

What's New Reference

A Consolidated Reference To Investor/RT Enhancements Through Version 11.2.8

This document is a compilation of all the “What’s new” since Investor/RT was introduced. It is not meant to be a “manual”, but a guide to help you find helpful information about Investor/RT and its enhancements. It is in reverse chronological order, from the most recent “What’s new” to the oldest. You may search this document by:

1. Clicking on the section in the “Table of Contents” that you would like to see, or
2. Doing a word search. Type Ctrl F, and enter a word or phrase.

Listed in reverse chronological order from the most recent release through version 1.5
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Historical Data Backfill Automation

Investor/RT has long featured automated backfill at startup, designed to backfill historical data since the date/time that the data feed was last stopped. Backfill is now automatic and has been enhanced to fill in any historical data per symbol for all trading that has occurred since the last trade recorded in the local database. In prior releases, Setup: Preferences: Backfill allowed user control on whether to auto backfill or not, whether to auto backfill all intra-day symbols or just those open in charts. Version 11.2 eliminates these choices and performs all necessary backfill on all symbols that the user has marked for intra-day data retention. Symbols that are open in chart windows are backfilled first; other intra-day symbols are then backfilled in the background but this activity will not interfere with real-time data reception or open chart windows. The improved backfill automation does what is necessary to ensure that all intra-day symbols' historical data will be complete and up-to-date each time you start the program and connect to your data source.

Improvements have also been made to automate historical data management. For example, a symbol setup to retain say 30 days of intra-day data may be charted using a chart setup that calls for say 100 days of data. Investor/RT will recognize situations like this, automatically download the extra data needed to fill the chart request and automatically adjust the setup of the symbol to retain that newly downloaded data. In the event that a chart calls for a static begin date/time, data is downloaded back to that begin date and the symbol is automatically setup to "Retain All 1-Min Data". This option to retain all 1-minute data is new in this release. When this option is in effect for a particular symbol, the 1-minute data for the symbol will be retained, unlike other symbols whose data is trimmed each day to retain only a fixed number of days on the local historical database. While this is not recommended, you may opt out of this chart driven backfill and automatic retention setup, by setting configuration variable `DataRetentionAutomation` to false in Setup: Configuration.

The improved automation of historical data management will be a welcome improvement for the vast majority of Investor/RT users. Nevertheless, we recognize that some users, perhaps those who track many hundreds of intra-day symbols, may wish to opt out of these improvements in order to exert more control over when data is downloaded. This can be accomplished by going to Setup: Configuration and setting the variable `BackfillAutomation` to false. Doing so will enable Setup: Preferences: Backfill to be used to manually control the auto fill process as in prior releases. During the download process, prior versions would output detailed diagnostic messages to the message log for each symbol backfilled. These messages are now suppressed. If you miss them, or wish to diagnose the data downloading activity for some reason, then a configuration variable named `HistoricalDownloadDiagnostics` can be set true to turn on detailed logging of every download request.

Volume Price Statistics Indicator (VPS) Improvements

A new result was added to the VPS indicator titled "Average Price" which simply takes the average price of all ticks/trades that occurred within the bar.

A new check box "Normalize (% of Total)" was added for the Statistic "Volume and Price" which computes a normalized result as a percentage of the total volume of the bar. This allows the user to compute statistics such as what percentage of volume within the bar was traded above the close of the bar. In addition, a price of "VWAP" was added to the "Volume and Price" statistic, in addition to close, high, low, and VPOC, allowing the user to access the amount of volume that traded above or below the VWAP of each bar.

Profile Indicator Improvements

A new check box option "Dev VA" was added to the Profile Indicator. This option allows the user to plot the developing Value Area High and Low for each profile. This developing VA allows the user to see where the VAH and VAL lines were at the close of each bar historically, and therefore see how price reacted to these values. This new option is in addition to the "Dev VPOC" feature that has been available to the Profile Indicator for some time.

Object Manager Improvements

The Object Manager now has a setup preferences window to customize the behavior of this centrally important window in Investor/RT. Choose Setup > Preferences > Object Manager, or right-click inside the Object Manager window itself to view this preferences panel. The preferences include all settings that formerly were available in Setup > Configuration as configuration variables. A key new feature is the ability to provide Investor/RT with a user-specified list of selected object types if desired. For example, if you use the Object Manager to select charts, quote pages and custom indicators during everyday use, then you can setup the Object Manager to offer only those three object types. This eliminates the clutter of object types that you only occasionally or never use in practice. If at anytime you wish to switch back to viewing the comprehensive list of all types of objects, right-click in the Object Manager window, click the "Show All..." radio button and click OK.

When the Object Manager window is resized narrow, the list of object types and object names are stacked instead of being side-by-side as they are by default. When the two lists are stacked, drag the divider line between the two list boxes to adjust the proportion of the window devoted to object types versus object names. If the room for the Object Type list becomes very small, Investor/RT revises the user interface to show the current object type as a menu button, a single line you can use as a menu to select the object type. This enables most of the window height to be used to display the names of the selected object type. Drag the divider line downward and the list of object types becomes a list box again.

Scrolling Charts Using Buttons

Investor/RT has long had a button "purpose" to Scroll Chart. The setup of such a button is a scroll code, the letter L (for left) or R (for right) followed by the number of bars to scroll left or right, e.g. a button setup with scroll code L25 will scroll the chart left (back in time) 25 bars. The bar count can be a number of bars less than 4096. Scroll codes LDAY and RDAY (abbreviated LD and RD if desired) are now available for scrolling an intra-day chart left or right one day (session) at a time. Any date and optionally a time can also be specified in the format mm/dd/yyyy hh:mm:ss. Buttons setup with specific dates (and times) will scroll the chart so the specified date/time bar is at the right edge of the chart. Finally, buttons with purpose "Scroll Chart" now recognize when the chart containing the button is setup for multi-link scroll (or multi-link time sync) and propagate the scrolling operation to associated charts as applicable.

New Annotation Tokens %MSG and %SESNAME

The token %SESNAME can now be used in the text of an Annotation indicator to display the name of the session currently being used by the chart. The session of the chart can be changed, for example, by pressing the comma key when the chart is active. When the session changes, the annotation will update to reflect the current session name. An Annotation indicator setup with %MSG in its text will show the most recently issue message displayed to the message area of the main toolbar.

Using Plug-in Indicators in Paintbars, Signal Markers, Color Markers

The Investor/RT Software Developer Kit (SDK) has long enabled C/C++ developers to write technical indicator plug-ins to extend Investor/RT functionality. Plug-ins can compute custom indicators in C/C++ or they can compute signals that tell Investor/RT whether the plug-in's signal is true or false for each bar in the chart. Plug-in indicators can be used inside RTL custom indicators and signals as well. In fact, one way to make a plug-in's indicator results or signal results available to the Paintbars, Signal Marker, and Color Marker indicators is to reference the plug-in from a simple RTL formula and then use that RTL custom indicator in the Paintbars and Marker indicators. Version 11.2 offers a more direct way. In the setup for Paintbars, Signal and Color Markers, you may now specify that a specific plug-in is to be the source signal or indicator. This approach is more efficient, eliminating the need for RTL purely as a way to make the plug-in results visible to these indicators.

System Defined Quotepage ".Unreferenced"

Investor/RT now keeps track of the date/time that historical data of any kind was last referenced for each symbol. Historical data is referenced when you open or backfill a chart, or when a custom column operates in a quotepage, or when a scan is run on the symbols of a quotepage. This date/time of last reference can be seen by adding the column named "Hist Accessed" to a quotepage. You may then sort the quotepage on this column to see the most recent or least recently referenced symbols among those you are following. The RTL token HIST is available; HIST is defined as the number of full hours that have elapsed since a symbol's historical data was last referenced. For example, the RTL scan: HIST > 72 will show a quotepage of all symbols whose historical data has not

been referenced during the most recent 72 hours (3 full days). Scanning using the HIST token requires Investor/RT with RTL license. Users without RTL access can open the system-defined quotepage named ".Unreferenced". This quotepage by default lists any symbols whose historical data has not been referenced in the past 5 days. You can revise the meaning by adjusting that configuration variable UnreferencedSymbolDays. This variable defaults to 5 days. These tracking features are added to enable users who follow a great many symbols to easily determine which symbols have not be referenced recently. The .Unreferenced quotepage could be used to delete the entire list of symbols for example.

Starting/Stopping Playback with Schedules and Keyboard Shortcuts

Schedules can now include actions: Start Playback and Stop Playback. A schedule can be assigned a keyboard short and that keyboard shortcut can be assigned to a chart button to, for example, have a Start Playback button in a chart.

New MPH Result: Touched Over Period

A new result option was added to the Multiple Price Highlighter (MPH) Indicator for highlighting prices "Touched Over Period". When this highlighting option is selected, the user specifies a look back period, and a number of bars that must be touched over that period. For instance, if a user specifies a period of 10, and a touch period of 5, then all prices who have been touched at least 5 times over the last 10 bars will be highlighted. This option complements the "Consecutive Bars Touched" option which requires all bars to touch over the period specified. These options allow user to quickly identify prices that are frequently returned to over a given period.

Investor/RT SDK

The SDK Version 11.2 has been enhanced to support an improved API for C++ developers while maintaining upward compatibility with plug-ins developed in earlier versions of the SDK. The new SDK supports an extended API for doing custom drawing of text, lines, and shapes by the plug-in. Interested developers who wish to use the SDK contact support@linnsoft.com for more information. The SDK has been updated as of Investor/RT Version 11.2.7; contract support@linnsoft.com to request the updated SDK. Investor/RT is backward compatible with all SDK updates since Version 10.0

Custom Column Persistent Data

A major enhancement to custom column calculation speed is now available. When this feature is enabled for a particular custom column, the custom column will maintain data and indicator calculations needed for all instruments in the quote page. This data is maintained real-time as new bars are formed; it serves to keep the custom column calculating continuously for each row in the quote page. When persistent data is not used, custom columns load data when needed, calculate, and discard the data per symbol each time the column calculates. This enhancement eliminates this

inefficiency, enabling a custom column to calculate continuously real-time. The persistent data will use memory and processing resources proportionate to the number of symbols in the quote page. The Calculation Tab of the custom column setup is where you specify whether to use Persistent Data or Load Data As Needed. When Persistent data is selected, the Type tab of the setup for custom columns allows the user to specify how much data should be loaded for the custom column, expressed as some number of days, or from all data from some starting date to present. The default for all existing custom column upon upgrade to Version 11.2 is the Version 11.1 behavior of loading custom column data as needed.

Investor/RT Startup Manager

Investor/RT has long had an emergency startup mode invoked by holding down the SHIFT key while starting up Investor/RT. Version 11 now detects the SHIFT key at startup as a signal to open the Startup Manager window. The Startup Manager is also opened at startup if Investor/RT detects problems with the database during startup. The Startup Manager window enables the user to check the database, restore the most recent daily backup, or revert to any restore point that is available. Deletion of all historical data before continuing with startup is also available. When continuing with startup the user may elect to startup "working offline" so that no attempt is made to auto connect to the data source in use. There is also an option to continue startup without opening any layouts. The Startup Manager window is a big improvement over the prompting messages associated with the former emergency (shift key) startup.

Transact/Infinity now available as Brokerage Destination for Trading

The Data > Configure Data Source/Broker window now support TransAct Futures and Infinity Futures as brokerage destination. This enables "Trading from the Charts" for clients of TransAct/ Infinity. Transact/Infinity may be used as both data source and brokerage destination, or you can use DTN IQFEED or eSignal as data source and specify TransAct or Infinity as the destination for trading orders initiated from within Investor/RT. Whether you use Investor/RT exclusively to trade your TransAct/Infinity account and/or use your broker provided execution platform (e.g. TransActAT) to submit trades, all fills and working orders will appear in your charts while trades are in progress and an annotation showing your current market position appears in the upper right corner of chart windows.

Investor/RT now offers brokerage integration for all supported brokerages: TransAct/Infinity, Interactive Brokers, Rithmic (e.g. Optimus Futures), Zen-Fire (e.g. Mirus Futures). Via Investor/RT integration with MarketDelta Trader supported brokerages, Investor/RT brokerage integration is available for all brokerages using the OEC, CQG, Rithmic, and Zen-Fire order routing systems as well. These include Stage 5 Trading, Open E-Cry, AMP Futures, Mirus Futures, Optimus Futures, and others.

New Periodicity - Modified Renko

The Renko periodicity has been enhanced to allow the user to provide a reversal criteria in addition to a box size. In order to access Modified Renko in the periodicity control, simply check the Renko radio button and enter two values, the box size and reversal criteria, separated by an x (eg. 1x10). The number preceding the x, the box size, is specified in tick increments, and controls the size of the advancing Renko moves. The number after the x, the reversal criteria, specified in tick increments, is the move required, from the open, to result in a reversal. When the drawing style is Candle or Wickless Candle, a reversal box is automatically drawn on every bar showing clearly where price must move in order to create a reversal. A configuration variable titled ModifiedRenkoDrawReversal can be set to false in order to turn the reversal box drawing off.

Indicator Drawing Styles - Steps and Steps (U/D)

Two new drawing styles, Steps and Steps (U/D), have been made available to most indicators. These new drawing styles are very similar to the Stepped Lines drawing style that has been available for some time, except Steps does not draw the vertical lines connecting the Steps, just the horizontal ledges. Steps draws all horizontal lines the same color, while Steps (U/D) draws increasing values in the up color (first color) and decreasing values in the down color (second color).

Rectangle Tool/Indicator Improved

Several new options were added to the Rectangle Tool: Labeling Options, Repeating Rectangles, and Solid Fill Option. Rectangles have always been labeled with Bars x Range. Now, in addition, the user has the option to label with Date, Day of Week, Time, or no label at all. Users now also have the option of repeating the rectangle at the same time every day or every week. This enables options the user to wrap a rectangle around a particular session, the initial balance, the first session of the week, etc. And a new "Solid Rectangle" option allows the user to fill in the rectangle, thus highlighting the background of boxed area.

Watermark Indicator Improved

Custom Watermarks may now be added to the chart background using RTL tokens to produce the watermark text. For example, the custom text "%TICKER %PERIOD" will produce a watermark showing the ticker symbol and periodicity of the instrument in the chart. %PERIOD is the short periodicity description, e.g. 30m, while %PERIODICITY produces the longer periodicity text, e.g. 30 Minutes. These two new tokens may also be used in annotation texts to show the periodicity.

Improved Method for Adding Futures Contract Symbols

Investor/RT 11.2 now maintains a list of widely followed futures contract types specific to each market data source the product supports. This list can be seen at any time for the data source in effect using File > Functions > Add Futures Contracts. The Add Futures Contracts window shows the list, sorted alphabetically by the name of the contract. This window provides access to the details of

each contract type; select one in the list and click the Details... button. If you follow futures not seen in the list, you can set these up manually by clicking the New... button. The Add Futures Contract window shows the contract months for the selected contract type; check/uncheck the months and click "Add" to add the contracts you wish to follow to your Investor/RT symbol list. The Setup: Instruments (Alt+A) window has also been enhanced to offer quick access to the Add Futures Contract window to enable you to lookup and/or add contracts as needed. In the Setup: Instruments window, click the magnifying glass icon (help tip: Lookup/Add Futures Contract) to bring up the Add Futures Contract window. Setup Instruments also has a built-in safe guard to alert you should you attempt to enter a futures contract symbol whose future type is unknown. For example, if you are using IQFEED as data source and you enter the futures symbol ESU3, Investor/RT will alert you that ES is incorrect for IQFEED (the message will inform you to use @ES along with a two digit year). Similarly if you are using MarketDelta Trader as data source (with say OEC order routing) and you enter a symbol EUZ3, Investor/RT will alert you that EU is an unknown futures type for MarketDelta Trader. The Add Futures Contract window will open automatically. There you will see immediately that Euro FX Futures use the 6E futures type, not EU. You may add your contracts there, or dismiss the window and enter 6EZ3 to correct the symbol and the Setup: Instruments window will add the symbol.

Improved Crosshair Date/Time Display

For Windows users, the display of date/time on crosshairs has been improved to honor the user-specified Date Format in Setup > General Setup. In the past, crosshair dates were shown in month/day format. If you prefer to see dates with the day first, e.g. 3-Oct instead of 10/3 make your selection in the General Setup window. When the crosshair is positioned within the present trading day in intra-day charts, the crosshair will show only the time. When the crosshair is positioned on a prior date within the last 30 days, the month and day is shown in the user preferred format. For any dates in the more distant past, the full month, day and 2-digit year is displayed. Daily, weekly, or monthly chart crosshairs show the month, day and year, using the Date Format selected in General Setup.

New Price Sources For Technical Indicators

Forty three technical indicators, including some key indicators such as Session Statistics, MA, MACD, MPD, and RSI allow the user to specify the price type (source) upon which the indicator is to perform its calculations. Price types include Close, High, Low, Volume, H-L Range, and a number of others. In Version 11.2.5, 11 new volume-related price sources are available for analysis by these 43 indicators. The new price sources include VPOC (Bar), VWAP (Bar), VWAP (Day), VWAP (All), Delta, Cum Delta (Day), Cum Delta (All), Buy Volume, Sell Volume, Ticks/Trades, Max Price Volume, and Average Size. These new options enable powerful new possibilities for technical analysis: A Moving Average of Cumulative Delta, the Highest High of Session of VWAP, and many more. Previously, such analysis could sometimes be done only by creating custom indicators in RTL. The new price types are not only easier to setup but they calculate more efficiently as well. Two additional price sources, VPOC (Day) and VPOC (All), are under development for near term release.

These new price analysis features require the Investor/RT Professional Edition license. Investor/RT Standard Edition users can use File > License... and click the Revise License button to upgrade to the Professional Edition to enable these indicator price types.

Time-Shaded Profile Drawing Option

A new drawing option has been added to the Profile Indicator titled "Time-Shaded" which paints the volume different time periods of each profile different shades or colors. The time division is dependant on the duration of the profile. For instance, one day profiles are broken down into overnight period (gray), opening range (yellow), initial balance (green), late morning (red), early afternoon (purple) and closing period (blue). Weekly profiles are divided into days. Monthly profiles are divided into weeks. Quarterly profiles are divided into months. Yearly profiles are divided into quarters. When Time-Shading is turned on, several color options are available including Rainbow (default), Grey scale, Red, Green, and Blue. Users may also toggle quickly amongst the profile durations mentioned above by selecting the Profile Indicator and then using ctrl+shift+up/down arrow keys on the keyboard.

Miscellaneous 11.2 Fixes and Improvements

- Session Statistics Indicator (SESST) duration "Quarters" is now available.
- Volatility Stop Indicator (VSTOP) - Added the option to "Use High/Low" price instead of considering only the close when computing the VSTOP.
- The right-click menu for the small scale button in multi-pane charts now includes a choice to set instrument range based scaling (RI).
- The Download Data window now presents a simple selection list of periodicities for downloading ticks, minute bar data, daily, weekly, monthly data.
- The RTL token SETTLE (settlement price) is available once again. It was unavailable in the prior version due to a bug.
- The Fibonacci Arcs indicator was enhanced to allow the begin and end dates to be expressed with "use price" or "use variables": two options which have been available for the Fibonacci Retracement Indicator for some time.
- A new result titled "Matches" was added to the Statistics Indicator which computes how many values match the current value over the period supplied.
- Custom Instruments, when used to sum two or more instruments, now are properly assigned a bid, ask, and volume representative of the action of the underlying

instruments. When a trade on a component goes off on the ask, a trade on the custom instrument is assigned, on the ask, with a volume matching that of the size of the trade of the component. This allows delta analysis on summations in addition to differences (pairs).

- A new duration of "Quarters" was added to the Session Statistics Indicator.
- The Download Data window now provides a listbox for periodicity instead of a periodicity control. The listbox provides download options of Tick, 1-Minute, Daily, and Monthly.
- The Zig Zag and Zig Zag Oscillator Indicators were both optimized to calculate much more efficiently as new ticks flow into a chart.
- A new OHLC Candles drawing style was added to the EquiIndicator.
- File > Functions now has a function for accessing the Yahoo! Finance stock screener.
- File > Functions now has a function for adjusting the price level of all specific-price reference lines for some symbol by a fixed +/- amount. This function may be useful when rolling over to a new futures contract month to adjust all reference lines to new levels that reflect the greater time premium reflected in the new front month.
- Setup > Keyboard Shortcuts has an improved user interface. The menu of shortcut keys at the top now shows all existing shortcuts and all function keys that are not presently being used. This enables immediately selection of an existing shortcut for editing and easier selection of vacant key to add a new shortcut.
- The RTL setup window can be used to create formulas for custom indicators, signals, and scans. When you use File > New > RTL Object..., the window opens, primed to create the same type of formula you last created/modified. To make it clearer which type of RTL object (scan, signal, custom indicator) the formula entry box will now contain a comment, e.g. . You may delete the comment text or use it to add your own descriptive text with the comment delimiters. Use the radio buttons at the top of the window to pick a different type of RTL object when needed. Certain lists and buttons are color coded as additional visual feedback when you are using this window to work on custom indicators (light blue), signals (light green), or scans (light yellow). Configuration variables are available in Setup: Configuration to disable the comment block and color coding if desired.
- Setup > Keyboard Shortcuts can be used to create shortcuts to "Open > Custom Indicator > New Custom Indicator..." or "Open > Signal... > New Signal" or "Open > Scan > New Scan...". These function key shortcuts open a new RTL setup window, primed for entry of the designated type of RTL object. File > New > RTL Object

(Shortcut Alt+R) does the same thing, but the type of RTL Object primed is based on the most recent type of RTL object created or modified.

- The Session Statistics Indicator now has a custom duration option to allow the user to specify the begin and end date/times for the statistic being computed. This is turned on by choosing "of the Custom" just below the price control. This option has been enhanced in two ways. First, if the width of the pen used to draw the indicator is greater than 1 pixel, then the line is drawn in the specified thickness for the period specified, then drawn thinner from the end of that period to the right edge (current) of the chart. This allows the user to clearly see the period on which the statistic is operating. Also, the user may select the indicator and use the arrow keys to adjust the start and end date/times. Using shift+left/right arrow will adjust the start date/time by 1 bar at a time. Using the ctrl-right/left arrows will adjust the ending date/time by 1 bar at a time. This allows you to quickly move the end points of the indicator without having to reference the preferences and adjust the date/time control.
- The Market Profile Info Box now shows the delta above and below the price of the cursor within each profile. The Info Box has always shown the volume above and below the cursor, but now it shows both the volume and the delta above and below.
- The Session Statistics Indicator was enhanced with an option to store the current value of the indicator into a User Variable (V#). This feature has long been available for custom indicators. With this option accessible directly from the Session Statistics Indicator, there is no longer a need to create a custom indicator with syntax SESST to achieve this.
- A configuration variable titled DashedProfileBorders was added to control how the borders around the Profile Indicator are drawn. The Profile Indicator has always drawn a dotted rectangle around each profile to identify the period that is being profiled. If DashedProfileBorders is set to TRUE (the default) then that behavior continues. When set false, a much more subtle border is drawn, highlighting only the corners of the rectangle; the dotted rectangles will still appear when the Profile is selected. Selection occurs by tabbing to the Profile Indicator or clicking the border around the right-most profile.
- A duration option was added to Session Statistics, titled "SubSession"; when SubSession is chosen, the indicator computes its statistic on a session which may be a subset of the session of the chart. For example, this makes it easy to compute the high of the day session on a chart of the full Globex session. This has always been available by using "Ignore First X Minutes". The SubSession duration is simpler, eliminating the need to compute the number of minutes in the overnight session.
- A configuration variable titled MaxMinutesPerTimeBar was added. Any minute bar chart with the number of minutes greater than MaxMinutesPerTimeBar will simply

split the session into two bars, one built from the first MaxMinutesPerTimeBar and the second built from the remainder of the data for the session.

- Four new columns were added to the exported data of the Zig Zag Indicator: Average Size, Trades, Slope (degrees) and Waves. This information is exported per leg (or trendline) of the Zig Zag. These will appear when exporting the Zig Zag Indicator data alone from any chart.
- When saving RTL objects, e.g. a signal or custom indicator associated with a paintbars indicator, a bug was fixed so that the paintbars drawing updates immediately in all charts affected by the revision of the RTL object.

Investor/RT 11.11.1 Release Date: April 18, 2013

MPD Indicator - Mix Sessions

The MPD (Mixed Periodicity Indicator) now enables historical data analysis using a session that differs from the session in use by the chart in which the MPD operates. This improvement enables, for example, calculating historical session highs and lows using an overnight session, and display of these overnight determined values in a day session chart.

Floating Window Maximization

A floating chart window can be maximized by double-clicking its title bar. Improvements were made for Windows users to position the maximized window based on the dimensions of the monitor on which the window resides. Consideration is given to the Windows Task Bar location and size. The task bar could be at bottom, top, left or right side of the main display, or it can be set to auto-hide to enable the monitor to be fully used. Investor/RT will maximize float charts and other windows to fit the available dimensions of the monitor. In the special case where the main Investor/RT task window is maximized on a particular monitor and floating window is then maximized to that same monitor, consideration is given to the Investor/RT main toolbar state. If the main toolbar is anchored inside the task window, maximized float window will be positioned just below the main toolbar utilizing the full dimension of the display below. This works very well when the main toolbar is setup in "Slim" mode with the layout toolbar to its right. If the main toolbar is floating however, maximized windows will be positioned just beneath the Investor/RT menu bar. These maximization improvements apply for floating charts, quote pages, portfolios, RTL setup windows, and text windows, e.g. the message log.

Email Alerts with Chart Image Attachments

The emailing subsystem built into Investor/RT has been enhanced to support outgoing mail with file attachments. This functionality has been used to extend Investor/RT features in meaningful ways.

Signal Actions have long been able to send outgoing text alert messages when user-defined signals fire in real-time. Now you can setup a signal action to include an image of the chart that produced the signal along with the alert message. The Investor/RT Scheduler (see File > Functions > Scheduled Events) has a new action "Email Chart" that can be used to setup Investor/RT to periodically email the image(s) of particular chart(s) to a specified email address. Finally, the Share Picture feature of Investor/RT has been extended to enable sharing of images with a specified email recipient. Choose Share Picture, and in the ensuing dialog box, choose to share by email or with Charthub.com. When sharing by email, you may select the share the image with or without attaching the definition, or you may share the definition alone. The sharing dialog prompts for an email address. A menu is available with the user's own email address and Investor/RT support. The File > Share command can now be used to send chart image and/or definition to support to request assistance or report a problem.

Multi-Pane Chart Aesthetic Enhancement

Several aesthetic enhancements were made for multi-pane charts. Two gradient background drawing styles were added: Radial Circle and Radial Square. These are available in the Colors tab of chart preferences. Formerly, solid background were the default with a gradient option, now called Linear Gradient. Radial gradient backgrounds use the two user-specified gradient colors to draw a gradient fading from the first color to the second in a radial direction starting at a location in the upper left quadrant of the chart.

A new "Scheme" listbox has been added to the Colors tab to facilitate setting up color preferences from pre-defined color schemes. Additional schemes may be available in future product releases. Presently, there are six schemes:

Dark Background, Grayscale
Dark Background, High Contrast
Dark Background, Low Contrast
Light Background, Grayscale
Light Background, High Contrast
Light Background, Low Contrast

Users who prefer a dark background, for example, can select one of the dark background color schemes. Selecting a scheme will adjust the background, grid line, candlestick and bar colors. You can apply the scheme "as is" to your chart, or you can adjust the color hue of the background to your liking before applying the scheme. To adjust the background hue, click on the background color control. Select an alternate color hue by clicking inside the color spectrum box that appears. The grid line and scale text colors will be adjusted to contrast with the selected background color when you apply. After you select a color scheme you may wish to also choose a background style. There are 4 choices:

Solid
Linear Gradient
Radial Circle

Radial Square

The background and color scheme selections operate in tandem, i.e. each of the four background choices can be used with any of the six color schemes. To facilitate testing these color scheme/background combinations, each choice you make from either list while holding down the shift key will be applied to the open chart immediately. Keep the shift key held down as you change background or color scheme and the chart will update to show the effect of each selection. Once you have a combination you like, you may then further customize color settings and click Apply or OK to update the chart.

Candlestick drawing has been improved to render the candlesticks symmetrically. Equal amounts of the candle body extend outward from both sides of the candlestick wick. Even when candles are zoomed down to 1 pixel wide, they continue to depict the open/close relationship and candle color. Formerly, the candlestick's visual portrayal of price action was lost or diminished at very small candle widths.

Investor/RT Version 11.1.6, Released: March, 11 2013

Simplified Menu System

Investor/RT 10.7 brings a greatly simplified user interface to the product. Where possible, redundant and unnecessarily detailed menu items have been eliminated. Our objective is to simplify the menu system for every day usage while preserving access to all of the powerful functionality that is under the hood. Key to this revision is an expanded role for what we now refer to as the Object Manager, formerly known as the Object Editor in prior versions of Investor/RT. This window has been considerably enhanced to serve as a central place for creating, opening, and organizing Investor/RT objects -- charts, quote pages, custom indicators, instruments, etc. The File Menu now has simplified New and Open submenus. File: Open: Object Manager is accessible there or by its Alt+O (O for Object Manager) shortcut. The main toolbar default button set includes the Object Manager button as well - the icon looks like a folder opening to convey that this window can be used to open just about anything you have setup in IRT: Charts, Quote page, Signals, Text Files, etc.

Using the Object Manager

To open the Object Manager, click the Object Manager icon on the main toolbar or select the Object Manager menu item from the File: Open Menu. The keyboard shortcut is Alt+O. The Object Manager is a window that shows lists of all of the "objects" you have setup in Investor/RT: charts, quote pages, layouts, etc. Select the type of object you are interested in at the left; the names of the objects of that type will appear to the right. Buttons at the far right enable you to delete, rename, export or open one of more object names selected in this list. Only the action buttons that apply to the type of object select will be visible. For example, when Layout is the selected type, the New button does not appear since Layouts must be created using the Layout Toolbar.

You can select a name by clicking on it, select a range of adjacent names by clicking on a name and then Shift-clicking a name anywhere above or below it in the list. You can also select non-adjacent names in the list by Ctrl-clicking each name you wish to select. You can use the mouse wheel to scroll through the list of names. The names are listed alphabetically. You can type a letter on the keyboard to position the list of names to those beginning with that letter. After making your selection(s), click one of the action buttons to open, delete, rename, or export the list of selected names. For convenience a Select All button is available, e.g. click Charts, then Select All, then Export to export definitions of all of your charts.

To create a new object

To create a new object of some kind, first select the kind of object, e.g. Chart, and then click the New button. The Chart Wizard window will open for creating a new chart. The New button works in analogous fashion with other object types. Presets are a special case. Technical indicator presets are listed when you select Preset as the object type. Presets are listed by indicator, e.g. signal action presets (ACT) are listed first, followed by other presets you may have for any number of different indicators. If you wish to create a new preset, first select the kind of preset you want by choosing an existing one for that indicator, then click the New button. For example, to create a new moving average preset, first select any existing MA preset and click New. Presets can also be created directly from any indicator in a chart by opening the indicator's preferences and choosing "New..." from the Preset menu.

Double Click of Mouse

Double-clicking the mouse on a type of object is a shortcut for selecting that object and clicking "New". Similarly, double-clicking on the name of some object, e.g. a chart name, will open that chart. Both double-click actions will also close the Object Manager. If you wish to open more than one object of some type, Select a name, click Open, select another name, click Open, etc. Click Done to dismiss the Object Manager or press the Esc key on the keyboard.

Object Manager Move & Resized

The Object Manager may be moved and re-sized to your preference. The size and location of the window is noted when the window closed. The window will reopen at the same size and position and object type selected when you last closed it. When you resize the Object Manager narrow, the two lists (Object Types and Object Names) are stacked vertically. When stacked, you may use the mouse to adjust the portion of the window devoted to either list by dragging the divider line between the two lists.

New Recent Checkbox

Certain object types such as charts, quotepages, and RTL objects give you the option to check mark a Recent checkbox. When checked, Object Manager shows the most recent objects referenced for the selected type. See Setup: Preferences: Groups to control how many recent

objects are maintained. When viewing sessions you may elect to view All Sessions or uncheck the All Session box to view only the sessions you have assigned to instruments.

Using the Advanced Functions Window

Use File: Functions to open the Functions window. Search for functions using a key word or phrase; select a function and click "Go" to perform the function. Some items in the function list are there because they are seldom needed and do not warrant inclusion in the menu system. Others are included to make them discoverable or more accessible than they would be otherwise. Press Esc or click the Cancel button to dismiss the window without performing a function.

PredictionPoints (External Data Indicator).

The External Data Indicator (EDI) now provides support for Prediction Points. Prediction Points are highly reactive price levels the market has a high probability of reacting to if it gets up to or down to a specific Prediction Point price. Prediction Points is a subscription service from Prediction Point Trading, LLC. Subscriptions are available for the E-mini S&P 500 ES and the Russell 2000 Mini (TF) futures. See www.predictionpointtrading.com/faq.html for more information.

Data Connectivity Improvement

For all real-time configurations, Investor/RT Version 11 automatically starts and maintains connectivity with the configured market data source and brokerage destination. If connectivity is lost due to external reasons, e.g. internet outage, Investor/RT will automatically attempt to establish connectivity until it is restored. If you stop the data connection manually or engage "working offline" mode using the Data Menu, Investor/RT will continue to perform on demand historical data downloads, e.g. from DTN MA historical service. While working offline, the main toolbar heartbeat icon will show "Off". To resume live data reception, issue the Start Data command or turn off the Working Offline check mark in the Data Menu. The key conceptual change versus prior versions is that whenever data feed connectivity is lost, the software is now programmed to try repeatedly to reconnect without user intervention. Data connectivity is automatic at start up, is maintained continuously, restarted automatically. If you wish to use the software without connectivity to a live market data source, choose "Work Offline" from the Data Menu. Choose Work Offline again (while it is checked) to leave offline mode and resume normal automatic connectivity.

A configuration variable can be used to turn off this new automatic connectivity method. Go to Setup: Configuration... and set AutoConnectToData=false. When false, Investor/RT will start and stop data flow based strictly on user command. In this mode, a connection at startup is a user option in the Data-->Setup feed-specific settings. There will be no automatic attempts to restore connectivity in this mode of operation.

Date Numbers in RTL

Date numbers in RTL formulas are numbers of the form YYYYMMDD where YYYY is the number of years since 1900, MM is the month and DD the day. Dates in the current century are hard to read, e.g. 1121115 specifies Nov 15, 2012. Version 11 now accepts date numbers in more traditional 6-digit or 8-digit form and handles them correctly internally.

When the date is a 6-digit number of the form yymmdd and mm and dd are proper month and day numbers, yy values of 30 and higher are interpreted as mm/dd/19yy. When yy is 00 thru 29, the date is interpreted as mm/dd/20yy.

When the date is a 8-digit number of the form ccymmdd and cc is either 19 or 20 and mm and dd are valid month and day numbers, the number is interpreted as mm/dd/ccyy.

All Windows Float

Floating windows have long been an optional feature of Investor/RT whereby selected charts, quote pages, time & sales windows, etc. could be designated floating to enable them to be positioned independently of the main Investor/RT task window. Version 11 has been enhanced to improve handling of floating windows whether they reside within the main task window or not. For example, the Window-->Next Window menu item (Ctrl+Tab) shortcut may now be used to tab sequentially through all open windows, including floating ones, bringing each one in turn to the front. With these improvements it is no longer necessary to draw a distinction between floating and non-floating windows. Non-floating windows are in fact disadvantageous since they can never rise above any floating window covering them. For this reason, Investor/RT 11 now floats every window unconditionally. Any open window can be left within the IRT task window or positioned on other monitors as desired.

Investor/RT floating windows have a narrow title bar without minimize and maximize buttons, only the close button. You may double-click the title bar to alternately maximize and restore a window to normal size. You may right-click on the title bar as well to access minimize/maximize/restore functions.

A configuration variable is available to opt out of this all floating windowing model. Setting FloatAllWindows=false will cause Investor/RT to revert to using floating windows only for selected charts, quote pages, as in version 10. We do not recommend that this legacy mode be used. If you decide to change this setting you should first close all windows using Window-->Close-->Close All Windows; then revise the setting in Setup-->Configuration; then File-->Exit and startup Investor/RT fresh in the legacy mode. Reverting to this mode may require window positioning adjustments. Position charts if necessary and save them and re save layouts. Conversely, if you run in the legacy FloatAllWindows false mode for a while and decide to return to FloatAllWindows true, close all windows, change the setting, and re start Investor/RT and adjust window positions if needed.

The Tile, Tile Vertical, and Cascade commands in the Window menu function well with the new all floating model. It is recommended that you run Investor/RT with the main task window maximized on one of your monitors and with FloatAllWindows set true. Any window can then be positioned on any monitor you wish. You could also elect to expand the main task window so that it spans multiple monitors. Moving to location of the main task window is not recommended. Your layout window locations are remembered relative to the screen location of the main task window. If you move your main task window to another monitor, your layouts may be affected.

QuoteBoard Improvements

Quoteboard indicators with "Plot Lines for Levels" checkmarked may now specify line drawing thickness and style. Access the QuoteBoard preferences and set these preferences using the provided color control. Line thickness and style apply to ALL lines for all levels. Each level may have its own unique color if desired.

Formerly, to have line levels drawn by the Quoteboard Indicator it was necessary to add the QB indicator to the same pane as the instrument and setup the QB as "hidden". This is no longer a requirement. Instead you may now add a QB indicator visibly to a chart pane other than the instrument pane. If the Plot Lines for Levels check is checked, the lines will be drawn in the pane where the instrument resides. This enables you to have a single QB Indicator in a chart to observe the visual presentation of the quoteboard and have access to the symbol selection feature of the quoteboard to update the charted symbol, while also drawing various line levels as reference lines for the charted instrument.

When a Quoteboard is setup to "Plot Lines for Levels", A checkbox titled "Compact Lines" controls how the lines are drawn. If unchecked (the default), lines are drawn across the full width of the chart. When checked, lines are drawn in a compact form, extending from the rightmost bar to the scale area at the right side of the chart.

Task Window Background Color

The Investor/RT task window background color may be customized by going to Setup: Preferences: General. Click the Task Window Color control at the bottom of the window and select a background color. Prior Versions of Investor/RT used a gray background color (RGB values 170, 170, 170). Using a light to medium blue color works well, try RGB values 100,166,215 for example.

Using a Button to Adjust Chart View Period

Version 11 chart buttons have a purpose "Set View Period Start". The setup for the button can be a date in mm/dd/yy (or mm/dd/yyyy) format or it can be a number of days, weeks, months, or years, e.g. use 100d to set the chart to start 100 days back from present. If you have various fixed start dates of interest, you can setup a single menu button with a comma separated list of dates, e.g. 1/1/2012,1/1,2011,1/1/2010. Clicking the button then gives you these date choices for your viewing period start date. Similarly a menu button can have a mix of dates and units back, e.g. "3 mo,6 mo,1 yr,3 yr,5 yr" setup will give you a menu of these five choices. The word day, week, month or year can be spelled in full or abbreviated, e.g. you will get a more readable menu using the setup: "3 months,6 months,1 year, 3 years, 5 years. The space between the count and the units is optional, the units are case insensitive, and only the first letter of the units is needed, i.e. 3m, 3 m, 3 M, 3Mon, 3 months all will set the viewing period three months back.

When using buttons with this purpose on intra-day charts, the view period starting date is changed and the spacing of the chart is not revised. If the chart is a daily, weekly, or monthly periodicity chart, Investor/RT will automatically adjust the pixels per bar so that the resulting bars fit into the chart

window pane. This enables you to quickly click through 1 year, 3 year, 5 year buttons, for example, with no adjustment needed to show the full set of data for each button's associated viewing period.

When using the chart wizard to create a new chart window, check the check box at the bottom right titled "Change View Period" and the new chart will have a menu button with a variety of view period choices. Daily, weekly, and monthly charts produced by the wizard will have an array of common periods as push buttons (3 mo, 6 mo, 1 yr, 2 yr, 5 yr).

Save Picture Improvements

There are various way to produce an image of a chart, quote page, or any other window in Investor/RT. The File Menu has a File: Save: Save Picture menu item that operates on the front window to produce an image of that window. Right-clicking in a chart and choosing Save->Picture, or Export->Picture does the same. Clicking the + button at the upper right of a quote page window and choosing Save Picture produces an image of the quote page. Choosing any of these menu items while holding down the SHIFT key, causes the image to be opened by your web browser or by whatever program you have designated to handle PNG (Portable Network Graphics) files on your computer. Popular screen capture programs like Snagit can be setup to handle your PNG files, in which case, your Investor/RT images will appear in the Snagit Editor ready for annotation and printing if desired. In Version 11, the SHIFT key also applies when you click the "camera" icon on the chart toolbar (either multi-pane or Market Profile charts). The camera button is normally used the share images and definitions on charthub.com but with the shift key down, clicking the button opens the image in your browser/image editor instead. The same thing applies to the Print button that may appear on the main toolbar. Hold down SHIFT while clicking the print button and the image of the front window will be produced and opened for viewing/editing in your browser or image editing software.

Go to Setup: Preferences: Import/Export and select "Use the Object Name" instead of "Prompt for File Name". With this setting, your images will be saved instantly without prompting in the images folder and will open immediately in the designated browser/image program without any intervening file name prompting. If you prefer to name each saved image and save them in some other location, use the "Prompt for File Name" option.

Alt Key Shortcuts (Windows)

A number of Alt+Key shortcuts have been added for Windows users that may be useful. Alt+C is a shortcut for creating a new chart using the Chart Setup Wizard; Alt+L toggles the Layout Toolbar on/off; Alt+M opens the message log or brings the message log window to the front if the log is already open; Alt+P will print the front chart, quotepage, portfolio, or text window; Alt+P with SHIFT key down will capture a PNG image of the front Investor/RT window and open that window in your browser/imaging editing program (see item #11 above); Alt+T and Ctrl+T do the same thing - toggle all toolbars on/off; Alt+V verifies the database.

Database Restore Points

Investor/RT Version 11 uses archive files to create Restore Points. A Restore Point is a point in time when an archive file is created to preserve the state of the database at that moment. Restore Points

can be created at any time upon command by the user, or they can be created automatically using a schedule that runs daily or once a week at a specified time of day. This feature enables the user to take multiple "snapshots" of the database and easily revert the database to that point in time later.

External Data Indicator Enhancements

The External Data Indicator (EDI) has been enhanced to allow users to import their own historical daily levels from a local file or from a file on a web site. Users and educators often have key daily support and resistance levels that are computed or provided from an external source. These daily levels may now be maintained in text or csv files which are in turn linked to the EDI indicator. One user may create and maintain a single text or csv file on a web server, while many users access that file automatically from the EDI indicator. The user may provide up to 24 arrays of historical levels in a single file and a single EDI instance.

Resizing Chart Windows

The Window menu in Investor/RT now has a Minimize menu item, keyboard shortcut Alt+Minus. The Alt Minus shortcut minimizes the front window. Windows are minimized (docked) to the main display just above the task bar. This menu item is added to compensate for the lack of a minimize button on each window. Chart windows (multi-pane charts) can have chart resizing buttons using the Button indicator. Add a button with purpose "Resize Chart". Setup the button to either minimize, maximize, or restore the chart. You can also setup a chart button to size the chart to a specific width and height, e.g. 800x600 or 640x480. If you have a button pane in your chart, any Chart Resize buttons will be aligned at the right side of the pane, apart from normal buttons. This new feature is also designed to compensate for the absence of minimize, maximize, restore buttons on chart window title bars. Version 11.1.2 also fixes an issue where some windows would not fully maximize to the display.

Custom Indicators - Naked Lines and Shifting

Two options were added for Custom Indicators: Extend Naked Lines and Shifting. Extend Naked Lines allows the price of the custom indicator on each bar to be extended right with a horizontal line until it is taken out by the price of a future bar. The Shifting options allows the custom indicator values to be shifted left or right by any number of bars, and drawn into the future when shifted right.

When "Extend Naked Lines" is turned on, the user specifies whether he would like the naked value of all bars extended, or only those of the visible bars. In addition, the user may specify how many bars the value must remain naked in order for it to be drawn and extended. The "Extend Naked Values" feature naturally works best for prices that stay within the high low range of the bar, such as High, Low, H+L/2, POC, VAH, etc. This feature makes it very easy to see when price returns to a key price that was made at a previous time in a prior bar.

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Shift Option

The Shift option allows the user to shift the custom indicator values in either direction by any number of bars. When shifting the custom indicator to the right, the values are drawn into the future past the right-most bar. Shifting has always been a feature of the Moving Average indicator, but is now available to all indicator by enabling it within Custom Indicators. Also, the Moving Average shifting has never drawn into the future past the right-most bar. This drawing into the future is available now for Custom Indicators and Moving Averages.

Button Indicator Synchronization

The Button Indicator is commonly used to toggle indicators on/off in a chart or to initiate the drawing tool of a given indicator. In previous versions, when a button was created to toggle an indicator, and then the preferences (color, period, etc.) of the indicator in the chart were changed, the indicator and the button became out of sync, the button continuing to use the former preferences. In Investor/RT 11, when the preferences of the target indicator are changed, Investor/RT will prompt whether to keep the button in sync with the revised indicator settings. Choices are to "Always" keep the button in sync or "Never" do so, to avoid further prompting for this particular button setup. The Button Indicator now has an option to reflect these synchronization enhancements so you may specify when you create a button how synchronization is to be handled. Typically however, buttons are created automatically by right clicking on an indicator and choosing Add a Button. In this common case, the synchronization preference will be set to prompt. When the Button purpose is either "Add/Remove Indicator" or "Activate Drawing Tool Preset", the user selects from three options "When Indicator Preferences are Revised": Synchronize, Do Nothing, or Ask Me.

The Button Indicator was also improved to better reflect the location of the indicator when the button is created. If a user right-clicks on an indicator in the Instrument pane, and chooses "Add Button", the indicator is identified as being in the same pane as the instrument, and the Button

Indicator is setup with a position of "Instrument Pane (Back)" or "Instrument Pane (Front)", depending on whether the target indicator is currently drawn behind or in front of the indicator. This way, toggling the indicator off and on returns the indicator to the instrument pane and positions it relative to the instrument (in front of or behind) based on where it was when the button was created. The user may revise this preference by right-clicking on the button to edit its preferences.

Miscellaneous 11.1 Fixes and Improvements.

- When re-sizing chart windows, Trading Rule buttons are moved into the same relative position (percentage wise) within the newly sized chart window. This corrects a problem in version 10.6 where Trading Rule buttons positioned at the right side of a chart were no longer visible after re-sizing the chart appreciably smaller.
- For multi-pane charts containing multiple instruments, you may want to have a chart button that revises a particular instrument. Buttons that change the ticker symbol in a chart now consider which instrument the button itself is associated with in determining which instrument to update with the new ticker symbol. When a chart has multiple instruments, you may associate the button with any of them by right-clicking on the button and choosing Associate. As you change ticker symbols using the button, the button remains associated with the newly substituted instrument
- Charts containing the ZigZag Oscillator indicator setup with Fresh Start enabled were being imported with Fresh Start off. This defect has been corrected.
- Setup: Configuration window support various color options. To see all configuration variable of this kind, enter the word "color" into the find box. When a color variable is selected, you may now choose "Color Picker" to pick the color you want, rather than entering RGB values or choosing one of the built-in color settings available.
- Setup: Configuration window support various color options. To see all configuration variable of this kind, enter the word "color" into the find box. When a color variable is selected, you may now choose "Color Picker" to pick the color you want, rather than entering RGB values or choosing one of the built-in color settings available.
- Alert sounds for charts that are hidden because they are not part of the active layout may be muted by setting configuration variable HiddenChartsNoAlertSounds to true. This applies only to sounds emitted by signal action setups presently.
- ZigZag and Trendline labeling options now include End Price and Change
- A search message log feature has been added. You can access this feature from the message log window itself using the menu button at the upper left corner, or you can use File: Functions; select Search Message Log, enter a search word or phrase and click Go. IRT will then display a new window listing all of the lines in the message log that include that word or

phrase. You can, for example, search for the word "warning" or "error" to see if there are any warnings or error messages in the log. You can search for a particular chart name or ticker symbol to determine if there are any messages related to the chart or instrument.

- Within the Indicator Edit window, the Presets menu at the lower left of the window may now be invoked by clicking the Presets menu button or by clicking the word "Presets" to the left of button. Users with very high resolution displays may use this work around if clicking the menu button does not bring up the Preset menu.
- Configuration variable CustColBarRequirePct controls the percentage of the requested bars must be available for RTL objects to calculate Custom Columns.
- Set configuration variable ShowCountDownInScale to true to turn on the countdown label in the scale of multi-pane charts. The label shows how much time is left in the bar for time-based periodicities, how much volume for volume bars, how many ticks for tickbars, and how much range for range bars. It will only appear when Highlight Price in Scale is turned on for the Instrument. The countdown value is the same as you would see in an Annotation indicator using the %BARLEFT token.
- Three new results were added to the Volume Breakdown Indicator. "Delta Since High" will give the delta since a new high of the price bar was achieved. Any time the price bar makes a new high, the delta resets to zero and builds from there. "Delta Since Low" will reset each time a new low is achieved on the price bar and "Delta Finish on Price" will reset each time a new high or low is achieved on the price bar.
- The VWAP Indicator has a custom duration option titled "2 Day". This option has been renamed "X Day" and opened up to allow user to supply any number of days (up to 20). This result gives the user a moving X Day VWAP on each bar. For example, if the user choose "3 Day", the VWAP would consider the data from the current day in addition to that of the previous 2 days. This window moves forward one day at end of each session.
- The "General Tab" within multi-pane chart preferences allows the user to adjust the width and height of the chart in pixels. A menu of common W x H choices is now available there as well. Holding down the shift key when selecting from this menu and the chart size will be applied immediately to the open chart window. Choosing "Golden Ratio" from the menu adjusts the width so it is 1.618 times the height, the so-called golden ratio for rectangles.
- The Fibonacci Extensions indicator has been enhanced with a new "Draw Triangle" option. When this option is checked, a triangle is drawn between the three endpoints. Users may elect to turn off all retracement levels and use this tool as a method for drawing triangles in charts. In addition, a "translucent" checkbox will transparently fill the triangle.
- Each component of a custom instrument has a multiplier, usually 1.0. Users may now specify that the multiplier value is to be obtained from a user variable. When a component has a user

variable as a multiplier, the component's V# value will be used as the multiplier. This allows custom instruments that sum, spread, or ratio multiple symbols with variable multipliers. Multiplier values could be imported into the appropriate user variables each day, for example. If a referenced user variable is found to contain zero, the value 1.0 will be used instead. For example, the pair (spread) AAPL - MSFT * V#1 will be computed as AAPL - MSFT if V#1 of MSFT was not yet set, i.e. it is zero. V# variables may be entered manually into quote pages, so you can enter V#1 for MSFT of 10 and the custom instrument will begin computing as AAPL - 10 * MSFT.

- A memory leak was fixed in the Statistics indicator (RTL Token STAT). Users who routinely use STAT in RTL formulas, or refer to the STAT indicator in the Volume Breakdown indicator or MPD indicator, will notice a major reduction in memory usage by Investor/RT. This defect did not affect Investor/RT Version 10.6.
- When a chart has scale settings that call for Medium or Large font size, Investor/RT will expand the size of the price scale area by an incremental number of pixels. If you wish to control this incremental width, go to Setup: Configuration and set ChartScaleWidthIncrement to a value between 0 and 25. A value of zero will retain the same scale area regardless of font, as in Version 10.6. The default value is 8 pixels. Increasing this to say 12 will cause the axis area to expand by 12 pixels when the Medium font size is used, or 24 (twice the increment) when Large font size is selected.
- Two new results were added to the Volume Breakdown Indicator: "Max Ask Size (Live Only)" and "Max Bid Size (Neg) (Live Only)". These results will get the maximum bid or ask size achieved within each bar. These options can be especially useful in 2-tick range bars in which all ask trading occurred at the upper price and all bid trading occurred at the lower price. The Max Bid Size is presented as a negative number so it can be combined within the same pane with the positive Max Ask Size. These results work in live trading only as there is no history of the bid and ask sizes. When a chart is initially opened, there will be no data for these results. However, the data will form in the chart as fed by live action.
- Two new results were added to the Volume Price Statistics indicator: "Price of Upper X % of Volume" and "Price of Lower X % of Volume". These results compute the price at which X % of the volume of the bar is above or below that price. The user customizes the value of X.
- Version 11.1.4 for Interactive Brokers has a correction that enables downloading of historical data from DTN Market Access when Investor/RT is not connected to IB/TWS.
- Version 11.1.4 for DTN Market Access has a correction that enables auto backfill of charts at startup.
- Version 11.1.6 Corrects a problem with auto backfill of custom instruments and a problem with the Paint Bars indicator.

- A bug was fixed in the auto backfill that was skipping backfill of some symbols when "Backfill Symbols in Open Charts" was specified.
- When viewing lists of recent charts, quote pages, or RTL objects, the list of recently referenced objects updates dynamically as references are made to objects of the type in view. For example, if you are viewing recent Charts and you click New to create a new chart, or use File: New: Chart, when you save and/or close the new chart, the Object Manager will immediately show that chart as the most recent one
- A bug was fixed that was preventing outgoing email alerts from being sent.
- Multiple scaling was improved for custom indicators and plug in indicators to allow each custom indicator or plug in indicator in a pane to have its own scale. Former behavior was that all plugins or custom indicators shared the same scale. This allows a group of custom indicators and/or plug in indicators to be put into a single pane. Each one will utilize the full dimensions of the pane with its own unique scale. See configuration variables UniqueScalePerPlugin and UniqueScalePerCustInd to opt out of this improved handling of scales. If you opt out, then all custom indicators in a pane will share a common scale, all plug in indicators in the same pane share a common scale.
- DTN Historical Server downloading has been operating in a substandard fashion in recent releases due to revisions made to auto-backfill custom instruments when their component instruments are backfilled. These issues have been resolved in version 11.1.8.
- We continue to add new functions to the File: Functions window to provide more convenient access to features that may not be readily available via a menu item or a toolbar button. New items have been added for quick access to Market Depth and Level II windows for futures and equities. An Email Restore Point function has been added. The File Function window is now resizable.
- A new labeling option was added for Trendline and Zig Zag Indicators: Dollar Value Change. For futures contracts, this value represents the dollar change of each trendline based on the point move of the line and dollar value per tick.
- A "Transparent" check box has been added to the Shapes Indicator. It is available when the shape is setup to draw a Rectangle. This setting enables elements (bars, grid lines, etc) drawn behind the rectangle to be seen through the transparent shape.
- A "Transparent" check box has been added to the Price Bands Indicator. It is available when the band is set to draw a Historical Band. This setting enables elements (bars, grid lines, etc) drawn behind the band to be visible through the transparent band.
- A "Snap to Price" option was added to the Trendline Indicator preferences titled "Current Price". When Snap to Price is checked, and set to "Current Price", the endpoint of the

trendline will attach itself to the current price and the current bar. With the trendline labels turned on, this allows users to easily display the change in price from any point in the past, to current price. When labels are turned on, they will be offset to the right so they do not cover up the current bar. In addition, if multiple trendlines are using Current Price with labels, their labels will be offset vertical so all are visible. The labels will also be drawn in the color of the trendline so they are easy to distinguish.

- Font size adjustments (small, medium, large) in multi-pane charts are handled better. When the font size is revised in the chart preferences or the vertical scale preferences window, and all panes are synchronized to use the newly selected font size.
- The symmetrical drawing of candlesticks was improved. At smaller pixels per bar settings, such as 5, candles were touching each other. This has been corrected.
- The drawing of several Profile Indicator styles, including Streamers and Shaded Lines, was adjusted vertically by half a tick increment so that the profile properly lined up with the center of the price on the scale, and the drawing of peak, valley, and poc line.
- Fixed a bug in Profile Indicator that was forcing some equities, e.g. AAPL, GOOG, IBM, to be drawn with ranges of 0.10 or 0.25 per price regardless of custom range setting. For efficiency purposes, equities that trade above \$100/share default to range larger than 0.01 when "automatic" price per range is set. A custom range of 0.01 can now be used if desired.
- New Result "Average Price" is available in the VPS (Volume Price Statistics) indicator.
- New Result "Pivot Bar" is available in the ZZO (ZigZag Oscillator) indicator. The result for any bar is 1 if that bar is the first bar of a new leg of the zigzag, zero otherwise.

Investor/RT Version 10.6.9, Released: September 23, 2012

MarketDelta Trader Integration/Support for OEC/CQG Order Routing

Version 10.6 of Investor/RT will offer integration with MarketDelta Trader. MarketDelta Trader is a robust trading platform developed by MarketDelta LLC that supports CQG and OEC order routing systems. MarketDelta Trader can be used by clients of dozens of brokers as an execution platform and as a source of real-time streaming market data for Investor/RT. When used in tandem with Investor/RT, traders experience the combined benefits of a powerful charting and analysis platform with robust order management capabilities integrated with the charts. DTN Market Access historical service provides historical data backfill when MarketDelta Trader is the real-time data source and brokerage destination, or Investor/RT clients running DTN IQFEED or eSignal can employ MarketDelta Trader as the brokerage destination for trading orders. When Trader is setup as the brokerage destination, all trading activity is fully integrated with Investor/RT charting. An annotation shows the

current position, a reference line automatically shows average fill price when in a position and working order reference lines show profit targets and stop loss orders.

Trades can be initiated from MarketDelta Trader's Footprint DOM and/or from Investor/RT using predefined trading orders. Single click order entry, cancel, revise order are supported. Automated order management is provided by Trader with predefined profit targets, stop loss, brackets, trailing and break even stops.

Investor/RT 10.6 features a powerful Trading Rule indicator (see item #2 below) designed to operate in an integrated fashion with the order management features of MarketDelta Trader. A chart may have multiple trading rule indicators, each looking for a specific signal to fire in real-time. Trading rules have setups describing when each rule is to apply, e.g. when long or short or flat, and/or when position size is in some specific range. When an applicable rule fires, a specified trading order is sent. When MarketDelta Trader is the brokerage destination, the order is handled according to predefined automated order management setups. Once in a position, other trading rules monitor for conditions to extend or flatten the position when specific signals occur thereafter. Trading strategies can be tested using the trading simulator built into Investor/RT or using demo (paper trading) accounts with the broker to see how Trader's automated order management features manage the trade.

MarketDelta Trader can be used free of license fees in tandem with Investor/RT or as a standalone trading platform by clients of any OEC broker or any CQG-based brokerage using AMP Clearing. These include for example, Vankar, OEC Direct, Global Futures, AMP Futures, Daniels Trading and many others.

Trading Rule Indicator

This indicator is designed to facilitate testing of trading signals and auto execution of trading orders when a signal fires in real-time. [Click here](#) for a description of the Trading Rule Indicator, or go to Setup: Preferences: Technical Indicators, select the Trading Rule indicator to view its setup window and click the Help button at the bottom of the window. The Trading Rule Indicator is especially powerful and useful when employed with brokerage destination MarketDelta Trader due to the extensive automated order management features Trader provides for auto-initiated buys/sell from the Trading Rules in a chart. ...

Enhanced Support for Jurik Indicators

Enhanced Support for Jurik Indicators. Users of the Jurik Indicators may now use the Jurik built-in indicator to add any of the four Jurik indicators(JMA, RSX VEL, and DMX). Formerly, Jurik indicators were available only via the Plug-in Indicator. The Jurik Indicator features added functionality in that any of the Jurik indicators can now be applied to various pricing arrays not just the closing prices that are supported via the Jurik plug-ins. For example, you can plot the JMA of the Highs or the Lows, or the High-Low range. In addition, Jurik is now available for selection as a moving average type in the Investor/RT Moving Average Indicator. Thus the MA token in RTL can now be used to calculate a JMA. Similarly the MA token setup for Jurik can then be easily applied to other indicators in a custom

indicator like MA(RAWK) to obtain a JMA smooth raw stochastic. Finally, the four Jurik Indicators are now available in RTL as built-in technical indicator tokens. For example, the formula: $CL < JMA$ and $CL.1 < JMA.1$ AND $RSX > 60$; is a RTL signal that tests for two consecutive bars closing below some Jurik Moving Average while Jurik RSX is above 60. When using the chart setup wizard to create a new chart, tokens JURIK, JMA, RSX, VEL, and DMX can be entered into the Technical Indicators entry box to have those indicators added to the new chart. The token JURIK will add all four Jurik Indicators, while JMA, RSX, VEL and DMX tokens cause one or more specific Jurik Indicators to be added, e.g. enter JMA, RSX to create new charts with those two indicators.

The Jurik Indicators are available from Jurik Research and are now supported on Windows XP, Vista, and Windows 7.

Improved Software Updating Process

Investor/RT 10.6 will check for the availability of software updates during the startup process and will offer to install the updated version when one is available. This occurs before any layouts are opened. Investor/RT will download the installer for you automatically and launch the installer if you elect to update. You may choose to install the update "Later" and Investor/RT will wait until you exit (quit) and will offer to install the update during the termination process.

External Data Indicator

The External Data indicator, also known as the Pivotfarm Indicator, provides support for Pivotfarm PowerZones (www.pivotfarm.com) within IRT charts. Other external sources, including user spreadsheet data, are planned for future implementation. Pivotfarm provides 12 daily price bands or zones called PowerZones. The prices of the 12 zones change each day. The indicator imports the zones automatically each day from the Pivotfarm.com web site. An account with Pivotfarm is required to obtain this data. Pivotfarm is enabling this indicator for IRT users free of charge for a limited time. The indicator preferences provide fields for username and password. The user may specify the colors for each of the 12 band levels, or mark a checkbox to force all bands to share a single color. By default, the bands transition at the day/date boundaries. Users may mark a checkbox labelled "Align Levels to Session" and the levels will adjust on the session boundary instead. Pivotfarm provides levels/zones for the following 12 markets: ES, YM, NQ, TF, GC, CL, USDCAD, EURJPY, AUDUSD, USDJPY, QBPUSD, and EURUSD. The user may specify a particular market or select "Automatic" and the indicator will use the appropriate market based on the ticker symbol in the chart.

Faster RTL calculation engine (TurboRTL).

Version 10.6 features a much faster RTL calculation engine. RTL formulas that use statistical functions (MIN, MAX, AVG, etc) will calculate faster in custom indicators and signal markers. Custom indicator calculations in general are faster, more noticeably so when the indicator is calculating initially on thousands of bars, e.g. when opening a long term intra-day chart having such indicator(s). Charts open much faster, charts recalculate much faster after a backfill, backtests and optimizations run faster, etc. If you have a particularly demanding custom indicator you may see it listed in the message log should it take more than 1000 milliseconds to calculate, e.g. when opening a chart and

doing a full calculation. In extreme cases, for example a chart of five years of 5 minute bars (96,000 bars) a statistical RTL formula that took minutes to calculate now calculates in under 2 seconds.

The faster RTL calculation methods were available in Version 10.5 by setting the configuration variable TurboRTL to "true". In Version 10.6 the TurboRTL variable is true by default.

Chart Setup Wizard Templates

The Chart Setup Wizard enables quick creation of charts for any symbol using an existing chart as a template. In the list of chart types, choose "Template/Other". Check the box "Use Existing Chart as a Template" and a list of chart name will appear above the check box. Choose the chart name desired. Choose the symbol and click OK. IRT will create a chart for that symbol using the selected chart's preferences and content. Any existing chart can be used in this way as a template. Note that the Chart Setup Wizard will remember the name of the template chart last used; thereafter, you can call up the wizard, specify the symbol, and click Apply or OK to construct charts from the same template. The Chart Setup Wizard can be called up from the Setup Menu (Setup: Chart Setup Wizard) or from the File Menu (File: New: Chart). A convenient mouse shortcut is to right-click the Open Chart icon button on the main toolbar. A convenient keyboard shortcut is to press Alt-1 and Enter. The Alt-1 shortcut opens a chart selection list, the enter key then selects the top entry in the list "New Chart" which opens the wizard window.

Main Toolbar Auto-Hide

By default the main toolbar is anchored within the main Investor/RT task window at the upper left corner. One of the disadvantages of the anchored mode is that maximizing a chart or some other window obscures the main toolbar, making it inaccessible until the maximized window is moved/resized to reveal the toolbar. You can unanchor the main toolbar to enable the main toolbar to "float" and position it where ever you like, but a chart or other window maximized on the same monitor will now have this large main toolbar floating over it, possibly obscuring the window content. A new feature called Auto-Hide enables the main toolbar to float as a thin strip just tall enough to show the status message text, at the top edge of the main Investor/RT task window. The message strip can be positioned so as not to obscure any maximized windows. The "heartbeat" icon is positioned at the right end of the strip so you can always see this important data feed status indication. When some function (button) on the main toolbar is needed, simply move the mouse pointer over the strip and the full main toolbar will come into view. The main toolbar will remain fully visible as long as mouse movements continue to occur within it. After 3 seconds of no mouse activity within the main toolbar, the toolbar hides itself automatically, reverting back to the thin message strip. A configuration variable can be used to specify the number of seconds of inactivity after which the main toolbar reverts to a thin strip. Go to Setup: Configuration and set HideMainToolbarAfterNSecs=10 for example to lengthen the main toolbar visibility time to 10 seconds. This auto hiding is fully compatible with out main toolbar options, e.g. button titles, showing all buttons, default buttons only, or customized set of main toolbar buttons.

The Auto-Hide mode can be engaged/disengaged at any time using the Main Toolbar-->Auto-Hide menu selection. The Main Toolbar submenu can be found in the main menu bar (Window--

>Toolbars-->Main Toolbar) or it can be accessed from the main toolbar itself by right-clicking within the toolbar message area and choosing Main Toolbar. The Auto-Hide menu item will appear check marked when auto hiding is engaged. Choosing the menu item toggles Auto-Hiding on/off. Note that Auto-Hiding does not apply when the main toolbar is Anchored. Choosing Main Toolbar-->Anchored to anchor the main toolbar will turn off Auto-Hide. Choosing Main Toolbar-->Auto-Hide to turn on auto hiding and will unanchor/float the main toolbar and reduce it to the message strip thereafter. Also, the Ctrl-T command (Toggle Toolbars) is a keyboard shortcut for hiding/showing all active toolbars. If the main toolbar has auto hiding engaged when you press Ctrl-T, it will expand to full size and auto-hide again after the specified number of seconds. ...

New RTL Historical Token HLP (Hi-Lo Price Count)

HLP is a historical token that gives you the number of unique prices within the high low price range of any bar. It is computed from HLR, the actual high low range of price. For each bar $HLP = 1 + HLR/TINC$; where HLR is the high-low range and TINC is the tick increment of the instrument. A custom indicator MA(HLP) will show you a moving average over some period of the high-low price count, a measure of average price volatility. HLP is a historical token so you can write signals like $HLP > 4$ AND $HLP > HLP.1$ AND $HLP.1 > HLP.2$; to detect current bar HLP above 4 prices and HLP rising for at least 3 consecutive bars. The "H-L Prices" is a column you may add to a quotepage. This column will show the number of prices within the current session high low trading range for each symbol in the quotepage.

System Status Window Improvement

Click the System Status icon on the main toolbar or choose Control-->System Status to see a report detailing your system status. In addition to the Workspace Summary showing how many charts and indicators you have open and working, there is now a summary of chart load times so you can tell at a glance which of your charts may be taking a lot of time to load. The report includes all multi-pane and Market Profile chart windows. Most charts load in under a second. The report first lists any taking longer than 10 seconds, followed by others that loaded in less time. Charts taking less than half a second to load are not listed by name, only a count of those is shown. This "Chart Loading Time" summary is also shown at the bottom of multi-pane chart Calc Statistics windows. This report can be summoned from any chart by right-clicking and choosing Calc Statistics from the menu. Details on the specific chart you clicked on appear first, followed by the summary of loading times for other charts you have open presently.

RTL Functions SETV, GETV; Referencing V# Variables by Name

RTL tokens V#1, V#2, ..., V#512 can be used within any RTL formula to reference the value of a user variable. If you create a scan, signal or custom indicator that sets the value of some user variable, e.g. SET(V#99, expression), you can then use V#99 in other signals, giving you the ability to make values available for reference lines or other RTL computations within a chart for example. If you then share the chart and its definition with another Investor/RT user, all works as expected unless the user who imports your chart and RTL is already using V#99 for some other purpose. When V# usage conflicts arise, it becomes necessary to revise the imported RTL to use a different V# and this can be difficult to do, especially for more complex RTL formulas with which you are not familiar.

Version 10.6 adds two RTL functions that enable references to be made to a user variable by its name (title), instead of its number. So if V#23 has a title "MaxHigh" then the RTL function SETV("MaxHigh", MAX(HI,10)) will set the value of V#23, just as if you had written SET(V#23, MAX(HI,10)). The SET function only understands user variables when you reference them by number, i.e. by the token V#23, while SETV allows you to specify either the number or the name (title) of the variable you want. When a name is used and there happens to be no user variable having that name, then RTL will simply assign one and give it that title so that all future references to that user variable name will use that assigned number. SETV can also specify the number of the variable you wish to use, e.g. SETV(23, CL) is the same as writing SET(V#23, CL). Interestingly the number you specify in SETV need not be a constant. You can write SETV(V#1, CL); this tells RTL to get the number from V#1 and then use that number to set the user variable having that number. So if V#1 contains 99 for instance, then SETV(V#1 + 1, CL) will set V#100 to CL, the current trading price).

The GETV function is the way to reference the value of a user variable by its name or number. GETV("MaxHigh") will find the user variable having the name MaxHigh and use its value. Similarly, GETV(123) is the same as writing V#123. GETV(V#2) will use the value of V#2 as a number to get the value of the user variable having that number. In general GETV(expression) and SETV(expression, ...) will get or set the value of a user variable identified by expression. If expression is a string enclosed in quotation marks, the user variable is referenced by name (title) with auto assignment of an available user variable if needed. If expression is an arithmetic expression that evaluates to a valid V# number then the reference is made to the user variable having that number. When referencing by number, if the number is less than or equal to 0, or if it is greater than the number of the last available user variable, then SETV does nothing and GETV evaluates to zero.

The greatest advantage of this facility is that RTL objects can be exported and shared with others with no user variable conflicts. Each user may end up with say "MaxHigh" being a different user variable. When all references to that variable are made by name, the imported RTL will work regardless of which actual V# number is used for "MaxHigh".

Miscellaneous 10.6 Fixes and Improvements

- A new configuration variable (see Setup: Configuration) enables the Layout Toolbar to be enabled and pinned to the right of the main toolbar at startup. Set PinLayoutToolbarAtStartup=true.
- The Shapes Indicator now allows a fill color to be specified when drawing solid shapes. The line color control allows specification of the border of the shape (line thickness, color and style). The Solid Fill Color specifies the color used to fill the interior region of the shape. Formerly, all solid shapes were drawn with the same border and fill color; now the border can be distinguished from the interior of the shape by specifying a fill color different than the line color.
- The Session Statistics Indicator now has a "Retracement of Range" statistic that calculates a user-specified % retracement from the high price during some period of trading. There is also

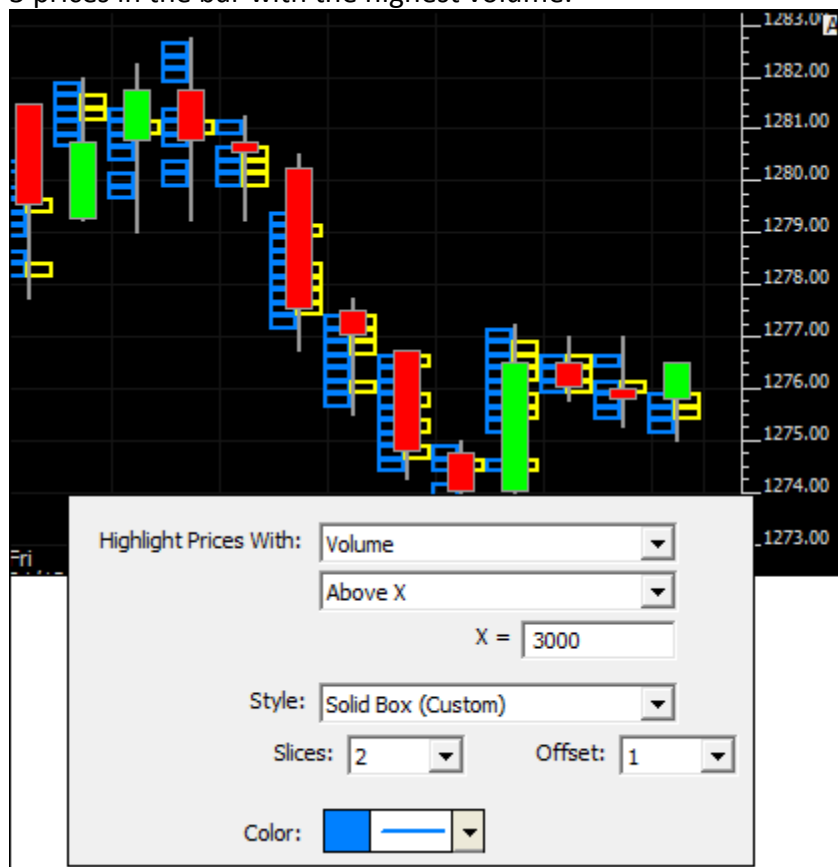
a "Midpoint of Range" statistic that, in effect, is the same result as specifying a 0.50 retracement from the high. Specify 0.618 to get a 61.8% retracement; 1.0 to get a 100% retracement from the high, etc.

- Chart buttons setup with purpose "Activate Drawing Tool Preset" now have an option to place the resulting drawn indicator behind or in front of all other indicators in the pane. There are three choices: Default Pane Order; Send to Back; Bring to Front. This allows you to specifically override the built-in default positioning which may vary from one indicator to another.
- A Profile Indicator option has been added to enable persistent labeling of each price with the volume at that price. Look for a check box at the bottom of the Profile Indicator preferences titled "Label Each Price". When checked, you may choose to label with Volume, Volume with # of Bars, or # of Bars. You may also specify the position of the labels: Right Outside, Right Inside, Left Outside, and Left Inside. For "Right Inside" for instance, the label will be placed just inside the right edge of the dotted rectangle of each profile. In prior Investor/RT versions, the volume at price labels appear only when the Profile Indicator is selected within the chart. Now these labels can be persistent with flexible positioning options. When the indicator is selected, a background is drawn behind the labels to make them easier to read. To select the indicator, click on the dotted rectangle around the profile, or click on the dotted rectangle around the rightmost profile when more than one profile is shown.
- A new Signal Statistics result titled "Seconds Since Last Signal" is now available.
- The Object Editor window has two icon buttons at the top left corner. The right arrow button is used to cycle the display of object names to the next object type. The plus button is used to create a new object of the selected type. The object editor is now capable of creating, viewing, editing, exporting, renaming and deleting named objects of any type. The Object Editor window has been arranged to show all of the object types listed at the left. Select a type from this list to see the objects of that type on the right. Buttons at the top of the Object Editor can be used to select the desired type of object also, e.g. Click the Chart icon to see a list of all charts. Right-click the Chart icon to create a new chart (same as the new Plus button). Double-click an object type in the list on the left to select all of the objects of that type. The buttons on the right perform actions on the list of objects selected. In the list of object you may select a series of adjacent names by clicking on the first of them and shift-clicking on another name below it. You may select non adjacent name by ctrl-clicking on each name you wish to select (Mac users Option-Click). The Object Editor window now responds to mouse wheel movements by scrolling the list of object names.
- In Windows Editions of Investor/RT, the File Menu now has File: Exit. The File: Quit and File: Quick Exit menu items have been eliminated. The software now exits promptly when you issue the File: Exit command, backing up the database immediately if that is called for in your user preferences.

Investor/RT version 10.5, Released April 11, 2012

New Indicator: Multiple Price Highlighter

The Multiple Price Highlighter Indicator (MPH) is designed to identify multiple prices within any given bar that present various volume-based characteristics. For example, the user may choose to identify the prices in each bar for which volume traded over 1000 contracts by specifying "Highlight Prices With: Volume: Above X: X = 1000. Alternatively, users can identify prices with volume Below X, Highest X Prices, Lowest X Prices, Highest X% of Prices, and Lowest X% of Prices. When user specifies "Highest X Prices" with X = 3 for instance, 3 prices will be highlighted in each bar which represent the 3 prices in the bar with the highest volume.



User may also choose to highlight bars with the Keppler Volume Tracker (KVT). This indicator was developed by Dr. John Keppler. The logic behind this indicator is proprietary but is designed to identify relative high volume prices taking into consideration the time of day. The two KVT Multipliers default to 10 and 20 and are used to adjust the sensitivity of KVT. The number of days specified tells KVT how far to consider data when determining relatively high volume. The user must ensure that the view period of the chart is greater than the number of days specified and that data is present for more than that number of days.

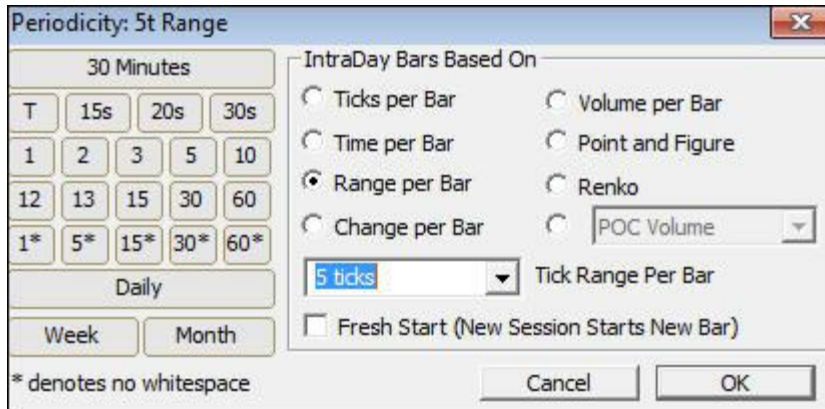
eSignal Extended Historical Data Now Supported



eSignal users who have signed up for eSignal's extended historical data can now access longer term tick data and one minute interval data. eSignal reports that the extended service allows users to access 12 years of minute-based bar data for North American equities and indexes, and 2 years of North American, European and Asian futures, Forex and treasuries. The new extended historical data will be especially helpful to back testers who require large amounts of historical data to track the performance of their strategies across all types of market patterns and conditions. Tick data, normally limited to the most recent 10 trading days, is now available for the last 40 trading days. Minute interval data, normally limited to the last 120 trading days is now available for 2+ years back. To support longer term downloading of extended historical data, Investor/RT will download and import the data in incremental segments, the most recent data arriving first and subsequent segments bringing in increasingly older data. A 30 day tick download may result in say 10 segments, the first arriving fairly quickly updating the chart(s) with the most recent 3 days or so of ticks and the next 9 segments bring in another 3 days of older ticks. This is an improvement over version 10.4 where Investor/RT would collect all the data for the entire download before importing any of it and updating the charts. The charts will fairly quickly reflect the most recent trading sessions and be usable while additional segments of data arrive incrementally. A configuration variable `kConfigUL_eSignalChunks`, set to 2 by default controls how much data is downloaded before importing a segment. The setting of 2 allows current and prior session tick data to be downloaded as a single segment; double the setting to 4 to increase the segment size for example. This will increase the time it takes to get the first segment of a long term download, but will result in fewer segments overall as the download proceeds.

Range, Change, Renko Periodicity Expressed in Tick Increment Units

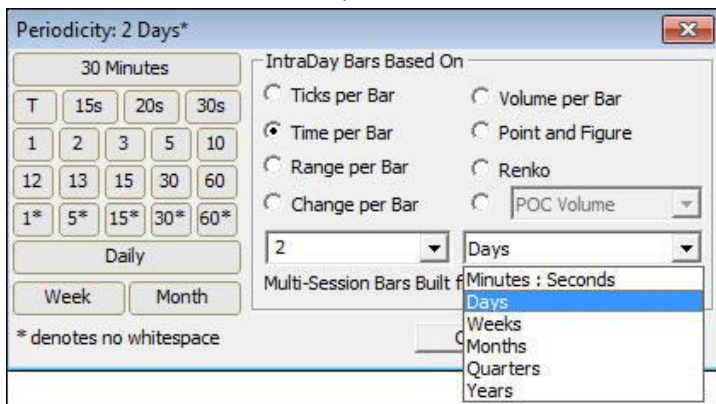
Investor/RT has long supported range bars, change bars, and Renko bars. Each of these periodicities is specified along with a numeric price range, or change amount, or box size in the case of Renko bars. The numeric amount specified has heretofore been expressed as an absolute amount, e.g. a 1.0 Range Bar periodicity for the ES futures represent a range of 5 trading prices in the ES contract. Because ES trades in .25 increments each range bar will include all trading at 5 distinct prices (the opening price of the bar plus 4 other prices above or below that opening price. Changing a 1.0 Range Chart from ES to some other futures contract that trades in .01 increments would produce range bars that span 101 trading prices due to the smaller tick increment. This is seldom the desired result.



In version 10.5 Range and Change amounts and Renko box size can be expressed in terms of a whole number of trading prices for the underlying future. The range and change amount is determined from the tick increment of the futures, i.e. changing a chart from one type of future to another will adjust the range amount automatically based on the tick increment of the future. For the ES contract, for example, if you specify a 5 tick range this means that each range bar will include trades at 5 distinct prices and will therefore include a 1.0 amount of price range. In general, if N is the tick range/change then the corresponding amount of range change will be (N - 1) times the tick increment of the future. If a future has display format 99.99 a tick increment of .01 is implied, thus a 5 tick range or change bar will include a price range of (5 - 1) times .01 which equals .04. Version 10.5 allows you to specify periodicity in absolute terms just as 10.4 does, by including a decimal in the periodicity entry. Using the Periodicity selection window, if you choose Range Bars and specify 1.0 you get a price range per bar of 1.0. If you specify a whole number, say 5, as the range without the decimal point, Investor/RT will give you a 5 tick range bar, i.e. a range bar that includes 5 distinct prices of the associated instrument. When upgrading to 10.5 all existing setups will continue to be price value range/change/box size. For example an ES chart might show 2.0 Price Range Per Bar in the Periodicity Window. You can replace 2.0 with 9 to get the equivalent 2.0 range expressed in tick prices, i.e. 9 distinct prices at .25 increments from the opening price of each range bar.

Multi-Session Intraday Periodicity

In the Periodicity window, the Time Per Bar option has long been used to specify some number of minutes and seconds, the constant duration of each bar formed from the underlying intra-day data.



Time intervals have been limited to a span of time of at most one 24 hour trading session, e.g. 405 minutes for a 6.75 hour day session, or 1425 for a full overnight session (1440 minutes is 24 hours, less 15 minutes for inter-session break). In version 10.5 when Time Per Bar is selected, a units menu button is provided. Normally it will show Minutes : Seconds and the time interval is specified in the usual way. The units button also includes choices for days, weeks, months, quarters, and years. When one of these units is

chosen, Investor/RT will accept a whole number of units, e.g. 1 week, or 3 days, or 3 months, or 1

quarter. These time interval periodicities, unlike normal daily, weekly, monthly charts in Investor/RT, will use intraday data as the source for constructing fixed time interval bars. The use of intra-day historical data to construct multi-session interval bars makes it possible to employ full overnight session intra-day data to construct say a weekly chart of just the day session hours. Investor/RT will consider only the intra-day ticks and bars within the day session hours when the chart calls for a day session override. A 1 day chart constructed from overnight session data will show the OHLCV for the full trading session, override to the day session to then see OHLCV bars for each day considering only the trading that occurred in the day session hours.

VWAP Enhancements

The VWAP Indicator has been enhanced to allow the user to automatically chart the weekly VWAP. In the process of adding this option, several other custom VWAP durations were all consolidated to a single listbox. These options include: Weekly, Cumulative From Date/Time, Composite Average (All Data), First X Minutes of Session and Last X Minutes of Session. With the new Weekly VWAP options, users can now see the developing weekly VWAP historically on their intraday charts. Also a "Time-Weighted" option has been added to the VWAP Indicator. When this option is checked, the indicator will give equal weighting to each price if each bar instead of using the volume of each price. The Time-Weighting option is more of a TPO-based approach similar to what is used in Market Profile charting.

Extended Naked Fractals

The Fractals Indicator identifies key relative highs and lows. An option has been added to the Fractal Indicator to allow users to extend these naked highs and lows until they are touched by a future bar. The user may specify the color, width, and style of these extension lines with different color for the highs and lows. The user may also specify whether to extend all fractals, the last x fractals, or all visible fractals. The fractal indicator can also be added to indicator panes such as the cumulative delta implementation of the Volume Breakdown indicator. This new feature can help users identify divergence and levels of divergence between price bars and indicator bars or values. A check box was also added to the Fractal Indicator titled "Hide Fractal Markers" which gives the user the ability to hide the markers while showing the extended naked lines.

Retracement Bands

The Bands Indicator now has an option for "Retracement Bands" with up to 12 retracement levels and colors. Within the Bands Indicator is an option for "Compact Band" style. The Compact Band draws a small band of user specified width along the right edge of the chart between the values of two user-specified custom indicators. The ability to specify the width of the band is also new in 10.5. The indicators can identify key prices such as session high and low, B high and low, previous session high and low, weekly high and low, etc. When the compact band option is specified, a "Retracement Band" check box is presented. When checked, the user is then given the option to specify up to 12 retracement levels, each with it's own color. These retracement levels are specified in % retracement. A 100% band would match the original band. A 150% band would extend the original high and low by 50% of the range of the original levels. A 200% band would be a full extension of the range in both direction. A 50% band would draw a small line at the center of the range. Labels can

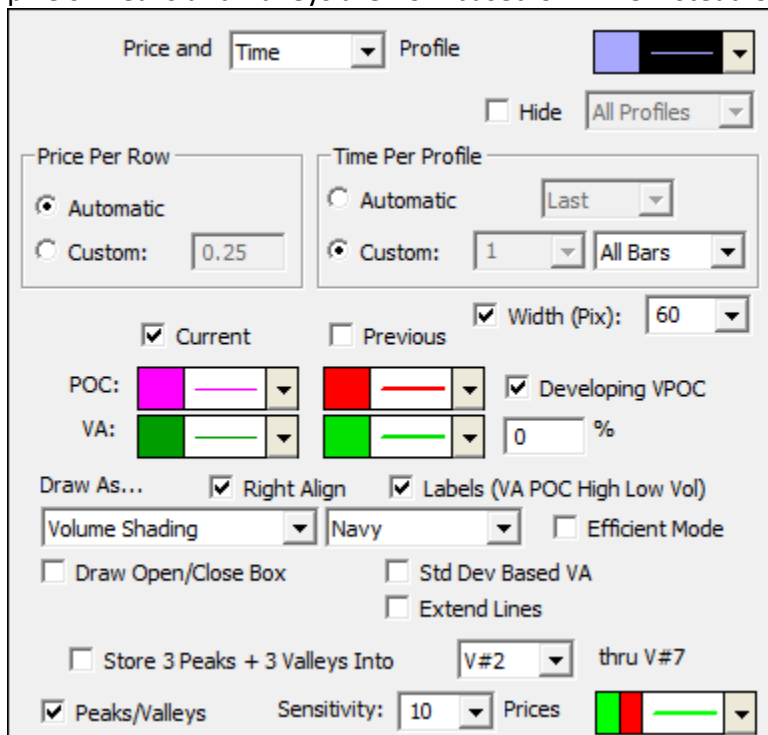
be placed over the compact band or in the scale providing either the retracement level or price of the band. If multiple compact bands are added to the same chart they will automatically be stacked side by side.

New Options for Quoteboard Indicator

Two new options have been added to the quoteboard indicator. A "Hide Quoteboard" check box has been added to allow the user to plot lines/levels without the presence of the quoteboard itself. A "Left Align Labels" check box has been added to enable alignment of the labels to the left edge of the label column of the quoteboard. The color of the quoteboard text is also more aware of the background color of each row, and now draws white text when the background color reach a certain darkness instead of always printing black text.

Profile Indicator Enhancements

Several enhancements were made to the Profile Indicator. Peak and Valley lines can now be customized with color, width, and style. User may now specify the width of time-based profiles in pixels. Peaks and Valleys are now based on Time instead of Volume for time-based profiles.



Developing VPOC for Composite Profiles

Users may now plot the developing VPOC using the Profile Indicator's RTL token "PROF". A new result has been added to PROF titled "Developing VPOC". When this result is selected, the developing VPOC is computed. When plotted, the result is similar to the developing VPOC available to the TPO Indicator. However, with this new PROF option, the user can access the developing VPOC of any of the many durations available to the Profile Indicator including daily, weekly, monthly, or

even multi-year composites. In addition, this implementation is much more efficient than using the TPO Indicator. Those that are currently using TPO Indicator to plot the developing VPOC should reconsider this new option.

Pivot Point "Locked" Option Added

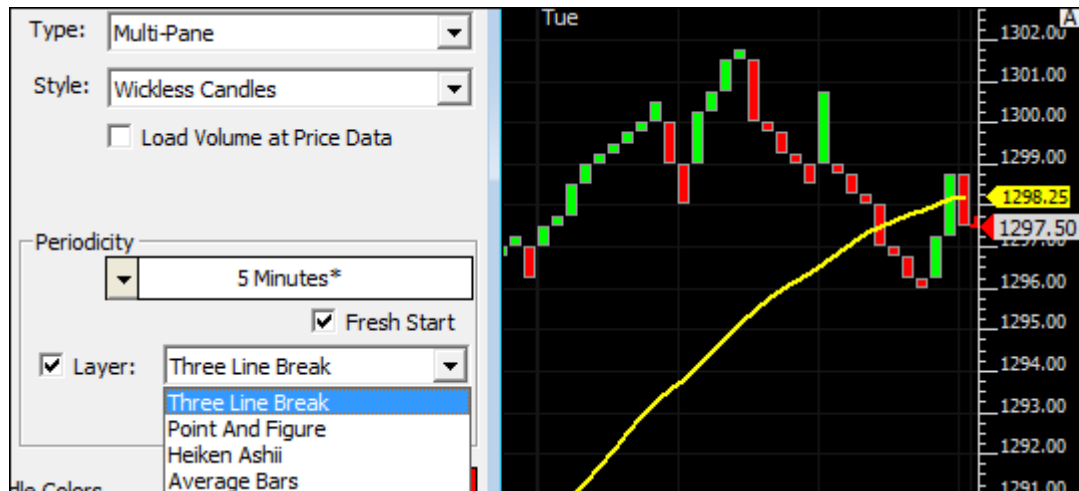
A check box has been added to the Pivot Point indicator titled "Locked". When the pivot point is locked, it cannot be adjusted with the keyboard. When a pivot point is unlocked, the left and right arrows on the keyboard adjust the "Bars Back" setting when the Pivot Point is selected. Most users would prefer the "Bars Back" setting remain locked at 0. This new option is similar to the "locked" check box of the Reference Line indicator which locks the reference line to a price and doesn't allow the price to be adjusted with the up/down arrows on the keyboard when selected.

New Zig Zag Oscillator Result Options

Five Zig Zag Oscillator result options were added including: Bars Since X Pivots Back, Volume Since X Pivots Back, Delta Since X Pivots Back, Volume Per Price Since X Pivots Back, and Delta Per Price Since X Pivots Back. These results accumulate data (volume, delta, number of bars) from a user-specified number of pivots back to the present, and in some cases, divides that result by the price change since that pivot.

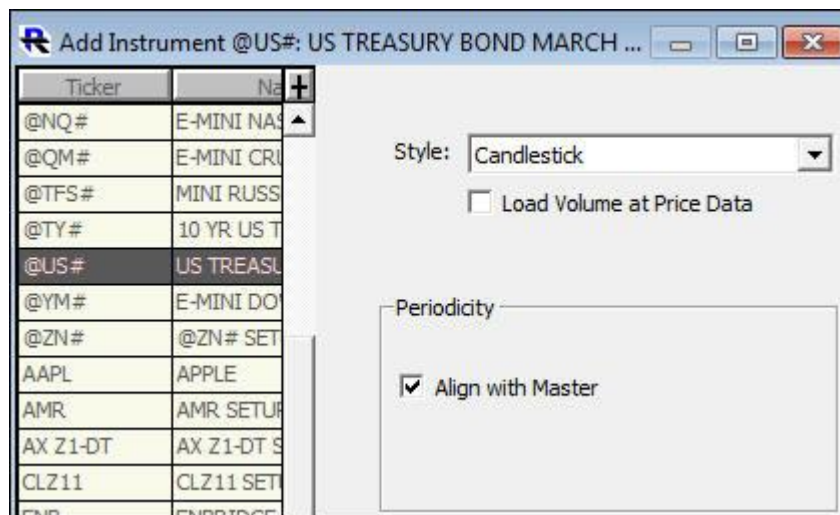
Layered Periodicities

Three Line Break, Point and Figure, Heiken Ashi, Average Bars. A check box option was added to the Instrument window titled "Layer" which enables new periodicity options: Three Line Break, Point and Figure, Heiken Ashi, and Average Bars. These periodicities are unique in that they all build upon another underlying set of bars of any existing periodicity. For example, a 5-minute Point and Figure would operate on the closing prices of the 5-minute bars instead of inspecting every tick. A daily Three Line Break will process and consider only the closing prices of each daily bar. For these options, the underlying periodicity will be loaded and present invisibly in the chart. The Point and Figure bars should be drawn with a Point and Figure style. The Three Line Break charts can be drawn either as candlesticks or as Wickless Candles to provide the classic presentation. The Point and Figure option that has been available for some time processes and considers every tick while this new layered option processes only the closing prices of the user-specified underlying periodicity. The Heiken Ashi and Average Bars use an averaging technique to average out the current bars with previous information. The Heiken Ashi uses a two-bar averaging technique while the Moving Bars allows the user to specify the number of bars averaged. For example, if a user specified a 5-bar Average Bar of 1-minute data, the result would be moving 5-minute bars, with each bar representing a moving window into the past 5-minutes. And two consecutive bars would actually share 4 minutes of information. Be on the lookout in our video library for videos providing more details on these new layered periodicities.



Aligned With Master- Matching Parent

A checkbox titled "Align With Master" has been added to the Instrument window. This option will line up a secondary instrument with the timestamps of the master instrument. In the past, this has been impossible with any periodicity that was not time-based, e.g. Range Bars, Volume Bars, Tick bars, etc. Now, a user can plot a Range Bar of some master instrument and plot bars of one or more secondary instruments below that line up with (match) the time period spanned by the bars of the master instrument. Within each bar of the secondary instrument will reside the trades that transpired during the same period as the master instrument. When the periodicity of the master instrument is adjusted, the secondary instrument will continue to align with the data of the master. This has many potential uses including the ability to plot a statistic or index such as TICK or TRIN in a secondary pane below a master futures instrument, aligned with the data of the master. The "Align With Master" option will only be available in the Instrument dialog when adding a second instrument to a chart. To add an instrument to a chart, use the top left button on the chart toolbar.



Export Trading Notes

Within the trading notes window you can export all of the trading notes for a symbol by selecting that symbol and choosing File: Save: Save As Export. If the Trading Notes window is the front window and you hold down the Ctrl key on the keyboard while choosing File: Save As Text, Investor/RT will export all trading notes for all symbols. You may also export all trading notes using File: Export: Trading Notes with no need to open the trading notes window. The resulting export file is shown after export is complete. This feature may be useful for example if you use Investor/RT on more than one machine and you wish to export all notes from one machine and import them using Investor/RT on the other machine. Use File: Import: Definition File to import the trading notes.

Floating Window Positioning Improvement

For users with multiple monitors on MS Windows, Investor/RT is designed to work best when the main Investor/RT task window is maximized on one of the monitors and screen real estate on other monitors is used to float Investor/RT charts, quote pages and other windows. Investor/RT works best when the main Investor/RT task window is kept at a fixed position and size. The reason for this is that all floating windows reside at positions (on other monitors usually) relative to the position of the upper left corner of the task window. Moving, resizing, repositioning the screen location of the main Investor/RT task window can cause ill side-effects when floating windows are opened since floating windows will now be positioned at the same relative offset from the new task window location. In extreme cases, this can lead to a floating window being positioned at a location "off screen" making it invisible to the user. The Window/Bring to Front menu item (with Ctrl key down) was the only way to bring such windows back to the main screen in Version 10.4.x and earlier. Version 10.5 solves this problem by determining when opening floating windows, whether the saved offset from the task window would cause the window to be moved off screen. If so, the window is automatically repositioned to a default location centered on the main task window to ensure it remains visible. You can then drag the window(s) to other monitors and position them as desired; there is no longer a need to use the Bring to Front menu to retrieve off screen windows. Note that this anomaly situation occurs if you reposition the upper left corner of the main task window. In some cases, adjusting the multiple monitor setup by adding or removing monitors can also manifest these off screen side effects. Regardless, floating windows will now remain visible when such adjustments are made.

Multi-Link Chart Scrolling and Time Synchronization

Investor/RT has long had the ability to Multi-Link two or more charts so that a change of symbol in one chart is propagated to one or more linked charts. The linkage of charts is accomplished by specifying the same Multi-Link color for some group of charts. The Multi-Link color for a chart is shown in the lower right corner of the chart. Clicking on this colored rectangle displays a menu for selecting a Multi-Link color for the chart. By convention, charts set to black are locked; they do not participate in any Multi-Link operations. Charts set to white Multi-Link color participate in all Multi-Link operations. When there is a Multi-Link change of symbol in a chart designated red, for example, the same symbol will be propagated to all other red charts plus any white coded charts.

Version 10.5 introduces the capability to scroll and time sync charts in tandem using the Multi-Linking method, i.e. scrolling a red chart to a certain date time can cause Multi-Linked charts to scroll

to the same date time. For full details on this significant new capability in Investor/RT go to this article- <http://www.linnsoft.com/helpdesk/knowledgebase.php?article=298>.

Developing VPOC Option for Profile Indicator

A check box has been added to the Profile Indicator titled "Developing VPOC". When enabled, the developing VPOC is plotted allowing the user to see how the VPOC changed from bar to bar as the profile formed. This option is available to all of the many flexible durations of the Profile Indicator including 30-minute profiles, daily profiles, or long-term composite profiles. The TPO Indicator has always made available the developing VPOC of daily profiles but this addition to the Profile Indicator is much more efficient and opens up this functionality to a much wider array of profile durations.

Current Price Label Updating During Closed Session

Multi-Pane charts provide an option to "Highlight Price In Scale" in the Options tab of each chart's preferences. This option draws the current price as highlighted text in the scale at the right. Prior to 10.5, the price updated only when the session of the chart was open. In version 10.5, the price will update even if the session of the chart is closed. This allows users to see price updating in a day session chart prior to session open, or after the session closes.

Scaling Toggle Button.

Each pane in a multi-pane chart (except button only panes) has a toggle button in the upper right corner. Clicking the button cycles among various common scaling settings (Automatic, Instrument Only, etc.). This button now has button help and a right-click menu. You may find this a convenient way to quickly set a particular scaling option and/or to access various chart preferences including the scale preferences. The popup menu also serves as a legend for what the letter codes on the face of the toggle button mean. Selecting M - Manual Scaling also opens the Scaling Preferences so the manual scaling range can be set.

Opening Most Recent Chart, Quotepage, RTL.

IRT maintains lists of the most recently referenced charts, quote pages, and RTL. You can review these lists of recent items, implemented as IRT Groups, by clicking the Open Groups icon on the main toolbar, or by using the menu File: Open: Groups (shortcut ALT-4). Select the Recent group of interest and a list of charts, quote pages or RTL items will appear for selection with the most recently referenced item at the top of the list. In version 10.5 there is now a shortcut for opening the most recent chart, quote page, or RTL item. Shift-click on the main toolbar Open Chart button to open the most recent chart; if that chart window is already open, it will be brought to the front. Similarly shift-click the Open Quotepage button or the Open RTL button to open the most recent item of that kind. If you import an RTL object, IRT now adds the RTL object(s) imported to the .Recent RTL group, thus right after import, you can SHIFT-Click the RTL icon on the main toolbar to view the most recently imported RTL.

Quickly Change Chart Session Using Keyboard.

Multi-pane charts respond to the keyboard in several ways. Type an alphabetic character or @ for example, and the chart assumes you want to change the symbol in the chart so a dialog appears to

assist you. Keep typing the letters of the symbol you want and press <enter> key to switch to that symbol. Similarly, typing a numeric digit 0-9 opens the periodicity selection window. For example, if you have a 5-minute chart open, type 15 and press <enter> to change to 15-minute periodicity. If you have a 500 Volume Bar chart open, type 600 and press <enter> to change to 600 Volume Bar.

To quickly change the chart override session, type a comma (or grave accent `) character followed by the session number you want and press <enter>. The comma calls up the Change Session dialog. The subsequent digits specify the session number and the <enter> key applies the session change, dismissing the dialog. The dialog also has a session menu accessible by clicking the down arrow. The menu lists all sessions and their trading hours. Say you have a Session 31 chart that you sometimes wish to view using Session 2 override to see only day session trading. Press .2<enter> to quickly switch to session 2. Then press .31<enter> to change back. The grave character is positioned on the keyboard at the left of the row of number keys, so this character may be more convenient than a period, for example when you want to switch the session 2, strike `2` and the chart will change to session 2. The first grave opens the dialog, the digit 2 specifies the session, the second grave accept the entry (no need to hit the enter key. This can be done quickly with one hand in the upper left portion of the keyboard.

The Change Session dialog has some keyboard shortcuts. Either the Esc key or period key will dismiss the dialog without changing the chart. Thus you can type two commas in succession to quickly see the current session setup of a chart without changing it. The P shortcut opens session preferences, so .p takes you to Setup: Preferences: Sessions where you can review or add new session setups. The N shortcut takes the chart back to "No Override Session". Thus when the chart is overridden to Session 2, the two keystrokes ,n will set the chart back to Session 31. The four keystrokes <comma>31<enter> does the same.

The Change Session dialog also detects override session errors. If you specify a session number that does not exist, the dialog will issue an error message and continue prompting for a valid session number. If you enter a valid session number but the hours of that session are not a proper subset of the main instrument session, an error message will report this and the dialog will continue prompting for a valid override session number. If you choose a session number from the menu, IRT will check to verify that the session you have selected is a valid override session for the chart. If so, the OK button will be enabled to accept that session; if the OK button dims this indicates the selected session number has trading hours that overlap with the session start and stop times of the primary instrument in the chart. More details on incompatible sessions can be found by searching the Investor/RT helpdesk (enter the phrase incompatible session in the Ask Question box at the top of this article and click Search).

Setting up Charts To Begin at a Future Time.

IRT 10.5 now permits charts to be setup with a viewing period "Begin to Present" where the beginning date and time you specify is in the future. For example. before the day session begins, you can set the view period of a chart to begin at current date and say 9:30, well before 9:30 has arrived. The chart will initially show no data, just a notation saying "Chart Begins 9:30 AM". At 9:30 the chart will being updating as trades occur, showing no data for periods before the starting time.

Main Toolbar/Layout Toolbar Related Improvements.

Function key shortcuts and a few new menu items have been added to make it easier to show/hide the main toolbar and change the array of buttons displayed in the toolbar when needed. If you right-click in the main toolbar message area and choose Main Toolbar, you will notice menu items for All Buttons and Default Buttons. These menu items allow you to quickly enlarge the toolbar to show all of the available buttons or contract it to the default set of buttons. These actions are also eligible for function keyboard shortcuts. Go to Setup: Preferences: Keyboard Shortcuts, pick a function key, e.g. F9 and pick Toolbar ... Main. Assign F9 to All Buttons. Similarly assign F10 to Default Buttons. You can then use F9 and F10 to quickly expand and contract the main toolbar button array. You can setup say F11 as Toolbar...Main...Show/Hide Toolbar and F12 as Toolbar...Layout...Show/Hide Toolbar to make F11 and F12 shortcuts for alternately showing and hiding the main and layout toolbars. Finally, the Window-->Toolbars submenu now has a Main Toolbar section where all of these main toolbar related actions can be performed from the Window menu direct, e.g. when the main toolbar itself is not visible.

Quickly Toggle Chart Whitespace On/Off Using Keyboard.

Setup: Preferences: Keyboard Shortcuts can be used to create a function key shortcut for toggling chart whitespace. Choose Toolbar...Chart as the function key action, and choose "Toggle WhiteSpace..." as the toolbar item. If the front chart window is a fixed time interval chart eligible for whitespace toggle, pressing the function key repeatedly will show the chart with or without whitespace for non-trading periods. As an added convenience, when an eligible multi-paned chart is the front window, pressing either the comma or asterisk key on the keyboard is a built-in shortcut for toggling whitespace on/off.

Mouse Scroll Wheel for Instrument (Symbol) Selection.

Various instrument selection windows in Investor/RT have been enhanced to accept mouse scroll wheel scrolling through the instrument selection list. For example, if you right-click on an instrument in a chart, a window opens with an instrument selection list for replacing the current symbol being charted with a new one. Similarly, clicking the Add Instrument button on the chart toolbar opens a window for selecting the symbol to add to the chart. Both of these now support mouse wheel scrolling. The Setup: Preferences: Configuration window was also enhanced to support mouse wheel scrolling through the list of configuration variables. In the Setup Instrument window, clicking the Add Instrument button at the top, opens an instrument selection window that now supports mouse wheel scrolling. Instrument selectors in general should now inherit this enhancement but there may be a few exceptions. If you come across an exception where the mouse wheel is non-functional please report it.

Profile Drawing Styles - Streamers.

Four new drawing styles have been added to the Profile Indicator including: Filled Line, Hollow Line, Shaded Line, and Streamers. Each of these options connect a line between the volume at each price. The Filled Line option fills these lines with a solid color. The Hollow Lines draws the a hollow line basing the line thickness on the thickness supplied in the color control at the upper right corner of the Profile preferences. The shaded works just like the Filled Line option except it shades each price

based on relative volume at price and using the shading color provided. Streamers works similar to the Hollow Line option but with a variable width line based on the volume at price with larger volume at price receiving a bolder line. These four options are available in the "Draw As" drop down listbox in the Profile Preferences.

Smoothed Profile Indicator.

A smoothing option has been added to the Profile Indicator allowing the user to perform a vertical smoothing of the profile. A check box titled "Smoothed" turns this option on and the user supplies the smoothing period. A 9 period smoothing would result in each price displaying an averaged volume at price, averaging the volume of the price with the volume of the 4 prices above and below it (9 prices total). Vertical smoothing results in a smoother profile with more clearly defined high and low volume areas.

Zig Zag Up/Down Slope Coloring.

A Up/Down Slope coloring option has been added to the Zig Zag indicator. A listbox has been added to the right of the trendline color which gives existing options of "One Color" and "Trend Coloring" along with the new option of "Up/Down Slope". When Trend Coloring or Up/Down Slope are selected, the color control provides both the user a way to specify two colors. The Trend Coloring option now also allows the user the ability to specify the two colors instead of forcing red and green as it did in the past.

Fractal Higher High, Lower Low Coloring.

A coloring option has been added to the Fractals indicator titled "Higher High, Lower Low". When this option is checked, the Fractal markers along with their text will be colored based on Higher Highs or Higher Lows (up color) or Lower Highs or Lower Lows (down color). In addition, a "With Text Labels" checkbox is provided to allow the user to label the markers automatically with HH (higher high), LH (lower high), LL (lower low) and HL (higher low).

Position Indicator - New Results.

Two results have been added to the Position Indicator: Session From End of Data and Sessions From Start of Data. These results tell the user how many sessions back into the chart or data each bar resides. If the result of "Sessions From End of Data" were selected, each bar in the most recent session would have a value of 1 while each bar in the previous session would have a value of 2, and so forth. This option can be especially valuable in custom indicators when the user wishes to see the values of an indicator only for the current session: $MA * (POS = 1)$.

Camarilla Pivots.

The Camarilla Pivots have been added to the Pivot Point Indicator. Camarilla is turned on by selected the "Camarilla" option from the Pivot Point drop down list. These pivots average the previous days high, low, and close as the pivot point. The support and resistance levels are computed by subtracting and adding multiples (1.1/12, 1.1/6, 1.1/4) of the previous high/low range to the previous close.

Session Statistics - Chart Statistics.

An option has been added to the Session Statistics indicator allowing users to compute statistics involving all the bars in the "Chart". This new "Chart" option is in addition to the options of Session, Week, Month, and Year. With this new option, users can easily draw lines showing historically the highest high of all bars of the chart or lowest low of all bars of the chart.

Info Box Labels for Indicators.

The Info Box Indicator can now print descriptive labels for each indicator displayed in the Info Box. The Info Box has an option to display any panes indicator values. In past versions, the labels for these indicator values used generic labels based on the name of the indicator used. Users now add custom indicators and session statistics indicators multiple times to a single pane, generally to plot time-sensitive prices such as the highest high of the week or the IB high. Users are now able to customize these labels regardless of what indicator produces them. Each indicator has an option to supply a custom text label at the bottom of the indicators preference window. When this custom text labels is turned on, it will be used by the Info Box. These custom text labels will also be appended to other lists of chart elements to help assist the user in identifying specific indicators from a long list. The Info Box now also uses the display format of the indicator if one is supplied at the bottom of the indicator's preferences.

Gann Arcs.

A Draw Gann Arcs option has been added to the Gann Angles Indicator. When this option is turned on, a circular arc is drawn from the end of the x1 line using the x1 lines length as the radius. Addition options for the Arc include "Project Angles from Arc" and "Custom Projection Length". When "Project Angles from Arc" is checked, the x2, x3, etc, angles will be projected only from the drawn arc. When the "Custom Projection Length" checkbox is checked, these projections will be drawn with a fixed length instead of drawing all the way to end of chart. The length of this project can be provided with user options of "x * Radius", "x * Radius * asin(Angle)", "x * Radius + asin(Angle)", or "(Radius/cos(Angle))-Radius" where the user supplies the x value.

Stochastic RSI.

A "Stochastic RSI" check box has been added to the Stochastic Indicator. When this option is checked, all stochastic calculations (RawK, FastD, SlowD) will be performed on the RSI results instead of the bar prices. The user can supply the RSI period along with whether or not to use Exponential Gain/Loss Smoothing. When the Exponential option is not checked, the RSI will be calculated with a simple smoothing method (this is the equivalent of the Morris Modified option of the RSI Indicator). Users have been able to create the Stochastic RSI in prior versions using custom indicators (SLOWD(RSI), FASTD(RSI), etc) but this makes it much more convenient and efficient to add the multiple Stochastic levels with a single indicator. Stochastic RSI is available now to users of Standard editions of IRT.

Reference Lines Repeating Alerts.

Reference Lines have an alert capability where a touch or break of the reference line triggers a specified signal action. Signal actions can play sounds or produce a message alert, or even execute a

trading order. Once a reference line alert is triggered it can be reset manually, either via the preferences or by dragging the line to a new price level to re-enable the alert.

Version 10.5 introduces an automatic reset feature for reference line signal actions. When reset is enabled, the signal action alert is reset at the beginning of each bar. In effect the alert is active for each new bar; if it should trigger, it remains in that triggered state until the end of the bar; then the indicator will automatically reset and resume testing for reference line penetration when the next bar begins. The reset option is especially helpful when using reference line alerts in indicator panes, e.g. a pane containing the Volume Analysis Indicator. You may place a reference line in the volume pane at a significant volume level. An alert will be triggered each time any bar's volume reaches that level. Reference line alerts can be used in this way for all indicators. Automatic reset can also be applied to price alerts for instruments that break a certain reference line price level.

In the Reference Line preferences you specify whether you want to be alerted when the reference line is penetrated from either direction (touching or breaking through the line from above, from below, or from either direction). This is especially useful for oscillating indicators such as RSI, MACD, or Stochastics, where there are typically multiple levels of interest. In this scenario you add two reference lines with reset "on", one to alert when some high level is reached from below, the other to alert when some low level is penetrated from above.

Briefly Hiding Indicators Within Instrument Panes.

In a busy multi-pane chart it may sometimes be useful to view the chart momentarily without all of the indicators that are normally present in the same pane as the instrument(s). With a multi-pane chart as the front window, pressing the minus key draws instruments alone in their panes. By default the chart automatically returns to normal after 5 seconds. If you occasionally want an extended period to see the chart with only the instrument(s) in view, press shift + minus (the underscore character). The chart will display no indicators for 60 seconds. Pressing the minus key again while indicators are hidden returns the chart to normal immediately.

In summary, use the minus key to momentarily view the chart without indicators with automatic resumption of normal drawing in 5 seconds. Use shift + minus for an extended view of instruments alone in their panes. Pressing minus while indicators are hidden returns to normal charting. The momentary period default of 5 seconds is user adjustable by setting a configuration variable in Setup: Preferences: Configuration. Set HideIndicatorSeconds=10, for example, if you want the momentary period to be 10 seconds instead of 5.

Quickly Change Chart View Period Using the Keyboard.

When a multi-pane chart is the front window, the keyboard <period> key serves as a shortcut for viewing/revising the "View Period" of the chart. If the chart's present view period is "Last N Days" or "Begin Date to Present", a small window will appear to accept further input. For example a "Last 3 days" chart can be quickly revised to show the last 5 days by typing three keystrokes: <period>5<enter>. Similarly <period>10<enter> updates the chart to show the most recent 10 days of trading. When the chart in question is set to show some begin date "To Present", the same small

window appears with a date entry control highlighted so you can use <tab> or <shift-tab> to move from Month to Day to Year and revise the date. The <tab> key also tabs out of the date control entirely so you can set the chart to "Last N Days" instead. If the window shows "Last N Days", pressing <tab> selects "Begin to Present". Further keyboard input can then be used to adjust the begin date. Notice that when entering a date, the number of days back for that date is shown in the Last N Days entry box. Similarly when you adjust the N for Last N Days, the date N days ago is reflected in the date control.

The date control in the Change View window is initially shown in Month Day Year form. You can use the down arrow menu at the left end of the date control to put the date entry control into "Relative Date" mode. In this mode, dates can be specified as N units ago, e.g. N days, weeks, months, etc. The <tab> key is used to move through the entry boxes as you would expect. When you tab to the Month in fixed date format, up/down arrow keys cycle through the months or you can type the first character of a month. In relative mode after tabbing to the unit entry box, up/down arrow keys cycle through the units choices or type d for days, w for weeks, m for months, y for years, etc.

When you type the <period> into a chart that is set to one of the other view period options (Begin to Ending Date, or N Days Ending, the View preference tab of the chart preferences will appear showing the current view period. You may then use the <tab> key in similar fashion to tab through the entry boxes and set new dates or change the N of N Days Ending. A mouse click can be used to change to a different view period option.

Profile Indicator: Custom Gradient/Blend.

Two more new drawing options were added to the Profile Indicator to provide the user more flexibility with respect to the display of volume- or time- based profiles. These two new options are available for the Volume Profile drawing style and are titled "Custom Gradient" and "Custom Blend". Both these options allow the user to select their own two colors, one for the high volume and one for low volume. The Custom Gradient fades a horizontal gradient from the high volume color to the low volume color. Each price presents a gradient from the low volume color towards the high volume color, with the higher volume prices digging deeper into the high volume color and resulting in a very pleasing aesthetic presentation. The Custom Blend draws each price in a single color which is a blend of the high and low volume colors, but that color is computed based on the volume of that price with higher volume prices blending towards the higher volume color and lower volume prices blending towards the lower volume color. These options offer the user complete flexibility with respect to volume profile color options.

TurboRTL and Experimental Configuration Variables.

Investor/RT 10.5 has two new experimental features that were developed during the final phase of candidate release testing. Both are significant improvements that we expect to integrate into IRT in the near future. They are available to users for experimentation until these features can be more thoroughly tested. Both features are off by default and may be turned on/off as desired using Setup: Preferences: Configuration.

Set TurboRTL to true to experiment with a faster RTL calculation engine. RTL formulas that use statistical functions (MIN, MAX, AVG, etc) will calculate much faster in custom indicators and signal markers. When TurboRTL is enabled, custom indicator calculations in general are faster, more noticeably so when the indicator is calculating initially on thousands of bars, e.g. when opening a long term intra-day chart having such indicator(s). Charts open much faster, charts recalculate much faster after a backfill, backtests and optimizations run faster, etc. If you have a particularly demanding custom indicator you may see it listed in the message log should it take more than 1000 milliseconds to calculate, e.g. when opening a chart and doing a full calculation. In extreme cases, for example a chart of five years of 5 minute bars (96,000 bars) a statistical RTL formula that took minutes to calculate now calculates in under 2 seconds. Please provide feedback on the effects you observe with TurboRTL set true. By making this experimental feature available we want feedback not only on how calculation times improve but also to verify that all RTL formulas are producing the identical results as when TurboRTL is false.

Set Experimental to true to enable testing of tick data sequence verification methods that monitor and correct date/time sequencing errors during chart loading. We have had isolated reports of charts showing a gap that can be remedied by performing a Full Data Download. When Experimental is set true, IRT will monitor tick date/time sequencing as part of all data loading operations. IRT does this very efficiently, making note of any needed data sequence corrections. The goal is to provide constant monitoring for data integrity as a normal by product of retrieving data for charts and other purposes, and to apply corrective actions automatically to improve data integrity and thereby improve the reliability of IRT charts. When a sequencing issue is detected a notice is placed in the message log. In the absence of any log messages when opening chart(s) it can be inferred that all tick data has been verified for proper date/time sequence.

Miscellaneous 10.5 Fixes and Improvements.

- When opening the Setup Instruments from a floating window, e.g. a chart, the Setup: Instruments window will now become a floating window so it appears above the requesting window. Note that checking the box titled "Floating Window" inside the Advanced section of the Setup: Instruments window will cause all Setup: Instrument to be opened as floating windows if desired.
- At startup Investor/RT deletes temporary files from the Admin folder. Backtesting reports are considered temporary files but these are now deleted only after they are 30 days old. A configuration variable can be used to keep backtesting reports for a longer time. Go to Setup: Preferences: Configuration and override the variable BacktestReportsDays to the number of retention days desired, e.g. set BacktestReportsDays=365 to keep the reports files around for year for future reference.
- You may now provide color/style/width of peak/valley lines in the setup for the Profile Indicator. This indicator is available only in the Market Profile editions of Investor/RT.

- A new result, "Delta Above/Below Close/Last Price", is available in the VPS (Volume Price Statistics) indicator. When added to a chart of full session periodicity (e.g. 405 minute, or 1425 minutes), this new result shows cumulative delta for each trading session.
- Transact/Infinity clients can do File: Open: Admin File and select the file named TransactContracts.txt to see a list of all futures and index symbols available to them. The format of this file has been improved to show the future type and the actual ticker symbol to enter into Investor/RT to track each contract or index, e.g.

6A: 6AZ1
 6B: 6BZ1
 6C: 6CZ1
 6E: 6EZ1
 6J: 6JZ1
 6M: 6MZ1
 6N: 6NZ1
 6S: 6SZ1
 EMD: EMDZ1
 ES: ESZ1
 NQ: NQZ1

- Exported definitions of scans, trading signals and custom indicators will now include only the export of token setups for tokens that are actually referenced within the RTL formula syntax. If export of unreferenced tokens is desired, go to Setup: Preferences: Configuration and set:

RTLExportUnreferencedTokens=true

Note that you may eliminate unreferenced (unused) tokens from any RTL setup by right-clicking on a column heading in the token list on the right and choosing Remove Unused Tokens.

- Investor/RT has an extensive list of setup information for various types of futures contracts. See Setup: Preferences: Future Types to view/edit/add future types. When you add a new instrument (symbol) to Investor/RT with security type future, it is important that the software know the characteristics of that type of future, e.g. its trading hours, the display format (tick increment), the name of the future type, etc. When you use the Setup: Instruments window to add a new futures symbol, e.g. ESZ11, Investor/RT determines ES is the type and fills in various information automatically. If you enter a symbol for a type of future that is presently unknown to Investor/RT, the new future type is now setup automatically. When this occurs the first time for some new future type, the new future type setup will appear in a window to enable you to verify, revise and ok the new setup. The new future type name will include the words SETUP NEEDED. Replace this with the actual name of the future type. Investor/RT will setup the tick increment based on the display format you entered for the new futures contract symbol. We recommend that you determine and fill in the dollar value of this price

move. Click OK to save any changes. You can edit the future type at a later time via Setup: Preferences: Future Types.

- When a reference line, setup to "Use Current Close" is placed in a pane that contains another indicator (and no instrument), the reference line will consider the current value of the indicator as the close. This enables reference lines to show the present indicator value across the full indicator pane for comparison with historical values of the indicator.
- The Object Editor has been improved to allow you to inspect the details of a chart (which instruments and indicators it contains) without actually opening the chart. This feature is designed as a diagnostic tool for inspecting a problematic chart in cases where opening the chart may cause an out-of-memory condition or some other fatal error exception. To inspect the setup details for a chart, call up the Object Editor from the Open menu; select Charts as the object type; select a chart name in the list; and click the View button while holding down both the SHIFT and CTRL keys. A report window will appear showing information about the selected chart: how many panes it has, what instruments and indicators reside in each pane, etc. Note that exporting the definition of a chart involves opening the chart internally. If exporting the chart definition is not possible, this chart inspector may be useful in diagnosing the problem.

Sometimes exporting a chart definition was not possible in 10.4 and earlier because the export process opens the chart with historical data invisibly in order to export the setup information. This process has been improved in 10.5 so that charts are opened without loading any historical data into them. This enables many chart setups to be exported for diagnostic purposes that otherwise might have caused an out-of-memory error for example due to an incorrect or corrupted setup.

- Weekly VWAP option was added to the VWAP Indicator.
- "Extend Naked Highs/Lows" Option was added to the Fractals Indicator.
- The Send Email window (File: New: Email Message...Alt-M) has a button titled Insert Msg Log; clicking it will insert the text of the message log into the message body. This may be useful when sending the log to support to report a problem.
- Quotepages containing custom columns and only a single symbol were not calculating the custom columns while the quotepage is minimized. This has been corrected.
- The Import Current Data schedule action (See Setup: Schedules) has been extended to support scheduled imports of files containing definitional text. A use of this automation could be a regularly scheduled import of a definition file containing trading notes listing the trades taken using some other trading platform.

- By default Investor/RT has long ignored trading holiday dates when charting overnight session instruments (typically futures contracts) because typically there is at least some trading perhaps in the early a.m. or late in the day of most trading holidays. Charting time interval periodicities without white space is often used around holidays so that all non-trading periods are simply not shown in the chart. You can elect to show the non-trading periods as white space or not by right-click in the chart and toggling Periodicity-->Whitespace on/off. This setting for overnight session instruments is a configuration variable (see Setup: Preferences: Configuration) with default value: `NoHolidaysOvernightSessions=true`;

Version 10.5 offers a similar configuration variable: `NoHolidaysDaySessions=false`. This one defaults to false, meaning that any holiday date specified in the holidays (or myholidays) file is effectively removed from charts. This setting works well for day session instruments, e.g. equities assigned to the U.S. Stocks session 0, on holidays. International users may wish for example to set `NoHolidaysDaySessions=true` when charting day session instruments that continue trading on international markets on trading holiday dates that pertain only to the U.S. markets. Setting `NoHolidaysDaySessions=true` means that holiday dates will be present in intra-day charts whether there is data or not. Turning off whitespace will eliminate the non-trading periods from charts for instruments that are not trading, while allowing those instruments that are trading to properly show the market data for those days. Using this setting may be more convenient than assigning U.S. equities to one session and non-U.S. equities to another.

In short, if you use the configuration settings...

```
NoHolidaysOvernightSessions=true;  
NoHolidaysDaySessions=true;
```

...Investor/RT will ignore any holiday dates that may be specified in the holidays.txt file or the user override myholidays.txt file, for all sessions, all instruments. When charting intra-day time intervals with white space on, non-trading periods will appear as a gap of white space. To eliminate the whitespace and show all trading data continuously, turn off the whitespace in the periodicity setup. Note that time independent periodicities, e.g. range bars, change bars, volume bars etc. are inherently "no whitespace" periodicities. Fixed time interval periodicities can be rendered in the chart with or without whitespace indicating non-trading periods.

- Right-click menu in multi-pane charts was revised to add an Export-->Definition to Clipboard menu item. Either the Save or Export submenus can be used now to export the definition text for the chart either to a file or to the clipboard for pasting.
- Setup-->Preferences-->Configuration now has a much needed built-in help feature that shows some help text for the currently selected configuration variable

Investor/RT Version 10.4.5, Released: July 22, 2011

Holiday Charting Improvements

Version 10.4 has fixed a variety of charting anomalies that surface either when running the software on the day of a holiday or in the days immediately following a holiday. Of particular note is the way that holiday charting is handled for multi-pane charts of day sessions. On the holiday date itself, day session intra-day charts (e.g. 1m, 5m, 30m) of a fixed time interval are static, even if data happens to be flowing for the symbol. Such charts are setup to display whitespace for non-trading periods and to eliminate entirely any holiday trading session time from the chart. Thus such charts cannot display holiday data even if it is present. The remedy is to turn off the whitespace option for the time interval chart (e.g. making the chart periodicity 1m*, 5m*, 30m*, the * indicating no-whitespace). For day session charts, Investor/RT will then display data for the holiday period when present and the chart will accept incoming real-time data if present. On holiday dates, some futures contracts often trade in the early hours of the day session in an abbreviated session. Multi-pane charts set to chart the overnight session always show all trading, but when the chart is set to display only the day session via the session override, this improvement allows the day session trading to be viewed real-time as long as the time interval chart is setup with no-whitespace. Toggling the whitespace on/off has been made more convenient by a Whitespace menu item in the Periodicity menu accessible by right-clicking in a multi-pane chart. If you do not want day session data to be displayed for holiday dates for time interval bars (no-whitespace), then this election can be made in Setup: Preferences: Configuration, by setting the variable ChartHolidayDaySessTimeBars to false.

Improvement to Chart Download Menu for Multi-Instrument Charts

When a multi-pane chart has multiple instruments, and you right-click in the chart and choose one of the Download menu items, Investor/RT now considers the pane in which the right-click occurred to determine the instrument for the ensuing download (backfill) operation. If a particular instrument in the chart is selected before you right-click, that instrument will be downloaded. If there is no selection, then the instrument in the clicked pane is downloaded if there is one. Otherwise Investor/RT finds the primary instrument in the chart and downloads historical data for it. Thus, for example, if you have a chart of a spread (a pair custom instrument) and additional panes containing the two component instruments of the spread, you can now initiate downloads on any one of them by right-clicking in the pane holding the instrument of interest. In earlier versions, only the selected instrument or the primary instrument in the chart could be the subject of the download. This improvement essentially eliminates the need to click first to select the instrument you wish to download before using the Download menu; simply right-click in its pane.

IMPORTANT INFORMATION ABOUT 10.4 UPGRADE

Some important precautions are in order for those who wish to upgrade to this significant new release. The list of key enhancements shown below includes Historical Database Management improvements. Version 10.4 uses an improved data base design that separates tick data and minute

interval historical data into separate physical files. Version 10.4 incorporates compression/decompression of tick data when reading/writing ticks to the database. These database management improvements increase the storage capacity of the intra-day historical database by an order of magnitude (~20 GB or more vs. 2 GB in version 10.3). The 10.3 database is migrated to the 10.4 database storage format at startup the first time you run version 10.4. A warning message states that the resulting database will not be compatible with version 10.3 and earlier.

Before upgrading to 10.4 it is recommended that you make a backup of your database and set aside a copy of the data_f and/or backup_f folder. If you later wish to revert back to 10.3, run the 10.3.14 installer; quit the installer without launching Investor/RT; then copy the files from the 10.3 backup folder into your data_f folder and startup 10.3.14. If you elect not to preserve a copy of your 10.3 formatted database, migrate to 10.4, and later decide to revert back to 10.3, it will be necessary to initialize the intraday database. To accomplish this, run the 10.3.14 installer and hold down the SHIFT key when launching 10.3.14 the first time. When the prompting message appears at startup, click the Initialize button. All of your chart setups and other preferences will be retained, but there will be no intra-day historical data until you backfill your charts and/or perform a Full Data download on each symbol.

Investor/RT Version 10.4.4 Released July 11, 2011

Historical Database Management and Importing Improvements

Version 10.4 adds a new database file for retaining intra-day interval historical data (bar data) apart from tick data. This change doubles the intra-day database storage capacity to 4GB. Investor/RT 10.4 incorporates zlib compression to manage the storage of tick data on the database. The compression ratio achieved varies from instrument to instrument. For the S&P Emini futures contract, compressed tick data uses about 10% of the database storage of uncompressed ticks. Testing across a wider universe of futures and equities, compression of tick data shows a ten-fold to four-fold improvement in storage capacity. These two data management improvements, on average, increase the intra-day historical storage capacity of Investor/RT significantly. Version 10.4 can store 16GB to 20GB of uncompressed intra-day data versus the 2GB capacity of the 10.3 database. Upon upgrade to 10.4 the database is migrated automatically. Compression takes place automatically as new tick data is captured from the real-time feed or as tick data is downloaded from a historical server. The database wizard window (Alt-U) has a new button to "Compress All Tick Data". This new utility function applies zlib compression to all tick data stored in the database and also compresses the tick.d01 database file to minimal size. See the message log for output showing how much tick.d01 disk storage was used before and after this utility is run.

Minute bar interval data is now kept apart from tick data and new import methods in 10.4 ensure that minute interval downloading does not affect the tick data retention period. If you have Historical Data preferences setup to retain say 100 days of intra-day data overall and the last 5 days as tick data, and you perform a 100 day minute download, the incoming minute bars will replace any

minute bars on file for the period but will not replace any tick data already present for the most recent five days. If you decide to increase your historical intra-day retention from 100 to 200 days, you can use the Data Download window to request 200 days of one minute bars for all symbols. Each download will backfill the one minute data 200 days back, but will leave the last five days of tick data as is. This is a major improvement versus 10.3 and earlier where every minute interval download had to be followed by a tick data download.

Backfilling intra-day charts with the last few minutes of ticks or last session or two of ticks is now faster and efficient. The improvement will be especially evident to users who retain many days of tick data. The Investor/RT database is now updated directly with the incoming data. If you have 60 days of tick data on file, a short term backfill will update just the most recent session of ticks on the database, leaving the prior 59 days of stored tick data in place. The improved data import process uses very little memory and is independent of the amount of tick data already on the database for the instrument.

Since tick and intra-day bar data are now kept in separate physical files, initialization utilities are now provided for each in the Database Utilities menu and in the Database Wizard (Alt-U) window.

Revised Behavior for Buttons Using Drawing Tool Indicators

If you right-click on a trend line, reference line, Fibonacci line, annotation indicator in a multi-pane chart and choose Add Button, Investor/RT adds a button to the chart that uses the preferences of the subject indicator to invoke the drawing tool associated with that indicator. If instead, you wish to actually toggle on/off the actual indicator, then you can right-click on the button and choose Edit button. You will notice that the button purpose has been setup as "Activate Drawing Tool Preset". Simply revise the purpose to "Add/Remove Preset Indicator" and click ok. Thereafter, clicking the will alternately remove and add back the subject indicator. This is an improvement over 10.3 where Add/Remove Preset Indicator was not available for drawing tool related indicators.

Sharing Preferences and Share Picture Improvements

Setup: Preferences: Sharing has been simplified. When using the Share Picture command to share a window over charthub.com, a prompting dialog will appear in which you can specify a comment and indicate whether you want the window definition shared along with the image.

DTN Market Access Improvements

Investor/RT users with no streaming market data source who use DTN MA as their source of market data will see some improvements in Version 10.4. Whenever historical data is downloaded, Investor/RT will process the intra-day data for the most recent trading session and update the values for open, high, low, close, volume, and previous close automatically. These values will be updated in any open quote pages and charts. User who run scans after the day session closes, can setup a schedule to automatically download tick or minute interval data for all symbols and follow this with a schedule step to "Post History". This will record the newly acquired OHLVC data as a new bar into the daily historical database so that scans on daily bars can be run immediately on the latest daily bar.

DTN MA users will also notice that as new symbols are added into charts or quote pages or using the Setup: Instruments window, historical downloading is initiated automatically. Charts and quote pages will update right away. This auto downloading can be turned off by adding a line to the configuration file: `DownloadFullDataNewSymbols=false;`

Trendline Drag and Drop Improvement

The behavior of trendlines when dragging within charts has been modified. In past releases, users could drag either end of the trendline to any position on the chart while the other end retained its position. This behavior remains when the user drags the endpoint of the trendline. However, when the starting end of the trendline is dragged, the entire reference line will be dragged together, holding its length and slope/angle. This gives the user the flexibility to adjust the slope and length of the line by dragging the endpoint, or move the line altogether while retaining the length and slope by dragging the start point. Users may ctrl-drag the start point of any trendline to make a duplicate of the trendline that retains the slope and length of the original trendline. Users may still access the original behavior when dragging the start point by shift-dragging the start point, to move the start point while retaining the position of the endpoint. The new method for dragging the start point allows users to drag trendlines into positions where the endpoint protrudes into the future past the current bar.

Profile Indicator - Sharing Peaks and Valleys Among Charts

The Profile Indicator has a new option which makes it easy to transfer peaks (or high volume nodes) and valleys (or low volume nodes) of composite profiles to other charts easily and efficiently. This allows the user to place the nearest three peaks and nearest three valleys on any chart without the overhead of increasing the overhead of expanding the viewing period of those charts and adding the Profile Indicator to those charts. Once chart computes the peaks and valleys and the other charts use that single calculation. This is implemented within the Profile Indicator by checking a new check box "Store 3 Peaks + 3 Valleys Into V#x thru V#y". The user specifies the series of user variables (V# variables) they would like the nearest three peaks and valleys stored in. The three nearest peaks will be stored in the first three user variables and the three nearest valleys will be stored in the next three variables. Once this is setup, the user can make use of the next two new features mentioned below to easily display these peak and valley lines on other charts.

Reference Line - Plotting Series of User Variables

The Reference Line indicator now has an option that allows users to plot lines for a series of user variables with a single indicator. When the user choosing to base his reference line on "Use V#", a new check box now appears to the right of this option labelled "+ x". If, for example, the user has chosen to "Use V#2" and then checks the new option with "+5", the reference line will then plot a line for not only V#2, but also the next 5 user variables of V#3, V#4, V#5, V#6, and V#7. If applicable, these reference lines will also use the title of the user variable as the label of the line. All lines will share the same color and style.

Auto Titling of User Variables

The User Variables preference window (Setup: Preferences: User Variables) now has a new option titled "Auto Title". When this button is pressed, user variables will be automatically titled based on their usage for exporting values from indicators and charts. This option currently handles peaks and valleys in Profile Indicator (HVN1, HVN2, HVN3, HVN1, HVN2, HVN3), Pivot Indicator (S3 thru R3), and Market Profile chart price levels (DPOCv, IBH, DVAH, etc). If a user variable is not used to export a value from an indicator or chart, it's title will be left alone.

Watermark Indicator

A new Watermark Indicator has been added to allow user to identify themselves, their organization, or the symbol in the chart with subtle translucent text overlaying the chart. The indicator gives the user the option to supply the text used, the position, the font and size, along with several levels of translucence/opacity.

Chart Time Axis Drawing Improved

Multi-Pane charts now show the date time labels and lines into the future (to the right of right of current bar) for time-based charts. This includes minute or seconds interval charts, daily, weekly, and monthly charts. Prior to Version 10.4 the lines and labels ended at the current bar. This makes it easy to identify the date time of future periods when there is a lookahead period or a right margin of white space in the chart.

Volume Breakdown - Indicator Access to High and Low

The Volume Breakdown indicator has been improved to allow indicators easy access to the high and low of delta bars or cumulative delta bars. When the user chooses "Statistics: Indicator" and specifies an indicator to operate on the VB results, this indicator now has access to not only the closing price of the delta bars, but also the open, high, and low prices of those bars. So for instance, if the user choose an indicator of "Session Statistics" and setup SESST to give the highest high of the session, the indicator will now operate properly on the high values of the delta bars. When this combination is now used, VB also allows the user to specify any drawing style (Stepped Lines, Histogram, etc) with which the result will be displayed.

New Formats for Export of Fractals, Volume Breakdown. Fractals

When the user right-clicks on the Fractal Indicator and chooses to "export data", the resulting data file is now formatted to provide the respective high or low price of each fractal. In past versions, a 1 was provided for any up or down fractal. This gives the user quick access to these fractal prices in the exported file without having to use alternate means (e.g. Excel) to extract that information.

Volume Breakdown: When the user right-clicks on the Volume Breakdown Indicator and chooses "Export Data", the data is now presented in a much smarter and easy-to-understand format. If delta bars are in force, the user will see four columns of data for VB_Close, VB_Open, VB_High, and VB_Low. Otherwise, a single column will be displayed providing the single array of results for each bar. If the user

holds down the shift-key during the export process, the columns for open, close, high, and low prices of the underlying bars will also be appended to the data.

Technical Indicator Text Label Option

Indicators may now be labelled with a text string just left of the current value on the vertical scale. This makes it easier to identify what each indicator represents when multiple indicators are present in a pane. To access this option, double-click on the indicator to view the indicator preferences. The "Text Label" settings appear near the bottom of the window beneath the "Label Current Value" settings. Choose "Custom" and provide a your own label or "Automatic" to use the default label for the indicator. If the "Use Scale Color" check box is checked, the label will use the inverse of the scale colors. Otherwise, the label will be drawn using the indicator colors and the background color of chart.

Profile Indicator - In Range Duration Option

A new duration option has been added to the Profile Indicator titled "In Range". This option is similar to the "All Data" option in that it considers all bars loaded in the chart. However, the In Range option takes an numerical period which dictates how many prices above and below the current price are to be considered in the profile. As an example, if a period of 100 was specified, then the profile would look at all bars in the chart, but would only process bars which were within 100 ticks or price increments of the current price. This allows users to limit the drawn profile to the relevant activity in general proximity of the current trading area.

Latest Rithmic R | API for Zen-Fire/Rithmic Users

Investor/RT Version 10.0 adopts the Rithmic R | API Version 4.0.0.0. All trading orders sent to the Zen-Fire/Rithmic brokerage destination are designated as Automatic or Manual trading orders. Any trading order that involves some user interaction that initiates the sending of the order are sent as manual orders. Orders that are sent by some automation, e.g. a trading system rule or a signal action will be marked automatic unless the trading order itself requires a user confirmation before sending the trade to the broker. Any automatically initiated trading order that requires a user interaction to specify a stop or limit price, e.g. via a mouse click, will be sent as a manual trading order.

Layout Toolbar Tab Sequencing Improvement

Each layout now has a layout sequence number. In the Layout Toolbar, you can view and edit the sequence number and Save the layout. Initially all layouts will have zero sequence number. After assigning a sequence number to each layout, the tabs will appear left to right, ascending by sequence number, the next time you start Investor/RT. if you have 2 or more layouts with the same sequence number, they will be sequenced alphabetically by layout name. Formerly, the sequencing of the tabs was done solely on the layout name; editing layout names was necessary to affect the alphabetical order of the tabs. It is not necessary for the sequence numbers to be consecutive. For example, if you have five layouts you could assign the layouts number like 10, 20, 30, 40, 50. Later you may want to add a new layout in second position, so assign it sequence number 15, now you have 6 layouts numbered 10, 15, 20, 30, 40, 50 with layout tabs appearing in that order.

Preferences Panel for Configuration Variables

The Setup: Preferences: Configuration window provides a simple user interface for adding configuration variable settings to the configuration file (configure.txt). These configuration settings can be setup the manual way by editing and saving the configuration file directly (File: Open: Configuration File; enter a line into the window; press Ctrl-S) but this new preferences panel has several advantages. The window shows an alphabetized menu of configuration variable names making them easier to find. A search feature is available via a Find box where you enter letters and matching configuration variables are listed. Enter the letter "c" and only those variables that begin with that letter are listed. Enter * followed by any series of letters to find variables having that series of letter anywhere in the name. A menu of common search patterns is available, e.g. choose *color from the menu to list all of the variables with names that include the word color, or *charts to see chart related variables. When you select a variable name, the window shows the recommended default value and the current override setting. If you modify the override setting and click OK or Apply, a line is added to your configuration file to set that variable to your specified value. The configuration file display window can open automatically whenever you apply a change to the file by checking a box in the window. Many configuration variables have a value of true or false, the others are numbers, like the SimulateTickDataDaysBack=50 variable described in item #19 below. There are three configuration variables that are used to specify a color. A color can be specified as three 3-digit numbers representing the red, green and blue component values of the color. Item #18 below discussed two new color configuration variables that can be used to specify the way scroll bars are drawn when scrolled to present versus when scrolled back in time. The Configuration window will show sample RGB values in the menus to assist you when you wish to change any of these color configuration variables.

Three buttons: View Configuration, Backup Configuration, Restore Configuration enable you to view the current contents of the configure.txt file; make a time stamped backup of the current configure.txt file; and restore the configure.txt file from a backup. Backups of the configure.txt file are stored in the admin folder with time stamped names of the form: configYYMMDD_HHMM.txt. When you make a backup file, a commentary line is added to the bottom of the file to remind you of the date and time the backup copy was made. You can view any backup file using File: Open: Admin File and choosing the file. You can open any backup config file, inspect it, then do File: Save: Save As and save it as configure.txt to update your current configuration. Note that the new configuration settings take effect immediately when you save configure.txt or do a Restore Configuration from the Configuration preferences window.

Chart Scroll Bar Color Preferences

MS Windows users will notice that the multi-pane chart scroll bar is displayed with the normal white background when the chart is scrolled to present and real-time updates are being observed. When you operate the scroll bar to look at periods of time in the past, real-time drawing within the chart does not occur; the scroll bar dims to a gray color. The appearance change reinforces that you are looking at data in the past. When you later scroll back to present, the scroll bar returns to white and real-time drawing resumes. Real-time data reception, indicator calculation, alarm monitoring, etc. takes place within Investor/RT charts at all times, whether scrolled to present or scrolled back in

time. When scrolled back, the chart is visually static; the scroll bar color simply serves as a reminder that the chart is displaying older data. Scrolling to present will make the chart dynamic again, reflecting changes in the market as trades occur. Any new bars formed or trades that occurred while the chart was scrolled back will, of course, be reflected in the chart when you scroll it to present again.

Some may prefer a different color scheme for chart scroll bars. For example, you may want the scroll bar to be drawn in a more vibrant color when charts are scrolled back in time as a stronger visual warning that the values being observed are not the present market prices. Go to Setup: Preferences: Configuration; Choose ChartScrollBackColor as the configuration variable, then choose Yellow or Red from the menu of Override Values; Click OK and thereafter, your scroll bars will be drawn with the selected background color whenever you are scrolled back. You may also adjust the color used to draw scroll bars when they are scrolled to present by overriding the ChartScrollPresentColor variable in similar fashion. The default white, gray, or light grey are recommended override values for ChartScrollPresentColor. See item #17 above for more on using the Setup: Preferences: Configuration window.

Miscellaneous 10.4 Fixes and Improvements

- At startup 10.4 checks for key sub directories inside the Investor/RT working directory and creates them if necessary. Folders such as admin and tickdata must exist in the working directory for Investor/RT to operate correctly.
- Multi pane charts setup to display background as a "gradient" would sometimes revert to a gradient color of black. This bug has been corrected in 10.4.
- String comparisons with the empty string are now possible in RTL, e.g. SECTOR = "" will scan for symbols having nothing for the sector field.
- A rare bug would cause instruments with volume-like values over 10 million, e.g. \$VOLD on eSignal, to auto scale incorrectly. Symbols this extremely large price values now auto scale properly.
- A bug was fixed in the eSignal version. Open interest is now properly download when daily bar data is downloaded for futures and options symbols.
- When DTN MA is used in conjunction with a broker feed, and the host ticker symbol having a correctly specified DTN alias symbol contains special characters (slashes, quotes, colons etc.) the historical download would fail. For example, a symbol setup as TICK/Q with DTN Alias NASTICK.Z, would get an error, while a symbol like TICKQ with the same alias would work fine. This has been corrected.
- A memory leak was fixed in RTL scans where the PROF (Profile Indicator) was used in conjunction with the MPD (Mixed Periodicity) token.

- The Window-->Bring To Front menu has a new menu item titled "All Alert/Message Windows". The effect is to show any open alarm windows and message display windows in a staggered fashion in the main Investor/RT task window.
- All Investor/RT Preferences windows now open as floating windows positioned initially at the top center of the main Investor/RT task window. This enables such windows to be left open and positioned on other monitors if desired, and it also ensures that opening a preferences window will result in a viewable window even if you have open floating charts or quote pages inside the main Investor/RT task window. In version 10.3 newly opened preferences windows could not be seen if a floating chart or quote page was occupying the main task window.
- An improvement was made to custom instruments where a custom instrument composed of only a single component using a multiplier and the last price will now carry the trading volume and the multiplier adjusted bid and ask prices of the component symbol in the custom instrument. This was only done when the multiplier was 1 in earlier versions. This allows the custom instrument to product a real-time stream with matching buy/sell volume of the underlying component.
- Investor/RT 10.4 has been updated to use the latest Transact/Infinity API (Version 3.0.0.666). This release features improved real time streaming data in high trading volume conditions.
- Candlestick wicks are now drawn with a bolder line when the candlesticks reach 12 pixels in width. The wicks are drawn bolder again when the candle body is 30 or more pixels wide. There is a configuration variable for this new feature. Add a line to the configuration file: `CandleWickIncAtWidth=10`, for example. The number you specify is the candle body width at which the wicks begin to be drawn bolder. Users who prefer the 10.3 rendering where all wicks are drawn as a thin 1 pixel line, set `CandleWickIncAtWidth=0`. Use File: Open: Configuration File; add the `CandleWickIncAtWidth` line; press Ctl-S to save the `configure.txt` file. The new setting goes into effect immediately.
- The built-in help window opens taller and wider. The window typically needed manual resizing in earlier versions; this should no longer be necessary.
- Vertical lines in multi-paned charts are drawn to denote the beginning of trading sessions and day of week transitions. A configuration variable can be set to cause these lines to be drawn at a fixed height rather than from bottom to top of pane. To adjust this setting do File: Open: Configuration File; add a line to the file reading, for example:

Press Ctrl-S (or do File: Save: Save) to save the configure.txt file. Boundary lines will now appear as short 16 pixel lines at the bottom of the pane. To turn off boundary line drawing completely, use `ChartBoundaryLineHeight=0`.

- Chart periodicities range bar, volume bar, change bar, ticks per bar, Renko bar and others require underlying tick data to compute precisely. If a chart with any of these periodicities has a View period that falls within the tick data retention period of the symbol, then the chart is rendered 100% with tick data. However, if the chart begins at some date in the past where only interval bar data is available, Investor/RT must in effect simulate tick data from the bars you have on file before your tick data actually begins. By default, Investor/RT will produce placeholder session bars for any bar data more than 50 trading days ago, and will produce simulated tick data from the interval bars for the period spanning 50 days ago up to the beginning of actual tick data on the database. For example, if your tick data retention is 10 days and your intra-day retention is 1200 days and you open a 1200 day range bar chart, the resulting chart will have precise range bars for the most recent 10 days, simulated range bars (produced from one minute data) for the 40 days before that, and one bar per session for any periods older than 50 days back. The default value of 50 can be adjusted by the user by going to Setup: Preferences: Configuration and setting the variable `SimulateTickDataDaysBack` to a larger or smaller number of days. The default setting is ample for most users and charts load very quickly with this setting at 50 or lower. Note that this

setting is only for "tick bar" periodicities that rely on tick data to load the bars. Time interval charts are not impacted by this setting.

- The Full Data download function in multi-pane charts, market profile and classic Footprint chart windows deletes all tick data on file for the symbol before initiating the Full Data download. This is done because otherwise Version 10.4 would not permit 1-minute data to replace tick data that is already on file (as earlier versions did). Removing tick data as part of the Full Data download function will result in Full Data download behavior similar to Version 10.3 and earlier, i.e the tick data retention period of the symbol will contain a fresh mix of one minute and tick data returned from the download data source. The tick retention period will contain 100% tick data if the tick data returned from the Full Download covers the entire period. If the tick retention period is longer than the period for which tick data can be downloaded, the 1-minute interval data will be retained for that period older than the tick data delivered to Investor/RT.
- Chart annotations can include either the %START or %STARTDATE token to note the starting date/time of the data in the chart. Both tokens show the date of the first bar in the chart. For intra-day charts, %START shows both the date and time of the first bar.
- Monthly charts update dynamically as trades occur. Prior to 10.4, only daily, weekly, and intra-day charts were dynamic.
- The Edit-->Copy User Profile menu item no longer prompts the user with a message; the profile text is copied to the clipboard and a message to that effect appears in the main toolbar message area. If you wish to see the text on the clipboard you can use Edit-->Show Clipboard, or if you hold down the Ctrl Key while choosing Copy User Profile, the profile is copied and is then shown in a text window.
- Chart definitions can now be copied to the clipboard by right-clicking inside a chart and choosing Save-->Definition to Clipboard. This may be useful if, for example, you are running multiple instances of Investor/RT and wish to copy a chart definition from one instance to another. After copying the definition, go to the other instance and do File: Import: Definition from Clipboard.
- A bug was fixed relating to chart slide shows and floating chart windows. When initiating a slide show from a chart's toolbar, the slide show was incorrectly using the first floating chart window for the slide show if there was one. The slide show now begins using the chart from which the slide show was initiated.
- Investor/RT Final Release Candidate #6 fixed a bug having to do with exporting tick data to a file. The fix adversely affected the Volume Breakdown indicator if the VB was setup to "Consider Trades with Volume < N". This has been corrected.

- The Periodicity Menu accessible by right-clicking in a multi-pane chart was improved: choices for 60 minute and 405 minute periodicities were added and a new menu item titled Whitespace enables the user to quickly toggle time-based charts between whitespace and no-whitespace drawing mode.
- Tranact/Infinity customers using Investor/RT can chart \$TICK, \$STRIN, \$TQCX, \$STRIQ indexes. You must be enabled by your broker for these symbols. To see if you have these symbols available to you, do File: Open: Admin File and select the text file named TransActContracts. This file lists all symbols that can be watched by Investor/RT.
- A bug, introduced in 10.4.3, that caused problems with the configuration file (configure.txt), has been fixed in 10.4.4
- Chart Buttons purposed for toggling a preset indicator on/off in a chart can now specify in the pane setup option whether to add the indicator to the instrument pane in front or at the back of the list of indicators in the pane. Most overlay indicators by default go to the front when adding them. You can now override this behavior to force an indicator to always be added behind the instrument and other indicator if desired. A few overlay indicators such as the Profile and TPO indicators by default are added to the back if you use "Default Pane" as the positioning choice. You can now override this create a button that adds the profile indicator on top of the instrument and other indicators in the pane.

Investor/RT What's New Released March 24, 2011

Intraday Chart Day-of-Week Labeling

A new option is available for labeling day-of-week transitions in overnight session charts. There are now two check boxes in Setup: Preferences: Charts: General that control boundary labeling. One for specifying that session boundaries should be drawn and a new one that pertains to day of week transition. Check the box titled "Label Day-of-Week Boundaries Within Overnight Session" to engage this feature; it is "on" by default. When "on", the session boundary vertical line (if enabled) is labeled with the session start time and the date. In addition, a day of week boundary line is drawn at midnight and the new day of the week is labelled there rather than at the beginning of the session. Showing both the session start/stop boundary and day of week boundary as separate lines make it clearer that the session passes through midnight and the day-of-week shown will now denote the day of the week that the session ends rather than the day of the week the session begins. If you want only session boundaries to be labeled, simply uncheck the box to see the same labeling as version 10.3.6.

If you want to see day of week boundaries labeled only in selected chart setups but not others, then you can turn off this new option and instead add a Vertical Reference Line indicator to any charts you want. Setup the Vertical Reference Line with any date and a time of 00:00:00 (midnight) and check the box "Draw every day at the Specified Time". Such midnight vertical lines will show the day-of-week label for overnight session charts when trading passes through midnight. This method might be

desirable if you want more control over the line color and style, where the label is drawn, or you wish to be selective about which charts have such boundary lines, or if you only want these lines to be drawn inside your instrument pane rather than through all panes in the chart.

Profile Indicator Volume Distribution Improvement

The Profile Indicator is commonly used to implement both short and long term composite profiles. When tick data is available, the Profile Indicators uses that tick data to compute true volume-at-price information. However, for periods in the past when only 1-minute data is available, the volume within each 1-min bar must be distributed in some way among the prices in the bar. Invisible 1-min bars are loaded into the chart for use by the Profile Indicator so it may provide the most accurate volume-at-price information possible based on available data.

Prior to version 10.3.9, the volume within these 1-minute bars was divided up equally among the prices. We have done some statistical analysis on the average distribution of volume among the prices in 1-minute bars using tick data for the S&P Emini contract. As a result of the studies, new distribution models were developed for allocating the volume among the prices within bars of various ranges. Upon further testing, these new distribution models resulted in a 35% increase in accuracy when compared to the method of equally dividing volume among prices. This new distribution method is in place for 10.3.9 and should result in more accurate volume distribution, especially for longer term composites.

New Button Purpose: Set V# from a List of Values

Investor/RT has for some time had a button type for setting V# variables to an instrument price value. This button purpose optionally submits a trading order after setting the V# to a mouse selected value. See the topic New in 8.3, item 22. for details. Version 10.3 adds a new button purpose Set V# from a List of Values. User Variables are sometimes used in setups for technical indicators. For example you could have a Moving Average indicator in a chart with V#37 specified as the moving average period. This new button purpose makes it easy to create a menu button for quickly changing the moving average period. Add a button, set the purpose to "Set V# from a List of Values", and use the setup string: V#37,3,9,15,30,45,60. Notice the first element in the comma separated list is the V# you wish the menu button to set, the second and subsequent items are the menu item choices you want for V#37. When you click the button in the chart, a menu pops up showing V#37 as the first menu item with the value choices listed below; select one and the moving average will update to reflect the revised V#37 value. The first menu item can optionally have a value as well, introduced by the equal sign, e.g. V#37 =3,5,6,15,30,45,60. In this case, the first menu item in the resulting popup will be "V#37 =3"; choosing this first item will set V#37 to the value 3. If a value is not present in the first menu item, you will be prompted to provide a value for V#37. If you provide names for your user variables (using Setup: Preferences: User Variables), your assigned name will appear in such prompts. For example, you can assign the name "MA Period" to V#37. The prompting message would then read something like: "...enter a value for @ES# user variable V#37 (MA Period). The current value is 30". The setup for the button can also contain some commentary text to make the button's menu more meaningful. For example, if you setup the menu button with the string:

V#37 MA Period,3,5,9,13

then the menu you see when clicking the button will show "V#37 MA Period" as the first menu item with the four choices for MA Period arrayed below. You can also setup a Push Button using this Set V#... purpose by listing the V# number followed optionally by a value (no commas, no list of menu items). For example, if you setup the button as a push button with the setup string "V#37", then clicking the button would prompt for a value for V#37. If the setup string is "V#33=15" then clicking the button will set V#33 to the value 15 for the symbol in the chart. Push buttons may also have custom colors and titles if desired.

Profile Indicator Volume Distribution Improvement

The Profile Indicator is commonly used to implement both short and long term composite profiles. When tick data is available, the Profile Indicators uses that tick data to compute true volume-at-price information. However, for periods in the past when only 1-minute data is available, the volume within each 1-min bar must be distributed in some way among the prices in the bar. Invisible 1-min bars are loaded into the chart for use by the Profile Indicator so it may provide the most accurate volume-at-price information possible based on available data.

Prior to version 10.3.9, the volume within these 1-minute bars was divided up equally among the prices. We have done some statistical analysis on the average distribution of volume among the prices in 1-minute bars using tick data for the S&P Emini contract. As a result of the studies, new distribution models were developed for allocating the volume among the prices within bars of various ranges. Upon further testing, these new distribution models resulted in a 35% increase in accuracy when compared to the method of equally dividing volume among prices. This new distribution method is in place for 10.3.9 and should result in more accurate volume distribution, especially for longer term composites.

Investor/RT Version 10.3.7, Released: December 23, 2011

Layout Toolbar Improvement

Layouts now be excluded from display in the layout toolbar. This is accomplished using the layout toolbar to select the layout in question, checkmark the "Exclude Tab from Toolbar" checkbox and then save the layout. The layout remains defined and accessible using the menu system, but its tab will no longer appear in the layout toolbar. The Open-->Layout menu or the File-->Open-->Layout command can be used to open any layout independently of the layout toolbar. When the menu system is used to open a layout that is presently excluded from the layout toolbar, the layout's windows will open and a tab for that layout will be added to the layout toolbar temporarily. This enables you to uncheck the "Exclude Tab..." checkbox and save the layout if you wish that layout to be available in the layout toolbar thereafter. At startup, any layouts having the "Exclude Tab..." setting will be passed over for inclusion in the layout toolbar. This feature may be of interest to users with a large number of layouts, many of which are rarely needed, or when the layouts of interest might change from time to time.

Intraday Chart Day-of-Week Labeling

A new option is available for labeling day-of-week transitions in overnight session charts. There are now two checkboxes in Setup: Preferences: Charts: General that control boundary labeling. One for specifying that session boundaries should be drawn and a new one that pertains to day of week transition. Check the box titled "Label Day-of-Week Boundaries Within Overnight Session" to engage this feature; it is "on" by default. When "on", the session boundary vertical line (if enabled) is labeled with the session start time and the date. In addition, a day of week boundary line is drawn at midnight and the new day of the week is labelled there rather than at the beginning of the session. Showing both the session start/stop boundary and day of week boundary as separate lines make it clearer that the session passes through midnight and the day-of-week shown will now denote the day of the week that the session ends rather than the day of the week the session begins. If you want only session boundaries to be labeled, simply uncheck the box to see the same labeling as version 10.3.6.

If you want to see day of week boundaries labeled only in selected chart setups but not others, then you can turn off this new option and instead add a Vertical Reference Line indicator to any charts you want. Setup the Vertical Reference Line with any date and a time of 00:00:00 (midnight) and check the box "Draw every day at the Specified Time". Such midnight vertical lines will show the day-of-week label for overnight session charts when trading passes through midnight. This method might be desirable if you want more control over the line color and style, where the label is drawn, or you wish to be selective about which charts have such boundary lines, or if you only want these lines to be drawn inside your instrument pane rather than through all panes in the chart.

Investor/RT Version 10.3.1, Released: October 22, 2010

Improved License Activation

Investor/RT 10.3 includes upgraded software components for license activation designed to improve the reliability of license activation and verification. The Windows Service "ASTSRV" is superseded by an improved service named NLSSRV32, the "NLS Service". The new service is installed automatically the first time Investor/RT 10.3 starts up. Windows 7/Vista users will have to run Investor/RT once "As Administrator" to install the service. The new licensing software operates effectively when RAID disk arrays are in use.

Zig Zag Enhancements

Two new options were added to the Zig Zag Indicator. The "Minimum Change" can now be specified in "Bars" in addition to "\$" and "%". Also, a new "Trend Coloring" option was added.

When "Minimum Change" is specified in "Bars" (20 bars for instance), this does not mean that each leg will be 20 bars in length. Instead, it uses the bar count in respect to new highs and lows. If the last leg was downward, then only a bar with a high greater than the high of the previous 20 bars can establish a new pivot and a new upward leg. Once that upward leg is established, only a bar with a low that is less than the lowest low of the previous 20 bars can establish a new pivot and a new downward leg. After establishing a downward leg, if we encounter a bar with a lower low than our

pivot bar, that bar replaces the pivot for the downward leg (just like "\$" and "%" currently work). This "Bar" method allows the volatility of the market to power the Zig Zag instead of requiring the user to supply a specific \$ or % value. The "Bar" method should also translate well among various instruments and security types.

A new check box has been added titled "Trend Coloring". When this check box is checked, each leg of the Zig Zag will be colored green when in an uptrend and red when in a downtrend. When in an uptrend, our state can only be reversed to a downtrend by a downward leg whose pivot low is lower than the previous downward leg pivot (a lower low). When in a downtrend, our state can only be reversed to an uptrend by an upward leg whose pivot high is higher than the high of the previous upward leg pivot (a higher high). This coloring options gives the user visual feedback to reflect whether the instrument is in an upward or downward trend.

Profile Indicator: Heat Map

A new "Heat Map" option has been added to the Profile Indicator. This option can be found by choosing "Draw As: Volume Shading" and then choosing "Heat Map" from the menu of colors. When this option is selected, the profile transforms into a vertical block showing a color gradient reflecting the relative volume at each price. The color gradient starts at black for lowest volume price and from there goes to blue, green, yellow, then red as the volume increases. This option gives the user a new visual display of high and low volume areas, especially on longer term profiles. When Heat Map is turned on, the user can check "Right Align" to position the Heat Map along the right edge of chart, or uncheck "Right Align" to position it along the left side. In addition, the user may check the "Width" check box to specify the width of the Heat Map block, in pixels. The user may stack multiple Heat Maps on either side of the chart, one for last month, one for last week, one for current session, etc.

Scrolling Charts with Scroll Wheel

Users may now scroll multi-pane charts horizontally (in time) using the scroll wheel. Simply hold down Ctrl+Shift (hold down both Ctrl and Shift keys together) while operating the scroll wheel, and the chart will scroll back and forward in time horizontally. Operating the scroll wheel alone (without Ctrl or Shift depressed) will zoom the chart horizontally. Ctrl+scroll wheel zooms the chart vertically. Shift+scroll wheel scrolls the chart vertically. Mac OS X users: use the Option key instead of Ctrl key.

IQFEED Symbol Lookup and Equity/Index Option Chains

Users of DTN IQFEED (Windows) now have access to the DTN lookup server for symbol lookup and listing of near month option ticker symbols for underlying equity/indexes. To use the new built-in symbol lookup feature, choose Symbol Lookup... from the IQFEED menu in Investor/RT. Enter a word or partial description optionally followed by a comma and a security type code (STK, OPT, FUT, INDX, FOPT, MUT). For example, enter STARBUCKS and Investor/RT will show a list of symbols (any security type) having the word STARBUCKS in the description. GOLD,FUT will list futures contracts whose description contains the word GOLD. AGGRESSIVE,MUT will return mutual fund symbols having the word AGGRESSIVE in the fund name, etc. Having identified the ticker symbol of interest you can then copy/paste or type it into the quotepage or the Setup: Instruments window to begin following it.

The option chain feature is available via the quotepage. Right-click on any equity or index and choose "Option Display". Investor/RT will respond with a list of 8 in-the-money and 8 out-of-the-money option ticker symbols with contract expirations in the nearest four months. Calls are listed first followed by a list of puts. The list of ticker symbols appears in a text window, one ticker per line. If you wish to add the symbols and begin tracking them with IQFEED you can select one or more (or all) the lines and copy the text to the clipboard (Ctrl-C), then open a quotepage and do Edit->Paste to paste the ticker symbols into the quotepage page, adding the symbols automatically. IQFEED will immediately begin watching the options and data will fill in.

New Method for Adjusting Indicator Colors

Revising the color of an indicator line, reference line, trendline, etc. can now be accomplished more simply and directly from the right-click menu in multi-paned chart windows. For example, right-click on a trendline and use the "Edit TLINE Color" submenu to change the color, style, or thickness of the trendline. The submenu includes some common color choices (red, green, blue, black, etc.). A Color Picker menu item allows any color to be specified. Right-click on any indicator and choose Edit Preferences... to view and/or edit the full set of preference settings for the indicator. For those who plan to use these color revision menus often, we have added a shortcut: Hold down the Ctrl key (Option key on Mac OS X) while right-clicking on an indicator and the menu of color choices will appear (rather than the more comprehensive indicator popup menu). Almost all indicators present in Investor/RT support this new color menu. For the few that do not, the menu will be dimmed when you right-click on such indicators. Some indicators that support multiple color settings will typically update the primary color setting only. A few special cases such as stochastics which have multiple lines and multiple line color settings will assign the color change to the appropriate line based on the current settings of the indicator. Use the Edit Preferences... menu item in cases where the line color you need to adjust is not the one affected by this new Edit Color menu.

Volume Breakdown Efficiency Improvements

Certain implementations (combinations of settings) of the Volume Breakdown Indicator (VB) require an extensive amount of memory upon initial loading/calculation of the VB. The most notable implementation involves VB with volume filter (Consider Trades w/ Vol >/< x). When VB involves a volume filter, then VB must go through all the ticks/trades to evaluate if each one should be considered. In past versions, all trades have been loaded into memory and then processed by VB, using only the ones that pass through the volume filter. In this release, the ticks are evaluated for meeting the volume criteria BEFORE being loaded into memory. The net result of this change is that VB will use much less memory when initially adding VB to a chart or opening a chart which contains a VB with a volume filter. The difference will be more dramatic for those that retain more tick data and who have volume-filtered VBs in charts with extended viewing periods. This memory issue has caused some users to run out of memory on initial startup/backfill and this should greatly alleviate that problem.

Label Current Value by Default

Each indicator is equipped with a "Label Current Value" option at the bottom of the indicator preferences window. This option can only be seen when opening the preference window after the indicator has been added to the chart. When this option is turned on, the current value of the indicator is highlighted and displayed in the scale to the right. In past releases, this option has defaulted to off. In this release, this behavior has changed to turn "Label Current Value" on for any indicator that is newly added to a chart. It will not affect indicators that have already been added to existing charts, only indicators that are added to charts after upgrading to 10.3 Beta 2 or later. For those that wish to retain the previous behavior of this option defaulting to off, choose "file: open: configuration file", and inset the following line on a blank line by itself, then choose "file: save: save".

LabelPriceByDefault=false

Pairs Historical Data Generation - New Option

A new option has been added for the generation of historical data on pairs (custom instruments). By default, when the user performs a download or backfill on a pair, every tick/price of each component is processed and included in the generation of the tick data and intraday data of the pair. For pairs of stocks, often a stock may have a bad tick (a tick well out of line with other prices) which in turn results in the generation of a bad tick on the pair. To help prevent this phenomenon, a new option has been added which results in the intraday pair data only considering the closing 1-minute prices of each component. This option can significantly clean up not only the intraday data, but also the daily data which is built from the intraday data. This option is off by default. To turn it on, choose "file: open: configuration file", and inset the following line on a blank line by itself, then choose "file: save: save".

PairsUseCloseOnly=true

Layout Management Improvements

Improvements were made to enable charts and other windows that participate in layouts to be shared in multiple layouts, with each layout possibly having the same window in a different position and/or a different size. Even when the same window is kept open but hidden until needed, it will appear in each layout at the size and position it was in when the layout was last saved. In prior versions, hidden windows would never change size or position when switching from one layout to another.

Profile Indicator: Major Improvements

Two major improvements were made to the software which will have a substantial impact on the Profile Indicator, and specifically those using the Profile Indicator for long-term composite profiles. These improvements will substantially reduce the calculation time for the indicator as well as substantially decrease the memory requirements of the indicator.

First, the calculation of this indicator is now much more efficient for composite volume profiles. In past versions, the Profile Indicator processed all the data every time it recalculated. Now the

previous calculations are being stored and only the last minute of data is being merged in. This results in an extremely quick recalculation where it might have taken up to 2 or 3 seconds in the past. Many users should see a performance boost from this change.

In addition, charts which contain the Profile Indicator should see a great reduction in the amount of memory required. In testing, one chart that consumed 30mb of memory before the improvements consumed less than 1.5mb after. Internally, these improvements were made possible due to a change in how the volume-at-price data of each bar is stored. Periods which contain only 1-minute data (no tick data) are now stored using much less memory.

Exporting Naked POCs from Market Profile

The nearest naked point of control above and below current price can now be exported from Market Profile charts to any user variable. In order to export these values, the user would setup a reference line with a label of "=NPOCA" (for the nearest naked POC above) or "=NPOCB" (for nearest below), and set the reference line value to "V#10" or whatever user variable the user wishes to export the NPOC to. This allows user to easily place reference lines on multi-pane charts at the closest NPOC above and below current price. And this line will update dynamically as NPOCs are taken out over time.

To access more information on how this is accomplished as well as how other prices may be export to user variables, visit: <http://www.linnsoft.com/qa/a/102.htm>

Text Window Floating Option

Any text window, e.g. the message log, can be a floating window for placement on a secondary monitor. The menu button at the upper left corner of all text windows has a menu item, Floating Window, that appears check marked when the window is a floating window. Choose this menu item to toggle the state of the window between non-floating (unchecked) or floating. Floating text windows can participate in layouts and the state of the window is honored when you activate a layout containing one or more text windows. Note that once you have a text window open you can use the menu button at the upper left of the window to view any file you like. Click the menu button and choose the Open menu item, then select the text file you wish to view in the window.

Trading Notes Marker Improvements

Trading Notes Marker indicator now has marker setups for both a "Buy Marker" (the default marker) and a "Sell Marker". Trading notes created automatically by the Trading Simulator or during live trading begin with the text "BOT" or "SLD". Any trading notes beginning with "SLD" (or "SELL") will use the sell marker (marker, color, and position), while other trading notes will be denoted with the buy marker setup. The indicator will now show the text of the trading notes associated with any marker displayed in the chart when the mouse pointer hovers over the bar in question. Options are provided to show the marker text in the main toolbar message area, the chart pane title, or as a tip window that appears for a few seconds when the mouse hovers over the bar. When the trading notes marker indicator is the selected indicator, the (possibly abbreviated) text of every marker is

displayed as a label centered above or below the marker. The setup for the trading notes marker indicator also permits the displayed note text to be trimmed in a user-specified fashion, showing only N words of the trading note, optionally skipping over the first M words. A "word" in this context is any span of characters ending in one or more spaces. Users of the brokerage features of Investor/RT, including the trading simulator, will now find the trading notes marker an excellent tool for reviewing the trading order fills that took place during the session. When there are multiple trading notes that fall into the same bar on the chart, the bar will be marked with the last of the notes that occurred during the bar's interval. The note text display(s) will show the text of the last note for the interval. To see all the notes, you can double-click on the marker image and then click "View All Trading Notes". Displaying multiple notes per bar is under consideration for future development. The improved trading notes marker is now automatically added to charts when a brokerage fill is received for the symbol in the chart. Similar to the trading related annotation, fill and working order reference lines, the trading notes marker will now automatically mark the bars where buys and sells have occurred.

See the video at <http://www.screencast.com/t/NTA5ZDVkZG> for a demonstration.

DTN Historical Data Compressed Downloading

Investor/RT 10.3 support compressed downloading of historical data from DTN IQFEED and DTN MA users. Typically, the compressed data sent by the DTN historical servers reduces bandwidth requirements by 50% or more. Historical download times are reduced and the reduced bandwidth improves performance of data reception for real-time data.

Multiple Selections from Selection List Windows

Click the Open Chart button on the main toolbar and a window appears listing all of your chart names. This window is called a selection list window. You can select any item in the list and click Apply to perform the selected action (open the chart) then select another item and Apply. This one-at-a-time select and Apply is no longer necessary when you wish to open several charts in the presented list. In version 10.3.4 you will notice that the selection list window title reads: Select a Chart (1 or more). You can select individual items in the list by clicking on them. Each time you click on an item, that item becomes the only selected item. You can select a range of consecutive items in the list by clicking on the first item in the range and SHIFT-clicking on the ending item in the range. You can extend the current selection to include non-adjacent items by CTRL-clicking on any additional items. Once the multiple items you want are highlighted (selected), click Apply or OK to perform the associated action, in this case opening all the charts you have selected. Look for the (1 or more) text in the window title when presented with a list of choice in a selection list window. This is your cue that you can perform the action in question on multiple items with one click of Apply or OK. For example, multiple selections are available in chart windows when you use the popup menu to delete one or more elements from the chart.

Miscellaneous 10.3 Fixes and Improvements

- The Plugin Indicator now supports V# variables as parameters. For example, the InvestorRT plug-in is programmed to accept two whole numbers as moving average periods, e.g. 10,20.

You can now setup the parameters using %RTL tokens, e.g. %V#22,%V#23. When the plugin is calculated, the values of V#22 and V#23 for the associated symbol will be passed to the plugin instead. This enhancement means that plugin indicators, including all the Jurik proprietary indicators, may now be backtested via the optimization features of the Investor/RT trading system tools to find optimum values for the periods.

- Trading Notes import is now supported via the File: Import: Definition File or File: Import: Clipboard command. Trading note definition files look like this:

```
BEGIN Investor/RT TRADING NOTE DEFINITION
<ticker>,<timestamp><note>
<ticker>,<timestamp><note>
END Investor/RT TRADING NOTE DEFINITION
```

Each line between the BEGIN and END lines must contain a recognized symbol being followed by Investor/RT, followed by a date in the form mm/dd/yyyy optionally followed by a space and the time in hh:mm:ss form. Seconds (ss) are optional. The <note> is any text up to 255 characters long. Ticker, timestamp and note can be comma or tab separated. Trading notes, imported this way from external sources, can be viewed in the Trading Notes window in Investor/RT or you may add a Trading Notes Marker indicator to a chart and Investor/RT will mark the bars that have associated trading notes. When the mouse pointer hovers over a marker in the chart, the text of the associated trading note appears in the main toolbar message area.

- Custom Columns can be setup to show numeric values as percentages by checking the Show Value as a Percentage check box in the Format tab of the custom column setup window. When checked, the result value of the custom column is multiplied by 100 and shown with a percent sign suffix using the user specified display format. For example a custom column setup to show as percentage having a display format of 99.99 whose result is 0.1234 will display this value in the quote page cell as 12.34%.
- In a related improvement, when editing V# variables in a quote page a numeric value with a trailing percent sign will be divided by 100 when storing the edited value. For example if you edit 12.34% where a custom column is showing a V# variable's value, the actual value of the V# variable being edited is .1234. If you then edit the value to 12.99% and press tab or enter, Investor/RT will adjust the V# variable to 0.1299. In other words, the % suffix indicates that the internal value has been multiplied by 100 to display the result as a percentage.
- The File: Reconfigure menu item has been renamed File: Configure Data Source/Brokerage. The Configure menu item is now present in the data source specific menu adjacent to the Help Menu, and is present in the menu that pops up when you click on the Heartbeat icon on the main toolbar. The Configure window has been simplified, eliminating rarely used database location setups. Users can change database location using Setup: Preferences: Database, or

add AllowDBLocConfigure=true to the configuration file to enable the database location setups in the Configure window as they were in version 10.2 and earlier.

- Renaming custom columns no longer impacts the association of the newly renamed column with the quote pages in which it resides.
- When importing text files containing historical data, current quotes or other data, fields in each line of data can be separated by either commas, tabs, or semicolons.
- Investor/RT users of the OS X version can now utilize the Archive Database utility. This utility makes a compressed archive of the data files in the data_f folder. These compact archives can be used as secondary backups and can also be emailed to support when troubleshooting unique setup related issues that are difficult to replicate without a comprehensive picture of your Investor/RT workspace. To archive your database, use the Control Menu (Control/Database Utilities/Archive Database), or use the Database Wizard (Command-U) then click the Archive Database button.
- When importing chart definitions containing indicator presets, Investor/RT will not replace existing presets having the same name as those being imported. This precaution prevents changing of presets unknowingly when importing charts exported by other users. For example, Signal Actions and Trading Order setup are stored as presets so the default behavior is protective of existing setups of these kinds. A configuration variable has been added for those who want presets to be updated when importing chart definition. This may be useful to a client who is importing his own definitions created on another machine for example. Use File: Open: Configuration File and add a new line: OnImportReplacePresets=true; then press Ctrl-S to save the configure.txt file. Remove this line to return Investor/RT to the default behavior. When importing presets, the message log will show a message for each preset added or updated.
- Fixed issues that was causing QuoteBoard lines to disappear during first minute of a new bar for certain charts.
- Fix to ensure that view period is retained when switching between tick- and time-based periodicities.
- Fix to Profile Indicator Hologram drawing option that was causing a random vertical line to get drawn in certain situations.
- Fixed Volume Breakdown to enable Custom Indicator to be used as an embedded indicator when "Statistic: Indicator" was chosen.
- Changed how the auto-scaling handles zero-slope trendlines. Only considers them if the start of the trendline is in view. This prevents old trendlines from obscuring the current auto-scaling.

- Fixed an issue with the "Multi-Link Periodicity" purpose of Button Indicator that was causing problems with multi-linked charts which involved the Profile Indicator (and thus invisible 1-minute bars)
- Fixed date-only vertical reference lines to allow them to draw into the future.
- Esc key no longer dismisses chart windows. Use Shift-Esc to dismiss a chart window.

Investor/RT Version 10.2.8, Released: July 26, 2010

Volume Breakdown and TPO Indicator Efficiency in RTL

The Volume Breakdown and TPO Indicators require seeing and processing each tick to retain accuracy. For this reason, any RTL item (custom indicator or signal marker) within a chart which involves VB or TPO has been forced to recalculate every 1 tick in previous versions. This works fine as long as VB or TPO is used alone and is not combined with other less efficient settings or tokens. However, many users do wish to combine these tokens (VB & TPO) with other logic. These combinations in the past have caused some serious problems for users, primarily causing the program to run behind due to the indicator calculating too frequently and taking too long to compute each time.

To solve this problem, these RTL objects that contain VB or TPO now honor the recalculation period that the user provides and does not force "every 1 tick" recalc. In order for VB and TPO to continue to provide accurate results, these components are added invisibly to the chart. These invisible VB and TPO indicators recalculate efficiently every tick. The RTL object simply grabs the the array of values from these invisible indicators each time it does recalculate and uses these update/accurate values. This change really opens the door for users to combine the various results available to both the VB and TPO indicators with other logic to create more robust and complex signals and custom indicators.

New Volume Price Statistics Results: Delta Above/Below Midpoint

Two new result options were added to the Price Statistics Indicator Delta Above Midpoint and Delta Below Midpoint. These results provide the user with the delta of all trading that occurred at prices above or below the midpoint of each bar. The midpoint of each bar is defined as being the price halfway between the high and low of the bars.

Profile Indicator: New Results: Buy and Sell Volume

The Profile Indicator has been enhanced to add new result options. In addition to "Price and Time" and "Price and Volume", the two options "Price and Buy Volume" and "Price and Sell Volume" are available. When the user chooses "Price and Buy Volume", the profile plots the amount of buy volume (volume traded at ask price) that traded at each price. Similarly, when the user chooses "Price and Sell Volume", the profile plots the amount of sell volume (volume traded at bid price) that traded at each price level.

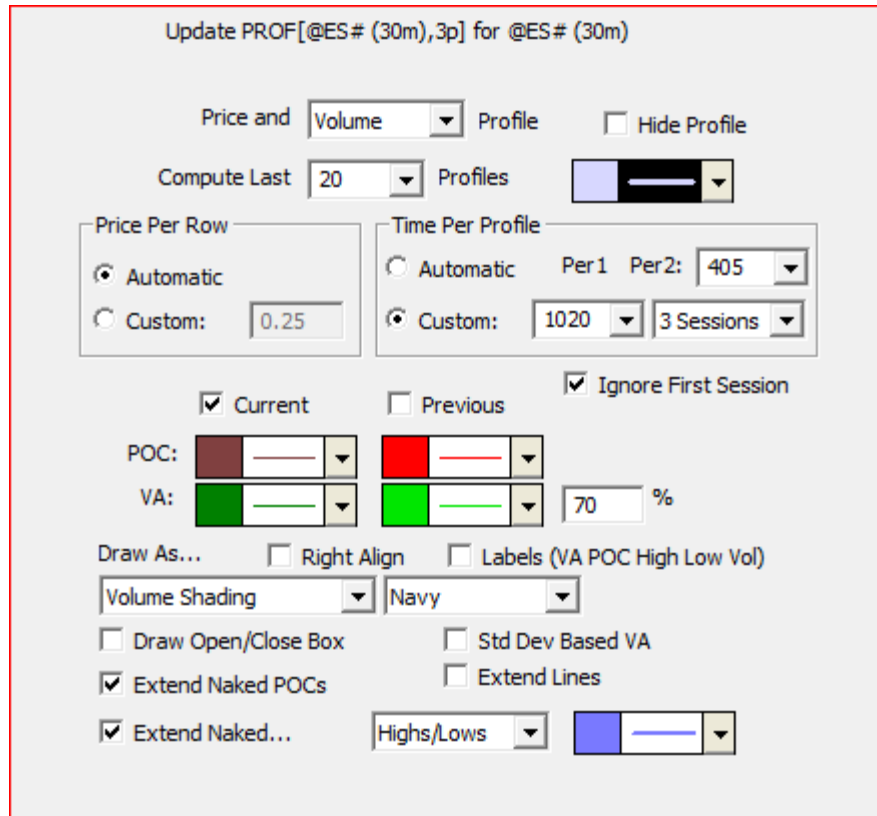
Profile Indicator: New Shading Results

The Profile Indicator has now been enhanced with 11 new shading options. A new listbox now appears when the user setups up the profile indicator with "Draw As: Volume Shading". These include Red, Green, Blue, Silver, Gold, Turquoise, Purple, Burgundy, Forest, Navy, Peak/Valley. The first 10 options color the each price a darker shade of the specified color based on the amount of relative volume traded at that price. The last option, Peak/Valley, colors each price a shade of red or green based on whether the price is closer to a peak (green) or a valley (red).

Along the same lines, the border color used to paint the border of the profile histograms was adjusted. In the past, the color specified for the candle border color of the chart was used. This has been changed to simply use a color that is slightly darker than the color being used to paint the price (based on relative volume of that price).

Profile Indicator: "Ignore First Session"

The Profile Indicator was enhanced with a new "Ignore First Session" checkbox which only appears when the "Time Per Profile" is set to "Custom: 3 Sessions". This profile duration option is commonly used to create split session profiles of the overnight session and the day session. As a specific example many users have a chart of the ES set to session 31, and they use a "3 Sessions" setting along with Period 1 of 1020 minutes and Period 2 = 405 minutes. This results in one profile for the overnight period (which is 1020 minutes in duration) and another for the day session (which is 405 minutes in duration). However, a number of users have expressed interest for an option which ignores the overnight session altogether, and provides just the day session profile on the session 31 chart, and extends the naked POCs, Highs, Lows, etc, while ignoring the overnight data altogether. In other words, do not terminate a naked high with overnight data, only terminate it if touched by day session bars.



New "Locked" Option for Reference Lines

The Horizontal Reference Line indicator has been enhanced with a "Locked" option. When this option is checked, the user is unable to draw the reference line up or down, and unable to delete the reference line by selecting it and pressing the delete key on the keyboard. It essentially locks it into place on the chart and prevents accidental deletion or dragging of the line due to mouse clicks or keyboard strokes. This will be common for users who want to add reference lines at various levels in indicator panes and lock them into place. The user must go into the reference line preferences and uncheck the "Locked" checkbox if they want to delete or drag the line to a different price. The user can however modify the price within the preferences window even when locked.

"Label Current Value" Honors Scale Font Size

Each indicator has an option to "Label Current Value" in the scale. The font size of these labels now honors the font size specified for the vertical scale. The vertical scale font size can be set to small, medium, or large, by double-clicking in the vertical scale to bring up the vertical scale settings. If the user would rather keep the current value labels small regardless of scale font size, they may open the configuration file by choosing "File: Open: Configuration File" from the main menu and entering the following line:

LargePriceLabels=false

Automation of "Load Volume at Price"

A number of indicators require the underlying bars/instrument to be setup with "Load Volume at Price" checked order to compute an accurate result. These indicators include Volume Breakdown, Profile Indicator, and Volume Price Statistics, among others. In the past, the user would be required to turn on this option manually in order to result in these indicators producing valid results. However, in version 10.2 Candidate 3 and later, Investor/RT detects the situation where one of these indicators has been added to a chart that does not have "Load Volume at Price" turned on, and turns it on automatically so the data will be available to the indicators calculations. The user no longer needs to be concerned with whether this option as been turned on.

Database Compression and Smart Tick Compression

The Database Compression feature has been enhanced to apply Smart Compression of Tick Data when compressing the Intra-day Database, if Smart Compression option is enabled. Formerly, users with long term tick data collections who enabled smart compression, would gain the benefits of smart compression only on newly downloaded, newly imported, or real-time collected ticks. If Smart Compression of tick data is enabled, performing a Compress Database on the Intra-day database will now compress the entire tick data collection for all symbols in one step.

RTL Improvement for PCHG() and CHG() Functions

A new numeric constant token ALLDATA has been added to the RTL language. It can be used in conjunction with the PCHG (percent change) and CHG (change) functions to produce a custom indicator of changes or % changes since the beginning of the time series. The RTL formula PCHG(CL,5) produces a moving line showing the % change in price over the preceding 5 periods. PCHG(CL, ALLDATA) produces a line showing the % change in price since the beginning of the entire time series of data. When this CI is added to a chart, the plot is identical to the line you would see if you were charting the underlying instrument as a % Change Line (with Price set to Close). If you save the formula PCHG(CL, ALLDATA) as a custom indicator named "Percent Change" and you use Setup: Preferences: Prices, Custom to set Percent Change as one of the eight "Custom Price" types, you can add technical indicators to the chart that do analysis on this Percent Change line. Simply choose the Custom Price "Percent Change" in any of various indicators that support price type. Moving Averages, Keltner Bands, and scores of other indicators can be applied to such custom price types. You can also apply other indicators to the PCHG or CHG function easily in RTL to form compound custom indicators. For example the RTL formula RAWK(PCHG(CL, ALLDATA)) produces a RawK stochastic line of the % change in price since the beginning of the time series.

Automatic Historical Data for New Symbols

When new symbols are added to Investor/RT, the software now auto-detects when the new symbol starts feeding real-time data. Reception of data validates that the symbol is valid, so a full complement of historical data (daily, one-minute, and tick data) is requested preemptively, before

there is a request for charting. As a result, after adding a new symbol and then opening a chart on it, you will often be greeted with a complete chart instantly; there is no need to initiate a download manually. This preemptive downloading of historical data pertains to all methods of adding new symbols: importing symbols or chart definitions, using the Setup: Instruments window, or simply typing a new symbol into the chart setup wizard or into a quotepage ticker cell. The data feed must be active for this to occur. If you add several new symbols while Investor/RT is not connected to the data feed, the preemptive downloading will be initiated when you start the feed later. If you enter a new symbol that is invalid, then there will be no data flow and no historical data either. If you correct the symbol or change one or more of its properties (exchange, expiration date, etc) and data then begins to flow, the preemptive downloading will be initiated for the new symbol when the first valid quote or trade report is received by Investor/RT. Users of brokerage data sources who use DTN MA for historical backfill will also benefit from this improvement so long as the DTN Alias Symbol is setup correctly. For most futures contracts and for all equities, adding a new symbol automatically creates the proper DTN alias symbol. When DTN MA is in use and the addition of a new symbol does not yield any historical data, the problem is likely to be the DTN Alias symbol is incorrect. Fix the alias and perform a Full Download manually to remedy (right-click in a chart and choose Download Data: Full Data).

Custom Instrument Setup Improvements

The Setup: Custom Instruments window has been improved to allow the user to adjust the symbol selector at the left to show only the symbols in a particular quotepage. Click the "+" button at the upper right corner of the symbol select and choose "Show Quotepage..." from the ensuing popup menu. A list of quotepage names will appear. Pick one and click OK. When forming SUM type custom instruments you may now do an "Add All" operation to add all the symbols currently listed in the symbol selector to the new custom instrument. The Add All is performed by holding down the SHIFT key while clicking the --> (Add) button. Similarly you can clear the list of components currently listed on the right side by holding down the SHIFT key and clicking the <-- (Remove) button. Using these new capabilities, you can form a new custom instrument SUM of all the symbols in some quotepage very quickly with a few mouse clicks. First use the + button to display the quotepage's symbols on the left, then Shift-Click on --> to add them all as components. The software now detects when an attempt is made to add a component with identical settings for symbol, price and multiplier and rejects any addition that would result in a duplicate in the list on the right with an explanatory message.

Date Format Preference

The display of dates throughout Investor/RT has historically been done as month/day/year or month/day. Version 10.2 introduces a user selectable date format preference, see Setup: Preferences: General. Initially, there are three date formats available. The default is mm/dd/yyyy, i.e. dates are shown as in the prior versions in month/day order, e.g. 5/17/2010. Alternatively, dd-MMM-yy format will show dates in day-month form, e.g. 17-May or 29-Sep-10. A third choice is MMM dd, yyyy, which shows the dates in this form: Apr 19, 2010 or Apr 19. Months are always abbreviated with 3 letters. In some contexts where space is limited, e.g. in the time scale of a chart, you may see

a date shown as 3Aug or Sep22. In rare instances where displaying the month abbreviation is not possible, Investor/RT will display the only numbers for day and month. You may see this, for example, the multi-pane chart time scale. If you have chosen the dd-*MMM*-yy form as your preferred format, a date of 4-May will be shown as 4-5. Generally you will see a progression of dates, e.g. 3-5, 4-5, 5-5, 6-5 on the scale so it will be clear that the first number is the day. It is anticipated that those who choose the dd-*MMM* format will be international clients accustomed to viewing dates as dd/mm/yyyy anyway.

When historical data is exported by Investor/RT, the date is always expressed as mm/dd/yyyy as this is the expected date format when importing data. To revise the date format setting, go to Setup: Preferences: General and choose the Date Format you prefer from the menu button. As you revise the format, a sample date/time is shown to the right. The selected format goes into effect globally when you click Apply or OK.

Note that this setting only pertains to displayed dates. There are various date entry "controls" in Investor/RT that were developed to accept the entry of a date/time in the form: mm/dd/yyyy hh:mm:ss. When using date entry controls, enter the month first, regardless of your date format preference.

Profile Indicator Enhancements

The Profile Indicator has been enhanced with several new options. In addition to the options of "Price and Time" or "Price and Volume", the user now has the option to base the profile on "Price and Buy Volume" or "Price and Sell Volume". When "Price and Buy Volume" is chosen, the profile will represent all volume of trades that occurred at or above the offer. When "Price and Sell Volume" is chosen, the profile will represent all volume of trades that occurred at or below the bid.

When the user chooses to "Draw As...Volume Profile", nine new colors are now available in addition to the navy color that has been the default in previous versions. The new choices include Red, Green, Blue, Silver, Gold, Turquoise, Purple, Burgundy, Forest, and Navy.

Split Session profiles may now be setup so the overnight session is ignored completely and only the day session is drawn. In addition, any naked lines will only consider the day session data and will not be terminated if touched by a bar during the overnight session. In order to set this up, choose "Custom: 3 Sessions" as the "Time Per Profile". Specify a Period 1 (under "Per 1" label) equal to the number of minutes in overnight session (commonly 1020 for session 31). Specify a Period 2 (to right of "Per 2" label) equal to the number of minutes in the day session (commonly 405 for session 31). Last, check the new checkbox "Ignore First Session" in the checkbox just below the "Time Per Profile" area. This option allows users to see the overnight data without it affecting their day session profiles and naked lines.

RTL Improvement for PCHG() and CHG() Functions

A new numeric constant token ALLDATA has been added to the RTL language. It can be used in conjunction with the PCHG (percent change) and CHG (change) functions to produce a custom

indicator of changes or % changes since the beginning of the time series. The RTL formula PCHG(CL,5) produces a moving line showing the % change in price over the preceding 5 periods. PCHG(CL, ALLDATA) produces a line showing the % change in price since the beginning of the entire time series of data. When this CI is added to a chart, the plot is identical to the line you would see if you were charting the underlying instrument as a % Change Line (with Price set to Close). If you save the formula PCHG(CL, ALLDATA) as a custom indicator named "Percent Change" and you use Setup: Preferences: Prices, Custom to set Percent Change as one of the eight "Custom Price" types, you can add technical indicators to the chart that do analysis on this Percent Change line. Simply choose the Custom Price "Percent Change" in any of various indicators that support price type. Moving Averages, Keltner Bands, and scores of other indicators can be applied to such custom price types. You can also apply other indicators to the PCHG or CHG function easily in RTL to form compound custom indicators. For example the RTL formula RAWK(PCHG(CL, ALLDATA)) produces a RawK stochastic line of the % change in price since the beginning of the time series.

Mixing Market Data Feed and a Brokerage Feed

In version 10.1.4 and earlier 10.x versions, brokerage integration features are available when a brokerage data feed is the market data feed. Users with brokerage accounts with supported brokerage feeds who use a non-broker data feed (DTN IQFEED or eSignal) can now setup Investor/RT 10.2 in a "dual feed" mode where market data is supplied by the market data vendor while brokerage actions are performed with the brokerage feed. At present, any of three brokerage feeds (Interactive Brokers, Rithmic, or Zen-Fire) can be used by DTN IQFEED or eSignal subscribers. This capability is new and experimental in the 10.2 Beta testing version. It is recommended that paper trading/simulated demo brokerage accounts be used to test these new capabilities. During the beta testing period, the mixed market data / brokerage feed capability is "off" by default. To gain access to this feature, it must first be enabled by setting a configuration file variable. Do File: Open: Configuration File and add a line at the bottom of the file that reads:

```
AdditionalBrokerageFeed=true;
```

Then press Ctrl-S (or do File: Save: Save) to save the configure.txt file. Then, you can go to File: Reconfigure. DTN IQFEED and eSignal users will see choices for the supported brokerage destinations. Select your brokerage destination from the list and click the Reconfigure button. Next check the feed setups by choosing the Setup menu item in the data feed menu. You can also access the Setup menu item by clicking on the heartbeat icon on the main toolbar. Notice that both market data feed preferences and brokerage feed preferences windows will open. Setup both windows and click OK. Then start the feed. Investor/RT will first connect to the market data source and then establish a connection to the brokerage feed. You can point your mouse at the main toolbar heartbeat icon and, assuming button help is enabled, see a text tip indicating whether both feeds are active. If you have your market data feed already running when you reconfigure to a brokerage destination, Investor/RT will automatically connect to the brokerage. This connection attempt may fail if your login id and password are not setup for example. After enter the setup information, stop and start the feed again.

Thereafter, any brokerage trading orders submissions will be done via the brokerage feed, while streaming market data flows as it normally does from DTN IQFEED or eSignal. Since two distinctly different data feeds are in use, your instruments must be setup with the proper "Broker Alias" symbol. For example, trading through Interactive Brokers using DTN IQFEED as the market data feed, the symbol @ES# or @ESM0 will be the instrument you see in your charts. You must setup @ES# with a broker alias of ESM0 so that trading orders initiated on @ES# will convey the proper symbol to IB. The @ES# symbol also must be setup with all the required IB settings: the expiration date, currency, underlying, and override exchange code must meet IB requirements for identifying the symbol when trading orders are submitted.

You may return to File: Reconfigure or use the Trading Order Desk at any time to set the brokerage destination back to the Trading Simulator. To disable further use of dual feeds, do File: Open: Configuration File and eliminate the AdditionalBrokerageFeed=true line or simply change true to false and Ctrl-S to save the file. Quit and startup Investor/RT again. Thereafter, only the market data feed will be used by the software.

Investor/RT Version 10.2.5, Released: June 30, 2010

Main Toolbar Customization

The main toolbar may now be customized to include just the buttons of interest. In addition, up to eight user-customizable shortcut buttons may be added to the main toolbar if desired. Each color coded shortcut button can be assigned to a keyboard shortcut that has been setup in the Setup: Preferences: Keyboard Shortcuts window. Thus, shortcut buttons on the main toolbar can run schedules, open particular charts or layouts, execute trading orders, add indicators to the front chart, etc. To customize the main toolbar, choose Setup: Preferences: Main Toolbar. If the main toolbar is visible you may right-click in its message area and choose Main Toolbar-->Button Setup. See the Video Library section of the Linn Software web site for a video tutorial on customizing the main toolbar.

Math Lines Indicator

Under construction.

Improved Drawing of Time Bars

Investor/RT users are able to create pseudo-daily bars using only the day session data by creating a chart assigned to session 2 (day session) with 405 minute bars. Since there are 405 minutes in the day session 2, each bar will represent a full sessions activity, but is limited to only the day session. When this method is applied the horizontal scale will now draw as if the chart is a daily chart, resulting in the display of much more meaningful labels and lines on month boundaries.

Volume Breakdown Efficiency Improvement

Due to the nature of the Volume Breakdown Indicator (VB) calculations, it is required to see and recalculate on every tick or trade. In general, VB recalculates very quickly and efficiently. However, certain combinations of settings, including the application of Statistics or Indicators within the VB preferences, can reduce the efficiency of this calculation. In version 10.2, VB was made much more efficient on this front, limiting the calculations of the statistic or indicator portion of the VB to every 1 second while still processing every tick into the underlying data of the indicator. Heavy users of the VB indicator, which use VB in this fashion, should see a big boost in performance in 10.2.

Profile Indicator Efficiency Improvements

The Profile Indicator, when setup to display longer term composite profiles, can take longer than most indicators to process the extended data using the method involved to divide volume and time among prices. In addition, since these composite profiles are profiling such an extended period of time, it's not as important to recalculate the Profile Indicator frequently. Some additional measures have been put in place to keep the Profile Indicator from recalculating too frequently.

Market Profile Playback - Go To Today

When operating the playback that is built into the Market Profile charts (buttons at bottom of Info Box), the user now has two new convenient shortcuts. The + button is used to step forward one increment (price change, TPO, etc) based on the settings the user has provided for playback in the Options tab of the Market Profile preferences. However, if the user shift-clicks on the + button, the chart will advance to the first letter of the next session. This allows users to quickly skip forward to the start of a day of interest. In addition, the user can Ctrl-Shift-click on that + button to advance to the first TPO of the current (last) session. This allows the user to quickly advance to the current session or the session that just completed and playback the most recent profile.

Volume Price Statistics: New Results

Several New Results were added to the Volume Price Statistics Indicator. The user can now access the following information: Volume Above or Below the Volume POC, Delta Above or Below the Volume POC, Buy Volume Above or Below the Volume POC, and Sell Volume Above or Below the Volume POC.

Time and Sales: New Options

The Time and Sales window was enhanced with two new options. First, the user can now check the "Aggregate Similar Ticks (Live)" check box and then all live ticks that trade at the same price, bid, and ask, will all aggregate on a single line. The volume of that line/entry will continue to build while price continues to trade at the same price, bid price, and ask price. In addition, a "Color Basis" entry was added with options of "Bid/Ask" or "Up/Down". Prior to version 10.2, each row in the Time and Sales window was always colored based on the price of the trade relative to the price of the bid and ask. If

the price traded at or above the ask, the row was given the Buy Color. If it traded at or below the bid, it was given the Sell Color. In version 10.2, the user still has the Bid/Ask coloring option, but also has a new "Up/Down" option. The Up/Down color basis will paint rows in the Buy Color for all trades that follow an up tick in price. The Sell Color will be used to paint trades that follow a down tick in price.

RTL Improvement for PCHG() and CHG() Functions

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Mixing Market Data Feed and a Brokerage Feed

In version 10.1.4 and earlier 10.x versions, brokerage integration features are available when a brokerage data feed is the market data feed. Users with brokerage accounts with supported brokerage feeds who use a non-broker data feed (DTN IQFEED or eSignal) can now setup Investor/RT 10.2 in a "dual feed" mode where market data is supplied by the market data vendor while brokerage actions are performed with the brokerage feed. At present, any of three brokerage feeds (Interactive Brokers, Rithmic, or Zen-Fire) can be used by DTN IQFEED or eSignal subscribers. It is recommended that paper trading/simulated demo brokerage accounts be used to test these new capabilities.

To setup Investor/RT for dual feed usage go to File: Reconfigure. DTN IQFEED and eSignal users will see choices for the supported brokerage destinations. Select your brokerage destination from the list and click the Reconfigure button. Next check the feed setups by choosing the Setup menu item in the data feed menu. You can also access the Setup menu item by clicking on the heartbeat icon on the main toolbar. Notice that both market data feed preferences and brokerage feed preferences windows will open. Setup both windows and click OK. Then start the feed. Investor/RT will first connect to the market data source and then establish a connection to the brokerage feed. You can point your mouse at the main toolbar heartbeat icon and, assuming button help is enabled, see a text

tip indicating whether both feeds are active. If you have your market data feed already running when you reconfigure to a brokerage destination, Investor/RT will automatically connect to the brokerage. This connection attempt may fail if your login id and password are not setup for example. After enter the setup information, stop and start the feed again.

Thereafter, any brokerage trading orders submissions will be done via the brokerage feed, while streaming market data flows as it normally does from DTN IQFEED or eSignal. Since two distinctly different data feeds are in use, your instruments must be setup with the proper "Broker Alias" symbol. For example, trading through Interactive Brokers using DTN IQFEED as the market data feed, the symbol @ES# or @ESM0 will be the instrument you see in your charts. You must setup @ES# with a broker alias of ESM0 so that trading orders initiated on @ES# will convey the proper symbol to IB. The @ES# symbol also must be setup with all the required IB settings: the expiration date, currency, underlying, and override exchange code must meet IB requirements for identifying the symbol when trading orders are submitted.

You may return to File: Reconfigure or use the Trading Order Desk at any time to set the brokerage destination back to the Trading Simulator. To disable further use of dual feeds, do File: Open: Configuration File and eliminate the AdditionalBrokerageFeed=true line or simply change true to false and Ctrl-S to save the file. Quit and startup Investor/RT again. Thereafter, only the market data feed will be used by the software.

Automatic Historical Data for New Symbols

When new symbols are added to Investor/RT, the software now auto-detects when the new symbol starts feeding real-time data. Reception of data validates that the symbol is valid, so a full complement of historical data (daily, one-minute, and tick data) is requested preemptively, before there is a request for charting. As a result, after adding a new symbol and then opening a chart on it, you will often be greeted with a complete chart instantly; there is no need to initiate a download manually. This preemptive downloading of historical data pertains to all methods of adding new symbols: importing symbols or chart definitions, using the Setup: Instruments window, or simply typing a new symbol into the chart setup wizard or into a quote page ticker cell. The data feed must be active for this to occur. If you add several new symbols while Investor/RT is not connected to the data feed, the preemptive downloading will be initiated when you start the feed later. If you enter a new symbol that is invalid, then there will be no data flow and no historical data either. If you correct the symbol or change one or more of its properties (exchange, expiration date, etc) and data then begins to flow, the preemptive downloading will be initiated for the new symbol when the first valid quote or trade report is received by Investor/RT. Users of brokerage data sources who use DTN MA for historical backfill will also benefit from this improvement so long as the DTN Alias Symbol is setup correctly. For most futures contracts and for all equities, adding a new symbol automatically creates the proper DTN alias symbol. When DTN MA is in use and the addition of a new symbol does not yield any historical data, the problem is likely to be the DTN Alias symbol is incorrect. Fix the alias and perform a Full Download manually to remedy (right-click in a chart and choose Download Data: Full Data).

Automatic downloading of newly added symbols is the default and is recommended, but if for some reason you would prefer that downloading be done manually you can turn off the automatic downloading by adding a line to the configuration file (configure.txt):

```
DownloadFullDataNewSymbols=false;
```

Custom Instrument Setup Improvements

The Setup: Custom Instruments window has been improved to allow the user to adjust the symbol selector at the left to show only the symbols in a particular quote page. Click the "+" button at the upper right corner of the symbol select and choose "Show Quotepage..." from the ensuing pop up menu. A list of quote page names will appear. Pick one and click OK. When forming SUM type custom instruments you may now do an "Add All" operation to add all the symbols currently listed in the symbol selector to the new custom instrument. The Add All is performed by holding down the SHIFT key while clicking the --> (Add) button. Similarly you can clear the list of components currently listed on the right side by holding down the SHIFT key and clicking the <-- (Remove) button. Using these new capabilities, you can form a new custom instrument SUM of all the symbols in some quotepage very quickly with a few mouse clicks. First use the + button to display the quotepage's symbols on the left, then Shift-Click on --> to add them all as components. The software now detects when an attempt is made to add a component with identical settings for symbol, price and multiplier and rejects any addition that would result in a duplicate in the list on the right with an explanatory message.

Date Format Preference

The display of dates throughout Investor/RT has historically been done as month/day/year or month/day. Version 10.2 introduces a user selectable date format preference, see Setup: Preferences: General. Initially, there are three date formats available. The default is mm/dd/yyyy, i.e. dates are shown as in the prior versions in month/day order, e.g. 5/17/2010. Alternatively, dd-MMM-yy format will show dates in day-month form, e.g. 17-May or 29-Sep-10. A third choice is MMM dd, yyyy, which shows the dates in this form: Apr 19, 2010 or Apr 19. Months are always abbreviated with 3 letters. In some contexts where space is limited, e.g. in the time scale of a chart, you may see a date shown as 3Aug or Sep22. In rare instances where displaying the month abbreviation is not possible, Investor/RT will display the only numbers for day and month. You may see this, for example, the multi-pane chart time scale. If you have chosen the dd-MMM-yy form as your preferred format, a date of 4-May will be shown as 4-5. Generally you will a progression of dates, e.g. 3-5, 4-5, 5-5, 6-5 on the scale so it will be clear that the first number is the day. It is anticipated that those who choose the dd-MMM format will be international clients accustomed to viewing dates as dd/mm/yyyy anyway.

When historical data is exported by Investor/RT, the date is always expressed as mm/dd/yyyy as this is the expected date format when importing data. To revise the date format setting, go to Setup: Preferences: General and choose the Date Format you prefer from the menu button. As you revise

the format, a sample date/time is shown to the right. The selected format goes into effect globally when you click Apply or OK.

Note that this setting only pertains to displayed dates. There are various date entry "controls" in Investor/RT that were developed to accept the entry of a date/time in the form: mm/dd/yyyy hh:mm:ss. When using date entry controls, enter the month first, regardless of your date format preference.

Profile Indicator Enhancements

The Profile Indicator has been enhanced with several new options. In addition to the options of "Price and Time" or "Price and Volume", the user now has the option to base the profile on "Price and Buy Volume" or "Price and Sell Volume". When "Price and Buy Volume" is chosen, the profile will represent all volume of trades that occurred at or above the offer. When "Price and Sell Volume" is chosen, the profile will represent all volume of trades that occurred at or below the bid.

When the user choose to "Draw As...Volume Profile", nine new colors are now available in addition to the navy color that has been the default in previous versions. The new choices include Red, Green, Blue, Silver, Gold, Turquoise, Purple, Burgundy, Forest, and Navy.

Split Session profiles may now be setup so the overnight session is ignored completely and only the day session is drawn. In addition, any naked lines will only consider the day session data and will not be terminated if touched by a bar during the overnight session. In order to set this up, choose "Custom: 3 Sessions" as the "Time Per Profile". Specify a Per 1 (user "Period 1" label) equal to the number of minutes in overnight session (commonly 1020 for session 31). Specify a Period 2 (to right of "Per 2" label) equal to the number of minutes in the day session (commonly 405 for session 31). Last, check the new check box "Ignore First Session" in the check box just below the "Time Per Profile" area. This option allows users to see the overnight data without it affecting their day session profiles and naked lines.

Database Compression and Smart Tick Compression

The Database Compression feature has been enhanced to apply Smart Compression of Tick Data when compressing the Intra-day Database, if Smart Compression option is enabled. Formerly, users with long term tick data collections who enabled smart compression, would gain the benefits of smart compression only on newly downloaded, newly imported, or real-time collected ticks. If Smart Compression of tick data is enabled, performing a Compress Database on the Intra-day database will now compress the entire tick data collection for all symbols in one step.

Volume Breakdown and TPO Indicator Efficiency in RTL

The Volume Breakdown and TPO Indicators require seeing and processing each tick to retain accuracy. For this reason, any RTL item (custom indicator or signal marker) within a chart which involves VB or TPO has been forced to recalculate every 1 tick in previous versions. This works fine as long as VB or TPO is used alone and is not combined with other less efficient settings or tokens. However, many users do wish to combine these tokens (VB & TPO) with other logic. These combinations in the past have caused some serious problems for users, primarily causing the program to run behind due to the indicator calculating too frequently and taking too long to compute each time.

To solve this problem, these RTL objects that contain VB or TPO now honor the recalculation period that the user provides and does not force "every 1 tick" recalculation. In order for VB and TPO to continue to provide accurate results, these components are added invisibly to the chart. These invisible VB and TPO indicators recalculate efficiently every tick. The RTL object simply grabs the array of values from these invisible indicators each time it does recalculate and uses these update/accurate values. This change really opens the door for users to combine the various results available to both the VB and TPO indicators with other logic to create more robust and complex signals and custom indicators.

Automation of "Load Volume at Price"

A number of indicators require the underlying bars/instrument to be setup with "Load Volume at Price" checked in order to compute an accurate result. These indicators include Volume Breakdown, Profile Indicator, and Volume Price Statistics, among others. In the past, the user would be required to turn on this option manually in order to result in these indicators producing valid results. However, in version 10.2, Investor/RT detects the situation where one of these indicators has been added to a chart that does not have "Load Volume at Price" turned on, and turns it on automatically so the data will be available to the indicators' calculations. The user no longer needs to be concerned with whether this option has been turned on.

"Label Current Value" Honors Scale Font Size

Each indicator has an option to "Label Current Value" in the scale. The font size of these labels now honors the font size specified for the vertical scale. The vertical scale font size can be set to small, medium, or large, by double-clicking in the vertical scale to bring up the vertical scale settings. If the user would rather keep the current value labels small regardless of scale font size, they may open the configuration file by choosing "File: Open: Configuration File" from the main menu and entering the following line:

New "Locked" Option for Reference Lines

The Horizontal Reference Line indicator has been enhanced with a "Locked" option. When this option is checked, the user is unable to draw the reference line up or down, and unable to delete the reference line by selecting it and pressing the delete key on the keyboard. It essentially locks it into place on the chart and prevents accidental deletion or dragging of the line due to mouse clicks or keyboard strokes. This will be common for users who want to add reference lines at various levels in indicator panes and lock them into place. The user must go into the reference line preferences and uncheck the "Locked" checkbox if they want to delete or drag the line to a different price. The user can however modify the price within the preferences window even when locked.

Profile Indicator: "Ignore First Session"

The Profile Indicator was enhanced with a new "Ignore First Session" check box which only appears when the "Time Per Profile" is set to "Custom: 3 Sessions". This profile duration option is commonly used to create split session profiles of the overnight session and the day session. As a specific example many users have a chart of the ES set to session 31, and they use a "3 Sessions" setting along with Period 1 of 1020 minutes and Period 2 = 405 minutes. This results in one profile for the overnight period (which is 1020 minutes in duration) and another for the day session (which is 405 minutes in duration). However, a number of users have expressed interest for an option which

ignores the overnight session altogether, and provides just the day session profile on the session 31 chart, and extends the naked POCs, Highs, Lows, etc, while ignoring the overnight data altogether. In other words, do not terminate a naked high with overnight data, only terminate it if touched by day session bars.

Profile Indicator: New Shading Results

The Profile Indicator has now been enhanced with 11 new shading options. A new listbox now appears when the user setups up the profile indicator with "Draw As: Volume Shading". These include Red, Green, Blue, Silver, Gold, Turquoise, Purple, Burgundy, Forest, Navy, Peak/Valley. The first 10 options color the each price a darker shade of the specified color based on the amount of relative volume traded at that price. The last option, Peak/Valley, colors each price a shade of red or green based on whether the price is closer to a peak (green) or a valley (red).

Along the same lines, the border color used to paint the border of the profile histograms was adjusted. In the past, the color specified for the candle border color of the chart was used. This has been changed to simply use a color that is slightly darker than the color being used to paint the price (based on relative volume of that price).

Profile Indicator: New Results: Buy and Sell Volume

The Profile Indicator has been enhanced to add new result options. In addition to "Price and Time" and "Price and Volume", the two options "Price and Buy Volume" and "Price and Sell Volume" are available. When the user chooses "Price and Buy Volume", the profile plots the amount of buy volume (volume traded at ask price) that traded at each price. Similarly, when the user chooses "Price and Sell Volume", the profile plots the amount of sell volume (volume traded at bid price) that traded at each price level.

New Volume Price Statistics Results: Delta Above/Below Midpoint

Two new result options were added to the Price Statistics Indicator Delta Above Midpoint and Delta Below Midpoint. These results provide the user with the delta of all trading that occurred at prices above or below the midpoint of each bar. The midpoint of each bar is defined as being the price halfway between the high and low of the bars.

Miscellaneous 10.2 Fixes and Improvements

- A long standing bug was causing multi-paned charts that were setup with "Look Ahead Bars" to draw without the look ahead period when the chart updated in real-time. This has been

corrected. While the "Right Margin" chart setting is now the recommended method for specifying white-space to the right of the last bar, the look ahead bars alternative may be desirable for those who wish to see trend lines or regression lines extended some fixed number of bars into the future to observe where the line extension intersects the vertical price axis.

- Duplicating a multi-paned chart while one or more indicators were selected was producing a fatal error. This has been corrected. The selection is released before the chart is duplicated.
- The Zig-Zag indicator was producing a fatal error if the turning points were setup to show total delta and there was no tick data on file to compute the delta values. This has been corrected.
- RTL formulas using WCCI indicator token were not working properly when the WCCI token was setup to use the CCI Turbo method. This has been corrected.
- A bug was fixed in the Database Wizard (Alt-U Window). The Compress Before Backup check box was not being considered properly. This is fixed now so that checking this box runs all of the check marked compressions marked in the Database Compression section of the wizard when you use the wizard's Backup Database button. A Windows 7/Vista specific bug was fixed to permit compression of Trading Notes. Windows 7/Vista was blocking this utility because of a disk write permissions issue.
- Two additional keyboard shortcuts were added under the "Open" Action. Open Object Editor and Open Market Profile Chart are now eligible for function key shortcuts in Setup: Preferences: Keyboard Shortcuts. The Open Chart keyboard shortcut enable the specification of a particular chart name to open. Open Market Profile Chart shortcut will show a list of available Market Profile chart names for selection at the time you invoke the shortcut.
- Version 10.2 checks the database backup location at startup to determine whether the backup_f folder in the current data_f (database) folder is setup as the backup location. This the recommended setting for most users. If the backup s specified as some other location, a prompt will appear at startup alerting you to this fact and requesting permission to change to the default backup location. Click OK to reset the backup location to the backup_f folder in the current data_f folder, click "Setup" to review the backup preferences, or click "Cancel" to do nothing. If you have some reason for specifying a non-standard backup folder location, these prompting messages can be eliminated by setting a configuration variable:
CheckBackupLocAtStartup=false;

The checking for non-standard backup locations is aimed at preventing accidental running of two instances of Investor/RT, both using the same backup location. By using the recommended setting, each database data_f folder will contain its own backup_f folder so there is no confusion about which backup goes with which database.

- Version 10.2 adds efficiency measures when RTL objects in the chart reference the VB or Profile Indicator. Investor/RT detects this usage and automatically inserts a hidden VB and/or Profile Indicator into the chart. This hidden indicator will efficiently track the real-time data and keep the VB or Profile data up to date. The RTL objects within the chart will then use the resident VB or Profile results directly instead of having to compute them. This has a major positive impact in reducing resources required for signals and custom indicators that rely on VB or Profile analysis.
- Brokerage support for Interactive Brokers was improved in 10.2 to better synchronize the Investor/RT Portfolio with the prior trade executions reported by IB to Investor/RT when connecting. All working orders and all previous fills for the day will now appear automatically in the Order Status window, and the net position in the portfolio will match that shown in TWS as it should.
- Version 10.2.3 fixes a bug that was causing chart buttons to be moved into a new button pane at the top of the chart window if the chart contains a custom indicator or signal that references the VB or Profile indicator.
- Version 10.2.3 fixes a bug that caused a message to appear at startup about load failed for brokerage DLL if the user was configured for use with Transact/Infinity.
- Clicking the + plus button at the upper right corner of Time and Sales windows to optimize the column width spacing now spaces the columns a bit wider than before to make the data more readable.
- Version 10.2.2 and 10.2.3 fixed two bugs that were causing Investor/RT to become non-responsive when opening charts containing particular indicators that require volume at price analysis.

Investor/RT Version 10.1, Released: March 16, 2010

Version 10.1 Enhancements

Efficiency Improvement Using Invisible Instruments

The MPD Indicator within multi-pane charts runs MUCH more efficiently when bars of the MPD periodicity and instrument are added invisibly to the chart. MPD then uses those invisible bars without having to load data each time it calculates. The net effect is a much more efficient MPD. Prior to version 10.1b8, the user was responsible for adding these invisible bars to the chart and ensuring that they were setup properly. Now, Investor/RT will automatically add these invisible bars to the chart with the proper setup. In short, the user now will get the most efficient implementation

of MPD each time without needing to be concerned with adding additional bars/instruments to the chart. This is a very convenient enhancement for users of the MPD indicator.

New Indicator: Woodie's CCI (RTL WCCI)

An Indicator titled Woodies CCI has been added to the library of technical indicators. This indicator implements the WCCI as described here: www.woodiescciclub.com.

New Indicator: Two Array Statistics (RTL TAS)

A new indicator called Two-Array Statistics has been added to the library of Technical Indicators. This indicator allows the user to compute a variety of statistics historically between any two arrays of custom indicators, including: Slope, R-Squared, Correlation, Product, Ratio, Difference, and Sum.

New Indicator: ATR Stop (RTL ATRS)

A new indicator titled ATR Stop has been added to the library of technical indicators. ATR Stop helps define the current trend. The indicator plots a line/dot above the prices bars when a downward trend is detected, and a line/dot below the bars when an upward trend is detected. These lines are commonly used as trailing stops. This indicator is commonly used as a exit tool rather than an entry technique. When price crosses the ATRS value, the trend reverses and VSTOP moves to the other side of price.

New Indicator: Volume Price Statistics. (RTL VPS)

A new indicator titled Volume Price Statistics has been added to the library of technical indicators. The Volume Price Statistics indicator provides the user with a variety of statistical measures based on the volume at price. These statistic options are described in more detail above.

New Indicator: Empirical Mode Decomposition (RTL EMD)

A new indicator titled Empirical Mode Decomposition Indicator (EMD) has been added to the library of technical indicators. The Empirical Mode Decomposition Indicator (EMD) helps identify whether a market is in a cycle or trend mode. This indicator is discussed in the article titled "Empirical Mode Decomposition" in the March 2010 Issue of Stocks and Commodities magazine, by John F. Ehlers and Ric Way. According to the article, when the Trend Component rises above the Average Peaks, the market is in an uptrend, when it is below the Average Valleys, the market is in a downtrend, and when it is between the two, the market is in cycle mode.

The EMD indicator has 4 optional components: the Bandpass Filter (or cycle component), the Trend Component, the Average Peaks, and the Average Valleys. The inputs include price, period, delta, and fraction. The price defaults to High + Low / 2. The period should reflect the cycle period (or frequency) of the market being studied and defaults to 20 bars. The delta should be set to half the

bandwidth with common values of 0.1 to 0.5. The fraction is the fraction of the average peaks and valleys used to display the upper and lower limits for the trend component. This value is subjective and can be adjusted to fit your trading style. For swing trades that prefer to trade in cycle mode, a larger fraction might be used such as 0.25.

For more information on this indicator, please refer to the March 2010 Issue of Stocks and Commodities magazine, by John F. Ehlers and Ric Way.

New Indicator: QuoteBoard

A new indicator titled QuoteBoard has been added to the library of technical indicators. The QuoteBoard allows the user to display columns of price and volume data on multiple symbols within a multi-pane chart. The QuoteBoard has extended capabilities including automatic sorting of the price rows within each symbol, hot/cold color shading or custom coloring of each row, price or tick display options, auto-sorting of symbols based on % Change, and much more. The QuoteBoard allows users to plot key Market Profile price values, OHLC, Pivot Levels (daily, weekly, monthly), all in a single column with automatic sorting and coloring. Videos will be forthcoming on the QuoteBoard as Investor/RT 10.1 goes final.

Data Retention Options Simplified

For most Investor/RT users, the Setup: Instruments (Symbols) window no longer offers check boxes for daily, weekly, or monthly data retention. The recommended settings of daily data retention, no weekly and no monthly data retention will be used. These have long been the recommended settings, suitable for most users of Investor/RT. Weekly and monthly charts utilize the underlying daily historical data to draw the weekly or monthly bars. We are removing these options because they can be confusing; some mistakenly assume that it is necessary to retain separate weekly or monthly historical data in order to view weekly or monthly charts.

Investor/RT is capable of producing monthly, weekly, or daily charts from 1925 to present when there is adequate data on file. While daily bar data is hard to come by going back that far, long term weekly or monthly data for equities, indexes or continuous futures contracts can be imported for analysis. The weekly or monthly data retention options are useful for this purpose. You may want to retain only a few years of daily bars, a decade of weekly bars and several decades of monthly bars. This reduces data storage requirements compared with keeping many decades of daily bars, although storage savings are insignificant except when a very large universe of symbols is involved. Generally, the weekly/monthly options are of little interest to futures traders. We are simplifying the user interface while keeping these seldom needed retention options available to any Investor/RT user who wishes to use them via a configuration setting. Any user who has made weekly or monthly data collection a default setting (see Setup: Preferences: Instruments) will continue to see the three retention options in the Setup: Instruments window.

Alternatively, you may wish employ the recommended default settings, but utilize weekly/monthly retention on only certain symbols. This can be accomplished by adding a setting to the configure.txt file. Add the line:

```
EnableWeeklyMonthlyRetention=TRUE
```

to the configuration file (File: Open: Configuration File) and Save the file (Ctrl-S or File: Save: Save). Thereafter daily, weekly, and monthly retention check boxes will be available once again for specifying your preferences for any symbol.

Exporting Instrument Data in a Chart

Instrument data of any periodicity contained in a multi-paned chart may be exported to text now by right-clicking inside the chart window and choosing Export: Instrument Data. The Export submenu is new in 10.1, allowing export of any indicator data or instrument data in the chart. If there are multiple instruments inside the chart, a list of them will appear for selection. If there is only one instrument in the chart or if a particular instrument is selected in the chart when you do the Export: Instrument Data command, that instrument will be exported without prompting.

File: Open: Admin File

Menu Item. The File: Open submenu now has an Admin File... menu item that will start the file selection process at the Investor/RT Admin folder. On Windows XP, the Admin directory is located in the installation folder, typically named investrt, located in the Program Files directory. On Windows 7 and Vista, the Admin folder is located in the LinnSoft directory within the C:\Users\username directory, where username is your Windows 7/Vista user login. The File: Open: File... menu item starts the file selection process at the mostly recently accessed directory, while File: Open: Admin File... simply makes the Admin folder the starting location for opening a file. When using the File: Open: File or the File: Open: Admin File... menu items, if you hold down the Ctrl Key, navigation will begin at the install folder on XP, or at the local LinnSoft folder on Windows 7/Vista. Finally, on the main toolbar, the "Open Group" button also serves as an Open File button if you hold down the Ctrl Key while clicking on it. File selection begins at the install folder on XP, or at the local LinnSoft folder on Windows 7/Vista.

These features are available to Macintosh users as well. On Mac OS X, the Option Key is used instead of the Ctrl Key. The Admin folder is customarily located in the Users/Username/Library/Application Support/InvestorRT/ folder, where Username is your Mac OS X user login id.

Smart Tick Compression

Investor/RT 10.1 introduces Smart Compression of Tick Data. This optional feature can be enabled in Setup: Preferences: Historical Data. Check or uncheck the box titled "Use Smart Compression of Tick Data". When Smart Compression is enabled, ticks are stored in the Investor/RT database in a more

compact form by consolidating the trading volume for ticks which occur at the same time, price, bid and ask. The consecutive ticks are stored as one consolidated tick having a trading volume representing the cumulative volume of the component ticks.

Our tests with financial futures tick data show Smart Compression reduces the stored tick count consistently by over 85%. Similarly, actively traded equities showed a 50-70% reduction. This reduction in tick counts leads to reduced storage requirement on the database, reduced memory footprint for tick-based charts, and reduced processing time when opening charts that use tick data. Smart Compression has a widespread beneficial impact on the performance and functionality of Investor/RT: more tick data can be stored in the database, Market Profile and Multi-paned charts load and process much faster, databases verify and backup faster, backtesting and optimization of trading systems run faster, etc. For example, a futures trader having a tick data retention setting of 3 days could retain 20 days of tick data using less space on the database by enabling this feature.

When Smart Compression is enabled, there are some aspects of Investor/RT that are adversely affected; this is why Smart Compression is optional. One obvious impact is for ticks/bar periodicity, where actual tick count is used to construct each bar. If ticks/bar charts are a part of your analysis, such charts will reflect compressed ticks/bar and will not reflect the actual trade count per bar. All other periodicities (Volume Bars, Range Bars, all fixed time interval bars) will be identical whether Smart Compression is enabled or not. Advanced volume functionality such as the Profile Indicator (Volume at Price / Delta at Price), the Volume Breakdown Indicator (Delta per Bar), and VWAP will be computed correctly when Smart Compression is enabled. Some of results choices for the Volume Breakdown (VB) Indicator are affected when Smart Compression is enabled. This includes any VB based on Trades instead of Volume, and any VB setup with a result that is based on tick counts. Tick count results include: Total Trades/Ticks; Average Size; Big Trades %; Average Buy Size; Average Sell Size; Buy Trades/Ticks; Sell Trades/Ticks.

For more information see <http://www.linnsoft.com/qa/a/193.htm>

Keyboard Shortcuts Added for Chart Scrolling

You may setup function key shortcuts for scrolling multi-paned charts left or right one bar at a time. This has been a requested alternative to having to repeatedly click the scroll bar. The Scroll Left and Scroll Right actions are extensions to the chart toolbar. In Setup: Preferences: Keyboard Shortcuts, choose "Toolbar / Chart" as the Action and pick "Scroll Left" or "Scroll Right" from the list of chart toolbar actions for your shortcut. If you setup F2 as Scroll Right, for example, you may then scroll the chart so it is positioned at some starting date and time in the past; then tap F2 repeatedly to bring one new bar at a time into view.

Layout Toolbar Improvements

The layout toolbar now offers a "Save As..." feature to save a copy of the existing active layout under a different name. Activate any source layout by selecting its tab on the layout toolbar. Hold down the

shift key while clicking the "Save Layout" button or icon button. Investor/RT will prompt for a new layout name. A new layout tab with the specified name will appear in the toolbar and become the activate layout. You may then revise the layout as you wish. The original layout remains intact. When naming layouts, the first word in the layout name is used as the "short name" that appears on the tab face in the toolbar, e.g. doing a Save As under the name "Test Layout" will create a new tab named "Test". When using the shift key to perform a save as, you may specify the name of an existing layout. Investor/RT will ask you to confirm the replacement of the former layout having that name with the new one you are saving.

When the layout toolbar is expanded to show the layout setup options, there are blue ? help buttons positioned to the right of the Save Layout and Delete Layout buttons. The Delete Layout button was revised to request confirmation before deleting the current layout.

On the main toolbar, right-clicking in the message area reveals a more compact pop up menu. This menu has sub menus for Layout Toolbar and Main Toolbar related options. In the Layout Toolbar submenu are commands to toggle (alternately show/hide) the layout toolbar, center the layout toolbar in the main Investor/RT window, and a "Pin to Main Toolbar" menu item that positions the layout toolbar to the right of the main toolbar.

Using the Mouse Wheel when Adding Indicators

When adding an indicator to a multi-pane chart Investor/RT presents a dialog with all the indicators listed on the left. You can use the keyboard to cause the list to jump to some alphabetic position. Subsequent repeats of the same single letter takes you down the list of indicators starting with that letter, e.g. press the letter m five times moves you to the 5th indicator having a name beginning with m, Money Flow in this example. You may also tab the space bar when you are scrolled down to snap back to the top if the list where "Choose Indicator" is displayed and the rolodex of indicator names appears on the right. For those that like to use the mouse wheel to scroll, a few new twists have been added. Rolling the wheel up or down selects and displayed the indicator as your scroll one at time thru the indicator names. If you hold the SHIFT key down as you move the mouse wheel, each click of the wheel advances you 5 forward or backward, i.e. you scroll faster. Then there is the Ctrl key for alphabetic jumps. With Ctrl key down each wheel click jumps to the top of the list of names beginning with the next or prior alphabetic letter. You can use the keyboard and scroll wheel in tandem of course, e.g. press m to go to the 1st indicator in the M's, Moving Average then move the wheel to move down thru the M's. If you want MPD and you remember that MPD is the last indicator in the M's then press N and wheel up one. You can also use the up/down arrow keys to scroll thru the list one item at a time. Shift and Ctrl only modify mouse wheel effects.

Handling of Indicator Exceptions

Investor/RT for Windows now uses MS Structured Exception Handling for all technical indicator calculations. Sometimes an indicator calculation can cause a fatal error. This could be due to a defect in the software itself, or perhaps some user specified preference setting was entered incorrectly, or

perhaps the indicator was a user-developed indicator running in Investor/RT as a PLUGIN indicator and there is a defect in the plugin (Investor/RT SDK required). In prior versions, such exceptions would be handled by stopping the data feed, closing the database, reporting the fatal error and requiring Investor/RT to be restarted. Now, these exceptions are handled in a manner that enables Investor/RT to continue running, only the particular indicator that failed is marked as having caused an exception and there will be no further attempts to calculate the errant indicator. The user will see no drawing for the indicator because it could not compute its results. If you revise the preferences for the indicator, IRT will try again to calculate the indicator using the revised preferences. If another exception occurs, it will be disabled. Sometimes a preference change will "fix" the problem and computation will resume normally for the indicator. This kind of exception handling will be especially welcome to users of the Investor/RT SDK where defects in programming plugins can now be detected without causing Investor/RT to terminate.

Profile Indicator: Naked POCs/Closes/Extremes

The Profile Indicator has been enhanced with an option to draw lines for naked POCs, naked closes, and naked high/lows. The naked POC lines will extend forward in time past the profile period until a bar takes it out (touches it). Naked closes work the same way but use the closing price of the profile period. Naked highs and lows similarly extend the highs and lows of the profile period until they are touched by a future bar.

Profile Indicator: Automatic Peaks/Valleys

The Profile Indicator has been enhanced with an option to automatically draw reference lines at peak and valley prices. A peak is defined as a price whose volume exceeds that of the prices surrounding it. A valley is defined as a price whose volume is lower than that of the prices that surround it. The user is given then option of selecting the Peak/Valley "Sensitivity". A sensitivity of 10 would require a peak price's volume to be higher than the 10 prices above and below it. A sensitivity of 20 would require a valley's volume to be lower than the 20 prices above and below it.

Session Statistics - Ignore First x Minutes

A new option has been added to the session statistics titled "Ignore the first x minutes of the session". This option can be especially useful to those trying to get the high or low of the day session (session 2) while looking at a chart set to the full GLOBEX session (session 31). In this instance, setup session statistics to ignore the first 1020 minutes of the session. It would then begin to compute the highest high or lowest low on the first bar of the day session.

Miscellaneous 10.1 Fixes and Improvements

- Layout Toolbar now permits empty layouts to be saved.

- Fundamental data items "Short Interest" and "NAICS" (industry classification code) are now available on IQFEED for display in quote pages. Either column may also be used in RTL formulas.
- Configuration variables were added. Use "AutoAddTempInvisInstruments=false" to turn off automatic addition of temporary invisible instruments. The default is true, the invisible instruments improve multi periodicity efficiency, when the Profile indicator and/or MPD indicator is used. For IB users, use "IBHistoricalPacingInterval=15" to allow 15 seconds between each IB backfill request. Default is 10 seconds. IB users with a DTN MA subscription have no pacing restrictions.
- Various tweaks for Windows 7/Vista were made. Pinned toolbars now align perfectly with their associated windows (as they long have on Windows XP). The position, size, and maximized state of the main Investor/RT task window is now properly re-instated at startup.
- Windows users will see a warning message if memory usage reaches an abnormally high level. The default warning level is 250MB, far beyond the memory footprint normally required by Investor/RT. Users with memory intensive workspaces can increase this threshold if the warning is bothersome. Use the configuration file variable "MemoryUsageWarningMB=300" for example to set the threshold to 300. If you see this warning consult with support to diagnose the cause of such abnormally high memory usage requirements.
- A bug was fixed in the Layout Toolbar. The Layout in effect when quitting was being retained as the startup layout only if the "Automatically Save Layout Changes" option was on for the layout. When this option was off, the "Last Session Layout" was mistakenly established as the active layout the next time Investor/RT is started.
- Clicking on a ticker symbol inside a chart QuoteBoard indicator will change the current chart to that symbol. This makes it very convenient to use the QuoteBoard as quickly changing symbols in the rest of the chart. If you set the multi-linking color of the chart to black using the color box at the lower right corner of the chart window, the chart becomes locked; symbol substitutions from multi-link operations or QuoteBoard clicks are disabled.
- A configuration variable was added to allow Windows users to specify whether the cross hairs show the price level near the intersection point of the cross hair, the new default behavior, or show the price level at the far right of the horizontal cross hair line near the price axis as in prior versions. Users who prefer to see the price at the vertical scale can open the File: Open: Configuration File; add this line to the bottom and save the file (Ctrl-S).

ShowPriceAtCrossHair=false
- A configuration variable was added for limiting the size of historical data arrays. The configuration variable, MaxMemoryArraySize, defaults to zero, meaning no limit. If MaxMemoryArraySize is set to a number, this number is multiplied by 1 million to set the limit on the size of historical data arrays. In prior versions of Investor/RT, a limit of 10 million

could be imposed by checking a box in the Historical Data preferences window. Setting `MaxMemoryArraySize=10` in the `configure.txt` configuration file has a similar limiting effect. When a limit is specified, attempts to open charts that call for millions of ticks to be loaded will fail if the tick data collection size exceeds the limit. The recommended setting is 0, no limit. If you are experiencing out of memory conditions, setting a limit of say 10 (million) will alert you to the chart that may be requesting too much memory before the out-memory condition actually arises.

- Layout Toolbar asks for confirmation when deleting a layout.
- The contextual menu when right-clicking in the message area of the main toolbar has an enhanced Layout Toolbar submenu. Menu items are provided for Enabling the toolbar, pinning the layout toolbar to the main toolbar at the right, and centering the layout toolbar in the main Investor/RT window.
- When symbols are deleted, e.g. using the red trash button on the quotepage toolbar or setup instruments window, any open windows containing the symbol are notified. Quotepages, for example respond by removing the affected row(s) from the quotepage. Multi-paned chart windows will remove the instrument from the chart and will close automatically if there are no remaining instrument(s) in the chart. Time and Sales windows will close automatically if they showing data for the now deleted symbol.
- System added temporary invisible instruments no longer appear in the pane title bar. User added invisible instruments are listed by ticker and periodicity only. The pane title displays drawing tool indicators (trend lines, ref lines, fibs, etc) after first listing all instruments and other indicators. Ref lines are listed last if present.
- Price labeling in the vertical scale area for instruments is now enabled when your scroll back in time, the value displayed is typically the close of the last bar displayed, not necessary the current price of the instrument. Value display is also enabled when the charting reflect percentage and not actual trading price. For example, an instrument with a drawing type of Histogram and a price type of %Change will now the %Change value of the last histogram block numerically.
- A bug was fixed in 10.1.3 where indicators associated with invisible instruments would not draw.
- A bug was fixed where intraday time interval charts expressed in minutes and seconds (not an even number of minutes) would not show a time scale on the horizontal axis.
- The Database Utilities Wizard (Alt+U) can now perform database initialization of the portfolio section of the Investor/RT database. All portfolios, positions, and historical position data are destroyed and the system starts with a clean slate with the Simulated portfolio setup for use

with the Investor/RT trading simulator. The Control-->Database Utilities-->Initialize submenu also includes this new utility function.

- Versions 10.1.3 and later now support the most recent TransAct API. In doing so, the "TransAct: Setup" menu now provides an option to "Connect to Demo Server". If the user has a demo account with TransAct, they should check this check box. Otherwise, if this check box is unchecked, the user will connect to the live TransAct server.
- Broker Alias symbol may now be displayed in a portfolio. This may be useful to those using a market data feed in conjunction with a brokerage feed where the broker symbol differs from the market data symbol.
- If Investor/RT encounters a fatal exception, diagnostic information is automatically sent via the internet to the development team. The diagnostic data is minimal and the transmission typically takes just a couple of seconds. You can turn off this reporting of fatal errors by adding a line to the configuration file (configure.txt): CrashReporter=false. It is recommended that you allow diagnostic reporting. This enables the developers to monitor stability issues and respond as needed with maintenance releases.
- A minor bug was corrected regarding the progress bar when backtesting a single symbol with a large amount of historical data where the percentage completed was incorrectly reported.

Investor/RT Version 10.0, Released: November 16, 2009

Version 10.0 Enhancements

Introducing Version 10.0 Investor/RT 10.0 marks a significant new direction for Linn Software. This release includes, for the first time, the ability to submit trading orders directly to supported brokerages from within Investor/RT charts and trading systems. While Investor/RT has long supported brokerage execution via intermediary software, Version 10.0 implements direct-to-brokerage connectivity and support for a broader range of brokerage clients. See Introducing 10.0 for more...

Investor/RT 10.0 introduces support for Rithmic and Zen-Fire

High-speed electronic trading networks used by Mirus Futures, Amp Futures and other brokerages. The Investor/RT platform provides integrated access to the Rithmic and Zen-Fire networks for market data, historical data, and brokerage execution, bringing the powerful decision support capabilities of Investor/RT to clients using Rithmic or Zen-Fire brokerage accounts. Trading via Rithmic and Zen-Fire is implemented using the "Trading Order" infra-structure of Investor/RT. Trading orders are created and saved by name using the Trading Order Desk window. Trading orders can then be executed directly from the Order Desk window, or by clicking trading order buttons deployed inside Investor/RT charts; they can be triggered automatically by trading signals that fire within a chart when user-specified market conditions occur; they can be integrated into powerful trading systems

created by the user with the Trading System Tools (Investor/RT tools for back testing, optimization, and deployment of automated trading systems). Initially, Investor/RT trading orders for Rithmic or Zen-Fire support Buy and Sell order actions for order types: market, limit, stop, stop limit. Cancel Order, Cancel All Orders, and Open Order/Position Status Requests are also supported via the Trading Order setups. A "Revise Order" order action is supported; it enables the user to submit revisions to open stop orders, limit orders and stop limit orders. Both order quantity and stop/limit prices may be revised. The revise order works well in conjunction with charts that contain Reference Lines that the user designates as the stop or limit price with an associated user variable. The user can set his stop price and limit price V# variables by dragging the appropriate reference lines to the desired price points in the chart. Then trading orders (e.g. a sell stop order) that reference the V# variable(s) are submitted and become open orders. Later, the user can drag and drop either the stop or limit line as desired and submit (e.g. via a click on a chart button) a Revise order to adjust the stop and/or limit price. Mouse click selection of stop and limit prices is also supported. When a trading order with this setup is submitted, the chart prompts for the stop or limit price. The user clicks in the vicinity of the desired price to see a price ladder of nearby prices and picks the precise stop or limit price from this list.

Fill reports and order status updates are handled by Investor/RT, updating the Trade Position Size (TR_POS) and Trade Fill Price (TR_FILL) quotepage columns and RTL variables. All order fills are recorded automatically in the Investor/RT Portfolio corresponding to the Rithmic or Zen-Fire account name in use. The user creates a portfolio account with the name of their brokerage account; the portfolio window will update in real-time as positions are opened and closed, showing gain/loss and other data about each open position. Support for other order types, e.g. Limit if Touched, Market if Touched orders will be added later in the beta testing period. The trading order architecture of Investor/RT is a foundation; it is an infra-structure for conveying brokerage orders to a brokerage destination. We will build on this foundation in future releases, adding user-interface components and brokerage strategy setups to further simplify various kinds of user-directed trading. Videos will be available demonstrating how trading orders are setup and deployed within Investor/RT.

Direct Brokerage Support for Interactive Brokers

Investor/RT has long supported Interactive brokerage trade execution using Autotrader software as a conduit or intermediary for routing Investor/RT "Trading Orders" to the IB TraderWorkstation brokerage platform. Version 10.0 introduces direct-to-broker support for IB. Users of the IB Edition of Investor/RT may now create and execute Trading Orders for Interactive Brokers and those orders will be conveyed directly to TraderWorkstation. Fill reports and order status updates are handled by Investor/RT, updating the Trade Position Size (TR_POS) and Trade Fill Price (TR_FILL) quotepage columns. New to the direct-to-brokerage implementation for IB users is that all fills are now recorded automatically in the Investor/RT Portfolio corresponding to your IB account. For example, you wish to "paper trade" using an IB account DU12345, you create a portfolio account with that name and it will update in real-time as positions are opened and closed. Initially, Investor/RT supports Buy, Sell, and Sell Short order actions and order types: market, limit, stop, stop limit, market on close, limit on close. During initial beta testing deployment of these new trading features trading orders will be permitted only on IB paper trading account. Those interested in live trading using Investor/RT trading

orders during the beta testing period please contact Linn Software after having thoroughly tested these trading methods using a paper trading account.

Autotrader and NinjaTrader are no longer supported by Investor/RT Verison 10.0 and higher.

Trading order setups no longer have a "Destination" and an "Account" setup. These setups were necessary in the past but now, with Investor/RT communicating directly to the brokerage system, the destination and accounts that are available for trading are now determined automatically from the brokerage. The user can specify the default brokerage destination in the File: Reconfigure window or in the Trading Order Desk. The trading order desk presents the list of trading destinations and accounts within each trading destination. Trading order setups are now independent of brokerage destination and account. When you submit a trading order manually or using an automatic method, the trading order will be sent to the current destination and current account setup for that destination.

Direct-to-Broker trading order support will be expanded over time to include additional data sources that support brokerage execution. Support for mixing brokerage configurations with real-time data sources that do not have built-in brokerage capability are also planned, e.g. using Interactive Brokers trading order execution while Investor/RT is configured for DTN IQFEED or eSignal. In general, future plans include tighter integration of brokerage activity across all aspects of Investor/RT and the addition of user-interface components and brokerage strategy setups to further simplify various kinds of user-directed trading. We welcome feedback and recommendations from customers as we move forward in this exciting new direction.

Trading Related Sound Events

Sound events are used by Investor/RT to produce audible feedback when various trading related events occur. The sound events introduced in Version 10.0 are: Order Submitted, Order Filled, Order Partial Fill, Order Revised, Order Canceled, Order Rejected, and Order Failed. Sound event "Confirm Order" is triggered when Investor/RT asks for confirmation before sending a trading order to the brokerage destination. By default, all of these events are associated with pre-defined "text to speech" sounds for each order status event. These sounds are triggered when trading events occur in response to trading orders issued with destination "Interactive Brokers", "Zen-Fire", "Rithmic", and the "Trading Simulator" destination (see item #4 below). Any sound event can be turned off (set to "No Sound") or it may associated with some other sound of your choice using Setup: Preferences: Sounds.

Trading Simulator

Version 9.x of Investor/RT included a modest simulated trading feature whereby trading orders could be setup with the "destination" being some Investor/RT portfolio. This simulator supported only market orders. Version 10 has a more robust trading simulator "destination" for trading orders. Typically, all fills for the trading simulator are posted into a portfolio named "Simulated". You may

use different portfolio account names if you like; just create a portfolio with the name you want to use and select that account name in your trading order setups. Trading orders may be executed manually using the Trading Order Desk window or by clicking buttons in a chart to execute a particular trading order or a group of trading orders. All fills are recorded in the portfolio account specified. The portfolio may be set to display format "Trading Format". This format shows the Long/Short status and size of the position, the entry price (open position price) and the net gain/loss based on current bid/ask prices of the realtime feed. Working orders can be seen in the improved "Order Status" window. Use the Control Menu to open either the Order Desk or Order Status windows. Simulated market buy orders are filled immediately at the ask; sell market orders at the bid. Limit, Stop Market, and Stop Limit buy/sell orders are also simulated. For example a buy limit order will fill as soon as the ask price reaches the limit price or better. A sell limit order will fill when the bid price reaches the limit price or better. A sell stop order will execute like a market order as soon as the instrument trades at or below the stop price, filling at the current bid. A buy stop order will execute like a market order as soon as the instrument trades at or above the stop price, filling at the current ask. Stop Limit orders are simulated similarly except the order becomes a limit order when the market trades at or above/below the stop price. While orders are working you can observe their status in the Order Status window. Using button in this window you may either cancel any or all working orders or you can revise the stop and/or limit price of the selected order using the +Increase and -Decrease buttons. Each click on the +Increase button will revise the stop and/or limit price up one tick, e.g. + 0.25 for the ES futures. When an order is working, you may also submit a trading order with action "Revise Order" that sets a new stop and/or limit price or adjusts the quantity of the order. Trading Orders must be setup with a specific order number entered into the order, or reference a V# variable where the particular V# has captured the order number when the trade was originally submitted for execution. The Order Status window will also show all filled and cancelled orders from the current trading session. All order actions will be accompanied by audible feedback confirming when orders have been submitted, filled, canceled, revised, etc.(see Setup: Preferences: Sounds and item #3 above). The trading simulator can be used to test execution of trading orders when signal actions fire within a chart. Users who license the trading system tools can run complete trading systems in realtime within a chart with various trading rules executing simulated trading orders. The trading simulator updates the TR_POS and TR_FILL as orders are filled. The user can also add annotations to the chart to show the %TR_STATE (long/short/flat). Reference lines can be added to a chart that are pegged to the TR_STOP, TR_TARG or any V# variable for the symbol in the chart. Moving these lines up or down with the mouse will adjust the value of the associated variable. You may then submit trading orders that use these reference lines variables to supply the limit and/or stop price within the trading order setup. Your charts will clearly reflect where your stop and target orders have been placed. Once the orders are working, you may use "Revise Order" trading orders to update the stop/limit prices after positioning the reference lines at the revised price levels. All of these same technique will work equally well with actual brokerage destinations.

New Indicator Drawing Styles: Price Boxes

Four new options have been added to the list of drawing styles available to most indicators. These options are intended for indicators, such as Moving Average, which generate results that are in line with the "price" of the underlying instrument and which plot on the same scale as the instrument.

Other indicator for which these options might be useful would include the Session Statistics, Statistics, VWAP, and many more. The new options are detailed below.

Price Box, Solid - This option draws a solid box around the price of the indicator on each bar. The width of the price is equal to the width of each bar (pixels per bar) and the height of box represents the height of one price or tick for the underlying instrument.

Price Box, Hollow - This option draws a hollow box around the price of the indicator.

Price Box, Solid (U/D) - This option, like the "Price Box, Solid" option, draws a solid box around the price of the indicator. This option also allows the user to specify two colors (Up and Down Colors). The up color will be used when the price of the indicator is greater than the previous value. The down color will be used when the price of the indicator is less than the previous value.

Price Box, Hollow (U/D) - This option, like the "Price Box, Hollow" option, draws a hollow box around the price of the indicator. This option also allows the user to specify two colors (Up and Down Colors). The up color will be used when the price of the indicator is greater than the previous value. The down color will be used when the price of the indicator is less than the previous value.

Calculation of Draw down During Backtesting

Investor/RT has long used the closing price of each bar during back testing to calculate the "draw down", defined as the dip in equity during a trade. The maximum draw down is reported in the back testing result reports. Version 10.0 introduces two additional draw down calculation methods, the high/low method and the open method. The high/low method uses the low when the trade is long to calculate the draw down and high when short. This method is the "worst case" draw down and is typically results in draw down figures a few percent larger than the other two methods. The open method uses the open price of each bar to figure the draw down at that bar during a trade. The close method, adopted originally by the Investor/RT back tester, will remain the default for a limited time. The high/low method will be of interest to many users and will become the default setting in a future

release. For now, to specify your preference you make an entry in the configuration file. Choose File: Open: Configuration File. Add a line to the file at the bottom:

DrawDownCalcMethod = N (then use File: Save: Save to save the configuration file changes)

N is a number, 0 for the new High/Low Method, 1 for the Close Method (the default), 2 for the Open Method. Any other value will take the current default. Thus you can specify 3 to get the default method, currently the Close Method. When the default changes in a future release to the High/Low Method, then your draw down calculation method will change to the new default later.

New Quotepage Multi-Linking Options

Quotepages now have a multi-link color setting and associated check box to activate a particular multi-link color for all multi-link operations involving that quotepage. When the "Use Multi-link Color..." check box is checked, any multi-linking operations initiated from the quotepage (e.g. double-clicking on a symbol) will multi-link the selected symbol using the quotepage's multi-link color. When the quotepage's "Use Multi-Link Color" check box is unchecked, multi-linking uses the color of the chart that is front most when the multi-linking operation occurs.

Essentially, activating a specific multi-link color for a quotepage "associates" the page with all chart windows having the same color, regardless of which chart is front most when multi-linking occurs. There are two ways of initiating a multi-link of some symbol in a quotepage: (1) right-click on the symbol and choosing "Multi-Link" and (2) double-clicking on a symbol. Note that double-click does a multi-link if Setup: Preferences: Charts: General specifies multi-linking as your preferred double-click action. If you prefer some other double-click action, you can now override the Charts: General setting for some of your quotepages by checking the new "Always Multi-link on Dbl-Click" check box in the preferences for those quotepage. Any quotepage that has this new check box unchecked, will use the preferred double-click action specified in the Charts: General Preferences.

Multi-Linking

Multi-Linking is the term used in Investor/RT to refer to changing the setup of various chart windows simultaneously to show a different instrument. More generally, multi-linking can also change the ticker symbol for NASD Level II windows, Quick Quote windows, and Time and Sales windows.

When you double-click on a ticker symbol in a quote page, Investor/RT performs the action specified as a user preference in Setup: Preferences: Charts: General. One of the radio button choices there is to "Multi-Link: Substitute ticker symbol into all Charts, T&S. Lvl2.". Thus a multi-link can be initiated by a double-click of the mouse when this is your preference. Alternatively, you can right-click on a

ticker symbol in a quote page and choose Multi-Link from the popup menu.

A third way to multi-link is activate a chart (make the chart the front window) and begin typing a new ticker symbol. A dialog box comes up to assist you in identifying the ticker to be inserted into the chart in question. At the lower left corner of this window is a "Multi-Link" checkbox. When checked, the selected symbol (instrument) will be inserted into the chart window in question when you click OK (or press the enter key) and a multi-link will be performed.

Multi-linking is selective when deciding which chart windows to update. Each traditional chart window and each Market Profile chart window has a "Multi-Link" color button in the lower right corner of the chart. The button is a small rectangle with the character "+" on its face. The background color of the + button indicates the "Multi-Link Color" of that particular chart window. Clicking on the + Button pops up a menu for changing the multi-link color code for the chart.

When the multi-link color for a chart is black, the chart is locked, i.e. it does not participate in any multi-link operations. The white multi-link color also has special meaning: the chart will participate in ALL multi-link operations.

When you perform a multi-link operation by typing a new instrument into a chart, Investor/RT will note the multi-link color code of the chart being updated and will multi-link the same instrument into all charts that have the same color code plus any others having the white color code. Any chart with a black multi-link color code and all other charts having a differing color code will not be affected.

Note that you can change the instrument of any locked (black) chart by entering a new instrument ticker, but only that one chart will be affected. Note also that if you multi-link the instrument of a chart having white multi-link color, only the other white color charts will be affected. For traditional charts the multi-link color coding scheme essentially replaces the "locked" checkbox in the chart preferences. When you change a traditional chart's multi-link link code to something other than black, the chart's "locked" checkbox is implicitly turned off. Similarly if you go to the chart preferences and check the locked checkbox, the multi-link color of the chart will change to black to indicate it is locked out of any multi-link action.

If a multi-link operation is performed from a quote page, Investor/RT determines which multi-link color in one of two ways. If the quotepage itself has an active multi-link color, then that color is used. The active multi-link color for a quotepage is specified in the quotepage preferences, by checking the "Use Multi-Link Color..." checkbox and using a color selection button. If the quotepage does not have an active multi-link color, Investor/RT inspects the current (frontmost) chart window and uses its multi-link color. All chart windows, multi-paned, Market Profile, Point & Figure, etc. have a multi-link color located in the lower right corner of the window itself.

As an example, suppose you have a quote page and seven charts open, one black, three with color code set to red and three set to green. If you activate a "green" chart, then double-click in the quote page, all green charts will be updated with the specified instrument. Similarly, by first selecting (activating) a red color coded chart, the quote page multi-link will affect only the "red" charts. If you have a quotepage that you wish to "associate" with a particular set of charts, say the red charts, then simply set that quotepage's multi-link color to red. From then on, whenever you multi-link from that quotepage, regardless of which chart window is frontmost, the red charts will receive the new symbol. Note that double-clicking is not the only way to multi-link from a quotepage. You can also right-click on any symbol and choose Multi-link from the ensuing menu.

Setup: Preferences: Charts: General has a setting for your preferred action when you double-click on a symbol in a quotepage. One of the choices is to Multi-Link, another is to substitute the symbol into the frontmost chart. Even if you have chosen substitution as your preferred double-click action, you can still setup particular quotepages to always multi-link upon double-click by checking a box in the quotepage preferences titled "Always Multi-link on Dbl-Click". This checkbox is located beneath the "Use Multi-Link Color..." checkbox in the preferences panel for each quotepage.

Shift-clicking on the + Button toggles the chart's toolbar on and off. Ctrl-clicking or right-clicking on the + button pops up the chart contextual menu. These shortcuts apply to traditional charts and Market Profile charts.

The multi-link color coding feature can be exploited very effectively using "Buttons" in your traditional charts. Buttons can be added to a chart window for the purpose of multi-linking a specific symbol into the chart and its associated color coded charts. Any button setup as a

ticker button or a ticker symbol menu button can be a multi-link button. To setup a button as a multi-link button, add a plus sign to the end of the ticker symbol in the Button setup, e.g. MSFT+. A button for MSFT+ when clicked does a "multi-link" of MSFT into the chart containing the button and all other charts associated with this chart via the multi-link color code. You can also add plus signs to the end of ticker symbols in a menu button setup. Choosing such an entry from a menu performs a multi-link instead of inserting the ticker into only the button's chart. Another way to multi-link using chart buttons is to hold down the shift key when you click on a ticker button. If shift is down when you click on a ticker button or when you choose from a ticker menu button, Investor/RT reverses the meaning, that is, if the button is a plain button, shift-click performs a multi-link. If the button is a multi-link button (e.g. IBM+) then shift-clicking on it will NOT do the multilink, it will only insert the symbol into the button's chart window.

Dynamic Profiles - Profile Indicator

The Profile Indicator has been enhanced to allow for dynamic profiling. This feature has been an option within the Market Profile charts for some time. Dynamic Profiles take two periods. The first period (minimum bars period or MPB) represents the minimum number of bars that each profile must contain. The second period (breakout period or BOP) determines the bars used to form a range which must be broken in order to start a new profile. For example, consider a dynamic profile with a MPB of 12 and a BOP of 8. Once the profile reaches 12 bars, on the 13th bar, the high and low of that 13th bar will be compared to the highest high and lowest low of the previous 8 bars. If that 13th bar breaks out of the range of the previous 8 bars on the high or low side (or both), then that 13th bar becomes the first bar of the new profile. If it does not break out of that range, it becomes part of the current profile, and then the high and low of the 14th bar are tested to see if they broke out of the range of the previous 8 bars, and so on.

There are a couple of advantages to the Profile Indicator implementation of dynamic profiles over that within the Market Profile charts. The Profile Indicator can build off any periodicity, not just time-based periodicities. Therefore, the dynamic profiles can be built on top of volume bars, range bars, tick bars, Renko bars, or point and figure bars. In addition, The Profile Indicator can be access in the RTL language with the PROF token, allowing users to access historical data values such as the POC, Value Area High, Value Area Low, and so forth. A new result has also been added to the PROF token titled "Avg POC" which allows the to specify a period and chart the average POC over the past X profiles historically.

New Letter Colors for Market Profile

Five new "letter color" options were added for Market Profile charts: Volume (TPO), Volume (Bracket), Volume (Price), Volume (Profile), and Delta (Price). "Volume (TPO)" colors the letters based on the relative color of each TPO. TPOs with more volume will be darker in color. "Volume (Bracket)" colors each bracket based on the relative volume of that bracket or time period. "Volume (Price)" colors each price with the relative volume that traded at that price within the profile. "Delta (Price)" colors each price with the relative delta of all volume that traded at that price within the profile.

%BARLEFT for PNF and Renko

The %BARLEFT token available to the Annotation indicator was enhanced to provide useful feedback for both Renko and Point and Figure periodicities. For Renko, it provides the change in price needed to produce the next Renko bar. The resulting value will be the minimum of the change needed to form a new up or down Renko bar. For Point and Figure, it provides the change in price needed to produce a reversal. For more information on %BARLEFT, visit: <http://www.linsoft.com/qa/a/110.htm>

"Use Price" for Alpha and Beta

The new "Use Price" check box in the Alpha and Beta Indicator preferences, causes these indicators to perform their calculations after creating a scatter plot of the actual prices, instead of the changes in price. The slope of the resulting best fit line through this scatter plot is the Beta while the Y intercept is the Alpha.

PaintBars for Point and Figure

Point and Figure bars (Xs and Os) can now be painted using the PaintBar Indicator.

Profile Indicator - New Results

The Profile Indicator can be used in the RTL language using the token PROF to provide a variety of data related to the profiles historically. Several new result options have been added and are explained below:

Avg POC - This option computes the average POC over any number of profiles, and allows the user to specify the number of profiles over which to compute the average. In addition, the user may specify a look back period of "result x profiles back". If no look back is desired, specify a 0. If a look back of 1 is specified for instance, the result will give the average POC of the prior profiles, excluding the current profile.

High x-TPO Price - This option provides the user with the ability to find the highest price in the profile that contained a user-specified number of TPOs. This option also comes with a look back period option. If no price contained that number of TPOs, then result will be 0.0.

Low x-TPO Price - This option provides the user with the ability to find the lowest price in the profile that contained a user-specified number of TPOs. This option also comes with a look back period option. If no price contained that number of TPOs, then result will be 0.0.

Avg Open of Profile - This option works just like the "Avg POC" option, except it uses the open price of the profile. This option also allows the user to average the open prices over any number of profiles, and allows for an optional look back period (specify "Result 0 Profiles Back" if no look back is desired).

Avg High of Profile - This option works just like the "Avg POC" option, except it uses the high price of the profile. This option also allows the user to average the high prices over any number of profiles, and allows for an optional look back period (specify "Result 0 Profiles Back" if no look back is desired).

Avg Low of Profile - This option works just like the "Avg POC" option, except it uses the low price of the profile. This option also allows the user to average the low prices over any number of profiles, and allows for an optional look back period (specify "Result 0 Profiles Back" if no look back is desired).

Avg Close of Profile - This option works just like the "Avg POC" option, except it uses the closing price of the profile. This option also allows the user to average the closing prices over any number of profiles, and allows for an optional look back period (specify "Result 0 Profiles Back" if no look back is desired).

Seven New RTL Functions have been added to the RTL language as described below:

SLOPE(exp, n) - Change-based slope of exp (expression) over past n bars: $(exp - exp.n)/n$. Slope (change per bar) of a trendline going from the value of exp n bars ago to current exp.

ACCEL(exp, n) - Change-based acceleration of exp over past n bars, or slope of current bar minus slope of last bar.

SLOPER(exp, n) - Regression-based slope of exp over past n bars. Slope of regression line through past n bars of exp.

ACCELR(exp, n) - Regression based acceleration over past n bars. Difference between the regression-based slope of current bar and regression-based slope of previous bar.

YINT(exp, n) - Current value of a regression line through the past n bars of exp.

CHG(exp, n) - Change of expression from n bars ago or $\text{exp} - \text{exp.n}$

PCHG(exp, n) - Percent change of expression from n bars ago, or $100.0 * (\text{exp} - \text{exp.n}) / \text{abs}(\text{exp.n})$

New Cumulative Profile Options for MP Charts

Two new options have been added to the cumulative profiles option available in the "Options" tab of the Market Profile Preferences: Previous Week and Previous Month. The Previous Week option provides a profile using all data from the prior week. The Previous Month option provides a profile using all the data from the prior month. Both options can build either TPO- or Volume-based profiles. These options are in addition to the "All Data", "Last X Profiles", "Current Week", and "Current Month" options that were previously available.

Custom Instrument Recalculation Frequency

Custom Instrument Recalculation Frequency for custom instruments having 2 components (pairs) is tick-by-tick, but for custom instruments having more components Investor/RT has limited the recalculation rate to 20 times per minute. Investor/RT 10.0 will, by default, update such custom instrument three times faster, i.e. once per second. This will add some processing overhead for many-component custom instruments having very actively trading components. The recalculation rate can now be specified in the Investor/RT configuration file. Goto File: Open: Configuration File. Enter a line at the bottom of the file containing:

```
CustInstRecalcMilliseconds=3000;
```

then do File: Save: Save (Ctrl-S) to save the configure.txt file. Thereafter, Investor/RT will recalculate at most every 3 seconds as has been the default in prior releases. If a faster recalculation rate is desired, values as low as 100 milliseconds can be specified. CustInstRecalcMilliseconds=100 will result in as many as 600 updates per minute of the custom instrument's value.

New Trendline Label Options

Three new options were added to the trendline labeling drop down list: Delta Per Bar, Delta Per Price, and Volume Per price. These options are available in both the Trendline and Zig Zag Indicators, and are detailed below:

Delta Per Bar - Divides the total delta of all bars involved in the trendline (or Zig Zag leg) by the number of bars involved/covered.

Delta Per Price - Divides the total delta of all bars involved in the trendline (or Zig Zag leg) by the number of prices (or ticks) covered in the vertical movement of the trendline.

Volume Per Price - Divides the total volume of all bars involved in the trendline (or Zig Zag leg) by the number of prices (or ticks) covered in the vertical movement of the trendline.

In addition, when the Zig Zag indicator is added multiple times to the same chart pane, but with different labels, those labels will be stacked vertically so that the user can clearly see all values instead of the labels printing on top of one another as they did in previous versions.

Profile Indicator: Draw on Right Option

A new option has been added to the Profile Indicator, when configured to draw a single profile, to draw the Profile "On Right". This option is currently only available when drawing single Price and "Volume" Profiles, which are drawn with style of "Volume Profile". In the past, these single profiles have been drawn on the left edge of the chart facing right. When the "On Right" option is checked, the profile will be right-aligned to the vertical scale on the right side of the chart, and face left. Some lookahead space is recommended when using this option to provide space for the profile. This allows the user to see the profile closer to the scale, and to plot two profiles of this nature with varying periods, one on the left of chart and one on the right.

Multi-Pane Charts: Redraw Full Chart

Multi-Pane charts, in order to maximize efficiency, only draw the past 2 bars each time the chart is redrawn/recalculated. This can cause certain reference lines and trend lines, such as a reference line that is attached to the current price and set to draw across the entire chart, to become disjointed. If you are experiencing this phenomenon, a new option is available in the multi-pane chart preferences under the "Options" tab to "Redraw Full Chart". When this check box is checked, then entire chart will be redrawn and then lines will stay together. This option will result in the chart taking more resources than the otherwise, but not enough to be of concern to most users.

Running Multiple Instances of Investor/RT under Windows Vista

Investor/RT has long supported running multiple simultaneous instances under Windows XP. To accomplish this, you install the software two or more times into different folders within the Program Files folder. Each instance can then be started from its folder and run in parallel. Each instance uses the database (data_f) folder inside the folder where the application instance resides in Program Files.

Under Windows Vista, this technique has not been possible since the Vista compatible edition of Investor/RT does not look within Program Files for the database, instead it looks for a folder named LinnSoft within the \Users\username directory (username is your Vista login username). The LinnSoft folder is called the working directory folder. It contains the database folder (data_f) and other administrative files (admin_f) used at runtime by the software. Version 10.0 of Investor/RT allows additional instances be created and directed to use a different working directory instead of LinnSoft. For example, say the username is JohnSmith. The primary Investor/RT working directory will be the LinnSoft folder inside C:\Users\JohnSmith\. To run a second instance, first install Investor/RT into a different folder in Program Files, e.g. C:\Program Files\Instance2\. Make a duplicate of C:\Users\JohnSmith\LinnSoft inside C:\Users\JohnSmith\ and name it the same name or something similar, e.g. Instance2WD. Finally, edit the configure.txt file at C:\Program Files\Instance2\admin\configure.txt and add a line at the bottom:

```
VistaWorkingDirectoryName=Instance2WD
```

Save the configure.txt file (you must have administrative privileges to perform the save). Thereafter, when you startup the software from the Instance2 folder in Program Files, it will detect that Instance2WD is the Vista Working Directory folder to use for this instance rather than LinnSoft. The instance will run independently of the other instance that by default uses the database within the LinnSoft working directory.

Historical Pivots Made Simple

The Pivot Point indicator has been enhanced to make it much easier for users to plot pivot levels historically (view pivot levels on prior days on an intraday chart). When the "Use Periodicity" (typically "Use Daily") check box is checked in the Pivot preferences, the "Plot Historical Levels" check box is now available. If this check box is checked, the pivot levels (S1, S2, S3, PP, R1, R2, R3) will all be plotted not only on the current day/session, but also across prior session.

In addition, these pivots can be computed off the data of only the day session. The daily bar of many futures contracts (such as @ES# of DTN IQFeed) reflects 24 hour Globex session. Many users prefer their pivots to be computed off the day session data only. By choosing the "Use Periodicity" check box and setting it to "Use 405 minute" data, as well as setting the charts session to session 2, the pivots (both current and historical) will reflect only the day session. To make this combination much more efficient, a second "invisible" instrument should be added to the chart (to same pane as the initial instrument and pivots) with a periodicity of 405 minutes. This way, the pivot indicator does

not have to load the data each time it computes the pivots and operates much more efficiently as a result. A video demonstrating this process will be forthcoming shortly at www.linnsoft.com/videos.

New Multi-Session Statistic: Rank

Two new multi-session statistics have been added to the Session Statistic indicator: Rank at Time (1=Highest) and Rank at Time (1=Lowest). This statistics works similarly to other multi-session stats such as "Avg of Bar at Time", in that it takes into consideration the bars of the same time period over multiple days/sessions, and it ranks the current bar in relation to those of prior sessions, where the number of sessions is controlled by the "X =" value specified. For instance, if a user setup the Session Statistics as "Last Price: Volume: All Bars of Session: Multi-Sess Stat: Rank at Time (1=Highest): X = 20", then each bar will have a value between 1 and 20. A value of 1 would signify that this bars volume is the higher than all the same bars (same time) for the previous 19 sessions. A value of 20 would signify lowest volume, etc.

New Optimizable Periods: Parabolic SAR and Ultimate Oscillator

The three periods of the Ultimate Oscillator and the 4 parameters of the Parabolic SAR are now optimizable. These periods/parameters can now be specified as V# variables (eg. V#12) instead of specific numbers. For more information on using V# variables as periods for optimization, watch the video on optimization at www.linnsoft.com/videos.

New Indicator: Average True Range Stop

A new indicator has been added to the Investor/RT library titled "ATR Stop" (ATRS). ATR stands for "Average True Range". ATRS using the average true range to provide a perpetual trailing stop. It works very similarly to the Parabolic SAR indicator, plotting a dot at the trailing stop price. Once the trailing stop is breached, ATRS moves to the other side of price and starts working in the other direction (long to short and visa versa). More information on this indicator will be forthcoming in the indicator section of the online tour: www.linnsoft.com/ti.

New Statistic: Rank

Two new results have been added to the Statistics indicator titled "Rank (1=Highest)" and "Rank (1=Lowest)". These results allow the user to rank the current price value in relation to the price values of the last x bars (where X is the period specified in the Statistics preferences). For instance, if a user chooses the settings "Rank (1=Highest): Volume: For the Last 30 Bars", then the result on each bar will represent the ranking of that bars volume in relationship to the volume of the previous 29 bars. A value 15 would signify a very average volume in relation to the last 29 bars. A value of 30 would signify that this bars volume was less than all 29 previous bars. A value of 1 would signify that this bars volume was higher than all 29 previous bars.

What makes this result (and several others) even more powerful is the way it can be used in the RTL language. For instance, using the settings mentioned above with this syntax in RTL:

STAT(CCI)

allows the user to rank the CCI values. CCI could be replaced by any historical token or expression such as VO, HI-LO, CI, etc..

Volume Breakdown: New Filtering Option

The volume filter option of the Volume Breakdown indicator has been enhanced to allow the user to provide both a lower and upper size limit. In prior versions, users could setup VB to consider only trades above or below a certain size (only big or small lots). A new option has been added to Consider Trades with Volume "betw" (between) an upper and lower limit. When this option is selected, the user provides those limits and only trades with size between those limits are considered in the analysis. The volume filter is a powerful component of the Volume Breakdown indicator as it allows users to see what big traders are doing relative to the smaller traders.

Linear Regression Forecast: Raff Channels

A new "Raff Channels" option has been added to the Linear Regression Forecast indicator which results in the bands being computed based off Raff Channel multiples as opposed to standard deviations. In addition, a "Use Hi/Lo" checkbox is available which gives the user the option to consider the highs and lows of the bars when computing the Raff Channels instead of just the closing prices. Raff Channels are formed at a distance from the linear regression line equivalent to the largest distance between price and the line of any bar which the line encompasses.

Statistics Indicator: Percentile

A new statistical result option was added to the Statistics Indicator titled "Percentile". When this option is selected, the user provides the desired period and percentile level, and the program computes the percentile of that period of bars. For example, if a period of 10 was specified along with a percentile of 70%, for each bar, that bar and the previous 9 would be considered, ranked and the 70% percentile would be computed.

Market Profile: Single Label Options

A new option has been added to Market Profile charts in the Price Levels tab titled "Label Singles with Extreme Price of Profile". When this option is checked, the singles are labelled with the extreme price of the profile in which they were created. If a single was created on the way up, it will be labelled with the low of the profile. If a single was created on the way down, it will be labelled with the high of the profile. This option was made available in response to certain trades who believed

that once the single was taken out, price would return to that extreme price. If this check box is not checked, the singles will be labelled with the actual price at which the single resides.

Andrew's Pitchfork: Attach Handle to High/Low Option

A new option has been added to the Andrew's Pitchfork titled "Attach Handle to Bar High/Bar Low". When this option is checked, the user can select whether the pitchfork's handle will be attached to the high or low of the handle bar. When this option is not checked, the program will automatically determine whether the handle should attach to the high or low based on the relationship of the handle bar's price to the average price of the forks. This new option has been added to allow users to override this automated behavior when price does not attached to the desired price of the handle bar.

Portfolio Enhancements

Investor/RT Portfolios are now being used to show open position status when trading via Investor/RT or using the Trading Simulator. Several enhancements have been made to portfolio functionality. For example, a new Portfolio format named "Trading Format" is setup automatically as a standard trading oriented format. You may revise this format if you wish. To change a portfolio into this format, right-click on any portfolio column heading and choose Change Format. Several new columns have been added, existing column content has been improved and some columns have been renamed. "Entry Price" is the new name for the "Open Posn Price" column. "Entry Time" is the new name for the Open Posn DateTime. The "Days Held" column has been renamed "Time Held" and the content of this column now shows either the minutes and seconds that the position has been opened or time held in hours and minutes. For long term positions, the number of days held is shown as before. Positions in the portfolio come and go automatically as live or simulated trading takes place in that portfolio account. If you wish to make manual adjustment to portfolio positions, right-click on any position and choose "Manual Order Desk". This opens the manual order desk window that enable you to journal positions into the portfolio or close positions manually.

"Price Change" is a new column that shows the change in price of the position's instrument since the entry, i.e. last price minus entry price. The new "%Price Change" column shows the price change expressed as a percentage to two decimal places. The new "Tick Gain" column tells you how many ticks you are up or down in the position. When the position is long, the Tick Gain will be +n when the last price is n ticks higher than your entry price, and -n when the last price is n ticks below where you entered. When short, the Tick Gain column will be +n when the last price is below where you entered and -n when last price moves above where you entered. For example, an ES futures position that trades in tick increments of .25 that was entered short at 925.00 after which price moved down to 923.00 will show a price change of -2.00 points and a Tick Gain value of +8 ticks. Like the Net Gain column the Tick Gain is color coded in the "up color" when the Tick Gain is positive and in the down color when negative. Color preferences can be set by right-clicking in the portfolio and choosing Preferences. The L/S (Long/Short) column has been renamed "L or S" and the cells show the text

"LONG" or "SHRT", color-coded in the up and down color respectively. Formerly, only a single letter L or S was shown in the cells and there was no color coding.

Market Profile Efficiency Improvements

Efficiency improvements were made to enable Market Profile charts to open faster with substantially reduced memory requirements during the data loading process. The improvement will be especially apparent to Market Profile users who retain five or more days of tick data with charts setup to compute profiles of five or more days. Internal testing with 60+ days of tick data and a 60 day Market Profile chart showed almost four times faster loading times and 70% reduction in memory required by the data loading process.

Annotation Indicator - Marker-Only Annotations

The Annotation indicator has been enhanced. Three types of chart annotations are now supported: text-only, text and marker, and marker-only annotations. When adding marker-only annotations to a chart, you click where you wish to place the annotation (the marker) and the marker appears with no prompting for text. Marker-only annotations are always pinned to a particular bar in the chart.

When adding a text or text & marker annotation to a chart, prompting for text is now optional. By default, the Prompt for Text check box in the annotation setup is checked; uncheck this box if you want the textual content of the setup to be used as is when adding the annotation. This enables the user to create annotation presets as buttons in the chart. Click an annotation preset button to invoke the drawing tool, then click to place the annotation text; the text will appear instantly where you click with no text prompting. When the annotation placement drawing tool is active, you can shift+click to place the annotation; the tool will remain active so you may click (or shift-click) again to place another annotation. Once an annotation of any kind is present in a chart you may hold down the Ctrl key while dragging the annotation to drop a duplicate of it onto some other bar. When an annotation is selected in a chart, use the left/right arrow keys to shift the annotation left or right one bar. Use the Ctrl key in conjunction with the up/down arrow keys to cycle the selected annotation thru various marker images (does not apply to text-only annotations of course). Use the Shift key in conjunction with the up/down arrow keys to increase or decrease the size of the marker image. For textual annotations, use Shift+Ctrl keys in conjunction with the up/down arrow keys to increase or decrease the font size of the annotation.

Finally, a check box titled "Posn" (position) was added to facilitate annotation of the current state of a trading position. For example, if you leave the text entry box blank, and check mark "Last" and "Posn", the resulting annotation inside an ES chart might read "ESZ9 1024.25 LONG 2 @ 1022.50", or simply "ESZ9 1024.25 FLAT". When the text entry box is empty, the annotation will include the ticker symbol. If you do not want the ticker in the annotation, put at least one character in the text box, e.g. a space. Then the annotation would look like this: " 1024.25 SHRT 1 @ 1026.75", showing only the last price and position.

Working Order Reference Lines

Horizontal reference lines can now be used to more effectively trade from the chart. Add one Reference Line indicator to a chart, setup with "Use V#, Other" checked and "Working Orders" as the type of line. This instance of the Reference Line indicator will draw nothing until there are working orders in progress for the symbol in the chart. When an order is working, e.g. a Sell Stop or Sell Limit order, compact ref lines will be shown at the stop and/or limit price for all working orders. Each line is labeled with an appropriate title, e.g. "Sell 1 Stop" or "Buy 100 Stop", or "Sell 2 Limit". You may right click on any working order line to access a pop up menu to cancel the order or revise the stop/limit price up or down 1 or 2 ticks. You can select the working order by clicking on the ref line to select it, then use the up and down arrows to submit "Revise Order" trading orders to the destination brokerage to revise the stop/limit price(s) up or down. Shift up/down arrow will increment or decrement the stop/limit price(s) by 2 ticks. You can click on the working order reference line and drag the line up or down and drop on the new stop/limit price to submit a Revise Order to the destination brokerage. Only one instance of a Working Order reference line is needed in the chart regardless of how many orders may be working at one time. When you right click, the pop up menu commands operate on the specific working order at the price you clicked on. When you click to select some working order price, the specific working order is also noted and that trading order is revised by subsequent up/down arrow keys as long as the Working Order Ref Line indicator is selected. When dragging and dropped a working order, feedback is shown in the main toolbar and in the chart as you drag to various price levels. The feedback in the main toolbar shows where you are adjusting a stop, a limit, or a stop/limit working order and tracks the current price level as you drag.

The Position Annotation and the Fill and Working Order Reference lines provide essential feedback when you are in a position for the symbol being charted. As a convenience, it is unnecessary to setup these indicators in your charts in advance; whenever you receive a fill from the brokerage system (or trading simulator) any intra-day charts for the symbol in question will automatically inherit these three special feedback indicators. The annotation will appear in the upper left corner of the instrument pane and the fill line will appear as a compact reference line on the right near the price scale. If you then place stops and/or limit orders, those will automatically appear as described above. If you setup your charts with these indicators manually, your manual setups will be detected and the default indicators will not be added.

If you have a chart with Fill and Working Order reference lines, up but no position annotation, for example, only the position annotation will be added automatically. At the present time, this feature is simply built-in; you will see these charting elements only if you use the brokerage capabilities of Investor/RT (live or simulated trading). Once the charting elements are added to the chart, the reference lines will not be visible unless you are in a position. You may edit the setups of these charting elements or delete them from the chart, e.g. to delete the position annotation (which will say "FLAT" when the position is closed), click on the annotation and press the Delete key on the keyboard. If you do not want any trading chart elements added to any of your charts automatically, i.e. if you prefer to manually setup these up on some but not all charts, you may opt out of this feature entirely by inserting a command line into the Investor/RT configuration file:

AutoChartTradingElements=false. Goto File: Open: Configuration File. Enter the line at the bottom of the file, and do File-->Save.

Profile Indicator: Splitting Sessions

The Profile Indicator has been enhanced to allow users to easily split the session up into two or three periods. For example, FOREX traders often want to split the 24 hour FOREX session up into three periods/profiles representing the Asian, European, and American trading sessions. This can be implemented within the Profile Indicator by a "Time Per Profile" of "Custom" and then selecting "3 Sessions" from the drop down list. When this option is selected, two periods are presented for the user to specify. "Per1" represents the number of minutes in the first period of the session and "Per2" represents the number of minutes in the second period. A FOREX trader may specify 600 minutes for the first 10 hours of the Asian trading session and 300 minutes for the next 5 hours of European trading. That will leave the last 9 hours (540 minutes) for the American trading session. This would result in three profiles per session, one covering the first 10 hours, another covering the next 5 hours, and a third covering the remainder of the day/session (9 hours).

If a user would instead like to split the session up into only two periods, simply enter the proper number of minutes for "Per". For "Per2", enter remaining number of minutes in the session. Since these two periods consume the entire session, only two Profiles will be drawn.

Trendlines: Snapping to High and Low

The Trendline tool/indicator has been enhanced with an option to snap the endpoints to the extreme high and low of the respective bars. When a downward sloping trendline is drawn, the begin point of the trendline will snap to the high of it's bar and the end point will snap to the low of it's bar. When an upward sloping trendline is drawn, the begin point of the trendline will snap to the low of it's bar and the end point will snap to the high of it's bar. This feature is implemented by checking the "Use Realized Price..." checkbox and then choosing a price of "High and Low" (top choice in the listbox). If this behavior is always desired, choose the "Presets: Make Default" choice at the bottom of the Trendline preferences after specifying these preferences.

Download Data Menu: New Options

Three new options have been added to the Download Data popup menu for both multi-pane charts and Market Profile charts. These new options are "Last 5 Minutes", "Last 15 Minutes", and "Last 30 Minutes". These options give the user to quickly download tick data for smaller recent time periods without having to download the full session of data. In addition, if the user holds down the ctrl+shift keys while making any selection in the Download Data window, that download will be performed on all symbols in open charts, giving the user a way to quickly backfill recent data for all charted symbols..

Miscellaneous 10.0 Fixes and Improvements

- Bug Fix: Importing quote page definitions was importing all the symbols correctly, but the resulting quote page would show only those symbols that were already defined to Investor/RT before importing. This has been corrected in Version 10.0.1 so all newly added symbols also appear in the imported quote page.
- Investor/RT was successfully tested on Release Candidate Windows 7. The software is fully compatible. Data retention inside the \user\username folder is identical to the way this is done under Windows Vista. Windows 7 is slated for release in October 2009.
- Indicator Presets created within charts using the Add a Button feature are now setup to display the indicator label in the price axis if one is called for in the charted indicator from which the preset is created. When you add the indicator by clicking the button, the indicator will when show its price label. In a related improvement, when editing an indicator preset using the Object Editor, you now have the ability to specify for each preset, whether the associated indicator, when present in a chart, should show its current value in the price axis. You can now also specify an override display format for this value as well. The setups for these preset options are shown at the bottom of the editing window, beneath the indicator preferences. After changing a preset's label and formatting settings, any buttons in existing charts that refer to that preset will use the new settings the next time the button is used to add/remove the indicator.
- Starting Investor/RT with the shift-key down elicits a prompt with three choices. Click "Normal" to proceed with normal startup, e.g. if you held down the shift key by accident during startup. Click "Maintenance" to perform database diagnostics and maintenance during the startup process. The third option is new. Click "Initialize" to initialize the intra-day historical database and then run the diagnostics and maintenance process. The initialize choice will clear all intraday bar data and tick data from the database. The maintenance steps will conclude with a verification of the database. Further prompts will allow you to continue with startup or restore your most recent backup database. Starting Investor/RT with the shift key down is the emergency startup procedure in the event that a fatal error is otherwise preventing the application from starting up normally.
- A bug was fixed in the email sending feature of Investor/RT that was causing certain lines of text to be repeated in the outgoing message. The lines of user-entered text in the email window are now sent precisely with no repeating text.
- Automatic Backfill for users of DTN IQFEED and DTN Market Access was improved. Only the data needed to bring the chart up to date is now requested. Formerly, a full session of tick data was being requested whether needed to not. For example, if you quit Investor/RT during a session and startup again five minutes later, only the tick data for the last five minutes or so will be backfilled into the charts at startup, rather than a full session of tick data for symbol backfill symbol.

- The %BARSLEFT token in the text of a chart annotation for a time interval chart having the "whitespace for non-trading periods" option turned off was incorrectly reporting 0 as the time remaining in the bar. This has been corrected. The %BARSLEFT now works the same whether whitespace is enabled or not.
- The "Time Expansions" option for the Fibonacci Retracements indicator was fixed for tick-based periodicities. DTN Market Access backfills can now occur without being connected to the data feed. This affects users of the Interactive Brokers, TransAct/Infinity, and Zen-Fire feeds.
- When backfilling data on Pairs (custom instruments), both the Settlement Price and the Previous Close price (quote page columns) are set properly based on the last tick of the previous day.
- The periods involved for the Choppiness Indicator and the Momentum Indicators were enabled to allow user variables for optimization.
- The Interactive Brokers version of Investor/RT has improved handling of invalid ticker symbols. When IB/TWS does not recognize the setup of an instrument, a message is placed in the message log (see File:Open:Message Log). Symbol setup errors can result from an incorrect ticker, exchange, currency, expiration date or underlying. Call up the symbol in Setup: Instruments and adjust any of these settings and click "Apply". (Apply is immediate and automatic if you adjust the exchange or session setup). If error(s) persist with the setup, you will see feedback from TWS in the Main Toolbar message area, announcing that the symbol in question is unrecognized. If the revision(s) enable market data to flow correctly for the symbol, the window will begin updating immediately to show the most recent trade price and time of trade. In prior versions, it would often require a Stop Data/Start Data sequence to get data flowing on an incorrectly setup symbol. Now, corrections can be easily made on a symbol by symbol basis without affecting the data flow for correctly setup instruments. The dynamic adjustment of exchange setting to correct symbol setups works the same way in the new Zen-Fire futures feed now supported in Investor/RT 10.0.
- New RTL Annotation token TR_POS and TR_STOPTARG were added. Including %TR_POS in annotation text produces annotations showing the fill price, e.g. "LONG 1 @ 926.25". Including %TR_STOPTARG in annotation text produces annotations with the current TR_STOP and TR_TARG values. When TR_POS is long (> 0) the annotation will read like this "SELL STOP: 924.00 TARG: 928.00", when TR_POS is short, the annotation will read "BUY STOP: 927.00 TARG: 923.00". Users may find it convenient to add these two tokens to a multi-line annotation. Enter the annotation text "%TR_POS\n%TR_STOPTARG".
- The Periodicity control now directly support minute intervals up to 1440 minutes (the number of minutes in a day). This enables intra-day charts of overnight traded futures contracts to be

charted "one bar per session". The resulting bars depict the entire session OHLCV derived from the underlying intraday data.

- An obscure bug having to do with maximizing multi-pane chart windows was fixed. If you maximized a chart, then minimized it and leave it minimized when quitting, the pane percentages were being incorrectly computed at the next startup. The chart window would reappear minimized just as it was when you last quit, however, upon restoring or maximizing the window into view, the pane sizes would be distorted, sometimes one pane dominating the entire window. In 10.0, the chart will be restored or maximized with the correct pane percentages.
- Exchange code MIBSX was added for IB/TWS users who track AP futures.
- The Zig Zag indicator behavior was modified slightly. When the "Draw Fib Levels" option is turned on, those Fib Levels will only be drawn on the last two legs in order to reduce the chart clutter created by these lines. However, when the Zig Zag indicator is selected, Fib Levels for all legs will then become visible.
- The Fibonacci Retracement indicator was modified to only draw the retracement levels from the endpoint of the trendline forward when "Extend Right" is checked with "Extend Left" unchecked. It was brought to our attention that drawing these lines between the trendline endpoints is unnecessary as price movement post the endpoint is what is important.
- The TPO indicator was improved to ensure that it sees every tick and recalculates properly when it is setup to calculate volume-based levels. In previous releases, the TPO Indicator or custom indicators involving the TPO token based on volume would often get out of synch due to the fact that they weren't seeing and recalculating on every tick. When the TPO is based on volume, it must see every tick at each price to retain complete accuracy.

Investor/RT Version 9.2.13; Released: May 27, 2009

Mouse Scroll Wheel Support Extended

The mouse scroll wheel can now be used to scroll any text window (e.g. the message log, or any of the various database reports). The scroll wheel is now supported on the Macintosh OS X platform.

Save and Save As... for text files

The File: Save: Save command operates on the front window. If the front window is a text display window, the text file is saved. File: Save: Save As... will also save a text file but you will be prompted first with a suggested file name and given the opportunity to save the file in a different location if you wish. Ctrl-S is the Windows shortcut for File: Save: Save. This change facilitates opening, editing, and saving text files that Investor/RT uses. For example, you may now do File: Open: Configuration

File, make edits to configuration settings, and Ctrl-S to save them. Similarly the holidays.txt or myholidays.txt file can be more quickly edited and save this way. You can even add your own notes to the message log text window and save it for emailing to support for example. Text windows always show the path to the text file at the top of the window. There is a menu of window specific commands at the upper left next to the file name and path. This menu now has both Save and Save As... menu items.

Emergency Startup Procedure

Version 9.2 enhances the shift-key-down emergency startup procedure to include database diagnostics during the startup process. If database errors are detected you are given the option of reviewing the database status report and/or restoring the backup database. As in earlier versions, no layout windows will be opened and the data feed will not be activated when shift-key down is detected during startup.

If you want to startup Investor/RT without doing any database diagnostics, yet you do wish to suppress layout windows and data feed, hold down both shift and ctrl keys during startup (Windows). Macintosh users hold down shift and option keys for this effect. Holding down the Windows ctrl key or Macintosh option key alone during startup (no shift key) has the effect of suspending execution of Investor/RT schedules (see Setup: Schedules).

Whether or not you elect to restore the backup database during the shift-key startup process, Investor/RT will always do a "Full Maintenance" before startup is completed. With this enhanced emergency startup procedure in place, Investor/RT is now more effective at diagnosing and in most cases resolving startup problems. If you ever have a problem starting the software, just relaunch Investor/RT and hold down the shift key immediately. You may release the key when you see the message that database verification is taking place. If you have trouble holding down the shift key quickly enough for it to be detected, you can force emergency startup to occur by adding a line to the configure.txt file in the admin folder. Add the line "DatabaseEmergencyStart=true", then launch Investor/RT.

When the emergency restart procedure is completed, Investor/RT will open the Database Wizard window automatically so you may review the backup report, restore report, or the database log, or perform other database functions if desired.

Time Interval Bars With or Without Whitespace

The Periodicity selection window enables "Time Per Bar" periodicity to be specified with or without whitespace denoting non-trading periods. The whitespace setting does not affect the bars themselves; all bars will be formed using the time interval specified in minutes and/or seconds, but when the bars are rendered in a chart, the whitespace setting affects how the bars are drawn. The "off" setting for whitespace may be useful around holidays, especially for overnight traded futures contracts that have irregular trading hours before and after the holiday. Some Asian markets, where

the session has a recess period during the overall day session, may now be viewed without the recess period shown as whitespace, if desired. For more information on this new capability click [here](#).

DTN Historical Server Improvements

Recent improvements made by DTN to the historical server protocol are now supported by Investor/RT. Backfill services can now refresh charts more quickly by requesting only the last few minutes of ticks rather than a whole day of ticks. The improvements also include a correction to the way Investor/RT was reporting tick volume for futures contracts that will result in more accurate tick volume.

Vertical Reference Line Tool

When using the Vertical Reference Line drawing tool, if you Ctrl-click (Option-click on Mac OS X) to position the vertical reference line, the line will be propagated to all panes in the chart. Without the Ctrl (Option) key, the vertical reference line is added only to the pane where the click occurred. This simple enhancement will save the extra steps of adding (or copy/pasting) additional lines into other panes when desired. Note that each vertical reference line indicator in each pane is independent thereafter; each can be moved or modified or removed without affecting any of the others that were originally added together. The Ctrl (Option) key may be used in tandem with the Shift key when using any drawing tool. When the Shift key is down, the tool remains active for adding another line. Thus you can now activate the Vertical Reference Line tool and Shift-Ctrl-click three times in the chart to add three multi-pane vertical reference lines to the chart.

Profile Drawing Tool

The Multi-pane chart toolbar has two new buttons, one for sharing a picture of the chart (on [charthub.com](#)), the other a new drawing tool button for the Profile Indicator (license required for Market Profile). Click the Profile drawing tool button, draw a rectangle encompassing the period in the chart you wish to profile and a Profile indicator will be added to chart for the period specified. You may then edit the properties of the profile indicator if desired by right-clicking on it and choosing "Edit".

Archive Database Utility Added

In the Control->Database Utilities menu, there is a new menu item Archive Database. This utility creates a compressed archive file (e.g. archive.dba) containing data files of the current database. The Investor/RT database consists of 59 files in all, 33 data files and 26 key files. The key files are not included in the archive; they can be easily rebuilt from the data files themselves. Archive files created by this utility could be used as a backup at a later time to restore the database, but the primary purpose of this feature is to make it easy to create an archive suitable for emailing to Investor/RT support on those rare occasions this information is needed to reproduce a problem you may be encountering in the software. Choose Control->Database Utilities->Archive Database, choose the

name and location where the archive is to be placed, e.g. your desktop. Then email the archive.dba file to support.

Improvement to TSI Indicator

The True Strength Indicator (RTL Token TSI) employs two double smoothed exponential moving averages to compute the indicator. TSI users may now specify the types of moving averages to be employed. All existing charts and presets will default to exponential/exponential. You can now experiment with other types of moving averages, any combination you like for the long term and short term smoothing.

Fibonacci Retracements - Deleting Levels via the Keyboard

Individual price retracement levels can now be deleted quickly from Fibonacci Retracements without opening the indicator preference window. To do so, simply select the underlying trendline by clicking on it or tabbing to it. Once selected, operate the up/down keys on the keyboard to select different levels. Once the proper level is selected, press the delete key on the keyboard to remove that level. An adjacent level will be left selected, so the user quickly remove multiple levels with a few keystrokes.

New "Scrub Data" Options

The "Scrub Data" option in the chart popup (right-click) menu now provides four levels of scrubbing: Light, Normal, Intermediate, and Heavy. The "Light" level is identical to the "Scrub Data" that existed in prior release, and does very light cleaning of the data, find ticks that are way out of synch with the rest of the data (200 price increments are more). Normal does more stringent cleaning, deleting any ticks that are 20 ticks or more out of line with the rest of the data sequence. Intermediate scrubbing takes it up one more level, deleting ticks that are 10 ticks or more out of line, and finally Heavy scrubbing deletes ticks that fall out of line with the rest of the prices by only 5 ticks or more. For symbols that reliably tick up or down one price increment at a time, the Heavy cleaning should provide a nice way to quickly clean out any bad ticks.

Market Profile - Bracket Volumes when Split

The Market Profile charts now show the volume per bracket/TPO in histogram form along the bottom of the chart, but only when the profile is split (showing each bracket/TPO in it's own column). To toggle the profiles, right-click in the chart and choose "toggle splits - all profiles". The color of the histogram represents the delta (buy volume minus sell volume) of the bracket or TPO. A green color represents positive delta (more buying) while a red color represents negative delta (more selling). The height of the histogram represents the relative volume of that bracket.

Multi-Line Annotations

The Annotation indicator has been enhanced to allow multiple lines in a single note. To accomplish this, simply enter the character sequence "\n" (without the quotes) any time you want to start a new line. For instance, a note with text "line one\nline two\nline three" would appear in the chart as three lines. This feature can be used in conjunction with the % RTL Token syntax to give multi line annotations such as "LAST: %LAST\nSYMBOL: %TICKER\nBARLEFT: %BARLEFT".

Custom Instrument Backfill for Pairs

Custom Instrument that are setup as pairs (difference or ration between two symbols) now generate true tick data when backfilling the pair, from the tick data of the components. For each tick of a component stock, the pair will have a matching tick complete with the volume of the underlying tick. This provides users the ability plot pairs using many of the tick-based periodicities such as range bars, change bars, point and figure, tick bars, etc. It also opens up pairs to the wealth of volume analysis tools available in Investor/RT such as the Profile indicator and Volume Bars. Pair traders will also benefit from the new scrub data enhancements mentioned above, making it easier to quickly clean up any bad ticks produced by a bad tick on one of the component stocks. Be aware that the backfill of pairs will now take a little longer, since it's producing true tick data, but users can monitor the progress of the backfill in the message area under the main toolbar.

Volume Profile - Pop up Menu Item

The "Type" submenu in the popup menu of multi-pane charts, now provides an option for "Volume Profile" enabling users to quickly switch bars to the Volume Profile style without opening the instrument setup window.

Tick Data on Pairs - Buy and Sell Volume

The loading of tick data for pairs (custom instruments) has been enhanced to assign bid/ask prices for the pair ticks based on whether the underlying tick occurred at the bid or ask price. Pairs are custom instruments which plot the difference between the prices of any two underlying symbols. When either of the underlying symbols generates a trade/tick, an associated tick is generated on the pair. If the tick on the underlying goes off at the ask price, then the tick on the pair will do the same. This opens up pairs to indicators such as Volume Breakdown which are geared towards dividing volume up into buy and sell volume based on whether each trade occurred at the ask (buy) or bid (sell).

Stochastics Indicator - New Draw Types

The stochastics indicator has been enhanced to allow the user to specify unique drawing types for all three components: Raw %K, Fast %D, and Slow %D. In the past, each component was drawn as a continuous line. Now the user can draw each one in any of the various styles including Histograms, Stepped Lines, Connected Lines, etc.

Session Statistics - Day of Week Results

Two new results have been added to the Multi-Session Statistics options of the Session Statistics Indicator: "Average of Bars at Time & Day of Week" and "Relative Strength (Day of Week)". The former option allows the user to plot the average data (commonly volume) that occurred at the same time and on the same day of week during previous weeks. As a specific example, if the user has Session Statistics setup with this option, and with X set to 3 and price set to "Last Price, Volume, All Bars", on a 30 minute chart, then the result on the 9:30 to 10:00 bar on Monday, 5/26 would be an average of the 9:30 to 10:00 bars on 5/19, 5/12, and 5/5. Similarly, the Relative Strength (Day of Week) option would divide the current volume on the 9:30 to 10:00 bar by that average previously discussed, and multiple result by 100 to give a relative measure of current volume to the average of past 3 weeks during same time slot. In addition, when choosing either of the "Relative Strength" multi-session statistics to provide a measure of volume compared to that of previous days, if the session is currently open, the current/forming bars volume will be projected based on the time into the bar. For example, if 5 minutes have transpired in the current/forming 30-minute bar, then the volume of that bar will be multiplied by 30/5 to project a closing volume before computing the strength relative the previous day/time average of volume. The following video has additional information on using the multi-session statistics results: http://www.linnsoft.com/videos/sess_stat/

Zig Zag Oscillator - Volume/Delta Since Last Pivot

Two new result options have been added to the Zig Zag Oscillator: "Volume Since Last Pivot" and "Delta Since Last Pivot". These results give the user access to the cumulative volume or delta that occurred within each leg of the zig zag since the last pivot. These values plot historically and provide accurate values for each bar as it builds within each leg and between each pivot.

Miscellaneous 9.2 Fixes and Improvements

- Users of DTN Market Access historical server who use IB or Transact as their real-time data source, can now specify whether or not to send all historical data requests to DTN MA. By default, DTN MA is always used as the default historical data source if DTN MA is present in the user's license. In the configure.txt file, if you add a line:

```
useDTNMAbyDefault = false
```

then backfilling or refreshing a chart via the space bar or download button will default instead to the host real-time data source. DTN MA, if present in the user's license, will still appear as an available data source in the data download window so that download requests can be initiated manually to DTN MA when useDTNbyDefault is false.

- Two user preferences formerly located in Setup: Preferences: General are being phased out. Mouse wheel scrolling is now on by default. The "No Holidays for Overnight Sessions" option is now on by default. Both of these will be removed from the Preferences window soon. We

have moved these preferences to the configure.txt file for backward compatibility. The intent is to make mouse wheel scrolling a feature that is always available (not accidentally turned off). Instruments that are tracked overnight do not at present fit well with the day session holiday schedule for Investor/RT. We have long recommended that holidays be ignored for overnight session instruments. While this does result in some white space around trading holidays for these instruments, the charts are reliable and reflect the exact trading that took place before and after the holiday period. To eliminate white space you can always override the chart to the day session and the holiday periods will be removed in full. The configure.txt file can be used to modify these settings if desired, but we recommend you do not do so. Include a line "MouseScrollWheel=false" to ignore mouse scroll wheel events; include a line "NoHolidaysOvernightSessions=false" if you, for some reason, want Investor/RT to minimize white space around trading holidays. Again, this setting is not recommended.

- The file named "configureDefault.txt" in the admin folder will always contain, release to release, the latest set of configure.txt configuration settings showing the default setting for each one. This file is produced by Investor/RT during startup. It may be used as a reference for the proper spelling of each "power user" setting to alter the runtime behavior of the software in various ways.
- The \$DEMO sample data ticker symbol has been improved to randomly tick in increments that are consistent with the display format of \$DEMO. For example, if you set \$DEMO display format to 4ths, then each tick of \$DEMO will have a trade price that is a multiple of .25. You may also enter a last price for \$DEMO by editing the Last column in a quote page and \$DEMO will begin ticking from that price. Historical backfill of \$DEMO also produces bars with reasonable properties consistent with the display format.
- A configuration variable was added to enable the user to set an application-wide background color that color coordinates with the color scheme in use. This setting applies primarily to the Windows platform. Under Vista and Mac OS X the default system background color defaults to a light grey silver color that goes well with the color scheme. On Windows XP, Investor/RT defaults to the XP Default Style which has a light beige background. If you use XP Color Style "Silver", your Investor/RT windows and toolbars will look better if you setup a light grey background instead of the beige default. To do this, include a line in the configuration file:

SystemBackColor=230,230,230

The three numbers represent the RGB (Red, Green, Blue) values for a silvery light grey color in this example.

- Dragging and dropping a date-specific annotation from one chart window to another containing a different instrument, now correctly maps the annotation to the date and price of the target instrument. If the target chart does not have historical data for the date in question, the annotation will be unseen until historical data for the date in question is available for the target instrument.

- There were improvements in 9.2.4 that make selecting, dragging, and dropping trendline-based indicators (and drawing tools) such as Fib Retracement, in tick-based periodicities (tickbar, volume bar, PNF, Renko, range bar, etc), much more reliable and precise.
- A bug was corrected in the IQFEED data reception (Windows Version) which was causing the +/- indicator in the time and sales window to be continually blank instead of indicating up ticks and down ticks.
- Interactive Brokers exchange NYSELIFFE was added in 9.2.7. This is the exchange code for ZG and ZI Gold and Silver futures contracts. Setups for ZG and ZI future types were revised to use this new exchange code.
- DTN MA standalone users (no real-time feed) will now have the last price checked for alarm levels when downloading historical intra-day data from DTN. Alarm checking is normally done only when "current quotes" are imported or downloaded, e.g. from Yahoo Finance. DTN MA does not have a current quotes download function, so the last price from the historical download is used to test for hi alarm and lo alarm levels.
- The Mark/Unmark Intra-day button on the quotepage toolbar will now mark the selected symbol in the quotepage for intra-day if needed. If the selected symbol is already marked for intra-day, a prompt will ask if you want to leave it marked or unmark it.
- The left and right arrow keys on the chart toolbar are working correctly again. These buttons allow you to cycle through a series of multi pane chart setup inside one chart window. Holding down the ctrl key (option key on Mac) changes the behavior of these two buttons: the current chart cycles through various periodicities instead.
- A fatal error was corrected in Market Profile when the chart setup called for a custom duration (in days) that exceeded the number of days of profiles requested, e.g. 5 days of profiles ending now with a custom duration of 5 days would (and still does) work fine, but requesting 1 day ending now in tandem with a custom duration greater than one day would cause a fatal error.
- To open the Layout Toolbar, right-click inside the message area of the main toolbar and choose Layout Toolbar from the pop up menu. If the toolbar does not appear, hold down the Ctrl key (Option key on Mac) while selecting Layout Toolbar from the menu. The Ctrl (Option) key instructs Investor/RT to position the layout toolbar centered inside the Investor/RT task window (on the main monitor under Mac OS X).
- Custom instruments were formerly created with an override of 0 days of tick data as the historical tick data retention setting. Now, all custom instruments are created with the "use default" setting which means the custom instrument will use the default tick data retention setting specified in the Historical Data preferences panel. This applies to all newly created

custom instruments, including those created by the pair wizard. Existing custom instruments can be set to the default setting either by calling up the custom instrument setup and re-saving it, or by adjusting the override setting for the custom instrument in Setup: Preferences: Historical Data so that the tick retention override matches the desired default.

- Setup: Preferences: Keyboard Shortcuts enables "Open Layout Toolbar" to be defined as a shortcut. The function key will toggle the layout toolbar visible/invisible.
- Version 9.2.12 fixes a Windows specific problem with the email sending function of Investor/RT. Emailing support and email alerts are now functioning properly.
- Version 9.2.12 fixes a DTN IQ issue for Mac OS X users. The year high and year low data items were mistakenly showing the year high price. This has been corrected.
- A bug was fixed in the Windows Vista version that was causing the Share Picture command to mistakenly share the wrong definition with the chart image sometimes.
- Under Windows Vista, plugin indicators must now be placed inside a directory inside the InvestorRT directory within the user folder. If you use the Jurik indicators with Investor/RT under Vista, copy the plugins directory from the investrt install directory to the InvestorRT directory within the user folder. Users who write their own plugins must place the plugin DLL's inside the plugins directory within the user folder. Under Vista, the plugins directory in the investrt install directory is no longer referenced.

When using a button to change the periodicity of a multi-paned chart to PNF, the charting style will remain unchanged even though the bars will be derived using the Point and Figure method. If you also wish the chart to be drawn in the PNF drawing style, you must switch the style to PNF, perhaps using a button.

Version 9.2.1; Released: January 6, 2009

Volume Profile Charting Style

A new charting style has been added titled Volume Profile. This style works with any periodicity and plots each bar as a vertical histogram displaying volume at price and highlighting the high volume node. This new feature has also enhanced several indicators including VWAP, Volume Breakdown, and Profile Indicator. The Volume Profile style and the performance benefits to these indicators is highlighted in this video: http://www.linnsoft.com/videos/volume_profile/. Volume Profile charting is available in all editions of Investor/RT.

The ability for each bar to track the volume at price data has opened the door for two unique periodicities introduced in Professional editions of Investor/RT 9.2. These are: POC Volume and Volume Breakout. With POC Volume periodicity, bars build until a user specified volume level is reached at any given price within the bar (the POC). The Volume Breakout periodicity builds until a

user specified volume level is reached (similar to volume bars). Once that volume level is reached, the bar continues to build until price breaks out of the price range formed while reaching that volume level. Volume Breakout combines both volume and price in a single periodicity. Both these periodicities are highlighted in this video: http://www.linnsoft.com/videos/volume_profile/. POC Volume and Volume Breakout periodicities are available in Professional editions of Investor/RT and Investor/RT Market Profile. They are also available to Investor/RT Standard edition users for evaluation in the Beta testing period.

Improvements to Chart Buttons, Button Panes

Button panes may now have a pane title bar like any other pane. When the pane title is present you may delete the pane by clicking the X close control at the left of the pane title bar, or you can right-click inside the pane title bar to access the pane ordering window for adjusting the order of the buttons in the pane. To toggle the pane title on and off, right-click inside the pane body and choose "Show Pane Title". Button panes can now have a double row of buttons in the pane, the top row of button consisting of those buttons having the "Position at Top" check box checked and the bottom row containing those that have this unchecked. Right-click on any button and choose Edit to adjust this check box. If a button pane has buttons of both types, then two rows of buttons will be shown and the pane will resize larger so both rows are visible. If all buttons in a button pane have the same Position At Top property then the pane will size to show only a single row of buttons.

The right-click pop up menu for buttons contains a Move submenu with choices for moving the button left, right, leftmost, rightmost, to top of pane, to bottom of pane. This new menu makes it much easier to arrange the buttons in a desired horizontal sequence. The right-click menu now has a "Cut" menu item (formerly "Delete") that is used to delete a button and copy it to the clipboard; you can then paste the button elsewhere into another pane in the same chart or into any pane of any other chart window. After cutting a button, right-click inside the destination pane and choose Paste to place the button there. You may Paste the same button several times if desired.

Layout Toolbar

Version 9.2 introduces a new toolbar for fast single-click switching among your various window layouts. The "Layout Toolbar" provides improved window management features for layouts. The layout toolbar is accessible from the Window menu in Investor/RT (Window-->Toolbars-->Layout Toolbar), or you can right-click inside the message area of the main toolbar and choose Layout Toolbar from the ensuing pop up menu. If the layout toolbar is open when you quit Investor/RT, it will reappear in the same position the next time you open Investor/RT. If you close the layout toolbar you can reopen it again from the Window menu or via the main toolbar pop up menu. The layout toolbar presents a series of tabs, each tab representing one of your layouts. Each tab will have a user-specified colored icon for the layout. To switch from one layout to another you simply click the tab for the layout you want. Normally the layout toolbar will be a thin strip showing 2 toggle button followed by the series of layout tabs. The first of these two buttons is used to expanded and contract the size of the toolbar to show/hide the settings for the activate layout. When you click the "New"

tab, the toolbar automatically springs open so you can specify the name, color, and settings for the new layout you are creating.

Each layout has several settings that control the appearance of the tabs in the toolbar itself and also specify how the windows of the layout are to be managed when you switch to a different layout. Each layout has a full layout name and a short name that will appear in the tab for the layout. The color setting of the layout controls the color of the icon that appears alongside the short name in the tab. The color coded tabs are designed to enable you to quickly locate the tab you want by color, especially useful when the layout toolbar has many tabs. The layout toolbar can be expanded horizontally to enable more tabs to be displayed at one time. If the number of tabs that can be displayed is less than the actual number of layouts, scrolling arrows will appear for shifting the right most tabs into view.

Window management rules for each layout control when the windows of the layout are originally opened, at startup or on demand when the layout becomes the activate layout by clicking on its tab. If a layout calls for opening the windows at startup, but the layout is not the active layout, the windows will be opened but hidden from view. This makes them instantly available when you later activate the layout; Investor/RT simply makes them visible with no delays opening and recomputing the window content. When the active layout becomes inactive (because some other layout's tab is clicked upon), the next option controls what happens to the windows of the layout, they can either remain open but hidden from view, or you may elect to close them. Closing the windows means it will take longer to activate the layout again later if you return to it; hiding the windows makes later activation of the layout instantaneous. The third window management option controls whether these hidden windows will be kept up to date while hidden or whether the windows will be idled. At present all windows are kept up to date while hidden. The option to idle the windows will be made available in a future release.

Prior versions of Investor/RT used two specially named layouts. If you created a layout named "Startup Layout", this layout would automatically be the layout of windows that would appear each time you started the application. If you have a Startup Layout, Version 9.2 will treat it just as any other layout. It will be your "Active Layout" when you start up the first time under Version 9.2. Its tab will have the short name "Start". When you quit Investor/RT, the name of the layout that is selected at the time is noted and that layout will be opened as the initial layout the next time you start the application. The "Startup Layout" no longer has any special meaning at startup. Prior to version 9.2 the set of windows open at the time Investor/RT quits was always saved as the "Last Session Layout". If there was no "Startup Layout" then the Last Session Layout would be opened at startup. When you upgrade to 9.2 your Last Session Layout (assuming there is no Startup Layout) will become the active layout in the layout toolbar at startup. It will have the short name "Last".

The final window management option is a check box that specifies whether you wish to automatically save the layout when you quit or switch to another layout. Say you have an active layout named X with three window and you have check marked the "Automatically Save..." check box for this layout. If you revise the size and position of windows or if you open or close individual windows while layout X is active, if you then quit Investor/RT or if you click another tab to switch to a

different layout, all of these revisions will be saved automatically; when you return to this layout it will appear exactly as it looked that last time it was the active layout. Leaving the "Automatically Save..." check unchecked means that your layouts are saved only when you explicitly click on the Save Layout button in the Layout Toolbar. If you quit Investor/RT and the active layout does NOT call for automatic saving of the layout, the currently open windows are saved as the "Last Session Layout". When Investor/RT starts back up again, layout X will still be the active layout, but the Last Session Layout will be available as well, showing you the state of the windows when you last quit the application. There is no need to save the Last Session Layout when the active layout calls for automatic saving since the active layout will retain any revisions made to the collection of windows open when Investor/RT quits.

To delete a layout you can click on its tab then expanding the toolbar to reveal the Delete Layout button. Click Delete Layout and the tab will disappear. The windows of the deleted layout will remain open and the "New" tab will become the selected tab. You could then save all or some of the windows under a different name for example. You can also delete a layout using the Object Editor (Open-->Object Editor) without opening the windows of the layout. The tab for the layout will disappear when you perform layout deletions using the object editor.

Click on a tab to make it the active layout. Shift-click on a tab to make it the active layout and also expand the layout toolbar to reveal all of the layout's settings. Ctrl-click on a tab to make it the active layout and hide the setting, making the toolbar into a strip of tabs again. You will notice that when the toolbar is condensed the color code of the active tab appears as a long strip of color across the entire width of the thin toolbar. By assigning a unique color to each of your tabs, this color strip provide more visual feedback of the layout that is presently the active layout.

When the layout toolbar is expanded to show the settings, you will see an array of convenience buttons at the left side of the window. These button provide quick access to all our charts, quote pages, portfolios, quick quote, and market profile chart windows for augmenting the activate layout. There is even an Open Layout button which opens all the windows of any layout on top of the current active layout. For example, suppose you have layout A with 3 charts and layout B with 5 charts and you wish to create a new layout with all 8 charts open at once. Click the "New" tab; the toolbar will expand automatically; no windows will be visible; click the Open Layout button and pick Layout A; click again to open layout B; make any adjustments you wish to the windows or the settings, and click Save Layout.

At the bottom of the layout toolbar setting, there is a place to specify a function key shortcut for the layout. This convenience feature is not yet implemented; however, you can easily setup a keyboard shortcut for activating any layout using Setup-->Preferences-->Keyboard Shortcuts.

Database Utilities Improvements

The database verify and maintenance utility functions now execute invisibly in the background under Windows; the black-background MS-DOS command windows you may have noticed in the past are no more. The output report of the utilities is now placed in a database log file named dbmaint.txt (in

the admin folder) and selected output is placed into the message log. You may inspect the report afterward using File-->Open-->Database Log and/or File-->Open-->Message Log. If the message log window is open when you perform the verification or database maintenance functions, you can monitor the progress of the utility in the message log window. This improvement also fixes a bug when Investor/RT runs under Windows Vista; Investor/RT now reliably determines if database errors were encountered by inspecting the report output directly. The improved reporting makes it unnecessary to quit Investor/RT and run database maintenance in standalone fashion via the Start Menu in order to see the detailed report of your database status. You can now copy and paste relevant report output from the Database Log window (or attach the dbmaint.txt file in the admin folder) into an email to support for assistance with any database related issues. The Database Wizard (shortcut Alt-U) has a "View Database Log" button in the top section as well. On the Macintosh platform, the utilities produce output to the internal system console. Mac users can see the results of any database verify or database maintenance using the Console application found in the /Applications/Utilities folder.

Miscellaneous 9.2 Fixes and Improvements

- Right-clicking on a chart button and choosing "Adjust Order" was not working properly for floating chart windows. This has been corrected in Version 9.2.
- Chart Button of type "Change Periodicity" now use abbreviated titles by default for intra-day periodicities, e.g. 100t instead of 100 tickbar, 30s instead of 30 seconds. If you want the longer title you can mark the "Custom Title" checkbox and enter the text you wish to see of the face of the push button.

Version 9.1.x Enhancements – Released August 12, 2008 through November 14, 2008

License Activation

Investor/RT 9.1 introduces a new product license activation system with two major benefits to Investor/RT users: (1) automatic monthly activation, eliminating the need to re-register each month via email, and (2) greater license flexibility. The license can be used on any one machine (PC or Mac) with any supported data source, any data service account. A detailed list of common questions and answers is available online at <http://www.linnsoft.com/licenses/>. Choose "Licensing FAQ" from the Help Menu in Investor/RT to open this page in your browser. A link to this page is also provided in the Setup: Preferences: License Activation window.

See the Licensing FAQ (Help Menu) for answers to these common questions:

* What
is a
License
Code?

* How
Do I
Retrie
e My
License
Code?

* How
Do I
Activate
the
License
Code?

* How
Do I
Change
My
License
to Add
or
Remove
Feature
s?

* What
Do I
Have to
Do to
Change
My
License
to a
Differen
t Data
Feed?

* How
Do I
Move
the
License
from
One
Comput
er to
Another
?

* When Would I Need an Additional License Code?

* What if my license is destroyed?

* What If I Cannot De-activate my License ?

* What If I Forgot to De-Activate my License ?

* Can I Run Multiple Instances of Investor /RT with One License Code?

* Is Internet

Access
Required to
Activate
a
License
?

* Do I
Have to
Do
Anything
Special
at the
Beginning of
Each
Month?

* How
Do I
End My
Subscription?

* Can I
End My
Subscription
for a
Period
of
Time?

*

License
Code
Trouble
shooting
g
*

Windows XP
Trouble
shooting
g
License

Activati
on
*
Windo
ws Vista
Trouble
shootin
g
License
Activati
on
*
Macint
osh OS
X
Trouble
shootin
g
License
Activati
on

Each Investor/RT user will have a unique 18-digit license code obtained by logging into your account at <https://www.linnsoft.com/login>. To activate the license, go to Setup: Preferences: License Activation; select "Online Activation" at the top of the window; enter or paste the license code into the space provided; click "Activate License".

If you wish to use the license on a different machine, go to Setup: Preferences: License Activation and click the De-Activate license button. You may then use the same license code to activate on a different computer. To return to the original machine, de-activate the license on the secondary machine; return to the original machine; go to Preferences: License Activation and click the Activate license button (no need to enter the license code since Investor/RT retains it internally while the license is inactive). An internet connection is required to activate the license. Simultaneous use on two different computers requires an additional license. See www.linnsoft.com for pricing.

The new licensing system makes it possible for existing subscribers to update their licenses to add or remove common features. Go to Setup: Preferences: License Activation and click the Revise License button and follow the on-screen prompts. The Linn Software web site now supports user login to view license details, update billing information, and add additional licenses. Login at <https://www.linnsoft.com/login> using your email address and password. The login page will email you your password if you have forgotten it.

During the transition period to the new licensing system, Investor/RT continues to support classic "registration codes". At the top of the License Activation window, you can select "Manual

Registration" and register as before. Once you have received your new 18-digit license code, there should be no reason to use this method. Customers with prepaid registration codes can use either activation method.

For MS Windows users, a separate stand-alone application, controlActivation.exe, is available in the investrt install directory. This application can be used to activate or de-activate the Investor/RT license on a machine. Windows Vista users must run this application "as administrator" to perform the very first activation of the license under Vista. Thereafter, the license may be activated or deactivated using Investor/RT itself or the controlActivation.exe application without the need to run as administrator.

Windows Vista Compatibility

Version 9.0 of Investor/RT must run on Windows Vista in XP/SP2 (Service Pack 2) Compatibility Mode. The reason for this is that Version 9.0 performs updates of files, including your Investor/RT database files, inside the Program Files directory where Investor/RT is installed. If Investor/RT 9.0 is started without first marking it for XP/SP2 compatibility, execution fails because Vista compatible applications typically do not have permission to write to files inside the Program Files directory. When Investor/RT is run as a XP/SP2 compatible application with "Run As Administrator" privileges, the software runs just as it does under XP, reading and writing files inside the directory where the software is installed.

Version 9.1 is Windows Vista compatible. Investor/RT can run as a normal Windows Vista application without administrative access. To accomplish this, Investor/RT must have write access to a folder where it can keep your Investor/RT database and other files that heretofore were kept inside the installation directory within Program Files. The recommended location for this folder is inside the "user folder" where the user has permission to read and write files. Versions of 9.1 up through 9.1.7 provided a semi-automatic setup of such a folder (named "IRT") inside the user folder. If you have already setup Investor/RT to run as Vista compatible using 9.1.7 then the 9.1.8 version will honor that setup and continue to use the "IRT" folder as the working directory for your data base and other files.

If you are still running Investor/RT is XP/SP2, Version 9.1.8 provides a fully automated method for Vista compatibility setup. Version 9.1.8 will setup a working directory for your database in the location of your choice. The recommended location for this "InvestorRT" folder is directly inside the user folder; this folder may be placed on another hard drive if you like. The only restriction is that the folder not be nested too deeply within other folders, and the chosen location is a disk location where the user has read/write permission.

To setup Investor/RT to run in Vista compatibility mode, right-click on the Investor/RT application and choose "Properties". Turn off XP/SP compatibility in the Compatibility tab. Also turn off "Run As Administrator" in the Compatibility tab. Then startup Investor/RT; the software will detect that you are running in Vista compatible mode for the first time and begin the automated setup procedure.

First you will be prompted to select the location for the "InvestorRT" folder. The prompting window will be positioned initially on your user folder; click OK to accept this default location (recommended), or navigate to the drive or folder where you wish the "InvestorRT" to be created and click OK. Next, the software will locate your Investor/RT database files and offer to copy them to the newly created "InvestorRT" folder. Once the database files are copied, Investor/RT will start up, configured for Demonstration mode using the new "InvestorRT" as its working directory. Click "Setup" when prompted and the Reconfigure window will appear; select the data source you wish to use and click Reconfigure to complete the setup process. If you do not see the Reconfigure window, use File: Reconfigure to open the Reconfiguration window to setup your data source.

RTL Setup Enhancement

When setting up scans, signals and custom indicators, a feature has been added to allow you to quickly pull token setups from other RTL objects into the RTL object under construction. Click the plus + button in the upper right corner of the token list and choose the new Add Tokens... menu item. A list of scans/signals will appear. Double-click on one to add its tokens to the token list window. If you wish to add the tokens from several scans/signals, click one and Apply, then click another and Apply, etc. Technical indicator tokens added in this fashion will retain all of the indicator setup parameters of the source token.

Using this facility, you can easily create one or more lists of frequently used tokens, named however you wish, and save them as scans. When defining a new scan, you can then fetch all the tokens in one of these master lists and immediately have all of them at your disposal for writing your formula. When the formula is completed, click the + button and choose Remove Unused Tokens. This will remove any tokens from the list that are not presently referenced in the formula.

Configuration Setting for Controlling Tick Data Buffering

Prior to 9.1.8, Investor/RT used a constant buffer size sufficient to hold 100 ticks for each instrument for data collection purposes. As ticks flow in, they are written to the hard disk whenever this 100 tick buffer becomes filled with ticks for the instrument. Due to extreme volatility in recent trading sessions, we have decided to increase the memory buffer size to 500 ticks per instrument in an effort to reduce the frequency of disk writes that must be done to collect tick data on intraday monitored instruments. This will permit Investor/RT to process incoming tick data more rapidly, since the software will be spending far less time writing tick data to the disk. Additional memory requirements for this revision will be approximately 4 MB for every 500 instruments tracked intra-day. A configuration setting has been added to the configuration.txt file to override this setting to either increase or decrease the number of ticks to be buffered before Investor/RT writes the ticks to the disk. If you track very few symbols intra-day, you could for example add the line:

```
TicksPerMemBuffer=1000
```

to the configuration.txt file to further reduce the disk writes to every 1000 ticks. If you track many thousands of symbols and wish to run the software as it has run in 9.1.7 and earlier, use: TicksPerMemBuffer=100. The minimum value for this setting is 100; multiples of 100 are recommended.

Performance Preferences

A preferences window has been added to Investor/RT to enable users of real-time data sources to control the amount of processing of bid and ask sizes and prices. Upon reception of a bid/ask/size quote (a non-trade quote) Investor/RT records the values for bid, ask, bidsizes, and asksizes. The user may elect to "Process All" to continue processing, or "Ignore" further processing or to do further processing on "Bid/Ask Price Changes Only" (i.e. do no further processing when the sizes change but not the prices). This election can be done independently on three classes of securities: Equities, Futures, and Options (equity/index/future options). Ignoring some or all further processing on bid/ask/size quotes will reduce processing requirements and could significantly improve performance during peak trading periods.

If you elect to allow some or all bid/ask/size quotes to be processed further, an additional level of control is provided for which types of windows will be notified of the bid/ask/size quote. Again, this election can be made independently for the three classes of securities: stocks, futures, and options. Within each class, you can elect to turn off notification of (1) charts (2) quotepages (3) time and sales window.

The choices give each user a fine level of control over which types of bid/ask/size quotes are important and which windows require notification. In the simplest case, a futures trader who tracks only futures contracts could ignore all bid/ask/size processing for those futures. What this means is that the current bid, ask, bidsizes, and asksizes will be recorded continuously as the data arrives but without further processing of that data. The reception of normal trade reports will drive the charts, quotepages, etc. and any display of bid/ask/size information that appears in charts or quotepages will reflect the bid/size/size at the time of the most recent trade.

A futures trader who also tracks a few options could ignore bid/ask/size for futures and process all bid/ask/size for his option contracts. Further, he could elect to notify only the time and sales window(s) for options of the bid/ask/size changes.

Finally, for each security class, Investor/RT now provides a user setting for how many trades (ticks) to collect in memory before writing a block of ticks to the hard drive. This was a global setting in the configuration.txt file in version 9.1.9. The configuration.txt file setting will be used in version 9.1.9 and higher to initially setup the Performance preferences, thereafter, the settings in the Performance preferences window will be used to allocate memory buffers for tick data collection for each class. Ticker symbols that do not fall into one of the three classes will use the minimum of the three class specific settings, e.g. security types Index, or Forex. Users who track relatively few symbols (a few hundred) can improve tick data reception performance significantly by increasing the number of ticks per block to 500 or more. For futures traders tracking electronic contracts where possibly hundreds

of trades per second can occur, setting this value to 1000 or more can substantially reduce disk activity and improve overall performance.

The settings in the Performance preferences are dynamic. That is, you can open this window, revise any of the settings and click OK or Apply, and the new settings go into effect immediately. Tick data buffering changes take effect after the next block of ticks is written to the hard disk for any particular symbol.

DTN Market Access Multiplier

When DTN Market Access is used in conjunction with some other real-time data source, e.g. Interactive Brokers, it is sometimes the case that the DTN supplied historical data is scaled differently than the quotes being received real-time. To address this, Investor/RT now provides a way to scale DTN historical using a constant multiplier. The multiplier is specified by suffixing the DTN MA downloading alias symbol with a space, an asterisk (to denote multiplication) and the multiplier value. For example, when tracking JYZ8 using IB, this futures contract is quoted by IB with prices like 0.009737 while DTN MA historical data, using alias @JYZ8, reports prices 100 times higher, i.e. 0.9737. Thus, to map the DTN historical data to the same scale each DTN MA historical price must be multiplied by .01. In the setup for JYZ8, the downloading alias @JYZ8 can be changed to "@JYZ8 *.01". The actual alias symbol, @JYZ8, must be followed by at least one space, an asterisk, zero or more spaces and the multiplier. All of the alias setups listed below are equivalent:

```
@JYZ8 *.01
@JYZ8 * .01
@JYZ8 *0.01
@JYZ8 * 0.01
@JYZ8 * 0.01
```

Miscellaneous 9.1 Fixes and Improvements

- The playback window is now resizable. A bug was fixed that could cause the dimensions of the window to be saved incorrectly; the playback window would appear with distorted dimensions when opened thereafter. The window now opens to its default size if the height or width of the window are unreasonable.
- Setup: Preferences: License Activation and Setup: Preferences: Registration both open the Licensing window.
- IB destined "pass-thru" trading orders with action "Revise Order" were not sending the revised stop, limit, quantity, duration, or order type to Autotrader. This has been corrected in 9.1. Also Revise Order trading order that use V# variables (for situations where there can be multiple orders working for the same symbol), now properly identify the correct order number to revise using the V# variable.
- The Download Data submenu in the right-click menu for chart windows has been improved. For intra-day charts, Market Profile and Footprint charts, the first choice is "Current Session".

This downloads intra-day bars or ticks for the current session in progress or the previous completed session during non trading hours. The "Current and Previous Session" choice expands the download to encompass the two most recent trading sessions. The "Full Data" choice shows the number of days of daily bars, intraday bars, and tick data that will be downloaded. This is called a "full download". The numbers of days are the settings specified in the Historical Data retention preferences. The menu item text will reflect the override settings for the particular symbol in the chart, if applicable. The final selection is "Other..."; this choice opens the Download Data window with the chart's symbol pre-specified. You may then revise the number of days of data you wish to download. The chart will update when the download is complete.

- Chart buttons with purpose "change periodicity" now accept Point and Figure periodicity descriptors of the form: <boxsize>x<reveral-criteria>[optional space(s)] P. Here are some examples: .25x3 PNF,.50x4 PNF,.33x5 P.
- The RTL ALIGN function now works properly, aligning a date number the most recent trading date. ALIGN(YYMMDD) where YY MM DD are digits (e.g. 1080704 for July 4, 2008) now computes correctly; it uses the default stock session as set in Setup: Preferences: Instruments to align the date back to the most recent non-holiday trading session end date.
- Sending trading orders to Interactive Brokers now works properly for "Forex" security type. Investor/RT ticker symbols for Forex instruments take the form xxx.yyy where xxx is the underlying IB symbol and yyy is the currency of the contract. For example the Investor/RT symbol EUR.USD is translated to symbol EUR with IB security type "CASH" when the trading orders for this Forex instrument are sent to Autotrader. It is not necessary to use a broker alias in the setup for EUR.USD. If a user is trading Forex as well as Eurex futures contracts e.g. (EUR.USD and EURU8), both will have EUR as the underlying symbol; however, the Forex instrument will have IB security type CASH, while the futures will have IB security type FUT (and an expiration date of the contract) when communicating the order to IB and/or Autotrader for managed trades.
- Traditional Chart definition exports of Reference Lines and Trendlines that are setup with an associated Signal Action will now contain the signal action setup.
- A new configuration.txt file variable has been added to allow users to extend the number of days back that Investor/RT does holiday related processing on intra-day charts. By default, Investor/RT checks for holiday dates during the prior 60 trading days and adjusts intra-day charts to exclude the trading session for those dates. Increasing the look back period increases the computational resources. If you want a longer lookup period set HolidayLookBackDays=100 (for example) in the configuration.txt file.
- A bug was fixed that was causing an "API Marks Out-of-Sync" message to appear shortly after starting up Investor/RT.
- When importing tick data for a symbol already having a huge number of ticks on file (over 50 million) would lead to an out-of-memory fatal error. The bug was fixed in 9.1.6. The database in question had 60 million ticks for one symbol after the successful import, the largest known tick collection to date for a single symbol. The previous record was 7 million.
- Version 9.1.6 fixes a flaw in the IB/TWS version that was causing DTN Market Access download requests to be ignored when the user was activated under the new online license activation system.

- Keyboard Shortcuts for Activate:License and De-Activate:License have been added to Setup:Preferences:Keyboard Shortcuts. This enables scheduling of license activation and deactivation for the convenience of users who wish to share a license codes between two or more machines frequently. For example, you may setup a schedule to deactivate the license code and quit at a schedule time each day so that the license code could be used after that time of day on a different machine.
- Version 9.1.7 corrected a new bug introduced in 9.1.6 and quickly replaced the 9.1.6 release.
- Version 9.1.8 fixes a bug in the Save Format command for quotepages. The Save Format command now correctly recognizes T# variables in the source page's format and creates the new format with the T# variables. In prior releases T# variables were unrecognized and became "ticker" columns in the resulting format.
- File->Register is now File->License. Help->Getting Registered is now Help->License FAQ. The Setup: Preferences: Registration window, temporarily titled Registration/License Activation, is now titled "License Activation".
- Version 9.1.8 include updates to the IB Version to support Russell 2000 Futures. Use TF or TO as the future type for these. Investor/RT is programmed to handle TF and TO futures with TO and TF as the "underlying type" and to request IB data using RUT as the underlying so they will quote properly. In 9.1.8 RUTZ8 will not work, but TFZ8 or TOZ8 will. The exchange setup for TF and TO is NYBOT.
- Version 9.1.8 for myTrack has been updated to included new exchange codes, e.g ICE-Fut where the Russell 2000 Futures trade now. Use the Exchange Setup command in the myTrack menu in Investor/RT to subscribe to this exchange if needed.
- Trading orders for Autotrader have been improved for trading TF and TO Russell 2000 futures contracts.
- New Technical indicators "AAB Indicator" and "Fishy Turbo" were added.
- The use of File->Reconfigure to switch to an alternate data source was causing the Daylight Saving Time status to be reset incorrectly. This was having a time shifting effect when downloading historical intra-day data from DTN Market Access, or DTN IQFEED. This problem surfaced only after a reconfigure, not when using the feed that was in configured automatically at startup. Historical data was time shifted one hour ahead. Quitting Investor/RT and starting up again would remedy the problem until the next File->Reconfigure was done. This has now been corrected.
- Version 9.1.10 now correctly supports a configure.txt option for activating the user license code at startup. Add the line `CheckLicenseAtStartup = true` to your configuration.txt file. At startup, if Investor/RT detects that the license code is de-activated on the machine, it will attempt to activate the license code automatically at startup. This feature is useful for those who move their license between two computers frequently. It eliminates the need to go thru the License Activation window every time you start up; as long as the license code has been de-activated on the other machine properly, the license code will automatically be activated at startup.
- A configure.txt option was added for users of IB/TWS who have authorization to watch more than 100 symbols at a time. Adding a line to the configure.txt file `"IBSymbolLimit=200"` for example, will cause Investor/RT to accept up to 199 symbol watch requests (1 slot of reserved for historical data requests).

- Buttons and indicators may be copied from one chart to another using copy/paste. Right-click on a button or on an indicator line and choose Copy to copy its setup to the clipboard. Then move the mouse to the destination chart, right-click in the pane where you wish to place the indicator or button and choose Paste. This copy/paste procedure has been improved; formerly it would place the indicator or button into the top most pane regardless of which pane you clicked in to do the paste. For buttons, as a special case, you can press ctrl-V or choose Paste from the Edit menu, the button is now placed into the top most pane which often is a "button pane". Formerly, the button would appear in the top most pane non-button pane.
- A bug was fixed in quotepage import/export. A quotepage setup to repeat sort every N seconds was failing to properly export the value of N. When the quotepage definition was imported the sort frequency was thus zero.
- A bug was fixed in the License Activation window. New users were prompted to enter the "User ID" number but the entry box for the User ID was not shown.
- Deleting every symbol in the .All Symbols quotepage while various charts and other windows are open was causing Investor/RT to terminate with a fatal error. This bug has been corrected. Investor/RT will now close all open windows, other than the .All Symbols quotepage, when the user confirms that he wishes to delete every symbol and start with a clean slate.

Version 9.0 Released February 28, 2008

Charting Improvements

A major improvement was made to the chart drawing functions of Investor/RT for Windows. Chart updates are now rendered "off screen" and sent to the monitor for display only after all drawing operations are completed. The visual effect is the elimination of all screen flicker. The enhanced drawing methods are now used in all traditional charts, Market Profile, and Footprint charts. Flicker-free off screen drawing techniques have long been used in the Macintosh OS X Versions of Investor/RT because they are provided implicitly to all applications by OS X.

Another significant improvement in 9.0 is the drawing of instrument and indicator price labels inside the vertical scale area rather than in the body of the chart. The background of the box is painted with the color of the indicator. In the case of a histogram, the up histogram color is used. The text color will match the background color of the chart. To turn "Label Current Value" on for any given indicator, bring up the preferences of that indicator by double-clicking on the indicator in the chart, and check the "Label Current Value" check box at the bottom. A display format option is also provided for customized formatting of the current value.

Improved Check for Updates feature

Investor/RT releases are now identified by major.minor release number followed by a build number between 1 to 99. Beta and Candidate releases will include a "b" or "c" designation in the release number. Some examples follow:

- 9.0b1 - Beta Release 9.0 Build 1
- 9.0b17 - Beta Release 9.0 Build 17
- 9.0c3 - Final 9.0 Release Candidate Build 3
- 9.0.1 - Final Release 9.0 Build 1
- 9.0.15 - Final Release 9.0 Build 15

The Check for Updates feature has been improved to notify users of beta and candidate releases when new beta or candidate versions are released for testing. When the beta testing cycle ends and candidate final releases are issued, beta testers will be notified to upgrade to the latest final release candidate. See Setup: Preferences: Mail & Internet. This preferences window can be used to disable the Check for Updates function entirely, or to enable it only for final release notifications, or to enable it for beta, candidate, and final release notices. The word "Beta" or "Candidate" will appear in the Investor/RT startup splash screen and at the right of the message area of the main toolbar in beta and candidate versions of the software. Beta and candidate builds of the software automatically expire in 30 days; a warning notice is issued at startup when the beta or candidate release is nearing expiration.

The check for updates function has been improved to enable minor optional fixes to be released. For example, 9.0.1 may be the current 9.0 release level when a build 2 (9.0.2) is released to fix a minor problem that affects only a few users of the software. The check for updates function will see 9.0.2 as current 9.0 release but will not notify users of 9.0.1 because 9.0.2 is designated an "optional fix" release. A user running 8.9 however, will be notified and guided to download 9.0.2, the latest build of 9.0.

When optional fixes are issued, a notice will be published on the discussion list with a description of the problem and links for downloading the latest build if desired. The new release will also be noted on the www.linnsoft.com home page, but the Check for Updates command will not prompt you to upgrade for optional fixes. When a new build is issued with new feature or to fix a more serious bug or a bug that potentially affects a larger number of users, the new build will be designated as a recommended update. All users who check for updates will be notified to upgrade.

Exporting Indicator Default Preferences

Menu item File-->Export-->Technical Indicator Defaults will create a definition export text file containing the preset default settings for every technical indicator in Investor/RT. This file can be imported into another Investor/RT system using File-->Import-->Definition from File. The feature will be useful to those moving Investor/RT from one computer to another, or to synchronize all defaults between two Investor/RT systems.

Fundamental Tokens Added

Seventeen additional fundamental data columns and associated RTL tokens were added. Each of these fundamental data items are available for download from Yahoo! Finance using the Fundamental Data download type.

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New RTL Date/Time Related Functions

Three new RTL functions were added for dealing with date/time within RTL formulas. Each function takes a single parameter. MPM(x) yields the Minutes Past Midnight of x where x is TIME or some time constant, e.g. MPM(TIME) is the minutes past midnight of the current instrument's last trade. MPM(0930) is the minutes past midnight of 9:30 a.m., i.e. $9 * 60 + 30$.

SPM(x) yields the seconds past midnight of x where x is a TIME or time constant. Internally, TIME is represented as hhmm.ss where ss represents ss/100 of a minute. SPM(TIME) is equivalent to writing $hh * 3600 + mm * 60 + (ss * 100)/60$.

ALIGN(x) yields the date number of the date X when aligned back to a valid trading day. Typically x will be the DATE token or perhaps a V# containing a date number or a date constant. Note that date numbers are whole numbers of the form yyymmdd, where yyy is the number of years since 1900, mm is the month and dd the day. For example 1071230 is the day number of Dec 30, 2007. ALIGN(1071230) is 1071228 since 12/30/2007 was a Sunday. Investor/RT keeps track of trading holidays for the prior 60 trading days. If the date passed to the ALIGN function is a holiday date, the ALIGN will yield the date of the trading session prior to the holiday.

New RTL Function BTST

BTST stands for "Bit Test". The BTST(expression, n) function returns TRUE or FALSE based on whether the nth bit of the integral value of the expression is on or off. BTST can be used to test bits 0 through 23 of any value. This function has been added primarily for use by programmers using the Investor/RT SDK to develop PLUGIN indicators. The new function can also be useful for testing value of MON or FLAG. MON and FLAG tokens are interchangeable. The FLAG token is a value representing various bit settings for the instrument. For example BTST(FLAG, 0) will be true for any instrument that is marked for intra-day monitoring (the intra-day monitoring bit is bit 0 of FLAG). Similarly BTST(FLAG, 1), BTST(FLAG, 2), BTST(FLAG, 3) can be used to test bits 1, 2, or 3 of FLAG which happen to represent the daily, weekly, monthly monitoring settings for each instrument respectively. Since many of the bit flags in FLAG are used to record the state of various historical data monitoring options, the MON token was added as a synonym for FLAG. Developers of SDK Plugins can calculate a value for each bar representing up to 24 distinct conditions for the bar. Each bar could be tested for a specific condition using BTST(PLUGIN, n) for various values of n. Here are some conditions that can be easily tested using BTST on the FLAG value.

- BTST(FLAG,0) TRUE when the instrument is marked for intra-day monitoring.
- BTST(FLAG,1) TRUE when the instrument is marked for daily historical data retention.
- BTST(FLAG,2) TRUE when the instrument is marked for weekly historical data retention.
- BTST(FLAG,3) TRUE when the instrument is marked for monthly historical data retention.
- BTST(FLAG,4) TRUE when the instrument has an alarm set for price greater or equal to some value (a high alarm).
- BTST(FLAG,5) TRUE when the instrument has an alarm set for price less than or equal to some value (a low alarm).
- BTST(FLAG,6) TRUE when the instrument has an alarm set for volume greater or equal to some value (a volume alarm).
- BTST(FLAG,7) TRUE when the instrument has triggered a high alarm.
- BTST(FLAG,8) TRUE when the instrument has triggered a low alarm.
- BTST(FLAG,9) TRUE when the instrument has triggered a volume alarm.
- BTST(FLAG,11) TRUE when the instrument has triggered a news alarm (news today).
- BTST(FLAG,12) TRUE when the instrument has traded (or been quoted) since the session opened.
- BTST(FLAG,17) TRUE when the data feed is active and the instrument is being watched real-time. All intra-day instruments are watched.
- BTST(FLAG,18) TRUE when the instrument has a high alarm set on the bid.
- BTST(FLAG,19) TRUE when the instrument has a low alarm set on the bid.
- BTST(FLAG,20) TRUE when the instrument has a high alarm set on the ask.
- BTST(FLAG,21) TRUE when the instrument has a low alarm set on the ask.
- BTST(FLAG,23) TRUE when the instrument has news items on file, not necessarily for today.

Configuration Startup File

At startup Investor/RT 9.0 looks in the admin folder for a file named configure.txt. If present, the file is examined line by line for special tokens that represent experimental and/or obscure configuration settings that control the operation of the software in some way. For more information on this feature click [here](#).

Andrew's Pitchfork - Schiff Options Added

The Andrew's Pitchfork has been enhanced with options to draw the Schiff and Modified Schiff Pitchforks, as well as an option to "Hide Andrew's" when showing the new pitchforks. Schiff and Modified Schiff Pitchforks are very similar to Andrew's Pitchforks in every way except the placement of the handle.

Chart Background Gradient Fill

Traditional charts, Market Profile, and Footprint Charts now have a "Gradient Fill" option for the chart background. In the chart's preferences, check the "Gradient" checkbox and the background color control will offer two color selections. The background of the chart will be drawn as a gradient fill, a transition from the up color to the dn color. In traditional charts, when gradient fill is used, it is important that the scale color be chosen so the price scale is clearly visible both at the top and bottom of each window pane. When adjusting the gradient colors, you can click the Apply button to see the effect you will get, leaving the Color preferences open for further adjustments. The Gradient option is also a global setting for traditional charting. If you want all new traditional charts you create to have a particular gradient color fill then go to Setup: Preferences: Charts: Traditional Charts. There in the Color tab, specify the gradient preferences. Thereafter, new traditional charts created by the Chart Setup Wizard will appear with the specified gradient fill.

Start Feed Revision

The method used to request intra-day streaming data for Investor/RT instruments was revised. The new method first issues watch requests for intra-day marked symbols. After all intra-day marked symbols are watched, then any non-intra-day marked symbols (instruments) that are open in charts, quotepages, or other windows are watched. The new method ensures that intra-day marked symbols are given priority. Depending on the symbol limit of the data vendor account in use, symbols that are not marked for intra-day will be watched in real-time only if there are "slots" available after all intra-day marked symbols have been watched. The new method is introduced in 9.08 for DTN IQFeed (for Windows and Macintosh) and for the Interactive Brokers edition. Other realtime data sources will follow in future releases. The change in method will have no effect on users whose universe of symbols is smaller than the symbol limit. DTN symbol limits are typically 500 or 1300. The IB symbol limit is 100. You can see your symbol limit in the user profile (system status window) or in the feed status window.

To illustrate the effect on those with large symbol counts, consider a user with a symbol limit of 500 whose has 900 symbols defined to Investor/RT; 300 of those 900 are marked for intra-day monitoring. The new method ensures that those 300 symbols are requested first each time the data feed connection is established. This leaves 200 slots for symbols that are not marked for intra-day monitoring. Investor/RT will determine (when opening the connection) if there are any non-intra-day symbols open in charts, quote page, portfolios, etc. and request realtime data on those as well, as many as 200 more could be watched in this example. The original method of constructing the watch list would have watched the first 500 symbols found to be either (a) marked for intra-day or (b) open in some window. Because the list of symbols is processed alphabetically, the older method could possibly exhaust the symbol limit before all intra-day marked symbols were watched. The new method is an improvement in that it makes the watched symbol list more predictable; it more properly gives priority to those symbols marked for intra-day.

DTN IQFeed Level II and Market Depth support

The Investor/RT for IQFeed Edition (for Windows using the DTN Connection Manager software) now support Level II for Equities and Market Depth for Futures if the user account in use is permissioned for Level II. To activate a Level II/Market Depth window, right-click on the symbol and choose Level II.

Pivot Point Calculation Options

Two options were added to the Pivot Point Indicator. First, a new pivot point formula was added to the list of options: $(High+Low+SETTLE)/3$. This option will work similar to $(High+Low+CL.1)/3$, except it will use the Settlement Price of the symbol instead of the closing price of the previous daily bar. The Settlement Price can be added as a quote page column and adjusted manually if needed. Also, a new checkbox was added titled "Alt S3 Calc". When checked, the S3 is calculated as $PP - 2 * (HI - LO)$ instead of the traditional $HI + 2 * (PP - LO)$. Similarly, R3 will be calculated as $PP + 2 * (HI - LO)$ instead of the traditional $LO - 2 * (HI - PP)$.

Volume Breakdown - New Result Options

Three new result options have been added to the Volume Breakdown Indicator: Tick Frequency Rating, Ask Size and Bid Size (Neg).

Tick Frequency Rating

The "Tick Frequency Rating" option gives the user an indication of the frequency of trades in combination with tick direction (buying or selling). This rating will plot on a scale from 1 to 100+ (or -1 to -100+). A value of 1 signifies that the tick came in over 5 seconds from the previous tick. A value of 100 signifies that a tick came in right on top of the previous tick (essentially at the same millisecond). Values beyond 100 signify that multiple ticks continued to come in on top of one another. Values in between 0 and 100 are plotted with a reverse

logarithmic scale. In essence, the higher the values, the faster the frequency of ticks. In addition, these values are plotted as positive values on buy ticks are up ticks and as negative values on sell ticks or down ticks (depending on how VB is setup). This result only works realtime, and therefore will begin forming from the time the chart containing it is opened, or from the time it's added to a chart. It also works best in on 1 tick charts. When viewed on other periodicities, it will sum the values of all ticks within the bar.

Ask Size & Bid Size

The new results "Ask Size" and "Bid Size (Neg)" are somewhat self explanatory. They plot the bid size and the ask size at the time of each tick or trade. These values only plot live (the VB will be blank when initially opening the chart and build from there). The ask size plots as a positive value, while the bid size plots as a negative value.

Custom Trendline Labels

Three indicators have been enhanced to allow users to provide their own labels for the trendlines involved in the indicators: Trendline Indicator, Zig Zag Indicator, and Regression Line Indicator. Each of these indicator has a "Label With" list that now provides a "User Specified" option. When this option is selected, a text box becomes visible which allows the user to type in his own label text. This text can include tokens such as %V#1 and %T#1 which in turn pull data from different properties of the symbol itself (a feature that the Annotation Indicator has provided for many years). This new custom label option on the trendline indicator gives user the ability to draw a line to a given bar and then provide some text labelling at the end of that line to describe or not what occurred on that bar.

Pixels Per Bar in Traditional Charts

The pixels per bar preference in traditional charts specifies the spacing between bars. Normally, Investor/RT adjusts the actual thickness of the bars or candles within that space automatically. You can use the up/down arrow keys or the mouse wheel (Windows-only) to increase/decrease the pixels per bar setting. A little-known enhancement to this setting has now been made more visible and adjustable. If you call up the chart preferences and look in the General tab, the menu of choices for pixels per bar now shows several settings where two numbers are given, e.g. 8:5 or 16:8 or 24:11. If you experiment with any of these dual settings you will find that the first number is the pixels per bar, still adjustable via the arrow keys or scroll wheel; the second number dictates the actual width of each bar drawn within the pixels per bar. If the second number is higher than the first number you get some interestingly fat bars than may overlap adjacent bars. You can use the arrow keys or the mouse wheel to adjust the second number also, just hold down the shift key as you press the arrow keys or use the mouse wheel. Note that the shift key has no effect on bar width unless the chart has a dual setting in effect. To return the chart to the automatic bar width setting, access the chart preferences and set the pixels per bar to any of the single number pixels per bar. Once the

"automatic" bar width is in effect, the shift key has no effect on bar width. These combination settings allow you to very precisely customize the spacing and thickness of bars and candlesticks to suit your preference. Chart definitions exported by Version 9.0.10 or higher now include the dual settings for pixels per bar.

Miscellaneous 9.0 Fixes and Improvements

- Setup: Preferences: Charts: General no longer permits default technical indicator recalculation frequency to be expressed in ticks. Any specific instance of an indicator in a chart can have its recalculation frequency specified as "Every N Ticks". However, using Every N Ticks as the default for every indicator that calls for "default setting" is no longer available due to performance considerations. Upon upgrade to 9.0 if the default setting is Every N Ticks, it will be revised to "Every 2 Seconds".
- The RTL token TINC and the associated quotepage column "Tick Increment" show the smallest allowable increment of price movement for an instrument. The RTL token was formerly named TICKUNITS and only pertained to futures contracts. TINC is based on the display format of the instrument, for example equities displayed in 99.99 format have a TINC of .01; a futures contract having display format 4ths has a TINC of .25.
- Backtesting reports are produced using a mono-spaced font. A revision was made in version 9.0 to use the font size specified in Setup: Preferences: General (at the very bottom of the window). Prior to this change, 9 point was used unconditionally. This improvement gives the user control over the size of the text in backtesting reports and other text displays in Investor/RT that call for mono-spacing, e.g. the Message Log, Alarm Log, etc.
- The Investor/RT SDK was enhanced to provide callback functions for calculating the CCI, Linear Regression Slope, and Parabolic SAR technical indicators from within a Plug-in indicator. A bug was corrected in the "set user variable" callback function. SDK users who are interested in these capabilities will need an updated SDK distribution. Email support@linnsoft.com to request it.
- Yahoo! Finance Fundamental downloader was enhanced to download the new fundamental items mentioned in item #5 above. In addition, Investor/RT date items "Yield" (RTL token YLD) is now updated with Yahoo! item "Forward Annual Dividend Yield", "Div xDate" is updated with Yahoo! item "Ex-Dividend Date", and "Payout Ratio" (RTL token PAY) is updated from the Yahoo! item having the same name, the "Div yield avg 60 mos" column (RTL token DIVAY) is updated with Yahoo! item "5 Year Average Dividend Yield".
- A bug was fixed in the IQFEED Version. The "Div xDate" data column is correctly updated in now for equity instruments.
- Adding parallel trendlines to an existing trendline having scope "This Chart, This Instrument" was not retaining the parallel lines when the chart was closed and reopened later. Trendlines with this scope are "preset" indicators and exist apart from the chart; they are added only when the specific instrument is present in the chart. Investor/RT now updates the preset automatically when parallel trendlines are added to it.
- Investor/RT installers now verify that Investor/RT is not running before beginning the installation process. If Investor/RT is found to be active, the user is prompted to quit Investor/RT and click OK to continue.

- The built-in email sending feature of Investor/RT has been upgraded on the Windows platform to a more robust email client. Support for email authentication by username and password is much improved enabling more clients to use this convenient feature. Also, emails are sent in a background thread so they do not in any way interfere with realtime data reception. Setup: Preferences: Mail... allows specification of the outgoing SMTP port number for sending email. Normally, port 25 is used. Some SMTP servers that require authentication use port 587 and Investor/RT now supports these if you specify that port number in the preferences.
- Traditional chart preferences Color tab has been improved to reinforce the association between candlestick up/down color settings and the "Hollow Up Candles" options. A checkbox titled "Hollow" appears to the left of the color control for Candle Colors now. When Hollow is checked the color control shows the up color as the chart background since this color will be used to draw up candles hollow. The actual up color will appear in the control when Hollow is unchecked. If you revise the up color using the Candle Color control this action causes Hollow Up Candle setting to be switched off automatically. Revising the candle down color does not affect the Hollow setting.
- Signal marker price labels are now displayed using the display format of the instrument. If the price label is the value of a custom indicator in the chart, then display format used is that of the custom indicator. If the custom indicator setup calls for "default" format, the display format of the indicator's instrument is used to display the price label.
- A bug was fixed to enable Andrews Pitchfork indicators to be adjusted once they are present in the chart. When the pitchfork drawing tool is activated on the chart toolbar, Investor/RT now provides a text prompt with instructions for drawing a new pitchfork (three clicks on specific bars are required to form the pitchfork, the first click anchors the handle of the pitchfork, the second and third clicks define the edges of the outer tines of the pitchfork. Once in place, the user can now drag any of the anchor points to a different bar by clicking on the anchor point and drag/drop.
- Switching periodicity between a range bar back to any minute interval periodicity was leaving the traditional chart scrolled back to an earlier time instead of "to present". This bug has been corrected.
- The Setup Future Type window has been corrected to support future types whose type codes exceed 4 characters, e.g. CAC40 type futures.
- New display format 200ths was added to support futures contracts that trade in .005 tick increments (e.g. the mini natural gas QG futures on NYMEX).
- The limit on the number of custom indicators has been increased from 1000 to 2000.
- The "Ticker Symbol Help" menu item in the Help Menu is now properly linked with the web site. When Mail & Internet preferences call for "web help pages" or if the shift key is held down while selecting this menu item, your web browser opens to the Ticker Symbol Guide page. This page lists common futures, index symbols for supported data feeds and has links to vendor specific web pages helpful for identifying the proper ticker symbol to use in Investor/RT.
- The Help Menu has a "Video Tutorials" menu item that takes you to the Investor/RT Video Library page in your web browser. This page shows a directory of currently available instructional videos organized by topic.

- Chart buttons with purpose "Remove Indicators" are used to eliminate all indicators of one or more types from the pane in which the button resides, e.g. one click and all trendlines are removed. Buttons of this kind can now be placed inside a button-only pane typically at the top of the chart. When a button of this kind resides in a button-only pane, the removal target pane will be the pane containing the instrument with which the button is associated.
- Reference Line label text can now include RTL tokens. The Reference Line will be labeled with the expanded text. For example, if you have a chart open of a symbol whose V#1 value is 30.00 and T#1 value is "Entry", then a Reference Line pegged to V#1 with label "%T#1" will plot at price 30.00 and show the text "Entry".
- Right-clicking in the pane title area of a floating traditional chart now opens the Pane Ordering window properly.
- Users of DTN MA will notice that @JY futures contracts historical data is now adjusted by dividing the DTN supplied prices by 100. When IB or opentick is used as the real time data source, the historical data will now be scaled to the same decimal precision as the real time feed. This enhancement was made in 9.0.6.
- Chart Buttons with purpose "Active Drawing Tool" are now exported and imported correctly via chart definition files.
- Chart Buttons with purpose "Add/Remove Preset Indicator" were exported correctly but not importing correctly in some cases. This has been corrected in 9.0.7.
- Running a scan setup to sort the resulting quotepage was not sorting as instructed for some fundamental tokens, specifically, those added recently (see item 4. Fundamental Tokens Added. above). This has been corrected in 9.0 build 8 (9.0.8).
- The opentick edition now support entry of opentick server and port number. This will enable beta testers to direct the opentick connection to test servers easily and will give users more explicit control over which production server Investor/RT is to use.
- Dragging certain indicators from one traditional chart window into another and then closing the destination chart would often lead to a fatal error. This could happen when dragging any technical indicator but dragging an annotation would almost always produce the error, now corrected in 9.0.10.
- Clicking to select an instrument inside a traditional chart now works more reliably for tick and tick per bar periodicity instruments than before.
- The RTL ALIGN function was updated to consider trading holidays for dates within the most recent 60 trading days.
- A bug in 9.0.13 was fixed having to do with importing of presets. Presets were imported with an incorrect technical indicator type. The bug was discovered when importing a trading system with signal action presets assigned to various rules. After import, the rules did not have the associated signal actions because the presets, although imported, were not imported correctly as signal action presets.
- Infobox was showing an incorrect value for the Kelner Channels upper band value. The lower band value was correct; the value shown as the upper band was actually the center line of the Kelter study. This has been corrected.
- A bug was corrected in traditional charting having a view period expressed as a fixed date/time "to present". After the user set the fixed date time, the chart's beginning date

would be updated to some other beginning date time when a data download occurred at some later time.

- The Setup: Equity and Index Options window has been improved to work with option symbol format for Yahoo! Finance. Yahoo Current Quote download can be used on the generated options symbols to view option pricing. At present Yahoo does not offer historical data for options.

Investor/RT Version 8.9 Rev 1, Released: October 16, 2007

Opentick

Beta testing of Investor/RT for opentick continues. Clients interested in this data service contact info@linnsoft.com to request a registration code. Supply your opentick login id. For more information on opentick, see <http://www.opentick.com>.

Opentick requires the correct exchange to be specified for each instrument. For futures, this setup automatic for all future types defined to Investor/RT (see Setup: Futures for a list of defined future types). Futures symbols by convention begin with a slash, however, the leading slash is optional in Investor/RT. Futures symbols are setup with the future type followed by the month code and year code. /ESZ7 and ESZ7 are equivalent and both are automatically assigned to the CME-EM exchange as required by opentick.

See <http://www.opentick.com/index.php?app=search&event=symbols> for opentick symbol lookup. You can specify the exchange in the Setup: Instruments window using the override exchange setting, or if you prefer you can include the opentick exchange code directly as part of the ticker symbol by appending a hyphen and the code. For example, to get quotes on MSFT from the Island Book, setup the ticker symbol as MSFT-is, or setup the ticker as MSFT and the override exchange as ISLAND in Setup: Instruments. Note, the -is suffix is lower case. When typing into the ticker symbol entry box, Investor/RT by default capitalized every letter you type since 99% of time, ticker symbols are uppercase. In those rare instances that you want one or more lower case letters in the ticker, precede the character with the backslash \ character. The \ will be ignored and the next letter you enter will not be uppercased automatically. Thus, to enter MSFT-is you would type msft-s and the entry box will read MSFT-is.

For stocks, with AUTO (automatic, no override exchange), Investor/RT will assume NYSE for symbols of 3 letters or less, NASD for longer symbols. If you want to follow a stock or EFT that trades on the AMEX, you can either enter the symbol as QQQQ-A or enter the symbol as QQQQ with override exchange set to AMEX.

Pay attention to message log messages that appear when you log into opentick (File-->Open-->Message Log). The log will (a) show you every exchange that you are licensed for real-time data (b) all exchange for which you are not licensed, (c) any ticker symbols that opentick does not recognize or for which you have no license.

Tick data downloading from opentick is available only on a delayed basis, suitable for aftermarket downloading several hours after the fact, but unsuitable for intra-day backfill purposes. For this reason, one minute downloads are recommended for opentick backfilling. However, Investor/RT users can sign up for a DTN Market Access historical services account if tick data backfill is needed, for example, to support Footprint Charting or volume breakdown analysis.

Renko Charts

Renko is now supported in traditional charts as a periodicity (and a drawing style). This significant enhancement marries the powerful features of the traditional chart window (indicators, buttons, multi-panes, etc) with this unique charting style.

To change any existing chart to a Renko chart, simply double-click on the instrument (bars or candles) in an existing chart, and setup the chart with a Style of "Wickless Candles". Wickless Candles will result in the traditional Renko "boxed" look and feel. It will simply chart a box from open to close. Users may opt for the "Candlestick" style, which will not only give the open/close box, but provides additional information with the candle wicks representing the high and low of each bar.

The Periodicity Control now has a new option of "Renko" just below the "Point and Figure" choice. Select this option, then provide a box size in the space provided below. The box size can range from the tick increment of the instrument (0.25 for ES) to multiples of the tick increment (0.5, 1, 2, etc).

In order to force each Renko box to be drawn perfectly square (the height of each box equals the width), a new vertical scale option has been added. Double-click in the vertical scale to bring up the vertical scale preferences. Select the 3rd Scaling Method specifying "Automatic scaling with Square boxes".

This option will keep the boxes square regardless of changes in chart dimensions, scrolling, or zooming. Some user may continue to prefer the Automatic scaling method, which tends to make better use of the vertical space in a chart. Once you've setup your scaling as "Square Boxes", you can easily toggle to automatic by clicking the "RA" until it becomes an "A", and toggle back to square boxes by again clicking on the "A" until it turns back into an "RA".

Investor/RT can be configured so that Renko bars reset at the beginning of each session (fresh start), or continue across session boundaries. The fresh start option is generally used for symbols that might gap heavily between session (and result in a long sequence of boxes to fill the gap). On symbols like ES that trade around the clock, the fresh start option is generally not needed or preferred. Go to "Setup: Preferences: Charts: General". If the "Continuous Tick & Volume Bars" checkbox is UNchecked, Renko charts will operate in "fresh start" mode. If it is unchecked, Renko charts will operate in "carry over" mode.

Tokens have been added to RTL to support Renko. Scans, signals, and custom indicators operating with Renko periodic data can use these token to inspect the state and box size of the Renko boxes. To test the state of the PNF box use the RENKO_STATE token. Constants RENKO_UP and

RENKO_DOWN were added to enable expressions such as "RENKO_STATE = RENKO_UP" or "RENKO_STATE = RENKO_DOWN". The RENKO_BOX token gives you the box size of the Renko data.

As an example, the following signal would look for 3 consecutive up boxes followed by a down box:

```
RENKO_STATE.3 = RENKO_UP AND RENKO_STATE.2 = RENKO_UP AND  
RENKO_STATE.1 = RENKO_UP AND RENKO_STATE = RENKO_DOWN
```

Here are some of the capabilities enabled by this Renko Charting improvement:

- ❖ Renko charts update dynamically tick by tick.
- ❖ True Renko square boxes built off tick data (or 1-min data)
- ❖ Build Renko charts using any box size
- ❖ Full library of over 150 built-in technical indicators to Renko charts, including Volume Breakdown, MPD, and TPO Indicators
- ❖ Full library of drawing tools, including 45 degree trendlines, reference lines, notes, Fibonacci, pivots, regression, and much more
- ❖ Add custom indicators written in RTL language (Targets)
- ❖ Write signals, add markers and alerts to Renko charts
- ❖ Write trading systems and backtest historical Renko data
- ❖ Flexible scaling, zooming, scrolling, and panning with drag and drop
- ❖ Keyboard and mouse wheel shortcuts for convenient manipulation of Renko charts
- ❖ Review historical Renko charts, going back weeks, months, or even years (varies with data vendor)
- ❖ Floating charts that may be dragged outside the Investor/RT task window
- ❖ View data from other periodicities (minute bars, tickbars, etc) on Renko charts
- ❖ Other helpful tools such as multi-chart highlighter, crosshairs, infobox, custom buttons, and multi-linking
- ❖ Autotrading available via the Trading System Indicator to limited brokerages
- ❖ Quickly switch chart between Renko and other periodicities (P&F, tickbar, minute bar, volume bar, daily, etc)
- ❖ All in one chart: Renko, P&F, Market Profile (TPO indicator), Delta (Volume Breakdown Indicator), Other Periodicity Data, drawing tools, historical indicators, markers, alerts, and much more

New Footprint Option: Shade Text Only

A new option has been added to the General tab of the Footprint Preference window titled "Shade Text Only". The option can be found at the bottom of the window just below the "Footprint Type" option. When the "Shade Text Only" option is checked, the chart shades the text inside each cell, as opposed to the background of the cell. In addition, When "Shade Text Only" is checked, along with a Footprint Type of "Bid x Ask Vol", only the side with more volume (bid or ask side) is colored, while the other side is left gray. Furthermore, a space is placed between the bid and ask volume, as opposed to the "x" that's placed between them when background shading is in place.

Backfill Automation

See Setup: Preferences: Backfill to enable automated downloading of historical tick data when connecting to the data feed. Investor/RT now keeps track of the last time real-time data reception ended. This information is then used when reconnecting to the data feed later to determine whether backfill is necessary on a symbol by symbol basis. The software can initiate tick data backfills automatically for all of your intra-day marked symbols, or just those that you have open in chart windows. At present this new feature is being introduced for testing. Your feedback is welcomed; we expect to make further improvements and refinements in future releases. Initially, this feature is available for users of eSignal, DTN IQFEED, DTN IQ, and other realtime feeds supplemented by DTN Market Access historical services.

Miscellaneous 8.9 Fixes and Improvements

- The RTL conditional operator (expression ? a:b) can now be nested to perform SET statements on text variables, e.g. SET(T#22, V#1 > 0 ? "a" : (V#2 > 0 ? "b" : "c")); will set the text variable T#22 to "a" when V#1 > 0, otherwise it will set T#22 to "b" or "c" based on the value of V#2.
- Trading System Import/Export was updated to support all trading system setup variables.
- Improvements were made to the rollover feature of Investor/RT for futures contracts. The rollover of a contract to the symbol for the next month no longer requires that all charts and other windows be closed.
- A bug was corrected that was sometimes causing Investor/RT to needlessly disconnect and reconnect to the data feed after performing a historical download if the user had checked the user option to "Automatically reconnect when no data" in the data feed preferences.
- Deleting symbols (instruments) while one or more Setup: Instruments windows were tracking symbols, would sometimes result in a fatal error when the window was closed later. This defect has been corrected.
- A Print Chart menu item was added to the traditional chart popup menu to enable floating windows to be printed. The File: Print command in the Windows version does not recognize floating windows.

Version 8.8 Rev 6, Released: September 7, 2007

Opentick

A beta testing release of Investor/RT for opentick is now available. Clients interested in this data service contact info@linnsoft.com to request a registration code. Supply your opentick login id. For more information on opentick, see <http://www.opentick.com>.

Automatic Restart Feature

The Windows edition of Investor/RT will now automatically restart the application in the event of a fatal error. When you click the OK button in the error message dialog, the application will terminate

and start up again quickly. Fatal error messages also have a Quit button you can use if you do not wish to restart Investor/RT.

Application Font Size User Preference

Investor/RT Version 8.8 for Windows adopted Tahoma 8 point font as the standard for all controls (buttons, list boxes, radio buttons, etc.). See item Investor/RT Default Windows Font for details. For those who prefer larger text in Investor/RT windows and controls, there is an Application Font preference in Setup: Preferences: General. Tahoma 8 is the default; Tahoma 9 and Tahoma 10 are offered as alternatives. Changing this preference takes full effect the next time Investor/RT starts up. A good way to compare the choices is to examine the Setup: Preferences: Technical Indicators window. The list of indicator names at the left side shows the effect of changing to a larger size font; the text is larger; there are fewer names displayed at one time. Use the up/down arrow keys to move through the list to see how the various controls appear for a variety of indicators. The main menu bar and various pop-up menus in Investor/RT continue to use Windows XP standard Tahoma 8 font size.

Setup Futures Improvements

Investor/RT has been improved to better handle default session setups when the user adds new futures contract instruments. In the past, newly defined futures were assigned to the default session, a user setting in Setup: Preferences: Instruments. This default session was often set to session 0, the US Stocks session, so this resulted in futures contracts collecting data only for the day session hours. Setup: Preferences: Instruments has been extended to provide two default sessions, one for futures contracts, the other for all other security types. The default for futures is Session 31, commonly setup for overnight traded futures contracts. The database of futures contract types now includes a default session for each future type. Each type (ES, YM, BP, etc.) can have its own default session. The Setup: Futures window, used to define futures contract symbols and edit future type setups, shows the default session number for each type of future. Whether you use Setup: Futures, Setup: Instruments, or simply type a new symbol into a quote page or dialog box to add a new symbol, Investor/RT will ensure that the newly defined futures contract is assigned to the correct session for any known future type.

New Drawing Options for True Range Indicator

The True Range Indicator now has multiple drawing options, including histogram, stepped line, connected line, and several more. In past versions, the True Range indicator could only be drawn as a line.

New Band Options for VWAP

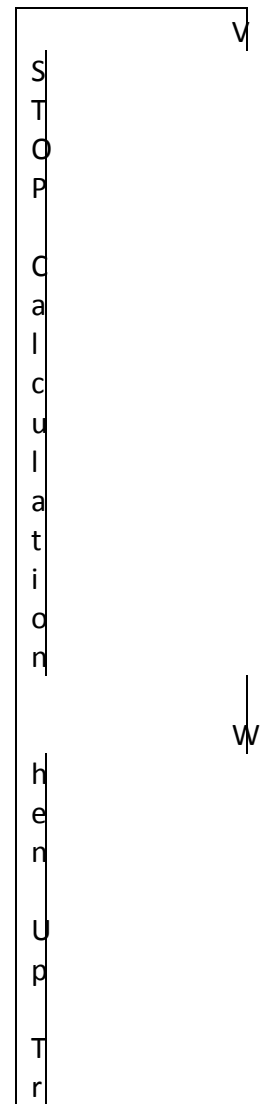
The VWAP Indicator now has options to draw one or two bands around the VWAP, as well as a variety of options for computing those bands. The options for Band Basis include:

- Variance(CL vs VWAP) - The variance between the closing price and the VWAP line, computed on a cumulative basis from the start of the session.

- 1/4 Days Range - One quarter of the range to that point in the day/session.
- 3 x Avg Bar Range - Three times the average range (hi - lo) of last 20 bars..
- Constant \$ Value - A constant \$ Value above and below the VWAP.
- Proprietary - This option is a work in progress and currently being kept proprietary.

New Indicator: Volatility Stop

The Volatility Stop Indicator helps define the current trend. The indicator plots a red line above the prices bars when a downward trend is detected, and a blue line below the bars when an upward trend is detected. These lines are commonly used as trailing stops. This indicator is commonly used as a exit tool rather than an entry technique. When price crosses the VSTOP value, the trend reverses and VSTOP moves to the other side of price. The VSTOP is calculated as follows:



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Trend reverses between up and down when Closing Price crosses VSTOP.

RTL Token: VSTOP

The RTL Token for the Volatility Stop indicator is VSTOP. A common system for trading the VSTOP might be to look for closing price crossing VSTOP:

More information on VSTOP can be found at: <http://www.linnsoft.com/tour/techind/vstop.htm>

New RTL tokens: VWAPIU, VWAPID, VSTOP

Three new tokens were introduced to the RTL Language. VWAPIU provides the upper VWAP band. VWAPID provides the lower VWAP band. VSTOP gives the value of the new Volatility Stop Indicator. For both VWAPIU and VWAPID, the user must provide the band basis and the band multiplier.

Miscellaneous 8.8.x Fixes and Improvements

- A bug was corrected that caused the last bar in an intra-day time-interval chart to draw to the right of the right margin line in cases where the number of seconds in the periodicity does not divide evenly into the number of seconds in the trading session.
- Traditional chart cross hair feedback was made bold with a larger font to improve readability.
- Using the Add Button command in a traditional chart to add a button for an indicator now uses the button purpose "Activate Drawing Tool" automatically if the subject indicator has a drawing tool, otherwise the button purpose will be "Add/Remove Preset Indicator" as has been the case before.
- When multiple instruments are varying periodicities are resident in the same traditional chart window, a bug was causing the last bar of some instruments to disappear. This defect only pertains to fixed time interval intra-day charts. The bug has been corrected.
- A bug was corrected that caused the mouse to be locked in panning mode. The bug surfaced when cross hairs were turned on and the user clicked on a chart button embedded in the chart to activate a drawing tool. Pressing the mouse down inside a chart window no longer turns on the panning cursor immediately if a pan delay is specified in Chart General Preferences. Instead the hand cursor appears only after the user specified delay, when the panning operation is ready to begin. Other qualitative improvements were made to ensure that when cross hairs are on and drawing tools are activated, the cursor shows the tool that is active instead of the small cross hair cursor.
- Groups of type "Chart" will now correctly accept charts of all types as members of the group. The File-->Add to Group menu commands now function properly when charts of different kinds are in use (Traditional, Market Profile, Footprint charts, etc.).
- Investor/RT IB users without DTN Market Access historical services rely exclusively on IB historical backfills. Investor/RT has been improved to pace IB download requests no faster than every 6 seconds to comply with IB imposed pacing rules. This improvement will eliminate failed download requests due the "Pacing Violation" errors.
- A rare but serious memory leak was eliminated. The process of producing monthly bars from daily bars was the source of the leak. Memory loss from viewing an occasional monthly chart was negligible. The problem could be serious, however, if some repetitive process was underlying the reference to monthly historical data, e.g. a scan running frequently on a large number of symbols with a formula referencing monthly data. The problem was actually discovered when a pivot point indicator was added to an intraday chart where the setup for the pivots called for using monthly data. An intraday chart including an MPD (mixed periodicity) indicator referencing monthly data would also magnify the effects of the memory leak.

- The main menu bar Edit menu was augmented with a Copy All menu item, useful for copying all of the text in a text window to the clipboard with one command. The command is equivalent to a Select All followed by a Copy. The Copy All command is also available text windows in the pull down menu at the upper left corner.
- The System Status window was improved to provide some workspace statistics. Buttons at the bottom of the window provide access to other windows with status information, e.g. the message log, alarm log, and the feed status window. Click the OK button to close the window.
- Keyboard shortcuts were added to Traditional Charts, Market Profile and Footprint Charts. The space bar is the shortcut for refreshing (downloading) data for the chart. For tick based charts, the space bar alone will download the current session ticks; shift+space will download the current and previous session ticks; ctrl+space bar performs a Full Downloading in accordance with the user's Historical Data preference settings.
- When creating new quote pages, Investor/RT uses the column format named "Default Format". This format can contain both built-in and custom columns now. Prior to this release, only built-in columns could be included in newly created quote pages.
- A bug was corrected in the Full Download function that was causing redundant historical download requests to be issued. The Full Download command typically issues three historical requests per symbol, one for daily data, one for one-minute bars, and a final request for tick data based on the settings in the Historical Data preferences window. After completing the Full Download, an unnecessary request was being issued depending upon the periodicity of the chart in question. The effect of this bug was magnified for traditional charts containing multiple instruments. A two symbol traditional chart would cause 8 download requests rather than 6, a three symbol traditional chart full download would issue 12 requests rather than 9. The additional downloads were not issued if the Full Download command was done explicitly from the popup menu in the chart window. The bug only affected full downloads issued using the new Ctrl + Spacebar chart window shortcut.
- A bug was corrected in the IB version of Investor/RT that caused fatal errors for clients tracking equity and index options. This bug was introduced in version 8.8 and fixed in 8.8 Rev 1.
- A minor bug was corrected in the Mac OS X version user profile that caused the OS X release in use to appear in the profile as 10.4.9 even after upgrade to OS X 10.4.10.
- Exports of multi-chart layouts having one more Footprint charts intermixed with other chart types were not imported completely (some charts were missed). This defect has been corrected.
- Performance improvements were made to the Verify/Repair Historical Data utility function. This utility now runs considerably faster than before, especially when processing futures contracts setup to retain only day session historical tick data.
- A bug was fixed in traditional charting Pane Size commands. When adjusting the sizes of panes in the traditional chart, the software was not taking into account the presence of a Button pane at the top of the chart window. This caused the relative percentages of the other panes to be different than intended. Charts not having a button pane did not have the problem.
- Version 8.8.4 is a maintenance release with several fixes and no new features

- Version 8.8.5 was updated for capability with NinjaTrader Version 6. The Order Desk Preferences window now has a check box for enabling NinjaTrader. By default the NinjaTrader check box is unchecked. Users who use to execute Investor/RT Trading Orders with NinjaTrader destination must check this box to enable NinjaTrader. When Investor/RT starts up it will only attempt to establish linkage with NinjaTrader if this user preference is on. If the preference is on at startup, Investor/RT does a second check to see if there is a file named "NoNinjaTrader.txt" in the admin directory. If this file is found, the NinjaTrader user preference will be turned off and NinjaTrader trading orders will be disabled.
- A bug was corrected in the management of user preferences. The compress before backup preferences were interfering with the "close windows when opening layouts" preference.
- A rare memory leak was fixed in the trading system optimization area having to do with optimizing on symbols.
- Fibonacci retracement lines were draw extended too far to the left in charts not having a fixed time interval, e.g. ticks/bar charts, range bars, etc. This has been corrected. Drawing of the ZigZag indicator for non-fixed time interval traditional charts is now available.
- Current quote downloading from Yahoo! Finance was updated to use HTTP 1.1 protocol to conform with recent changes instituted by Yahoo! Finance. Prior to Version 8.8.6, Investor/RT was communicating with Yahoo! Finance using HTTP 1.0 protocol; HTTP 1.0 requests were resulting in "Bad Request" responses from the Yahoo! Finance web site.
- Setup: Preferences: Historical Data has a user option to "Disallow Data Accesses that Exceed...". The limit was formerly 1 million ticks; it is now ten million ticks. If this box is checkmarked, retrieval of tick data from the Investor/RT database for up to ten million ticks will be allowed to process. Uncheck this box if you wish no limit at all to be imposed. There is no practical limit on the number of intraday or daily, weekly, monthly bars that can be accessed in Investor/RT. This limit check only serves as a warning that a request for "tick periodicity" has exceeded ten million ticks. Multi-day Market Profile charts and Footprint Charts commonly request many days of tick data that can well exceed a million ticks for many instruments. This was causing problems for clients who were unaware that this checkbox was checked. Since million tick accesses are increasingly common today, the limit has been increased ten fold.
- A bug was corrected in the DTN.IQ Version for Mac OS X that was causing Investor/RT to sometimes set the DTN.IQ symbol limit to 100 rather than the actual user symbol limit of 500 or 1300.
- Investor/RT 8.8.6 was updated for use with the latest eSignal published API, Build 152. Prior to Version 8.8.6 Investor/RT uses eSignal API Build 135. A bug was fixed that was preventing Investor/RT from launching the eSignal Data Manager once eSignal version 10.0 was installed.
- Downloading (generating) intra-day historical data for a custom instrument was not loading the complete data for the underlying components of the custom instruments for the current session. This has been corrected in Version 8.8.6.

Version 8.8.5, Released August 24, 2007

New RTL Token: EVAL

The EVAL token is used within an RTL formula to evaluate another RTL formula for a single bar. This new token is designed for use primarily in backtesting trading signals. The SIGNAL, SCAN, and CI tokens can also be used in a formula to accomplish the same thing, but these tokens typically calculate an array of values instead of just a single bar. The distinction between EVAL and the others has to do with how trading signals formulas are evaluated during backtesting. When a trading signal used in a trading rule includes SIGNAL or CI tokens to reference other RTL formulas, the subordinate SIGNAL(s) or CI(s) are evaluated as an array of values before the backtesting begins. For example, if a trading rule signal includes a SIGNAL token to reference the formula $CL > MA$; the Investor/RT backtester will evaluate whether the close is greater than the moving average for the entire backtesting period before the actual backtest begins to go through the historical data testing the rules of the trading system. Sometimes it is desirable to perform a series of actions in a subordinate signal, a series of actions that includes setting of user variables that needs to be done for each bar during the backtesting process. Consider a simple example, a trading rule that references a subordinate SIGNAL having the formula:

This signal puts the midpoint of the high - low range for the bar into user variable V#33 and returns TRUE if the close of the bar is greater than this value. The trading rule signal that references is signal might look like this:

`SIGNAL AND MA > V#33`

This example illustrates the need for the EVAL token. The SIGNAL token in this example is evaluated in advance for the entire set of data to be backtested, as is the MA token, both represented as an array of values used to test each bar during the backtest. However, the parent signal is here relying on V#33 being set by SIGNAL for each bar as the backtest proceeds. V#33 is not set at all after the backtest begins, only during the precalculation phase. Thus, this formulation will not give the desired results because V#33 will not be the expected value. If instead the trading rule signal were written:

```

EVAL
AND
MA
>
V#33
;
```

where EVAL is setup to evaluate the same trading signal as SIGNAL was, will produce the desired results. The reason is that EVAL will not be pre-evaluated for all bars to be backtested. It will be evaluated for each bar individually as the backtesting proceeds bar to bar through the historical data.

Thus when using EVAL you can rely on (make reference to) user variables that are set by the subordinate signal to have the current bar's value as the backtest proceeds.

In summary, the EVAL token should be used to evaluate other RTL formulas within a trading system rule IF the subordinate signal or custom indicator sets user variables that you wish to reference during the backtest. If there are no user variables or other static properties being set (via the SET function) within the subordinate signal, it can just as easily and probably more efficiently be referenced using the SIGNAL to CI token instead.

The EFLAG token can be used to inspect or modify certain instrument flags (extra flags) that are not accessible via the FLAG or MON RTL tokens. In particular the flag for the instrument setting "No Tick Data Filtering for this Instrument" can be turned on or off using an RTL SET statement. SET(EFLAG, 64) turns on this setting, i.e. the instrument is exempted from tick data filtering, while SET(EFLAG, -64); turns this setting off, i.e. the instrument will participate in tick filtering. The expression:

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Feed Performance Monitoring using \$FEED Symbol

The ticker symbol \$FEED is available to users of the DTN IQFEED and eSignal Versions of Investor/RT for Windows to monitor the performance of the software in handling incoming data. Add the \$FEED symbol as a "cash" type symbol. It will update ten times per minute with a price value indicating the amount of time in seconds on average that incoming data is waiting for processing once received by Investor/RT. Typical values should be .50 seconds or less; this indicates little or no delay once data was been received by Investor/RT and queued for processing into the charts and other workspace windows.

The tick volume of each update will reflect the number of data packets that were processed by Investor/RT since the previous update of \$FEED. The \$FEED symbol will be available in other real-time data feed contexts in future updates. The intent in introducing this performance measurement tool is to give Investor/RT and the user a way to detect abnormally high data waiting conditions. The software can respond to such conditions by giving more priority to data feed reception. The user could respond by closing non-essential charts and quotepages to reduce the load on the system. The \$FEED can be monitored just like any other symbol in a quotepage or a chart. A small chart with periodicity "Tick" displaying \$FEED as price and volume histograms gives a good picture of how much data is being processed and the average latency. For eSignal the number of packets that are awaiting processing is updated tick by tick as the \$FEED open interest value. Thus you can add an "Annotation" indicator to a chart with the text "%OI" to watch this number update change value. For IQFEED, the open interest reflects the amount of data measured in K bytes that is awaiting processing by Investor/RT. It can be similarly view in an annotation or directly in a quotepage that shows the Open Interest column. At present, \$FEED updates every six seconds; its price value is an average latency value computed over the preceding 5 ticks, i.e. it is a measure of average latency time for the immediately preceding 30 seconds.

The latency will vary from user to user based on the number of symbols monitored intra-day, the type, number, and complexity of charts that are open, the number of technical indicators being calculated real-time and their recalculation frequency, the number of quotepages open, etc. If you use this new facility to monitor performance, please send feedback on the average levels you are

experiencing to support. This will help in our continuing efforts to offer our clients the highest performance real-time trading platform.

Version 8.8.3, Released August 8, 2007

New Historical RTL Token: PNF_HEIGHT

The PNF_HEIGHT token provides historical reference to the number of X's and O's in any column of PNF bar data. This token can be used in scans, signals, and custom indicators, the only requirement being that the scan, or chart, or custom column where the RTL formulas is being evaluated have periodicity set to Point and Figure. This token can be used in conjunction with PNF_STATE to easily create trading signals that consider the number of X's or O's in the current or any previous Point and Figure bar/column.

Performance Related Change re Indicator Recalculation Frequency

During period of extremely high trading volume, technical indicators having a recalculation preference of "Every Price Change" can result in rapid indicator recalculation that can delay the processing of incoming market data. Under normal trading conditions, this setting serves well, in fact, this is the default setting for indicators setup in the "Futures Installers". We have revised the algorithm that governs indicator calculation for cases where "Every Price Change" is the user preference for the indicator. If a trade occurs and it has been one second or more since the last change in price, the indicator is recalculated; if a change in price occurs in under a second, the indicator will be recalculated only if the current price differs from the last price and the price before that. This revision will reduce indicator recalculation under heavy volume trading conditions when price may be oscillating rapidly between two prices.

The technical indicator recalculation preference "Every 1 Tick" is no longer permitted as the default setting for new indicators. This preference setting can be found in Setup: Preferences: Charts: General. Setting a particular indicator to calculate every tick is permissible, but users are cautioned not to use this setting excessively because it can result in unnecessary indicator calculation that delays the processing of incoming market data.

The System Status window, accessible by clicking the System Status button on the main toolbar, now shows a summary of the workspace. This gives you an idea of how much load is being placed on the system with the present set of open windows. The summary shows the number of symbols tracked, charts and quote pages open, how many technical indicators are present, how many indicators are being recalculated every tick, how many every 5 ticks or less, how many are being calculated every price change, and how many are being recalculated once per second. In you are unfamiliar with the recalculation preference, take a look at the workspace summary to see how your indicator calculations are setup for your typical workspace.

New Chart Menu Item: Scrub Data

Traditional Charts, Market Profile and Footprint Charts have a Scrub Data menu item in the right-click menu. This command examines the intra-day tick data for the instrument in question for the most current 3 trading session and removes bad ticks. It then performs a Verify/Repair historical data for all of the historical data on file to eliminate any out-of-sequence ticks from the data, then refreshes the chart. This new feature essentially automates what Investor/RT clients have done in the past using the "Edit/Delete Tick Data" tool for traditional charts to remove bad ticks in the charts, and makes this functionality available to Market Profile and Footprint charts as well. If a bad tick gets into your chart, choose Scrub Data and the in most cases the chart will refresh quickly with the anomalous data eliminated.

New User Preference for Drawing Order When Adding Indicators to Charts

Investor/RT Traditional Charts were revised recently so that most indicators are added at the top of the element order. Thus when adding indicators, reference lines, trend lines, etc. these are drawn on top of the instrument data bars or candles. A number of users have expressed a desire to always have their indicators drawn behind the instrument. If this is your preference, you can elect this option in the Setup: Preferences: Charts: General window. Check the box titled "Add Indicators Behind Bars". Note that when adding indicators to panes that do not contain an instrument, the newly added indicator will be drawn above any existing indicators in the pane. You may adjust the pane element order of any traditional chart pane by double-clicking inside the pane and choosing "Element Order", or you can right-click in the pane title to access the Pane Ordering window.

Version 8.8 Rev 1, Released: July 31, 2007

MB Trading

Investor/RT is now available to clients using MB Trading (MBT) (www.mbtrading.com) as a realtime data source. MB Trading streams realtime data for equities, futures, options, and indices. Up to 100 symbols can be watched realtime. Investor/RT supports MBT Level 1 and Level II data. Investor/RT MBT users have built-in access to all Yahoo Finance data retrieval services, including historical data backfill of daily, weekly, monthly charts for stocks, indices, funds. DTN Market Access historical services for intra-day chart backfill (tick data and one-minute interval data) are available (monthly fee \$12). MBT plans to offer historical data services directly in the future; Investor/RT will be updated to access those services when they become available. Trade execution through MBT is accomplished via the MBT Navigator software (<http://www.mbtrading.com/navigator.asp>) which runs in parallel with Investor/RT. Investor/RT users can also utilize trading orders setup for with NinjaTrader destination to submit orders to MBT. Direct integration of Investor/RT with MB Trading order execution platform is planned for future releases of Investor/RT.

Point & Figure Traditional Charts

Point and Figure is now supported in traditional charts as a periodicity (and a drawing style). This significant enhancement marries the powerful features of the traditional chart window (indicators,

buttons, multi-panes, etc) with this unique drawing style. More written documentation will be added before 8.8 goes final. Interested users should watch the video on this subject: <http://www.linnsoft.com/videos/pnfbeta>. The Chart Setup Wizard was revised to create Point and Figure charts with user selected indicators and moving averages. The wizard creates the Point and Figure chart with default reversal criteria of 3 boxes and box size determined automatically from the instrument setup. You can also use the periodicity menu to specify a specific box size and reversal criteria. Choose the .25x3 PNF sample periodicity from the periodicity menu and adjust the numbers if you wish. Note that the entered text must be followed by a space and the letter P, e.g. ".1x3 PNF" to be recognized as a point and figure periodicity.

Tokens have been added to RTL to support the PNF Periodicity. Scans, signals, and custom indicators operating with PNF periodic data can use these token to inspect the state of the PNF column for any PNF bar, the box size and the reversal criteria. To test the state of the PNF use the PNF_STATE token. Constants PNF_UP and PNF_DOWN were added to enable expressions such as "PNF_STATE == PNF_UP" or "PNF_STATE == PNF_DOWN". The PNF_BOX token gives you the box size of the PNF data for the instrument, PNF_REV gives you the reversal criteria (the number of boxes).

Chart Buttons setup to revise chart periodicity or chart drawing style can be used to with PNF also. Use the code "PNF" in the button setup to change the drawing type of the chart to Point and Figure. A periodicity button can be setup using a code such as 0.25x3 PNF to switch the periodicity (and implicitly) the drawing style to Point and Figure with a box size of .25 and reversal criteria 3.

New Technical Indicator

Volatility Profit Indicator (RTL: VPI, VPIL). The VPI indicator can be added directly to traditional charts, or its upper and lower lines can be accessed via the RTL language using the VPI and VPIL tokens. More documentation will be added before 8.8 goes final.

Sharing Pictures of Market Profile and Footprint Charts

The Share Picture command is now available on the Market Profile and Footprint Chart toolbars. Just click the "camera" icon to share the associated chart on charthub.com. The camera icon/share picture button replaces the "Export Chart Definition" button.

Exchange Codes

The list of exchanges in Investor/RT was expanded to include all valid exchange codes used by the IB version. Exchanges are stored on the Investor/RT database. At startup a text file named `exchanges.txt` is loaded. Further additions to the exchange codes will be accomplished by updating this text file for time to time as new versions of Investor/RT are installed.

Investor/RT Default Windows Font

Investor/RT Version 8.8 for Windows adopts Tahoma 8 point font as the standard for all controls (buttons, list boxes, radio buttons, etc.) Tahoma 8 is the font Microsoft uses as the default display font for Windows. See item #7 below. We recommend using Tahoma 8 or 9 as your default quote page font. This will cause instrument selection lists throughout Investor/RT to be presented with a consistent font appearance. Tacoma 8 will be the default font specified in Investor/RT installers for new customers. Existing customers can adjust their font settings manually using the appropriate Setup: Preferences windows.

Instrument Selector Font and Size Preference

Instrument selection windows will now appear using the default font and size the user has specified in Setup: Preferences: Quote page. The font and point size of the instrument selector was formerly not adjustable. Helvetica 10 was formerly used on the Windows platform; Lucida Grande 12 was used on Macintosh OS X. For Windows users, we suggest you use Tahoma 8 or 9 point font for quote pages and instrument selectors.

Trendline Alert Improvement

Several users have requested the ability to have trendline alerts trigger when price nears the trendline instead of waiting for price to actually touch or cross the trendline. In version 8.8, any trendline with a parallel line turned on above or below the trendline, can consider those parallel lines when evaluating the alert. This allows the user to be alerted as price nears the trendline, through the use of parallel trendlines positioned close to the actual trendline. To activate this new feature, put the letter "a" for alert just after the number representing the % distance above or below the trendline for your parallel line. For example, a parallel trendline specified as 3a % above the trendline would give you an alert if price falls to within 3% of the trendline from above.

RTL Context (CTX) Token

The RTL CTX token can be used to determine within an RTL formula whether the formula is being evaluated in the context of a Quote page Scan, a backtest, or an optimization, using built in constants CTX_QPSCAN, CTX_BKTST, CTX_OPTI. An additional token CTX_REAL was added recently but not documented. CTX = CTX_REAL is true when the formula is being evaluated as part of the realization process. A new constant token CTX_TSYS can be used in version 8.8 and higher to test for formulas running in a trading system deployment inside a chart via the TSYS Indicator. The constant token CTX_OTHER (CTX = 0) will be true if none of the others are, e.g. a formula running inside a custom indicator assigned to a custom column in a quote page. The new CTX_TSYS makes it easier to write signals for a trading system that work differently depending on whether the signal is operating under a deployed trading system (in a chart) vs. backtesting. For example, a formula of the form:

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Chart Cross Hairs Improvements

Prior to Version 8.8 traditional chart cross hairs were a "global" setting. If you turned on cross hairs for one chart and later moved the mouse over to a different chart, cross hairs would appear there too. While this may be a preference of some users, the global nature of cross hairs is undesirable to others. Further, the methods used to keep track of the mouse pointer while cross hairs are on globally, were causing internal problems for some users, especially those with multiple monitors with chart windows galore. While cross hairs are active, opening a preferences window above the chart and clicking inside the preferences window would send the preferences behind the chart, sometimes hiding the window fully behind the chart. This problem was traced to the methods used to track the mouse while cross hairs are active. To address these issues and to make the use of cross hairs more customizable for individual preferences, the cross hairs feature has been overhauled.

From a user interface perspective the most important change is that cross hairs is now a chart-specific setting. You can turn them on for one chart but leave cross hairs off for others. The cross hairs option, just like grid lines for example, is saved with the chart definition on the database. Thus when you save a chart that has cross hairs on, and open it again later, the cross hairs will appear automatically as you move the mouse within the window; there is no need to activate cross hairs from the toolbar. To provide a visual cue for the cross hair state as you activate chart windows, the chart toolbar now shows the cross hair tool button with a green color when the current chart window has cross hairs "on" and with a red color (as before) when cross hairs are "off". When you click the cross hairs button it changes color to indicate the on/off (green/red) state for that particular chart.

Some users may wish to have cross hairs "on" for every new chart they create. This can now be accomplished by setting the "default" cross hair preference in Setup: Preferences: Charts: Traditional Charts. In the Options tab, check the "Crosshairs" check box if you want cross hairs on for each newly created chart. When you modify the default preferences, Investor/RT gives you an opportunity to apply the new cross hair default setting to all open charts, or all charts. If you confirm when prompted, the Crosshairs setting will be applied to the charts you specify. Thus you can turn cross

hairs on or off for every one of your traditional charts by adjusting the default Crosshairs check box and applying to "All Charts".

Investor/RT now uses a new method internally to keep track of which charts need cross hairs and which chart presently has the mouse pointer. The new method eliminates the anomalies mentioned above. When cross hairs are on and you right-click, for example, you'll notice that the standard arrow cursor appears over the popup menu and the cross hairs stay fixed where you right-clicked until you are finished making your popup selection. Preferences windows no longer disappear behind the chart when you click on them, etc.

The keyboard shortcut for viewing cross hairs temporarily is to hold down the Shift and + Ctrl keys while moving the mouse inside the traditional chart. The toolbar button is not revised while using this shortcut. The first mouse movement after releasing Shift+Ctrl keys will turn off the cross hairs. Macintosh users hold down Shift + Option keys for this effect.

IB Trading Orders Improvement

Trading Orders with Destination "Interactive Brokers" can specify a V# variable that will be updated with the IB assigned Order ID number when the trading order is submitted. The same V# specification can then be used in Cancel or Revise Order trading orders to specify which order id is to be cancelled or revised. If no order id V# is specified in a cancel or revise order, Investor/RT will cancel or revise the most recently submitted trading order. The user variable specification enables multiple orders to be placed and cancelled/revised independently using the V# order id specifier.

Info Box Multi-Valued Indicator Display

The InfoBox Indicator was improved for selected indicators having multiple result values to show more than one line in the InfoBox display. For example, the Bollinger Bands indicator will feedback two lines in the InfoBox, the upper and low band values. If the "Use Indicators Color" checkbox is checked in the Info Box setup, each line of the display is color coded with the color used to draw the corresponding indicator line. The RTL Tokens for each line are shown. For example, if you have the Stochastics indicator in the chart, the Info Box may show up to three lines labelled RAWK, FASTD, SLOWD.

Tick Data Loading Efficiency

Internal improvements were made to significantly speed up the loading of tick data for charts and other purposes. This improvement will be especially noticeable to users of multiple day Market Profile Charts and Footprint Charts, Volume Breakdown users, and multiple day tick periodicity charts.

Database Maintenance Startup Wizard

An emergency startup wizard has been added to Investor/RT to provide step-by-step assistance in resolving database problems at startup. Starting Investor/RT with the shift key down is a long standing method of starting the software with no data feed connection and no windows open. This method will avoid fatal errors at startup related to a particular chart window for example. In some cases however, Investor/RT may issue a fatal error at startup due to database problems. The database maintenance wizard is designed to help you resolve such problems quickly.

The wizard is triggered by holding down the M key (think M for Maintenance) during Investor/RT startup. You can hold down Shift and M together to invoke the database maintenance wizard and the "no windows/no datafeed" startup option combined, or hold down M alone. The M key triggers the running of the database maintenance utility before Investor/RT accesses the database at startup. In some cases, this utility will repair minor problems with the database, allowing Investor/RT to continue starting up normally with the problem resolved. Investor/RT will show a message box informing you whether errors were detected in the database. Next you will see a three choice prompt to: "Continue", "Quit", or "Report". The "Report" option is recommended when errors have been detected. Clicking "Report" produces a detailed diagnostic report showing the status of the Investor/RT database and providing details of any errors found. You can email this report to support for assistance; copy/paste the report text into an email message. After closing the report window, Investor/RT will prompt you to "Continue", "Quit", or "Restore". If errors were reported you can quickly Restore your backup database and continue with startup by clicking "Restore". If you elect to continue without restoring, Investor/RT will resume its normal startup sequence until it has successfully loaded all of the symbols you are tracking from the database. At this point, Investor/RT will perform a "Full Maintenance". This is a four step process that verifies all of the historical data on file for all symbols, compresses the historical data and eliminates errors in the historical section of the database. This process will often eliminate common problems with the historical data that can be the root cause of startup failures. When the Full Maintenance completes you will again be informed whether the database is now okay and be prompted one final time to "Continue", "Quit" or "Restore" the backup database. If errors persist and you elect to Restore at this phase of startup, Investor/RT will restore the backup and relaunch itself automatically using the newly restored backup database. Otherwise Investor/RT completes its normal startup. Finally, the Database Wizard window opens automatically in case you wish to perform other database utility functions based on the errors detected.

This database maintenance startup wizard is rarely needed but if you encounter any kind of fatal error attempting to start Investor/RT, starting again with the M key or Shift + M held down is an easy way to get past most problems quickly. The "Report" option is a convenient way to notify support when problems are detected in your database; the report gives us the information we need to advise you further how to repair the database if you elect not to restore your backup immediately. If errors do persist after the maintenance or full maintenance steps, the "Restore" option will eliminate them by replacing the damaged database with the verified backup so Investor/RT startup can continue.

Quality Assurance Improvement

A feature has been added to provide feedback to Investor/RT software developers in the event that the software issues a fatal error. Information about the error, the version of the software in use, and the user (email address) who encountered the problem is reported to the developers automatically via the internet. This information will help us monitor and respond quickly to any problem in the software, and will also improve the effectiveness of our quality assurance testing during pre-release beta testing periods.

Miscellaneous 8.8 Fixes and Improvements

- A bug was corrected that caused the last bar in an intra-day time-interval chart to draw to the right of the right margin line in cases where the number of seconds in the periodicity does not divide evenly into the number of seconds in the trading session.
- Traditional chart cross hair feedback was made bold with a larger font to improve readability.
- Using the Add Button command in a traditional chart to add a button for an indicator now uses the button purpose "Activate Drawing Tool" automatically if the subject indicator has a drawing tool, otherwise the button purpose will be "Add/Remove Preset Indicator" as has been the case before.
- When multiple instruments are varying periodicities are resident in the same traditional chart window, a bug was causing the last bar of some instruments to disappear. This defect only pertains to fixed time interval intra-day charts. The bug has been corrected.
- A bug was corrected that caused the mouse to be locked in panning mode. The bug surfaced when cross hairs were turned on and the user clicked on a chart button embedded in the chart to activate a drawing tool. Pressing the mouse down inside a chart window no longer turns on the panning cursor immediately if a pan delay is specified in Chart General Preferences. Instead the hand cursor appears only after the user specified delay, when the panning operation is ready to begin. Other qualitative improvements were made to ensure that when cross hairs are on and drawing tools are activated, the cursor shows the tool that is active instead of the small cross hair cursor.
- Groups of type "Chart" will now correctly accept charts of all types as members of the group. The File-->Add to Group menu commands now function properly when charts of different kinds are in use (Traditional, Market Profile, Footprint charts, etc.).
- Investor/RT IB users without DTN Market Access historical services rely exclusively on IB historical backfills. Investor/RT has been improved to pace IB download requests no faster than every 6 seconds to comply with IB imposed pacing rules. This improvement will eliminate failed download requests due the "Pacing Violation" errors.
- A rare but serious memory leak was eliminated. The process of producing monthly bars from daily bars was the source of the leak. Memory loss from viewing an occasional monthly chart was negligible. The problem could be serious, however, if some repetitive process was underlying the reference to monthly historical data, e.g. a scan running frequently on a large number of symbols with a formula referencing monthly data. The problem was actually discovered when a pivot point indicator was added to an intraday chart where the setup for the pivots called for using monthly data. An intraday chart including an MPD (mixed

periodicity) indicator referencing monthly data would also magnify the effects of the memory leak.

- The main menu bar Edit menu was augmented with a Copy All menu item, useful for copying all of the text in a text window to the clipboard with one command. The command is equivalent to a Select All followed by a Copy. The Copy All command is also available text windows in the pull down menu at the upper left corner.
- The System Status window was improved to provide some workspace statistics. Buttons at the bottom of the window provide access to other windows with status information, e.g. the message log, alarm log, and the feed status window. Click the OK button to close the window.
- Keyboard shortcuts were added to Traditional Charts, Market Profile and Footprint Charts. The spacebar is the shortcut for refreshing (downloading) data for the chart. For tick based charts, the spacebar alone will download the current session ticks; shift+space will download the current and previous session ticks; ctrl+spacebar performs a Full Downloading in accordance with the user's Historical Data preference settings.
- When creating new quotepages, Investor/RT uses the column format named "Default Format". This format can contain both built-in and custom columns now. Prior to this release, only built-in columns could be included in newly created quotepages.
- A bug was corrected in the Full Download function that was causing redundant historical download requests to be issued. The Full Download command typically issues three historical requests per symbol, one for daily data, one for one-minute bars, and a final request for tick data based on the settings in the Historical Data preferences window. After completing the Full Download, an unnecessary request was being issued depending upon the periodicity of the chart in question. The effect of this bug was magnified for traditional charts containing multiple instruments. A two symbol traditional chart would cause 8 download requests rather than 6, a three symbol traditional chart full download would issue 12 requests rather than 9. The additional downloads were not issued if the Full Download command was done explicitly from the popup menu in the chart window. The bug only affected full downloads issued using the new Ctrl + Spacebar chart window shortcut.
- A bug was corrected in the IB version of Investor/RT that caused fatal errors for clients tracking equity and index options. This bug was introduced in version 8.8 and fixed in 8.8 Rev 1.
- A minor bug was corrected in the Mac OS X version user profile that caused the OS X release in use to appear in the profile as 10.4.9 even after upgrade to OS X 10.4.10.
- Exports of multi-chart layouts having one more Footprint charts intermixed with other chart types were not imported completely (some charts were missed). This defect has been corrected.
- Performance improvements were made to the Verify/Repair Historical Data utility function. This utility now runs considerably faster than before, especially when processing futures contracts setup to retain only day session historical tick data.

Version 8.7.2, Released June 12, 2007

Miscellaneous 8.7.2 Fixes and Improvements

- A bug was fixed in the "Check for Updates" process that was causing failures at startup.
- The Info Box indicator now properly excludes various indicators for which a display value for each bar is not applicable. The bottom edge of the Info Box was clipped off when the traditional chart contained certain combinations of indicators. This has been corrected.
- A Macintosh-specific bug was fixed in the dialog box that appears when the user begins typing a ticker symbol into a traditional chart window. The keyboard focus now stays properly on the instrument selector rather than shifting inappropriately to the periodicity control.
- A bug was fixed in the myTrack edition of the software that was adversely affecting the time stamps of incoming data. Symptoms of this problem included messages in the message log and status message area reporting a clock offset of 6 or 12 hours randomly. The problem has been resolved.
- Indicator drawn as histograms would not "select" when clicked upon. This bug was been corrected.
- Traditional chart time interval charts now update in realtime "flush right" without adding any white space. If you wish to maintain some white space between the live updating bar and the vertical price axis, then set the right-margin setting accordingly. You can do this by simply dragging the small triangle at the bottom right of the pane to the left the desired distance.

Version 8.7.1, Released June 8, 2007

Chart Buttons for Drawing Line-based Indicators

Traditional Chart Buttons can now be created for activating drawings tools of various kinds. The Button Purpose is titled "Activate Drawing Tool Preset". This button purpose works similarly to the Add/Remove Preset Indicator button purpose. The difference is that the Activate purpose considers only indicator presets for line-based indicators, e.g. Trend lines, Horizontal and Vertical Reference Lines, Regression Lines, Fibonacci Retracements, Projections, Arcs, Rectangle, Annotations, and others. Unlike the Add/Remove purpose, the Activate Drawing Tool purpose never removes a preset indicator; it always activates the drawing tool for the indicator preset whose name is part of the setup for the button. For example, suppose you wanted to have three trend line drawing buttons in a chart window: one for drawing red trend lines, another for green lines, the 3rd for blue lines. First go to Setup: Preferences: Technical Indicator, pick the Trend line indicator and setup the preferences for a red trend line. Then use the Preset menu at the bottom to create a new Preset. Name it Red Trend line. Repeat the process to create trend line presets named Blue Trend line, and Green Trend line. Now add three buttons to the chart, each one uses "Activate Drawing Tool Preset" as the purpose, and each one specifies one of the three trend line presets you created. Each of the buttons has a default title of TLINE. You could specify a different text time for each one and/or use a color for each button so that each button's title color matches the color of the trend line to be drawn. When you

click on any of these buttons, the cursor will change to the trend line drawing cursor and the message "TLINE Drawing Tool Activated" will appear in the message area of the main toolbar. Mouse down and drag the mouse to trace the slope of the line; when you release the mouse, the trend line will be drawn in the color specified in the button's trend line preset.

Miscellaneous 8.7.1 Fixes and Improvements

- Traditional Chart definitions now include the session override if specified. When importing a chart definition having a session override, Investor/RT will verify that the override session number is a defined session in your setup. If so, the chart will be imported with that session number specified. Ensuring that the session hours are appropriate is beyond the scope of the import/export mechanism. This must be done manually. If the session override specifies a non-existent session then the chart session override is discarded and a message informing you of that is presented.
- A Mac OS X specific bug was fixed in the Instrument dialog that appears when replacing a symbol in a traditional chart with another. Typing letters into the dialog would sometimes activate the periodicity control. This has been fixed. The instrument selector will now receive all input when typing into the window.
- Quotepages setup to sort by user variable V#46 and higher, or any of the user text variables T#1 - T#32 were not properly retaining the sort column specifier. Thus when the quotepage was saved, closed, and reopened, the quotepage sort column setting was erroneously set to some other column. This has been corrected.
- Clicking in a traditional chart to select a trend line was not detecting clicks on the line when the trend line slope was steep. This has been corrected. For steep trend lines, clicking on the trend line with the horizontal position of the mouse to the left of the bar/candle works best.
- Importing Market Profile and Footprint Chart definitions, now properly saves the imported chart. Prior to 8.7.1, the imported chart would appear but would be discarded if you closed the window without making any modifications to it.

Version 8.7.1, Released: May 29, 2007

Mac OS X Improved Sound Support

The Mac OS X Edition of Investor/RT was improved to utilize the latest Apple Core Audio methods for playing alert and custom sounds. OS X users may now place files encoded in any of a wide variety of audio formats into the Sounds folder within the installation folder. These files then become available in the Setup: Preferences: Sounds window for preview and assignment to various sound events within Investor/RT, or they may be used in Signal Actions. Supported audio file types include: .aif, .aiff, .mp3, .mp4, .acc, .wav, and many more. Investor/RT users can easily create their own custom alert sounds using Apple's Quicktime Pro (\$30) or a 3rd party recorder such as Recorder/Xhead (\$15) (www.xheadsoftware.com). Once in the Investor/RT sounds folder, custom sounds may be played by schedules, or assigned to play via a Signal Action when a reference line or trendline is broken in a

chart, or when a signal marker triggers a signal action in real-time. Windows users have similar capabilities; Investor/RT for Windows supports only the .wav file format.

Setup: Instruments Window Improved

The Setup: Instruments window has been substantially improved in Version 8.7. For the benefit of users of the IB Edition of Investor/RT, the Advanced Section of the window now includes controls for viewing and adjusting the Expiration Date, Underlying Symbol, and Currency of any symbol. These setups are especially important for futures contract setups in the IB Edition. Various controls in the setup window will be disabled until you enter a symbol already defined to Investor/RT. Other controls are available as you begin typing a new symbol that you are about to add to Investor/RT. As you enter an existing symbol, its setup information will fill the entry boxes automatically. The current last price of the instrument is shown just to the right of the "Display Format" menu button. Revising the Display Format of a symbol will show the last price in the revised format, providing immediate feedback of the changed format. The actual change is not applied, of course, until you click "Modify" to apply the revised setups. The last price will initially be displayed with a ? after it. If you are connected to a realtime data service, the first trade that occurs after the initial display will remove the ?. The window will show the last trade time as trades occur. This essentially provides immediate visual feedback that the symbols is properly defined and realtime data is flowing for the symbol.

A variety of iconic buttons have been added to facilitate access to Investor/RT features after adding or adjusting the setup of the instrument. An eight button embedded toolbar at the upper left of the window perform functions based on the symbol currently entered in the ticker symbol entry box. When the ticker symbol entry box does not contain an existing symbol defined to Investor/RT, the embedded eight button toolbar is hidden from view. The toolbar includes:

- QuickQuote - a window for checking if data is flowing on a newly added or adjusted symbol.
- Time and Sales - opens a Time and Sales window for the symbol.
- Chart Setup - opens the Chart Setup Window, providing quick access to all chart types on the symbol.
- New Ticker - opens a streaming news window on the symbol, applicable for some data feeds.
- Get Info - Shows detailed information about the symbol.
- Trading Notes - View or Add trading notes for the symbol.
- Alarms = Setup price and/or volume alarms on the symbol.
- Delete - Delete the symbol from Investor/RT.

Six additional icon buttons are positioned next to various entry boxes in the window. To the right of the symbol entry box are two buttons. The first is a button for opening a symbol selection window. The symbol selector will be positioned alphabetically on the first symbol matching the letters already in the entry box. For example, type ES into the entry box and click the button to see all ES contracts that are already setup in Investor/RT. The other button is for requesting symbol setup assistance. For most data services, this button opens the symbol lookup page for the data vendor you are using. The

Interactive Brokers Edition of Investor/RT uses this button to request "contract details" for the underlying future or symbol in question. The requested information is displayed in the Investor/RT "Message Log". The message log window opens automatically when you request symbol setup assistance. You can view the message log later using File-->Open-->Message Log, or use the shortcut: double-click in the message area of the main toolbar.

To the right of the security type menu button is a "QP" button that opens the System-Defined quotepage corresponding to the selected security type. For example, if you are setting up a Future, clicking the button will open the .Futures quotepage. It lists all existing futures contracts being tracked by Investor/RT.

To the right of the Session menu button is a preferences button that takes you to the Setup: Preferences: Sessions window for viewing and/or adjusting session setups.. The window will position automatically to the selected session in the Setup: Instruments window.

In the Advanced Section of the window there is a red ? Help button in the lower right corner of the window. There is a preferences button to the right of the Underlying symbol entry box. Clicking this button takes you to the Setup: Futures window for the particular underlying symbol. For example, if you want to add futures contracts of type YM you can enter YM into the Underlying box, and click this button to open Setup: Futures for YM. From there you can click once to generate symbols automatically or view/adjust the settings for YM contacts if you wish.

All of the embedded iconic buttons have button help tips if desired. Turn them on/off by right-clicking in the main toolbar message area and choosing "Button Help".

The Expiration Date entry box has a convenient menu of upcoming contracts to choose from or you can enter the expiration month and year in dd/mm/yy (e.g. 3/15/07) or mmm yyyy (e.g. Jun 2007) format. When entering expiration date only the month and year are important for data reception purposes in the IB Edition of Investor/RT. For other data sources, the expiration date is documentary only and need not be specified at all.

When the Setup: Instruments window is in compact form without the advanced section, the underlying, exchange, and currency values set for an instrument will be visible as textual content along the bottom of the window. This feedback is designed for users of the IB Edition since these three items of information are essential for data reception for futures contracts; displaying this information makes it unnecessary to toggle the advanced section open to inspect these settings.

When you add a new symbol (by clicking "Add"), the newly added symbol will remain setup in the window so you can observe the current quotes after Investor/RT requests streaming data for the symbol. The Add button changes to read "Modify" to enable you to make further adjustments if necessary. Clicking the Modify button applies any changes to the current symbol and clears the window so you can enter a new symbol. If you wish to keep the current symbol in view, shift+click the "Modify" button to apply changes leaving the symbol in place.

The title of the Setup Instruments window is augmented with the name of the data service in use and indicates whether the data feed is active or inactive. Instrument setup window images are often shared on Charthub.com, so this will make it clear that the shared setup pertains to the symbology used by the particular data vendor.

For users of multiple monitors on the Windows platform, the Advanced section has a check box titled "Floating Window". Checking the box enables the window to be positioned outside the normal Investor/RT window without being obscured by other floating charts and quote pages. Checking or unchecking the Floating Window check box causes the desired window status to take effect immediately. Note that turning off the check box will relocate the window into the Investor/RT task window since it must be inside to be seen. Only floating windows can be moved outside the overall task window workspace.

For equity and index options and future options setups, the Advanced section of the window shows an entry box for viewing and editing the strike price of the option and radio buttons for specifying whether the option is a put or a call. If you use the Setup: Equity and Index Options window or the Setup: Futures Options window, these properties are setup automatically. For completeness the strike and rights are now available for editing should you need them.

Finally, the Setup Instruments window now communicates directly with IB/TWS regarding setup information for futures contracts that Investor/RT does not have pre-defined in its database. Investor/RT uses a setup file named futures.txt located in the admin directory as a guide for setting up futures contracts. If a user of the IB Edition of Investor/RT attempts to setup a futures contract for an underlying that Investor/RT does not know about, Investor/RT will request contract data from IB/TWS. When TWS responds, the future type is setup automatically and the symbol being added is added with the correct currency and exchange setup. The icon button to the right of the Underlying entry box in the Advanced section can be used to inspect Investor/RT setups for any future type.

Improved Preferences for Market Profile and Footprint Charts

The Preferences windows for Market Profile and Footprint Charts now feature a compact multi-tab user interface. There are five tabs in the Market Profile preferences:

Profiles Tab

Here you specify the number of days to profile, optional special profile duration, session override, and volume bars/trade bars overlay options.

Letters Tab

All Letter related preferences are specified here including letter size, color, and font, letter spacing, etc.

Price Levels Tab

Line color, style, and thickness are specified here for POC, VA, and IB lines.

Reference Lines Tab

Line color, style, and thickness for each of twelve optional reference lines are specified here. Individual color controls for each line is a new feature in Investor/RT 8.7.

Options Tab

Miscellaneous preferences are set here, including chart playback settings, info box size, grid lines, split letter setting, and others.

The Footprint Chart Preferences are similarly organized into five tabs:

General Tab

The nature of the chart (Time/Volume/Trades at each price) and the Footprint type is specified here along with other general options.

View Period Tab

The time period to be analyzed in the Footprint is specified here along with session override.

Columns Tab

Optional columnar data to be shown for each bar in the Footprint are requested here.

Color Tab

All color settings are presented here.

Options Tab

Miscellaneous preferences are set here, including row height, chart playback settings, grid lines, borders, and others.

Session Override for Scans

Investor/RT Scans normally run under the session of the instrument(s) for evaluation. A session override option is now available that will use the same override session times to evaluate the scan. This option is applicable only to scans with intra-day periodicity of course. It may be useful in situations where a collection of symbols that have differing session assignments are scanned. The override session will cause all symbol to be evaluated using the specified session times instead of the

individual instrument session. This option is in the extended setup window accessed by clicking the Setup button at the bottom of the RTL setup window for scans.

Chart Scrolling Improvements

Scrolling in traditional chart windows was improved. The scroll bar thumb size shows the proportion of time or bars represented by the visible bars relative to the number of bars or amount of time in the charts overall view period. While using the scroll bar thumb to scroll the chart, the chart redraws as you slide the control left and right. The horizontal time scale starting and ending date/times are shown as feedback as you slide the thumb, making positioning to a specific time easy. Related changes were made to improve the overall performance and accuracy of the horizontal scroll bar. The use of the up/down keyboard arrow keys (or the mouse scroll wheel) to adjust a chart's "pixels per bar" spacing was improved to keep the current rightmost bar at the rightmost position of the chart as the chart is refreshed. This enables you to now scroll back in time to an earlier date/time and adjust the bar spacing to zoom in/out while staying anchored at that time in the past. Note that as pixel spacing increases bars at the left edge may be pushed out of view since it is the rightmost bar that is anchored. Prior versions of Investor/RT did not allow such adjustments while scrolled back; each adjustment would auto-scroll back to the present. The traditional chart window now makes more effective use of the available chart window width to show the maximum number of bars that will fit based on the present pixels per bar setting. For some charts this may result in the current bar being close to right side price axis. If you wish to have some margin to the right of the last updating bar in your charts, set the right margin preference for the chart accordingly. For live charts, the chart does not respond to incoming realtime data while the scroll bar is not at the far right position. Incoming data is recorded, of course. Live updating of the chart resumes when you scroll to the present. The chart window may be resized while scrolled back and the larger or smaller window size maintains the same relative position at the right side of the chart with more or fewer bars shown off to the left. Formerly, re sizing the chart would reposition the chart to the present regardless of where the window was scrolled before re sizing.

In a related improvement, the chart panning tool has been revised. Panning the chart no longer affects the "Lookahead Bars" setting of the chart. The lookahead bars setting has been superseded by the right margin pixels setting as the means for specifying white space at the right side of the chart for labels and annotations. Lookahead Period (in bars) is independent of the right margin setting (in pixels). The Lookahead Period (bars in the future) is seen in the chart only when the chart is scrolled "to present". The purpose of the Lookahead Period preference is to establish a fixed number of bars beyond the most current bar so you can see visually how a trend line projects forward a known period of time into the future. By expressing this distance in bars, the trend line extension will be mathematically correct as the pixels per bar setting is revised (by arrow keys or mouse wheel) so it intersects the price axis at the price predicted by the trend line N bars out. In the past, the lookahead bars feature was utilized by many who simply wanted some white space to the right of the current bar for a variety of reasons: reference line labels, annotations, etc. The disadvantage of using lookahead bars for white space is that the amount of white space varies as the chart is zoomed in and out (varying pixels per bar). For this reason, we recently introduced a new

Right Margin setting in pixels, a constant number of pixels reserved at the right side of the chart window that does not vary with pixels per bar.

The traditional chart preferences for a particular chart (view period tab) now has a choice for either Right Margin or Lookahead Period. The two settings are mutually exclusive. Both cannot be in effect simultaneously. The right margin is expressed in pixels. If you simply want whitespace for labels and annotations, then use the Right Margin Pixels setting, and specify the precise number of pixels you want to be available at the right side of the chart window. This margin will then be present whether you are scrolled to present or scrolled to some period in the past. The right margin applies to every chart type regardless of periodicity.

If you want a Lookahead Period in your chart for projecting trend lines or regression lines a fixed number of bars into the future, then setup the preference to Lookahead Period and specify the number of future bars you want. The Lookahead Period, expressed in bars, has nothing to do with margin. The Lookahead Period feature is applicable only to charts having a periodicity expressed in units of time. This includes Daily, Weekly, Monthly interval charts, and well as intraday charts having a fixed number of minutes (or seconds) per bar. A Lookahead Period is not applicable to charts having time-independent periodicity; thus you may not use lookahead bars when a chart has a periodicity of tick, or N ticks per bar, or range bars, change bars, volume bars, etc. When you specify a Lookahead Period, the chart will be setup with a fixed period of time in the future beyond the last real bar. You can then rely of the mathematical precision of trend line projections that intersect the price axis. The Lookahead Period expressed in bars can only be adjusted by entering the number of bars you want in the preferences for the chart. The right margin in pixels can be adjusted using the mouse. Each chart pane containing an instrument has a vertical line with a triangular marker at the bottom of the pane just past the last real bar in the chart. The white space to the right of this marker line, between it and the vertical price axis, represents the chart's right margin pixel setting. When you hover the mouse pointer above the marker or on the vertical line extending through it, the cursor will change to a left-right resize cursor. You may mouse-down and drag the marker and line to the left or right to increase or decrease the right margin pixels setting. Note that you can drag the right margin whether you are scrolled to present or to some period in the past without affecting the scroll position.

There is a global default setting for right margin pixels in the View Period tab of Setup: Preferences: Charts: Traditional Charts. Setting a default value for right margin there ensures that every new chart will be created with that right margin. The right margin white space is present in a chart regardless of how the chart is scrolled. If you want all of your charts to have a particular pixel setting for right margin, then revise the default preferences. Investor/RT will ask if you wish to apply appearance settings to all charts or all open charts. If you respond All or Open, the default margin setting is applied to the charts you designate.

Many Investor/RT users have used the Lookahead Bars feature in prior versions for the purpose of adding some white space to charts for annotations, reference line labels and such. The changes in this release have repositioned the Lookahead Period back to its original purpose: enabling time-based projections of trend lines and regression lines. The right margin pixels setting is preferable for

white space since the amount of white space does not change as you expand and contract the spacing of the bars in your charts. When you drag the diamond as described above, if your chart happens to have a lookahead period, the chart will be auto-converted to right margin pixels as you drag the mouse. There is no need to access the chart's preferences. Similarly, all charts that are not time based, e.g. range bars, change bars, etc. will be converted to right margin pixels automatically when you upgrade to version 8.7.

Automatic Labeling for Technical Indicators

Each indicator now has an option to "Label Current Value of Indicator". To access this option, double-click on any indicator in a traditional chart to bring up the indicators preference window. This options can be found at the bottom of the update indicator window. When this option is turned on, the current value of the indicator will be labeled, with a horizontal line drawn from the label to the indicator's last plotted value. This chart demonstrates the feature:

<http://www.charthub.com/images/2007/05/04/Labels.png>

The label will only be printed if there is room to do so (ample right margin setting). To adjust the right margin, drag the small triangular control marker in any instrument pane to the left or right. As you scroll back in time, the selected right margin will be present for prior time periods. The indicators labels will update in the margin area as you scroll back to show the value of the indicator(s) at the right-most bar.

Normally, the display format of the indicator is determined automatically by Investor/RT, however, if you wish to override the automatic display format, edit the technical indicator and check mark the "Format" check box and specify the desired numeric display format for the technical indicator values.

Chart Setup Wizard Periodicity

A periodicity menu for traditional chart setup is available in the Chart Setup Wizard window. The menu of common choices includes 100 ticks/bar, 1, 5, and 30 minutes, 30 seconds, .025 range bar, .25 change bar, 1000 volume bar, daily, weekly, and monthly. You may revise (edit) the numeric portion of the selected periodicity to create a traditional chart of literally any periodicity desired. For example, select "1 minute" from the menu, then change the 1 to 13 and click ok to create a 13 minute chart. Similarly, you can select range, change, or volume bar menu items then revise the number. If "Default" is chosen from the periodicity menu, the periodicity that has been specified in Setup: Preferences: Charts: Traditional Charts (View Period tab) is used by the wizard to create traditional charts. This enhancement essentially makes it easy to specify any desired periodicity in advance rather than having to revise the periodicity after the wizard has created the new chart.

The Chart Setup Wizard creates charts using the session of the instrument to be charted. Sometimes, you may wish to create a chart that uses a different session (a session override). This can be accomplished by appending a colon and the desired override session number to the ticker symbol in

the setup wizard entry box. For example, if ES #F is the instrument in the entry box, add :2 tot he symbol (ES #F:2) and click OK to produce a chart with session #2 as the override session. Override sessions can be specified for traditional charts, market profile charts, and Footprint Charts. This is a shortcut that saves time by eliminating the additional step of accessing the resulting chart's preferences to adjust the override session setup.

Miscellaneous 8.7 Fixes and Improvements

- A bug was corrected in the myTrack version having to do with trade times being 1 hour later than expected. This bug affected users of myTrack Investor/RT in time zones East of GMT. When the user time zone is not yet on DST while the US is on DST, time zones are now adjusted automatically to account for the one hour difference.
- A bug was corrected in the myTrack version that was causing Investor/RT to incorrectly report that the computer clock was 23 hours off when the date in the user's locale was different that the date in New York. For example, users in the Pacific time zone between 9 pm and midnight local time would see this erroneous message.
- The trading order executions via AutoTrader or NinjaTrader were blocked in the new IQFEED Edition. Trading orders submitted to these destinations now work properly in the IQFEED (Windows only) Edition.
- When sharing chart images, if you include an annotation in the chart with annotation like "%FEED %TICKER %NAME". Investor/RT will substitute the name of the data feed in use for %FEED, and the ticker and name of the instrument in the chart for the other tokens. This might be useful if you use multiple data feeds to remind you of which feed you are running on when you view a chart with such an annotation.
- Daily Historical data importing from Metastock format files functions correctly on both PowerPC and Intel Macs. A bug was corrected that was causing such importing to fail on Intel Macs.
- IB users tracking Cocoa and other futures traded with exchange code LIFFE_NF can now track those instruments in Investor/RT. The LIFFE_NF exchange code is now available for selection in the Setup: Instruments window.
- The DATE token is RTL now provides a "date number" of the form yyymmdd where yyy is the number of years since 1900, mm is the month, and dd is day of the month. A bar for April 15, 2007 would have a DATE of 1070415. Formerly this token yielded larger numbers like 20070415.
- Floating chart windows are always exported and imported as non-floating charts. If the recipient running Windows wishes to float the chart and move it outside the Investor/RT task window, right-click in the chart and choose Floating Window.
- DTN IQ users and DTN Market Access Historical users in locales that are not on daylight savings time will now receive historical data time shifted correctly to their standard time zone.
- Investor/RT text windows can contain as many as 65,525 displayed lines of text. The scroll bar work properly when viewing files this large. Formerly, scrolling was effective only for files with up to 32,767 lines. This improvement affects all text display windows in Investor/RT including the message log, alarm log, backtesting reports, etc.

- The File: Import: Chart Definition command determines if a definition is present on the clipboard. If so, Investor/RT will prompt "Do you want to import the definition on the clipboard?". Press enter or click Yes to import that definition. Click "No" and Investor/RT will prompt you to select a definition file to import. If you issue the Import: Chart Definition command with the shift-key down, Investor/RT will import unconditionally from the clipboard. This revision is designed make it more convenient to importing of a chart from charthub.com. When viewing a chart definition in your web browser, select all of the text and copy it to the clipboard. Then issue the File: Import: Chart Definition command. There is also a File: Import: Definition from Clipboard menu item further down in the menu, but the top menu item is more convenient and will do the appropriate thing whether a definition on the clipboard or not.
- Traditional chart windows are designed to enable a double-click on an instrument or an indicator to edit the preferences of the element in the chart. If you double-click in an area of the chart that Investor/RT does not recognize as being "on" an indicator or instrument element, Investor/RT present a list of preferences you can edit, including all of the instruments and indicators in the pane which received the double-click. Select the preferences you wish to edit and click OK. Preferences for the specific chart, the pane clicking inside the body of the chart is the method used in Market Profile Charts, Footprint Charts, and other non-traditional charts to access preferences.
- A bug that prevented Level II windows from updating properly in the eSignal and myTrack editions of Investor/RT has been corrected.
- Backup Preferences has a check box for requesting a warning if any data file reaches a user-specified size, expressed in megabytes (MB). Most database files are small with sizes under a megabytes, but a few files, most notably the tick.d01 and hist.d01 files can grow large since they contain intra-day and daily/weekly/monthly historical data for each symbol. This check box is off by default. We recommend turning this option on with a warning level of 1500 MB. The database system Investor/RT employs supports file sizes up to 2 GB (2048 MB).
- The Database Wizard has a button in the top section for calling up the Backup Preferences windows.
- The Hull Moving Average indicator was corrected. Prior versions of Investor/RT were incorrectly calculating this low-lag moving average.
- Setup: Preferences: User Variables has a check box for specifying whether the V# number should always be appended to quotepage column titles for V# columns. This is a global option; it pertains to all V# variables. For example if you have V#13's title set to "Support" and V#14's title to "Resistance", checking this box will result in quotepage columns "Support (V#13)" and "Resistance (V#14)" respectively. If you check or uncheck the check box and press the Apply button, all open quotepages that contain V# variable will adjust titles dynamically.

Version 8.6 Rev 3 - Released: March 23, 2007

Market Playback

Investor/RT now offers a comprehensive Market Playback (replay) feature. Tick data and/or bar data for one or more instruments can be replayed into your Investor/RT workspace at a user specified

playback rate (actual, 2x, 10x, 20x, etc). The Playback feature operates with all dynamic Investor/RT window types including traditional charts, Market Profile Charts, Footprint Charts, quote pages, times and sales, windows, etc. Tick data is fed into the Investor/RT workspace in proper time sequence to provide a realistic simulation of many symbols trading in concert. For details on this new capability, [click here](#).

NOTE: The Version 8.6.3 Playback feature is being released in preliminary form. Some planned features are not yet supported. Please experiment with this new facility and provide feedback and suggestions to support@linnsoft.com.

Spacebar Shortcut for Downloading Historical Data

Traditional charts, Market Profile, and Footprint Charts allow the user to press the spacebar to request historical data for the chart. Some clients may wish to disable this feature to avoid accidental data downloading. To disable the space bar shortcut, go to Setup: Preferences: Charts: General and uncheck the box titled "Press Spacebar to Download". If you wish to setup an alternate keyboard shortcut for downloading historical data, use Setup: Preferences: Keyboard Shortcuts. Downloading Data may also be initiated from the chart's toolbar or by clicking the Download Data button at the lower right corner of these chart types.

Adding Reference Lines to Traditional Charts

Reference Line

The Reference Line indicator draws a horizontal line on the displayed chart according to the preferences of the user. The line can be drawn according to a trading value on a particular day, an alarm value, or an arbitrary value of the user's choosing. This tool may be used repeatedly to overlay several reference lines on a given chart.

Using the mouse you may drag a reference line to adjust its reference value. The value is based upon where the tip of the mouse is positioned when you "drop" the reference line. Dragging a reference into a different pane moves the reference line to the new pane while retaining the same reference value.

Adding Reference Lines to Traditional Charts.

In traditional charts, holding down the Ctrl key (Option Key on Mac) and double-clicking inside the chart body or inside the price scale area places a reference line at the mouse location. Conversely, if you ctrl-double-click on an existing reference line, the line is removed. These shortcuts save a trip to the chart toolbar to activate the reference line tool when you want to add a line, and it eliminates a step when

removing lines (you can click on a reference line to select it and press the delete key to remove). The new method for adding/removing reference lines in traditional charts is similar to the method used in Market Profile charts. In Market Profile charts the ctrl-double-click must be inside the price scale area. In traditional charts it can be in the scale area or inside the body of the chart.

Multithreading of DTN Historical Server Requests

Investor/RT now performs DTN Historical downloads using threads. Up to four requests can be active at a time, independent of the real-time data reception thread and Investor/RT user interface. This infra-structure improvement applies to both MS Windows and Macintosh OS X platforms and to all versions of Investor/RT that employ DTN historical services. The improvement results in an improved user experience for all clients using DTN historical data. Quotepage downloads for multiple symbols are now exceptionally fast, completing downloads at the rate of up to 3 requests per second.

Miscellaneous 8.6.3 Fixes and Improvements

- A bug was corrected in Trading Orders affecting Stop Limit order setups destined for Interactive Brokers via AutoTrader. These order types are now sent correctly to Autotrader.
- Various problems were corrected in the TPO technical indicator, including memory leak issues.
- The Volume Breakdown indicator has two additional result types: "Average Buy Size" and "Average Sell Size".
- A bug was fixed in the Yahoo! Finance Current Quote downloading function. Mutual fund prices are now captured correctly.
- Users of the IB version of Investor/RT will now see a warning message box when connecting to TWS if one or more symbols are setup improperly and/or are unrecognized by IB/TWS. Detailed messages can be viewed in the "message log" immediately after connecting to TWS by choosing Open: Message Log from the File Menu. The shortcut for opening the log is to double-click in the main toolbar message area.
- IB users who subscribe to the DTN historical service often have ticker symbols that are valid only for DTN downloading purposes. These symbols will typically cause an error message when you connect to IB/TWS because the symbols are unrecognized by TWS. For such symbols, you can specify a downloading alias of "NO IB" (5 characters, uppercase, no quotes). This tells Investor/RT that no IB real-time data is expected for the symbol, thus Investor/RT will not ask for real-time market data and no error messages will result for that symbol. A checkbox will be added to the Advanced section of the Setup: Instruments window in a future release to enable this declaration to be made more easily.
- Yahoo! Finance Current Quote download function is operational again. Yahoo! revised the URL for downloading current quotes and this required a programming change in the software.
- The Candlestick Pattern Recognition (CPR) Indicator was improved to operate on tick/bar, range bar, change bar, and volume bar periodicities.

- Improvements were made to the price box in the vertical scale of traditional charts to position the box appropriately when you scroll the window, resize the window, or adjust the scale with the mouse.
- Drawing hollow up candles with the chart's border color set to the same color as the chart background would make the up candles invisible. This erroneous combination of settings is detected now and the up candles are drawn with the up color as the border color instead. As long as the candle border color is set to something other than the background color, that color is used to draw the border around the hollow up candles.
- Using eSignal Investor/RT, sending trading orders to Interactive Brokers via Autotrader was not possible for the AB futures. This has been corrected. The eSignal instrument (AB #F) must be setup with a brokerage alias of ER2 M7 for example. Note the space between ER2 and M7 is required so that Investor/RT can properly recognize the future code is ER2. In earlier versions, Investor/RT would see ER2M7 and mis-interpret the underlying future code to be ER rather than ER2. For brokerage alias, eSignal users should specify the IB underlying future code (ER2 in this example) followed by a space, the month code, and year code. Also, the IB future code must be setup properly in the Setup: Futures window to enable trading orders to be composed properly.
- A bug was fixed in the Chart Setup Wizard. Entering multiple symbols for the chart now work properly. Further, traditional charts produced with multiple symbol are now automatically setup with multiple scaling in effect for pane where the symbols are placed.

Version 8.6 Rev 2 - Released: February 28, 2007

Share Picture Command (Charthub) Now Available on Macintosh OS X

The Share Picture command is now available to users of the Macintosh OS X Edition of the software. For more information on sharing Investor/RT images and setup definitions via charthub.com, go to Setup: Preferences: Sharing. Then press F1 to access the built-in Help topic.

New Display Format: 40ths

40ths display format has been added to Investor/RT. This format was added specifically for the Crude Oil E-mini which trades in 0.025 increments. When this format is assigned, the prices will be displayed to 3 decimal places, but more importantly, Market Profile charts and TPO Indicators set to "Automatic" Price Range will properly pick up the 0.025 tick increment of the symbol (QM).

Market Profile Enhancements

Limitations Removed

In prior releases, Market Profiles were limited to 29 profiles per chart, and to 256 letters per profile. The limitation of 256 letters per profile commonly caused problems for those that wished to merge 20 or more days of profiles. The limitation of 29 profiles per chart was

increasingly becoming an issue for various combinations of settings, including dynamic profiles and merged profiles. These limitations on letters per profile has been completely removed, allowing as many profiles to be merged as a user wishes. The limitation on profiles per chart has been greatly expanded, to 150, which should satisfy just about any combination of Market Profile settings. Keep in mind however that while it is possible to load as many days/profiles into a chart, the user should still only load what he needs, as the additional days can slow down various aspects of the operation of the chart (calculations and drawing).

Value Area & POC In Scale

The current and previous value areas (VA), and points of control (POC) are now highlighted in the scales of the Market Profile charts. The VA is highlighted in gold, while the POC is highlighted in yellow. The left scale highlight the previous day VA & POC, while the right scale highlights the current developing VA & POC.

Current Price Highlighter

The Current Price has always been highlighted in pink in both the left and right scales. In 8.6.2, the current price is highlighted across the entire chart. This was done to provide the user with a clearer indication of where price is currently trading across all aspects of the chart.

Improvements to Saving/Sharing Images

Investor/RT 8.6.2 adds a new folder named "images" inside the installation folder. When you use the Share Picture command, PNG images are now saved in the images folder rather than the admin folder. When using the Save As Picture command it is recommended but not required that the image be saved in this location. The Save As Picture command now honors the "Output File Name" user setting in Setup: Preferences: Import/Export. If this setting specifies "Prompt for File Name", you will be presented with a dialog box in which to specify the name of the file to be saved and its save location. This is how the Save as Picture has performed prior to 8.6.2. However, if the "Use the Object Name" setting is used, the image is saved without a prompting message using the name of the object with .PNG appended to the file name. PNG files saved in this fashion will be saved in the images folder.

Keyboard shortcuts are available for Share Picture, and Save Picture. Both of these shortcuts, if defined, operate on the front window at the instant the shortcut function key combination is pressed. Two more shortcuts have been added. These are titled "Share Picture, No Comment" and "Share Picture, No Definition". If these shortcuts are defined, they perform the Share Picture command overriding the user preferences for comments or including definitions. For example, if the

Sharing preferences call for prompting ("Ask Me") for a comment, then issuing the keyboard shortcut "Share Picture, No Comment" will perform the Share Picture as if the user preferences called for "Never" including comments.

Sharing a Picture without the necessity of answering prompting message(s) is important if the image you wish to share is sensitive to the position of the mouse pointer when the image is created. Investor/RT creates the images after these prompting messages are completed. These prompts are undesirable if you wish to show a chart with a particular bar highlighted or the info box or pane title feedback positioned at a particular bar in the chart. If you normally include comment prompting as your preferred Sharing setup, then adding, for example, F2 as a shortcut for sharing with no comment will produce an image with the mouse positioned at the desired location when F2 is pressed.

The Share Picture command now considers user preferences found in the Setup: Preferences: Import/Export Preferences panel when sharing pictures of charts and their associated definitions. When chart definitions are exported, they can carry a user comment if desired. This comment appears when a recipient imports the chart. When sharing chart images, the Sharing Preferences can be setup to have Investor/RT prompt for a comment as well. This comment will appear on the web page on charthub.com where the chart image and associated definition are posted. If the Sharing Preferences are setup to ask for a comment and the Import/Export preferences are also setup to ask for a comment, then Investor/RT now asks only once for the comment. The supplied comment is used both on the charthub web page and inside the definition that goes out with the chart. If the Import/Export preferences call for either "no comment" or a "fixed comment", then that preference will be honored when creating the definition to accompany the chart image. Only when both the chart and the definition are setup to ask for a comment is the same comment used for both purposes. This eliminates the need to respond to two dialog boxes when sharing a chart and its definition.

Session Statistics Enhancement - All Bars

The Session Statistic Indicator was enhanced to allow computation of statistics across "All" bars in the session, in addition to the "First X" and "Last X" bars of the session. In the past, users commonly specified "First 999 Bars" in order to accomplish this result, but this solution will handle charts which could involve more than 999 bars per session. As an example of how this might be used, in order to get the lowest low of the day, the user would specify "Lowest Price: Low: of All Bars of the session". And to get the low of the previous day, the same settings would be used in combination with "Multi-Session Statistic: Value X Sessions Back: X = 1".

Volume Breakdown Indicator - Up/Down Tick Breakdown

The Volume Breakdown Indicator (VB) has been enhanced with an option to divide up volume by "Up Tick vs Down Tick Volume". In the past, volume was always broken down between Ask Traded and Bid Traded volume. Now, the user has a choice of dividing up Buy and Sell volume as either "Ask

Traded vs Bid Traded Volume" or "Up Tick vs Down Tick Volume. When "Up Tick vs Down Tick Volume" is specified, each trade that occurs on or after an uptick is placed in the buy volume category, while any trade that occurs on or after a downtick is considered in the sell volume category.

Keyboard Shortcuts for Market Profile and Footprint Toolbars

Setup: Preferences: Keyboard Shortcuts no supports setup of function key shortcuts for any of the toolbar buttons on either the Market Profile or Footprint Chart Toolbar. Choose "Toolbar, Market Profile" or "Toolbar, Footprint" as the action, then pick the particular toolbar function to be assigned to the designed function key. This improvement also enables the user to define schedules that perform various Market Profile or Footprint related functions since a schedule action can execute any keyboard shortcut.

Quotepage Column: Sector/Industry/Market Capitalization

Add the quote page column "Sector/Industry/Cap" to see the sector, industry group, and market capitalization for equities in the quote page in a single composite column. This new column combines three columns into one, enabling two additional columns that may have otherwise not been allowed (quote pages are limited to 30 columns). The primary benefit however, is gained by sorting a quote page by Sector/Industry/Cap. This gives you the effect of a 3-column sort. Stocks are listed alphabetically by sector with the industry groups alphabetical within each sector. All the stocks within an industry group are listed in descending order by market capitalization. A sample quote page is available for viewing on charthub.com at http://www.charthub.com/images/2007/02/10/Some_Stocks.png

RTL Improvements for Text Variables

A number of improvements have been made in RTL to facilitate the manipulation of text variables using the SET function. Each instrument defined to Investor/RT has 32 user text variables whose RTL tokens are T#1, T#2, ... T#32. Each of these can hold 30 characters of text. In addition, there are several additional built-in text variables for each instrument that have corresponding RTL tokens. RTL now supports SET statements of the form:

SET(target, source)

where target and source are any of the text tokens in the language. Text tokens include all T# variables and USERDATA, ALIAS, NAME, INDUSTRY, SECTOR, and CURRENCY. If the source token's text is empty, the target's text does not change. If the source text begins with + the text following the + is appended to the target's existing text. Otherwise the source text replaces the target's former text. There are now four special token names you can assign to any text variable to manipulate the text of the variable. There are CLEAR, UPPERCASE, LOWERCASE, and CAPITALIZE. Examples are shown below:

```
SET(T#1, SECTOR); SET(T#2, T#1);
```

Here's a scan formula that uses the + to append some text to the USERDATA token conditionally.

```
IF (CL > STAT) THEN SET(USERDATA, "+ New High %DATE");
```

The STAT token is setup to find the highest high for some period of interest. When the scan runs and finds an instrument closing above its long term high, the text " New High mm/dd/yyyy" is appended to the user data. The %DATE token in the quoted string is replaced by the current date.

```
SET(USERDATA, CLEAR);  
SET(SECTOR, UPPERCASE);  
SET(T#30, LOWERCASE);  
SET(INDUST, CAPITALIZE);
```

```
SET(T#3, (USERDATA= "*BUY*") ? "+***" : "+???");
```

T#3 will have "***" appended to its text for all instruments having the letters "BUY" anywhere in the user data text. Instruments without the BUY text will have "???" appended the T#3.

```
IF (CURRENCY != "?*") THEN SET(CURRENCY, "USD") ELSE SET(CURRENCY, UPPERCASE);
```

If the CURRENCY field for the instrument is empty (i.e. it does not match the pattern above), then set the currency to "USD" (US Dollars), otherwise uppercase all characters in the currency code field of the instrument.

Miscellaneous 8.6.2 Fixes and Improvements

- A bug was fixed in the IB Version that affected clients tracking equity and index option contracts. IB/TWS now transmits real-time updates of "delta" and "implied volatility" for options. Investor/RT has been enhanced to capture this information. IB users who add "Delta" and "Implied Volatility" to quote pages will see the IB calculated (transmitted) values.
- The File: Open menu has a new menu item "Futures File". This command displays a text file named futures.txt which is used at startup by Investor/RT to setup definitions for various futures contract types. Generally, this file is updated from time to time when you install software upgrades and user editing of this file is not recommended. Viewing this file may be useful for diagnostic purposes.
- A bug was fixed in the Share Picture facility. When sharing chart definitions, the software now properly handles the Sharing user preference on whether to share "Button" setups along with the chart definitions. Prior versions were always excluding button setups. Chart button setups will not be included unless the user checks the box calling for buttons to be excluded from chart definitions.

- When viewing intra-day time interval traditional charts in the days following a trading holiday, in particular when viewing an override day session where the underlying instrument is followed in an overnight trading session, chart anomalies would result due to overnight session data present on the database for the symbol. This holiday related problem has been corrected; all ticks/bar data for the trading holiday date are now filtered out of the day session bars when the data is initially fetched from the IRT database. Even if overnight data is downloaded later which contains trades that occurred on the holiday date (e.g. for viewing other overnight session charts), that data will no longer affect day session charts that view a period of time spanning a trading holiday.
- On the MS Windows platform, Investor/RT is optimized for viewing at a display DPI setting of 96 DPI (Normal Size). Users of Version 8.6.1 and earlier who elect to use "Large Size (120 DPI)" will typically see misplaced controls in certain Investor/RT dialog boxes, for example those containing color setting controls, date controls, etc. While, we continue to recommend that the Normal Size (96 DPI) Windows XP Display setting be used, the dialog box anomalies in 120 DPI mode have largely been corrected in release 8.6.2. For more information on this DPI related issue see <http://www.linnsoft.com/qa/a/21.htm>. This issue is not applicable to the Macintosh platform.
- A shortcut was added to enable the user to exit Investor/RT without making a backup, a way of overriding the "Backup When Quitting" user preference. Hold down the shift key and the ctrl key (option key on Macintosh) as you make the File menu selection to Quit or Quick Exit. For MS Windows user, a shift-ctrl click to close the Investor/RT task window exits the application without making a backup.
- Setup: Preferences: Keyboard Shortcuts now has a "Save All" shortcut in the "Save" category. The user may now setup a function key to perform the Save All command in the File Menu. The effect is to issue a Save on each open window, saving any changes made to each window's setup.
- Holding down the spacebar for a few seconds was causing multiple, unintended download requests to be issued rapidly if a chart window is the front most window. Improvements have been made for traditional, Market Profile, and Footprint chart windows to keep such rapid spacebar characters from setting off unintended download requests. A message will be displayed in the main toolbar message area and a beep will sound periodically to inform the user that spacebar characters are being ignored by the chart. This could indicate that you are unintentionally keeping the spacebar depressed, or perhaps that your keyboard's spacebar is stuck in the down condition.
- When revising color controls from a preferences window associated with a floating window, the color selector window was appearing on the main screen for multi-monitor users, rather than one the screen where the preferences window appears. This has been corrected.
- Investor/RT historical data importing was improved to accept dates in the hyphenated form yyyy-mm-dd (e.g. 2007-02-17). Adding this format fixes a Yahoo! downloading issue where historical data is sometimes sent in this newer format. Investor/RT recognizes dates in a wide variety of formats: 2007-02-17, 20070217, 17-Feb-07, 17-Feb-2007, 02/17/02, 02/17/2007 are all recognized as February 17, 2007. When importing data manually, there is a user preference to specify European date format. When this is checked, slashed dates have the month and day reversed, e.g. 17/02/2007 or 17/02/07 are interpreted as Feb. 17,2007

- In a traditional chart window, you can click on an indicator to select it, then issue Ctrl-C or use the Edit menu to Copy that indicator to the clipboard, then activate another chart and Ctrl-V or use Edit Menu to Paste the indicator into a different chart. If you click on an instrument graph (line/bar/candle) to select the instrument, Investor/RT simply copies the ticker symbol of the instrument to the clipboard. You can then open a quote page window and paste the ticker into the quote page or go to another application, like a web browser and paste the ticker into a form for example.
- Portfolio windows can now show the previous days close for each position. Right-click in a column heading and choose Add Column to add the "Prev Close" column to any portfolio window. Along with the \$Change column you can see the actual change in price in the position since yesterday's close and the associated increase/decrease in each position's value since yesterday's close.
- The (IRC) Chat window now has a new toggle "Chart" toggle button at the lower right corner to make it easy to view web page URL's that appear as messages during a chat session. For example, when a user shares a chart image via charthub.com, the URL of the image web page is automatically placed on the clipboard so the user may click inside the chat input line and "paste" the URL into the chat room to let other users in the chat room know how to locate the image. Users interested in viewing the image can simply click anywhere on the line containing the URL, then click the "Chart" toggle button. The web page will then open in your default web browser. Note that it is not necessary to precisely select the actual URL text, just click anywhere on the chat line that contains the URL you wish to view.

Version 8.6.1 Released Jan. 17, 2007

Market Profile/Footprint Charts, Toolbar/Multi-linking Improvements

The Market Profile chart and Footprint Chart now has a download button and a multi-link color button in the lower right corner of the window. These corresponded precisely to the identical buttons present in traditional chart windows. This improvement means that Market Profile charts and Footprint charts can now participate in color coded groups of charts that multi-link together. For more information on the use of the multi-linking feature of Investor/RT see this help page.

The Market Profile floating toolbar has been expanded to include buttons for activating chart features formerly available only inside the "Info Box". This will facilitate access even when the info box is closed. Showing and Hiding the Market Profile toolbar is available by shift-clicking on the multi-link color box at the lower right corner of the window, as you can do with traditional charts. The toolbar includes button help for each icon as you point at them. Activate button help if necessary, by right-clicking in the message area of the main toolbar and choosing Button Help to "checkmark" that menu item.

The Footprint floating toolbar has been expanded to include buttons for adjusting the background color, turning on/off grid lines, session override, TPO Style, and Profile display. Just as in the Market Profile toolbar, the background color button cycles through a series of colors. Hold the shift key down while clicking this button to move in the reverse direction through the color series.

Rate of Change, ROC Summation Indicators

These indicators have been enhanced to permit specification of periods with V# variables. This enables these indicators to be optimized by the trading system optimizer in the Pro Complete edition of the software.

TPO Indicator: Bands and Auto Tick Increment

The TPO Indicator has several new options. First, an option for "Automatic" Tick Increment was added. It works just like the automatic "Price per Row/Letter" option in Market Profile charts. When "automatic" is chosen, the tick increment is deduced from the display format of the symbol (0.01 for 99.99, 0.25 for 4ths, etc). This allows the user to change symbols in the chart without having to change tick increment. The user has the option of plugging in a "Custom" increment if desired.

A "Draw Bands" option was added. It causes the Value Area to be shaded (from value area low to value area high). Options are available to draw bands for the current VA, the previous VA, or both. When both are drawn, the current VA band will be drawn on top of the previous VA band, however, a line at the previous VA high and low will be drawn over the current band so the user can still see both values. Drawing "Both" bands has a very nice visual effect, especially combined with solid POC lines set to 3 pixels or larger.

Market Profile: Height x Width

The InfoBox of the Market Profile chart was enhanced to show the "Height" (in prices) and the "Width" (in TPOs) of each profile. When pointing at any profile, the "RNG" line of the InfoBox will now show something similar to this: "RNG: 11.50 (46x9)". This means that the range of the profile was \$11.50, and it covered 46 prices (TPOs) vertically, and it's POC was 9 TPOs wide. This can help give the user a good indication of when the profile is becoming "mature".

New Display Format: 320ths (1/64)

A display format named "320ths (1/64)" was added. It displays price in a format of 1420`080 where the 080 represents a fraction of 320ths (180/320) but the underlying symbol ticks in 1/64 increments. The existing "320ths" display format now appears as "320ths (1/128)" and is used for symbols that tick in 1/128 increments, but are commonly displayed also as a fraction of 320ths. The proper display format is important for aspects of the program like the Market Profile charts, and TPO indicator, where the "tick increment" can be set to "automatic". With an automatic tick increment, the display format will be used to determine the increment. An increment of 1/128 will be used for symbols with "320ths (1/128)" as the display format, and an increment of 1/64 will be used for symbols with the "320ths (1/64)" format. These display formats tend to be used by some Interest Rate Futures of the CLOT. The 10 year US Treasury Note futures (ZN), for example, use "320ths (1/64)" while the 2 Year U.S. Treasury Note Futures (ZT) is a symbol that would use "320ths (1/128)".

Tick-Based Charts and Volume Breakdown Indicator

Over the last few releases, refinements have been made to ensure that tick-based charts (tickbars, volbars, rangebars, changebars), and the corresponding Volume Breakdown indicator values, remain consistent when reloading and refreshing charts. The volume breakdown indicator has been an instrumental tool for identifying and diagnosing areas that needed improvement. Minor defects have been corrected in a number of areas including: (1) the handling of ticks at the session open, (2) merging ticks into the database when downloading, (3) time stamping of ticks, (4) real-time reception/accumulation of tick data. Users of the Volume Breakdown indicator will see improved consistency when refreshing (downloading) tick data in version 8.6.1. Please provide feedback to support if you notice any change in tick-based bars, Volume Breakdown values or related signals with this release.

Interactive Brokers Data Downloads (Backfill)

Investor/RT for Interactive Brokers users without a DTN Market Access historical server account have reported numerous problems with data download requests directed to IB/TWS. When a data download (backfill) request has been submitted to IB/TWS and is "in progress", additional download requests for the same or other symbols are queued; they wait for the in progress request to complete. Sometimes, Investor/RT does not get a response to a download request and the end result is that pending requests remain pending. The only solution to the logjam up til now has been to Stop Data to disconnect from IB/TWS then Start Data and reissue the data download requests. Version 8.6.1 adds a menu item to the IB menu to enable the user to cancel a backfill request in such situation, when IB/TWS is non responsive. This enables other pending requests to proceed without having to disconnect/reconnect to IB/TWS. We hope that this "Cancel Download" command will provide a solution while we further investigate the underlying causes for this problem and continue to improve the reliability of the software in this area.

The Feed Status window has been enhanced in the IB version to display the status of backfill requests in progress, including the number of backfill requests waiting. If you make a download request and the request does not complete as expected in a few seconds, right-click in the Heartbeat button on the main toolbar to view the data feed status. If the request remains pending for an extended period of time, issue to Cancel Download command from the IB menu to allow other waiting requests to proceed.

Toolbar Style Adjustment Improvement

Object toolbars all have a button titled "Change Toolbar Style" to facilitate changing the global preference for toolbar style directly from any toolbar rather than having to use the Setup: Preferences: General window. The "Change Toolbar Style" button has been improved to adjust not only the button size and orientation of the toolbar but also the "pin" preferences, if applicable. For example, open any traditional chart (or Market Profile or Footprint chart) and press the "Change

Toolbar Style" button repeatedly. Each time you click, the toolbar will change size and/or orientation (horizontal or vertical). If you have your toolbar position set to any one of the "pin to" settings, the toolbar will transition from pin-to-left, to pin-to-top, to pin-to-right and finally to pin-to-bottom as you click.

Since the screen position of the toolbar changes when you click, you have to move the mouse to click on "Change Style" again. To make mouse movement unnecessary for chart windows, you can instead shift-ctrl-click repeatedly on the "multilink color" button in the right corner of the chart to advance through the various toolbar style combinations. Note that the toolbars for all object types are adjusted to the new settings. For example, if you use this method to adjust your Market Profile toolbar to "small, horizontal, pin-to-top", and then open or activate a traditional chart window, the traditional chart toolbar will have the same style and pin position as the Market Profile chart toolbar, relative to its associated window.

Miscellaneous 8.6.1 Fixes and Improvements

- The use of T# Variables introduced in 8.6 for the correlation coefficient indicator has been extended to the Relative Strength, Alpha, and Beta Indicators. See Item #15 above for details.
- A bug was fixed in the Equity and Index Options Generator. The generator now works properly under the DTN IQFEED version (non-legacy)
- Traditional Charts containing more than one instrument were unnecessarily recalculating technical indicators when trades arrived for either symbol. This has been corrected so that only the indicators for the traded symbol are updated. This bug was problematic for the Volume Breakdown indicator which does analysis of trading volume each time a trade occurs.
- The Share Picture command was not working properly on some technical indicator setup windows in cases where the window title happened to contain a double quote characters. This has been corrected. Share Picture (Windows only at present) should be able to share an image of any Investor/RT window on the ChartHub.com web site.
- Shift-click on the traditional chart download button was mistakenly closing the chart window. This has been corrected. Shift-clicking the download button is a shortcut that causes all indicators in the chart window to be recalculated.
- The File->Open submenu has a new menu item titled "Holidays File". This command opens the holidays.txt file for viewing. If the user has created an override myholidays.txt file, it is displayed also.
- Shift-clicking the X checkbox at the left edge of any traditional chart pane title bar will eliminate all technical indicators from the entire chart. Buttons will remain. Ctrl-clicking the X check box will remove all indicators, including buttons, from the chart window.
- Re sizing the message log or alarm log windows will scroll the window to the bottom now. Formerly, a resize would position the log text back at the top requiring the user to scroll down to the bottom to see the most recent alarms or messages.

Investor/RT Version 8.6 Released Dec. 22, 2006

Traditional Chart Right Margin Setting

A new setting is available in traditional chart preferences to allow the user to specify a right margin. The right margin, expressed in pixels, is designed to reserve room at the right side of the chart for annotations and reference line labels that might otherwise be obscured by instrument and indicator graphs. In earlier versions, the "Lookahead Bars" setting was often used to accomplish this objective, but this technique is unsatisfactory for small values of the "Pixels Per Bar" setting. The new Right Margin setting is independent of "Pixels Per Bar". It reserves a fixed amount of space to the left of the vertical axis in which bar data will not be drawn. Typically a setting of 30 to 40 pixels is ample for reference line labels shown at the right end of the reference line. The Right Margin and the Lookahead Bars setting work together. When Lookahead bars is zero, the Right Margin is the actual number of pixels reserved. If both Lookahead Bars and Right Margin are specified, Investor/RT computes the amount of margin that will be contributed by the lookahead bars. This is function of the Pixels Per Bar setting. Only if necessary are additional pixels reserved for the margin. The best way to see the interplay between the two settings is to create a simple candle chart with a reference line showing a label at the right. Specify 10 Lookahead bars and 40 pixels of right margin. Then use the up and down arrow keys to expand and contract the pixels per bar. As pixels per bar rises to 4 and higher, the lookahead period of 10 bars is wholly sufficient to provide the 40 pixels margin. However, as the pixels per bar declines to only 1 pixel, the right margin is still maintained at 40 pixels even though the lookahead period alone would not suffice.

The Lookahead Bars setting for traditional charts is a setting used to provide space for extending trend lines and regression lines into the future. For example, when viewing a daily chart with a regression line calculated on the last 100 trading days, you may wish to see where that regression line predicts the price of the instrument will be in say 30 periods (days). So specify Lookahead at 30 bars and setup the regression line to "Extend Right" and observe where the line intersects the price axis. The lookahead bars setting is also employed when you "pan" a chart to the left or right using the "Pan" tool on the chart toolbar. Panning enables you to adjust the Lookahead period dynamically using the mouse so you can see reference lines or trend line/regression line extensions that would otherwise be "off the chart".

The Lookahead bar count and the Right Margin pixel setting each have their own purpose. These two settings can be used independently or in combination. If you have been using the Lookahead setting to provide white space for reference line labels, we recommend you change your chart setup to use a suitable right margin setting instead. Doing this will ensure that the reference line labels are not obscured by other graphs as you adjust the pixels per bar with the up/down arrow keys.

CQG Support for MarketDelta Users

The CQG data feed will soon be supported in the MarketDelta editions of the software. A CQG version will be available for beta testing in the near future. Contact support@marketdelta.com if you have interest in beta testing.

NinjaTrader Trading Order Improvement

Trading Orders destined for NinjaTrader can specify a NinjaTrader strategy name and strategy_id with a trading order to uniquely identify an instance of that strategy to which the order pertains. This specification of strategy_id is especially important if the Investor/RT user has multiple trading position in progress. Trading orders for exiting the position or adjusting stops and targets must have a way to unique identify which position the trading order pertains to. The strategy id can be specified by the user as some arbitrary string of letters and digits, or it can be specified as a T# variable or V# variable where each instrument has a unique value. This enables the user to have multiple positions open on difference instruments and each instrument has it's own unique strategy_id. The V# or T# approach does not enable you to discern between multiple open positions of the same instrument however. To make this possible, the strategy id may now to be specified with the syntax &V#n, where n is a valid user variable number. The ampersand preceding the V# declaration is important. It tells Investor/RT that the strategy_id will be a number that Investor/RT assigns and that the assigned number should be set into the specified V#n for the instrument. Thus if you want to execute several concurrent trading position using NinjaTrader strategy named "MyStrategy" on an instrument you could setup one trading order to initiate a position using V#30 using "MyStrategy[&V#30]" in the trading order strategy setup. You could have another trading order setup to initiate a position using "MyStrategy[&V#40]". When open positions are working on the same instrument, the instrument's V#30 value will then contain the unique strategy_id for one of the positions and V#40 will have the strategy_id of the other. You can then have trading order setup to exit those positions using "MyStrategy[V#30]" and "MyStrategy[V#40]" (no ampersands). Use the [&V#n] syntax on the trading order that initiates the position and use [V#n] syntax on related trading order setup that exit or modify the position in some way.

Market Profile Improvements

Custom Colors and 24hr Session Market Profile charts have a "Custom" option for coloring letters. This options gives the user the ability to customize the color of each letter by clicking on the appropriate letter in the time line at bottom of the chart, and then choosing that letter's color. This feature however is limited to 30 colors, and did not work properly in prior releases for sessions that involved more than 30 letters, such as the 24 hour session (number 31). In version 8.6, if the session involves more than 30 letters, the last 29 letters colors will be customizable, with the first letters sharing the same color. So for instance, session 31 involves 48 letters. The first 19 letters will share a color, while the last 29 are customizable.

In addition, if the chart is set to Session 31, shift-clicking within any overnight letter (the first 26 letters), results in all overnight letters getting set to the selected color. Similarly, shift-clicking within any RTH letter (last 14 letters), results in all RTH letters getting set to the same color. For those using overnight session 31, a start letter of U will resulting in the a first RTH letter of D, while a start letter of R will resulting in a first RTH letter of A.

TPO Indicator - Value Area % Option The TPO Indicator has been enhanced by giving the user the ability to specify the Value Area Percent. The most common percent used, and the default, is 70 %, but the user now has the freedom to change that % level if he chooses, similar to the flexibility in Market Profile charts.

Toggling Reference Lines Reference lines in Market Profile charts can now be added and removed easily by simply double-clicking on any price in the price scale of the chart. The double-click action will add a reference line at that price if one does not exist, or remove an existing line. This makes it easy for users to quickly add and remove lines on demand to MP charts without going to the trouble of opening up the preference window and specify the price.

Additional Reference Lines A new capability was added to Market Profiles to greatly expand the number of reference lines that a user can add to the chart. This capability works as follows. The user plugs in a reference line with the following format:

Where x controls the number of V# variables that will be used, and y is the V# variable at which to start. As a specific example, suppose the user plugged in the following:

The result will actually be 4 reference lines. The V# variables used will be V#10 plus the next 3 (V#11, V#12, and V#13). Reference lines will be drawn at the price values specified within for those 4 V# variables. User can add quotepage columns for each of their V# variables to provide a way to quickly change these values (by just changing the value directly in the quotepage cell). To take things to an extreme, the user could specify:

And have 512 reference lines, all the way from V#1 through V#512.

In addition, users may now transfer the following MP data out to V# variables: High of Current Profile (=DHI), High of Previous Profile (=HI), Low of Current Profile (=DLO), and Low of Previous Profile (=LO). For more information on this feature, please visit:

<http://www.linnsoft.com/qa/a/102.htm>

Market Profile Fonts Users can now shift-click on the "Blocks" button in the Market Profile InfoBox to toggle through different letter fonts. The button will toggle through all the available fonts in the operating system. The works nicely in combination with the "Color" and "BG" buttons which allow the user to cycle through the letter and background colors to come up with just the right look.

Market Profile Charts at Session Open Market Profile charts, prior to this release, were reloading their data and recomputing the chart at the session open. This was causing excessive delays for some users so now the charts will just continue processing the data at session open without any reloading or recomputing. This should result in a much smoother open for those with lots of MP charts, or lots of data on symbols in MP charts.

Value Area in Info Box The Market Profile Info Box was enhanced to show the value area high and low (VAH & VAL).

Time and Sales "No Trade" Color

A new color control was added to the Time & Sales window to the right of the "Show All Bid/Ask/Size Change" check box. When this check box is checked, this color will be used to color quotes which are non-trades (zero volume), which involve only changes in bid size, ask size, bid price, or ask price. This will allow the user to quickly identify actual trades.

New Draw Types for Technical Indicators

A number of technical indicators are provided with several options for drawing styles, including "Line, Continuous", "Line, Connected", "Histogram, Hollow", "Histogram, Solid", "Histogram, Custom", "Line, Two Color", and "Line, Stepped". Several of these drawing styles involved two colors. Those that involve two colors are painted based on either whether it's a rising/falling value (from previous), or whether it's a positive/negative value. This has always been a global option in Investor/RT,

controlled by a setting in "Setup: Preferences: Charts: General", and thus forcing all indicators to share the same setting. Four new options have now been added to the drawing types: "Histogram, Hollow (U/D)", "Histogram, Solid (U/D)", "Histogram, Custom (U/D)", and "Line, Two Color (U/D)" in addition to changing four of the existing options to "Histogram, Hollow (+/-)", "Histogram, Solid (+/-)", "Histogram, Custom (+/-)", and "Line, Two Color (+/-)". With these new options, the user now has independent control over how each indicator is colored: (U/D) is colored based on whether the value is Up or Down from the previous value, while (+/-) is colored based on whether the value is positive or negative. User who previously used the global "Rising/Falling" option, will have to update their indicator settings to the new (U/D) choices for the indicators they wish to be painted based on rising/falling values.

Zig Zag Indicator- Hide Trend Lines

A new "Hide Trend Lines" check box was added to the Zig Zag indicator that allows user to hide the trend lines while the labels remain visible. This can reduce clutter in the chart while still displaying important information through the labels.

Improvements to Volume Breakdown Indicator

The Volume Breakdown indicator has been enhanced with several new options. In the "Results" listbox at the top of the Volume Breakdown preference window, users will now find options for:

Buy Volume % - Percent of volume within each bar which was classified as buy volume (traded at or above the ask).

VWAP - Volume weighted average price of each bar. Each tick is weighted by it's volume to produce a weighted average price of all ticks within each bar.

Big Volume % - Percent of volume within each bar which was classified as "Big Volume". "Big Volume" is defined as any trade with a size greater than a size specified to the right of the "Consider Only Trades With Volume" check box. That Volume Box will be editable whenever "Big Volume %" or "Big Trade %" results are selected.

Big Trade % - Percent of Trades within each bar which was classified as "Big Volume". This result simply deals with the number of trades, as opposed to the size of those trades.

Also, in the Volume Breakdown indicator, the word "accumulate" has now become a listbox with choices "Accumulate", "Average", "Maximum", and "Minimum". With these options, in addition to "accumulating" the days values, the user can also average those values, or find the highest or lowest value of the day (or of the entire charted period). The "Average Days Values" works especially well in concert with the "VWAP" result option, to get a very accurate number of the volume weighted average price of the day, built using every tick.

Normalized Delta An option was added to the Volume Breakdown indicator to allow the user to "Normalize" the result. When the "Normalize" check box is checked, the VB Result (such as Delta) is divided by the volume and then multiplied by 100, to give in effect a positive or negative percent of total volume. For instance, a normalized delta of 34 would mean that the delta was positive, and 34% of the total volume. A result of -100 would mean that all the volume traded in that bar was sell/bid volume (negative).

Delta Momentum Two results were added to the Volume Breakdown Indicator: Delta Momentum and Delta Mom Count. Delta Momentum essentially sums up the delta values while the per bar delta remains on the same side of the zero line. When delta turns from positive to negative, the result will reset to that negative values, and the result will continue to accumulate while the deltas remain negative. When delta becomes positive, the result will reset back to that positive value, and accumulate from there while delta remains positive. Delta Mom Count works in the same way, except it simply counts how many bars delta has remained positive or negative consecutively. A value of -5 means we've had 5 consecutive negative delta bars.

Reference Line & Trend lines Alerts on Indicators

In the past, reference line or trend line alerts have been based on instrument price crossing the line value. In version 8.6, a reference line or trend line that is placed in a standalone (non-instrument) pane along with a technical indicator, will alert based on the indicator's value crossing the line, instead of the current price of the symbol. Users can now add reference lines to panes involving CCI, RSI, MACD, and other standalone indicators and be alerted when the indicator's value crosses the reference lines. The line may then be repositioned for further alerts. This provides a quick and easy method of setting up alerts on indicator values, eliminating the need to create individual trading signals and associated signal marker indicators for each level. This makes indicator alerts available to users that license standard editions of the software without the RTL Language. Indicator alerts work only in panes having no instrument. The association of the reference line or trend line to the target indicator is done automatically to the first indicator in the pane that is not a reference line or trend line. In cases where you have more than one candidate target indicators in the pane, use the Pane Ordering feature to position the indicator you wish to monitor at the top. If you have two indicators that you wish to setup alerts on, each should go into its own pane. Some of these restrictions may be relaxed as we move toward a more generalized method of allowing an indicator to be associated with another indicator elsewhere in the chart in future releases of Investor/RT.

New Technical Indicator: Relative Slope (RELS)

Authored by Dimitris Tsokakis, the relative slope takes an exponential moving average of typical price (HLC/3), commonly a 20 period EMA but the period is customizable. It then takes the resulting values, and for each value, the previous value is subtracted and the result is divided by the sum of the two values. These results are then further smoothed with a 3 period EMA. The RTL Token for the Relative Slope is RELS. A common system for trading the RELS would be to buy when it turned positive:

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Volume Breakdown Indicator Enhancements
See <http://www.linsoft.com/tour/techind/vb.htm>.

RTL Tokens: LAST#1, LAST#2, LAST#3

In prior versions, the LAST#1 RTL token, and the Last.1 quote page column, reflected the price of the previous tick or trade, regardless of whether the price of that tick/trade was different than the current price. In 8.6 Beta 4, this has changed. LAST#1 (Last.1) now represents the last price that was different than the current price (LAST). So if price changes from 1387.50 to 1387.75, then LAST#1 would be 1387.50 and would continue to be 1387.50 as long as the current price didn't change. Once the current price ticks up OR down, then LAST#1 would change to 1387.75. Now users may rely on the custom indicator syntax LAST - LAST#1 to give them an indication of which direction price last ticked. This custom indicator could efficiently be added as a custom column to show which direction each symbol last ticked (and color coded accordingly). Similarly, LAST#2 represents the price achieved prior to LAST#1, and LAST#3 represents the price achieved prior to LAST#2. LAST#1 - LAST#2 and LAST#2 - LAST#3 custom indicators could also be used to look at the prior two price changes.

To provide access to the previous 3 actual trade prices (regardless of price change), new RTL tokens TICK#1, TICK#2, TICK#3 are now available.

Yahoo! Screener Enhancements

The Yahoo! Screener feature (Setup: Screen) has been enhanced significantly by making a number of additional criteria available for screening.

- Share Price
- Market Cap
- Dividend Yield
- Beta (Volatility)
- Sales Revenue
- Profit Margin
- P/E Ratio
- Price/Book Ratio
- Price/Sales Ratio
- PEG Ratio
- Estimated 1 Year EPS
- Estimated 5 Year EPS
- Average Analysts Recommendation

The user can screen for these criteria to be above a certain level, below a certain level, or between two user defined levels. While the Yahoo! Finance web site screener limits you to specific values for each criteria, Investor/RT lets the user specify the exact numbers they would like to use. The numbers available in the menu lists are guidelines; enter any value into the entry boxes.

Session Override Added to Custom Columns

A "session override" feature was added to custom columns. This feature functions similarly to the override available in various charts and in back testing. When a custom column is set to an intraday periodicity, the session override may be used to dictate the session data that is loaded for calculation of the Custom Column value. This may be especially valuable to futures traders who keep most of their symbols set to the 24 hour session (#31), but would like to see certain custom columns computed only on the RTH session data (session #2).

Correlation Coefficient, Relative Strength, Alpha, Beta and T# Variables

Users can now add the correlation coefficient, relative strength, alpha, or beta indicators to a quote page as a custom column, but allow each symbol to be correlated/compared with a different base symbol. This is done using the following procedure. First, add a new symbol to your system with the ticker symbol "T#1" (any T# text variable can be used). Make the T#1 symbol of security type "Cash" (so that Investor/RT will not attempt to monitor it via the data service). Now, in the indicator setup, set up the indicator to correlate/compare with symbol "T#1". Now add T#1 as a quote page column also, and for each symbol row, plug into T#1 the ticker symbol with which the row's symbol is to be correlated/compared.

Miscellaneous Fixes and Improvements

- When issuing the Save As Picture command to create a PNG (Portable Network Graphics) image of a chart or some other window in Investor/RT, if you hold down the shift key, the resulting PNG image is also displayed in your web browser (or whatever program you may have setup in MS Window to open PNG (Portable Network Graphics) images).
- The Time and Sales (T&S) window was improved to periodically free memory resources associated with the window. This reduces the memory usage of T&S windows that are kept open for extended periods of time. For minimal memory usage, use the T&S setup to display "Last N Ticks". T&S windows setup for "All Trades" also benefit, but they can consume considerably more memory because there is no limit to the number of ticks collected for display. If you use the new option to view bid/ask changes along with actual trades, it is strongly recommended that you use the Last N Ticks setting rather than All Trades. The title bar of the T&S window tells you the number of ticks (and bid/ask changes) currently available for display in the window. If you wish to keep an eye on the Time and Sales of one or more instruments, it is recommended that you make something like "Last 100 Ticks" or "Last 500 ticks" your default setting. This will minimize long term memory usage for T&S windows, even if the windows remain open and updating for the entire trading session. In addition, far less CPU resource is required to manage T&S windows when the Scroll Rate option is checked.
- Custom Indicator technical indicator preferences includes a new setup calling for the current value of the indicator to be maintained in a user-specified user variable.
- A bug was fixed in the DTN IQFEED (Windows) Edition having to do with trade volume showing up in the Time and Sales window even for bid/ask changes. The tick volume is correctly shown as zero for bid/ask changes now.
- Industry and Sector are available for inclusion in portfolio formats. This enables portfolios to be sorted by industry or sector. Industry and sector are available for downloading in all editions of Investor/RT using Yahoo! Finance as the source in the Data Download window.
- A bug was fixed in traditional charting that was causing the chart to end prematurely if the (rare) case that the chart contained more than 32,768 ticks or bars.
- There is a new trend line labeling option titled "Prices". When this option is selected, the trend line will be labeled the number of prices (or ticks) covered by the trend line. What constitutes a price or tick is dictated by the symbols "display format" (in Setup Instruments window). For instance, a display format of 99.99 results in prices of 0.01 ticks. A display

format of 4ths results in prices of 0.25 ticks, etc. This labeling option is available for other trend line-based indicators as well including Regression Lines and Zig Zag.

- FILL, STOP, TARG as Market Profile Reference Line Values. Users may now enter the text "FILL", "STOP", or "TARG" in any Market Profile reference line's value field, and that reference line will be drawn at the corresponding symbol's TR_FILL, TR_STOP, or TR_TARGET price.
- New Display Formats: Fives and Tens. Two new display formats, "Fives" and "Tens" were added. These formats should be used for Instruments that trade in \$5 or \$10 tick increments.
- Market Profile Button Shortcut. A new shortcut is available for the Market Profile "OR" button. The OR button (Opening Range) can be shift-clicked to change the opening range to a 1-min opening range, and it can be ctrl-clicked to change to a 5-min opening range. A regular click toggles the OR lines ON/OFF.
- When adding or modifying symbol setups in the Setup: Instruments window, shift-click the "Add" or "Modify" button will apply the changes made without clearing the window for entry of a new instrument.
- The Save As Picture and Share Picture commands (Windows Version) now produce PNG graphic files that include the subject window's frame and title bar.
- Display Format 128th price data is now shown in the format xxx^yyy where the ^ symbol indicates the number following is the number of 128ths. Formerly, 128ths display format caused price values to be shown as reduced fractions.
- Setup: Preferences: General has a user check box titled "Disable Bring to Front Menu". Many Investor/RT users seldom if ever use the Bring to Front menu. Checking this box eliminates the overhead associated with keeping the list of open windows available for selection. Some users who routinely keep 50 to 100 or more windows open at all times, and/or those who have well over 1000 charts, quotepages, and RTL objects setup will benefit by checking this box. A large number of open windows coupled with a large number of defined objects (whose names appear in various menus) makes for considerably more memory usage and processing overhead associated with opening and closing windows due to the requirement to adjust the menu hierarchy each time. This new feature has been added to reduce resource requirements under very demanding conditions to increase product stability. When the Bring to Front menu is available (enabled), you may disable it by choosing "Disable This Menu" from the menu itself (the second menu item). Once the menu item has been disabled, it can be enabled from the General Preferences window.
- A bug was corrected in the TPO Indicator, where the indicator would not properly reset at the session open, but would instead continue with the previous days VA & POC values.
- The Profile Indicator now works properly on tick-based period charts (tickbars, volume bars, range bars, change bars).
- DTN.IQ (Legacy) and IQFEED (Windows Only) data feed support was improved to use DTN provided time stamps for the time of each trade. At present only the hour and minute of each trade is supplied by DTN. Investor/RT reports the time stamp as HH:MM:01. DTN plans to introduce HH:MM:SS time stamps in the next few months, adding SS seconds to more precisely stamp the time of the trade. Prior versions of Investor/RT use the local computer clock's time to timestamp each trade as it is received. This method has the advantage of reporting the hours/minute/second each trade was received, but can sometimes result in a trade being mis-recorded into the incorrect minute interval. When historical data is

downloaded from DTN IQFEED the ticks and/or bar data supplied are based on the trade times, not the "reception time" as recorded by Investor/RT.

The change to use the DTN supplied HH:MM time stamp will improve the overall integrity of the resulting data. However, trade times will no longer reflect seconds, at least for a few months; this means that periodicities that are not whole minute intervals (e.g. 30 secs) will not be possible using IQFEED until the HH:MM:SS timestamp transmission begins in 2007. When timestamps are transmitted in HH:MM:SS form, DTN will also begin tagging each trade with a unique tick sequence number. This additional information will enable Investor/RT to more precisely synchronize downloaded ticks with the realtime transmitted trades when tick data downloads are requested during live trading sessions. At present, Investor/RT synchronizes as best it can using the HH:MM time stamps, but a small number of ticks that happen to occur while a tick data download is being requested may end up being replicated twice in the resulting data after the download completes. Once the tick sequence number transmissions begins, these redundant ticks will no longer be an issue. These minor imperfections are typically invisible to most users but those using Footprint charts or Volume Breakdown indicators, or tick/bar periodicities may be affected by the presence of a few redundant ticks in charts after a download. Again, these imperfections will cease to be an issue once the tick sequence numbers begin transmission in 2007.

- Traditional chart buttons with purpose "Change Scaling" were ineffective if the button belonged to the "button pane" at the top of the chart window. Such buttons work fine when they are placed inside the pane whose scale is to be adjusted. When such a button resides in the button pane, the scaling revisions are now applied to pane beneath the button pane.

Version 8.4.1 – Version 8.5.6 Release July 14, 2006 – October 12, 2006

IRC Chat Floating Window Preference

IRC Chat windows can be floating windows by checking the "Floating Window" checkbox in Setup: Preferences: Chat. The Floating preference takes effect with all subsequently opened chat windows, public or private, as well as chatroom preferences windows. This option allows MS Windows users to drag the IRC Chat window outside the Investor/RT task window. Also, double-clicking inside the chat window no longer opens the preferences. Instead use a right-click inside the chat window, or simply click the new Preferences toggle button at the lower right corner of the chat window.

IQFEED Feed Support via IQ Connection Manager

For Windows users, connection to DTN IQFEED is now supported via DTN's IQ Connection Manager software. When configuring Investor/RT for use with DTN IQ feed, there are two choices for DTN IQ: DTN IQFEED and DTN.IQ (Legacy). The IQFEED choice configures Investor/RT to connect to DTN via

the IQ Connection Manager software. This enables Investor/RT to operate with streaming DTN data in parallel with other application using IQ Connection Manager. At present the IQFEED supports only Level I streaming data. News and Level II streaming data are supported at present only in the legacy DTN.IQ configuration. The legacy configuration requires the Investor/RT be the exclusive application using the DTN IQ/IQFEED account. Macintosh users will continue to be supported via the legacy connection method.

If you elect to use the IQFEED configuration, you must download and install the latest DTN Client software from the DTN web site:

<http://www.iqfeed.net/index.cfm?displayaction=support§ion=download>

NYSE Advance/Decline from IB

The NYSE Advancing and Declining Issues are available in the IB version of Investor/RT using the ticker symbol AD-NYSE. The AD-NYSE instrument must be setup as an "Index" with Override Exchange code NYSE. This is an unusual IB symbol. The advancing issue count is transmitted via the bid and the declining issue count as the ask price. The number of unchanged NYSE issues is reported in the "Bid Size". No "Last price" is transmitted for this symbol.

Changes were made to Investor/RT 8.5.2 for IB to allow the advances, the declines, or the difference or ratio of the two to be easily tracked using custom instruments. First, the bid (advances) of AD-NYSE is mapped by Investor/RT to the last so that a simple line chart of AD-NYSE will show you how the advancing issues changes over time. To see the declines, setup a custom instrument (Setup: Custom Instrument), a "sum" of just one component AD-NSYE using the ask price for that one component.

To track the advances minus the declines or the advance/decline ratio, create a custom instrument with two components as a "difference" or a "ratio". Both components will specify AD-NYSE with the bid price specified for the first component and the ask price specified for the second component.

The IB ticker symbol VOL-NYSE works similarly. The advancing volume is reported in the bid, the declining volume in the ask, and the unchanged volume in the bid size. Similar custom instruments can be setup easily to track the NYSE advance/decline volume spread or ratio.

Historical data for these custom instruments is not available. The custom instruments will update in real-time for charting or display in quote pages. Mark the custom instruments for intra-day monitoring to retain real-time collected historical data for charting.

New Chart Data Downloading Options for Tick Data

New options were added to Setup: Preferences: Historical, having to do with tick data downloading. To review details click [here](#) or open the Historical Retention Preferences window and click the "More Information..." button in that section of the window.

New Full Download Command

The popup menus for traditional charts, Market Profile and Footprint charts now have two choices for downloading data: Chart Download and Full Download. The Chart Download performs a historical download based on the periodicity requirements of the chart and the chart's associated ticker symbol(s). See the discussion in item #8 above concerning new options for when to download tick data vs. minute interval data. The shortcut a Chart Download is to tap the spacebar when the chart is the front window. Traditional Charts also have a Download Data button in the lower right corner that has the same Chart Download effect.

The new "Full Download" command performs a three-step historical download of daily bars, intra-day minute bars, and tick data using the Historical Retention settings for the instrument in the chart to determine how many days to download. A "Download Data" menu item was also added to the quotepage popup menu. To perform a Full Download for any symbol you can thus right-click on the ticker symbol in a quotepage and choose Download Data. For users who have a mixture of charts, some of which require tick data and others requiring longer term intra-day interval data, the Full Download provides a means of initially loading a full complement of daily, intra-day, and tick data to satisfy diverse charting requirements. See Setup: Preferences: Historical and press F1 for details on setting up default and instrument specific data retention settings.

The "+" menu in the upper right corner of any quotepage can be used to perform a Full Download on all of the symbols in the particular page. Investor/RT will prompt for an OK before initiating a multi-symbol full download.

For traditional charts, you can setup a function key shortcut for performing a Full Download on the symbol in the chart. See Setup: Preferences: Keyboard Shortcuts. Use "Toolbar" and "Chart" as the shortcut action and select "Full Download" from the list of chart toolbar functions. For example, you could setup F2 to mean "Data Download" and Shift-F2 to mean Full Download. These shortcuts will apply the current traditional chart, not to Market Profile or Footprint Charts.

Time and Sales Improvements

A new checkbox was added to the Time & Sales preferences titled "Show All Bid/Ask/Size Changes". When checked and when the tick volume filter is off, the Time and Sales window will show non-trade activity as the bid, ask, or bid/ask sizes change value. Such lines will have zero volume. When this checkbox is unchecked or when a tick volume filter is active, the Time and Sales window shows only trades with volume at or above the filter limit. A bug was fixed in the time and sales window that was preventing the column widths and some other setting from being saved properly when the Save As Default button was clicked.

Automatic Session Time Zone Setup

Investor/RT detects your operating system time zone setting at startup and verifies that your Investor/RT time zone setting is set to that time zone. For new users who have never setup a time zone, the computer's time zone is now established automatically as your Investor/RT time zone and all of the standard session definitions included with Investor/RT will be time-shifted to reflect the local times of that time zone. For existing users who have already setup a Investor/RT time zone, Investor/RT will verify that this setting is correct and if not, Investor/RT will ask at startup if you wish to adjust your settings to the correct zone. If you "OK" this prompt your time zone will be set to the correct time zone for your computer and all session definitions will be translated from the former time zone to the new correct time zone. If you cancel this message, no changes will be made. It is recommended that you okay this message. In order for Investor/RT to correctly translate date/time values received from various data vendors to your local computer time zone, Investor/RT must be set to the correct local time zone.

For the time being, the Setup: Preferences: Sessions window will still allow you to make adjustments to the time zone, but this should rarely if ever be necessary. In the past, there have been periods of time when daylight saving time goes out of effect in some time zones but not in the U.S. for a week long period. Investor/RT is designed to detect whether your computer is currently on daylight savings time and to adjust accordingly. But if you are in a time zone where DST is not in effect, yet Investor/RT is informed by MS Windows that DST is in effect, this can confuse the software so it is "off one hour". Should this problem reoccur, a temporary solution is to set your time zone one zone over to compensate. If this is necessary, Investor/RT will prompt you at startup as described above until this work around is no longer necessary. Just reply cancel to the prompts until you are ready to move back to your real time zone.

If you move your computer to a different location and decide to change your computer's time zone to the new time zone, quit Investor/RT, make your date/time control panel adjustments, and startup Investor/RT again; the software will detect the new zone and (with your ok) shift all of your session times to the new time zone automatically.

At present, this new automation is available only under MS Windows. Support of this feature in Macintosh OS X will follow at a later time.

Sharing Chart/Quotepage Definitions

The Share Picture command (see item #4 above) has been enhanced to enable sharing of chart and quotepage definitions along with the image. The charthub.com web site now shows a link above the image titled "Definition" whenever a definition is available for the displayed image. Click the Definition link and your web browser will show the definition text in a new window. You can the right-click inside the definition text page and choose Select All, right-click again to Copy to copy the selection to the clipboard; then choose File: Import: Definition from Clipboard to import the chart or quotepage into your Investor/RT workspace. If you do alot of importing from charthub.com you may

want to setup a function keyboard shortcut, e.g. F2 for "Import Definition from Clipboard". See Setup: Preferences: Keyboard Shortcuts.

Setup: Preferences: Sharing opens a window where you specify whether or not to include definitions when sharing charts and quote page images, or whether Investor/RT should ask you each time a Share Picture command is issued.

Each image shared with the Share Picture command carries the name of the "Author" inside the png image file. The Sharing preferences window provides an entry box for a nickname to identify yourself as the contributor of the shared image. If the nickname is left blank, the user name from the Setup: Preferences: Registration window will be used. A check box is also provided if you wish to share using the nickname "Anonymous".

You may elect to submit a specific comment or no comment each time you share a picture, or you may request that Investor/RT ask you to supply a comment each time you share an image. The comment is saved as the "Description" inside the png graphic image that is shared on charthub.com.

Effective with Version 8.5.5, the first time you issue a Share Picture command, Investor/RT will instead bring up the Sharing Preferences showing default settings. Once you setup your preferences and Apply or OK them, you may begin using the Share Picture command with the new sharing features.

Miscellaneous Fixes and Improvements for Version 8.4.1– 8.5.1

- Recent improvement of the recalculation efficiency of the Volume Breakdown indicator had an unintended side effect, a fatal error if any of the Jurik Indicator plugins were used inside a custom indicator or signal. The defect is corrected in 8.4.1. The four Jurik plugin indicators, JMA, DMX, RSX, and VEL were updated and now show a revision date of July 2006.
- In the Rules tab of custom column setup, clicking in a signal action or schedule cell to specify the named action or schedule was ineffective if the selected action or schedule happened to be the last name in the presented list of choices. This has been corrected.
- Chart buttons for setting a user variable and optionally executing a trading order now accept TR_STOP and TR_TARG. The button setup "V#23 comment[myTradeOrder]" will prompt the user to click the mouse to set V#23 (showing comment) and then execute trading order myTradeOrder after V#23 has been set to the selected price. Similarly the setup "TR_STOP[myTradeOrder]" sets the token TR_STOP to the selected price and executes the trading order myTradeOrder.
- A bug was fixed in the Intel Mac OS X edition of Investor/RT that was causing connection attempts to DTN Market Access historical server to fail. Users of PowerPC Mac OS X and MS Windows editions were not affected. This bug affected DTN MA Edition users as well as IB/TWS users that have DTN Market Access accounts.
- Here are some handy shortcuts for using the QP button on the main toolbar: A Ctrl-Click on the QP button opens the .All Symbols quote page (Mac users option-click). Right-click

- on the QP button to create a new untitled quotepage (Mac users with a single button mouse use control-click). Shift-click on the QP button to view the quotepage name selection list. This list can be used to open several quotepages via its Apply button. Each of these actions can be done, of course, by clicking on the QP button to obtain the menu and then making the appropriate menu selection. These shortcuts, if you can remember them, save you the trouble of navigating the menu. In general, right-clicking on a button in the main toolbar gives you the "Create a New One" effect. For example, to create a new chart, right-click the Chart button; to create a new RTL object, right-click the RTL button.
- Several bugs were fixed to eliminate fatal errors stemming from deleting every symbol in Investor/RT. Eliminating every symbol is something a new Investor/RT user might do to eliminate the sample ticker symbols provided by the Investor/RT installers.
 - The time and sales (view/edit) window was enhanced to refresh the window when the "Show Trades with Volume..." Preference setting is adjusted. The resulting time and sales window will show only those trades with volume equal to or greater than the number specified. In the past, changing this setting only took effect for new trades arriving into the window. Also, the volume threshold number can now be entered using k or m suffix notation, e.g. 5k or 5K is accepted as 5000, 1.2m or 1.2M is accepted as 1,200,000.
 - A bug was fixed in the Volume Breakdown Indicator in Versin 8.5.1. The bug caused the indicator to flatline as new bars formed after the initial display of the indicator.
 - Improvements were made to the Setup: Equity and Index Options and to the IB data feed support to enable suite of stocks options to be generated with all of the setups necessary for the stock options to begin quoting immediately.
 - eSignal Version of Investor/RT updated to support newly available 2500 symbol limit accounts.
 - An obscure bug was fixed that was causing intra-day chart drawing problems for clients in GMT + 8 and higher timezone (Hong Kong, Singapore, Tokyo, Australia and New Zealand time zones).
 - Improvements and corrections were made to Investor/RT support for floating windows.
 - Setup: Preferences: Mail & Internet has a new checkbox to the right of the "Check for Updates" checkbox. The new checkbox is titled "Check for Beta Test Updates". If you check this option along with Check for Updates, Investor/RT will notify you if there is a beta test version of the software available that is more current than the version of Investor/RT that you are running. Investor/RT does not offer to download beta test releases at this time, but the software displays a notification message with a reference to the web page where the beta release may be download. Beta test releases of Investor/RT give you access to bug fixes and new features before they are made generally available via a final release version.
 - The Download Historical Data event type in the Setup: Schedules window is normally used to perform a scheduled download daily or intra-day data for all symbols in a chosen quotepage. An new option has been added by way of a checkbox titled "Download for Frontmost Chart". When a schedule runs with this option checked, the download action is performed on only one symbol, the symbol found is the front chart window.
 - A bug was fixed in the portfolio management area that would in certain cases prevent additional positions from being added to a portfolio. The bug seemed to surface only with

large portfolios containing 25 or more open positions. Opening new positions functions reliably now, regardless of portfolio size.

Version 8.4.0, Released June 28, 2006

Chart Buttons for Adding/Removing Instrument

A chart button with purpose "Change the Instrument" has a secondary purpose of adding an instrument to a chart instead of replacing (substituting) the existing one. This is accomplished by prefixing the ticker symbol in the button setup with a plus sign. A setup such as +TRIN adds the instrument TRIN to the chart in a new pane leaving the existing instrument in the chart. The behavior of this additive feature has been revised to remove the specified symbol if it already is present in the chart. Thus a button with setup +TRIN will show the TRIN on the first click and remove the TRIN graph on the next click. The behavior is now similar with the "Add/Remove Indicator" button purpose.

NinjaTrader Trading Order Enhancements

Incremental improvements to Investor/RT-NinjaTrader interoperation continue to be made. See item #21 of the Version 8.3 What's New for details of 8.3 released improvements in this area. The latest improvements have to do with submitting Change Order commands to NinjaTrader. These trading order setups now allow an order quantity of zero, which NinjaTrader interprets as "no change" to the quantity of the order being revised. Most trading orders submitted to NinjaTrader are now followed within a few seconds with an automatic check of market position and order status. These checks record messages to the Message Log showing the status of every order and the position status of the instrument that was the subject of the submitted trading order. If NinjaTrader responds with a position size for some symbol, Investor/RT will records the TR_FILL and TR_POS tokens with the returned values. These values can be displayed in chart annotations, or in a quote page. The user may also elect to send "Get Order Status", "Get Market Position", and "Get Strategy Position" trading orders to NinjaTrader using any of the techniques available for executing (sending) trading orders.

Screenshots of Investor/RT Windows

The Windows edition of Investor/RT has an improved screenshot feature that can now be used to capture a bitmap (bmp) image of any Investor/RT window. Make the desired window the front window by activating it, then choose File: Save: As Picture. For chart windows, you can right-click inside the chart and choose Save: As Picture. The improved image capture is no longer limited to chart windows; any open window may now be captured as image. Macintosh OS X users have window capture facilities as part of the Mac OS. Press Apple+Shift+4 to activate the Mac's built-in screen capture facility. Then tap the spacebar to activate the "capture window" mode and click inside the window you wish to snapshot. The Macintosh captures the image as a PNG (Portable Network Graphic) file, a compressed format. At present the Windows capture feature in Investor/RT creates uncompressed bitmap (BMP) files. Work is underway to improve Investor/RT to save images in PNG format also.

Miscellaneous Fixes and Improvements for Version 8.4

- When modifying the exchange or session setup for an instrument in the Setup: Instruments window, changes to display format were being discarded. In some circumstances, other checkboxes modified before changing the session or exchange was reverted to their original settings. These defects have been corrected.
- When choosing a scan to open from a menu or list, Investor/RT shows all scans plus all signals that are marked as dual-purpose. If you choose a signal, Investor/RT will now open the signal and setup the window as if the signal were a scan. Similarly when choosing a signal to open, if you choose a dual-purpose scan name, the resulting setup window will show the scan formula as a signal.

Version 8.3.5, Released May 20, 2006; Version 8.3.6 Released May 22, 2006; Version 8.3.7 Released May 26, 2006; Version 8.3.8 Released June 9, 2006; and Version 8.3.9 Released June 19, 2006

IB Backfill Extended

IB users who elect not to subscribe the DTN Market Access historical server can now backfill daily charts directly from IB for the past year. One-minute bar downloads have been supported directly from IB for some time now. The new release adds support for IB tick data backfill, limited to the last 20 hours of trading. IB supplies 1-second interval data, not actual ticks. For each one second interval, the open, high, low, close and volume is reported. Investor/RT maps these into pseudo ticks to reflect the prices realized and the volume. If all trades for the 1-second interval occurred at the same price, 1 tick results with all the volume, otherwise volume is distributed amongst the realized prices in the interval data. It is recommended that tick data downloads from IB be done from the Download Data window with the downloading period expressed as the number of minutes (not days) of ticks to backfill. IB requires that each request for one-second interval data be no more than 30 minutes or so so a full day of tick data will result in as many as 40 requests. If you only need the last few minutes or last few hours of tick data then only ask for that much.

For users with DTN Market Access subscriptions, Investor/RT will continue to reference DTN for backfill requests unless you specifically use the Download Data window with the Source setup to IB/TWS. DTN Market Access provides backfill for actual ticks for the most recent 8 trading days, and intra-day interval data for the last 120 trading days. IB backfill is limited to pseudo tick data (1-sec interval data) for 20 hours, and intra-day 1 minute interval data for 30 trading days.

Using Custom Columns in the Standard Edition

A defect was corrected that was preventing Investor/RT Standard users from fully utilizing quote page custom columns that reference built-in technical indicators. Custom columns that reference scans, trading signals, and custom indicators are supported only in the Professional Edition of Investor/RT; however, custom columns that directly reference most built-in technical indicators are now fully functional in the Standard Edition. There are a few built-in technical indicators that incorporate references to scans/signals/custom indicators that do require a license to use the Professional version. In the Standard Edition, all features involving scans, signals and custom indicators are enabled for the \$DEMO ticker symbol to allow demonstration and experimentation with the advanced features available in the Professional Edition.

Defining New Instruments via Quote Page Entry

The ability to add new instrument setups by typing a new ticker symbol into a quote page has long been a feature of Investor/RT. Press the Insert key to insert a blank row, type in a symbol and press the Enter key. If the symbol is already setup, it is added to that row, but if the symbol is unknown to Investor/RT, the software must add the new instrument; Investor/RT tries to determine what type of instrument it is by using various heuristics. For example, symbols that contain a numeric digit and begin with a known future code, e.g. ESM6, are recognized as futures; so are symbols that end with # (the DTN.IQ convention) or #F (the eSignal convention). myTrack futures contain the grave character ` . Stocks generally are 4 or fewer capital letters, mutual funds are five capital letters ending in an X, and so on.

When Investor/RT cannot deduce the security type from the symbol, it falls back on the default setups you have specified in Setup: Preferences: Instruments. Generally, this works well, but security types, display formats, special session assignments and so forth should be double-checked when you add a new symbol in this way, since you may not always get what you expect.

To this end, there is now a quote page preference that calls for the Setup: Instruments window to appear immediately after Investor/RT adds a brand new symbol via the quote page entry method. The setup window will show all of the assumptions that Investor/RT made about the symbol. You may make adjustments as needed or press the Esc key to dismiss the window. If you do not find this feature helpful you may turn off the checkbox in the quote page preferences titled "Show Instrument's Setup After Adding a New Symbol". By default, this option is "on" for all quote pages.

Forex Quote Page

A system-defined quote page named ".Forex" has been added. It references all instruments defined with security type "Forex". The .Forex page may be opened from the list of System quote pages using the QP button on the main toolbar, or from the Open: Quote page submenu. When using an instrument selector you may refine the list of displayed symbols to include only the Forex instruments by operating the "+" menu button and choosing Show Forex. Keyboard shortcuts for opening the .Forex quote page may be created using Setup: Preferences: Keyboard Shortcuts (use the

"Open" - "QuotePage" action). In general, the .Forex quotepage is listed everywhere in Investor/RT where a quotepage selection is available, e.g. the download data window, backtest setup window, etc.

NinjaTrader Strategy Trading Improvements

The NinjaTrader trading order mechanism has been improved and some bugs fixed relating to submitting "Change Order" trading orders to NinjaTrader to make adjustments to stops and targets of a trade in progress. When initiating new positions via NinjaTrader, the Investor/RT user can specify a NinjaTrader strategy name in the trading order setup. This is done in the "Acct/Strategy" entry box in the trading order setup. Depending on how the strategy is defined in NinjaTrader, NT may submit stop and/or target orders to the broker. At any point in time there may be multiple positions (trades) in progress, each one using the same named strategy, each with a different instrument perhaps. Thus, to have Investor/RT issue a "Change Order" to NT to adjust the stop price, the trading order must tell NT which particular instance of the strategy to adjust. This is done via what NinjaTrader calls a "strategy id". A strategy id is just a unique string of letters or numbers that is provided when the trade is initiated. When issuing Change Order trading orders, the Investor/RT user may use the same strategy id to make adjustments to stops and target orders produced by the underlying strategy.

To accomplish this the "Acct/Strategy" entry box has been enhanced to allow specification of a strategy id inside square brackets [] immediately following the strategy name. For example, if the brokerage account is Sim101 and the Strategy Name is MyStrategy you may setup a trading order with Sim101/MyStrategy[x123]. The x123 is just an arbitrary string of letters and numbers which uniquely identifies the instance of the MyStrategy strategy. If you specify a strategy name without an id in brackets, Investor/RT will assign a random 3 digit strategy id for you. If you plan on using the same trading order repeatedly to initiate trades you can specify a T# variable or a V# variable as the strategy id. At the time the trading order is executed the value of the specified T# or V# must be unique. In this example you could specify Sim101/MyStrategy[V#37] where each symbol you trade may have a different V#37 value. If you plan to allow multiple trades in progress at any one time, it is important that the strategy-id be unique for each trade. This can be done by having different trading order setups or it can be done by a single trading order that specifies a user variable for the strategy-id. You must ensure that the user variable values for each instrument you trade are distinctly different.

A NinjaTrader strategy can entail stop loss and profit target orders having special IDs such as STOP1, TARGET1, etc. The Change Order trading order can be used to send adjustments to say the STOP1 price of a position that is in progress. In this example you would specify the order action "Change Order" with the order ID: STOP1. The order type would be "Stop" and the Stop Price would be specified as a V# variable perhaps or via a mouse click selection done at the time the Change Order is executed. To uniquely identify the target of this Change Order, you must specify the same strategy id as was specified at the time the associated position was initiated with NT, e.g. with the original "Buy" order.

The Acct/Strategy entry, in summary, has this format:

<account>/<strategy>[<strategy-id>]

<account> is the name of the account in NinjaTrader, this name must be specified.

<strategy> is optional; if specified, it must be the name of a strategy defined in NinjaTrader. The <strategy> may be T#n if you want the strategy name to be obtained from a user variable for the instrument that is the subject of the trading order at the time the trading order is executed.

<strategy-id> is optional. It can be any string of letters and digits, or it can be V#n or T#n if you want the strategy-id to be obtained from a user variable associated with the subject instrument at the time the trading order is executed.

When constructing strategy-based trading orders, specify a strategy id if you want to be able to pre-define "Change Order" trading orders to make adjustments to a trade in progress under that strategy.

The Trading Order Action Setup for NinjaTrader has been expanded to provide two "reverse position" actions. You may now create trading orders with action "Reverse & Buy" when you wish to cover an existing short position and buy to go long. Similarly, the order action "Reverse & Sell" is used to exit a long position and Sell to go short. The two reverse actions have all of the same properties as a Buy or Sell order action. When you reverse you must specify the quantity of contracts/shares for new reversed position. This need not be the same as the quantity in the former position. If you are sending a Reverse command to NinjaTrader where the original position was initiated with a trading order that included a strategy strategy, you must specify the same strategy and strategy-id to uniquely identify the position you wish to reverse.

Finally, the Investor/RT message log will show the complete formatted command that Investor/RT sends to NinjaTrader for every trading order executed. The format is the same format displayed in the NinjaTrader log. The format is documented in the NinjaTrader documentation under the topic "Order Information Files (OIF)".

Chart Buttons for Setting User Variables

Button(s) can be added to traditional chart whose purpose is to set some V# user variable to a price value using the chart's price scale. Suppose you add a button to the chart to set V#37, and you setup V#37 with the title "Limit Price". When you click on the button, a message will appear inside the chart window "Click to Set V#1 - Limit Price". You then click anywhere in the chart "near" the price level you want. Investor/RT responds with a popup price ladder, showing you the price you clicked on and three "ticks" above and below that price. Click on the price you want and the V# variable you specified will be set to that price. If you have reference lines that depend on that V# variable in this or other chart windows, they will respond by moving to the new price level. This feature may be useful when setting up for a trade. Trading Orders can have stop or limit prices expressed as V#

variables. You can setup buttons for single V#'s and assign a custom title to each one, e.g. "Set Stop" or "Set Target". You can create a "Menu Button" for setting any of some list of V#'s. When you click on a menu button, the list of V#'s you will popup in a menu. For example, in the button setup you can list the V#'s like this:

V#37,V#42,V#57

or like this

V#37 Limit,V#42 Stop,V#57 Target

Each V# can be optionally followed by a space and a title. Each V# with optional title ends with a comma. The titles make the button's popup menu easier to read; you can see a reminder of each V#'s role in the Button menu. It is also recommended that you assign meaningful titles to the V#'s (see Setup: Preferences: User Variables) that you employ with this feature since those titles will appear in prompts and feedback messages.

In some cases you will want a trading order or perhaps a group of trading orders to be submitted after the V# variable has been set. You can set up the button to perform this task for you by including a trading order name or a group name in brackets after the V# variable and optional title. For example, a setup like this:

V#37 Limit Price[myLimitOrder]

will prompt for V#37 (and include the text "Limit Price" in the chart prompting message. If you complete the price selection successfully, Investor/RT will then execute the trading order named "myLimitOrder". In this instance, that trading order is setup as limit order with V#37 defined as the source of the limit price for the order. If the name in brackets is the name of a group of type "Trading Order", all of the trading orders in that group will be executed in turn, each one of them using the same value of V#37 in their setups.

Annotations in Range/Change/Volume Bar Charts

Annotations in traditional charts for periodicity Range per Bar, Change per Bar, or Volume per Bar may now include the %BARLEFT and %BARPCT tokens. %BARLEFT will show the amount of range, change, or volume remaining for the bar to be completed, while %BARPCT will show the percent complete. Note that Range Bar and Volume Bar periodicities will show a BARLEFT amount that monotonically declines as the bar progresses. Similarly the BARPCT will monotonically increase as the bar forms. The Change Bar periodicity charts will show variable BARLEFT and BARPCT numbers that rise and fall as the bar progresses and the change in price since the open varies. The %TPB (ticks per bar) token is also designed to operate in annotations with range/change/volume bar annotations. This token will show the range, change, or volume per bar currently set as the periodicity of the chart. Thus you may have an annotation text setup like this:

%BARLEFT left, %BARPCT of %TPB

In a 5000 volume per bar chart, the annotation might show something like this:

4000 left, 20% of 5000

In a .5 range chart the annotation might read:

.20 left, 60% of .50

Miscellaneous Fixes and Improvements - Rev 5-9

- A bug was fixed in the Yahoo! Finance "Current Quotes" download when quotes for index type symbols were requested via the "Download Alias". When the requested quotes come back from Yahoo!, Investor/RT now correctly maps the alias ticker symbol to the actual ticker symbol.
- Memory leaks were eliminated in three technical indicators.
- A MyTrack Chat bug was fixed that was uppercasing user entered text.
- Rev 6 for Mac OS X corrects a fatal error when opening the TPO Indicator setup window.
- A bug was fixed in the "Setup Future Type" window. The Display Format was not being shown properly when editing an existing type and the display format chosen was not being recorded properly when adding new future types to Investor/RT. Since many of the most common future types are pre-defined in Investor/RT this setup window is not often required. For those who edit or add new future types, this window will handle display format correctly now.
- Memory leak was fixed in the TPO Indicator.
- Adding TSYS Indicator token TSYSI to a custom indicator was producing spurious "Invalid CID" messages. This has been corrected.
- MS Windows Only: When adjusting preferences for a "floating" traditional chart window, the window's on screen position was shifted upward a few pixels upon pressing OK or Apply to revise the preferences. This defect has been corrected.
- The Setup: Preferences: Groups window allow the user to control whether Investor/RT makes note of recently used windows when either opening them, closing them, or both. The default setting has been to add items to the ".Recent" lists when you open them. The non-traditional charts (TPO, Volume Profile, Daybar, Point and Figure, Raw Tick, etc.) were not being recorded upon closing the window if that preference was requested. This has been corrected. By choosing to update Recent Groups when Items are closed, the .Recent Charts list will show the most recently closed chart windows. The default setting will be revised to record items in the recent lists when either opening and closing windows for all users. See Setup: Preferences: Groups to adjust this setting if this is not your preference.
- Corrections were made to the Jurik Indicator plugins, JMA, DMX, RSX, and VEL. The indicators were correctly calculated in RTL formulas and when adding the indicators to an existing chart, or when opening a chart containing the Jurik indicators. However, real-time updates of the associated instrument were not re-computing the last bar(s) correctly when new bars were

formed in real-time. This defect, now corrected, was in the Investor/RT software, not in the Jurik Indicators themselves.

- A bug was causing database problems when modifying a ticker symbol in a quotepage, e.g. when editing a ticker symbol to roll over a futures contract symbol. The bug would surface if the user clicked cancel to any of the ensuing prompting messages. The bug has been corrected. The prompting message for expiration date of the new futures contract has been eliminated. Investor/RT prompts for download alias ticker symbol only if the symbol already has an alias that differs from the symbol itself and the user either has a Dial/Data or myTrack subscription or the user has the IB version with DTN Market Access.
- Alt-5 (Apple-5) keyboard shortcut for opening a quotepage has been reinstated.
- Trading Orders now accept a T# variable in the account entry box. The account (portfolio) associated with the order can now be variable, depending on the instrument's T# value at the time the order is submitted. You can use this variability to test trading orders with a simulated account name before changing the instrument's T# to the real account for actual trading. This eliminates the need to make any changes to the trading orders themselves.
- Quotepages with "Dynamic" refresh checked and "Highlight as Rows Update" checked, will highlight rows as they update. The highlighting feature was not active due to a defect introduced a few weeks ago.
- An obscure bug was corrected in RTL. If you have a formula that references say V#31(IBM) the formula will be setup to reference the V#31 token for IBM regardless of which symbol is the subject of the RTL formula. If you later revise the formula to read simply V#31, Investor/RT will now setup a new V#31 token that refers to the V#31 value of whatever symbol is the subject of the RTL formula. The bug was causing V#31 to refer to V#31(IBM) after revising the formula, unless you first took the step of eliminating the V#31(IBM) token from the list of tokens at the upper right of the setup window.
- When importing chart definitions containing a symbol not presently setup in Investor/RT, the software prompts you with a window giving you the opportunity to add that symbol to your system. If you okay the prompting message, the symbol is added and the chart continues to import. If you revise the symbol to an existing symbol however, the chart import would fail. This bug has been corrected. You may now substitute any symbol, existing or new, and the import will continue applying the resulting symbol to the chart.
- Volume Profile charts now prompt for the new chart name when you issue the Duplicate command. This behavior is now consistent with duplicating traditional charts and TPO Price/Time Profile charts.

Version 8.3.4, Released May 9, 2006

File: Duplicate Command

A "Duplicate" menu item is available in the File Menu. Its purpose is to make a duplicate of the front most object window. At present, the command pertains only to chart windows: any Traditional chart, TPO Charts, Volume Profile Charts, Point and Figure Charts, Three Line Break Charts, Day bar Charts, and Raw Tick Charts.

The Duplicate command first saves any changes made to the original chart. Then Investor/RT prompts for a name for the duplicate. A unique name that begins with "Untitled" is presented. You may press the enter key to accept this name or enter a name of your choice. If you accept the Untitled name, you will be prompted later to assign a name to the chart when the chart is saved.

The duplicate window is displayed offset slightly from the original chart, but is otherwise identical to the original. This feature can be used along with the chart setup wizard to create an array of charts with various periodicities, different symbols, or other properties. First use File: New: Chart to create a chart. Then use File: Duplicate several times to make additional copies of the original. Then position the windows and revise the periodicities and/or symbols as desired. You can then use File: Save: Save Layout to save the array of charts as a layout.

The Duplicate command is also present in every chart window's pop up menu, as an alternative to using the File: Duplicate command. The popup menu is accessible by right-clicking inside the chart window. Macintosh users that have a single-button mouse must hold down to Control key when clicking to access the pop up menu.

Volume Breakdown Indicator

Documentation Not Yet Available

Miscellaneous Fixes and Improvements for 8.3.4

- DayBar Charts, Point & Figure Charts, Three Line Break Charts and Raw Tick Charts have a Save command in their popup menus. Also, on the Windows platform, there is a checkable menu item titled "Floating Window" that appears check marked when the window is a floating window that can be dragged outside the Investor/RT task window. Toggle the checkmark on/off by choosing the Floating Window menu item.
- A bug was fixed in the chart setup wizard for traditional charts. If the moving averages entry box reads "No Moving Averages", the wizard was mistakenly adding a red 1 period moving average line into the chart(s). This has been corrected.
- When viewing a Raw Tick Chart, the up/down arrow keys or scrolling the mouse wheel will increase/decrease the "ticks per bar" setting. Holding down the Ctrl key while using the up/down arrow keys or mouse wheel, will increase/decrease the width of each tick or bar displayed in the chart.

Version 8.3.2 – Released May 2, 2006 & Version 8.3.3 Released May 4, 2006

Miscellaneous Fixes and Improvements

- The up/down arrow keys now function consistently inside the "instrument selector". The arrow keys were not working properly when the instrument selector was scrolled down near the end of the list of instruments.

- Day Bar, Point and Figure, and Three Line break charts may now be created as floating windows using the Chart Setup Wizard by checking the "Floating" checkbox. At present, traditional charts, TPO Charts, Volume Profile, Point and Figure, Three Line Break and Day Bars can be created as floating windows for placement outside the Investor/RT task window under the MS Windows version.
- Risk Statistic reporting has been added to the Investor/RT backtesting system.

Version 8.3.1 – Released April 26, 2006

Miscellaneous Fixes and Improvements in 8.3.1

- Choosing Open->Time & Sales was mistakenly performing an export of the tick data rather than viewing it in a time and sales window as it now does.
- The "Send to Back" command in the Windows menu (often assigned to a shortcut key) was malfunctioning in the Windows version due to revisions made to support "floating windows" in 8.3. The feature now operates correctly again.
- Signal Marker alerts and other alert message boxes were not positioned properly in 8.3, another unintended consequence associated with the addition of floating windows. This has been fixed for 8.3.1.
- The "datapath.txt" file in the admin folder/directory is now deleted if Investor/RT cannot resolve the path to the data_f folder using the file. This eliminates the need to delete this file manually before starting up Investor/RT again.
- Schedule actions for downloading current quotes and fundamental data from Yahoo! Finance were added to the list of available "Database Functions" where the comparable Dial/Data downloads are listed. The Yahoo! current/fundamental data downloading options were removed from the "Download Data" schedule action; this action is again used exclusively for scheduling historical data downloads.
- Exporting Chart definitions from the Object Editor was producing a fatal error in some cases. This has been corrected.
- DTN.IQ and DTN Market Access now support continuous futures contract symbols. Instead of the month and year codes, add a # to the future type code, e.g. @ES# is the continuous front month symbol for the Globex ES contract. Investor/RT now recognizes these special futures ticker symbol and correctly determines the underlying type (e.g. ES) for these now. These symbols can also be used by IB Version users as the downloading alias for the DTN Market Access.

Version 8.3, Released April 20, 2006

Major New OS X Version - Investor/RT for OS X goes Universal

Investor/RT 8.3 for Mac OS X represents a major upgrade with significant changes in the way the software is installed and organized. This new version was developed using Apple's Xcode integrated development tools along with an improved Xcode compatible version of the XVT developer toolkit from Providence Software Solutions. The Investor/RT software for OS X is now distributed as a "bundle", a package of software and resources named simply "InvestorRT.app". The installer for

Investor/RT is a disk image (.dmg) file with this InvestorRT.app icon on it. To install the new version, drag InvestorRT.app to the root /Applications folder on your Mac hard drive. Put InvestorRT.app on your dock to facilitate startup of Investor/RT from the dock. The new version does not require an InvestorRT folder in your Applications folder; in fact it is recommended that the InvestorRT folder (or whatever you named it) be moved to a more suitable location in your "home" directory. Many of the files that in prior versions were kept in the InvestorRT folder are now packaged in the InvestorRT.app bundle in your /Applications folder. Complete instructions for relocating and cleaning unneeded files from your InvestorRT folder are provided in the "Read Me" file that accompanies the InvestorRT.app. Please review this important information before installing the new 8.3 version and before starting InvestorRT 8.3 for the first time.

Here are a few of the improvements resulting from the adoption of the Apple Xcode development tools for this latest version of Investor/RT for Mac OS X:

Investor/RT is now a Universal application.

Investor/RT is faster. The PowerPC version is optimized for the PowerPC G5 processor using the latest optimizing gcc 4 compiler; on G4 and G5 hardware the program is noticeably faster. The Intel version is significantly faster, since it is running on faster Intel hardware.

Instant Data Source Configuration

The Reconfigure application has been eliminated. Switching from one data feed edition to another is done dynamically by selecting the desired data source in the File: Reconfigure window. This will improve the experience of users who license multiple feed versions of Investor/RT, or new users who switch from using Demonstration to a licensed edition.

Cosmetic Improvements

Investor/RT now has a proper application icon. Investor/RT windows minimized to the Dock now show a miniature RT "badge" to identify them as Investor/RT windows. The Apple standard Preference menu item now appears in the InvestorRT menu (command+comma is the standard Apple shortcut). For example, command+comma, the letter R, then the Enter key opens the Registration Preferences. Apple standard command+period is now supported throughout the product as a means of cancelling (closing) windows and dialogs, including the Investor/RT built-in Help window.

Other Fixes

The OS X version now has a Quick Exit command in the File Menu for quitting the application. The standard Quit command (Apple+Q

shortcut) resides in the InvestorRT menu, however, the Quit menu item occasionally becomes disabled (unselectable) for reasons unknown at present. Until this is resolved, the Quick Exit command in the File Menu may be used as an alternative. Investor/RT ensures that the menu items in the File Menu are not disabled.

TPO and Volume Profile Enhancements

Major new features were added to the TPO (Price/Time Profile) and Volume Profile charting for this release. These include a playback feature for TPO and Volume Profile charts, enhanced info box feedback, and much more. These features will be documented in further detail on the web site at <http://www.linnsoft.com/profiles>. The Advanced Profiling features of Investor/RT are available in all editions of the software that support tick data, both streaming and non-streaming intra-day versions. Effective June 1, 2006, the advanced profiling capabilities will be an optional feature of the product requiring a registration code for activation. Pricing will be from \$10 to \$20/month; details will be published shortly at <http://www.linnsoft.com/pricing>. All users of Version 8.3 with an intra-day data source may preview these profiling capabilities until June 2006.

Futures Rollover Automation

Improvements were made to more fully automate the process of rolling a futures contract ticker symbol to a new contract month. To illustrate, consider an IB user tracking the March S&P E-mini contract, ticker symbol ESH6. The user also employs DTN Market Access for backfill. ESH6 is setup with @ESH6 as the "downloading alias" symbol. To rollover ESH6 to the June contact, the user opens a quotepage, e.g. the .Futures page, and edits the ticker symbol ESH6, changing ESH6 and ESM6. Press tab or enter key to complete the edit. Investor/RT will then prompt whether to create a new instrument ESM6 or modify the existing instrument. We recommend "Modify" since all of the historical data for ESH6 will then be available under the new symbol ESM6. If the user chooses "Modify", Investor/RT will prompt for the new downloading alias ticker and broker alias ticker if appropriate, and then prompt for the new expiration date. The current expiration will be shown, e.g. 03/09/06 (mm/dd/yy), so in this example, change 03 to 06. The day of the month in June is not critical. If you know it edit the day also. Finally, Investor/RT will ask if you would like to update all charts containing the former symbol (ESH6). If you choose "Yes", Investor/RT closes all chart windows, scans the database for any charts that contain ESH6 and updates each chart setup to reference ESM6 instead. This process targets all traditional charts and special chart types: TPO Price/Time Profile, Volume Profile, Point & Figure, etc. Traditional charts, unlike the specialty charts, can have multiple instruments with some indicators associated with one instrument and other indicators associated with another. Investor/RT handles these more complex chart setups, updating the ESH6 instrument to ESM6 and updating all associated indicators for ESH6 to use ESM6, while leaving other instruments and their indicators as they were.

If, during the rollover over process you respond "Cancel" to any of the prompts, Investor/RT will revert the quotepage row back to its former symbol and undo your edit of the ticker symbol.

Rollover automation will greatly improve the user experience when moving to a new futures contract month. After rollover is complete, open your charts or your layout and your charts will contain the same data as before (e.g. the data formerly associated with ESH6) yet the chart will now track ESM6 real-time and download ESM6 data upon request.

NOTE: After rollover, it is important that you avoid downloading historical data into the chart for the period prior to the rollover date. It is advisable that you turn off automatic downloading (Setup: Preferences: Charts: General) unless all of your charts are for the current session only. If you have a last ten day intraday chart open, for example, and downloaded data, any data for the period before the rollover would replace the former symbol's data. For this reason we recommend using the data download window to request historical data since there you may specify the exact beginning date of the download and in general better control the downloading period. Another technique is to use the File: Export command to export say 1 minute bars for the contract immediately after performing the rollover. This exported data will then be available in a text file that may be easily imported using File: Import: Data if necessary.

32nds and 64ths Number Formatting

Prices for instruments whose display format is 32nds are displayed in the form xxx'yy where xxx is the integral price and yy is the number of 32nds. When display format is 64ths, prices are displayed in the form xxx`yy where yy is the number of 64ths. Note the use of the grave character (key above the tab key on most keyboards) instead of the single quote character used for 32nds. In prior releases, 64ths were reduced to a least common denomination fraction. When entering values for reference lines for such instruments, you may use the quote character to enter 32nds, or the grave character to enter 64ths. Prices for instruments having 32nds or 64ths display format always show 2 digits for the number of 32nds or 64ths, i.e. there will now be a leading zero if the number of 32nds or 64th is less than 10.

DTN IQ Feed Fields

Upon connecting to DTN IQ, Investor/RT now receives the current trade count (tick count), up tick volume and down tick volume from DTN IQ. These fields then continue to update dynamically from the realtime feed. A new field, called Financial Status is now transmitted by DTN IQ for NASD, NYSE, AMEX stocks. This is a one character code indicating the financial reporting status of the company, N for normal, Q for bankrupt, D for Deficient, etc. Investor/RT has two quotepage columns for displaying the financial status indicator, the column named Fin Status shows the abbreviated one character code; the column Financial Status, shows the full text of the code, e.g. Normal, Bankrupt, Superseded, Deficient, etc.

While adding support for these fields to the DTN IQ version, a bug was discovered that was masking certain fields from Investor/RT, a prime example being the after market last trade price. This has

been corrected. DTN IQ users will now see quote page, time and sales, and charts reflecting after market and pre market trading properly.

Tick Trend Quote page Column

The quote page column "Tick Trend" shows the most recent ticks as a series of +-* characters representing up tick, down tick and no change ticks respectively. This column now updates real-time for all editions of Investor/RT. The newest ticks appear at the left and the tick characters travel from left to right as new ticks arrive. A series of ticks at the same price as the previous price is represented by one and only one asterisk. This field gives you a quick visual indication of trade price fluctuations for the most recent trades reported to Investor/RT.

Floating Windows (Pertains to Microsoft Windows Version Only)

Traditional Charts, TPO Charts, Volume Profile Charts, QuotePages and Time & Sales windows may now be detached from the Investor/RT task window and positioned on other monitors if desired. The float option is turned on by choosing Floating Window from the right-click menu in a chart or the "+" menu of the quote page, or in the Time and Sales preferences. In charts and quote pages, the Floating Window menu item will appear with a check mark to denote whether the window is now floating. When you toggle the floating state of a window, you will notice that the window title bar becomes more narrow than normal. Once floating, you may resize and position the window on any monitor independently of the main Investor/RT task window. If you uncheck the Floating Window menu item, the window will automatically be centered inside the Investor/RT task window. Floating windows can participate in Investor/RT layouts just like normal windows, and their screen positions will be properly retained when you open a layout. When you invoke the preferences for a floating window, Investor/RT will make the preferences window floating so it can float over the subject window as you adjust the preferences. In the Macintosh version of Investor/RT there is no task window; all windows implicitly float independently of all others. The "Floating Window" menu items and preference settings are either hidden or disabled in the Macintosh version of the software.

The Floating Windows feature is a work in progress. There are a number of issues that will be addressed in future releases. Some of the commands in the Investor/RT menu bar that apply to the "front window", e.g. File: Save, do not consider these floating windows. The popup menus for TPO and Volume Profile Charts now have a Save: Chart menu item for saving the changes to the chart setup when the toolbar is not handy.

Mouse scroll wheel notices are now sent to floating windows as long as you have activated the floating window. When a floating window is first opened or when you click on its title bar or inside the window, Investor/RT designates the window as the front window for mouse wheel events.

There are no minimize/maximize controls in the title bar of a floating window, however, if you right-click on the narrow title bar of a floating window you can choose to minimize/maximize the window. When you minimize the Investor/RT task window, the task window and all Investor/RT floating

windows are hidden. Using one of the Pin options for toolbars is recommended so that toolbars will snap to the left or top of a floating window when you activate it. Since toolbars and floating charts are both "floating", it is possible for a chart to obscure its toolbar. Toolbars always float above non-floating windows inside the Investor/RT task windows.

Please provide feedback and recommendations for improvement as you notice them. We hope this new feature will be a welcome improvement for our Windows users with multiple monitors.

Chart Setup Wizard

The Chart Setup Wizard enables the Investor/RT user to create robust chart setups quickly and easily. The wizard window appears when you choose File: New: Chart, or when you right-click on the "Open A Chart" button on the main toolbar, or when you click the "Open a Chart" button and then choose "New Chart" from the list of chart names. The Chart Setup Wizard is also available from the Setup Menu

There is another wizard in the Setup Menu called the Chart Quotepage Wizard. Formerly known as Chart Wizard, it has been renamed now that there are two chart related wizards. The Chart Quotepage Wizard enables creation of an array of instances of some chart, each chart showing a different symbol in the subject quote page. The two wizards may be used in combination. First use the Chart Setup Wizard to create a chart; save it, assigning it a name. Then open the Chart Quotepage Wizard; select the subject quote page and the chart name just created, and produce an array of charts. Scroll to the bottom of this help topic for more information on the chart quote page wizard.

Overview

The Chart Setup Wizard window is divided into sections; the first section provides choices for the kinds of charts you can create and choices for chart size; the second section is for specifying the instrument (ticker symbol) to be charted. Optional sections below that are for requesting one or more moving averages; for requesting one or more indicators, and for requesting commonly used buttons to be incorporated into the resulting chart. These optional sections are visible only when the chart type is one of the traditional types (candlestick, bar, line, etc.).

Specify the Chart Type

Five common styles of traditional charts and six special chart types are available. The window contracts and expands to show options available for the selected type. If the selected type is "Other", pressing OK or Apply will open the "Create New Chart" window that, in prior versions of Investor/RT, was the starting point for creating a new

chart. There are a few less frequently used traditional charting styles available from this window.

Specify Ticker Symbol

Ticker symbols may be keyed directly into the entry box, or you may use the pull down menu, or you may call up the symbol selector by clicking on the ... button. You may also call for the symbol selector to show only a particular security type by clicking on radio buttons (Stock, Future", Index, etc.).

The ticker symbol section has a "Multiple Instruments" check box; when checked you can quickly enter a list of symbols separated by commas. For traditional chart types (candles, bars, lines) this feature can be used to quickly create comparison charts. For single instrument charts (TPO, Volume Profile, et al), the wizard opens one chart for each ticker entered.

Specify Chart Size

The Chart Size menu in the Chart Setup Wizard is used to specify the size of the chart(s) to be created. The Small, Medium, and Large settings will create charts that occupy 40%, 60%, and 80% of the screen, respectively. Choose Maximize to create a Large chart and maximize it to full screen. The "Default" choice will create the chart(s) using the default dimensions for the particular type of chart to be created. Use Setup: Preferences: Charts: <type> (where <type> is Traditional, TPO, Volume Profile, etc.) to set these default dimensions. Choosing "Other" from the Chart Size menu reveals entry boxes for the height and width in pixels. Like other wizard settings, the most recently used size settings are retained; they will reappear the next time you open the Chart Setup Wizard.

For Traditional Charts, TPO Price Time Profile, and Volume Profile Charts, the Chart Type section will show a checkbox titled "Floating" (in the Windows version of Investor/RT only). When checked, the chart(s) created by the wizard will be floating windows that may be moved outside the Investor/RT task window.

Specify Moving Averages

For traditional charts, you can provide a list of moving average periods, e.g. 3,9,12,26 and a moving average type (simple, weighted, etc.) and the resulting chart will have the specified moving averages, each drawn with a different color. Use the menu to select from a list

of samples, or choose "No Moving Averages" or leave the entry box empty if no moving averages are desired in the resulting chart.

Specify Technical Indicators

Any of the built-in technical indicators can be added to the new chart by selecting their codes using the ... button. Some sample combinations are available via a pull down menu, e.g. a setup of "RSI,MACD,RAWK" will cause the resulting chart to have panes for the RSI, MACD, and Stochastics indicator. All indicators will initially have the default preferences, and these may be overridden, of course, once the chart is open. Further, when you call for one or more indicators, the wizard creates a button for each indicator; the button will toggle (add/remove) the associated indicator in the resulting chart.

Specify Chart Buttons

Checkboxes are provided for many of the commonly used chart button types. Chart buttons for adding/removing each requested technical indicator will be created for you automatically. When three or fewer buttons are added to the chart, the buttons are positioned at the lower left of the topmost chart pane, the pane containing the instrument(s), otherwise, the wizard creates a "Button" pane at the top of the chart window and places all of the buttons there.

Using Apply Button vs. OK Button

The Chart Setup Wizard "Apply" button can be used to create a chart while leaving the wizard window open. You may then change various setups and create another. When you click OK, a new chart is created from the settings at hand and the wizard window closes.

If you are a new Investor/RT user and you wish to explore the various kinds of charts available to you, open the chart setup wizard and move the window off to the side so it will not be obscured as you create sample charts. Then select each of the chart types in turn and click Apply to view them. Experiment with the sample settings for moving averages, indicators, and chart buttons for traditional charts.

User Preferences for Controlling the Wizard

The chart setup wizard utilizes default preference settings to create charts. By taking the time to setup your favorite default settings, the charts created by the wizard will reflect those settings. For example, if you frequently use TPO Price Time Profile charts, go to Setup: Preferences: Charts: TPO and specify the settings you will

want most often. Thereafter, any TPO charts produced by the wizard will have those initial settings. For traditional chart users, use Setup: Preferences: Charts: Traditional Charts. If you specify a default periodicity of daily there, then all wizard produced traditional charts will appear initially as daily charts. If you prefer intra-day charts, then revise the default periodicity and the wizard will thereafter create intraday traditional charts, saving you the extra step of switching the periodicity from daily to intraday. The same concept applies to technical indicators. Go to Setup: Preferences: Technical Indicators and setup the MACD indicator default preferences to reflect the averaging periods and average type that you most commonly use. Thereafter, when you specify MACD in the list of indicators to be included in the chart, these settings will be used.

Keyboard Shortcut for the Wizard

The Chart Setup Wizard is available for assignment as a keyboard shortcut. Go to Setup: Preferences: Keyboard Shortcut, select F2, for example, and pick "Open" as the action and "Chart" as the object type. The first item in the list of chart names will be "Chart Setup Wizard". If you assign this name to the keyboard shortcut, then you can press F2 anytime to call up the chart setup wizard; it will appear with the same setups that were used the last time the wizard created a chart.

Another Wizard: Chart QuotePage Wizard.

The Chart QuotePage Wizard is a chart setup assistant that can create multiple chart displays from the list of instruments present in a quote page. The Chart QuotePage Wizard can be opened from the Setup Menu or by clicking the Chart icon in the Quote Page toolbar when no row in the quote page is selected. After running a scan, for example, you can click the chart icon on the scan results quote page toolbar to quickly view an array of charts on the issues identified by the scan. [Click here for a detailed description.](#)

Keyboard Shortcuts for Window State

Keyboard shortcuts may now be setup for manipulating the state of the front window. In the Setup: Preferences: Keyboard Shortcuts window, choose Window and an associated action: Minimize, Maximize, Restore, Close, or Identify. Window - Minimize moves the current front window to the MS Windows task bar or to the Mac OS X Dock. The Window - Maximize shortcut key will maximize the front window; Window - Restore will then restore the maximized window to its normal position. Window - Close simply closes the front window. The Window - Identify shortcut makes the front

window tremble for a second or two; this may be useful to those having windows open on many monitors to quickly see which window is the front window without otherwise affecting its state.

Mac OS X Users: The shortcut Window - Maximize works as a Zoom/Unzoom toggle for Mac OS X. The window zooming implementation in Investor/RT 8.3 has been improved so that windows that are zoomed out to full screen are automatically sized to account for the OS X Dock if present. Furthermore, the shortcut Window - Maximize will automatically hide the main toolbar when you zoom a window out, and show the main toolbar again when you press the shortcut to zoom back to normal size. The built-in shortcut Apple+T can be used to open the main toolbar; it will float above a maximized window. When you zoom in and out using the green dot at the left side of a window's title bar, the main toolbar will remain visible after the zoom out. The shortcut with auto hiding of the main toolbar may be more convenient than clicking the zoom button manually.

New Database Compression Utility

A database compression utility has been added for the "Objects" database files (object.d01 and object.k01) used to hold the setups for charts, scans, signals, custom indicators, trading systems, optimizations, and trading system realizations. The utility can be invoked via the main menu (Control: Database Utilitizes: Compress: Objects Database) or by using the compression section of the Database Utilities Wizard (Alt-U). Setup: Schedules includes "Compress Object Database" in its list of database functions that can be included in a schedule.

Miscellaneous Fixes and Improvements.

- Keyboard shortcuts have been added to the Database Wizard. Click here for details. (scroll the bottom)
- In a quote page, right-clicking (control-click) on a symbol and choose "Copy" to copy setup information about the symbol to the clipboard. This paste command may be then used to paste this text into an email or into a chat room window to quickly convey to others how you have the symbol setup. This feature will be useful when diagnosing system setup issues with support. Here is an example of the setup text copied to the clipboard:

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- Volume Profile Charts now respond to mouse scroll wheel (with or without shift key down). Effect is the same as using the up/down arrow keys on the keyboard.
- The IB (Interactive Brokers) version of Investor/RT no longer disconnects from TWS when TWS reports that it has lost it's connection to the IB servers. Investor/RT will now report the outage and wait for TWS to reconnect and resume normal operations. Some users have

reported having to "Start Data" periodically during the trading session. This will no longer be necessary.

- Additional memory allocation is made for the purpose of data reception during heavy volume trading. The software has also been biased more strongly toward processing incoming data rather than servicing the user interface. While this may make the software seem sluggish at times in responding to mouse clicks and such, this change is aimed at eliminating or at least minimizing any latency in the data feed during heavy volume periods.
- A memory leak was eliminated in the "Finite Volume Element" technical indicator (RTL token: FVE). A memory leak was eliminated in RTL.
- Volume Profile charts may now be exported and imported. To export use the Volume Profile Toolbar or popup menu (Save As Chart Definition command). To import, use File: Import: Chart Definition. At present, Traditional Charts, TPO Price/Time Profile Charts, and Volume Profile Charts are exportable as text file for sharing setups with other Investor/RT users or when emailing questions to support about a chart.
- \$DEMO bid/ask prices were made more realistic, more closely tracking the last price.
- Dynamic Quotepage updating is available once again on the Mac OS X version. Use this option only if you have adequate hardware. If you experience CPU saturation during real-time trading then set all quotepage with a refresh rate rather than using a dynamic option. The dynamic option is not an issue with end-of-day or non-streaming editions of Investor/RT, in fact, it is the recommend setting for all versions that do not have realtime streaming data source.
- When displaying volume numbers, the "Abbreviate Volume" setting in Setup: Preferences: Quotepages, controls when volumes are expressed in k(1000's) or m (millions) suffixes. Volumes under 10k are now displayed as whole numbers. Formerly, values between 1000 and 9999 were shown as nk, where n = 1,2,3...9. Now they will appear as 4 digits, e.g. 1500 or 2950 instead of 1k or 2k respectively.
- A bug was fixed in the OS X version having to do with continuous data feed reception during low traffic periods, e.g. in the evening well after the end of the day session. The fix results are much faster reception of after market data for some data feed, especially myTrack.
- The chat room window (IRC chat) contents may now be saved as a text file or saved to the clipboard using the File: Save: submenu. The Edit Menu, Select All followed by Edit: Copy (ctrl-C) is another method of saving the entire text of the current chat session to the clipboard.
- A tick data downloading bug was fixed in the DTN historical downloader that would cause a spike in trading volume at midnight when downloading one day of tick data. The first tick after midnight was incorrectly reported with an actual session to date volume rather than the incremental tick volume. This bug affected users of DTN.IQ, DTN Satellite, and DTN MA.
- When the Setup: Instruments Window is the front window, the mouse scroll wheel may be used to show/hide the Advanced section of the window. One or more wheel clicks down shows the advanced settings, one or more clicks up collapses the window to the smaller state.
- A bug was fixed in RTL. The bug was observed when using MPD (Mixed Periodicity Indicator) with an embedded custom indicator, where the MPD custom indicator in turn references another embedded custom indicator. The bug could theoretically surface in other contexts where one custom indicator makes reference to another. The bug was that the embedded custom indicator was operating on the data as if it were daily bars rather than the actual

periodicity of the source data. Many Investor/RT indicators, e.g. a moving average of N periods do not consider the periodicity properties of the data; they simply compute the result based on N consecutive bars of data. Some indicators, such as SESST (Session Statistics), are inherently sensitive to the periodicity of the data being operated upon. This bug was causing miscalculation in those cases where "periodicity sensitive" indicators were referenced via an embedded custom indicator.

- Display format selections were added for six decimal (99.999999) and halves, and the display format selection list was ordered in a more logical manner.
- The IRC Chat window was improved and some minor bugs were fixed. Right-clicking or double-clicking in the chat window opens the chat preferences. Ctrl + enter key also opens the chat preferences from the keyboard. The chat preferences have a new button "Save Chat Log" that creates a time stamped text file of the current chat session in the admin folder. This button does the same thing as issuing the File: Save As Text command while the chat window is the front window. A long standing bug was corrected, the symptom being that the chat preferences window would open but would be unresponsive to the mouse or keyboard for a some period of time.
- In Traditional Chart Windows, the Periodicity menu item in the popup menu is now a submenu. The first item is "Other..."; this item opens the periodicity selector window in which you can specify any of the many periodicity setups supported Investor/RT. Beneath "Other" are 1 minute, 5 minute, 30 minute, Daily, Weekly, Monthly selections that may be used to set those common periodicities. End-of-day (non-intraday) editions of Investor/RT will have just the Daily, Weekly, Monthly selections in the Periodicity submenu.
- A bug was fixed for the moving average and exponential moving average indicator. The shift-right option was not being honored for daily/weekly/monthly periodic charts and right-shifted exponential moving averages were not being drawn shifted in intra-day charts. Right-shifting was working properly in intra-day charts on in the standard moving average indicator, not the "Moving Average, Exponential" indicator, a special indicator that permits the period of the exponential average to be expressed in other than a whole number of periods, e.g. 2.333 periods.

Version 8.2.3 – Released February 9, 2006

Scheduled Exports of Historical Data

Setup: Schedules now supports a new action, named "Export Data". This action exports historical data for a user-specified quotepage to a file in the Investor/RT startup folder. The setup for this action includes the selection of the quotepage containing the symbols whose data is to be exported, the number of minutes, hours, or days to be exported, and the periodicity of the export. Periodicity choices are: tick data, one-minute bar data, 60-minute (hourly) bar data, or daily historical data. The export file will contain lines of data for each symbol with a heading line at the beginning of each symbol. The heading line begins with a hyphen. The name of the file exported is XYZ.txt where X is the name of the schedule performing the export action, Y indicates the periodicity of the export (Daily, Hourly, Minute, or Tick) and Z is the name of the quotepage exported. If the exported quotepage is a system-defined quotepage, Y is the name of the page without the period. For

example, MyExportDailyStocks.txt would be the name of the quote page produced by a schedule named "MyExport", containing "Daily" historical data for the ".Stocks" quote page.

8.2.3 Miscellaneous Fixes and Improvements

- Exchange code KSE (Korea Stock Exchange) is now available for users of the IB Version of Investor/RT who wish to track KSE stocks.
- A long standing bug regarding time zone related adjustments to downloaded historical data was fixed. In particular, the bug affected international clients running Investor/RT with time zone setup as GMT + 8, GMT + 9, ..., GMT + 12. In Setup: Preferences: Sessions, choices for time zone "(GMT +08:00) Hong Kong, Perth, Singapore, Taipei" and below in the menu list, resulted in historical data downloading problems. A typical symptom is a chart that backfills after downloading, stopping one hour before the present time of day. Version 8.2.3 properly shifts downloaded historical intra-day data, translating the bars of data into the user's local time zone.
- When a Volume Profile chart is opened and there is no data available for the charted symbol, a message to that effect is shown in the otherwise empty chart window. The message was invisible on a black background; this has been corrected.
- Users of the OS X version of Investor/RT who import text files (historical data, ticker symbols, definition files, etc.) would sometimes find that the file they wanted to import was dimmed (disabled) in the list of files presented. The dimmed files represent those that OS X does not recognize as "TEXT" files. This has been a common problem when importing files received via email for example. Such files, even those ending with a .txt suffix, do not carry the internal type/creator codes of the Mac OS to identify them as text files. For a while now, an Applescript applet has been provided as a work around. Dragging problematic files onto the applet adds the TEXT type and IVRT creator codes to the files to make them "visible" in the import file selection dialog. To eliminate this inconvenience completely, Investor/RT now enables any file to be selected. Some caution is in order here. If you choose a file that Investor/RT cannot identify as a text file, either by its .txt filename extension or its type code, you will be prompted to confirm that you wish to import the file.
- For Windows users, the File: Open File command and the various Import functions of Investor/RT now prompt for .txt files. The File Selection dialog box lists only files having the .txt extension. Metastock import functions do not limit the display of selectable files since those prompt the user to locate non-text files named Master or XMaster. To import or view a text file that does not have a txt extension, it will be necessary to rename the file so its extension is .txt, otherwise it will not appear at all in the file selection dialog. If you happen to know the file's name however, you can navigate to the folder it is in and type the first few characters of the file name and the standard Windows file selection dialog will allow you to select the file from a list of matching names. Should you enter a valid file name for a file that does not have the .txt filename extension, Investor/RT will prompt you to verify that you wish to import the file as a precaution.
- All text file produced (exported) by Investor/RT have the .txt extension by default. You may of course override the file name in the standard save dialog. Retain the .txt extension if you

want the file to appear in the standard open file dialog later or if you plan to send the file to another Investor/RT user for import.

- A minor bug was fixed in the Cross Reference Report. V# variable usage within Reference Line indicators was reported incorrectly.
- Several bugs were fixed in the STAT (Statistics) Indicator relating to the use of the date/time control to compute statistics beginning at some relative date/time forward. The specification "N Days Back/Session Start" was incorrectly calculating the date/time in some cases, thus the statistical calculation called for in the STAT setup was using more or fewer bars than expected. The STAT indicator was sometimes returning a zero result when the session of the instrument differed from the session (override) in the chart whether the STAT was being used. These flaws have been corrected.
- Use of downloading alias symbol when performing Yahoo data downloading is now supported in the IB Version so long as the user does not have the DTN Market Access account setup.
- The DTN.IQ (IQFEED) Version of Investor/RT was incorrectly extracting the future type code from the ticker symbol for @ER2H6. Instead of future type ER2, Investor/RT was using ER. This has been corrected so that Investor/RT will find "ER2" to be the future type of @ER2xx symbols. Users who have worked around this problem by defining ER as a future type, should ensure that ER2 is setup as a valid future type with the correct settings.
- A bug was fixed in the REF function. The RTL expression REF(exp1, exp2) yields the value of expression exp1, exp2 bars back. Investor/RT was mishandling the case where exp2 is less than or equal to zero 0. The REF function is often used in formulas where the second parameter is a variable or some computed number of bars back, e.g. REF((CL + HI)/2, V#1). With this fix, any expression REF(exp1, exp2) will now function for any value of exp2. Note that zero and negative values for the second operand in a REF function are handled as REF(exp1, 0), no bars back, yielding the current value of exp1 for the bar in question.
- There was a bug in the export of quotepage definitions. The "Update Every X Seconds" setting was not exported properly. On the import side, this preference was erroneously set to "Dynamic", an option no longer supported. The bug has been fixed. Export files will now carry the quotepage refresh rate setting.
- A bug was fixed in the Download Data schedule action for tick data. Scheduled tick data downloading was failing to occur when the schedule was run. Other periodicities were not affected. Tick data downloads are working once again in schedules.

Version 8.2.2 – Released January 30, 2006

NinjaTrader Trading Orders

Using Strategy Order Names Further enhancement of the trading order "order id" was done for version 8.2.2. First, the order id can now be specified as a user text variable (T#1 through T#32). When a trading order is executed, the T# is resolved for the instrument that is the subject of the trading order and the resulting order id (possibly an empty string) is used. When a trading order does NOT specify a NinjaTrader strategy name, the order id is generated automatically by Investor/RT and prepended with the order id string supplied by the user, if any. No-strategy orders can be changed or cancelled by simply supplying the same order id string as was used when the order was placed.

Order id's are a bit more complex when a NinjaTrader strategy name is supplied in the trading order. The order id string for strategy-based orders is not needed at all for buy and sell orders, i.e. those that initiate a new instance of that strategy. For Cancel Order and Change Order commands relating to strategy based trading, the trading order specifies the strategy name (possibly via a T# variable), and a NinjaTrader "order name". NT order names are capitalized tokens that unique identify a particular order within the associated strategy. The order id entry box in the trading order setup now has a menu of these tokens for your convenience. In general these order names are ENTRY*, EXIT*, STOP*, SIMSTOP* and TARGET*, where the asterisk represents a numeric digit. The Investor/RT order id menu contains three entries for each order name, e.g. TARGET1, TARGET2, and TARGET3. The number of valid order names is strategy dependent; For example a simple NinjaTrader strategy that enters the market with a limit order and then employs one stop loss and one profit target order, will use order names ENTRY1, STOP1, and TARGET1. Those three names may be used in Investor/RT trading orders to cancel or change the quantity or stop or limit price of the corresponding NinjaTrader managed order. These special strategy-order-names may be entered directly into the trading order setup, or the trading order can specify a T# variable; the actual T# value for the instrument being traded will then be used when the trading order is submitted to NinjaTrader.

Version 8.2.2 Miscellaneous Fixes and Improvements

- When a Volume Profile Chart was setup with a black background, the price scale became invisible. The price scale is now appears in white when the background color is black.
- If user preferences call for automatic start data (connection) at startup, Investor/RT was connecting even when the system was setup as "Working Offline". This has been corrected. If you quit Investor/RT while "working offline" is in effect, working offline status will be honored at startup and no connection to data feed will be made.
- A bug, having to do with deleting erroneous ticker symbols more than 23 characters long, was fixed. Such symbols are now trimmed to 23 characters at startup, so they may be deleted if desired. Users of Investor/RT Professional can view a list of trimmed symbols by running a scan of the .All Symbols quotepage with formula: LEN = 23. Use the Red Trash can button on the resulting quotepage's toolbar to delete all of the symbols. Another way to quickly determine if you have any unusually long ticker symbols is to add the column "Length of Ticker" to the .All Symbols quotepage. Click on this column heading once or twice to sort the quotepage; all of the longest symbols will sort to the top of the page.
- TPO Chart Info Box now shows the correct total volume for the time period represented by each letter as you point the mouse at a particular letter in the chart.
- Attempting to open a traditional chart with periodicity tick/bar (or range bar, change bar, etc.) where the data on file results in more that 32,767 bars was causing a fatal error relating to set up of the chart's scroll bar. The bug has been fixed in Version 8.2.2.
- Clicking the data download button in a traditional chart with a custom instrument in the chart at a time that the data feed connection was not active, was not "generating" the data for the custom instrument. Instead the data download window would appear. This has been fixed so that data generation for custom instruments can occur in continuous feed versions of Investor/RT even when unconnected to the continuous feed. For example, when offline

(disconnected) from eSignal, one can fetch several years of daily historical data for IBM and MSFT from Yahoo Finance, then use the Pair Wizard to create the spread IBM-MSFT; daily chart that spread and click the download button to generate and view the computed historical spread of those two stocks.

- Attempting to open more than 256 windows would cause a fatal error having to do with setting up the Investor/RT "Windows" menu. This has been corrected.
- A bug was fixed in the STAT token (Statistics Indicator) relating to the use of STAT in an RTL formula for a custom indicator. The STAT function was incorrectly using the symbol's session instead of the override session of the chart. In cases where the time component of the STAT setup was relative to a particular session, e.g. the session start time, this was causing STAT to return an invalid result. The STAT function has been revised to use the session of the chart when it is different than the session of the ticker symbol in the chart.
- Users of the IB version of Investor/RT can now track Canadian stocks that are quoted in Canadian dollars. Setup the instrument as a stock, specify the override exchange, e.g. VENTURE. Then view the instrument in a quote page, e.g. the .Stocks quote page and add the data column "Currency" to be page. Edit the Canadian stocks' currency to CAD instead of USD. When you connect to TWS, these instruments will begin quoting correctly.
- A bug was fixed in the Cross Reference Report (see Control Menu->Database Utilities). Trading System setup windows for each user-defined trading system were opened and left open after the report was complete. For users with a large number of trading systems, this was causing the report production to take longer; the trading system setup windows consumed memory unnecessarily. The cross reference report also involves opening each user-defined chart to extract information from the chart setup. If the user has "automatic downloading" turned on, this was resulting in numerous unnecessary download requests during the report production process. Auto-downloading is now temporarily turned off while producing the cross reference report.
- Data vendor supplied security names that exceeded 40 characters were causing memory corruption. Fortunately, the bug is rare, usually surfacing only when certain mutual funds with very long names are setup by the user. Security names are now trimmed to 39 characters to eliminate unpredictable side effects. Symptoms of this bug include extraneous characters appearing in the downloading alias for an instrument and in some cases, fatal errors upon opening a chart of such an instrument.
- The DTN.IQ version was revised to ignore the "downloading alias" when requesting historical data from the DTN historical server. This eliminates the possibility of downloading data accidentally for the wrong symbol due to an incorrect alias setup. The downloading alias is needed in other versions of Investor/RT (e.g. the IB Version) where the instrument ticker may be different than the symbol needed to request data from DTN historical servers. There are 4 versions of Investor/RT that can download from the DTN historical server: (1) DTN.IQ (IQFEED) Version, (2) DTN Realtime (Satellite) Version, (3) DTN Market Access (Non-streaming) Version, and (4) Interactive Brokers (IB) Version. The downloading alias will be used if specified for cases 2, 3, and 4, as long as the user does NOT have a Dial/Data account setup. The downloading alias setup for an instrument is used exclusively for Dial/Data downloading when the user has a Dial/Data account setup in the product registration.

- An Annotation or Info Box indicator having a font specification other than regular (plain), e.g. bold, italics, etc., would interfere with the drawing of cross hairs in its pane. Smudges (residual drawing artifacts) would appear in the scale area of that pane as the mouse moved. This was corrected in version 8.2.3.

Version 8.2.1 – Released Jan 24, 2006

NinjaTrader Trading Orders

Order ID Setup Buy, Sell, Change Order, and Cancel Order actions now support an optional "OrderID", a user-specified string of characters used to uniquely identify the order. For example, if you have a trading order that submits a limit buy order, you can specify a string such as "BuyAtLimit" as the order ID. You may then have a "Change Order" trading order that is setup to revise the limit price of this order once it is working. This change order can specify "BuyAtLimit" to identify the working order to revise. When there is only one working order in progress, Investor/RT will apply a change order or cancel order to that particular order, the order ID specification is not required or needed. But in situations where your trading strategy may have several working orders, this id string provides a way to distinguish which order is the target of a change order or a cancel order trading order.

If an order id is not specified in a Buy or Sell trading order, Investor/RT will supply a unique id, e.g. BUY100AXP915 may be assigned to a BUY order for 100 shares of AXP, the 915 being a number tacked on to ensure uniqueness of the id. When Order Status trading orders are executed, the message log will show something like this:

```
Order  
BUY  
100  
AXP  
915
```

F
e
d
O
r
d
e
r
B
C
Y
H
O
O
A
X
P
9
0
6
F
e
d
O
r
d
e
r
B
C
Y
H

0
0
A
X
P
9
0
7

W
o
r
k
i
n
g

If you specify an order ID string in the BUY or SELL trading order, that ID string is prepended to the generated id, e.g.

Order myLimit_SELL100AXP914 - Filled	Order myLimit_BUY100AXP915 - Working
--------------------------------------	-----------------------------------------

When a Change Order or Cancel Order trading order is executed and the trading order setup includes an order ID string, Investor/RT will search for the actual order id to change or cancel using that order ID to match the first part of the order ID of any working orders. In version 8.2.2 (see item #6 below), the order id in the trading order setup can also be a T# variable.

Miscellaneous Fixes and Improvements

- A bug was adversely affecting AutoTrader destined Trading Orders for futures contracts. The expiration date of the contract was not being sent in versions of Investor/RT other than the IB Version. AutoTrader would therefore reject the order. This has been corrected. When a non-IB version of Investor/RT are used in conjunction with AutoTrader, Investor/RT uses the brokerage alias to infer the expiration date. For example, an eSignal user watching ES #F has the eSignal instrument setup with brokerage alias ESH6. Investor/RT examines the brokerage alias and infers that ES is the underlying symbol and H6 means 03/2006. When a trading order is executed, the underlying and expiration month/year are sent to AutoTrader to identify the subject instrument for the trade.
- Further improvements were made to holiday-related date/time functions. TPO (Price/Time Profile) charts, in particular those assigned to overnight sessions, now properly eliminate the

holiday periods from the chart. Exchange code "VENTURE" was added in this release to enable IB Version users to specify this exchange for Canadian Stocks.

- Setup: Preferences: General has a check box for enabling Mouse Wheel Scrolling in the Windows Version of Investor/RT. When this feature is enabled, TPO charts respond to mouse wheel movements by scrolling up and down. The effect is the same as using the up/down arrow keys on the keyboard. Hold down the shift key while using the mouse wheel to expand/contract the TPO "Letter Height" within the range of letter sizes you have setup in the chart's preferences.

When the Ctrl key is held down, TPO charts scroll left/right in response to wheel movements, just as they do for the left/right arrow keys. When Ctrl and Shift are both held down, the mouse wheel changes the ending day of the chart, just as shift-left arrow and shift-right arrow keys do. For example, if you have the chart setup to "Show 2 Days Ending Now", successive ctrl-shift-wheel-up movements will revise the window to show 2 days ending 1 day back, then 2 days back, then 3 days back, etc. Ctrl-shift-wheel-down movements bring the chart back toward "ending now". Observe the window's title bar for feedback as you scroll the ending day.

- The Object Editor window contains a ten button pallet for calling up lists of various objects. The RTL icon, the same icon used for RTL objects on the main toolbar, calls up all of the Signal objects. If the Shift key is held down when clicking the RTL icon, the list of Scans is displayed instead. Note that the Signal list will show any Scans that have been marked for dual usage as scans and signals. The list of Scans will show all scans, whether marked for dual usage or not. The list of scans will not include Signals that have not been marked for dual usage. Similarly the Signal list will not include those scans that have not been marked for dual usage. If all scans and signals have been marked for dual usage, there is no difference between the list of scans and the list of signals. If the Ctrl key is held down while clicking the RTL button in the Object Editor, the list of custom indicators appears. There is also a button dedicated to custom indicators just below the RTL button.

Version 8.2.0 – Released January 9, 2006

NinjaTrader Trading Orders, Strategy Setup.

When a trading order has a destination of NinjaTrader the account/strategy entry box should typically be an account id known to NinjaTrader, followed by the name of the strategy template NinjaTrader should use for the position. The strategy specification pertains to Buy, Sell, Reverse, and Change Order actions. To provide the Investor/RT user with the ability to easily revise strategies on the fly without having to edit the trading order setups, the strategy name may now be specified indirectly using a T# user variable. For example, an account/strategy setup using T#5 would look like this: Sim101/T#5. When the order is executed from some instrument, that instrument's T#5 string value will be used to submit the strategy template name to NinjaTrader.

IB Version, Forex Improvements

The IB Version now supports improved setup and chart backfill for currency pairs, e.g. EUR.USD, JPY.USD, etc. When adding such instruments via the Setup: Instruments window, choose "Forex" as the security type. Investor/RT automatically sets up the Underlying Symbol and the Currency for the instrument by extracting this information from the ticker symbol, e.g. the ticker EUR.USD results in EUR as Underlying and USD as currency. In the IB version of Investor/RT it is important to specify the requested exchange (override exchange) in Setup: Instruments as well, typically IDEALPRO or IDEAL. Intra-day data for Forex instruments having exchange IDEALPRO can be downloaded directly from IB.

You may also enter brand new ticker symbols directly into a quote page. The IB version of Investor/RT will recognize any ticker symbol of the form XXX.YYY as a "Forex" (security type) instrument with XXX being the underlying symbol and YYY being the currency. Such tickers will be setup automatically with security type Forex and exchange IDEALPRO. If you wish to specify some other exchange you may enter Forex symbols into the ticker cell of a quote page using the format XXX.YYY:EXCH:SESS where EXCH represents an alphabetic exchange name and SESS represents the numeric session id. For example, you may enter JPY.USD:IDEAL:33 into a new row in a quote page and Investor/RT will define a new Forex instrument with underlying symbol JPY and currency USD; IDEAL will be setup as the override (requested) exchange and 33 will be the new instrument's session.

In order for Investor/RT to receive quotes on currency pairs from IB/TWS, the most crucial parts of the instrument setup are the "Security Type", "Underlying Symbol", "Currency" and "Requested Exchange". It is recommended that you use the format XXX.YYY for all Forex ticker symbol so that Investor/RT automatically sets up the underlying and currency when you add the symbol. To troubleshoot your setup when data is not forthcoming from IB/TWS, add the four crucial data columns to a quote page so you may view and edit them if necessary. Also, check the message log (File: Open: Message Log) for error messages when Investor/RT connects to TWS. If the ticker symbol setup is in error a message to that effect will appear in the log.

Version 8.2.0 Miscellaneous Fixes and Improvements

- When using the Setup: Schedules window to duplicate a schedule, the duplicate schedule will inherit all of the scheduling options of the original. The duplicate will be set to "Inactive" so it will not begin executing until you mark it active again. Inactive schedules are listed in the schedule list with an asterisk. You can activate a schedule by editing it and turning off the "inactive check box", or you can ctrl-double-click on the schedule name to toggle the schedule between active and inactive (suspected) status. A bug was fixed to enable selection of the day of week check boxes when setting up schedules to run only at startup. Also, the Setup: Schedules window title now shows the days of the week that the schedule will run, e.g. "Everyday" or "M-F".
- The Quote page Preferences dialog had two "stuck" check boxes that would not respond to mouse clicks; this bug was fixed.
- The Verify Historical Data report has been condensed to report only the first of many consecutive "timestamp outside of session" errors. This reduces the size of the report and the

time it takes to produce the report for users who track thousands of symbols and download lots of intra-day data.

Version 8.1.5 – Released December 21, 2005

Trading Order Integration with NinjaTrader 5 for Windows Users

Investor/RT trading orders can be defined with destination "NinjaTrader". This feature of Investor/RT works in conjunction with Version 5 of NinjaTrader utilizing the NinjaTrader DLL interface, called the Automated Trading Interface (ATI). See the NinjaTrader documentation for more details. This capability must be considered "beta test" at this time. The implementation is still in progress; the basic functionality is in place but further work is needed for more advanced usage, e.g. advanced trading order placement using the TSYS indicator.

Interested NinjaTrader (NT) users are encouraged to experiment with this new facility using the NinjaTrader simulated datafeed (Sim101 Account) and provide feedback. Trading orders destined to NinjaTrader can be executed directly by clicking on chart buttons setup for that purpose, or by signal actions that reference a trading order name. The "Trading Order Desk" can be used as a vehicle for creating, editing, and sending trading orders. The discussion of trading orders in the context of using AutoTrader generally applies to any trading order destination. When you select NinjaTrader as a trading order's destination, the list of available order actions will be those supported by NinjaTrader's ATI. One key difference is that the user can create trading strategy templates in NT. When setting up a trading order, the order can simply specify the account (no strategy), or it can specify an account name followed by a slash and the strategy name. BUY, SELL, and REVERSE orders sent to NT from Investor/RT will be handed by NT in accordance with the trading strategy template named in the trading order, if any. Trading Strategies in NT provides for stop and target order placement.

Version 8.1.5 Miscellaneous Fixes and Improvements

- Regarding Database Backup and Recovery Improvement, the checkpoint backup files are now written to the backup folder as specified in Setup: Preferences: Backup, thus no backup files will be created inside the data_f database folder as in the previous version. Users who operate with the Investor/RT database data_f folder on a ram disk and backup folder on a hard disk will benefit from reduced ram disk memory usage.
- A rare bug was fixed having to do with downloading from Dial/Data shortly after shutdown. At startup Investor/RT connects to the LinnSoft web site to check for availability of new versions and administrative messages for the user. If these administrative tasks happened to complete while a Dial/Data download was in progress, a fatal error would occur. The fix eliminates the conflict between Dial/Data connections and Investor/RT administration connections.
- New menu item in Setup Menu, Setup: Signal Action... take you directly to the default preferences for the Signal Action indicator. From there, you can create named signal actions using the Preset button.
- Setup: Preferences: Order Desk has newly renamed order desks. The "Portfolio Order Desk" will give you the Investor/RT default order desk for making journal entries and/or trade

entries into Investor/RT portfolios. In prior versions this was called simply "Order Desk". The "Trading Order Desk", formerly called the AutoTrader/IB Order Desk, has a more general name since the Trading Order feature of Investor/RT can now be used to route trading orders to several destinations. Trading Orders can now perform simulated trading into Investor/RT portfolios, real or simulated trading via AutoTrader to Interactive Brokers, real or simulated trading to IB and other brokerages via NinjaTrader 5 software for Windows.

- Custom Column rule setup for schedules and signal actions has been improved. Clicking in the schedule or action cells of a custom column rules popups up a list of schedules or signal actions respectively. These lists now have "New" as the first choice at the top of the list. Choosing "New" guides the user through the process of setting up a new schedule or a new signal action.
- The IB version of Investor/RT now support currency pairs (Forex) quotes, e.g. the EUR.USD pair is defined in TWS with underlying EUR and currency of USD, with exchange code of IDEALPRO. To setup this symbol for track in Investor/RT, use ticker symbol EUR.USD, security type "Forex", and override exchange code IDEALPRO. You must all assure that the quotepage columns "Underlying Symbol" and "Currency" are setup as EUR and USD respectively. Once these settings are in place, Investor/RT will begin receiving real-time quotes from TWS. Investor/RT maps changes in the bid into the "Last" price (these pairs do not have a last price per se). Investor/RT tracks open, high, low, and last based on tracking the bid prices over time.
- A constant token SEC_FOREX was added to RTL to facilitate listing of symbols having this security type. The scan formula "SECTYPE = SEC_FOREX" will find all instruments having Forex as security type.
- A memory leak was fixed in the Equi-Indicator.
- Several significant memory leaks in the Macintosh OS X Version were eliminated. OS X users will experience considerably reduced memory requirements when running Investor/RT 8.15 and higher for extended periods. Memory leakage was occurring when windows were opened or closed. The rate of memory leakage was proportional to the number of menu items in the various submenus of the "Open" menu. Generally, these memory leak fixes should result is an overall improvement in product memory usage, speed, and stability in the OS X environment. The MS Windows Version was not subject to or affected in any way by these OS X memory leak issues.

Version 8.1.4 Released December 1, 2005

Chart Buttons for Adding/Removing Symbols from QuotePages

Chart buttons may be added to a traditional chart to facilitate adding or removing the charted symbol to/from any user-defined quotepage. When reviewing charts in a slideshow for example, such buttons provide a quick and easy way to make note of instruments you may wish to come back to later. The Button setup now includes two new purposes, "Add Symbol to QuotePage" and "Remove Symbol from QuotePage". For push buttons, either type in the name of the quotepage, or use the provided menu of user-defined quotepage name to select the target quotepage. For Menu buttons, enter a list of quotepage names separated by commas, or use the menu to build the comma

delimited list by making two or more selections. You may also create a special "all quote pages" menu button by entering a ? as the quote page name. When ? is the quote page name, Investor/RT will present a menu of all user-defined quote pages when the button is clicked upon in the chart. When you click on the pushbutton button in a chart or click on the menu button and make a quote page selection, Investor/RT will determine whether the target quote page is open and if so, the symbol in the chart (the instrument associated with the button) will be added to a new row at the bottom of the page, or its row will be removed from the open page according to the button purpose. When the target quote page is not open, Investor/RT updates the database, adding or removing the symbol according to the button purpose. Messages are placed in the log for each symbol added or removed.

TPO Chart Info Box and Highlighter

TPO Charts have been enhanced with an optional Info Box and Highlighter. The two features are linked in that the Highlighter is turned on only when the Info Box is on. A check box has been added to the TPO preference window titled "Info Box" along an entry box for the width of the Info Box. The Info Box will appear to the left of the vertical scale, on the far left edge of the chart. When the Info Box is on, mouse/cursor movements across the chart drive the new Highlighter, highlighting the cursor's row/price and the cursor's letter. For instance, if the cursor was over the letter "C" at the price of 1125.75, then all the C's in that profile would be highlighted, along with all the letters in the row of price 1125.75. As the cursor is moved over a new letter, the highlighter responds dynamically.

The Info Box provides information related to the position of the cursor/highlighter. The information is grouped into three sections. The top section provides information related to the profile over which the cursor resides. The middle section provides information related to the row/price of the cursor. And the lower section provides information related to the letter over which the cursor resides. The profile information includes date/time, TPO count (TPO), TFF, Q%, POC, Rotation Factor (RF), Volatility (VLT), Range (RNG), and volume (VOL). The price/row information includes price (P), volume (V), and TPO count (TPO). The letter information includes the letter, the time of the letter, the high of the letter (H), the low of the letter (L), and the range of the letter (RNG).

These new TPO features will be turned "on" when you upgrade to version 8.1.4. Existing TPO charts will open with the InfoBox displayed and newly created TPO charts will open by default with the InfoBox in view. The tab key can be used to quickly toggle the Info Box (and the Highlighter) off and on. A Toggle InfoBox menu item is also available in the TPO popup menu for this purpose. If you want newly created TPO charts to appear without the InfoBox, adjust your default preferences using Setup: Preferences: Charts: TPO...

Version 8.1.4 Miscellaneous Fixes and Improvements

- The File: New menu has a new item. File: New: Chart - TPO opens the Create New Chart window preset to create a TPO chart. The user can then select the symbol and press enter or click OK to open the new TPO chart.

- Double-clicking in the message area of the main toolbar (or using the File Menu or the popup menu) to open the message log will open a new text window to show the message log if necessary. If a message log text window is already open, however, Investor/RT will instead bring that window to the front. Message log windows are shown in a fixed system font (e.g. Courier) with no word wrap. When a message log window is included in a layout, Investor/RT will reinstate the window when the layout is opened, preserving the special fixed font, size, and word wrap setting, rather than using the user's text font/size preferences. These minor revisions for the message log behavior also apply to the alarm log file.
- When you use Setup: Instruments to revise the session for a symbol, Investor/RT determines if there are any chart windows open for that symbol and the charts are updated to reflect the new trading hours assigned to the symbol. This feature has long been present in Investor/RT, however, only charts having the symbol in question in the top pane of the chart were being updated. This bug has been fixed so that all charts containing the symbol in any pane will refresh to reflect the new trading hours.
- Further improvements have been made in Version 8.1.4 OS X edition for users who run without administrative access privileges. The Reconfigure application and the two database utility applications, Database Verify and Database Maintenance, have been improved so that they recognize when the user has installed a ~/library/application support/investorrt folder for local storage of their database and other user-specific Investor/RT related files. Even for users with admin access, Investor/RT now fully supports storage of user-specific database files, admin folders, etc. in the user's private home directory, while the application and feedlibs reside in the system owned Applications folder. See See What's New in 7.5, 'Running Investor/RT on OSX without Administrative Access' for details on how to setup your Investor/RT folders
- A bug was fixed in the 8.1.3 IB Version that affected DTN Market Access downloads of Daily Historical Data. Far fewer bars were being downloaded than requested.
- A rare bug was corrected having to do with downloading historical data for traditional charts, where the view period was expressed in bars, e.g. Last 200 days for a daily chart, or Last 500 Bars for any minute interval. View periods expressed in years or days or explicit dates were not affected. The bug surfaced when the data available at the time the chart was opened constituted far fewer bars than needed to fully populate the view period. The theoretical starting date of the chart was being mistakenly replaced by the actual starting date of the data loaded into the chart. The result was that subsequent attempts to download data for the chart could not retrieve data any earlier than that initially loaded. Changing the view period to Last N years (daily) or last N days (intra-day) would remedy the problem. This is now fixed so that the theoretical beginning date of "Last N Bars" charts is correctly retained. The end result is that clicking the download button will now backfill the chart to the desired period. This bug was rare because it is often the case when opening a chart on a brand new symbol that there is no data available at all. In such cases, the theoretically starting date/time of the chart was retained, and data was then downloaded into the chart. That data would be retained and the problem described above would not surface.
- A bug unique to Version 8.1.x was fixed in the OS X Version that caused a fatal error if more than 200 quotepages were defined. Up to 1000 quotepages can be defined.

- A bug unique to version 8.1.x was fixed in the OS X Version that was causing fatal errors when Investor/RT was performing Dial/Data downloads in the myTrack version while the myTrack feed connection was active.

Version 8.1.3, Released November 11, 2005

New Symbol Selector

Option.Setup: Preferences: General has a new user option that provides control over how instrument selectors respond when an unrecognized ticker symbol is typed. By default the new checkbox, titled "Prompt for New Symbols When Using Symbol Selector", is checked. This setting is recommended for new users and others who find it convenient to add new symbols this way. Users who have a known, stable list of tickers, may find it desirable to turn off this option. When the option is OFF, typing into an instrument selector always starts anew at the top of the list whenever you enter a sequence of characters that form a new symbol not yet defined to Investor/RT. So for example, when you type MSFTX, Investor/RT recognizes the tickers MS and MSFT as you continue typing; but when you type the X, since there is not a valid ticker symbol MSFTX, Investor/RT will jump to the first ticker beginning with X. If there is no symbol beginning with X, Investor/RT positions you at the top of the selector's list of known tickers. With this option in the default "On" state, typing MSFTX would result in a prompting dialog offering to add MSFTX as a new ticker. When typing into an instrument selector, if you pause typing for 2 seconds or more, the instrument selector assumes that the next character you type is the beginning of a new lookup request. When using an instrument selector anywhere in Investor/RT, after you have begun typing a ticker, you may press the esc key to start over with a new lookup request, rather than pausing for two seconds. If you press the esc key before beginning to type, the window containing the instrument selector is dismissed (closed).

Import/Export of TPO (Price/Time Profile) Chart Definitions

TPO Charts may now be exported and imported. The export process creates a definition text file that can be emailed to support or shared via email with other Investor/RT users. Export of TPO chart definitions can be initiated in several ways:

- a. Right-click in the TPO Chart and choose "Save As Chart Definition"
- b. Click the "Export Chart Definition" button on the TPO toolbar.
- c. With a TPO chart as the front window, choose File: Export: Chart Definition.
- d. When one or more TPO charts are open, export them all into one definition file using File: Export: Current Layout.

To import a definition text file, use File: Import: Chart Definition. Investor/RT will prompt you to select the file to be imported, open the file to determine whether it is a TPO Chart or a Traditional Chart definition, perform the appropriate import, and display the chart(s). As with traditional chart imports, the "Import/Export Preferences" apply. Also, you will be prompted when the chart name being imported already exists and given the choice of replacing the existing chart or importing the new one with a unique name.

Logging Improvements

Chat sessions are now logged to a file name chatlog.txt in the admin folder/directory. After disconnecting from a chat room you can refer back to the most recent chat session using File: Open: Chat Log to view the text. Chatlog.txt is considered a temporary file, thus it will be deleted if you perform the "Delete Temporary Files" function. Similarly, the transcript of the most recent email sent by Investor/RT is logged to the temporary file maillog.txt in admin. The log of the most recent Dial/Data download session is available in the file irtlog.txt in admin. This file can viewed using the command File: Open: Internet Log. The irtlog.txt file was not being created in earlier OS X versions of Investor/RT, but this logging function now has been restored for OS X user. Dial/Data downloads also display a small status window of download progress in the OS X version, another feature that had been temporary unavailable as a result of revisions to the TCP/IP connection software in the OS X version of Investor/RT.

Database Backup and Recovery Improvement

Database concepts and facilities of Investor/RT are discussed in detail in the help topic Database Backup and Recovery. Version 8.1.3 adds a new backup mechanism aimed at providing improved backup of object definitions in the Investor/RT database. Object definitions of many kinds are stored in a database file named object.d01, called the "object database", inside the data_f folder. Objects stored therein include scans, signals, custom indicators, trading systems, realization and optimization setups, and chart definitions of all kinds (traditional charts, TPO Charts, PNF Charts, .etc.). Another database file, preferen.d01 (preferences.d01 on Macintosh), is used as a repository of user preference settings, technical indicator default preferences, preset definitions, layout definitions, keyboard shortcuts, and user variable (T# and V#) values for each ticker symbol.

Every 15 minutes Investor/RT performs a database "checkpoint" to assure that all database updates are written to the database files in the data_f folder. When a checkpoint is performed, Investor/RT determines if any object or preference setups have been updated since the last checkpoint. If so, the object.d01 and preferen.d01 files and associated key files named object.k01, preferen.k01, and preferen.k02 are quickly backed up. These five backup files, with .bak suffixed to the file name, are kept in the data_f folder along with the real object and preferences database files. The checkpoint backup of these database files is conceptually similar to making a normal full backup. The key differences are that the backup pertains only to the object and preference files and it takes place very quickly and more frequently as objects and preference settings are updated. In the event that an Investor/RT database becomes damaged and a database restore is required to regain database integrity, the checkpoint backup files will usually be more current than the full backup. Typically a full backup is performed each day while the checkpoint backup will be made within 15 minutes of the most recent object or preference modification. When restoring the Investor/RT database, the more current object and/or preference backups are restored if more current than the corresponding daily backup file.. This assures minimal or no loss of object definitions and preference settings even in the extreme case that a database restore is necessary. This new facility is fully automatic; there is no user involvement; the bottom line is that Investor/RT does a better job of backing up your definitional

work for many key Investor/RT objects/preferences, and restoring those object definitions and preference settings automatically in the event that database restoration is ever needed.

New Technical Indicators: Alpha and Beta.

Beta measures the volatility of a security relative to something else, usually a benchmark index like S&P. To calculate beta, you scatter plot the bar to bar changes of the symbol (stock or fund) along with the bar to bar changes of an index on an XY graph (with the index going on the X axis) for a user-specified period. A best fit (regression) line is then drawn through these points. The slope of that line is beta, while the Y intercept is alpha.

A beta that is greater than one means that the fund or stock is more volatile than the benchmark index over the given period, while a beta of less than one means that the security is less volatile than the index. A beta of 0.9 should be interpreted as follows: the stock/fund would return only 9% while the market/index went up 10%, however, it would it would lose only 9% while the market/index dropped 10%. Similarly, a beta of 1.5 would be interpreted as follows: the stock/fund would return 15% while the market/index went up only 10%, however, it would it lose 15% while the market/index dropped only 10%.

Alpha is a measure of residual risk of an investment relative to some market index. Alpha is the Y intercept of the best fit line mentioned above. Alpha is expected to be equal to risk-free rate times (1 - beta). The following equations explains the relationship between alpha, beta, and the Stock and Index returns.

$$\text{StockReturn} = \text{Alpha} + \text{Beta} * \text{IndexReturn}$$

The preference windows for both Alpha and Beta are essentially identical. Both ask the user to specify the underlying symbol (generally an index like S&P), a price, a period, and drawing style. Again, the underlying symbol should generally be an index such as S&P, and that symbol should have data for the same period that is being studied. The price should generally be "close", but the user may choose to use something like that High/Low average. Commonly, beta and alpha are calculated over 3 or 5 year periods of monthly data. This would require a period of 36 or 60, and a periodicity of monthly.

Profile Indicator Option - Extend Lines to Present

A check box titled "Extend Lines to Present" was added to the Profile Indicator. When checked, all "Previous" POC and VA lines from each past profile will be extended to the right edge of the chart.

Download Data Window Improved

The date/time controls in the Download Data window have been adjusted to provide the user with a simpler, more convenient method of specifying the amount of data to be downloaded. In most cases, you will see "X Days Back" in the "From" control, and "Present" in the "To" control. This should satisfy most historical download requests. When downloading intraday data, the setting "0 Days Back" (Beginning of Session) will get data back to the most recent session start time. Actual date/time feedback is provided beneath the "To" date in the download data window as you manipulate the from date. The setting "1 Days Back" will go back two session starts and so on. For example, if the present time is mid-session on Thursday, "Last 0 Days" will request data back to the start of the Thursday session; "Last 1 Days" will download data beginning from at the start time of Wednesday's session. The date control now accepts "X minutes back" and "X hours back" choices for shorter term downloads. The minutes or hours back are interpreted as "trading hours". The "To" date control is usually set to "Present". The only data source that allows downloads that end in the past is Dial/Data.

While the from date control will usually offer the X Days back format as a starting point, the control may still be used to specify a fixed date or a relative beginning date. The menu button at the left edge of the date control can be used to select other date/time specification methods if desired. The "Relative Data Beginning" choice, for example, enables the starting date for the download to be specified as the beginning of the current session (new in this release) as well as the beginning of the week, month, quarter, half, or year. When the date specification is in "X back" relative date format, the "X Bars Back" choice provides a periodicity dependent method. The beginning date of the download is determined based how much time back it would take for the desired number of bars. X Bars Back is inappropriate for "tick/bar, range bar, change bar, volume" periodicities however. since the amount of time needed to form such bars cannot be determined in advance. Thus the new X Minutes, X Hours, or X Days Back choices can be used effectively for these periodicities.

Version 8.1.3 Miscellaneous Fixes and Improvements

When Charts, Quotepages, and RTL Objects (Scans, Signals, Custom Indicators) are deleted, Investor/RT removes the object from any .Recent groups in which it may reside.

Typing a ticker symbol very rapidly into a chart window could cause the first two letter of the ticker to be exchanged. For example, typing M,S,F,T very rapidly could cause the ticker to be seen by Investor/RT as SMFT instead of MSFT. This could cause the Add a Ticker popup dialog to appear needlessly. This flaw was corrected in 8.1.3.

Main Toolbar Menu Improvements: Right-click (control-click) in the main toolbar's message area to access a menu of commands and preference settings. Access to the General Preferences panel for Investor/RT is now available via this popup (contextual) menu. The general preferences panel is used to specify toolbar related preferences and other system-wide user preferences such as the tick data filter, text window color and font defaults, etc. The popup menu provides a menu item "Message Log" that opens the message log file for viewing. When the shift key is held down while choosing this menu item, the message log is trimmed to its default size before display. The default size is a user preference in Setup: Preferences: Message Log. When the Ctrl key (Option key on

Macintosh) is held down, choosing Message Log empties (clears) the log before opening the window for display. Double-clicking inside message area of the main toolbar is a shortcut for displaying the message log. The new shift and ctrl (option) key modifiers work with the double-click as well, i.e. ctrl-double-click in the message area to clear the message log and open the empty log window for viewing. Subsequent log messages will scroll into the message log window.

The traditional chart popup menu items for toggling (showing/hiding) buttons, pane titles, and the chart toolbar have been renamed and made checkable to indicate their current status. The revised menu item names are "Show Buttons", "Show Pane Title", and "Show Toolbar". These menu items will appear checkmarked when the item is presently shown and unchecked when the item is hidden. Thus, for example, when chart buttons are invisible, the popup menu item "Show Buttons" will appear unchecked, choosing it will "show" the buttons. Choosing an unchecked menu item makes the corresponding item visible and adds the checkmark to the menu. Similarly, choosing a checked menu item hides the corresponding item and takes the checkmark away.

User Text Variables T#1 through T#32 are now available for inclusion in portfolio formats.

When a T# variable is present as a column in a portfolio, the text value of the variable may be viewed and edited if desired in the windows, just as they can in a quote page.

Exporting Historical Data for ticker symbols that contain special characters (e.g. /, \, <, >, :) is now better supported. Special characters in the ticker symbol are now replaced with hyphens or the # pound sign to make the suggested file name for the export a legal file name.

For Macintosh OS X users, Version 7.5 introduced the capability of running Investor/RT in a multi-user environment where the user logged into OS X need not have "administrator access". See What's New in 7.5, "Running Investor/RT on OSX without administrative access" for details. In this context, Investor/RT software resides in the Applications directory, but all user specific files, including the Investor/RT database, reside in a subfolder of the user's home directory. This capability has worked well, so long as the user home directory is on the same disk volume as the Application directory. In Version 8.1.3 this capability has been extended to support setups where the application may not reside on the same volume as the user home directory. This enables users without administrator privileges to run the Investor/RT application from a server volume, for example, where their Investor/RT local files are resident on the local hard drive. Similarly, users with dual hard drives may run Investor/RT from the application directory folder on one volume, even if their user home directory resides on a different volume.

The Control->Database Utilities sub-menu has a new menu item titled "Checkpoint Database". This command instructs Investor/RT to assure that all database updates are written to the database files on the hard drive. Such checkpoints are taken automatically every 15 minutes and also after some database utility functions are performed, e.g. after any of the compression functions. This command simply provides a way for the user to initiate a checkpoint manually. As explained in item #19 above, a backup of the objects and preferences database files is performed as necessary when the checkpoint occurs. Thus, for example, after an extensive period of editing and saving charts, RTL objects, or trading systems, requesting a checkpoint from the menu results in an immediate backup of all

definitional work, thereby establishing a "checkpoint" (sometimes called a "commit point" in database jargon) that you can get back to, even if the database were to be restored later.

A database checkpoint is essentially instantaneous and does not cause any disruption in data feed reception. In contrast, a full database backup requires that data feed reception be suspended while the backup of all database files is performed. The time it takes to verify and backup a full database is a function of database size, the number of ticker symbols defined, processor speed, and other factors; a backup can take just a few seconds to 30 minutes or longer. A checkpoint will typically take only a second or less. The Checkpoint Database command is also available as a schedule event. A keyboard shortcut for taking a checkpoint can be created easily as a "run schedule" shortcut, where the named schedule performs this action. When checkpoints are performed, a message will appear in the message log whenever a backup of the object database is made. When a checkpoint is initiated by the user, Investor/RT resets a timer so automatic checkpoints will resume 15 minutes later.

Version 8.1.2, Released: October 19, 2005

Improved Positioning for "Pinned" Toolbars

The toolbar position options in Setup: Preference: General include four "pin" styles for toolbars, used to specify that toolbars be pinned to the top, bottom, left or right side of their associated window. This option works as expected when opening charts, quotepages, etc, but when dragging a window that has a toolbar to another location, the associated toolbar would stay where it was until the object window is either resized or it loses and then regains "focus". This has been improved so that any mouse movement inside the object window will cause the toolbar to snap to its pinned position. On the Macintosh platform, this happens instantly when a window is moved to a new position. On the Windows platform, the mouse must move into the content area of the object window to cause the toolbar to pin to the new location.

Chart Popup Menu, Toggle Buttons Menu Item Added

Choose "Toggle Buttons" from the chart popup menu to hide all the chart buttons inside the pane. Choose this menu item while the buttons are hidden to show them again. This command will be useful for those who wish to send a screenshot of an Investor/RT chart without all the button images, to cut down on the visual clutter in the screenshot. All charts, when initially opened, are in the "Show

Buttons" state, so even if you save a chart while its buttons are hidden and close it, upon reopening, its buttons will be visible.

Tick, TickBar View Periods Expressed in Days vs Hours

For traditional chart view period preferences, when the periodicity is tick, ticks/bar, range bar, change bar or volume bar, the view period can be expressed in hours, bars, and now in days.

Price/Time Profile (TPO) Charting Improvements

The Price/Time Profile Chart in Investor/RT is sometimes referred to as a "TPO Chart". TPO is an abbreviation for "Time Price Opportunity" or "This Price Occurred". This profile chart type is also called a market profile chart, a term trademarked by the Chicago Board of Trade. Investor/RT now uses the TPO abbreviation in various menus and messages relating to Price/Time Profiles, e.g. the chart type menu items show "TPO - Price/Time Profile" rather than "Price/Time Profile". Similarly, the abbreviations PNF (Point and Figure) and TLB (Three Line Break) appear in various menu items prefixed to their longer names.

TPO - Price/Time Profile charts can now display profiles of any number of minutes, resulting in multiple profiles per day. In prior releases, it was possible to specify a profile duration of one day (default) or multiple days. Now, each day (session) may be subdivided into multiple sessions, each comprised of a user-specified number of minutes. For example, the RTH session may be divided into three 130-minute profiles (9:30 to 11:40, 11:40 to 13:50, 13:50 to 16:00). A 24-hour session may be divided into two profiles, one for overnight, and one for the day session. This may be done by specifying 1020-minutes per profile, resulting in a profile spanning 1,020 minutes from the session open (15:30), ending at the day session open (9:30). The following profile will not have a full 1020 minutes (it will have only 405 minutes in this example), because profiles end at session boundaries.

In the TPO Chart preferences, sub-session profiles are available via a menu with choices for "Days/Profile" or "Profiles/Day". The menu is available only when the "Multiple" check box is marked. The "Days/Profile" choice provides the previously existing multi-day profile capability, while the "Profiles/Day" choice provides the sub-session profiles. The user supplies the number of minutes per profile in the box just to the right. Any number of minutes may be entered; a menu of common minute intervals is provided. The user can show multiple days of sub-session profiles using the "Show X Days" option above. The "First Letter Time" and the "Start Letter" options are honored within each sub-session profile.

When multiple profiles per day are requested, the horizontal scale will reflect the date of the first profile of each session, and the time of the subsequent profiles.

Version 8.1.2 Miscellaneous Fixes and Improvements

- The "Delete Temporary File" function in the Control: Data Management menu has been improved. It works faster and eliminates unneeded temporary files more effectively than before.

- A bug was fixed having to do with typing into a symbol selector. If letters forming a new symbol are detected, a dialog box appears allowing the addition of the new ticker symbol. Additional letters typed are now correctly appended to the ticker symbol in the dialog box and the letters are capitalized.
- Issuing the "Run Scan" command in the File Menu would result in a fatal error if no scans were defined to Investor/RT. This was a rare bug. It could surface if the user had deleted all of the sample scans supplied in the installed database. It has been corrected.
- A bug was fixed in the historical data downloader for eSignal, DTN.IQ, and DTN Market Access. The bug affected downloaded price data for futures contracts that trade in 32nds and 64ths. The data capture process was losing some precision in the price data. Imported prices are now accurate to 6 digits of precision to the right of the decimal.
- By default, the Schedule Action "Start Data" is not executed when Investor/RT is in the "Working Offline" state. The Start Data schedule action setup has a new check box titled "Start Data even if working offline". Check this box for your schedule actions if you want the Start Data to be executed regardless of state. If you mark this new option and the schedule runs while you are working offline, Investor/RT will end the "working offline" state and start (connect to) the real-time data source.
- A bug was fixed having to do with dragging the border of two chart window panes. If the upper of the two panes had no pane title bar, but the lower of the two panes did, the drag would not allow the upper pane to be completely minimized. With this corrected, you can completely minimize any pane, a "button pane" for example, by dragging its lower border all the way up to the top edge of the button pane. This has the effect of hiding all the buttons in a button pane.
- Choosing "Place a Trade" from the chart pop up menu opens the user-selected order desk window. If the order desk is the "AutoTrader/IB Order Desk", the system would occasionally open a chart of the first instrument listed in the order desk window. This extraneous chart window bug has been fixed.
- The Setup: Preferences: Sessions window now monitors the user-specified post time as the user is editing a session setup. The post time for day sessions must be on or after the end of the session. Similarly, overnight session post times must be on or after the end of session and also before the next session begins. Any attempt to enter an invalid post time will cause a message to appear in the main toolbar message area. Invalid post times will be corrected automatically by setting the post time to the session's end time. These new safety checks will prevent various side effects associated with having a session that does not "post" each day. Investor/RT performs various housekeeping functions each day at the prescribed post time for each session. These housekeeping functions are not essential for users of various Investor/RT end-of-day and non-streaming versions. They pertain primarily to realtime streaming editions of Investor/RT.
- The REF token in RTL is used to make reference to the Nth value back of some expression, e.g. REF(CL, 5) is equivalent to CL.5. However, a bug was causing the second parameter to the REF function to be reduced by one. Thus REF(CL, 5) would incorrectly provide the value of the closing price 4 bars ago (CL.4 instead of CL.5). This flaw has been corrected. Note that the second parameter to REF can be a variable, e.g. REF(CL, V#88), or REF(CL, STAT) where STAT is setup to provide the "bars since..." some minimum or maximum price occurred. Anyone who

has employed the REF function successfully despite this flaw, has done so by adding one to the second parameter, REF(CL, STAT + 1) for example. Since this compensation is no longer required, RTL formulas involving the REF token will need to be revised now that this defect has been eliminated.

- In the Database Utilities Wizard window (Alt-U) holding down the shift key while clicking on the "Database Maintenance" button is a shortcut for displaying the text file dbmaint.txt, the database maintenance report file in the admin directory/folder. On the Macintosh platform, this file is updated every time the Database Maintenance application runs, e.g. when it is run from the Investor/RT Control Menu or from the wizard window. On the Windows platform, this file is produced ONLY when the dbmaint.bat file is run, typically using the MS Windows Start Menu, i.e. Start: Programs: Investor/RT: Database Maintenance. This file is not updated when the database maintenance functions are invoked by Investor/RT.

Version 8.1.1, Released: October 7, 2005

Version 8.1.1 Miscellaneous Fixes and Improvements

A memory leak issue was fixed having to do with running scans repeatedly using a schedule.

Those running hundreds of scans per hour would experience unrelated stability issues stemming from low memory resources after several hours of continuous operation.

A bug in the Interactive Brokers version was fixed. It could cause random bad tick prices to be received. A typical symptom would be that the last price of some instrument would be assigned to another instrument.

The OS X version sometimes mistakenly disables its menu items. This issue is still under investigation, however, a workaround solution was developed. OS X users who encounter this menu problem, can shift-control-click in the status message area of the main toolbar to enable the menu items. If the main toolbar is not visible, choose the first menu item in the Windows: Bring to Front menu, the one titled "--Ctrl-Click to Center...". This workaround does not re-enable the Quit Menu item inside the OS X InvestorRT menu. To quit the Investor/RT application, use the menu in the OS X Dock instead, i.e. mouse-down on the Investor/RT icon in the dock and choose "Quit".

The Verify Historical Data utility function has been improved to show an error report if invalid historical data was found in the historical database.

Trading Order setup for AutoTrader managed trades now include the Cancel Order command.

Formerly, this command was available only for pass-thru orders to Interactive Brokers.

Preliminary work was done in the Trading Order setup to support Financial Advisor accounts (IB "FA" accounts). New Autotrader commands "Get Managed Accounts" and "Get Allocation Profiles" have been added as trading order actions. The accounts and profiles of the financial advisor will then appear in the Account menu of the trading order setup. The next release will further support trading order submission using these accounts.

Version 8.1, Released October 3, 2005

Database Utilities Wizard

The Control: Database Utilities menu has been re-organized and a new menu item, "Database Utilities Wizard" appears at the top. Its keyboard shortcut is Alt-U (command-U on Mac). This new wizard menu provides convenient access to all of the database utility functions. [Click here for details.](#)

A new utility function called "Full Maintenance" is accessible from the wizard; it is also present in Database Utilities sub-menu. Full Maintenance is a composite utility that executes all compression utilities, verifies historical data, and executes the four step database maintenance utility which concludes with the verification of the database. "Full Maintenance" is also available as a schedule action. Full maintenance can often correct all of the problems in a damaged database, thereby eliminating the need to restore the database to an earlier backup.

Trading Order Enhancement

Trading Order setups can now specify a user text variable (T#1 thru T#32) in the Symbol setup. This is similar to using "Default" as the symbol, except that the text variable value of the default symbol is used as the brokerage symbol rather than the default symbol itself. So for example, if you are running the eSignal version of Investor/RT and watching ES #F in a chart having buttons for trading orders, you could have T#1 of ES #F setup as "ESZ5" and the trading orders for your buttons setup to use T#1. When a trading order associated with ES #F is executed, the value of T#1, ESZ5, is used to convey the order. Note that ESZ5 must be setup in Investor/RT as a legitimate instrument, it should be setup, in this case, as a future with exchange GLOBEX, and expiration date 12/2005 as these setups are required for trades passed to Interactive Brokers.

When ESZ5 rolls over to ESH6, you can add the ESH6 setup to Investor/RT, then revise the T#1 variable of ES #F to "ESH6" and all of your trading orders will then begin working on the ESH6 contract without having to make any modification to the trading orders themselves.

Creating Chart Buttons

The right-click menu for traditional charts has a menu item named "Add a Button" that makes it easy to setup buttons for indicators in your chart. Normal usage of this menu item is to first "select" an indicator, e.g. some moving average, then choose "Add a Button" and Investor/RT will instantly add a button to your chart pane the will toggle the selected moving average in and out of the chart. If you choose "Add a Button" when no particular indicator is selected, Investor/RT prompts for the indicator. When no indicators (other than buttons) are present, Investor/RT formerly issued an error message. This has been changed so that Investor/RT now adds a "blank" button and prompts you for the button's setup information. You can add a many blanks as you want this way, as long as there are no indicators (other than buttons) in the chart.

Sometimes you may wish to add a button that is not affiliated with a particular indicator even when there are indicators present in the chart. When Investor/RT prompts for the indicator for the new button, you can now pick "New" instead of an indicator. Investor/RT will then produce a blank button and prompt you for its setup. When you choose Add a Button from the popup menu, Investor/RT will present a list of all of the existing indicators in the chart along with this New choice. An "Apply" button is now available. Thus, if you wish to add buttons to your charts for several indicators or produce multiple blank buttons, this is now possible using the Apply button repeatedly on selected items in the list.

Improvements to Interactive Brokers (IB) Version

Investor/RT now handles proper reception of "Prev Close" information from TWS. This improvement means that the Change, %Change, and Prev Close data columns will now reflect the previous close value being transmitted by TWS. Further improvements were made in the handling of volume updates from TWS. The total volume figures shown in Investor/RT quote pages will be much more accurate now. Regarding futures symbol setups, improvements were made to automatically fill in the future's contract expiration date and the underlying symbol (future type). Expiration and underlying symbol information is required to obtain market data and historical data from IB. When importing quote pages or charts from other sources, this information is typically not setup by the import process. This improvement eliminates the need to do further setup work after importing.

Automatic Trendlines and Tick/Bar Charts

The Automatic Trendline indicator has been enhanced to operate correctly with traditional chart having tick-based periodicities. These include tick, ticks-per-bar, range-per-bar, change-per-bar and volume-per-bar periodicities.

Main Toolbar Resizing

The Windows version of Investor/RT now has a re-sizable main toolbar. This is an experimental feature that will be incrementally improved over time. At present the re-sizing is temporary in that the main toolbar is always opened to full size at startup. The size of the toolbar can be changed in the normal way, from its lower right-corner or from the right or bottom edges. When the main toolbar is unanchored, it floats above all other windows, so the ability to size it smaller is useful.

Price/Time Profile (TPO) Improvement

An option has been added to the Price/Time Profile preferences to control the height of the time line in pixels. A height of zero may be specified to suppress the time line. The time line is now drawn with the "rainbow" colors. This enables those who use a single solid color to clearly see the division between time line elements.

Pivot Point "Hide Text" Option Added

This check box in the Pivot Point indicator setup is off by default. When checked, the requested pivot point support and resistance line levels are drawn without text labels (the R1, S1, etc. labels). A similar check box allows the price level labels to be suppressed also.

Version 8.1 Miscellaneous Fixes and Improvements

The Interactive Brokers (IB) Version of Investor/RT would sometimes issue a fatal error when the user issued the Stop Data command in the IB menu to end the connection to TWS. This has been corrected.

A bug was corrected involving the export and import of Signal Action presets. If the signal action was defined to execute a named trading order, the name of the trading order was not being exported with the signal action. The trading order itself was being exported correctly, but the association between the signal action and the trading order is lost when importing. The solution to this problem involved changing the format of signal action exports to correctly convey the trading order name. Unfortunately, this change implies that users of Version 8.1 and higher must be careful when importing definitions that contain signal action setups, since export definitions created by earlier versions of Investor/RT are not in the new format. Before importing a chart definition or trading system definition that may contain signal actions you can check to see which version of Investor/RT was used to create the definition by opening the file as text. To open a definition file as text, use File: Open: File and hold down the shift key while selecting the file to be opened. The shift key tells Investor/RT to ignore the fact that the file is a definition file and just show the definition text rather than import the definition. Look for a line in the file that begins with the word VERSION.

In the IB Version, a bug in the "tick filter" was causing Investor/RT to filter excessively once an invalid last price found its way into the system. The result was that valid ticks were continuously rejected. The bug has been corrected so that the filter allows the new price level to be established after three consecutive "out of bounds" ticks are ignored.

A fatal error could result while using Chart Wizard to produce an array of charts using the list of symbols in a quote page. If a scan happened to run and replace the quote page with a new list of scanned symbols, a fatal error would result. The bug has been fixed; once the chart wizard begins to produce an array of charts it now uses its own symbol list to produce the array of charts. If the quote page associated with the chart wizard is replaced by a scan, the new list of scanned symbols will take effect with the next batch of chart wizard charts.

Version 8.0.5, Released September 14, 2005

8.0 Rev 5 Miscellaneous Fixes and Improvements.

- The Interactive Brokers (IB) Version of Investor/RT now supports multiple day downloads of one minute bars from TWS for chart backfill.
- Downloading of 52 Week High and Low from Yahoo! Finance is working again (Fundamental Data Download). A problem was also corrected in the "Current Quotes" download from Yahoo! Finance that was causing certain ticker symbols to be "missed" by the download.

- In Price/Time Profile Charts, Initial Balance (IB), Point of Control (POC), and Value Area (VA) lines, when requested, are now drawn on for all sessions/profiles.
- In the Setup: Instruments window you can expand the Advanced section of the window by clicking on the disclosure triangle or on the word "Advanced".
- When entering a ticker symbol into the "One Instrument" box in the Download Data window, you may type a question mark at any point to open the instrument selector. The instrument selector will be positioned on the first symbol matching what has been entered before the question mark.
- The keyboard shortcut Alt-D (Apple-D) will open the Download Data window setup with the ticker symbol (when a chart is the front window), or with the quote page name (if a quote page is the front window).
- The Download Data window title now shows whether you are downloading for a specific ticker or a quote page.
- The Schedule Action, Download Data, was performing the incorrect download type in some cases. This has been corrected.
- A bug was fixed in the IB Version that was causing the Chat feature to disallow chat connections.

Version 8.0.4, Released September, 12, 2005

Price/Time Profile Enhancements

Price/Time Profile (TPO) setup now includes an option to specify the starting letter other than A if desired. The duration of the first time period can now be specified if you wish it to be different from the others. A horizontal scale has been added at the bottom along with a time line showing the percentage of the session completed thus far and the percentage of each time interval completed thus far.

Intra-bar Rules for Trading System Indicator

Trading systems deployed in charts using the Trading System Indicator may now have special rules that are tested "Intra-bar". For example, a TSYS Indicator running in a one minute chart, can have a "recalc interval of say 5 seconds". Any intra-bar rules in the trading system will be tested during each one minute interval as the incoming data triggers indicator recalculation. Intra-bar rules can be used for example to test for stop and target being reached and cause a signal action to fire to exit the trade. Once an intra-bar rule triggers a signal action, it is not eligible to do so again until the next bar begins. When backtesting a trading system having intra-bar rules, those rules will only be tested at the end of each bar.

Window Tremor in Setup: Preferences: Sounds

A special sound named <Window Tremor> is not available for use in Setup: Preferences: Sounds. This is a silent sound, it has only the visual effect of trembling the front window. To see the effect, go to the Sound Preferences, select <Window Tremor> and click the Preview button. The Sound

Preferences window, being the front window, will tremble. There is also a <Window Tremor + Beep> choice in the sounds lists.

8.0 Rev 4 Miscellaneous Fixes and Improvements

- A bug was fixed in the Chaiken Money Flow indicator that could cause a fatal error when insufficient data was available to calculate the indicator.
- A bug was fixed in the downloading/import of historical data that dramatically improves the speed of import for users who maintain long term intra-day databases with tens or hundreds of thousands of ticks or bars on file.
- A bug was fixed in the running of scans. Scans that run periodically, manually or on a schedule, and produce quotepages of results, were not properly handling the case where the resulting quotepage becomes empty. If a scan result quotepage is already open, showing results from an earlier run of the scan, and the latest run of the scan makes the quotepage empty, this could setup conditions leading to random fatal errors at some unpredictable time many minutes or even hours later.
- The "Check for Updates" process, when invoked manually via the Help Menu, or automatically from time to time, has been improved to download the latest Investor/RT installer for you when a new version becomes available. The user is prompted before the download begins and is notified that Investor/RT must quit while the installer is run or downloaded from the web site. If it is not convenient to quit when you see the "new release available message", click cancel, then choose "Check for Updates" from the Help Menu at some more convenient time. In the past, Investor/RT would open the Quick Download center web page, now the installer for your platform (Windows or OSX) will begin immediately. This capability is not available in the Macintosh Classic version.

Version 8.0.3, Released August 23, 2005

Object Editor Export Function

The object editor now has an Export button. Select all, one, or several consecutive object names from the list of names and click Export. Investor/RT will then prompt for the name of the text file with the suggested name "export.txt". Definitions for each of the selected objects and their dependent objects will be placed into the file you specify. This feature enables you to create a bulk export containing many object definitions that can be imported into another Investor/RT system using the File: Import command. For example, you can easily create an export definition file containing every one of your chart setups and all of the indicator presets, signals, and other objects referenced by those charts. Simply open the object editor, click the "Charts" icon, click Select All, and click the Export button.

At present, exporting definitions via the Object Editor is available for the following object types: Charts, Custom Columns, Custom Indicators, Presets, Scans, Signals, Signal Actions, and Trading Orders. Export for other objects will be added in future Investor/RT releases. The Export button will

be dimmed if the object editor is displaying lists of objects for which the export function is not available.

The menu item: File: Import: Definition from File can be used to import any text file containing one or more object definitions.

8.0 Rev 3 Miscellaneous Fixes and Improvements

When importing a schedule definition, if the schedule of the same name was already present, a fatal error would result. This has been corrected.

When exporting schedules, charts presets for indicators, signals actions and trading orders that are referenced by actions within the schedule are exported as well. In general, exporting of signal actions, trading orders and other "presets" are more comprehensive. For example you might have a schedule the executes a chart button preset that in turns involves a signal action preset with a confirming signal after which another schedule is invoked. Investor/RT will handle such "nestings" of dependent objects so that the resulting export file will contain all of the schedule setups, presets, signals, and other objects that are directly or indirectly required to implement the intended effect.

Instrument selectors, e.g. the selector in the QuickQuote window, now support new quotepage related functions in the right-click menu. Right-click on any symbol in the selectors and choose any of the three choices in the QuotePage submenu. These menu choices enable you to add or remove the selected symbol from any number of quotepages, or view a list of quotepages that contain the selected symbol. These functions, long available in the quotepage itself, are now supported from any instrument selector window. Note that when the list of quotepages appears you can add (or remove) the selected symbol from multiple quotepages by shift-double-clicking the quotepage names one by one. The shift key down while double-clicking tells Investor/RT to use the Apply button (and leave the quotepage selection list open) rather than dismissing the window after adding the instrument to the quotepage.

The chart popup menu (right-click menu) has a new menu item in the "Add To..." submenu for adding the selected chart instrument to a quotepage. Right-click and choose Add To: Add Instrument to QuotePage and a list of quotepage names will appear at the right side of the chart. Choose the page and click OK or Apply to add the selected instrument to that page (use double-click and shift-double-click shortcuts as described in the preceding paragraph if you like). Note that if the chart has several instruments in it, you may first select the one you wish to deal with by clicking on its graph, otherwise the first instrument Investor/RT finds in the chart will be used.

Mouse Scroll Wheel support has been added to the List Selection windows that are used throughout Investor/RT. For example, if you click the "Open a Chart" button on the main toolbar you get a possibly long list of chart names. You can type any letter to jump to the charts whose name begins that begin with that letter. You can position your mouse pointer on the ok button and then operate the scroll wheel to advance down the list to the chart name you want to open and click ok to open the chart. Mouse Wheel special handing can be

turned on for this and other windows types in Setup: Preferences: General. This feature is available only in the MS Windows version of Investor/RT at this time (August 2005).

Version 8.0.2, Released August 12, 2005

Industry and Sector Downloading from Yahoo! Finance

Sector and Industry names for stocks can be downloaded from Yahoo! Finance using the Data Download window. You can request the download for individual stocks, or for all symbols in the .Stocks quotepage, or any user defined quotepage of stocks. Each request for sector and industry for a particular stock requires a connection to Yahoo!, there is no "bulk request" for this information. Investor/RT will skip any stocks in the subject quotepage that already have both sector and industry names to avoid unnecessary downloading. If you have hundreds of stocks setup in Investor/RT and you add a few new ones from time to time, you can simply request industry and sector for your .Stocks quotepage again and Investor/RT will quickly update just those new stocks that do not yet have this information. You can of course show Sector and Industry as columns in your quotepage. Investor/RT Professional users can run scans to list stocks in certain sectors or industries. For example:

```
SECTOR = "Technology" AND CL > CL.1;  
INDUST = "*Software" AND CL > MA
```

If you wish to clear out any current information you have for sector and industry you can easily do so by running the following scan on the .Stocks quotepage:

```
SET(SECTOR, CLEAR);
```

Then perform the Yahoo! Sector and Industry download for the .Stocks page to update all stocks you are tracking with Investor/RT. Allow approximately 3 second times the number of stocks in .Stocks for this to complete.

Miscellaneous Fixes and Improvements

A bug was fixed in Yahoo! current quote download that could cause a fatal error when requesting current quotes for 200 or more symbols where the symbols in question were longer symbols like Yahoo indexes or mutual fund symbols.

A bug was fixed in the new Pair Importing feature that would cause a fatal error whenever a list of pairs involving more than 5 unique ticker symbols.

Version 8.0.1, Released August 8, 2005

Enhancements to Price/Time Profile (TPO) Charts

New features include multi-day profiles (up to 40 days/sessions can be combined into a single profile). Up to 29 Profiles/Days can be shown simultaneously side-by-side in a given chart. For complete details, including screen shots and setup instructions, see this page on the Linn Software web site:

<http://www.linnsoft.com/tour/tpo.htm>

Sounds and Signal Actions

This enhancement is designed to make setup of trendlines, reference lines, and signal markers easier for those who simply want to have a sound played when a signal triggers or a line break occurs. The Reference Line, Trendline, and Signal Marker technical indicators all have an "action" setup that specifies the name of a "Signal Action" that is to be executed when the trendline or reference line break occurs, or when the signal marker's signal triggers on the current bar. Signal actions can be setup in Investor/RT to perform one or more functions, including playing a particular sound, issuing an alert message, or even executing a trading order. In many cases, however, a signal action that does nothing more than play an alert sound is needed. The extra step of creating a new signal action to play the sound can be tedious or even confusing to new Investor/RT users who may not be familiar with signal actions.

As a convenience, Investor/RT now adds pre-defined "Play Sound" signal actions for every sound to the list of signal actions. Each of these signal actions have names of the form "Play X" where X is a sound name. All of the automatically added sound-only signal actions are listed after the user-defined signal actions in list. The new signal actions are added automatically when you upgrade Investor/RT from Version 8.0 or earlier to Version 8.0 Rev 1 or later. If you do not wish to use these new signal actions, you may easily remove them using the Object Editor (Control: Data Management: Object Editor: Signal Actions). Select any or all of the "Play X" signal action names that you wish to delete, and click the "Delete" button. If, at some later time, you wish to add them back again, or if you should add new sounds to Investor/RT in the future, you may use the Setup: Preferences: Sounds window to assure that all sounds have an associated signal action. Open the Sound Preferences, check the box titled "Create Signal Actions for each Sound..." and click Apply or OK.

Custom Instrument (Pairs) Setup Using an Import File

The File: Import: Ticker Symbols feature of Investor/RT has been enhanced to support import and automatic setup of custom instrument pairs. The text file to be imported should have a line with the command:

```
/TYPE PAIR
```

followed by lines of text that describe the pairs, e.g.

```
/TYPE PAIR AMZN,YAHOO  
KO,PEP
```

To learn more about this feature, visit the Linn Software web site at:
<http://www.linnsoft.com/qa/a/83.htm>

The import text files can be prepared using any text editor or Investor/RT itself. To create a new import file using Investor/RT, use File: New: Text file. Investor/RT will respond with an empty text window. Enter the /TYPE PAIR command followed by the lines of text for each pair you wish to create. Then use File: Save: Save and name the text file. Then use File: Import: Ticker Symbols to import the file.

Current Quotes Downloading from Yahoo! Finance

Downloading Historical Data from Yahoo! Finance and Fundamental Data Retrieval from Yahoo! Finance describe downloading of Daily historical data and fundamental data for equities from Yahoo! Finance. A third Yahoo! download function has been added to acquire "Current Quotes" for a symbol or list of symbols in some quotepage. Downloading of current quotes from Yahoo! can be scheduled using the "Download Data" action in Setup: Schedules. Choose "Yahoo! Finance Current Quotes" as the data server selection. The Current quote download presently requests up to 200 symbols at a time from Yahoo! Finance. If you request current quotes on a page containing more than 200 instruments, Investor/RT will issue multiple requests of 200 each to update all stocks and indexes in the source quotepage quickly. The Yahoo! current quote download support open, high, low, last trade and volume. Bid and Ask are also acquired if available. The Investor/RT data column "Feed Time" is updated with the time of the last trade price provided by Yahoo! The Previous Close is also updated thereby updating the Change and %Change data columns.

Unbounded Stochastic

A check box has been added to the Stochastic indicator preferences. When checked, the RawK values are allowed to go outside the 0 to 100 boundaries imposed by the standard stochastic indicator. The RawK is computed as a relative position of the closing price within the range of the "previous" n bars (n being the RawK period). The only difference being that the range of the unbounded stochastics does not consider the current bar, thus allowing the close to go outside of that range. The standard stochastic indicator includes the current high and low in its calculation of that range, thus never allowing the closing price to exceed the bounds of that range (since it must lie between the high and low of current bar). The difference between the calculations can be seen in the expressions below:

Standard Stochastic

$$\text{Raw \%K} = 100 * [\text{CL} - \text{MIN}(\text{LO}, n)] / [\text{MAX}(\text{HI}, n) - \text{MIN}(\text{LO}, n)]$$

Unbounded Stochastic

Raw %K = $100 * [CL - MIN(LO.1, n)] / [MAX(HI.1, n) - MIN(LO.1, n)]$

The unbounded stochastic provides additional information as to the strength of the move/trend that the standard stochastic can often hide. The unbounded option makes it easy to spot strong breakouts with values below 0 or above 100.

Version 8.0.0 Released, July 12, 2005

Interactive Brokers/DTN Market Access Edition of Investor/RT

The Interactive Brokers (IB) Edition of Investor/RT operates in conjunction with IB supplied software known as the Trader Workstation (TWS). TWS is a Java application that runs both on MS Windows and Macintosh OS X. Thus the IB Edition of Investor/RT is available to both Windows and Macintosh users. If you have not yet installed the TWS software, visit the Interactive Brokers web site for installation instructions. Here is a good starting point:

Windows Users: http://www.interactivebrokers.com/cgi-pub/tws_windows_users.pl

Macintosh Users: http://www.interactivebrokers.com/cgi-bin/mac_standalone.pl

Investor/RT connects to TWS when you issue the Start Feed command. The IB user may setup Investor/RT to connect automatically at startup by checking the appropriate check box in Setup: Preferences: Data feed. Up to 100 ticker symbols may be monitored real-time via the Investor/RT - IB connection. IB/TWS provides historical intra-day data upon demand for the last 24 hours for backfilling intra-day charts. Historical backfill can be invoked automatically when you open a chart if you have the Automatic Download option turned on (see Setup: Preferences: Charts: General), or you can request historical intra-day data by clicking the data download button located at the lower right corner of traditional chart windows. The Data Download window, opened from its main toolbar button or from the Control Menu (Control: Data Management: Download), can be used to request backfill on individual ticker symbols or for all symbols in some Investor/RT defined quotepage.

If you have not already setup the TWS software to accept "socket clients" you must do this before Investor/RT can connect to TWS. In the TWS software, there is a menu named Configure. Click Configure and choose API. In the API submenu, make sure that "Enable ActiveX & Socket Clients" is check marked. Also, if you use the "Trusted IP Addresses" menu, you can setup "127.0.0.1" as a trusted IP address. This will enable Investor/RT to connect to TWS without a TWS prompting message to okay the connection.

The IB Edition of Investor/RT provides integrated support for longer term historical downloading from DTN Market Access. Long term daily, weekly, monthly historical data requests are routed

automatically to DTN servers. Intra-day backfills from charts are routed to IB/TWS. The Data Download window can be used to retrieve intra-day data (minute bars, tick data etc.) for the past 120 calendar data from DTN Market Access. Downloads may be initiated on specific ticker symbols or on all the symbols in a user selected quote page. DTN Market Access is a subscription data service of DTN. No sign up with DTN is required, however, as this service is included with the IB Edition of Investor/RT. When setting up ticker symbols for realtime monitoring over the IB/TWS connection, you may specify an "Alias Ticker" that will be used whenever requests are made to DTN servers.

Ticker Symbol Setup for Investor/RT for IB

Ticker symbols setup for futures contracts in Investor/RT for IB requires that the user know the underlying contract type and the exchange code that IB/TWS uses. It is important that each ticker symbol be setup using the correct security type and exchange. For stocks, Investor/RT lists an exchange code of SMART which corresponds to the IB required exchange code for equities. The AUTO (automatic) exchange code, the default in Investor/RT, may also be used for stocks. For indexes, specify the exchange code you see in the TWS software, e.g. for INDU specify NYSE as the exchange. For futures and options, use the actual TWS/IB exchange code. In the Setup: Instruments window, the exchange code setup is called the "Override Requested Exchange" setting. Check the box and pick the exchange code you wish to use for the ticker symbol. This setup is located in the Advanced setup area of the Setup: Instruments window. You will have to click on the "Advanced" disclosure triangle in the upper left of the setup window to access the exchange code menu.

For futures traders, Investor/RT has been setup with the database of commonly traded future types, ES, EUR, ER2, etc. The Investor/RT database has information about dozens of futures contract types, including the exchange code used in the TWS/IB system, the alias future type needed for automatic retrieval of historical data from DTN Market Access, the months that the contract type trades, and the "tick value" (point move), and the "Dollar value" of that move, information used in portfolio evaluation and backtesting of those futures contracts. You may view and edit this setup information for any underlying future type by going to Setup: Futures and clicking the Setup button at the upper right. Enter the underlying future type, e.g. ES and you will see that it has GLOBEX as the IB exchange code, it trades Mar, Jun, Sep, and Dec, trades in tick units of .25, each such move worth \$12.50. This information is used by Investor/RT to automate the setup of futures ticker symbols.

The recommended method of setting up futures symbols in the IB version of Investor/RT is to use Setup: Futures. For example, issue the Setup: Futures menu command, pick ES as the future type you want, click the check boxes so that say, Sep and Dec are marked. Then click Add. Investor/RT will add the two contracts to your system, having tickers ESU5 and ESZ5. These Investor/RT instruments will be automatically setup with GLOBEX as the exchange, the expire dates of the contracts will be filled in automatically, the underlying symbol, ES, will be setup and the download alias ticker symbol will be setup for you, in this case the DTN historical server tickers are @ESU5 and @ESZ5. You can see this tickers in the .Futures quote page, double click on the ticker and the chart will fill in with data from DTN historical server, if this optional feature is available to you, otherwise IB backfill will be requested.

You may also use Setup: Instruments to add individual futures contracts. This window also makes use of the future setup information in the Investor/RT database to automate the process of enter future contract. When enter the ticker symbol you must follow this conventional format:

XXXXMY

where XXXX is a 1 to 4 letter future class (future type) for the contract in question.

M is a one letter month code, the industry standard future month code, e.g. H for March, N for June, U for Sept and Z for December.

Y is a one digit year code, e.g. 5 for 2005, 6 for 2006, etc.

For example, if you want to follow the September expiration of the 10 Year Bond E-Mini Futures, you need to know that ZH is the underlying contract type and that U is the month code for September, thus when you enter ZHU5 as the ticker symbol and set the security type to future, Investor/RT will automatically fill in the rest of the Setup Instruments window for you (assuming that ZHU5 is not already setup, i.e. it's a brand new ticker symbol). Investor/RT will set the exchange to ECBOT for you, setup the alias ticker for downloading historical data as @YHU5 (the DTN required symbol). Internally, Investor/RT will also setup the new instrument with the contract expiration date and underlying symbol, ZH, so that required data about the ticker symbol for monitoring market data and trading through AutoTrader is ready to do. If your IB data connect is active you see data flowing for the newly defined symbol as soon as you click the Add button in Setup: Instruments.

See this web page for a list of common futures contract setups:

<http://www.linnsoft.com/symbols>

For users of the IB version of Investor/RT, Linn Software offers an optional historical data service from DTN Market Access. This service is integrated into the IB version of Investor/RT. When you have this service enabled your Investor/RT registration code will have both an IB account number (U number) and a DTN Market Access id, e.g. U123456/LIN357. Investor/RT chart windows automatically access the DTN Servers to backfill daily, weekly, monthly, minute interval, and tick data charts. Intra-day historical data for the preceding 120 calendar days is available from any Investor/RT chart, or from the Data Download window.

IB users who have a data service account with eSignal, DTN.IQ, myTrack, or Quote.com may utilize these services after market hours to download historical data of any periodicity. This is accomplished using the Reconfigure command in the Investor/RT File Menu to switch Investor/RT to the alternate data service. After downloading historical data, use Reconfigure again to switch back to the IB feed. Investor/RT also offers built-in support for retrieving daily, weekly, and monthly historical data, and fundamental data for equities from the Yahoo! Finance web site.

Investor/RT can accumulate as many days of intra-day data as you wish using the IB supplied or DTN supplied historical data. Go to Setup: Preferences: Historical and set the number of days of intra-day

data you would like Investor/RT to maintain for you for each symbol you track. Thus intra-day historical database will grow day by day even beyond the 120 calendar days provided by DTN Market Access. This happens automatically if you have Investor/RT running for the entire trading session continuously. Otherwise, you should download (backfill) your charts at the end of each trading session so this data will be archived. This data management function can be automated using a schedule. See Setup: Schedules.

Investor/RT now features extensive integration with AutoTrader software for IB/TWS trading from within the Investor/RT system. These capabilities are available in the IB Version of Investor/RT as well as all other commercial data vendor versions (Investor/RT for eSignal, Investor/RT for DTN and DTN.IQ, Investor/RT for myTrack, and Investor/RT for Quote.com). These trading related features are described in detail in the Help Topic titled "AutoTrader", [Click here to view this help topic](#).

AutoTrader Integration for IB Traders

Important Notice

The Investor/RT - AutoTrader integration features in Version 8.0 are preliminary and should not be relied upon for actual live trading until you have thoroughly tested your setups with the IB TWS Demo Account or Autotrader Simulation Mode. This Investor/RT release is designed to operate with the AutoTrader beta latest version 1.24.145 or higher. AutoTrader version 1.24 can be downloaded from the Linn Software web site at:

WINDOWS: www.linnsoft.com/dl/win/

MACINTOSH: www.linnsoft.com/dl/osx/

AutoTrader is a Java application for trading order management and simulation that operates in conjunction with the Interactive Brokers TWS software.

Investor/RT users can use AutoTrader to initiate AutoTrader managed trades, or AutoTrader may be used as a conduit for submitting trading orders directly to Interactive Brokers from within the Investor/RT software environment. AutoTrader supports only a single managed trade at one time. If you want to issue orders for multiple instruments, e.g. pair trading a pair of stocks or futures contracts, then these orders can be passed to Interactive Brokers directly by AutoTrader. There is no AutoTrader management of stops and target in this case. Integrated support for AutoTrader in Investor/RT is built into the "Trading Order". [Click here for more information on Investor/RT Trading Orders](#).

In a nutshell, a Trading Order is a named specification (a "preset") for an order. Trading orders are usually (but not always) associated with and are executed by a "Signal Action". A signal action is a named specification for one or more actions to be performed when the signal action is executed. Trading Orders can be executed in several ways:

Manually, by clicking on a chart button setup for the purpose of executing some signal action or trading order.

By an indicator in a chart (e.g. a signal marker, trend line, reference line) that has an associated signal action.

By a trading system rule associate signal action. Trading systems run inside charts using the Trading System indicator.

Using the Interactive Brokers order desk window in Investor/RT to directly send a specific trading order.

Chart Buttons may be setup to execute trading order setups directly or to execute signal action which have an associated trading order. If you want the clicking of the button to be accompanied by a particular sound, or if you want a signal to be tested as confirmation before sending the trading order, then you must create a Signal Action preset and specify the signal action as the button's purpose. If the only thing you want to happen when you click the button is to send a trading order, create the button with the purpose "Execute Trading Order" and include the name of the trading order preset you wish the button to initiate. There are a number of convenience features in Investor/RT that makes setting up trading order buttons very easy.

Adding Trading Buttons to Investor/RT Charts

The first method, the manual method, for using AutoTrader is to include chart buttons in your chart(s) for buying, selling, closing positions, etc. It is very easy to setup chart buttons that initiate trading orders to IB via AutoTrader. As a simple example, suppose you want to setup two buttons in your chart, one for sending a market order to buy 100 shares and another market order to sell 100 shares. Open the chart to which you want to add these trading buttons. Leave the chart open as you begin the setup process for the trading order.

Press Alt-T (Apple-T) or click the Setup Menu and choose "Trading Orders". When the "Trading Order Preferences" window appears, choose "Interactive Brokers" as the Destination. Setup the order's action as Buy, Quantity 100, and choose "Market" as the Order Type. For Symbol, choose "Default". This means that the ticker symbol for the order will be determined when the order is submitted based on the symbol in the chart. Finally, check the box "Request Confirmation...". This completes the setup the order properties. Click the "Presets" menu at the bottom of the window and select "Send to Chart as Button". A prompt for a name will appear. Provide a name for this trading order preset; call it "Buy Market". A button will then appear in the chart window titled "Buy Market". To create the sell order, simply change the order action from Buy to Sell, click the Preset menu again and select "Send to Chart...". Enter the name "Sell Market" and click OK. A second chart button will appear in the chart window titled "Sell Market". In the Trading Order Setup window, click cancel or OK, or press the esc key to dismiss the window.

You can test the chart's newly added trading buttons by clicking them. Since you checked the Request Confirmation check box in your trading order setups you will be prompted for an OK before the order is sent to Interactive Brokers. The confirmation message is displayed in green text for buy orders and red text for sell orders. Click "cancel" in response to these so that the orders are not sent to IB. Now change the ticker symbol in the chart. Test the buttons again. Notice that the orders are now pegged to the ticker symbol currently in the chart.

If you are using IB as your real-time data source, you can test the Investor/RT trading orders more extensively before using them for actual trading by running the Interactive Brokers TWS software in demo mode (using user name edemo and password demouser) rather than your actual IB Account. If you are using one of the other real-time data feeds as your real-time data source you can leave your IB/TWS running with your real trading account, but setup AutoTrader in "Simulation Mode" rather than "Live Mode". The AutoTrader software must of course be running and connected to TWS. When you click the button "Buy Market" in the chart, Investor/RT will present the confirmation message. Click OK and the order will be sent to Interactive Brokers via AutoTrader. Trading Orders with a destination of "Interactive Brokers" will be sent to AutoTrader as pass-thru orders. This means that AutoTrader will simply serve as a conduit to send the order to IB and will not manage the trade in any way. Use the order destination "AutoTrader (IB)" to initiate "managed" trades. Managed Trades will have one of four Order Types: "Buy" (go long), "Sell" (go short), Reverse, and Close Position. User preferences in the AutoTrader software control how the trade is managed. See AutoTrader documentation for details. Investor/RT trading orders have several "order actions" that have to do with setting stops and targets for managed trades. These order actions will be covered in detail later.

If you wish to shorten the button titles, right-click on the button and choose Edit Button. Shorten the name to "Buy". You may choose to color code your trading buttons, e.g. green for the "Buy" button and red for the "Sell" button.

In this simple example, the order quantity in the trading orders is fixed at 100, but suppose that you want your trades to be different sizes depending on the price of the stock you are trading. This can be easily accomplished using a V# user variables. First, go to Setup: Preferences: User Variables and setup a user variable, e.g. V#33 as your order quantity user variable. Assign the name "Order Qty" to V#33 and set the display format to 99 (meaning whole number display, no decimals).

Return to the chart, right-click on the "Buy" button and choose Edit Button. You will see that the button setup calls for executing the trading order preset named "Buy Market". Click the "Edit" button to edit the Buy Market trading order. Note that there is a shortcut for editing trading order buttons: ctrl-click (option click on Mac) on a chart button and Investor/RT will open the associated trading order for editing. This ctrl-click shortcut works for signal action buttons and technical indicator preset buttons as well. The ctrl-click tells Investor/RT you want to edit trading order associated with the button, not the button itself.

Look at the trading order setup. Note that the order quantity is set to a constant 100. Edit the 100, changing it to V#33 (you can type in V33 or v33 or v#33 or v 33 and Investor/RT will recognize that you mean user variable V#33. Click OK to save this modification and close the trading order. Your chart button will now use the value contained in the symbol's user variable V#33 when composing the order for Interactive Brokers.

We recommend that you create a user-defined quotepage named "Trading List" to keep a list of the stocks or futures you are trading. Open (or create this quotepage) add the symbols you want and add V#33 as a column to this quotepage. You will see the column title "Order Qty" for this user variable.

Suppose your chart contains the stock CSCO, make sure CSCO is in your Trading List. You can enter a value for Order Qty directly into the quote page cell for CSCO. Enter say 200 and press enter or tab to complete the entry. Then return to your chart and click the "Buy" button. You will notice that the confirmation message reads "Buy 200 CSCO...". The ticker CSCO was obtained from the chart's instrument, the quantity 200 was obtained from user variable V#33 for CSCO. This illustrates the concept that trading orders in Investor/RT are essentially "templates" for submitting orders. The same V# variables techniques are available for "Limit Price" and "Stop Price". Set aside say V#34 as your limit price variable and V#35 as your stop price variable. Then when you create trading order presets for limit or stop orders you can specify V#34 and V#35 respectively.

Does this mean that you have to enter limit and/or stop prices into quote pages before you can submit a trade. No, of course not. You can do this if you wish, but a better way is to add "Reference Lines" indicators to your trading chart. Add a reference line setup to track V#34 (limit price) and another pegged to V#35. You can enter "ball park" numbers for these reference lines into your quote page cells directly, or you could simply run a daily scan to "set" these V# variables to reasonable values for your entire list of symbol. For example, each day before the market opens you schedule a scan to run on your "Trading List" quote page, setting, for each instrument, the limit price to say .5 above the last trade and the stop price to .5 below the last price. The scan formula would be:

```
SET(V#34, CL + .5) AND SET(V#35, CL - .5);
```

Now when you view your chart (and change from ticker to ticker) you will see your two limit/stop lines above and below the current trading level. You can, of course, color code these lines appropriately and you can specify a text label for each line, e.g. "Limit" and "Stop". Now as you drag the reference lines up and down the price scale you are not only moving the line but you are also updating the value of the associated V# variable. The values in the V# variables that will be used when your limit (or stop) orders are submitted.

Auto Trading Using Investor/RT Trading Signals

The second method of executing trading orders is to associate the trading order with a signal action that operates in an Signal Marker or some other indicator in a chart. A signal marker indicator in a chart essentially checks a user-specified trading signal written in the RTL language. When the signal triggers TRUE on the current bar, the associated signal action triggers. By associating an AutoTrader or Interactive Brokers destined trading order with such a signal action, trades to enter or exit a position can be initiated automatically by Investor/RT. Automated orders can be based on any market condition expressible in the RTL language. Notice that the Trading Order need not have "Request Confirmation" check marked, although this is certainly recommended until you are very well versed and comfortable with the operation of your trading signals.

In the earlier example, reference lines were used as a vehicle to adjust stop and limit order prices before submitting trading orders via button clicks. Note also, that you can click on a reference line to select it, then use the up/down arrow keys on the keyboard to move the line and its associated V#

user variable up or down one price tick. Another way of using reference lines is to have the reference line serve as a trigger for submitting an order, just like a signal marker does. For example you can create a signal action that will play some alert sound of your choice and submit a sell order when the instrument trades at or above the reference line.

To do this, we first must create the Signal Action and setup it up with the proper trading order. Press Alt-T to quickly open the Trading Order default preferences. Then choose "Signal Action" from the list of names at the left. Setup the Signal Action to Play a particular sound, then mark the "Trading Order" check box and choose "Sell Market" (the name of our sell market order preset created earlier). Then click the Preset Menu at the bottom and select "New...". Provide a name for this Signal Action preset, e.g. "Sell Market Action". Press esc to dismiss the setup window and return to your chart. Edit the reference line in the chart (right-click on the line and choose Edit). Check mark the "Action" check box. Then choose "Sell Market Action" from the list of Signal Actions and click OK. The reference line will then "monitor" price levels and as soon as the instrument in the chart reaches or penetrates the reference line, the signal action will fire and the trading order will be sent to Interactive Brokers. In this example, we describe the reference line as a target price for selling to exit a long position when prices rise up to or above the target reference line. A similar reference line stationed below the current trading price could be used to trigger a sell order if price falls to or below the reference line. The reference line can be repositioned, moved up like a trailing stop, using the arrow keys or by dragging the line with the mouse. Similar techniques can be used to handle stops and targets in short positions. Signal Markers, Trend lines, and Horizontal Reference Lines all have this "Signal Action" capability.

Using the Order Desk for AutoTrader/Interactive Brokers.

Setup: Preferences: Order Desk can be used to specify AutoTrader/Interactive Brokers as your preferred order desk. Thereafter, clicking the Place Trade button on the main toolbar (keyboard shortcut Alt-L) will open the AT/IB order desk window. The order desk window presents a list of your trading order presets and trading order groups, and a list of the ticker symbols in your "Trading List" quotepage. You can select a trading order (or group) and a symbol and then view the order's description in the text box to the right. Buttons are provided for editing the selected trading order or creating new trading order presets. This window dynamically updates to show the current bid, ask, and last trade and sizes for the selected symbol. When the symbol you have selected has an open position reported to Investor/RT by AutoTrader, you will see Long or Short and Quantity in the live quote display at the upper right of the window.

Trading orders with limit or stop prices expressed as V# variables will update dynamically as V# values are updated/recalculated. Orders may be sent to AutoTrader using the Send button. A find box is also provided for entering a search pattern. Investor/RT will respond by listing the trading orders that match that pattern. For example, the pattern text *buy will list only trading order that contain the text "buy" in their trading order preset name. If you have a stop or limit trading order with "Mouse Click" as the limit or stop price, sending the order will cause the intra-day chart for the symbol in question to appear prompting for limit or stop price selection. Click the mouse at the price level you wish and select the actual limit or stop price from the ensuing pop up menu. Limit/Stop

price selection via menu is exactly the same as if the order had been placed directed from within that chart via chart or trading signal for example.

The AT/IB Order Desk is a convenient play to define new trading orders or edit existing ones. You can also delete, rename, view and edit Trading Orders and Trading Order Groups using the Object Editor Window. The Object Editor window is opened by clicking on the Object Editor button on the main toolbar.

Getting Feedback from AutoTrader

Investor/RT Version 8 also has capabilities of receiving "feedback" when operating with AutoTrader. New quotepage columns named "Position", "Position TR", "Fill Price", "Fill TR", "Fill Time", "Target" and "Stop" are available for display in Investor/RT Quotepages. At present the Position, Position TR, Fill Price, Fill TR and Fill Time will update when Investor/RT receives an "order filled" status back from AutoTrader. The RTL tokens POS_SIZE and ENTRY can be used to refer to the position size and fill price (entry price) values in scans and in trading signals active in chart windows. Note that POS_SIZE and ENTRY have a different meaning when backtesting or using the Trading System indicator. Instead, use TR_POS, TR_FILL tokens if you use Trading System Indicator. The Target and Stop quotepage columns can similarly be referred to using TARGET and STOP tokens in RTL.

When AutoTrader has a managed position open, the Investor/RT user can send trading order with order action "Get Position Info" and AutoTrader will respond with the current values for Target and Stop for the position. These values are reported to the quotepage Target TR and Stop TR columns. These values can be referenced for the instrument in question using RTL tokens TR_TARGET and TR_STOP respectively.

Submitting Limit and Stop Orders from Investor/RT Charts

Investor/RT 8.0 supports trading order setup where the Limit Price or Stop Price can be setup as "Mouse Click". This kind of setup means that when the order is executed by Investor/RT, the software will prompt you to pick your limit or stop price by clicking inside the chart window where the order originates. A prompting message will appear in the middle of the chart window and the cursor will change to indicate you are being prompted for a price level. Click the mouse inside the chart window at the approximate price level you want and Investor/RT will pop up a menu of selectable prices at or on either side of the price you clicked upon. If you mis-click, simply click again at some different price level and the pop up menu to revise itself. After selecting a price from the menu, the order will be submitted to AutoTrader, with an intervening confirmation box if you have requested order confirmation before submission. The confirmation message will display the actual limit price or stop price from your menu selection.

The AutoTrader / InterActive Brokers Order Desk Window

Setup: Preferences: Order Desk can be used to specify AutoTrader/Interactive Brokers as your preferred order desk. Thereafter, clicking the Place Trade button on the main toolbar (keyboard shortcut Alt-L) will open the AT/IB order desk window. The order desk window presents a list of your trading order presets and a list of the ticker symbols in your "Trading List" quote page. The order desk is of little or not value until you have created and populated your Trading List quote page with instruments that you wish to trade via AutoTrader.

Important Note Regarding Ticker Symbols

When trading stocks, there is no confusion at all about ticker symbols. You can use AutoTrader and Investor/RT together to trade stocks regardless of whether you use the IB Version of Investor/RT or whether you use one of the commercial data vendors that Investor/RT supports (eSignal, DTN/DTN.IQ, myTrack). When trading futures however, the ticker symbols used by the commercial data vendors will usually differ from those used in the TWS IB System. For example, if you are using eSignal and track the current front month S&P E-Mini Contract, your Investor/RT ticker symbols will be ES #F or ES U5, for DTN.IQ it will be @ESU5 for the Sept 2005 contract expiration. When sending trading orders for these Investor/RT ticker symbols in the TWS/IB software, Investor/RT uses the "Brokerage Alias" symbol. The "Broker Alias" for each Investor/RT instrument can be setup using Setup: Instruments in the Advanced section. Or you may add this data column to your Trading List or any other quote page and edit the broker alias cell directly in the page.

Investor/RT uses the following convention for broker alias symbols for futures contracts:

XXXXMY

where XXXX is a 1 to 4 letter future class (future type) for the contract in question.

M is a one letter month code, the industry standard future month code, e.g. H for March, N for June, U for Sept and Z for December.

Y is a one digit year code, e.g. 5 for 2005, 6 for 2006, etc.

Thus, for example, the broker alias for eSignals ES #F would be ESU5 for the Sept 2005 expiration. For the Euro FX E_Mini futures the DTN.IQ Investor/RT ticker symbol would be @EUU5, the IB/TWS future type is EUR, thus the broker alias for @EUU5 should be specified EURU5. Note that internal to TWS/IB, IB sometimes refers to this as 6EU5, but remember, the Investor/RT convention is to use the future type + the month code + the year code. Internal IB "local symbols" do not affect the ability of Investor/RT and AutoTrader to convey proper trading orders to TWS. Investor/RT uses the future type code, expiration date, and proper IB exchange code to convey trading orders. All the user has to do is code the broker alias with the correct IB future type (sometimes call the underlying symbol or underlying type in IB terminology). Now, what about the exchange code needed for trading? The exchange code for a large number of common IB futures types is kept in the Investor/RT database. In

effect, Investor/RT "knows" that the exchange code for the ES and EUR is GLOBEX so you do not have to specify this anywhere. You can view or update future type information using Setup: Futures. Click the Setup button at the upper right and enter EUR as the future type. You will see there the GLOBEX is the exchange code that Investor/RT will use when communicating with AutoTrader concerning EUR future contract trading.

Continuing now with the discussion of the Order Desk...

You select any trading order name listed in the order desk and an associated symbol if applicable and then view the order's description in the text box to the right. Buttons are provided for editing the selected trading order or creating new trading order presets. This window dynamically updates to show the current bid, ask, and last trade and sizes for the selected symbol. Trading orders with limit or stop prices expressed as V# variables will update dynamically as V# values are updated/recalculated. Orders may be sent to AutoTrader using the Send button. A find box is also provided for entering a search pattern. Investor/RT will respond by listing the trading orders that match that pattern. For example, the pattern text *buy will list only trading order that contain the text "buy" in their trading order preset name. If you have a stop or limit trading order with "Mouse Click" as the limit or stop price, sending the order will cause the intra-day chart for the symbol in question to appear prompting for limit or stop price selection. Click the mouse at the price level you wish and select the actual limit or stop price from the ensuing pop up menu. Limit/Stop price selection via menu is exactly the same as if the order had been placed directed from within that chart via chart or trading signal for example.

OCA orders are supported via an OCA check box in the Trading Order setup. Also, trading order groups are also supported. A trading order group is a collection of two or more orders that can be submitted as a group at the same time, either via a button click or via the IB/AT Order Desk.

Creating Trading Orders for AutoTrader

Use the "New" button in the AutoTrader/IB Order Desk window to create a new trading order. If you want AutoTrader to manage the trade for you, set the Destination of the trading order to "AutoTrader Managed (IB)". See the AutoTrader documentation for details on how AutoTrader provides stop and target management of trades, scale in and scale of positions, etc. If you want more direct control over all trading activity, create trading orders with Destination "Interactive Brokers". These are called "pass thru" orders, Investor/RT sends such orders to AutoTrader and AutoTrader passes them to The IB/TWS for execution. It takes less than a second from the instant Investor/RT sends the order until it is received by the IB/TWS software, whether the order is for an AutoTrader managed position or a pass thru order.

The choice of "Order Action" depends on the destination. First, consider the order actions that are available when AutoTrader Managed is the Destination:

- Buy - Enter a new long position.

- Sell - Enter a new short position.
- Reverse - Reverse the current open position.
- Close Position - Exit the current open position

For Buy and Sell order actions, a variety of order types are available: Market Orders, Limit Orders, Stop Limit Orders, and Stop Market Order (called Stop Orders). There are also special AutoTrader limit orders, called Buy@Bid, Buy@Ask, Sell@Bid and Sell@Ask, where AutoTrader supplies the limit price from the current bid or ask of the instrument being traded.

There are several order related command for getting or setting values used in the trading management activities of AutoTrader, for example, Get AT Position Info can be send as an "Order Action". AutoTrader responds with the current position symbol, qty long or short, current target price and stop prices. These values are posted to the Investor/RT instrument. YOU can see the values in a quotepage via the "Position TR", "Target TR" and "Stop TR" columns, or you can reference the current value of these fields in RTL formulas using tokens TR_POS, TR_TARG, and TR_STOP. When an AutoTrader position is initiated, the TR_Fill token is also set to the fill price of the position, the entry price.

The order actions Set Target, Set Target Offset, Set Stop, Set Stop Offset cause AutoTrader to adjust the current stop or target price in the IB/TWS for the currently open position.

Now, let's consider pass thru orders, trading orders with Destination "Interactive Brokers". This Order Actions are similar, but keep in mind that there is no AutoTrader management and any stop or target related brokerage orders must be initiated individually if you use pass thru orders. The advantage of pass thru orders is that the Investor/RT user can have as many different open positions as you like. AutoTrader is limited to managing one instrument at a time. YOU can add to a managed position but you cannot have managed positions for more than one instrument at a time. Here are the pass thrus order types:

- Buy - Enter a new long position
- Sell - Exit a long position
- Buy (cover) -Buy to cover a short position
- Sell Short - Enter a new short position

New Chart Button Purpose: Execute Trade Order/Trading Order Group

Chart Buttons enable you to add push buttons or menu buttons to any chart window. The buttons enable you to quickly change either the ticker symbol or the periodicity of the chart in which the button resides. Buttons can be added to any pane in a chart window. Use the "Add Indicator" toolbar button and choose "Button" as the indicator to add to the chart. The Setup for the "Button" indicator allows you to specify whether the purpose of the button is to change chart periodicity or to change the instrument in the chart. Further, you can specify whether the button will operate as a push button or whether it will activate a popup menu. If you choose the "Menu" option, you can enter two or more menu items separated by commas, otherwise you enter only one ticker symbol or

periodicity. For example, to create a menu button of your favorite instruments your item list may look something like this:

IBM,APPL,MSFT,QQQ,INDU

Note that the list is comma separated, spaces are optional. If one of the items in the list begins with a hyphen then the menu item will appear as a separator line in the resulting menu.

Similarly, a periodicity menu button could be created like this:

Tick,1,3,13,60,-,Daily,Weekly,Monthly

Note the separator between the intra-day and Daily/Weekly/Monthly periodicities.

To create a button for just one ticker, check "Push Button" instead of "Menu Button", and enter the ticker symbol in the space provided.

After a button is in place in the chart window, click on it to choose from the popup menu. If the button is not a menu, then it's face will show the ticker symbol or periodicity it represents. Clicking on it will simply switch the ticker or periodicity to that shown on the face of the button.

If you right-click on a button (use command-click if Macintosh) then you will see a popup menu allowing you to edit the button, delete the button, or add a new button. Menu buttons show an icon image indicating the presence of a menu. Specific ticker or periodicity buttons show the ticker or periodicity on the face of the button.

Using this handy feature you can easily create a user interface that has just those tickers and/or periodicities that you use in your trading. You can then easily switch to exactly what you want with a single click or quick menu selection. If you add buttons to your default chart, then all of your charts will appear with the same set of convenient button. Note that every saved chart in Investor/RT can have its own unique set of buttons if you like since buttons are "saved" with the chart just like any other indicator.

New Chart Button Purpose: Execute Trade Order/Trading Order Group

Chart Buttons were enhanced so that a button can be assigned the purpose of "Execute Trading Order". There is no point in setting up a "Signal Action" that in turn executes a particular trading order if that is all the signal action will do. A signal action IS required to execute a trading order if you want the trading order executed when some kind of signal (alert) occurs, e.g. a trend line or reference line penetration or a signal marker triggering event. But for manually clicking buttons in the chart, it is more straightforward to simply setup the button to execute the trading order directly. Once a trading order button is created you may wish to inspect the trading order associated with the button. To edit the button, right-click on the button and choose "Edit..". The name of the trading order will be shown in the button setup. You may click "Edit" again there to see the trading order

setup. A shortcut method is available that avoids this two-step edit process. In the chart, hold down the ctrl key while clicking on a button and Investor/RT will take you immediately to the associated trading order. On Macintosh, use option-click instead. This ctrl-click shortcut works with all buttons that have an associated "preset", all technical indicator toggle buttons, signal actions, and trading orders can be edited this way.

Like other button types, trading order buttons can, be setup as menu buttons containing as many trading order presets as you wish. Thus you can create trading order presets with appropriate names for all of the typical trading order you use and have every one of these orders available in the chart in a single menu button. Trading order menu buttons use the "Place a Trade" icon that appears in the Investor/RT main toolbar and elsewhere.

If you wish you can setup a menu button containing all defined trading orders. Simply specify a question mark ? as the trading order name in the button setup. When you click such a button a menu listing all trading orders alphabetically will appear. You may also easily create menu buttons listing all trading orders whose names match some pattern. To do this, enter the ? followed by pattern= followed by the pattern. In the pattern use * to represent any string of zero or more characters, and use ? to represent any single character. Here are some sample setups:

```
?pattern=*buy*
```

This will create a menu button listing all trading orders that contain the letters buy anywhere in the trading order name. Note that the pattern matching is NOT case sensitive.

```
?pattern=buy*
```

This will create a menu button listing all trading orders whose names begin with the letters buy.

```
?pattern=???_lmt*
```

This will create a menu button listing all trading orders whose names begin with any 3 characters followed by an underscore and the three letters lmt followed by anything. This pattern will find, for example, "buy_lmt...", or "sel_lmt...", but not "sell_lmt..." since the word sell is more than 3 characters.

A second new button purpose, Execute Trading Order Group, allows you to create push buttons (not menus at present) that execute a group of trading orders at once. Specify the name of the group. A new group type, called a trading order group can be created using File: New: Group. You can then use the Object Editor window (see item #20 below) to add trading orders to such a group.

Convenience Functions for Creating Signal Action and Trading Order Buttons

When viewing or editing the setup of any signal action or trading order, the "Presets" menu at the bottom of the window can now be used to quickly create buttons with the purpose of executing the

Signal Action and/or Trading Order. Click on Presets and choose "Send to Chart as Button". This menu item essentially creates a new preset for the signal action or trading order (using a name that you provide) and then creates a chart button to execute that named preset.

Keyboard Shortcuts for Signal Actions and Trading Orders

The keyboard shortcut facility of Investor/RT was enhanced to enable keyboard shortcuts to be defined to "Execute" either a signal action or a trading order. To setup a keyboard shortcut, click the Setup Preferences button on the main toolbar and choose Keyboard Shortcuts. In the Keyboard Shortcut window, choose "Execute" as the action, and either Signal Action or Trading Order as the object type to execute. A list of preset Signal Actions or Trading Order will then appear for selection.

Preset Signal Actions or Trading Orders can be created using the Setup: Preferences: Technical Indicators window. A new shortcut, Alt-T (Apple-T on Macintosh) has been added to get you there quickly. Alt-T opens up the technical indicator default preferences for "Trading Order". You can click "Signal Action" at the left of the window if you wish to setup signal action presets. New presets are created using the "New" command in the Presets menu button at the bottom of the window. First setup the preferences the way you want, then click on Presets and choose "New". You can view any existing presets by clicking Presets and choosing from the "Load" submenu.

New RTL function REF

The STAT indicator in the RTL language can find how many bars have occurred since a minimum or maximum value occurred. Sometimes it is desirable to find the value of some formula N bars ago where N is the number of bars ago that a maximum or minimum value of some other formula occurred. A simple example would be a custom indicator that shows the high of the bar at which the lowest low in the trailing 20 periods occurred. This can be accomplished using a new function named REF (REF stands for Reference). The REF function takes two arbitrary expressions as parameters. The first expression is a formula for the value to be referenced, the second expression is a formula that yields how many bars ago to reference the formula value. For example, the custom indicator:

$$\text{REF}((\text{HI}+\text{LO})/2, \text{STAT} + 1);$$

Where STAT is setup to find the minimum low in say 20 period with the resulting value of "Bars since that minimum value" occurred. This formula will show you the midpoint price of the bar having the lowest low in the preceding 20 periods.

RTL supports V# variables that control how many bars back to reference the value of a token. For example the expression HI.V#1 where V#1 happens to be 5 for some instrument is equivalent to HI.5. The formula REF(HI, V#1) does the same thing. The advantage of the REF function is that both the first and second expressions inside the REF's parentheses be formulas of any complexity, not limited to individual tokens or V# variables.

Setup Instruments Enhancement

This window allows the user to define a new instrument or modify an existing one. Instruments are specified by a ticker symbol, and exchange id, and a session. This window may be used to indicate a type for each instrument (stock, index, mutual fund, etc.) and to indicate whether to track the issue on an intra-day, daily, weekly, or monthly basis.

Alarm settings for high price, low price, and volume are set here. The instrument's Dial/Data alias ticker symbol may be specified here as well. Alarms may be set on the last price, bid price, or ask price by marking the appropriate radio buttons.

Symbol

Enter the ticker symbol. If the instrument is known already, its information will appear automatically. If the ticker symbol is unknown, default values will appear and the security name will be "Untitled". When an instrument is unknown, the button at the lower right corner will read "Add". When the instrument is already known to Investor/RT, the button will read "Modify".

Type

Choose the desired instrument type from the drop-down list. Windows users may tab to this list box and type the first letter of the desired type, e.g. F for future, I for index, S for stock, etc.

Exchange

The default is the AUTO (automatic means any exchange). This value cannot be changed in the Setup Instrument window, AUTO is sufficient 99% of the time. However, some data feeds require special exchange settings to receive Canadian Stock quotes, for example. If for some reason you have to provide an exchange code other than AUTO, you can do so by editing the "Requested Exchange" data column in a quote page containing the instrument(s) in question.

Session

This reflects the time of day when the instrument is open and trading. The default session is 0 (NYSE Session) reflecting the most common day session for each instrument. Additional sessions for tracking may be created and assigned by the user. Choose from the pop up menu whether to display the quotes in decimal or fractional format.

Alias Ticker

This field applies for continuous feed users who also use Dial/Data to download historical or current data. Dial/Data uses a different symbol configuration than the continuous feed providers for some classes of symbols such as futures. The Alias Ticker feature allows Investor/RT to accommodate the difference so that data is stored appropriately. In cases where the Dial/Data symbol differs from that of your continuous feed provider, enter the

alias ticker symbol for the security in this field. Some instruments such as user-defined instruments or portfolio cash instruments have no Dial/Data ticker. In such cases enter a hyphen for the Dial Ticker. The hyphen notifies Investor/RT to bypass the associated symbol when downloading quotes or historical data for a quote page via Dial/Data.

User Data

This "extra" field accommodates a user-defined code containing up to 24 characters. Examples of possible uses: CUSIP number, risk levels, "Long" or "Hot Stock", an environment-friendly index, age or salary of CEO. Sort the Quote pages by the User Data field to group the rows in the quote page according to how you use this field.

Monitor

Indicate in this field over which time frames you would like to retain history. Choosing Daily is always recommended so that at least the daily information is retained on the instrument. In addition, you may select intra-day, weekly, or monthly.

If, after recording data, you later uncheck Daily, Weekly, Monthly, or Intra-day, Investor/RT will ask if you wish to discard the associated data. Warning: if you confirm, the associated bar data will be permanently removed from the database. Weekly or Monthly data can be easily recreated from the daily data by checking the Weekly or Monthly checkbox.

Alarms Optional

Choose the appropriate alarm and then enter the price or volume level in the box provided. When entering volume alarm levels you may use "k" and "m" suffixes to denote thousands and millions respectively, e.g. 1100k, 1.1m, or 1100000 are equivalent. If you set a value into High Alarm, Low Alarm, or Volume Alarm, Investor/RT begins monitoring price and volume levels for the instrument. If you enter a zero value, price and/or volume monitoring will be turned off for the instrument.

Last

Once the symbol is entered a last trade quote is supplied for as long as you are working in this screen.

Reset Alarm

Click this button to clear alarms. This button only appears if an alarm is triggered on the instrument. Modifying any alarm price or volume level also resets the alarm.

Delete

Click this button to delete the instrument permanently from Investor/RT. Confirmation is requested.

Modify

Click this button to modify existing information on the symbol already in a quote page.

Add

Click this button add a newly defined instrument to Investor/RT.

Setup Instruments Enhancements, Version 8.0

The Setup Instruments Window (Alt-A) has a "?" button just to the right of the ticker symbol entry box. A click on this button opens a ticker selection window. If you have typed in part of a ticker symbol already before you click this button, the instrument selection window positions itself alphabetically on the first matching symbol and "completes" the ticker for you automatically in the Setup: Instruments window. You may of course continue typing or using the arrow keys to pick a different symbol and then press the return key, or you may use the mouse to scroll and pick the symbol you want by double-clicking it.

For those who do not wish to take their hands off the keyboard, a new mouse-less method is available. Start by pressing Alt-A (Command-A on Macintosh) to open the Setup: Instruments window. The text entry cursor will be positioned inside the empty "ticker symbol" box. Type any initial characters followed by a question mark. For example, to lookup an IBM option you could type in IB?. When Investor/RT "sees" the ? it will open the instrument selection window and position the list on the first instrument ticker that begins with the letters IB. You may then arrow down to the ticker you want, select it by pressing return. Investor/RT will dismiss the instrument selector, leaving the Setup: Instruments window filled in with the properties of the chosen symbol.

If you type a ? as the first and only character in the ticker entry box, the instrument selector will appear positioned at the top. Begin typing the first few letters of the ticker symbol you want. When you see the ticker highlighted in the selection window, press return.

Bottom line: when typing into the ticker entry box in the Setup: Instruments window you may enter a ? at any time to invoke the instrument selector without taking your hands off the keyboard. Any characters you have entered preceding the ? will be used to complete the ticker symbol if possible.

Chart Window Ticker Symbol Entry

Traditional chart windows now have a ticker symbol entry box in the lower left corner just above the chart name. The entry box may be used to quickly switch the chart to a different ticker symbol. Click in the entry box; you will see a blinking text cursor. This indicates that the entry box has "focus" and is ready for your input. Type in the ticker symbol (Investor/RT will auto-capitalize) and press the tab key or the enter/return key to complete the entry. The chart will update; the previously charted ticker symbol will be replaced by the new one. The entry box is cleared after a successful substitution, ready to accept a new ticker. You may enter symbols in rapid succession to call up a series charts very quickly this way.

If you prefer to use the classic method of "typing the ticker" blindly into the chart, first click inside the chart window. This will ensure that the blinking cursor is removed from the ticker entry box. As

you begin typing, the classic "Update/Replace Chart" dialog will appear to assist you in identifying the ticker symbol you want. The Update/Replace Chart dialog has a standard instrument selector and other chart setup options, such as "multi-linking".

The new ticker symbol entry box offers a convenient way to add new symbols to Investor/RT and chart them in one step. Type a new ticker symbol and press tab or return. If necessary, Investor/RT will issue a prompting message informing you that the ticker you entered is not yet setup. You can click an Add button to add and chart the symbol immediately, or click the Setup button to open the Setup: Instruments window. Clicking the Add button causes the new ticker symbol (instrument) to be added and that new instrument is inserted into the chart. If you have the auto-downloading option turn on, Investor/RT will request historical data for the new symbol and the chart will fill in automatically. Otherwise, press the Data Download button in the lower right corner to request historical data for charting for the newly added symbol.

When entering a new symbol this way you may use "ticker: exchange: session" notation or simply enter the ticker by itself. For example, entering ES`U:AUTO:31 will add ES`U as a new instrument and assign it to session number 32. AUTO (automatic) is commonly used as the exchange code in Investor/RT. Enter ESM5:GLOBEX:31 to setup the ticker symbol ESM5, assign it to session 31, and give it an override exchange id of GLOBEX.

If you click "Setup" when prompted to add a new symbol, the Setup: Instruments window will appear with the new ticker symbol filled in. You may then setup the session, display format, and other instrument properties before adding the symbol. When the Setup: Instrument window closes, you will notice that the newly defined ticker symbol is still present in the chart's ticker symbol entry box. Press the tab or enter/return key to chart the new symbol.

From time to time, the focus may shift away from the ticker symbol entry box. For example, if you click on a chart button or select an indicator in the chart for editing, the blinking cursor in the ticker symbol entry box will disappear and the focus for keyboard activity will return to the chart itself. When the focus is on the chart, you can, for example, press the <tab> key repeatedly to tab through your indicators, or you can press the space bar to download data, or you can begin typing a ticker and the Update dialog will appear to assist you. When you want to use the ticker entry box and you notice that the focus is not present in the entry box (no blinking cursor), you can direct focus to the ticker entry box by typing a forward slash character. For example, if the keyboard focus is on the chart window itself, quickly type the five characters /IBM<tab>. The / will direct the focus to the ticker entry box which will then receive the next three characters IBM. The tab (or return key) after that will substitute IBM into the chart. Normally when you complete the entry of ticker symbol and press tab or return, Investor/RT will substitute the new ticker into the chart and leave the focus on the ticker symbol cell. However, if the ticker you enter has no historical data and you have automatic downloading option on, then the downloading and refreshing of the chart window leaves the keyboard focus on the chart window rather than the ticker entry box. Typing a slash before your next ticker will assure that the characters you type after the slash are put into the ticker symbol entry box. Note that if focus (blinking cursor) is in the ticker entry box and you type a slash, the slash will be entered into the box like any other character. Typing the slash is just a shortcut you can issue from

the keyboard without having to take your hands off the keyboard to use the mouse to click inside the ticker entry box to set the keyboard focus there.

If you prefer not to have the ticker entry box in your chart windows, uncheck the "Ticker Symbol Entry Box" check box in Setup: Preferences: Charts: General. This is a global chart setting. The entry box is either present or not in all traditional chart windows.

Checking for Software Updates

The "Check for Updates" command in the Help menu will inform you whether you are running the latest publicly available release of Investor/RT. If a new version of Investor/RT is available for downloading a message will appear to that effect. Click the "Update" response button for this message and your web browser will open the Investor/RT Quick Download web page. Click to download the latest update installer for your platform.

The "Check for Updates" command requires an active Internet connection. Setup: Preferences: Mail & Internet has a check box titled "Check for Updates". This box is checked by default. When checked, Investor/RT will automatically inform you if a new version of the software is available when you startup. If you leave Investor/RT running all the time, the check for updates will be done at some random time between midnight and 1 a.m. local time. You will not be notified of any pre-release candidates or beta test releases, only final release versions that are listed on the Quick Download Center web page at www.linnsoft.com/dl.

The "Check for Updates" command may be setup to run as part of a schedule. See Setup: Schedules. For example, you could turn off the "Check for Updates" check box in the Mail and Internet Preferences and create a schedule that runs once a week every Friday after the close to check for new software updates.

Automated Methods for Creating Custom Columns

Investor/RT supports various automated methods for quickly adding scans, signals, custom indicators, and technical indicators as custom columns. When you right-click on a technical indicator in a chart, for example, choose "Send to QuotePage" and the indicator in question will appear instantly as a custom column in the front quote page. You must have a quote page open, of course. If several quote pages are open, the front most quote page will receive the custom column. The custom column for the technical indicator will be computed using the same periodicity as the technical indicator in the chart. Investor/RT creates the custom column automatically. If the Investor/RT suggested name for the custom column is already in use, you will be prompted to enter a new name or replace for former custom column.

The Send To Quote page command is also available in the RTL Setup Window. When setting up signals and custom indicators, click the "Send To..." button at the lower right of the window, choose "Send to Quote page" from the ensuing pop up menu. The signal or custom indicator will be added as a

custom column to the front quotepage. Since signal and scan setups do not have a periodicity (they are periodicity independent), Investor/RT uses the periodicity of the front chart window as the periodicity of the newly created custom column. Daily periodicity is the default in case no chart window is open.

The "Send To..." button is a new feature in Investor/RT Version 8. See the following What's New item for more information.

Automated Methods for Adding Signal Markers, Custom Indicators, Paint Bars, and Color Markers to Charts

The RTL Setup window has a "Send To..." button when the window to being used to create signals and custom indicators. Clicking on this button pops up a menu for sending the particular scan or custom indicator either to a quotepage (as a custom column) or to a chart as an indicator. In prior versions of Investor/RT, a signal could be sent to the chart only as a signal marker. The Send To... menu button now enables the signal to sent to the chart as a Paint Bar indicator or a Color Marker indicator as well. For custom indicators, the "Chart" button of earlier releases of Investor/RT is replaced by the Send To menu button, enabling the custom indicator to be sent to chart as an indicator, a Paint Bars indicator, or as a Color Marker indicator.

In the RTL Setup Window for Custom Indicators the pop up menu provides these choices:

- Chart - Custom Indicator
- Chart - Color Marker
- Chart - Paint Bars/Background
- Chart - Horizontal Line
- QuotePage - Custom Column
- Custom Prices

In the RTL Setup Window for Trading Signals, the pop up menu provides these choices:

- Chart - Signal Marker
- Chart - Color Marker
- Chart - Paint Bars/Background
- QuotePage - Custom Column

These options provide a convenient way to quickly add custom indicators or signals to charts or quotepages. Custom indicators can be added to charts as any of 4 technical indicators: custom indicator, color marker, paint bars, or horizontal reference line. Similarly, signals can be added to charts as signal markers, color marker, or paint bars. Both custom indicators and signals can be added to quotepages as custom columns by choosing the "QuotePage - Custom Column". In each case, multiple setup steps have been reduced to a single menu selection.

When choosing any of the "chart" options, the chosen technical indicator will be added to the front most chart. If there is no chart open at the time, the "default" chart will be used. After the indicator is added to the appropriate chart, the chart will be brought to the front, and the indicators preferences will be presented. Make any changes to the indicator preferences (if needed) and then click "Enter" to dismiss the window and view your charted indicator. If you prefer not to see the preference window, simply hold down the shift key when making your selection from the pop up menu.

"Send To Chart" Button in Trading System Window

The "Chart System" button now appears as the "Send to Chart" button, and the action taken when this button is clicked has been modified. This button now takes the trading system and adds it to the front most window as a Trading System Indicator. If there is no chart open at the time, the "default" chart will be used. After the indicator is added to the appropriate chart, the chart will be brought to the front, and the indicators preferences will be presented. Make any changes to the trading system indicator preferences (if needed) and then click "Enter" to dismiss the window and view your charted system. If you prefer not to see the preference window, simply hold down the shift key while clicking on the "Send to Chart" button.

Last N Days Scaling Option for Traditional Charts

The option, "Last X Days", has been added to the vertical scaling preferences for traditional charts. This option allows the user to specify automatic scaling based on any number of the most recent days in the chart. For instance, if "Last 1 Days" is specified, the chart automatically scales to the current day's trading range. This option is built into the range based scaling option. To access this option, double-click (or right-click) in the vertical scale area of any pane to bring up the vertical scale preferences for that pane. Check the third scaling option and select "Automatic" scaling based on "Last X Days". Specify the number of days to use for scaling in the box to the right. At present, there is a limit of 98 days for this scaling option. This scaling option should work for any periodicity, including daily, tick bar, 20-minute, etc.

Downloading Historical Data from Yahoo! Finance.

The Data Download window "Source Menu" lists "Yahoo! Finance" as a source for retrieving daily, weekly, or monthly historical data from the Yahoo! Finance web site. End-of-Day users of Investor/RT who are following relatively few instruments will find this a convenience and reliable source of historical data. The latest daily bar data from Yahoo! updates quotepages, portfolios, etc. Historical downloading from Yahoo! is also available in the free demonstration version of Investor/RT so that evaluators of the Investor/RT product may update daily, weekly, monthly charts of the Dow Jones 30 Industrial stocks setup in the demonstration version. Historical downloads from Yahoo! Finance may be scheduled using Setup: Schedules. Use the "Download Data" action and pick "Yahoo! Finance as the server.

Trading System Realization (Optimization and Forward Testing).

Realization (Walk-Forward Out-of-Sample Testing)

The Realization feature in Investor/RT refers to the process of walk-forward out-of-sample testing (or walk-forward optimization). In essence, Investor/RT optimizes (or backtests) over a given period, then tests using the optimized variables (or best performing symbols, or both) over a subsequent period immediately following the optimization period. In this way, we are seeing historically what we could have achieved in reality by trading our optimized results or best performing symbols. This process can gauge whether the system should be traded going forward, or shelved/re-evaluated.

Below is a list of the user options available in the Realization window, along with a description of each option:

Name - Name of Realization

Generally, it is recommended to use the same name as the optimization and trading system it is built upon.

Optimization

The Optimization setup to be used in the realization process. If optimization is not needed for your realization, you must nevertheless create an optimization setup that references the trading system you want to realize upon. You specify this optimization in the realization window.

Optimization Period

Number of days to be optimized or sampled before performing the subsequent "real-testing".

Realization Period

Number of days to perform the "real-testing".

Test X Days Ending mm/dd/yy

Controls the period used for the realization. In most circumstances, this period should encompass the period for which you have data.

Realize Best X Symbols By [APS/Net Profit]

The user may choose to test/trade only the best symbols (based on average profit per share or net profit).

Optimize Only the Best X Symbols

When this option is checked, a "pre-test" will be run over the optimization/sampling period on all the symbols, and then only the best X symbols will be optimized and the "real" tested.

Run Scan _____ Before [Every/First] Iteration

This option is available primarily in order to reset variables between each iteration, or before the first iteration.

Show Intermediate Optimization and Backtest Reports

When checked, the optimization and backtest reports will appear just as if you were running them independently.

There are three primary methods for using Realization:

1. Survival Of The Fittest (SOTF)

Test a large group of symbols over a given period of time (optimization period). Take only the best (fittest) symbols of this group in respect to either Net Profit or Average Profit / Share. Test these best symbols over a subsequent period of time (realization period). Repeat. This method is based on the premise that the symbols that have performed best most recently will continue to perform best over the near future. The "Skip Optimization" checkbox should generally be checked when using this method.

2. Forward Optimization

Optimize one or more parameters/variables over a given period of time (optimization period). Use the optimal set of parameters (based on Net Profit or Average Profit / Share) and test over a subsequent period of time (realization). Repeat. This method can be used with one or many symbols. This method is based on the premise that the parameters which worked best over a recent period will continue to work best over a subsequent future period. Parameters may be optimized in either a "per symbol" method (each symbol gets its own optimal set of parameters) or a global method (all symbols share same set of parameters).

3. Hybrid

A hybrid of the two methods above. Use a combination of the best symbols and optimal parameters when forward testing.

The Realization window asks for an "Optimization" on which to operate. When performing SOTF realization, there is no need to optimize, however, an optimization must be created involving the trading system which the user wants tested, and that optimization should be specified in the realization window. In this scenario, the "Skip Optimization" checkbox should be checked as well.

When a Realization is in process, a "Status" area at the bottom of the Realization window provides the user with useful information regarding the progress and state of the Realization. The information provided includes which iteration is currently being processed, which process is currently running (pre-testing, post-testing, optimization, or real-testing), the status of the process currently running, the approximate amount of time left in realization, the Net Profit and APS overall, the Net Profit of Last iteration, and the date range of the data currently being tested.

When the Realization is completed, a report is provided which looks very similar to the "Day by Day" backtest report. It provides a variety of cumulative statistics for the realized testing, including Net Profit, Average Profit / Share, Total Trades, Best Day, Worst Day, etc. It also breaks down each day. If SOTF realization was performed, the "best" symbols used for each iteration, along with the statistical value (Net or APS) of each symbol, is listed for each iteration.

For additional information on Realization, including some examples, visit www.linnsoft.com/tour/realization

New Chart Button for Removing Indicators by Type

Chart buttons may be added with purpose "Remove Indicators". This button purpose supports both push button and menu buttons. The setup for a "Remove Indicators" button specifies an indicator "type" code, e.g. MA for moving average indicators, TLINE for trend line indicators. The user does not need to know these codes off-hand, just select the indicator from the list of descriptive names in the menu and the setup will be updated to show the indicator type code for the one(s) you select. When you click on the push button or choose one of the indicator types from the menu button's pop up menu, Investor/RT will remove all of the indicators of that particular type from the pane where the button is located. This feature was designed for those who frequently draw many trend lines, reference lines, or fib retracements, in their charts as trading progresses. These buttons provide a way to quickly clear the pane of all trend lines, for example, without eliminating any of the other kinds of indicators present in the pane.

New Order Desk for AutoTrader/Interactive Brokers

Setup: Preferences: Order Desk can be used to specify AutoTrader/Interactive Brokers as your preferred order desk. Thereafter, clicking the Place Trade button on the main toolbar (keyboard shortcut Alt-L) will open the AT/IB order desk window. The order desk window presents a list of your trading order presets and a list of the ticker symbols in your "Trading List" quote page. You can select a trading order and a symbol and then view the order's description in the text box to the right. Buttons are provided for editing the selected trading order or creating new trading order presets. This window dynamically updates to show the current bid, ask, and last trade and sizes for the selected symbol. Trading orders with limit or stop prices expressed as V# variables will update dynamically as V# values are updated/recalculated. Orders may be sent to AutoTrader using the Send button. A find box is also provided for entering a search pattern. Investor/RT will respond by listing the trading orders that match that pattern. For example, the pattern text *buy will list only trading order that contain the text "buy" in their trading order preset name. If you have a stop or limit trading order with "Mouse Click" as the limit or stop price, sending the order will cause the intra-day chart for the symbol in question to appear prompting for limit or stop price selection. Click the mouse at the price level you wish and select the actual limit or stop price from the ensuing pop up menu. Limit/Stop price selection via menu is exactly the same as if the order had been placed directed from within that chart via chart or trading signal for example.

Yahoo! Finance Stock Screener

The Stock Screener requests symbol lists from the Yahoo! Finance Stock Screener web site (screen.yahoo.com/stocks.html). Use Setup: Screen to access this feature. Currently, the screening criteria are limited to price and average volume. Additional criteria will be added over time. The Yahoo! database of stocks includes over 8600 stocks from the Nasdaq, NYSE, and AMEX exchanges. A check box labeled "Exclude OTC BB (.OB) and Other OTC (.PK) Stocks" excludes any stocks considered OTC BB (with .OB endings) and "Other OTC" (with .PK endings) from the results. Screen setups can be named and saved for future reference. Once the criteria have been specified, click the "Screen" button. Investor/RT connects to Yahoo! with your screen request. When Yahoo! responds, the user is presented with the number of stocks that were found. You may proceed to import those symbols or cancel. The retrieval process will take approximately 3 to 4 seconds 20 symbols. The user can cancel the process at any time by clicking the cancel button.

Custom Column Action Enhancement

The rules of a custom column can specify actions to be performed when the rule is evaluated as true. These actions includes opening a chart window, playing a particular sound, or running a schedule that in turn performs the prescribed scheduled actions. The way custom column rules trigger these actions has been revised and an automatic reset option has been added. These improvements are described in detail in the help topic for custom columns. Read the section titled Custom Column Rule Enhancements at the end of the "Custom Quote Page Columns" help topic.

Broker Alias Ticker Symbol

Each instrument (ticker symbol) in Investor/RT now has two alias symbols. The download alias is the alias ticker symbol that will be used when retrieving historical data from a historical data service in cases where the historical service uses a ticker other than the instrument ticker. This alias ticker has been a feature of Investor/RT for many years for users of Dial/Data. The download alias is also necessary for some instruments when using the IB version of Investor/RT since this version uses the DTN Market Access historical service. The instrument ticker symbol will in this case be the IB local symbol used for real-time data monitoring, while the download alias will be used when retrieving historical data from DTN servers. The download alias ticker can be viewed and edited in quotepage using the Alias data column or you can specify the download alias symbol in the Setup: Instruments window (in the Advanced Settings Section).

The second alias symbol is the Broker symbol. With Investor/RT trading order integration with InterActive Brokers, uses of other realtime data sources (eSignal, DTN.IQ, myTrack, Quote.com) need an alias for conveying the IB symbol in trading orders. For equities trading orders, the instrument ticker will typically be the same as the IB broker symbol, but for other security types such a futures contracts, the broker alias will be used when transmitting trading orders to IB. The Broker alias symbol can for each instrument can be viewed or edited in a quotepage using the "Broker Symbol" data column. The Broker alias may also be setup in the Setup: Instruments window (in the Advanced Settings Section).

Object Editor Window formerly Edit/Delete/Rename Window

The Object Editor Windows (formerly known as the "Edit/Delete/Rename" window) has been enhanced to support four new object types: (1) Trading Orders (2) Signal Actions (3) Optimizations (4) Realizations. Trading Orders and Signal Actions are special cases of indicator presets that are now listed in the Object Type menu at the top of the window. Choose Trading Orders, for example, and a list of all trading order (presets) will be shown. YOU may then delete, rename, view and edit the trading orders. Note that renaming trading orders does not automatically adjust all of the buttons that may refer to the former trading order name. The Object Editor window has a key role in setting up groups of objects. You can select any object and add it to a group by clicking the Add to Group button. For trading orders, there is a special new group type called a Trading Order group. A trading order group is a group containing only trading order presets for a set of orders that can be submitted to the broker simultaneously. Trading order groups can be executed either from the IB / AutoTrader Order Desk window or by clicking a button in a chart window (where the button is setup to execute a particular named group of trading orders).

New RTL Tokens for Trading Feedback

New Tokens have been added to RTL to provide access to brokerage position related information when using the new trading order features of Investor/RT. When trading orders are sent to Interactive Brokers (via AutoTrader), Investor/RT will monitor the status of those trading orders and when Investor/RT receive a fill notification, it will record the status of the user's position. The new RTL tokens are TR_FILL (the latest fill price for the instrument), TR_POS (the position size, positive for long, negative for short, zero for no position open), TR_TARG and TR_STOP (target and stop prices for AutoTrader Managed positions, are not yet implemented). These new tokens may be used in trading signals to make signal firing dependent upon the state of the trade. For example, a custom column in a quote page could calculate a stop or target price based on the TR_FILL price and record that value in a V# when in turn can be used to submit target or stop orders at that V# price level. The TR_FILL token yields the same value as the ENTRY token, and the TR_POS yields the same value as the POS_SIZE token, EXCEPT when the signals are executing under a trading system indicator, since ENTRY and POS_SIZE are set by the trading system. We recommend that TR_FILL and TR_POS be used as these token refer specifically and unambiguously to the results reported to Investor/RT by the trading order status feedback from the brokerage.

For Annotation display purposes, a special token TR_STATE is supported in traditional chart annotation text. When %TR_STATE is included in annotation text, the token is replaced by LONG N or SHRT N or FLAT depending on the trading state of the symbol associated with the annotation. N is the number of contracts or shares in the current trade position. For example your annotation text message might be setup as "%TR_STATE %TICKER". Assuming you are viewing a chart of say, ESU5, your chart annotation could read "LONG 1 ESU5", or "SHRT 3 ESU5", or simply "FLAT ESU5".

New Order Desk for IB/AutoTrader Trading

The Place Trade button on the main toolbar opens a user-specified order desk window. By default, this order desk is the Investor/RT Portfolio order desk, a window for opening and closing positions in any Investor/RT portfolios. Investor/RT Users who will be trading with InterActive Brokers via the new AutoTrader/IB trading orders features of Investor/RT, can now use the new AutoTrader/IB Order Desk window. To activate this order desk in place of the Investor/RT Portfolio order desk, go to Setup: Preferences: Order Desk, and specify "AutoTrader/IB Order Desk" as the one to use for Stocks and Futures trading. The AT/IB Order Desk lists all user-define trading orders and symbols in your "Trading List" quote page. YOU can easily use this window to create new trading orders, edit existing order, and submit trading orders to IB by simply choosing the order and the symbol and clicking Send. The AT/IB Order Desk support individual orders as well as groups of orders. When you select an order, its description appears to the right; when you select a trading order group name the names of the trading orders in the group appear to the right. The order desk is "live", giving you continuous updates on last trade price, bid/ask and sizes for the selected symbol. For users with many trading orders, a convenient search feature is available, just type in a few letters to see those orders with names beginning with those letters; type in * to see all orders; type in * followed by some letters to see a list of trading orders having those letters anywhere within the name. A list of common patterns is available by clicking the mouse on the menu disclosure arrow, e.g. choose *buy to see all orders having the word buy anywhere in the order name. The AT/IB Order Desk window is sizable.

Fundamental Data Retrieval from Yahoo!

Finance.Investor/RT can now download 19 different key statistics / fundamental values from Yahoo! Finance.

Currently supported values are:

- Yahoo! Finance Term - Investor/RT Term
- Market Cap - Market Cap
- Trailing P/E - P/E Ratio
- Price/Sales - Price to Sales
- Price/Book - Price to Tangible Book Value
- Revenue Per Share - Revenue/Shr
- Total Cash Per Share - Cash/Shr
- Current Ratio - Current Ratio
- Book Value Per Share - Book Val/Shr
- Beta - Beta
- 52-Week High - 52WeekHigh
- 52-Week Low - 52WeekLow
- 200-Day Moving Average - MA Price
- Shares Outstanding - Shrs Outstanding
- Float - Float
- % Held by Insiders - % Held by Insiders

% Held by Institutions - % Held by Institutions
Shares Short - Short Interest
Short % of Float - Short Int % of float
Dividend - Dividend

To download these values for any quote page of symbols, click on the "Download" button in the main toolbar to open the Download Data window. Select the Source: "Yahoo! Finance" and the Type: "Fundamental Data". Choose the "All Instruments in Quote page" option on the left, and select the quote page for which you would like to download fundamental data. Now click the "Download" button. Data retrieval will take approximately 2 to 3 seconds per symbol.

The "Download Data" schedule action has also been enhanced to allow scheduling of "Yahoo! Finance Fundamental" downloads.

You can read more about downloading fundamental data from Yahoo! Finance by visiting:
<http://www.linnsoft.com/qa/a/73.htm>

Schedule Definition Export and Import

The File: Export and File: Import menus now provide for exporting and importing schedule definitions. File: Export: Schedule Definition will prompt you with a list of schedule names. Pick the one to export and click OK. You can export all of your schedules by clicking the "All" button instead. File: Import: Schedule Definition will prompt for the file to import. If you receive a schedule definition as text in an email you can copy it to the clipboard and use File: Import: Definition from Clipboard to import it. When importing a schedule you will be prompted if the schedule name already exists. You can replace the existing schedule, cancel the import, or choose "New Name" and Investor/RT will import the schedule by appending a number to the existing name to make the name unique. All imported schedules are marked as "Inactive" as a precaution. Schedules can do just about anything in Investor/RT so it is a good idea to review the action list for the imported schedule before enabling it to be run on your system. Inactive schedules appear in the Setup: Schedules window with an asterisk prefixed to the schedule name. To activate (enable) an unactivated schedule, ctrl-double-click on the schedule name, or simply edit the schedule and uncheck the "Inactive" check box. Macintosh users option-double-click to toggle a schedule between active and inactive status. Exported schedules can make reference via their scheduled actions to other Investor/RT objects, e.g. charts, scans, quote pages, indicator presets, trading systems, etc. At present, exporting a schedule will export scans referenced by actions within the schedule. The automatic export of other dependent objects will be added in subsequent releases of Investor/RT. In the meantime, the user must manually export any dependent charts, quote pages, etc. and send those definitions along with the schedule definition to the intended recipient.

Setup: Futures Improvements

The Setup: Futures window has been improved to make it easier to select the type of futures contracts you wish to add. The button menu at the top of the window still has a list of futures contract names suffixed with the future code, e.g. "US 10Year Treasury Note ZN". With so many future types to choose from the selection of the contract type can be tedious, especially when you "know" already that you want to ZN's. At the bottom left of the window there is a text entry box with a menu attached that lists all of the futures contract types alphabetically by type code rather than name. This selection list may be use to select the contract you want, or you can simply enter the letters directly into the box, e.g. type in zb and Investor/RT will set the window to the correct type for producing the symbols you want to track with Investor/RT. Just to the right of the future code entry box is the "Setup Type" button. If you enter a future type that Investor/RT does not have in its database of future types, click this button to open a window for setting up futures types. Send an e-mail to support@linnsoft.com to report any future types that you would like to see added to the database. This will help us to know which future types are commonly used so we can add them to the Investor/RT database in future releases of the Investor/RT software.

Using Reference Line to Monitor Trades

Improvements have been made to the Reference Line indicator to facilitate monitoring of fill price, stop price and target price when a trade is active. You may create reference lines in a chart that are associated with these values by using the menu of "V#1, Other" price types in the Reference Line setup. These reference lines have a special property; they will only appear in the chart when a position is active for the charted instrument. When you submit a trading order and it is filled, Investor/RT establishes the position size and fill price. If you have a "Fill Price" Reference Line in a chart of that instrument, it will pop into view when the trading order is filled. Reference Lines for stop and target prices work similarly. The stop and target prices can established by submitting a "Get AT Position Info" trading order. AutoTrader responds to this trading order with the current AutoTrader established stop and target prices for the managed position. When the stop and target prices are established, Reference Lines associated with these price values will appear in the chart. When the position is closed (TR_POS becomes 0), the lines will no longer appear in the chart. The Stop and Target Reference Lines work best with AutoTrader managed trading. User who use AutoTrader pass thru orders for trading via Interactive Brokers can use these reference lines but there must be some mechanism in place to "SET" the values of TR_STOP and TR_TARG, the RTL tokens for these values. For example, a TSYS (Trading System) Indicator operating in a chart could have rules that decide when to raise a trailing stop and setup the rules to perform a SET(TR_TARG, expression) to establish the new target price. The Target Reference Line in the chart will automatically adjust to show the newly computed target price.

The addition of these three new choices to the "Use V#, Other" menu in the Reference Line setup may have some side effects in Reference Line setups for users who have participated in the beta testing of version 8.0. Users who upgrade to 8.0 Final Release from 7.6.3 or earlier will have their Reference Line setups adjusted automatically. Version 8.0 beta tester who have Reference Lines in charts that are associated with a V# variable should inspect the settings for all reference line and

update the settings if necessary. Typically, the beta test user may find a setup and is 3 menu choices lower. For example, V#47 might be mistaken set to V#50. To repeat, this only applies to 8.0 beta testers, users upgrading to version 8.0 from an earlier final release are not affected.

Overnight Session Holiday Improvements

Traditional charting of overnight traded instruments has long been problematic on days immediately following a trading holiday. The recent July 4th holiday was no exception. Typical of Monday holidays, any historical data for the Sunday pre-holiday trading hours are mis-handled by Investor/RT, disturbing the appearance of the charts for overnight traded instruments. Two enhancements have been made to deal with these issues. First, Investor/RT will hence forth treat the Sunday session preceding a Monday trading holiday as a "holiday date" as well. Thus when refreshing a chart's historical data after a holiday, such Sunday data will not be included in the chart. When Monday holidays occur, charts will end at the session closing time of the preceding Friday, and resume at 12 a.m. the beginning of the Tuesday following the holiday. ANY trading during Sunday and Monday will not be included in the chart. This enhancement will clear up much of the chart distortion experienced heretofore. A second enhancement was made in the form a new check box in Setup: Preferences: General. By default this box, titled "No Holidays for Overnight Sessions" will be unchecked. If you enable (check) this option, then Investor/RT will suspend its normal handling of holiday trading periods and show all trading, current and past that occurred during the holiday time periods. There will be "white space" for periods of no trading activity at all, but pre-holiday trading Sunday, and even post holiday trading late in the day on a Monday holiday will appear in proper time perspective. This check box may be used on the actual trading holiday date to chart live and historical trading activity pre and post holiday. Post holiday charting for instruments trading during "day sessions" are not affected by these enhancements.

Ctrl-Enter Shortcut for Accessing Preferences

Ctrl-Enter (Option-Return on Macintosh) has been adopted as a universal shortcut for calling up the preferences for the window at hand. This new shortcut works for quotepages, portfolios, charts of all kinds, view-edit windows, time and sales, etc. When a quotepage or portfolio is the front window and a particular row (symbol) is selected, the Ctrl-Enter will instead open the setup (the preferences) for the symbol. When no particular symbol is selected, the preferences for the quotepage or portfolio will be opened.

Version 8 Fixes, Miscellaneous Enhancements

- The Show/Hide toolbars keyboard shortcut, formerly Alt-H or Apple-H, has been changed to Ctrl-T (MS Windows) and Option-T (Macintosh). Think "T for Toggle Toolbar". The Apple-H command is reserved in Macintosh OS X (to hide the application - minimize the application to the dock). On MS Window, Alt-H now pulls down the Help menu on the main menu bar.
- A bug was fixed in traditional chart windows having to do with the operation of the "close box" in the title bar of the top pane in the chart. Clicking the "x" box at the far left of the title

bar of any chart pane has a dual purpose. The first click on the x will remove all of the indicators from the pane. If the pane has no instruments in it, the pane closes since it is empty. For panes with indicators and instruments, the x box is useful for quickly removing all of the indicators in the pane. The pane remains open showing only the instrument(s). Clicking the x box in a pane containing one or more instruments (and no indicators) will close the pane. Of course, if the instrument to be removed from the chart is the only instrument in the chart, the entire chart will close. Investor/RT will warn you that you are about to close the chart if this is the case so you can cancel the action if you wish. The bug was that a mouse click inside the x box was not detected for the top pane in the chart. This has now been fixed so that the x box is functional for every pane in the chart. When you mouse down inside the x box, the box will highlight; releasing the mouse while the x box is highlighted will perform the remove indicator/close pane action, depending upon the pane's content.

- DTN Satellite Version of Investor/RT now supports reception of FOREX currency quotes. DTN Realtime Satellite service offers realtime currency quotes from Barclays, Tullett, and Hotspot. Forex charts in Investor/RT track the current bid/ask for the FOREX instrument tick by tick. Each quote received generates a "last price tick" at the bid price with a simulated trade size of 1. Thus a simulated volume for each time interval bar is available for volume charting. The volume numbers represent the number of FOREX quote updates received during the chosen time interval.
- A bug was fixed in the Session Statistics Indicator where the number of bars in the setup was specified as a user V# variable.
- The Split Adjustment window (Control: Data Management: Adjust for Splits...) has check boxes titled "Adjust Intraday Data Only" and "Adjust D/W/M Data Only". This feature was added for the benefit of those using data sources that provide split adjusted data in one case but not the other. In the past, the split adjustment feature of Investor/RT would perform adjustments on all pre-split date data of all periodicities. You can now deal with intra-day data adjustments or daily/weekly/monthly split adjustments without affecting the other.
- The Setup Instruments window shows the override exchange ID when you edit existing ticker symbols (instruments) if the instrument has an assigned exchange other than AUTO. The exchange ID is shown just to the right of the display format for the instruments. The Interactive Brokers version of Investor/RT does require that the exchange be setup for futures and options symbols. The Quote.com version of Investor/RT requires that certain ticker symbols, e.g. Canadian stocks, been assigned a specific exchange. Since the exchange setup information is setup in the Advanced section of the Setup Instruments window and this advanced section is often closed, this display has been added as a convenience so you can tell that the symbol is assigned to a specific exchange without having to open the advanced section.
- A bug was fixed in the eSignal version of Investor/RT having to do with retrieving historical data for ticker symbols containing a forward slash. Certain securities such as preferred stocks have as /P ticker suffix for example. This problem has been corrected.
- When saving a signal (or scan) while a trading system window and its corresponding backtest setup window are both open, Investor/RT would issue an XVT fatal error and quit. This has been corrected.

- A preferences panel was added for Message Log settings. The panel provides user control over the log time stamp format and the size of the message log file. "Clear Log" and "Trim Log" buttons can be used to empty the message log or trim back its size.
- The OBI On Balance Volume indicator accepts a V# variable as the period, making this indicator available for optimization.
- A bug was fixed in the Preset menu that appears in technical indicator setup windows. The Preset Menu's "Save As..." command was working improperly. Investor/RT was saving the settings under the wrong preset name, not the preset name selected from the menu.

Version 7.6 Rev 3, Released: February 28, 2005

Version 7.6 Rev 3 Fixes, Miscellaneous Enhancements.

- The Setup Optimization window was not responding to the tab or shift-tab keys for tabbing through the window's controls. This has been corrected.
- The Setup Optimization window has a Cancel button. This may be used to cancel a running optimization, or to close the Setup window when an optimization is not running. The esc key is equivalent to clicking the cancel button. The enter key is equivalent to clicking the "Optimize" button to initiate the optimization process.
- The Optimization report window now highlights the column heading of the "sort-by column" by enclosing the column heading in [brackets].
- Improvements were made to custom columns to eliminate internal XVT error messages when the TSYS (Trading System Indicator) is used as a custom column.
- The Schedule Action "Open Group" was enhanced. Instead of presenting the user with a list of objects that may be opened, the "Open Group" action now opens each of the objects in the group, including the objects in any subgroups.
- E-mailing Text Files from Investor/RT below describes a method whereby an Investor/RT user can email definition text directly from the program. The File: Import command has been enhanced to enable the recipient of such an mail to "paste" (import) the definition directly into Investor/RT. Simply copy the text of the definition to the clipboard in your email program, then go to Investor/RT and issue the File: Import: Definition from Clipboard... command. Note that the first line of text in any Investor/RT definition has the format:

BEGIN Investor/RT <type> DEFINITION for <name>

where <type> is the object type (CHART, QUOTEPAGE, or SIGNAL, etc.) and <name> is the name of the object. If Investor/RT does not find the "BEGIN" line as the first line of the clipboard text, the import will fail and Investor/RT will display the raw text it found on the clipboard.

- Scans, Signals, and Custom Indicators may now be saved with names that end with a numeric digit. At one time, this restriction was enforced to avoid confusion in token names since numeric suffixes might be mistaken for the bars back qualifier. However, since references to scans, signals, and custom indicators within an RTL formula are now done with the SCAN, SIGNAL, and CI tokens respectively, the name of the scan, signal, or custom indicator is simply

a property of the token. Names may now be composed of any alphanumeric characters and underscores of length less than 32 characters. Note that token names in RTL that end with a numeric digit follow the convention established by V#n and T#n user variable tokens: a token may end with a digit or series of digits if the digits are preceded with a # character. For example, you use a 25 period moving average in your RTL formula, you can name the token MA#25 if you wish and use the notation MA#25.1 to refer to the previous bar's value of MA#25. But MA25 is a invalid token name since the digits in the token name are not preceded by #.

Version 7.6.2, Released: February 21, 2005

Version 7.6 Rev 2 Fixes

- A bug was introduced into version 7.6 Rev 1 that was causing incorrect/unreliable backtesting results for all but the simplest of trading signals. This has been corrected (quickly).
- A bug concerning custom instruments that reference custom price values was fixed in 7.6.2. This bug was causing a fatal error when attempting to edit such a custom instrument definition.
- A bug in the Profile indicator was fixed in version 7.6.1 to enable it to calculate correctly when there are more than 32,767 bars in the chart. This fix extended the limit to 65,434 bars. The 65,434 limit has been removed in version 7.6.2.

Version 7.6.1, Released: February 18, 2005

E-mailing Text Files from Investor/RT

The "Send E-Mail" window has a new button titled "Insert Text File". This is used to include the text of any file at the end of the email message body. Investor/RT will prompt you to select the text file. This feature is designed to enable Investor/RT users to quickly send chart and other Investor/RT object definitions to <support@linnsoft.com> or other recipients. For example, with a chart open you can use File: Export: Chart Definition or right-click in any chart and choose "Save: As Chart Definition" to create a definition text file. Then click the "E-Mail" button on the main toolbar (or choose File: New: E-mail). An empty e-mail window will appear pre-addressed by default to <support@linnsoft.com>. Click the "Insert Text File" button and choose the definition file you wish to send. The definition text will be added to the e-mail body and the e-mail subject (if not yet specified) will be set for you to reflect the name of the file being emailed. Then Click Send.

Note: when a file is inserted into an e-mail message, Investor/RT automatically adjusts the e-mail message body to turn off "word wrap". This is done so that the definition file will be accurately sent with no additional line breaks. This enables the recipient to copy the text and paste it into a file, using Notepad, for example, for import into the recipient's Investor/RT system. In a future release of Investor/RT, the File: Import menu will be enhanced with an "Import from Clipboard" menu item to facilitate importing definitions directly from incoming email messages.

Version 7.6 Rev 1 Fixes, Miscellaneous Enhancements

When running a scan, the RTL tokens NUM and SEQ tell you the number of ticker symbols in the quotepage being scanned (NUM) and the index of the ticker symbol currently being scanned (SEQ). These tokens have now been enhanced to provide similar results when running a backtest. NUM will be the number of symbols currently being backtested, i.e. the number of symbols in the quotepage being backtested. NUM will, of course be 1 when a specific ticker, rather than a quotepage, is specified in the backtest setup. SEQ will be 1 for the first symbol scanned or backtested and will increment by one as each additional ticker symbol is scanned or backtested.

When sending email from Investor/RT, checking the "CC Me" checkbox in the lower left corner of the Send Email window assures that a copy of the message will be sent to your own email address. A minor bug was fixed that was causing the CC feature to fail randomly.

A bug in the Profile indicator was fixed to enable it to calculate correctly when there are more than 32,767 bars in the chart (e.g. a one-minute chart with a view period of "Last 90 days").

Day by Day Backtest Report Enhancement: Max PullBack. The Day by Day backtesting report has been enhanced with a new entry titled "Max PullBack". The new entry might look something like this:

Max PullBack Overall: \$(2,861.20) [02/11/2005, 2 days] (1 Day Recovery)

This value represents the furthest the system pulled back and considers every (start of) day as a potential starting point and every (end of) day as a potential ending point. The date at which the pullback reached it's peak is reported, along with the number of days spent in the pullback, and the number of subsequent days required the recover from this pullback (or "No Recovery" if it never recovered during the period tested).

This value differs from the "Max. Adv. Exc. Overall" in two ways. First, Max PullBack considers every days start as a potential starting point, while MAE considers only the beginning of the test period as the starting point. Also, Max PullBack only considers the balance and P&L at the end of each day, while MAE considers intraday swings.

Version 7.6, Released: February 17, 2005

Global ARRAY User Variables

The ARRAY user variable token introduced to RTL recently has been enhanced to support global arrays. The initial implementation of the ARRAY token (or AV token) required that each array be "instrument specific". For persistent arrays of values, the array ID (A1, A2, etc.) is used to construct an instrument specific pseudo ticker symbol (type Cash) to hold the array values. The Setup for the ARRAY token now allows the user to specify whether the array is to be instrument-specific or global. When "Global" is checked, the array ID becomes the actual ticker symbol used to hold the data for that array. This means that when running a backtest for example over a quotepage of ticker symbols, the a global array can be to used to "collect" information for across the entire list of tickers.

Support for Outgoing Mail with Authentication

The Setup: Preferences: Mail & Internet window allows the user to check a box titled "My Outgoing Server Requires Authentication". When this is checked, the user can enter the username and password for the outgoing mail server. Using this setup will enable users whose outgoing mail server requires authentication to send email directly from Investor/RT. Formerly, such users were unable to use the emailing features of Investor/RT. The Investor/RT Software Registration process makes use of the outgoing mail server to send a confirmation message. An override code (bypass code) required in prior versions to register the software properly, will no longer be needed.

Investor/RT supports SMTP standard "LOGIN" type authentication. Support for secure password authentication (CRAM-MD5 method) will be added in a future release. The Investor/RT emailer has also been improved to create a log of the email sending process to enable easier diagnosis of user specific problems. After attempting to send an email from Investor/RT, use File: Open: Internet Log to review the transcript of the conversation between Investor/RT and your outgoing mail server. Send this log text to support@linnsoft.com for diagnosis if you have trouble sending email from Investor/RT. The log file is kept in the admin directory under the name irtlog.txt.

New RTL Token NORM: Normalized Price Indicator

The Normalize Price indicator is now available for use in RTL formulas using the token NORM. Normalized Price Indicator The Normalized Price indicator graphs the price movement of an instrument using 100 as the base value for a user specified base date/time. The normalized value for each bar after the base date/time is the percent of the base price expressed as a whole number. (i.e. 100 times actual price divided by actual base price). The normalized price indicator can be used in RTL formulas using the token NORM.

This indicator shows the percentage move in price relative to the price at some fixed starting date/time. For example, if you add this indicator to a daily chart using 12/31/2004 as the base date, the indicator line will show you how the issue has performed since the beginning of year 2005. Values above 100 indicate the percentage increase in price since the beginning of 2005. For example, a value of 115 means the price has increased 15% since the base date, while a value of 82 would indicate a decline of 18% since the base date.

The "price" graphed can be any of the standard Investor/RT price values: close, high, low, high + low average, or high + low + close average. An optional smoothing can be applied to the resultant graph.

Another purpose of the Normalized Price indicator is to provide a means of easily comparing the price action of two or more instruments since some fixed starting point. When a chart window contains two or more instruments, you may create normalized lines for each of the instruments and add them all to the same pane. Be sure to use the same base date/time in all normalized price indicators.

New QuotePage Columns/RTL Tokens

Four new bid/ask related quotepage columns with corresponding RTL tokens are now available:

Bid Tick Count (RTL: BTICK)
Ask Tick Count (RTL: ATICK)
Bid Volume (RTL: BVOL)
Ask Volume (RTL: AVOL)

These market data items update in real-time as trades are received for the instruments you are tracking:

- BTICK counts the number of trades that occurred at or below the current bid.
- ATICK counts the number of trades that occurred at or above the current ask.
- BVOL accumulates the trade volume for trades that occur at or below the current bid.
- AVOL accumulates the trade volume for trades that occur at or above the current ask.

The values of these four instrument properties are reset to zero automatically the session opens. The values can also be examined or SET in RTL formulas. For best results, Investor/RT should run continuously during the trading session. If you quit and startup Investor/RT during the day however, the values of these items will be retained and will pick up where you left off once data reception resumes.

There are many interesting ways you can utilize these new tokens to monitor buying/selling activity for the instruments you track. For example, you can create a custom indicator with the formula $(AVOL/BVOL) * 100$. This formula calculates the percentage ratio of trading volume at the ask price vs. the bid price. Save the custom indicator, naming it "Buy Sell Volume Ratio", for example. You may then create a custom column referencing this indicator for display in your quotepages. Values near 100 indicate an approximately equal level of buying vs. selling volume. Numbers above 100 indicate more buying volume than selling volume, and conversely, numbers below 100 indicate more selling volume. You can color code the quotepage custom column using rules to improve the visual effect, displaying, for example, values between 95 and 105 with a neutral background, values above 105 with a green background, and values below 95 with a red background.

Another way to utilize the Buy Sell Volume Ratio custom indicator is to track the values of this ratio for specific instruments over time in a chart. This can be accomplished by setting up the Buy Sell Volume Ratio custom indicator as one of your "Custom Prices". Do this in Setup: Preferences: Prices, Custom. For example, assign "Buy Sell Volume Ratio" to custom price slot P8. Since custom instruments can reference custom price values, you may then create a custom instrument to track the ratio historically for any ticker symbols you wish. Here's how:

Suppose you want to historically track the buy sell volume ratio indicator for ticker symbol INTC. Go to Setup: Custom Instruments. Create a new custom instrument, assigning it a ticker such as INTC_BSVR. Setup up INTC_BSVR as a "Sum". It will have only one component. The component is

"INTC", the underlying ticker we wish to monitor, with a "Value" of P8:Buy Sell Volume Ratio. Note that P8 is the "custom price" setup previously. Press the Save button. Thereafter, each time INTC trades, the value of the custom instrument INTC_BSVR will update to reflect the current value of the buy sell volume ratio indicator for Intel. INTC_BSVR can, of course, be charted like any other ticker. You can monitor INTC_BSVR in a traditional chart of any intra-day periodicity. It is interesting to watch the tick by tick progression of the ratio in a raw tick chart. To create a raw tick chart of INTC_BSVR use File: New: Chart, and choose "Raw Tick" as the Type of chart. You can even add INTC_ABVR to a separate pane of a traditional chart window containing INTC itself. You can easily observe the correlated movement of the ratio with the price action in the underlying INTC.

Since INTC_ABVR is tracking the ratio tick by tick, you can also set alarms on it like any other instrument. Using the automatic stepping feature of the Investor/RT alarm feature could be useful. Alarms on the value of the buy sell volume ratio can alert you to significant swings in either direction.

Backtest Reporting: Daily MAE and MFE

The Day by Day backtest report was enhanced with additional information regarding Maximum Favorable Excursion (MFE) and Maximum Adverse Excursion. In prior releases, the MFE and MAE represented the most the system was ever up (MFE) or down (MAE) overall. New MFE and MAE "Daily" entries have been added to report the furthest the system ever got up or down within any given day. MAE and MFE columns were also added to show how far the system went up or down on each individual day (or trade/bar if specified). These values can give the user a good indication of the risk involved in an intraday system.

Version 7.6 Fixes, Miscellaneous Enhancements.

The Dial/Data (end-of-day) Edition of Investor/RT now has a "Work Offline" menu item in the Dial/Data menu. The menu item appears with a checkmark if Investor/RT is currently working offline. Choosing the menu item toggles back and forth between working offline and normal operation. While working offline, the feed status icon at the right end of the main toolbar shows a special "Off" icon. While working offline no Dial/Data downloads will be attempted when opening chart windows, doing slide shows, using the chart wizard, etc. Normal behavior resumes by choosing Working Offline from the menu when the menu item is checked.

A bug was corrected in the MetaStock daily data import feature that was causing a fatal error in situations where invalid dates were found in the Metastock file(s). The current version has improved error checking. Historical data having invalid date(s) is skipped and the fatal error condition has been eliminated.

When Investor/RT emails a quotepage, the "Date" and "Date Time" cells of the quotepage are now emailed in mm/dd/yyyy format, even if the date happens to be the current date. The abbreviated "today" notation is still used to display dates in quotepage cells on screen, but when emailing, the actual date is sent.

A fatal error bug was found relating to the use of the TSYs token in an RTL formula associated with a quotepage custom column. A fatal error would occur when closing the quotepage containing such a column. This bug has been corrected.

Clicking the "Backtest" button in the Trading System window while a backtest was already running would cause a fatal error in the MS Windows version of Investor/RT. The error would also occur if the user "double-clicked" the Backtest button. This has been corrected.

Exporting definitions of charts, scans, signals, and custom indicators was impossible for those having names including a colon character. Trading system names containing a colon character could not be backtested for similar reasons. This has been corrected.

Version 7.5.2, Released: January 27, 2005

QuotePage Browser Improvements

OS X Support. The QuotePage Browser, a tool introduced in the MS Windows version of Investor/RT several releases ago, is now supported on the Macintosh OS X Version of Investor/RT. The QuotePage Browser can be opened in various ways. The QP button on the main toolbar brings up a popup (contextual) menu that includes a menu item "Browse QuotePages...". The Open: QuotePage menu also has this menu item. Further, "Open: QuotePage Browser" is now a choice in the keyboard shortcut setup window. Thus you can assign a Function Key to open the browser, and you can create a chart button to open the browser by having the chart button invoke the keyboard shortcut. The browser is also available from any open quotepage by clicking the "+" button in its upper right corner. The contextual menu has an item titled "Browse..." for opening the quotepage browser.

Day Bar: "Last Session Only" Option

A new "Last Session Only" option has been added to Day Bar charts. This option is only relevant when building the day bar using the "Last X Minutes". When this option is checked, the bar is built using only data from the current session (or the most recently completed session if the session is currently closed). If this option is turned off (unchecked), then day bar can cross session boundaries. As an example, if "last 60 minutes" were specified, and it was currently only 20 minutes into the session, then the first 20 minutes of the current session, along with the last 40 minutes of the previous session, would be used. However, "Last Session Only" were checked, then only the first 20 minutes of the current session would be used. Regardless of which option is selected, the last 60 minutes of the previously completed session would be show when the session was closed. In prior releases, day bar charts always functioned in "last session only" mode.

Backtest Reporting: Positions, Entries, and Exits

A new option has been added to "Backtesting Output Options" area of the "Backtest Setup" window which allows the user to select the definition of a "trade". Options include counting all "Entries", all "Exits", all "Entries plus Exits", or all "Positions". In prior releases, trades were always computed by summing all "positions". In other words, regardless of how many "buy more" and "sell some" transactions may have occurred within the position, the position was still recorded as a single trade.

Many brokerages charge commissions on a per trade basis, with trades including all transactions (such as "buy more" and "sell some"). Therefore, many users might prefer to report trades buy summing all "Entries plus Exits". This would include all partial exits (sell some) or additions to the position after the original entry (buy more).

In addition, several new lines have been added to the "Per Trade" and "Per Share" sections of the Day by Day report. The "Per Trade" section now has lines for "Positions", "Entries", and "Exits" (but only if these numbers are not all three identical, in which case, only a "Position" line will be shown). The "Per Share" section now has lines for "Avg Gross/Share", "Avg Profit/Position", "Avg Profit/Entry", and "Avg Profit/Exit". Again, the "Avg Gross/Share" will only be shown if it is different from the "Avg Profit/Share" (which is a Net profit). They should always be different if commissions/fees are specified in the Backtest Setup window. Also, the "Avg Profit/Entry" and "Avg Profit/Exit" again will not be shown if there is only one entry and exit per position.

Price/Time Profile: TPOs.

The Price/Time Profile has been enhanced to show the number of TPOs above and below the POC line. These values are shown in the label for POC in a format of PRICE(ABOVE/BELOW). For instance, "25.92(77/70)" would represent a POC at a price of 25.92, with 77 TPOs above the POC line, and 70 TPOs below the POC line. These values can also be viewed in the title bar of the chart for the current and previous session based on which session the cursor is over.

Five New RTL Tokens for Backtesting Usage

Tokens have been added to the RTL language to enable trading signals to interrogate various backtesting related numeric values:

BT_NET	Cumulative Net Profit
BT_POS	Number of Closed Positions
BT_ENT	Number of Entries
BT_EXIT	Number of Exits
EXIT	Most Recent Exit Price

Data Management Function: Purge Historical Data

Historical Data retention preferences are specified in the Setup: Preferences: Historical Data window. The purging process takes place each trading day as part of the Post History process for each trading session. The posting time setup for each session (in Setup: Preferences: Sessions) dictates when this occurs. Now that the posting of historical data is optional, we have added a Purge Historical Data command to the Control: Data Management menu. This command will discard all daily, weekly, monthly and intra-day data older than the retention periods setup by the user for each category of historical data. The Purge Historical Data command purges data for instruments in every trading session. If you need finer control over the purge process on a session by session basis, a new

Schedule Action has been added for performing the purge process on the instruments that belong to a particular session. The new action, also called "Purge Historical Data" is under the Database Functions action category. The setup for this action, like the "Post Session" action, includes a menu choice of the session to operate upon. Using a schedule with one or more purge actions, you can cause historical data purging to take place independently of or in addition to the normal Post History process.

Version 7.5 Rev 2 & Rev 3 Fixes, Miscellaneous Enhancements

- A bug was fixed in the portfolio window that could cause a fatal error when the user click on a column heading to sort the portfolio by that column.
- When the vertical scale price feature is active for a traditional chart window, instrument(s) in the chart set to "Invisible" will no longer have their prices highlighted in the vertical scale.
- A bug was corrected related to Signal Actions issuing simulated Trading Orders to an Investor/RT portfolio. Sell trading orders were being mistakenly accepted even when there was no open position to sell. Similarly, Cover Short orders were posted to the portfolio even when there was no open short position to cover. Erroneous closed positions resulted and these were displayed in the portfolio close positions reports. Investor/RT will reject such order now when there is no open position found in the target portfolio.
- The Setup: Schedules window, when resized wider, now expands the size of the list box containing the list of actions for each schedule. This may be useful for those who have signal actions whose titles are lengthy. Simply resize the window wider until the full text of the signal action title is visible. Note that Investor/RT records the size of Setup: Schedules window so the window will open it with the same window dimensions later.
- Backtesting: Day by Day Reporting Enhancements: Several new statistics were added to the Day by Day report. In the "Per Trade" section, "Avg Profit/Long" and "Avg Profit/Short" were added to provide the net profit per trade for both longs and shorts. "Avg Profit/Long" and "Avg Profit/Short" entries were also added to the "Per Share" section to provide the net profit per share for both longs and shorts. These entries will not appear in the case that all trades were long, or all trades were short. In the "Miscellaneous Stats" section, "Avg Net/Winning Day" and "Avg Net/Losing Day" entries were added to provide the average net profit per day over all winning days, and all losing days. A bug was also fixed relating to "Consec Losing Days". This statistic has not been accurately reported in past releases.
- The RTL Setup window's "Show All Tokens" menu has a new menu item titled "Backtesting Tokens". Selecting this item causes the token list to display only those tokens that are specifically related to backtesting, POS_STATE, POS_SIZE, for example. The tokens displayed are those that typically cannot be used for normal scans, signals, or custom indicators.
- A fatal error bug was corrected in Price/Time Profile Charts when the profile requests spanned more than 2 days.
- Dragging a ticker symbol from a quote page into a chart window was not marking the chart as having been revised. Thus the chart was not saved when closed and thus when reopened it still retained the original symbol. This has been corrected.

Version 7.5.1, Released: January 10, 2005

Running Investor/RT on OS X without Administrative Access

Macintosh OS X, with its UNIX underpinnings, has robust multi-user capabilities that allow multiple users to share the same computer. Each user of the computer has a home directory/folder for organizing his data files. Each user has access privileges (permissions) that control which folders/files can be viewed and updated. Users having "administrative access" privileges can, for example, install and update files in the root Applications folder, while other users with standard access can run applications from the Applications folder, but do not have the permissions necessary to update or create files except those within their own home directory and its sub-folders.

Investor/RT for Mac OS X has, since inception, required that the user have administrative access privileges to run the software. The reason for this is that Investor/RT was originally designed to use the startup directory (the folder where the application itself resides) as the working directory for accessing files as the software operates. Typically, the Investor/RT application is installed inside a folder named "InvestorRT" that resides in the root Applications folder. /Applications is a public folder, and its contents can only be modified by administrative users. Investor/RT updates and creates files in that folder, so administrative privileges are required to run Investor/RT in its default configuration.

Investor/RT 7.5 Rev 1 has been enhanced to allow an OS X user without administrative access to operate the software. This is accomplished by creating an InvestorRT folder within the user's Home directory. The Investor/RT application and various utility programs such as Database Verify, Database Maintenance, and Reconfigure will continue to reside in the root Applications folder. All other files and subfolders can now be relocated to the user's private InvestorRT folder.

Specifically, a folder named "InvestorRT" must be created inside the Library/Application Support/ folder within the user's home directory (~/Library/Application Support/InvestorRT). The following folders and files should be copied to this private InvestorRT folder:

Folders: admin, charts, data_f, mail, markers, news, plug-ins, scans, sounds, symbols, tickdata
Files: irtdb75.dbd, twp.csc

At startup Investor/RT looks for a folder named "InvestorRT" within the "Library/Application Support" folder in the Home directory of the user that launched the application. If this folder is found, Investor/RT will consider this private InvestorRT folder to be its "working directory". Investor/RT will expect to find all of the above listed files and folders inside this directory. Administrative access is not necessary since Investor/RT will operate on private files permissioned for updating by that user. If the user launching Investor/RT does not have a private InvestorRT folder, Investor/RT will use the folder in which the InvestorRT application resides as the working directory. Operating this way requires administrative access. Users with administrative access may elect to keep their Investor/RT related files inside their own private Library/Application Support/InvestorRT folder rather than in the root Applications/InvestorRT folder.

The following files should remain in the InvestorRT folder within the root Applications folder:

InvestorRT (the application) feedlibs (a folder containing shared libraries for data feed access) Reconfigure (a utility application for selecting which data feed Investor/RT will use) Database Verify (database verification utility program) Database Maintenance (database maintenance and verification utility program)

The various features for relocating the Investor/RT database (data_f folder) can be used by non-administrative users. The only requirement is that the data_f be located where the user has read/write permission.

Investor/RT Installer software for OS X is, at present, setup to install various files into a single folder. Typically, this is the InvestorRT folder inside the root Applications folder. Update installers typically update the InvestorRT application, the help file (twp.csc) and occasionally, a database related file named irtdbxx.dbd (where xx is the release number, e.g. irtdb75.dbd). For now, running OS X installers will continue to require administrative access. After installation of an update, the administrative user should run the Investor/RT application at least once to complete the configuration process to select the data feed to be used by Investor/RT. If a private InvestorRT folder exists, the files twp.csc and irtdbxx.dbd must be copied into the private InvestorRT folder for each user. Occasionally, an OS X installer will update a file or two in the admin directory (e.g. holidays.txt or tips.txt files). These files should also be copied to each user's private InvestorRT/admin directory. In the future, a smarter installer will be developed that can be run by non-administrative users. In the meantime, Investor/RT users who desire to have the security and privacy OS X multi-user logins provide will have to perform a few extra steps when installing Investor/RT release updates.

Express Optimization and Other Optimization Improvements

A checkbox has been added to the Optimization window titled "Express Optimization". This option is designed to significantly reduce the number of backtest iterations when many variables are involved or when each backtest takes a substantial amount of time. Here is an example to describe how express optimization works. Consider an optimization involving 6 variables, where each variable has six values to be optimized. A standard optimization would backtest 46,656 times to test every combination of the 6 variables. Obviously this would be unrealistic for all but the simplest trading systems. Express optimization takes a different approach. Instead of testing every possible combination, it tests each variable one at a time (holding all other variables in place). Once it's completed testing all values of a given variable, it plugs the most profitable value back into the variable, and then moves on to the next variable. In this way, the example above takes only 36 iterations instead of 46,656, a much more manageable task. The variables will be tested in the order they are listed on the optimization window (from top to bottom). The initial state of each of these variables for each symbol is very important. The user should employ a scan to set these variables to reasonable default values before beginning the initial express optimization. Once an initial express

optimization is completed, subsequent express optimizations could be performed and could further refine the variables.

Optimization Spreadsheet Reports. A checkbox has been added to the Optimization window titled "Spreadsheet Report". When it is checked, a report file will be generated in the "Admin" folder. The file is formatted for use in spreadsheet programs such as Microsoft Excel. The name of the file will have the form optname_OPT_SS.txt where "optname" is the name of the optimization. On MS Windows, users can right-click on the file and choose "Open With: Excel". The spreadsheet report excludes the extraneous header information seen at the top of the normal report. When the spreadsheet is opened in Excel, it can be quickly sorted on any column (just highlight all columns and choose "Data: Sort" from the menu). The standard optimization reports that pop up in Investor/RT when the optimization is completed have also been revised for improved printing. This checkbox is analogous to the "Spreadsheet Reports" button in the Backtest Setup window.

Optimization "Show Last Report" Button

A button titled "Show Last Reports" has been added to the optimization window. When it is clicked, the last report for the selected optimization will be displayed (if available). This button is analogous to the "Display Latest Reports" button in the Backtest Setup window.

Price/Time Profile Enhancements

Price/Time Profile charts have been enhanced to provide optional Point of Control (POC) and Value Area (VA) lines. Checkboxes are provided in the Price/Time Profile preferences window to request these lines. Both lines have color preferences. Further, the Initial Balance lines are now optional and have their own color preference. The preference window has been reorganized. Calculation and drawing efficiency improvements were made to make price/time profile charts update more smoothly.

Definitions:

- Time Price Opportunity (TPO): Each "Letter" in the Price/Time chart is a TPO Point of Control (POC): Row with the most TPOs (each day has it's own TPO)
- Value Area (VA): Area in which 70% of TPOs reside.
- Initial Balance (IB): Area which encompasses the first hour of trading (involving letters A & B).

Style Choices for Traditional Chart Grid Lines

Traditional chart grid lines may be drawn in any of three styles: solid, dotted, or dashed. Prior to Version 7.5.1, grid lines were drawn as solid lines in a user-specified color. The choice of grid line drawing style is a global setting at present. That is, all traditional charts that have the grid lines option on will display the grid lines using the same specified style. The color used in each chart may vary on a per chart basis. Use Setup: Preferences: Charts: Traditional Charts (select the Colors tab) to specify the grid line drawing style. Click on the down arrow at the right side of the grid lines color control and choose Solid, Dotted, or Dashed from the Style menu that appears. By default, all

Investor/RT users upgrading to 7.5.1 from an earlier version will initially have Solid drawing style. The Grid Lines color control also has a menu for selecting pixel width, however grid lines are always drawn as one pixel lines. The grid line style option can be modified using the Traditional Chart preferences or from the chart preferences/color tab of any traditional chart window. Again, this setting is global. Each chart has its own grid line color setting and each chart has the option of showing grid lines or not, but every traditional chart shares the same setting for grid line drawing style. The new drawing styles for traditional chart grid lines do not at present apply to any of the specialty chart types, e.g. Point and Figure charts. Non-traditional charts at present draw solid grid lines unconditionally.

New RTL token AV. Array (Historical) User Variables

An indicator token AV has been added to the RTL language to enable time-stamped historical values to be saved in the Investor/RT database for any ticker symbol. Just as User V# variables provide a means of saving a single computed value for a ticker symbol, the AV token can be used to save a historical array of values, one value for each bar backtested. The AV token is a historical token, thus it has values for each bar; previous bar values can be referenced in an RTL formula with a bar qualifier (AV.1, AV.2, etc.). A value can be set for a bar using the SET function, e.g. SET(AV, <expression>) will set the current bar's AV value to the calculated value of the expression. The AV token is also available in the token list under the token name ARRAY.

The AV token, like other "indicator" tokens, has a setup window. A "Persistent..." checkbox, when checked, means that the historical values SET into the array by a signal will be saved in the Investor/RT database. If the "Persistent" checkbox is unchecked, this means that the array is a "temporary" array. A temporary historical array is initialized to zeros. Values may be SET into the array during a backtest; present and past values of the array may be referenced by the signal during the backtest; the array values are discarded upon completion of the backtest.

If the setup for the AV token specifies persistence, the historical data is loaded from and stored to the database using a "pseudo instrument" to hold the data. The pseudo instrument is created automatically by Investor/RT with a ticker symbol derived from the underlying ticker symbol. For example, if you run a backtest on the symbol MSFT and there is a rule in the trading system with a signal formula SET(AV, POS_SIZE), this will create an historical array of data matching the periodicity of the backtest with one AV value for each bar examined during the backtest. The setup for the AV token contains a "suffix" text option that is used to create the pseudo instrument. In this example, the historical values of position size are saved under a ticker symbol MSFT_A1, where A1 is the user specified suffix in the AV setup. The historical values of MSFT_A1 can be inspected using the View/Edit window. In this example you could add a signal marker to a MSFT chart having the formula AV.1 = 0 AND AV > 0; setting up AV with the A1 suffix. This would show signal markers on each bar where the backtest entered into a new long position. Persistent arrays can also be viewed in a chart directly using the "Array User Variable" indicator", just add the indicator to a chart like any other indicator. If persistent array data exists for the associated underlying ticker in the chart, it will be displayed in the chart as a line or histogram, etc. in accordance with the preferences for the Array User Variable indicator.

Another use of this facility is to perform a complex calculation using a one rule trading system, saving the results for each bar in an AV historical array. Then, when you optimize your actual trading system, the system's rules can refer to the AV values instead of computing the complex formula repetitively for all iterations of the trading system optimizer. This technique can be used to considerably reduce the time it takes to optimize trading systems having computationally intensive signals.

When an RTL formula that references a persistent AV token is executed (via a scan, signal, or custom indicator) Investor/RT will load previously saved AV values from the database. If there is no previously saved data, the AV token will be initialized to zero values for each bar. When the scan or backtest using the formula completes, Investor/RT will check to see if the array has been modified (via a SET statement) and if so, the updated array of value will be stored in the database. Investor/RT creates ticker symbols automatically using the suffix in the AV setup to serve as containers for the historical data. These pseudo ticker symbols have a security type of Cash. If you delete any of these tickers from your Investor/RT system, this is equivalent to setting the AV array values to zero for the underlying ticker symbol. You can open the ".Cash" system quotepage to see at list of all cash ticker symbols at any time. If you use common suffixes such as A1, A2, A3 etc for array storage, you can easily list all of the cash ticker symbols having a particular suffix by running a scan, e.g.

```
SECTYPE = SEC_CASH AND TICKER = "*_A1"
```

This will list all pseudo tickers ending with _A1, so you can view/edit the values or delete the entire list if needed.

Since the user specified suffix is any arbitrary string of up to seven characters, there is no practical limit on the number of ARRAY user variables that can be created for an instrument. Caution is advised if you plan to use this feature with a large number of underlying ticker symbols since each unique suffix will result in the creation of a new pseudo instrument. You can keep an eye on the number of instruments created for array variables by opening the ".Cash" system quotepage.

Version 7.5 Rev 1 Fixes, Miscellaneous Enhancements.

- Charts with periodicity expressed as "Change per Bar" were not forming change bars properly in realtime. Such charts would load properly with correctly calculated change bars, but live updating of the chart was incorrectly using the "range bar" criteria rather than the change bar criteria to form new bars. This has now been corrected.
- SET operators in RTL formulas involving IF/THEN/ELSE were sometimes being evaluated (SET) twice. If the SET statement was "self referencing" (e.g. SET(V#1, V#1 +1)) the redundant SET would result in an incorrect value for the V#. This has been corrected. The fix will also speed up RTL formulas involving IF THEN SET, especially when complex expressions are used in SET statements.
- Volume Profile charts, Raw Tick charts, and DayBar charts saved with a ticker symbol that was later deleted or renamed, would not open. This has been corrected. Investor/RT will simply

substitute some other ticker symbol for the missing one and open the chart window. A message will appear in the status message area of the main toolbar and in the message log if a substitute ticker is used.

- In the Trading System setup window, if a Find pattern is in effect when a trading signal is deleted using the Del button, the Find pattern is used to refresh the list of displayed signals after the deletion.
- A crash bug related to the use of asset class names for portfolio asset classes was corrected. Investor/RT users who wish to assign names to asset classes can edit a file named `assetclasses.txt` in the admin folder/directory. The bug related to the processing of this file to extract the class names when opening a portfolio that has Asset Class as a data column.
- A crash bug related to importing chart definitions was fixed. Investor/RT chart definition files are text files containing some very long "lines" of formatted text. The text must be sent via email as an attachment so that the line endings of these long lines are not affected. Sending chart definition text in the "body" of an email message will necessarily involve wrapping the text of the long lines into multiple lines. This causes confusion when Investor/RT imports the definition and leads to a crash condition in version 7.5. The correction prevents the crash from occurring, however, chart definition text that has been altered by email programs cannot be relied upon to import properly. One method to assure that your chart exports are importable is to set the properties of the definition files you produce, marking such files as "read only". Make a zip archive of the read-only file(s) and send the zip file as an email attachment. When the recipient unzips the archive and saves the definition files locally they will retain the "read-only" property. Thus the definition files cannot be accidentally modified even if they are opened for viewing by a text editor prior to importing them.
- The token DAYW (day of the week) was functioning incorrectly, giving Sunday (0) as the day of the week for every bar when backtesting, for example. This has been corrected. The tokens DAY and DAYW are synonymous in RTL. The DAY token was not affected by this bug. DAY is the original day-of-the-week token. Later, DAYW and DAYM were added for day-of-the-week and day-of-the-month, respectively.
- When saving a chart definition for a chart containing a trading system indicator (TSYS), the trading system definition is exported along with the chart. However, when a chart instead contains a signal marker indicator that in turn references a trading system via the TSYS token in the signal formula, Investor/RT was failing to export the trading system. This has been corrected.
- In some cases, user variables with blank title setups were being added to quote pages with a blank column title. This has been corrected. The name of the user variable, e.g. V#30 or T#32 will be used in the quote page column heading if no title is setup for the user variable in Setup: Preferences: User Variables.
- The OS X Version of Investor/RT was skipping the normal quit confirmation dialog. When quitting Investor/RT, the OS X user will see a message with three choices: Quit, Save & Quit, or Cancel. Entering C or clicking Cancel will cancel the quit command, leaving Investor/RT active. Quit or Save & Quit will continue with the termination process. Save & Quit first issues a Save command for open windows whose contents have been modified, thereby avoiding further prompting messages regarding saving changes. If the "Always Save" option is selected in Setup: Preferences: General, then there is no difference in effect between Quit and Save &

Quit. If you have selected the "Ask Me" option and use the Quit choice when quitting, Investor/RT will prompt for each modified window, so you can decide whether to save on a per window basis.

- The Quotepage Popup Menu "Highlight" command for highlighting an instrument row was using a black color as the highlighting color of the row in cases where a highlight color had never been specified for the particular instrument. This behavior has been revised. If an instrument has a black highlight color (RGB value 0 or 1) when you choose to turn on highlighting, Investor/RT will substitute the quotepage's default highlighting color instead. You can adjust the highlight color for any instrument in the advanced section of the Setup: Instruments window. Once a highlight color has been set for an instrument, that color is retained for the instrument as you turn the highlighting option on or off for the instrument. In the Setup: Instruments window, if you turn off the highlighting checkbox and set the highlight color to black (RGB value of zero), then Investor/RT will supply the appropriate highlight color later if you elect to turn on highlighting for the instrument in some quotepage. You can also run a scan with the formula SET(COLOR,0) to turn off highlighting of all scanned symbols (without disturbing the instrument's highlight color). Or, you can scan with SET(COLOR, 1) to turn off highlighting and reset the instrument's highlight color so the instrument will be assigned a default highlight color the next time highlighting is turned on for the instrument in some page.
- The myTrack version of Investor/RT supports an Option Display command via the ticker symbol popup menu accessible from quotepages, portfolios, quickquote windows and other instrument selection lists. Normally, the Option Display command shows puts and calls with strikes 50% in and 50% out of the money for the two front months for the subject ticker symbol. There is a new setting in the myTrack preferences for option month; it defaults to "front 2 months". The user can pick a specific month from the list and apply the setting. Thereafter, Option Display commands will produce a quotepage of puts and calls for that particular month only.
- The Macintosh OS X Version of Investor/RT for myTrack had a defect regarding downloading of tick data. An OS X fatal error would result if myTrack responded with no tick data available. This has now been corrected.
- Recently, Investor/RT was revised so that the ".All Symbols" list no longer includes so-called "## Tickers", cash instruments whose tickers begin with ##. These special tickers are used for quotepage references and as quotepage sectional headers. When a ## ticker refers to a quotepage (via its instrument name), adding the ##ticker to a target quotepage using the "Add Symbols to Quotepage" window, has the effect of adding all of the symbols of the referenced quotepage to the target quotepage. This feature is useful for building quotepages that combine the symbols of other quotepages. Since ## tickers are no longer shown in the .All Symbols list in the Add Symbols to Quotepage instrument selection window this feature was unavailable. In version 7.5 Rev 1, the instrument selector has been improved so the user can display all cash instruments, including ## tickers, for selection when needed. Within any instrument selector you can click the + button at the upper right corner of the selector to access a popup menu. Choose "Show .Cash Symbols" and the instrument selector will give you access to any ## tickers. This restores the ability to combine quotepage using ## tickers as described above.

- Price/Time Profile charts now operate on instruments that can take on negative or zero values.

Version 7.5, Released: December 2, 2004

Trading System Setup Window Improved

When adding rules to a trading system, it can be inconvenient to locate the signal you want to use when the signal list has grown large. The signal list is alphabetical, but locating a particular signal name in a list of hundreds can be tedious.

Most users name their signals using words such as buy, sell, reverse, enter, exit, etc. to indicate the purpose or action to be taken when the signal fires. Version 7.5 provides a convenient way to list those signals that contain certain letters or words. This enhancement makes signal selection faster and easier.

Beneath the list of signals is a Find entry box where you can enter a "pattern" that reduces the list to include those signal names that match a pattern. The characters * and ? in a pattern have special meaning. The asterisk represents any span of zero or more characters; a question mark represents exactly one arbitrary character. Thus a pattern such as *buy* will result in a list of all signals with names that include the word "buy" anywhere in the name. Without the asterisk at the beginning of the pattern (buy*) the pattern will show those signals whose name begins with "buy" followed by arbitrary characters. Pattern matching is not case sensitive. More precise patterns can be used, e.g. ???_MA* will list any signal whose name begins with 3 arbitrary characters followed by _MA, followed by any or no additional characters.

When typing characters into the entry box, there is an implied asterisk at the end of the pattern. For example, when you type in the four characters *rev, Investor/RT will actually use *rev* to show the signal names containing "rev" anywhere in the name. You can type in the asterisk at the end if you wish but it is not necessary. As you type into the Find box, the list of matching signal names is updated each time character(s) are added or removed from the pattern.

The two most common uses of this feature will be to (1) type in one or more letters to list signals whose names begin with those letter(s), or (2) type in an asterisk * followed by some letter(s) to list those signals that contain those letter(s) anywhere in their names. Any patterns you enter of 3 characters or more will be added to the list of pattern choices in the popup menu for the entry box. Click the down arrow at the right side of the entry box to choose a pattern you have used before. The menu also includes some sample patterns that may be useful, e.g. *buy* and *sell*. When the entry box is empty or contains only an asterisk, all signals are listed. The 15 most recently used search patterns are kept in the Investor/RT database. Once you have entered your most common search patterns, you can operate the Find function using the menu arrow rather than having to type into the entry box.

In version 7.5, when the Find box is used, the list of signal names will begin with those signals matching the pattern. The list will then have a divider line (a row of hyphens) followed by the names of the trading signals that are presently used in existing rules of the trading system. A signal name will only be listed once. That is, if a signal in an existing rule matches the pattern, it will be shown above the divider line, but not redundantly below the divider line. This refinement assures that every signal presently used in the trading system will appear in the signal list, whether it matches the pattern or not. Signals not presently used in the trading system that match the Find pattern, will be listed first.

When the Find box is used for a trading system, the last pattern entered into the Find box will be saved with the trading system definition. When you open the trading system again later, the trading system will initially appear with the same Find pattern, showing only the matching signals if any along with any signals current used by the trading system.

RTL Setup Window Improved

When setting up scans, signals, and custom indicators, it is often the case, as revisions are made, that the token list on the right accumulates tokens that are no longer referenced in the syntax of the formula. The "+" button at the upper right corner of the token list on the right now offers a popup menu with two commands: (1) remove unused tokens and (2) remove all tokens. The first command will detect any tokens that are not specifically referenced in the RTL formula and remove them from the list. Note that for technical indicator tokens, this will discard the settings for the indicator as well. The second command will unconditionally remove all tokens from the list on the right. After removing all tokens if you then click the "Check" button, Investor/RT will add back any required tokens and prompt for new setups for those tokens that need them.

Trading System Rules - Cut, Copy, Paste

The Trading System Definition window has been improved to support Cut, Copy, and Paste commands in the Trading Rules list. Cut/Copy/Paste commands can be issued via the Edit Menu or using the usual keyboard shortcuts (Ctrl-X, Ctrl-C, Ctrl-V on MS Windows, Command-X, Command-C, Command-V on Macintosh).

Cut and Copy operate on the currently selected (highlighted) rule in the Trading Rule list and place that rule on the "clipboard". Cut removes the rule from the rule list as well. The rule on the clipboard can then be pasted elsewhere into a rule list, in the same window or into another trading system window containing some other trading system. Before issuing the Paste command, first select the destination rule in the destination window. The Paste command will add the rule immediately above that rule. The pasted rule will become the selected rule, so you could, for example, cut the rule again if you wish, or use the "Move Rule" button to move the new rule down the rule list. Using the up and down arrow keys combined with Ctrl-X and Ctrl-V (Cut and Paste), you can easily pick rules, cut them, move to another destination rule with the arrow keys and paste the rule where ever you wish in rule

list. This is a marked improvement over the "Move Rule" button, especially for trading systems with dozens of rules or more.

Custom Column Improvements

Some improvements were made to the Custom Column Setup window in the "Format" tab of this four-tab window. The Custom Column Title entry box is now prefaced by a checkbox. Unchecking this box will cause the name of the custom column to be used as the quote page column heading. When checked, you may enter your own column title. The default for newly created custom columns will be to leave this option unchecked (i.e. Investor/RT will use the custom column name as the column title). In other words, for new custom columns, you have to explicitly check this box, and enter a column title, if you want a title that is different from the custom column name.

The "Default Cell Color" has a new option checkbox titled "Use QuotePage Colors". This option will be checked by default for newly created custom columns. When checked, this option means that the default cell colors for the custom column cells will be derived from the host quote page. The rules associated with the custom column may override these, but in the absence of any rule color effects, the custom column's cells will blend in with the other cells of the quote page. When unchecked, the custom column cells will default to the explicit colors selected in the "Format Tab" regardless of the host quote page color properties.

Multi-statement RTL Syntax

RTL formulas (syntax) may now be composed of multiple statements, each statement ending with a semicolon. When an RTL scan, signal, or custom indicator has multiple statements, the last of the statements serves to convey the result of the scan, signal, or custom indicator. This feature may be used to advantage to compose several SET statements followed by a formula for a custom indicator or scan. For example:

```
SET(V#1, MAX(HI,5));  
SET(V#2, MIN(LO,5));  
CL > (V#1 + V#2) / 2;
```

This scan, consisting of three statements, is equivalent to the single statement formula:

```
CL > (MAX(HI,5) + MIN(LO,5))/2;
```

However, V#1 and V#2 are set as byproduct in the three statement case.

The multiple statement capability implies that multiple IF THEN ELSE statements may now be combined into a single scan or signal. Each IF THEN ELSE statement must, of course, have a THEN clause, but the ELSE clause is optional. Here is an example of a signal used in a trading system:


```
IF (POS_STATE = POS_LONG) THEN SET(TARGET, ENTRY * 1.05);  
IF (POS_STATE = POS_SHORT) THEN SET(TARGET, ENTRY * .92);
```

Formerly, conditional SET operations would typically require that a separate signal and trading rule be created for each IF THEN ELSE. Now, any number of IF THEN ELSE statements can be included inside one signal.

Multi-statements may be useful in custom indicator formulations as well. Here is a simple example:

```
SET(V#1, MAX(HI,5));  
SET(V#2, MIN(LO,5));  
(V#1 + V#2) / 2;
```

For each bar, V#1 and V#2 are set to a computed value. The last statement specifies the resulting value of the custom indicator for each bar.

Alarm Handling Improvements for Signal Action, Trendline, Ref Line Alarms

Improvements have been made to incorporate trendline alerts, reference line alerts, and signal actions into the general alarm handling framework of Investor/RT. The general alarm preferences (Setup: Preferences: Alarms) specify which actions Investor/RT should perform when an alarm occurs. In version 7.4 and earlier, trendline alerts, reference line alerts, and signal actions were handled independently of this framework. By incorporating these three cases into the general alarm handling framework, we open up the possibility for trendline or reference line breaks to be emailed or sent to a chat room. Signal actions have long had chat room capability, but this enhancement makes emailing of signal action text possible and enables signal action text messages to be recorded as trading notes if desired.

In the case of signal actions, a new checkbox has been added to the signal action setup, titled "Alarm Text". When checked, the user specified text will be handled as an alarm message in accordance with the user preferences in Setup: Preferences: Alarms. Any or all of the following actions can be requested for the signal action text:

- Open a standard alarm notification window, showing a quote of ticker symbol involved, the window title showing the signal action text.
- Play a Sound (the sound name is specified in the signal action setup).
- Email the message to a specific email address.
- Send the message to a designated IRC chat room.
- Add the text as a trading note for the ticker symbol involved.

The "Open a Chart" option in the Alarm Preferences is not applicable to signal actions, trendline, or ref line alerts, since these alert conditions originate from a chart in the first place.

When version 7.5 is released, any existing signal actions will by default have the "Alarm Text" checkbox unchecked. You must specifically adjust the preferences to turn on alarm handling for any existing signal actions.

Trendline and reference line alerts were formerly enabled by an "Alert" or "Alert on Break" checkbox in the trendline or reference line setup along with the selection of a particular alert sound. In version 7.5, trendline and reference line preferences have an "Action" checkbox instead. There is an associated menu for selecting the name of the signal action to be executed when the reference line or trendline break occurs. In order to maintain upward compatibility, the former "sound name" settings will continue to be honored. The user will not have to adjust any existing trendline or reference line setups when upgrading to 7.5 unless the greater flexibility of signal actions is desired.

Once the user adjusts the settings for a trendline or reference line to specify a signal action name instead of a sound name, the break alerts will be handled in accordance with the specified signal action setup, just as signal actions are handled for the signal marker indicator. If the name in the trendline or reference line's new "action" option is NOT the name of a signal action, then Investor/RT will handle the alert by using the supplied name as a sound name. When alerts trigger and the supplied name is not a signal action, an alert message will be passed to the normal alarm notification framework instead. The sound specified in the trendline or ref line preferences will be honored as before. The user may choose <No Sound> or <Default Alarm Sounds>. The default alarm sounds are those specified in Setup: Preferences: Sounds for "High Alarm" and "Low Alarm". The choice of sounds depends on whether the break occurred moving above or below the trendline or reference line. If Setup: Preferences: Alarms calls for a Notification window, the revised behavior will be that a standard alarm notification window will appear rather than an OK message box. The alarm notification window will state the reason for the alarm and provide a current quote and the alarm time, etc. The new behavior will enable three new capabilities for trendline and reference line breaks, if these are called for in your general Alarm Preferences:

- Email the message to a specific email address.

- Send the message to a designated IRC chat room.

- Add the alert notification text as a trading note for the ticker symbol involved.

When adding new trendlines or reference lines, or editing the preferences of existing trendlines and reference lines, the user of Version 7.5 will see a list of signal action names rather than a list of sounds. For upward compatibility, the former sound name, if specified in earlier versions of Investor/RT, will continue to be available for selection, along with two special sound related menu items: <No Sound> and <Default Alert Sounds>. If one of these three sound related items is chosen as the action, alerts will be handled by playing the appropriate sound (or no sound) and passing the alert through the normal alarm handling framework of Investor/RT as setup in Setup: Preferences: Alarms. When a signal action name is specified, the setup of the signal action controls what should be done when the alert occurs. If the signal action in turn calls for alarm handling (by checking the Alarm Text checkbox) then the alarm message text specified in the signal action setup will be passed through the normal alarm handling framework after all actions called for in the signal action setup are performed.

In summary, signal actions, which have long been associated with signal markers, can now be specified for trendline and reference line alerts as well. This gives the user full control over which alert actions should be performed when a signal marker fires, or a break of a trendline or reference line occurs. In the case of trendlines and reference lines, which formerly had only a sound preference, upward compatibility is maintained; the same sound will sound; however a message describing the break will be passed to the normal alarm handling framework. The user is free to select a signal action name to replace the sound name at any time to gain more flexibility for particular trendline or reference line break alerts.

New Technical Indicator: FVE : Finite Volume Elements

The Finite Volume Element Indicator (FVE) was developed by Markos Katsanos and introduced in the April 2003 issue of Technical Analysis of Stocks & Commodities magazine. It was modified for volatility in the September 2003 issue of TASC. FVE is a money flow indicator but with two important differences from existing money flow indicators.

- It resolves contradictions between intraday money flow indicators (such as Chaikin's money flow) and interday money flow indicators (like On Balance Volume) by taking into account both intra- and interday price action.
- Unlike other money flow indicators which add or subtract all volume even if the security closed just 1 cent higher than the previous close, FVE uses a volatility threshold to take into account minimal price changes.

The FVE provides 3 types of signals:

The strongest signal is divergence between price and the indicator. Divergence can provide leading signals of breakouts or warnings of impending corrections. The classic method for detecting divergence is for FVE to make lower highs while price makes higher highs (negative divergence). An alternative method is to draw the linear regression line on both charts, and compare the slopes. A logical buy signal would be for FVE, diverging from price, to rise sharply and make a series higher highs and/or higher lows.

The most obvious and coincident signal is the slope of the FVE line. An upward slope indicates that the bulls are in control and the opposite for downward.

This is a unique and very important property of this indicator. Values above zero are bullish and indicate accumulation while values below zero indicate distribution. FVE crossing the zero line indicates that the short to intermediate balance of power is changing from the bulls to the bears or vice versa. The best scenario is when a stock is in the process of building a base, and FVE diverges from price and rises to cross the zero line from below, at a sharp angle. Conversely the crossing of the zero line from above is a bearish signal to liquidate positions or initiate a short trade.

The FVE is computed as follows:

```
INTRA = LOG(HI) - LOG(LO)
VINTRA = STD(INTRA, PERIOD)
INTER = LOG(TYP) - LOG(TYP.1)
VINTER = STD(INTER, PERIOD)
CUTOFF = 0.1 * (VINTER + VINTRA) * CL
MF = CL - (HI + LO)/2 + TYP - TYP.1
VE = Volume Element
IF(MF > CUTOFF)
VE = +VOL
ELSE IF(MF < -CUTOFF)
VE = -VOL
ELSE
VE = 0
FVE = 100 * SUM(VE, PERIOD) / (MA(VOL, PERIOD) * PERIOD)
where
STD = Standard Deviation
LOG = Natural Logarithm (base e)
TYP = Typical Price (HI + LO + CL)/3
PERIOD = FVE Period
```

The FVE can then be optionally smoothed with a user specified period and smoothing type.

New RTL Indicator Token: PCVP (% Change Volume/Price)

The charting indicator "Percent Change Volume or Price" is now available for use in RTL. This simple indicator can be setup to easily reference the percentage change in the closing price or volume for any N bar period. This indicator can be easily calculated in RTL directly of course, e.g. the five bar percent change in price is simply $100 * (CL - CL.5)/CL.5$. RTL formulas can now easily reference PCVP values for the current bar or any previous bar using a single token and qualifier.

```
For example:
PCVP > 3 AND PCVP.1 > 2.5
is easier than writing:
(100 * (CL - CL.5)/CL.5) > 3 AND (100 * (CL.1 - CL.6)/CL.6) > 3
```

Get Info Command

The "Get Info" display for an instrument has long been available in Investor/RT via the QuickQuote window's Get Info button (the button's icon is a blue circle containing the letter "i" for info). To make this feature more globally available, a Get Info command has been added to the Quote page, Portfolio, and instrument selector popup menus. You may now right-click on a ticker just about

anywhere and choose Get Info to access this display. The Get Info window is a text window showing information about an instrument in one consolidated report. The report content includes:

- A list of the objects (windows) in which the instrument is active, e.g. charts, quotepages, portfolios, etc.

- Portfolio positions currently open for the instrument.

- News items for the instrument.

- Trading Notes for the instrument.

- A comprehensive alphabetical listing of quotepage column data for the instrument. Columns having zero or no value are not included, e.g. only the non zero V# variable values are listed.

In addition, there is a historical data diagnostic feature activated when you hold down the Ctrl key (MS Windows) or the option key (Macintosh) as you request the Get Info report. A diagnostic summary of historical data records on file in the database is shown for the instrument in question.

Instrument/Quotepage Management

Sometimes it is desirable to see a list of the quotepages in which a particular instrument resides, or to add or remove an instrument from one or more quotepages without having to open those pages(s). A sub menu named "Quotepages..." has been added to the quotepage popup menu to facilitate these actions. Right-click (control-click on Mac) on a ticker symbol in any quotepage and choose from the QuotePages... submenu. There are three menu items: (1) Add to QuotePage... (2) List QuotePages... and (3) Remove from QuotePage.... The List QuotePages menu item presents a list of quotepages in which the symbol resides. You can open any quotepage in the list by selecting it and clicking OK or Apply, or simply dismiss the list with the Esc key. The Remove from QuotePage menu item presents the same list. Select a quotepage and click Apply or OK to remove the selected ticker symbol from the quotepage. Finally, the Add to QuotePage menu item presents a list of all user-defined quotepages. Select a quotepage, then click Apply / OK to add the selected ticker to the quotepage.

The List, Add, Remove capability described above has long been present in Investor/RT as a somewhat hidden feature. The QP button on the quotepage toolbar and the QP button in the quick quote window can invoke these same actions. A single click on the QP button will List the quotepages in which the selected symbol resides (the selected symbol is the symbol selected in the quotepage at the time or the symbol selected in the instrument selector of the quick quote window). A shift-click on the QP button invokes the Add to QuotePage function. A ctrl-click (option-click for Macintosh) invokes the Remove from Quotepage function.

Chart Recalculation via Schedule/Keyboard Shortcut

In Version 7.3 a chart recalculation feature was added. The traditional chart window "download" button in the lower right corner accepts a shift-click on the toggle button. A normal click initiates a download of historical data. The shift-click will force a recalculation of all indicators in the chart.

In Version 7.5 this "Recalculate Indicators" function is available when creating chart buttons. A chart button having the purpose "Execute a Toolbar Button", can now reference "Recalculate Indicators" as the toolbar function. Note that there is no such actual button on the chart toolbar, but the function name is nevertheless available for selection in the list of toolbar functions. Thus you can create your own "recalc" button within the chart window.

Now that a chart button of this kind can be created, you can extend this easily to schedules and keyboard shortcuts. To do so, first save the setup for the button as a Preset using the Preset->New menu item in the button's setup window. The preset may, for example, be saved with the name "Recalc Chart". From there, you can execute this button preset from within a schedule using the schedule action "Execute Chart Button" and picking the "Recalc Chart" preset as the button preset to execute. Schedule actions can thus be included in a schedule to recalculate the front most chart window or a specific named chart window. Finally, since a recalc preset can be used to create a single action schedule, you can assign a function key to that schedule, e.g. F2 can be your "recalc" button for the front most chart.

Changing Indicator Association in Multi-Instrument Charts

Each technical indicator in a chart has an associated instrument whose data is used in the calculation of the indicator. When there are multiple instruments present in the chart, the Add Indicator dialog provides a menu that is used to select the instrument to be associated with the newly added indicator. Once an indicator is added to a multi-instrument chart, however, there was no easy way to change its associated instrument. Deleting the instrument and adding it back again associated with the desired instrument was required. Version 7.5 now has an "Associate..." command in the chart element popup menu. Right-click on an indicator and choose "Associate...". A list of instruments will appear. Pick the one you want the selected indicator to operate upon. Notice that the list of instruments has both an Ok and an Apply button. The Apply button allows you to see the effect of associating with an instrument before closing the selection list. In some cases, it may be difficult to right-click on a particular indicator in order to access the popup menu. An alternate way to access the Associate command is to tab through the chart elements until the indicator you want is selected. Press the enter key (return key) to edit the selected indicator's preferences. Press ctrl-enter (ctrl-return) to issue the "Associate..." command on the selected indicator. The Associate command is not applicable (has no effect) if no indicator is selected or if there is only one instrument present in the chart.

Version 7.5 Fixes, Miscellaneous Enhancements

Sorting a quote page on a custom column and then immediately scrolling the quote page would show incorrect values for the custom column cells for those rows scrolled into view. The custom column values would self-correct if the quote page was updating and the custom column recalculated in accordance with the calculation options. The bug has been fixed so

that correct values are shown instantly when scrolling after a sort. This bug did not affect custom columns of type "built-in", only technical indicator and RTL related custom columns. Chart Definitions exported by version 7.4 and earlier did not export line width and style for instruments drawn as continuous or connected lines. Only the line color was exported. Thus, upon import, the instrument would always appear in the chart as a solid line 1 pixel wide. Instrument line width and line style are now exported/ imported properly.

The Elastic Volume Weighted Moving Average Indicator (RTL Token EVW) has been improved. Prior to version 7.5, when the Volume Period was specified as "Use Average Volume x __", the average was always computed with a period of 40 (40 period moving average of volume). This period has now been made an option, and reads in the preferences as "Use __ Period Average Volume x __". Also, all three available values/periods in the Volume Period group box are now "Optimizable" (can be specified using V# variables). These values/periods include the Constant Value, the new volume smoothing Period, and Average Volume multiplier.

When the Message Log window is open and scrolled to the end of the document, new lines of text automatically scroll into the bottom of the window as messages arrive. If you scroll back to review prior lines, new incoming message will continue to build but the window will no longer scroll automatically to the end. To resume auto scrolling, you must scroll the Message Log text window to end again (press the End key on the keyboard).

A crash bug relating to the use of custom columns was fixed. The bug would cause a fatal error a few seconds after a new row was added to the quote page, for example after dragging and dropping an instrument from one quote page into another one having custom columns.

The Help command in the Preset menu button is now functional. Also, when loading a preset in the default preferences case (Setup: Preferences: Technical Indicators), the color preferences for some indicators where not being setup with the color preference of the loaded preset. This has been corrected.

Backtesting now considers any trade that gained or lost a penny in the statistics. Formerly, only trades that gained at least \$1 were considered winning trades. Due to a bug, all trades that lost any amount or gained less than \$1 were considered "losing trades". This has been corrected.

The Optimization Setup window is now re-sizeable.

Users that have setup quote page sectional ticker symbols (tickers beginning with ##) were erroneously prompted to enter a new ticker symbol when opening a quickquote window. This bug relates to the fact the ## tickers are not shown in instrument selection lists such as the one in the quickquote window. This has been corrected.

A holiday related bug in the myTrack server software was causing Investor/RT to receive intra-day historical data that was incorrectly time stamped. The problem affected, for example, certain UK futures and indices that were trading on a US holiday date. Although the source of the problem was incorrectly transmitted dates, and not an Investor/RT bug, Investor/RT has been improved so that historical intra-day downloads will delete the current realtime collected data for the current trading session ONLY when the incoming data is dated with the current trading day. This means that realtime collected data will be retained even if the user attempts an intra-day download for the current day if the resulting intra-day data is time stamped for a previous trading day. Prior to version 7.5, current intra-day data was deleted unconditionally

when intra-day downloads were performed in the myTrack version of Investor/RT. This improvement will mean that whenever myTrack sends intra-day data dated for a prior day that any existing realtime collected intra-day data will be retained. Current day intra-day data will be discarded only when the mytrack server responds with intra-day bars (or ticks) for the current trading day.

Presentation Mode is now a toolbar function that can be assigned to a chart button of type "Execute Chart Toolbar Button". The effect of clicking the chart button is to toggle the presentation mode on/off. Presentation mode can be toggled on/off using the popup menu on the main toolbar, or by checking/unchecking a box in Setup: Preferences: General. If you toggle this feature frequently, it is more convenient to create a chart button for it.

Download Data is now a toolbar function that can be assigned to a chart button of type "Execute Chart Toolbar Button". The download data button in the lower right corner of the chart window is always available, of course, but in some larger sized charts with buttons arranged at the top, it is more convenient to have a download button near by, e.g. adjacent to a menu button that you use to switch instruments.

When a schedule runs periodically every 60 seconds or more frequently and the schedule contains an Import action, Investor/RT will make note of the modification date of the file to be imported each time the schedule runs. If the file specified in the import action has not changed since the last time it was imported, the import action will be skipped. This enhancement will avoid redundant imports of the same information while assuring that whenever the import file contents are revised, the import will be performed on the next run of the schedule. Investor/RT users who employ NinjaTrader for automated trading can setup an import schedule that runs frequently (once a second for example) to import a file NinjaTrader updates when trade related events occur. With this improvement the import overhead will be incurred only when NinjaTrader updates the file with new or revised information. A message is written to the message log each time a scheduled import occurs. The message log will now show a message only when the modification date dictates that the import be performed.

A bug was fixed in the quotepage area having to do with double-clicking on cells for HiAlarm, LoAlarm, or VolAlarm levels. The double-click effect is to open the Alarm Setup window for the instrument. The double-clicked cell will no longer remain selected for editing. To edit the value in an alarm level cell, click once in the cell to select it, then edit the numeric value and press tab or enter to complete the edit. A right-click (new in Version 7.5) has the same effect as a double-click in the HiAlarm, LoAlarm, or VolAlarm cell. Further, the alarm setup window will now open with the particular alarm level value selected for editing. For example, if you right-click on the HiAlarm cell for MSFT, the Alarm Setup window for MSFT will open, with the current high alarm value selected for editing. Formerly, the ticker symbol cell was selected, making it necessary for the user to tab to the particular alarm level entry box.

A long standing bug was causing imports of chart definitions to fail in some cases if the imported chart had more than eight panes. The message "Chart has too many panes..." was appearing incorrectly during the import process and all panes were not being imported. The bug is fixed in version 7.5.

Version 7.4 Rev 5-6, Released: October 28, 2004

Version 7.4 Rev 5 Fixes, Miscellaneous Enhancements

- Tokenized text, e.g. in Signal Actions, that contained no %tokens at all would cause a fatal error when the signal action triggered. This bug was introduced in 7.4.4 by way of a %token enhancement that allows %tokens to be qualified by a ticker symbol. Due to the severity of this problem version 7.4.5 was released to provide an immediate fix.
- Trading System names and Optimization names containing slash /, backslash \ or < > characters were causing Investor/RT to be unable to produce the backtesting report files since the names were being used to construct file names and these special characters are disallowed in file names. Investor/RT now automatically substitutes hyphens for these characters in the report filenames to eliminate the problem.
- Export/Import of TBL Oscillator setup was not portable between MS Windows and Macintosh versions of Investor/RT. This has been corrected in 7.4.5 so that exports of TLBO setups created by 7.4.5 and higher will import correctly into the 7.4.5 and higher Macintosh version. Due to this change, exports created for TBL Oscillator setups in prior versions, are not compatible with Version 7.4.5 and higher.
- The TPB token (ticks per bar) in RTL is applicable to intra-day periodicities of tick and tick bar. Its value is the number of ticks per bar in the current periodicity. Formerly, TPB would provide a value of -1 if the current periodicity was not tick or tick bar. In version 7.4.5, TPB will return a number when the periodicity is Range Bar, Change Bar, and Volume Bar. For range bar and change bar periodicities, the number is the range or change value for the current periodicity. For volume bar the value is the amount of volume per bar requested for this periodicity.

Version 7.4 Rev 6 Fixes, Miscellaneous Enhancements.

The TPB token when used in an annotation (%TPB) was displayed in whole number format. For range bar and change bar periodicities, the annotation would therefore typically display 0 since the range or change value is typically a value less than 1.0. This is fixed now so %TLB displays properly in such cases.

The Trading System Definition window's "Move Rule" button has been replaced with "Up" and "Down" buttons. The selected trading rule can be moved either up or down within the trading rule list using these buttons.

In the Backtest Setup window, the "Display Latest Reports" button was failing to show the "User Notes Report". This has been corrected.

A minor bug was fixed for custom columns. The "row number" built-in quotepage column (column title is #) was not handled properly when referenced by a custom column. The custom column cells would read 0.0 rather than the row number of the quotepage as expected. This bug was fixed. Thus you can now add the # row number built-in column as a custom column and specify color coding rules that color the quotepage rows differently for certain ranges of row numbers. Normally, the # built-in column is shown in a 3D raised cell format. Color coding rules do not apply to these 3D cells. You can turn off this 3D formatting in the quotepage preferences by unchecking the checkbox whose title begins "3D...". This 3D option pertains to the ticker symbol and row number column.

For a saved trading signal that is not marked as enabled for use as a scan, checking the "Enable this Signal for Use as a Scan" checkbox was not properly adding the signal name to the scan menu until the next Investor/RT startup. Similarly, unmarking this checkbox for a signal was (incorrectly) removing the signal name from the list of signals. Both flaws have been corrected.

A combination of circumstances (fortunately a rare combination) was leading to product instability traced to quotepages with custom columns. If one or more custom columns were setup to "update all rows" (as opposed to just the visible rows), and the quotepage itself was set to update "dynamically" (as opposed to every second or so), and the user engaged in frequent editing of cell contents during active trading, and the update frequency of the custom column(s) was every few seconds, an intermittent fatal error would occur. The solution to this problem in version 7.4.6 was to suppress cell updating relating to custom column recalculation while the user is in the process of editing a cell in a dynamic updating quotepage. Dynamic updating quotepages are inefficient and waste valuable CPU processing time processing updates that are not visible to the naked eye anyway. Nevertheless, users who insist upon using this option in conjunction with custom columns should be aware that cell updates relating to custom column recalculations will be inhibited during periods that a particular cell is selected for editing. All visible quotepage rows will continue to update in response to incoming tick data even if editing a cell is in progress. It is good practice to complete the editing of non-ticker symbol cells by pressing the enter (return) key to remove the focus from the cell. Note that pressing the enter key while the focus is on a ticker symbol cell will insert a new row into the quotepage and leave the focus on the ticker cell of the new row. When focus is on a ticker symbol cell you can de-select the cell (and the row) in question by either (a) pressing the esc key or (b) pressing shift + enter (shift + return) (c) clicking in a "gray area" of the quotepage if there is some gray area visible, or (d) clicking the + button in the upper right corner of the quotepage. Be careful using the esc key to remove focus. When any cell in a quotepage is selected, pressing the esc key will cancel the edit and remove the focus from that cell. Pressing the esc key any time no cell is selected closes the quotepage window.

Version 7.4 Rev 4, Released: October 25, 2004

QuotePage Browser

An experimental feature called the QuotePage Browser has been added to the MS Windows version of Investor/RT. The browser window presents lists of quotepages (System Quotepages, User Quotepages, Recent QuotePages) and the instrument ticker symbols for each quotepage. User-defined quotepage groups and subgroups are also shown in an indented outline format. Any group can be expanded or collapsed by double-clicking on its name. Group names will have "..." appended to the name to indicate that the group can be expanded to show its members (quotepages and/or subgroups). Double-clicking on an instrument causes that instrument to be charted just as if the double-click had occurred on that ticker in a quotepage. See Setup: Preferences: Charts: General. The "When double-clicking..." option controls how double-clicks on instruments in the quotepage browser window are handled. At present a single click on a symbol does not invoke any action other

than establishing that symbol as the selected item within the browser window. From there the arrow keys can be used as described below to move up or down the list of symbols. When arrowing onto a symbol, Investor/RT will perform the double-click action.

To open the browser window, click the "+" button at the upper right corner of any quotepage and choose "Browse...". The browser window will open showing three built-in groups of quotepages along with any user-defined groups of type "QuotePage". The group hierarchy can be navigated using the keyboard; up/down arrow keys move up and down the current list. Right-arrow will expand the current item, left arrow will contract the current item. Striking character keys will cause the selection to advance to the next item whose name begins with that character. Moving to a ticker symbol with the up/down arrow keys or character keys causes the charting action to be performed (just like double-clicking).

The browser tool is implemented using the MS Windows standard "tree viewer" control; it operates in a fashion similar to the folder navigation dialog (Choose a Folder...). This tool will be especially useful to users with hundreds of quotepages organized in a hierarchical fashion using the "groups" feature of Investor/RT. The browser makes it easy to find a "group" and view a list of subgroups, each subgroup having several quotepages for example. The instruments in a particular quotepage can then be listed and quickly charted by arrowing through the symbol list. Groups and subgroups may be "nested" to any extent the user desires.

New RTL Token CCODE - Candle Codes

The Candle Codes indicator can now be referenced via the RTL token CCODE. When the Candle Codes indicator is added directly to a chart, the preferences for the indicator allow one or more lines to be drawn: the raw codes, and the single and double smoothed values. There is also an oscillator setting that uses double smoothing. When the RTL token is setup, Investor/RT permits only one of these options to be checked. If you need more than one "result" the RTL formula may of course make reference to 2 or more CCODE tokens, e.g. CCODE_S and CCODE_D could be setup to reference the single and double smoothed values respectively in the same RTL formula. The candle code indicator requires at least 20 bars of data to compute regardless of the moving average periods involved.

Level II Windows Multilinking Improved

The Level II preferences window now has a "multi-link color" setup that controls whether or not the window is to participate in multi-linking actions. Set the level II window's multi-link color to black to turn off multi-linking for that window. White multi-linking color means that the window will participate in ALL multi-linking operations. Any other color defines the participation of the particular Level II window as a member of a group of windows having that same multi-link color. The level II window will only participate in multi-links that involve the member windows of that color group.

This improvement means that you may have multiple level II windows open at one time, each with its own multilink color. When you open a new level II window, it will initially have the global default

multilink color (see Setup: Preferences: NASDAQ Level II). You can then edit individual windows' multilink color. Since there are no saved instances of level II windows, you must adjust the multilink color each time you open one unless the default value is what you want.

If, while there are open Level II windows, you make revisions to the default settings for Level II windows using Setup: Preferences: NASDAQ Level II, Investor/RT will prompt you, asking if the default multi-link color should be applied to the open windows. If you reply "No", the open Level II windows will retain their multilink color codes but other default preferences will be applied as before.

MPD Periodicity Optimization

When specifying intra-day periodicity for the MPD indicator, the user may now specify a user V# variable instead of a fix numbers of minutes and seconds. This enhancement makes it possible to perform backtesting optimization by varying the periodicity used by an MPD indicator inside a trading signal for example. When intra-day periodicity is specified as a V#, the value of the V# variable is used to determine the periodicity that the MPD indicator will use. Here are the rules for specifying the numeric values for periodicity within a V# variable:

Positive values 1 through 1000 specify the number of minutes for each bar.

For values X above 1000, X - 1000 represents the number of seconds in the bar, e.g. 1030 in the V# variable would mean 30 seconds per bar.

Zero means "tick" periodicity, i.e. 1 tick per bar.

Negative Numbers represent the number of ticks per bar, e.g. -100 means 100 ticks per bar.

Position (POS) Indicator Improvements

Two new result options are now available: (1) Missing Bars Over Period (Historical) and (2) Missing Bars Over Period (Scan). Both options accept a user-specified period. The historical (1) result determines the number of time-based bars that are missing over the specified period. This result can be useful in charts to detect incomplete data. The scan (2) result is used in scans and custom columns to determine the number of missing bars during the last N periods. Missing bars, e.g. in a one minute chart, reflect periods of no trading for the instrument.

Version 7.4 Rev 4 Fixes, Miscellaneous Enhancements

- A bug was fixed when importing a definition file containing more than one chart, e.g. a definition file created using the Export: Current Layout. The chart import function was ignoring all but the first chart in the definition file.
- Traditional tick and tick/bar charts, with gridlines option off, were displaying an straight line artifact at the right edge of the chart. This display flaw has been corrected in Version 7.4 Revision 4.

- %RTL tokens used in display strings (e.g. in chart annotations, signal marker text strings, SHOW and NOTE strings, etc.) can now be qualified with a ticker symbol in parentheses. For example the annotation string "IBM=%CL(IBM) MSFT=%CL(MSFT) %TICKER=%CL" will output the annotation text showing the closing price of IBM, MSFT, and the instrument in the chart itself, respectively. This overriding by ticker can also be used to advantage in trading signals to refer to so-called "global" V# variables. For example, if you create a cash instrument with ticker symbol \$G, you can use %V#99(\$G) in SHOW and NOTE commands within signals during backtesting to show the values of such global V# variables in the backtest detail report.
- Definition files exported by the MS Windows version of Investor/RT were not importing properly in the Macintosh OS X version due to "inconsistent line endings" in these text files. Improvements were made in the MS Windows version so that exported definition text files have line endings recognized by the Macintosh versions.
- Macintosh users who receive ".txt" definition files via email or download will not be able to import such files until the files have the Macintosh file type "TEXT". Files received from other Macintosh users often carry the type designator so importing these are no problem. But files exported by users of the Windows version of Investor/RT will not have the TEXT type designation. An AppleScript applet is now available in the Investor/RT Folder so that Macintosh users can simply "drag and drop" one or more files onto the applet to give those files the "TEXT" type designation. The applet is named SetTypeToText. Move the applet or make an alias of it on your desktop so you can conveniently drag and drop files onto its icon. When you use the File: Import command in Investor/RT, the TEXT files will be available for selection in the Choose File dialog.
- Custom Indicators that use the conditional operator (x ? y:z) syntax, were not working properly when the y or z expressions were qualified historical tokens. For example, the custom indicator $CL > CL.1 ? CL : CL.1$ was yielding the close of each bar, regardless of whether $CL > CL.1$. Interestingly, the equivalent formula $CL > CL.1 ? CL : (CL.1 + 0)$ would produce the desired indicator just fine. RTL has been improved to handle these formulations correctly. As a by product, V# variables are now supported as qualifiers within conditional expressions. For example: $CL > CL.V\#1 ? CL : CL.V\#1$ will produce the appropriate indicator based on the numeric value of V#1 for the associated instrument.
- A bug was fixed in the portfolio manager. When one and only one portfolio remains after deleting some other portfolio from the system, the order desk would not show the list of open positions for the remaining portfolio when the user attempted to close an open position. The bug also could surface when a portfolio was renamed.
- In the Macintosh Versions of Investor/RT, trading signals that reference numeric constants (e.g. $POS_STATE = POS_LONG\dots$) would fail to evaluate during backtesting. In this example the numeric value of POS_LONG is 1. Changing the formula to read $POS_STATE = 1$ would bypass the problem. This bug has at last been found and corrected. Macintosh users may now make use of numeric constant tokens in signals that are used within trading systems.
- The Setup Future Type window is opened by going to Setup: Futures and clicking the "Setup" button. This definitional window has been revised to make clear that it is used to define generic "types" of futures, not futures instrument ticker symbols. Further, the Delete function, formerly unimplemented, is available. Enter the future type code and press the Delete button to remove that definition from the list of future types.

Version 7.4 Rev 3, Released: October 5, 2004

Sectional QuotePages

A Sectional QuotePage is a quotePage that is divided into two or more sections such that the instrument rows within a section remain sectionalized whenever the quotePage is sorted on some criteria. Consider a simple example of a quotePage containing three index ticker symbols at the top, followed by 20 stocks. Sorting the quotePage by % Change will sort all 23 tickers so the index tickers will be ranked and inter-mixed with the 20 stocks according to % change. Version 7.4.3 allows you instead to create a section at the top containing the indexes and a section below for the stocks, sorting by % change or any other criteria will sort each section separately, the indexes section will remain at the top followed by the stocks section below, both sections listed in order by % change.

The sectional quotePage facility makes use of special ticker symbols (instruments) that begin with ##. These ticker symbols occupy rows in a quotePage to mark the beginning of a new quotePage section. The ## tickers are "placeholders". These special ## tickers will not be listed in the ".All Symbols" quotePage. Instead a new system-defined quotePage named ".Cash" has been added to Investor/RT so you can see ## tickers and other tickers of security type "Cash", if needed.

Investor/RT uses special ticker symbol rows as "Section Headers". Ticker symbols that begin with ## and have security type "Cash" are inserted into quotePages to mark the beginning of a new section (and the end of the previous section if there are rows above). For example, open any quotePage and insert a blank row somewhere in the middle, enter "##DIVIDER" into the ticker symbol cell and press the enter key. This will break the quotePage into two sections, the top section comprises all instrument rows above the ##DIVIDER and the bottom section all those below it. Note that the top section need not have a header row but it can if you wish to add one. Now sort the quotePage on various columns by clicking on the column headers to see the sectionalize sorting of the quotePage.

For convenience, you can right-click on any ticker symbol cell and choose "Insert-->Section Header" to have Investor/RT create a unique ## ticker for you and insert it beneath the clicked row. The ## ticker will have the form ##n where n is a number that makes the ticker unique. If you wish the section header row to have a more descriptive ticker symbol you can replace the ## ticker with another. For example you can create a ##INDEXES ticker Symbol with a more descriptive name such as "Major Market Indices" as the "name" of ##INDEXES. Here are the general rules for creating sectional quotePages:

1. You may have as many ## sectional headers as you want in a quotePage. Each ##ticker can be followed by zero or more instrument tickers. The same section header ## ticker may be used in any number of sectional quotePages.
2. Each ##ticker row is color-coded using the instrument highlight color of the ##ticker instrument. To adjust the highlight color, right-click on the ##ticker and choose Setup.

In the "Advanced" section of the Setup: Instruments window that appears, adjust the highlight color. This gives you complete control over color coding each row separator, regardless of the quotepage's color settings.

3. Sectional header rows will be blank except for the ticker symbol, name, and volume columns. The volume column, if present in the quotepage column format will contain the count of the number of instruments in the section.
4. Sorting works on any quotepage column just as it does with non-sectional quotepages. The only difference is that the sorting applies to each section as a group and all instruments stay within their section after sorting. This applies of course to manual sorts initiated by clicking on a column heading, or to periodic automatic sorts as specified in the quotepage sorting setup.
5. You can easily move instruments up and down to move them from one section to another using the up and down buttons on the quotepage toolbar. After moving one or more tickers from one group to another, a sort will rank them within their new section. Similar, you can easily move any section header up or down to revise the content of that section (and the section above it).
6. There are no practical limits on the number of sections or the number of instruments in each section. All the scrolling features of Investor/RT quotepages apply in the expected way, scrolling sections into view as you would expect.
7. The name cell of any ###ticker has a special meaning in Investor/RT. It can provide the name of a linked quotepage. Double-clicking on a ## row will open that linked quotepage, if in fact, the security name of the ## ticker is a valid quotepage name. For now, the feature of ## tickers will continue to operate as it has before. So, for example you could have a ###ticker with the symbol ##INDEXES used as a section header inside some quotepage. Perhaps there are just a few indexes in the section. The security name of ##INDEX could be setup ".Indexes", the name of the built-in system defined quotepage listing ALL index ticker symbols. Thus ##INDEXES serves a dual purpose, it is a section header used to keep some index ticker symbols together in a quotepage, and it serves as a shortcut for opening the quotepage of all indexes by double-clicking on the ## row.
8. You can insert ## rows anywhere you wish inside an existing quotepage. When you do this, all the instruments below the new ## row down to the next ## row (if any) will essentially become a section and will sort as a section thereafter. Similarly, when you remove a section header from a quotepage, all of the tickers below it down to the next ## row will then become part of the section above the deleted section header. Thus, removing all ###tickers from a quotepage essentially results in a non-sectional quotepage where the entire list of tickers symbols in the page are sorted as a group. To remove a section header simply right-click and choose Delete, or select a row and

press the Delete key on the keyboard. Deleting ## tickers that are used in several quotepages will have the effect of removing the section header from every quotepage where that ##ticker is used. This is why Investor/RT creates a unique ##n ticker when you use the menu command Insert-->Section Header to add a section header. If you have a ##ticker and wish to know how many quotepages contain that ##ticker, you can lookup the ##ticker in a quickquote window and click the QP button.

Switching Databases

A schedule action "Open Database" is now available under the Database Functions in Setup: Schedules. The action setup includes a path specification, the path to the folder/directory that contains the database (data_f) folder. A browse button is provided to pick the target folder. A checkbox specifies whether or not you wish the target database to be verified before continuing. This new feature enables users of multiple Investor/RT database to easily create schedules (with keyboard shortcuts if desired) for switching among them. Note that when switching databases, there may be no actions in the schedule following the Open Database action. The schedule being run when the switch occurs is terminated as the new database's schedules replace those of the former database.

There is a new command in the File Menu, File: Open: Database.... This command prompts the user to identify the data_f or parent folder of data_f; Investor/RT then opens that database. Investor/RT continues using the same data feed in concert with a chosen database. Some Investor/RT users have different databases that they use with different data feed sources. The File: Reconfigure command has been improved to enable the user to switch both the data provider and the database location simultaneously. When you specify a data provider different from the one currently in use and press the "Reconfigure" button, Investor/RT will quit and instantly restart configured for the new data provider. If a different database location is also specified, Investor/RT will startup using that database instead of the one in use with the former data provider.

When switching databases Investor/RT always disconnects from the data service before opening the new database. After opening a new database, the preference settings of the new database pertaining to connecting to the datafeed at startup are used to decide whether to reconnect to the data service or not.

Using Multiple Databases

The Investor/RT database is a collection of 59 files that resides in a folder/directory named data_f. By default, Investor/RT looks for the data_f folder inside the Investor/RT startup folder. The startup folder is the folder where the Investor/RT application resides, e.g. the investrt folder. Investor/RT can be setup with multiple independent databases and the program can easily switch from one database to another. Some Investor/RT users, for example, have a lean database used for live trading. After market hours, they switch to another database that contains longer term historical data that they use for backtesting,

experimentation, etc. The export/import features of Investor/RT make it easy to export signals, trading systems, historical data, etc. from one database to another.

It is easy to setup one or more alternate databases. Here is a step by step guide:

1. Create a parent folder inside the investrt startup folder. Name the new folder with a short descriptive name. In this example, we will use the name "alt", short for alternate.
2. Open the alt folder and create a folder inside it named data_f.
3. Open the alt/data_f folder and create a folder inside it named backup_f. The folder investrt/data_f is the place where the "default" database is kept. investrt/alt/data_f is the place where the alternate database will be kept. Each data_f should contain a backup_f folder where backup images of the 59 data_f files are kept.
4. With Investor/RT inactive, copy the 59 files from the default data_f into the investrt/alt/data_f folder.

You now have two independent databases setup and ready to use. Initially both database are identical of course. The default data_f is located directly inside the investrt folder; you can think of this one as the "investrt" database since investrt is the name of the parent folder containing that data_f. The other data_f folder is located inside the alt directory; it is the "alt" database; alt is the name of its parent folder/directory.

When you startup Investor/RT, it will startup using the database it was using when you last ran the program. You can check to see which database Investor/RT is using by opening the Data Feed Status window. Choose "Status" from the data feed menu, or right-click the heartbeat button at the right end of the main toolbar. At the bottom of the Data Feed status report you will see something like this:

```
Startup Folder: C:\investrt
Database Location: .\data_f
Backup Location: .\data_f\backup_f\
```

The ".\" notation means "the startup directory", so this indicates Investor/RT is running with the default data_f residing directly inside the investrt directory folder.

There are a variety ways to switch from one database to another.

1. Use the File Menu. File-->Open-->Database...
2. Use Setup: Preferences: Database. Click the Browse Button in the Database Location Section at the top of the window. Setup: Preferences: Database is the same window as Setup: Preferences: Backup.
3. Create A Schedule containing the Database Function action "Open Database". A keyboard shortcut can be assigned to the schedule.
4. Use the Run Schedule command in File Menu, to run a schedule that contains an Open Database action.

When switching databases, MS Windows users can designate a text string to be displayed in the Investor/RT task window title bar that will indicate which database is in use. For example, when using the "alt" database, go to Setup: Preferences: General and enter the string "Alternate DB" as the task window title string. When running with the normal default database, use "Default DB" for example. As you switch back and forth between the two databases, the task window title will always show you instantly which database is currently in use.

Under MS Windows there is a restrictive limit on the length of the path to the data_f folder that Investor/RT can handle. This is why using short folder/directory names is recommended. While generally it is a good idea to keep all databases inside the investrt startup directory, this is not necessary; you may place them anywhere you like as long as the path the database is not too long. The database folder(s) can reside on a different volume if you like, or on a RAM Disk volume, regardless of where the startup directory/folder resides. The advantage of keeping the alternate database inside the startup directory is that the path the database can then be specified as a "relative path" starting from the directory where the Investor/RT application resides. For example, if the the startup directory is "C:\program files\investrt\" and the alternate database data_f is kept inside the startup directory in a folder named "alternate", then the absolute path to the database is:

```
C:\program files\investrt\alternate\data_f\
```

This path exceeds the path length limit however, since the path is located inside the startup directory, it can be specified as:

```
.\alternate\data_f\
```

since the alternate directory is directly inside the startup directory.

When you use the various "browse" buttons in Investor/RT windows to locate the database folder, Investor/RT will automatically "reduce" the path to the database, if possible, to a relative path to avoid the path length restrictions.

If you want to have many databases for some reason, a nice technique is to create a folder inside the startup folder named simply "DB", short for databse. Create as many folders inside the db folder as you wish, each with a short descriptive name. For example, create folders named small, medium, and large inside db. Setup each of the three as described above so that each contains a data_f folder with a backup_f inside it. Running with your default database, create scheduled named "Switch Small", "Switch Medium", and "Switch Large" with the appropriate Open Database actions. Switch to each of the databases in turn, and create a schedule within each of the three alternate databses to "Switch to Default DB". Keeping all databases inside a single DB folder makes it very convenient when browsing for the database you wish to use.

When running with an alternate database, all of the database utility function in the Control Menu will operate on the alternate database currently in use. Note however, that the MS Windows Start Menu commands "Database Maintenance" and "Verify Database" are specifically targeted at the default database in the Investor/RT startup directory/folder.

A special file named datapath.txt, located inside the admin folder, is used at startup to inform Investor/RT of the location of the database to use. If this file is not present in the admin folder, the default data_f inside the startup directory/folder is used. Thus, if you want to assure that Investor/RT starts up using the default data_f, simply delete this file from the admin before starting Investor/RT. Alternatively, you may edit (or create) the text file so its first line of text specifies the path to the parent folder that contains the data_f you wish to use. For example, a datapath.txt file with the first line in the file reading:

```
C:\investrt\db\small\
```

Will cause Investor/RT to start up using the data_f inside the small directory/folder. Macintosh users have the same facility, except that colons are used instead of backslashes in path names and the name of the hard drive is used instead of a drive letter like C:, e.g.

```
Macintosh HD:InvestorRT Folder:db:small:
```

The Macintosh version of Investor/RT does not have the same path length restrictions cite above for the MS Windows platform.

QuotePage Custom Column Calculation Order

QuotePage preferences now provide a checkbox for specify that custom columns within the quotepage be calculated from right to left. In the past, all custom columns calculations were performed from left to right. When the result of one custom column (e.g. a V# result) is considered in the calculation of another custom column the order of calculation is important. With this right to left option, custom columns can be arranged in the column format so that the final result column is to the left while other custom columns having precursor calculations are to the right. This new option is available only with refreshing quotepages (those that refresh periodically on an interval rather than tick by tick dynamic).

Version 7.4 Rev 3 Fixes, Miscellaneous Enhancements

The chart preference setting "No Highlighting for This Chart" was being saved with the chart but not properly reinstated when the chart was closed and reopen later. Further, once the option was turned on, it could not be turned off. Both of these flaws have been corrected in version 7.4.3.

A fatal error could result if a custom column of type "Technical Indicator" referenced an indicator setup having a "period" preference expressed as a V# variable rather than a constant numeric period. This bug has been eliminated in version 7.4.3.

Under rare circumstances, switching the periodicity of a chart from range bar to volume bar would result in a fatal error. This problem has been corrected in version 7.4.3.

Importing intra-day historical data having date/time expressed in the form mm/dd/yy hhmm resulted in incorrect times. The hhmm format (with no colon separator between hh and mm) is handled properly by the import function in version 7.4 Rev 3.

A new database utility function, Initialize Groups, has been added to the Control : Database Utilities menu. This function will erase all group setup information and empty all .Recent groups. Confirmation is requested.

Vertical Grid Lines and New Day labels are now drawn in tick and tick/bar charts, plus charts using the new range, change or volume periodicities. The new day labels are included if the global setting in Setup: Preferences: Charts: General is set, while the grid lines option is controlled by the chart's preferences.

A bug was corrected in the Quote.com version of Investor/RT having to do with downloading intra-day historical data for expired futures contracts. The no data condition for the present date (resulting from the fact that the contract is no longer trading) was causing Investor/RT to prematurely end the download process. Investor/RT handles such downloads properly now. When downloading data for expired futures contracts use the Data Download window where you can specify the starting and ending dates for the download.

The Reverse Engineer indicator is now available for use in the RTL language using the token RENG. Note that RENG is not a "historical" indicator, thus its use is limited to scans and custom columns in quotepages. It returns a single value, obtained using "to present" instrument data; it does not provide an array of values for each bar, only the present bar's value.

Version 7.4 Rev 2, Released: September 21, 2004

New Indicator: Reverse Engineer

The Reverse Engineer indicator answers the following question: "What current price would be required to attain an indicator value of X". For instance, you may want to know what closing/last price (on a daily chart) would be required in order for the RSI value to reach 70. Or you might want to know what high price would have to be reached (on a daily chart) in order for the current day's range to exceed its average range over the past 20 days. There are three key components the user specifies in the Reverse Engineer indicator: (1) the price to use (close, high, low, open, or volume), (2) the underlying indicator, and (3) the indicator's "projected" value. Once the three settings are specified, Reverse Engineer computes a single resulting value representing the price needed to attain the underlying indicator's projected value. The result is a single "current" value (no historical values) based on a single projection of the current value of the underlying indicator. Since there is only one

result, it is displayed in a chart as a horizontal reference line, with similar display options as the horizontal reference line indicator. Options include: "compact", "Label with Price", Label "On Right", and "Include Line When Auto-Scaling".

The user specifies the underlying "Indicator" at the top of the preferences window. Once the underlying indicator is selected, the "Indicator Preferences" button is used to adjust the settings for the indicator. The "Engineered Price" provides options of "Close", "High", "Low", "Open", and "Volume". The "Engineered Price" is the type of price involved in the calculation of the indicator. The "Indicator Value" can be specified directly using "Specific Value") or as a User Variable (V#). If User Variable is selected, then the indicator value will be obtained from the corresponding V# variable for the symbol associated with the indicator.

Allowing the user to specify the indicator value as a V# variable opens up some interesting possibilities. First, the user can set the V# variable of many symbols using a scan. For example, the V# can be set to the highest value of the indicator over the past 5 days, or the previous day's value of the indicator plus some percentage. The V# values can be adjusted automatically each day (or more frequently) by specifying that the scan be run on a schedule (see Setup: Schedule).

The user can put a reference line in the same pane as the underlying indicator, associating that reference line to the corresponding V# variable ("Use: V#1"). This way, the user can drag the reference line to adjust the V# indicator level at any time. The Reverse Engineer indicator will then display the price needed to attain that level in the instrument pane.

Quotepage Export/Import and User Variables

When quotepages containing V# or T# user variable columns are exported, Investor/RT will export the title (column title) of each user variable and, for V#'s, the numeric display format to use for the column. Only user variable columns with titles are exported. If the quotepage contains one or more custom columns of type "built-in" and the built-in column displayed by the custom column is a user variable column, that user variable setup is exported with the quotepage. This improvement means that the resulting quotepage when imported will have the same column titles and numeric display formats. Note that in order to import such user variable setups, the recipient must assure that Setup: Preferences: User Variables has allowed for an appropriate number of user variables. For example, if a user exports a quotepage containing V#200 then the setup for V#200 will be imported only when the number of user variables allowed in the recipient system is at least 200.

Zig Zag Indicator Improvement

The Zig Zag indicator now provides the zig zag line value feedback in chart pane titles and info boxes. The Zig Zag oscillator indicator has a new result option titled "Zig Zag Line Price", that may be useful in RTL formulas For any bar you can now easily compare the current price to the value of the current zig zag leg at that bar.

Version 7.4 Rev 2 Fixes, Miscellaneous Enhancements

- The Send Email window has a new checkbox titled "CC Me". When checked, Investor/RT will send a copy of the message to the user's email address. The CC Me checkbox will remain on for all emails Investor/RT sends until you turn it off.
- The Investor/RT DDE Link now supports T# variables, e.g. =rt|MSFT!'T#1' will put the text of T#1 for MSFT into the Excel cell. Note that T# and V# column names must be enclosed in single quotes to satisfy Excel syntax requirements. Also, if you elect to use column numbers rather than column names you must include the column number in single quotes. For example, =rt|MSFT!'2' will put the last price of MSFT into the Excel cell (Last is column number 2). Another way to use column numbers is use the three letters "col" followed by the column number, e.g. =rt|MSFT!col2. Excel does not require quotation marks around col2. Thus =rt|MSFT!col2 and =rt|MSFT!Last and =rt|MSFT!'2' are equivalent Excel formulas.
- When using T# or V# variables in DDE formulas, it is no longer necessary to enter leading zeros in the V# or T# number, e.g. V#001, V#01, and V#1 will all be recognized as V#1.
- A bug was fixed in the QuotePage Save Format command. User variables V#21 through V#512 were being saved in the resulting format as if they were V#1 through V#492 respectively, i.e. the saved V#n was 20 less than it should have been.
- A bug was fixed in the traditional chart instance preferences. The bug was causing chart gridlines to be turned off each time the preferences were updated. This was a short-lived bug introduced in 7.4.1.
- A bug was fixed in the traditional chart window "download" button in the lower right corner. A shift-click on this button now initiates a recalculation of indicators in the chart rather than a data download. Some problems were fixed regarding mouse behavior when shift-clicking this button.
- The schedule action "Run Backtest" will now close the backtest setup window after running the backtest. Only the requested report window(s) showing the backtesting results will remain open.
- The popup menu accessed by right-clicking in the message area of the main toolbar now has a menu item for toggling the new chart highlighter feature on/off. The menu item will show a checkmark when chart highlighting is "on". The main toolbar popup menu has been rearranged into 3 sections. The first section includes "checkable" menu items for global options that can be toggled on/off (Button Help, Chart Highlighter, Presentation Mode). The middle section contains some miscellaneous commands (Hide Toolbar, Message Log, and Quote Setup). The bottom section contains checkable options for the main toolbar display style (Archored, Condensed, Slim, Button Titles).
- The "Custom Indicator" indicator has a new option for display format. This user preference controls the output display format when the custom indicator's numerical values are displayed in chart pane titles, info boxes, etc. One of the display format choices is "Instrument", which means that the indicator's value will be displayed using the display format of the associated instrument (ticker symbol) used to calculate the indicator's values. This new preference defaults to "2 decimal" format. Prior to the 7.4 Rev 2 release, all custom indicator value displays were fixed at 4 decimal places. Investor/RT users who desire to see

more than two decimal places of precision in particular custom indicators will therefore have to adjust the indicator settings.

- The "No Highlighting for this Chart" option (see item #9 above) was not being retained when charts were saved, thus the checkbox had to be re-checked each time the chart was re-open to turn off the highlighting in the chart. This has been corrected in 7.4.2.
- When resizing a traditional chart window, all pane titles are reset to show a generic description of the pane's content rather than the actual data values of the last bar pointed at. Instrument and indicator data in pane titles will reappear when the mouse pointer enters the window to designate a bar. This revision was made to eliminate any chance of confusion over which bar's values are displayed after window resizing.
- A bug was corrected in the Setup: Schedules window having to do with editing the actions of schedules. In some circumstances, changes made to preferences of an action were not permanently updated in the database. The action would execute with the updated settings as expected until the next Investor/RT startup when the former setup from the database would be reinstated. In version 7.4 Rev 2, any editing performed on an action in a schedule updates the database when you close the Setup: Schedule window or move on to a different schedule in the list.
- A long-standing bug was corrected that was specific to the Macintosh OS X and Macintosh Classic Versions of Investor/RT. The bug had to do with dragging Investor/RT windows on very large monitors (more than 1024 pixels vertically or horizontally). Dragging was limited to horizontal or vertical positions no more than 1024 pixels from the upper left corner of the screen. When screen resolutions greater than 1024 are used, dragging a window beyond the invisible 1024 pixel point was not permitted, thus limiting the usable screen space for users of large monitors. This bug also affected Macintosh users of smaller displays in some cases when multiple monitors were used. Investor/RT includes a fix to the XVT development system that eliminates this problem.

Version 7.4 Rev 1, Released September 9, 2004

Excluding Charts when using Multi-Chart Highlighter

A new checkbox in the "Options" tab of the preferences for a specific chart instance can be used to exclude the chart from the "Chart Highlighter". Check the box titled "No Highlighting for this Chart" if you wish to keep the chart highlighter on, yet exclude one or more specific charts from having their bars highlighted. Note that when you move the mouse in a window that has been excluded, the highlighter may very well continue highlighting corresponding bar(s) in other chart windows.

Version 7.4 Rev 1 Fixes, Miscellaneous Enhancements

The introduction of the "Pixels Per Bar Override" feature (see item #7 above) adversely affected some traditional chart setups. When upgrading to version 7.4 Rev 1, Investor/RT scans all traditional chart setups and assures that the pixels per bar override is turned off, unless a "reasonable" X:Y value is setup. See item #7 for details on the X:Y setup meaning. A check is

now made to assure that the Y value is no more than three times the X pixels per bar value. If Y exceeds $3 * X$ then the override Y value is turned off (set to 0).

Price and Volume alarms are now checked when importing "Current Quotes" or importing daily historical data for the current day. If a high, low or volume alarm is triggered, the effect is the same as if a trade occurred in real-time, e.g. an alarm sound and/or dialog box may appear, email might be sent or a line of text may be sent to a chat room etc.

DTN Satellite grain futures prices were mistakenly being quoted as whole numbers. This problem has been corrected in version 7.4.1.

A fatal error bug was fixed related to the use of the Data Validation indicator in traditional charts.

A fatal error bug was corrected in the Mixed Periodicity (MPD) indicator relating to the use of "tick" MPD's in a chart having a Range Bar, Change bar, or Volume Bar periodicity. The bug only affected more complex cases of nested MPD's, e.g. a custom indicator that references another custom indicator that in turn references an MPD indicator.

Version 7.4, Released: September 2, 2004

Custom Column Enhancements

Two significant improvements have been made to the "Rules" setup for custom columns that considerably extend the power of this important Investor/RT feature. First, the "Text" column in the Rules setup, normally used to display a textual comment in a quote page cell when some condition is true, can now be a "tokenized string". A tokenized string is a textual string, like those in a chart annotation indicator that contain RTL tokens that are filled in dynamically based on current market data. For example, you could have a "signal" custom column that displays the text "%TICKER %V#1" with a green background color when the signal is true, or the text "%TICKER" with some other background when the signal is false. This new facility means that the displayed result in each cell of a custom column can be dependent upon the ticker symbol in that row. Generally, most tokens you can use in an annotation can be used as the text to be displayed in a custom column. The quote page cell can hold at most 40 characters of text per cell. Longer tokenized strings will be truncated.

The second major improvement is that rules that compare the column value with numeric values X and Y can now specify V# variables for X and/or Y. Prior to Version 7.4 the values of X and Y were fixed numeric values; now X and Y can be variable for each instrument. For example, consider a custom indicator type custom column with the indicator having the formula: $ABS(CL-MA)$. The column displays a positive number, a measure of price distance from current price to some moving average. You can have a rule for the custom column that has the operator "Is Less than X". In the X cell for that rule you can enter V#3 for example. This means that the rule will be true whenever the distance from the MA is less than some threshold value found in V#3 for the instrument. V#3 can, of course, be set to a different value for each instrument and may be adjusted at any time. The behavior of the rule will be altered immediately whenever the value of V#3 changes for any instrument in the quote page.

Multi-Chart Highlighter Feature

An exciting new Chart Highlighter option has been added. The highlighter setup options may be found in the "Setup: Preferences: Charts: General" window. When the chart highlighter is turned on, it has 3 different modes: "Single Chart", "Multi-Chart (All)", and "Multi-Chart (Multi-Link)". The Highlighter has color options including "Custom", "Automatic", "Gridline", and "Background".

Single Chart Mode

When the highlighter is on in Single Chart mode, the bar over which the cursor is placed will be clearly highlighted across all panes, as if a highlighting pen was used to draw a line from the top to bottom of chart. As the cursor moves to a new bar, the highlighter will follow. This allows the user to quickly line up bars and data across multiple panes, and to clearly see which bar the pane title is providing information on. As the cursor moves to a new chart, the highlighter again will follow. In Single Chart mode, the highlighter will only be visible in one chart at any one time. If the cursor is not over a chart, no highlighter will be visible (and this is true for all modes).

Multi-Chart (All) Mode

When the highlighter is on in Multi-Chart (All) mode, the highlighter is no longer limited to a single chart. If the cursor is pointing to a 5-minute bar in a 5-minute chart, not only will that 5-minute bar be highlighted, but in a neighboring 1-minute chart, all the 1-minute bars (5) contained within that 5-minute bar will also be highlighted. Similarly, the daily bar that contained that 5-minute bar would also be highlighted in a daily chart. If the cursor is over a daily bar in a daily chart, not only would that daily bar be highlighted, but in a neighboring 30-minute chart, all the 30-minute bars contained with that day would also be highlighted. And if a weekly chart was also open, the weekly bar that contained that day would also be highlighted. The highlighter allows you to easily line up periods of time in multiple charts of multiple periodicities in Multi-Chart (All) mode, in addition to helping to line up bars and data over multiple panes within the same chart.

Multi-Chart (Multi-Link) Mode

When the highlighter is on in Multi-Chart (Multi-Link) mode, it works in much the same way that Multi-Chart (All) mode works, with one key difference. The charts that are highlighted will be dictated by the rules of the Multi-Link colors of the chart. Those rules essentially work as follows. We'll call the chart over which the cursor currently resides the "cursor chart". Also, and color referred to should be assumed to be the "Multi-Link" color of the chart. When the cursor chart is white, all other open charts will be highlighted except those with a color of black. When the cursor chart is black, no other charts will be highlighted. When the cursor chart is any color other than white or black, any other chart with a matching color, or a color of white, will be highlighted. In Multi-Linking, black essentially means "exclude from multi-link" while white means "multi-link all colors". This mode gives the user the ability to highlight specific groups of charts together.

Custom Color

When "Custom" color is selected, the user will be able to choose any color desired from a color control. That color will be used globally as the highlight color for all charts.

Automatic Color

When "Automatic" color is selected, Investor/RT will automatically compute a highlight color which works well with the background color of the individual chart. If each chart has a different background color, then each chart will also have a different highlight color.

Gridline

When "Gridline" color is selected, the highlight color of each chart will be set to the gridline color of that chart.

Background

When "Background" color is selected, the highlight color of each chart will be set to the background color of the chart. This is by far the most "subtle" of the color options. Since a slim border is drawn around the highlighting, the effect of this background color option is just a slim border around the highlighted bar or bars. The effect is more of a subtle border than a highlight.

Chart Buttons and Keyboard Shortcuts

The highlight feature can be easily turned on/off (toggled) by creating a chart button or keyboard shortcut. To create a chart button use the button purpose "Execute a Toolbar Button" and select "Toggle Highlighter" as the toolbar button. You can also use Setup: Preferences: Keyboard Shortcuts to define a function key to toggle the highlighter. When you toggle the highlighter using a keyboard shortcut or a chart button, a message will appear in the main toolbar message area stating that the chart highlight is now on (or off).

New Charting Style: Day % Change Bars

Day Percent Change Bars work in similarly to the existing Day Change Candles, except they are drawn as bars not candles and are based on percent change rather than change. The prices of these bars (open, high, low, and close) are computed by subtracting the previous bar's close from the actual prices and dividing by the previous bar's close.

New Charting Style: Hi/Lo Bars

High Low Bars are very similar to Wickless Candles, except they are drawn from the low to the high, instead of the open to close. The bars are still painted based on the relationship of the close to the open (up or down). The body of the bar (a rectangle) is drawn vertically representing the high at the upper extreme and the low at the other.

DTN Satellite Symbol Setup/Lookup Improvements

Investor/RT now supports the improved DTN Satellite Cross Reference Files in the Symbol Lookup window. Specifically, the list of symbols available for any particular DTN "database" now includes the security name. Formerly only the ticker symbols were shown. For databases that contain more than 4000 symbols, Investor/RT can list at most 4000 tickers in the Symbol Lookup Window, however, the first line in the list of symbols will be a line of text showing the total number of symbols in the database. For example, if you choose the "NASDAQ STOCKS" database from the list on the left, the first line of the symbol list to the right will read:

- Add all 9650 NASDAQ STOCKS Symbols -

If you select (highlight) this first line and click the "Add Selected" button, Investor/RT will add instrument setups for all 9,650 NASDAQ Stocks to your Investor/RT system and begin monitoring them. Formerly, it was necessary to do multiple adds using patterns to achieve this kind of bulk symbol setup for an entire database of more than 4000 symbols. After adding a huge number of symbols like this, you may wish to perform a scan on the resulting quote page to find symbols trading below some threshold price or trading volume in order to delete them from your system.

The DTN Symbol Lookup Window is now resizable vertically so you can see longer lists of ticker symbols if you wish.

Instrument Selector Improvement

The instrument selection control that appears in many Investor/RT windows has been enhanced. The instrument selector is essentially a miniature quote page that appears for the purpose of selecting a particular ticker symbol in various windows. For example, when you use File: New: Chart or if you begin typing a ticker into any open chart window, a dialog will appear with the instrument selector acting on your keystrokes to pick the ticker symbol you want. The upper right corner of this "miniature quote page" is the + button, the same button icon you see in normal quote pages. Within the instrument selector the + button will now popup a menu. New menu choices enable you to Add a New Ticker Symbol to Investor/RT, or Search the instrument list by name or by ticker. There are also a variety of "Show" commands that allow you to revise the instrument selector to show only ticker symbols of some particular type of property. For example, "Show Custom Instruments" will cause the instrument selector to show user-defined custom instruments, "Show Intraday" will list only the instruments marked for intraday monitoring, and so on.

Note that whenever an instrument selector has the keyboard focus, pressing the Insert key has the same effect as choosing "Add New Symbol" from the + popup menu, i.e. a dialog box will prompt for a new ticker, one not yet known to the instrument selector.

Pixels Per Bar Override

Over the years, several users have expressed a desire to make bars or candles larger or smaller while keeping the pixels per bar setting constant. Some preferred more white space between bars/candles, while others preferred bars/candles that stand out more or even overlap a bit. Investor/RT has long had the ability to adjust the pixels per bar setting of any chart and thereby adjusting the size of the bars/candles. However, while increasing the size of the bar/candle, the space provided for that bar/candle is also increasing. This space provided to draw each bar/candle can be referred to as the existing "Pixels/Bar" option in chart preferences. Adjusting this setting automatically adjusts the size of the bar.

In this release, the user can specify the size of the space and the size of the bar/candle independently. This is done as follows: In the chart preferences (double-click in the horizontal scale), click on the "General" tab; note the "Pixels/Bar" option about half way down the page. Normally, the setting is a single number. In order to provide an override size for the bars or candles, enter a Pixels/Bar in the format "X:Y" (two values separated by a colon). X will represent the size/width of the space provided for each bar/candle, while Y will represent the actual size/width of the bar drawn. For instance, if you entered "20:10", each bar would be given a width of 20 pixels; however the bar/candle would be drawn 10 pixels wide, leaving the remaining 10 pixels between each bar/candle. Similarly, if you specified a Pixels/Bar of "10:20", the bars would actually overlap since the bars/candles are much larger than the space provided. The appearance resembles a deck of cards fanned out across the chart.

This new override Pixels/Bar number can be adjusted from the keyboard using the Shift-Up/Down Arrow keyboard combination (similar to how Up/Down Arrows adjust the normal Pixels/Bar). To turn off the override pixels/bar at any time, just open the chart preferences and enter a single number in the Pixels/Bar setting.

The Chart Button feature may also be used to create chart buttons that provide easy access to various pixel per bar settings in the new format. The button purpose "Change Pixels/Bar" will accept numbers of the format X:Y, either for individual push buttons or for menu buttons.

Version 7.4 Fixes, Miscellaneous Enhancements.

- A bug was fixed in the Synchronize D/W/M Database utility that was causing extra monthly bars to be added to the database in some cases. This utility function is not applicable to most Investor/RT users. It is used to synchronize daily historical data with the weekly and monthly historical data for those instruments for which separate weekly and monthly data are being maintained. The bug has been corrected. See What's New in Version 7.3 for more information on the Synchronize utility.
- Clicking the Setup Button in the RTL Setup window (scan case) was incorrectly marking the scan as having been modified when in fact nothing was changed in the setup. This bug has been corrected; the fix eliminates the "Save the Changes?" prompting message that was appearing needlessly when closing the RTL setup window.

- With a few exceptions, double-clicking on any editable cell in a quote page will now correctly select the entire text of the cell for editing. The exceptions are that some editable cells have special "double-click effects". For example, double-clicking on a ticker symbol cell has the effect of charting the instrument. Double-clicking on either the HiAlarm or LoAlarm cells will open the Setup: Alarms window for the instrument in that row. In particular, the double-click-to-select-all behavior will be useful when editing the values of V# or T# variables in a quote page. Simply double-click a V# cell to select the existing value then type the replacement value.
- Double-clicking on a non-editable custom column cell will now display the setup for the custom column. A "right-click" on any custom column cell, editable or not, will display the setup for the custom column. Macintosh clients using a single button mouse can control-click on a custom column cell to view the setup.
- The RTL SET function for V# and T# variables was not working properly when the V# or T# variable was "overridden" with an alternate ticker symbol. For example, the statement SET(V#99(IBM), 100) was being treated as SET(V#99, 100), thus the target instrument of the SET was not IBM, but the subject instrument itself. The same problem was present for SET statements where the user variable was overridden by @1, @2..., e.g. SET(V#99(@1), 1) should have set the V#99 value of the 1st component of the subject custom instrument to 1, instead it was setting the custom instrument's V#99 value to 1. This has been corrected now. The fix makes it possible to SET "global" instruments whose only purpose is to hold numbers or text strings of a global nature. For example, you could create a cash type instrument having the ticker symbol GLOBAL. Then you could run a scan looking for some technical condition of interest and tack on the statement "AND SET(V#1(GLOBAL), HITS)" to the scan formula. As the scan runs through each instrument, it updates the V#1 value for GLOBAL setting it to the number of instruments for which the scan is true. You can then display %V#1(GLOBAL) or make reference to the V#1(GLOBAL) hit count in other scans when you want something to happen based on the number of symbols found by the original scan.
- Tick data for intra-day marked instruments is staged to temporary files in the tickdata folder/directory. The tick data in these files is merged into the database during the Post History Process each day and the temporary files are deleted. Improvements have been made to assure that when the user deletes a ticker symbol, any tickdata file associated with the deleted symbol is also deleted. This was not being done in earlier versions of Investor/RT thus there is the possibility that old tick data files exist unused inside the tick data folder/directory for instruments no longer tracked, or perhaps instruments no longer marked for intraday monitoring. The Delete Temporary Files utility in the Control->Data Management menu has therefore been enhanced to remove any unused tickdata files from the tick data folder/directory.
- In traditional intra-day charts the toolbar button titled "Edit/Delete Tick/Bar Data" is used to call up the tick data for the bar you click on. A bug was fixed that caused Investor/RT to report no tickdata available when using this tool to edit the last bar or so of an intra-day chart. The bug was especially likely to surface in tick, tick bar or one minute charts.
- The QuotePage column name "Delay" is now reported for the Quote.com data service for each symbol indicating the number of minutes the quotes are delayed. A zero in this column means "realtime data". Formerly, this column only applied to the DTN.IQ data service.

- The DTN.IQ historical downloader, when used by the DTN Satellite version of Investor/RT was downloading intra-day data in some cases even when the periodicity of the chart was daily, weekly, or monthly. Intra-day downloads were not affected by this bug. Daily, weekly, monthly downloads now work properly.

Version 7.3 Rev 5, Released: August 23, 2004

New Database Utility: Synchronize DWM Database

The Control: Database Utilities menu has a new menu item for running the "Synchronize D/W/M Database" utility. This new utility function will be useful for those users who elect to keep separate weekly and/or monthly historical data on file. Our recommended historical retention preferences are to maintain only daily historical data. This way, all weekly or monthly historical charts or scans will use weekly or monthly historical bars manufactured from the same underlying daily historical data. Everything is consistent. Some users however, may wish, for example, to routinely do weekly or monthly analysis doing back say 10 to 20 years for thousands of stocks and do not have the requirement to look at daily charts for more than a few years back. If our recommended settings were followed, ten to 20 years of daily historical data would have to be maintained on the database in order to view monthly charts going back that far. Instead, the user may conserve disk storage space by keeping separate weekly and monthly historical data. In this scenario, the historical data retention preferences could be setup to keep only say 2 years of daily data, maybe 10 years of weekly data and 20 years of monthly data. The problem with keeping separate weekly and monthly database has been keeping everything synchronized. This new utility function does precisely that.

The new utility will look for instruments that have been marked for either weekly and/or monthly data retention and for each one it will take the daily data on file for these instruments, and assure that the period of time covered by this daily data is perfectly synchronized with the weekly and/or monthly bars for the same period. In effect, the utility generates the weekly or monthly bars from the daily data for this period of time and places (replaces) these bars into the weekly and/or monthly historical database. Thus for example, the user can download daily data for the last few weeks for instruments to bring them all up to date, then run this utility to update the weekly and/or monthly historical data to reflect the recently downloaded daily data. This eliminates the need to independently download weekly and monthly bars. Note that weekly or monthly data on file for the period of time preceding the daily historical data is not affected by this utility.

The Synchronize DWM Database utility can be scheduled to run as a "Database Function" action of a schedule. Thus you can schedule this function to run automatically each day after posting historical data. You can create a keyboard shortcut to run this utility by creating a schedule and setting up a Run Schedule function key shortcut.

Improved Intra-day/Daily Data Generator for Custom Instrument Pairs

The historical data generator for custom instruments has been improved. The improvements apply to generation of intra-day bars for custom instruments having two components, i.e. pairs. The

generator will now defer generation of intra-day bars until both component instruments have intra-day data for each session. For example, consider the pair IBM-CA. Say IBM has one minute bars beginning at 9:31 while CA's opening one minute bar does not occur until 9:33. The data generator will defer generating a one minute bar for the pair IBM-CA until it has a bar for both instruments for the session. Thus the first IBM-CA one minute bar in this example will be at 9:33; the open of this bar will be the 9:33 open of IBM minus the 9:33 open for CA. The technique used in earlier versions of Investor/RT did not consider session boundaries when generating intra-day data. It would generate bars for the pair even when the last known price for one of the two components was for an earlier session. This improvement will generate more accurate intra-day bars for the custom instrument, and these improved bars will be used in turn to generate higher quality daily bars for the custom instrument when daily generations are requested.

Pair Wizard Improvements

The Pair setup wizard window now has check boxes titled "Show Pair Chart" and "Add Pair to Quotepage". The checkboxes will appear checked or unchecked as you left them the last time you used the Pair Wizard. The Show Pair Chart checkbox controls whether a chart of the new pair will appear when you Save or "Save and Close". The Add Pair to Quotepage checkbox controls whether the new custom instrument (pair) ticker symbol will be added as a new row to the current (front) quotepage.

Custom Instrument Export and Import

When Exporting QuotePages that contain one or more custom instruments, Investor/RT will export additional definitional information so that the custom instruments can be setup automatically when importing the quotepage into another Investor/RT system.

Using Buttons to Add Instruments to a Chart

The button purpose "Change Instrument" can be used to add instruments to chart windows by prefixing the ticker symbol with a plus sign in the button setup. The plus sign may be used as a ticker suffix to request multi-linking. A "Change Instrument" push button with a setup of "INDU" will substitute INDU for the instrument currently in the chart. A setup of "INDU+" does the same but also substitutes INDU into all eligible multi-linked charts. This enhancement allows a setup of +INDU to add the instrument INDU to the existing chart. The INDU graph will be placed into a new pane and will have the same type (bar, line, candlestick) and periodicity as the existing instrument(s) in the chart. Note that you can create "menu buttons" that contain any of the variations. For example, you could create a three choice menu button with the setup "INDU,INDU+,+INDU". The three menu choices would substitute, multi-link, or add the ticker INDU, respectively.

Variable Ticker Symbol References in RTL

The RTL language enables any instrument property or historical token to be qualified by a ticker symbol. For example, when running a scan, the token CL refers to the closing price of the instrument being considered by the scan (the subject instrument), while the expression CL(\$INDU) refers to the current closing price of the instrument \$INDU. Such ticker symbol references are constant references, i.e. the CL(\$INDU) qualified token will refer to \$INDU for every symbol considered by the scan. Version 7.5.3 introduces a powerful new facility for specifying the ticker symbol qualifier as a variable that can differ depending on the subject instrument.

Variable ticker references are coded as an @ at-sign followed by a number from 1 to 32. For example the expression CL(@1) - CL.1(@1) uses the instrument variable @1 in two places. @1 refers to some instrument. This new feature works one of two ways, depending upon whether the subject instrument being considered by the RTL formula is a normal instrument or a custom instrument.

When the subject instrument of a scan, signal, or custom indicator is a custom instrument, the @n instrument references refer to the components of the custom instrument. @1 refers to the first component, @2 refers to the second component, etc. Thus you could run the following scan on the .Custom Instruments quotepage:

$$\text{CL}(@1) > \text{CL}.1(@1) \text{ AND } \text{CL}(@2) > \text{CL}.1(@2)$$

This scan will show you which custom instruments have both component 1 and component 2 rising in the current bar.

This facility is also available for use when using RTL formulas in scans, signals, and custom indicators for regular instruments (non-custom instruments). Since regular instruments do not have components, the @1, @2, ... references are resolved differently. They correspond to a ticker symbol stored in the corresponding T# text user variable for the subject instrument. @1 refers to the instrument whose ticker is in T#1, @2 refers to the instrument whose ticker is in T#2. Any of the 32 T# variables can be used to hold a ticker reference, e.g. CL(@32) refers to the closing price of the instrument whose ticker is stored in T#32. Notice that the RTL formula references to these @n instruments are not resolved until the scan is actually run or when the signal is evaluated during backtesting, or when a custom indicator is calculated in a chart. If the T# variable is not properly setup with a valid ticker symbol then Investor/RT will treat the token as an unqualified token, i.e. CL(@1) is the same as CL for any subject instrument whose T#1 does not contain a valid ticker symbol.

This feature may be useful in charting custom indicators that compare a stock's historical performance to an index. The index ticker for comparison might vary depending on the subject instrument. For example, the custom indicator (CL/CL(@1))*100 will compare the closing prices of any stock with some other instrument represented by @1. Each stock's T#1 variable would dictate the ticker to use in the comparison.

Another interesting use of this new facility is that @1, @2, through @32 are recognized as ticker symbol references by the MPD (Mixed Periodicity Data) Indicator. Thus you could setup an MPD to reference @1 and then control which mixed ticker is used by that MPD indicator by setting the T#1 value. If you use MPD in conjunction with custom instruments, @1 refers to the first component of the custom instrument associated with the MPD indicator.

Finally, a new token, MULT, has been added to the RTL language to enable RTL expressions to access the multipliers used in the setup of custom instruments. The MULT token must be qualified by an @n reference to be meaningful. For example, MULT(@1) will refer to the multiplier of the first component of the subject custom instrument, while MULT(@2) will refer to the multiplier of the second component and so on. If the subject instrument is not a custom instrument MULT(@1) thru MULT(@32) will refer to the numeric quantity stored as text in T# variables T#1 through T#32 respectively. The token MULT by itself without a qualifier will always have the value 1.0. Similarly, the token MULT qualified by an explicit ticker, e.g. MULT(IBM) will yield a value of 1.0.

Periodic Custom Column Recalculation

The "Calculation Tab" of the custom column setup window has been improved. When the recalculation frequency is expressed in minutes or seconds, the "Calculate Which Rows" option can be set to either "All Rows" or "Visible Rows". Prior to version 7.3.5, only visible rows were recalculated. When the "All Rows" option is specified, every ticker symbol in the quotepage will have its custom column value recalculated at the designated time interval, regardless of whether the ticker symbol is visible or not. When the Visible Rows option is used, only the ticker symbols whose rows are fully visible in the quotepage window will be recalculated. Note that partially visible rows may be present depending on the window size and these are not considered "visible". The new "All Rows" option is conceptually equivalent to running the custom columns RTL formula, like a scan, on the entire quotepage. If the custom column Calculation Tab specifies that the resulting value be set into a V# variable, this means that you can rely on the V# being updated for all ticker symbols in the quotepage at the designated recalculation frequency. When the "Visible Rows" option is specified, V# variables update only for the fully visible rows in the quotepage. This new option works in tandem with quotepage update frequency specified in the quotepage preferences, including the Dynamic updating option. For example, if the quotepage update frequency is every 2 seconds and the custom column update frequency is say every 5 seconds, the custom columns will be recalculated every 6 seconds since it takes six seconds for the custom column to be notified that 5 seconds have elapsed since the last recalculation. Dynamic updating of quotepages is not recommended for efficiency reasons, but if this option is used and there are actively updating tickers in the quotepage, then the custom columns will recalculate at the designated interval.

Point & Figure, TLB Calculation Using High, Low

A change has been made to the way data is processed for Point and Figure and Three Line Break charts/indicators when the "Use Highs and Lows" option is selected. In previous releases, the way that Investor/RT processes the data follows:

```

if (OP = CL) // Open and Close for the bar are equal
{
if (UP) process HI, LO, CL; // currently in an up column
else process LO, HI, CL; // currently in a down column
}
else // Open and Close are different
{
if (OP > CL) process HI, LO, CL; // currently in an up column
else process LO, HI, CL; // currently in a down column
}

```

The logic has been changed to the following:

```

if (UP) // currently in an up column
{
process HI;
if(HI did NOT produce any new X's)
process LO;
}
else // currently in a down column
{
process LO;
if(LO did NOT produce any new O's)
process HI;
}

```

In other words, only the high and low are considered (Close and Open are no longer involved). Also, at most, there can be only one column per bar (with old method, there was an outside chance of up to 3 columns being created in any single bar). If currently in an up column, check the high. If it created new X's (added to the height of the up column), we're done and move on to next bar. If not, we process the low and see if it caused a downward reversal. Similarly, if we're in a down column, we check the low. If it created new O's (added to the height of the down column), we are done and move on to next bar. If not, we process the high and see if it caused an upward reversal.

Fibonacci Time Zones Enhancements

A new checkbox labeled "More Zones" gives the user the ability to draw one or more zone lines in addition to the 8 zones that are currently available. The zones numbers are specified in the box below, and should be separated with either a space or a comma (eg. 89, 144, 233, etc). Each zone will be drawn in the color and thickness specified in the color control to the right of the checkbox.

Another new checkbox labeled "Label with Date/Time (instead of Zone)" has been added to the bottom of the Zone preferences window. When this option is checked, each zone vertical line is labeled with the date (if daily, weekly or monthly) or time (if intraday). When this option is

unchecked, zones lines will be labeled with the zone number, just as they have in the prior to this release.

Profile Indicator Enhancements

The Profile Indicator has been enhanced to allow Custom "Time Per Profiles" of "Every X Bars" and "Every X Days". Before this release, only "Last X Bars" and "Last X Days" were available. As an example, assume it's currently Friday, and a user would like to see a Profile (on a 30-minute chart) for Monday through Wednesday, then another Profile for Thursday and Friday. This can now be done by specifying a Custom "Time Per Profile" of "Every 3 Bars", along with setting the chart's Viewing Period to "Begin to Present" (beginning at the begin of session on Monday). It's important to pay attention to the "Viewing Period" when using these two new options, as they work closely together. These two options will start building the first profile on the first bar in the chart (the "Compute Last X Profiles" setting is ignored when these new options are used).

Version 7.3 Rev 5 Fixes, Miscellaneous Enhancements

- A bug was fixed that was causing the MPD indicator to report erroneous results for the last bar when initially opening tick/bar charts having a view period of "Last N Bars".
- The Post Session schedule action (under Database Functions) was mistakenly omitted from the list of schedule actions.
-

Export and Import of Chart Definitions prior to version 7.3.5 did not include the begin and end dates for chart view periods such as "Begin Date to Present" or "Begin Date to Ending Date". The chart export import feature has been improved in this release to include the begin/end dates so that the view period of the exported chart is now reproduced precisely when importing.

Custom Instruments, particularly pairs setup as spreads (differences) can often have open, high, low or last values that are negative. Negative values for open, high, or low in such instruments were being erroneously replaced with the current trade price during realtime updating of custom instrument charts. This has been corrected in version 7.3.5.

A bug was introduced in the Setup: Schedules window, improved recently to add "Dup" (duplicate) buttons for schedules and actions. Clicking the "Suspend All Schedules" button would mistakenly issue the "Duplicate" command as well and issue a prompt for the name of the new schedule. This has been corrected.

Versions of Investor/RT prior to 7.3.5 considered trading holidays that occurred within the last 30 days. This has been increased to 60 days, in particular to enable custom instrument daily (and intra-day) data generation to properly handle holiday dates when constructing historical data for pairs and other custom instruments. -----

In addition to its normal function, the "Delete Temporary Files" command in the Control Menu, will trim the Message Log to a smaller size, discarding older logged messages. Formerly, it was necessary to open the message log for viewing for this trimming to take place. For users who run Investor/RT to long periods of time without quitting, it is recommended that you schedule the Delete Temporary Files function to run automatically each day or so.

A bug was corrected in the POS indicator that adversely affected the calculated results for tick per bar periodicities when the "Seconds From Begin of Session" was requested.

There is a change in the behavior of Investor/RT when responding to double-clicking a ticker in a quotepage to open a specific named traditional chart. In Setup: Preferences: Charts: General, if the double-clicking option is set to either "Substitute..." or "Multi-Link" and there is no traditional chart window open already for substitution, Investor/RT will open the specific chart (NOT a copy of the specific chart). Note that any changes you make and save to the specific default chart will become your default chart settings. In the General Chart preferences, the first of the three double-clicking options has been re-titled "Open A Copy of "Default Chart" in a New Window" to make it clear that this option always opens a copy of the default chart name, not the actual default chart. If you choose the first of the three options you have to specifically open the default chart name using the Open: Chart menu or the Open Chart button on the main toolbar to open the original default chart to make changes to it.

The Cut and Clear commands in the Edit Menu are now supported in traditional chart windows. Cut (Ctrl-X) will copy the currently selected technical indicator to the clipboard and then delete the indicator from the chart. The Paste command can then be used to paste the indicator into another (or the same) chart if you wish. The Clear command will simply delete the selected indicator from the chart, i.e. Edit: Clear is equivalent to pressing the Delete key on the keyboard. Note that Cut and Clear are applicable only when a single technical indicator is selected in the chart window.

The traditional chart window "download" button in the lower right corner accepts a shift-click on the toggle button. A normal click initiates a download of historical data. The shift-click will force a recalculation of all indicators in the chart. Tapping the space bar is equivalent to clicking the Data Download button (when a chart is the front window). If you depress the shift key while tapping the spacebar, Investor/RT will recalculate all indicators and refresh the chart.

The spacebar has a different effect on the chart window when you are running a slideshow. The spacebar will advance the slideshow chart(s) to the next ticker symbol in the associated quotepage. The shift+spacebar will backup to the previous ticker, while ctrl+spacebar starts the slideshow over at the beginning with the first ticker of the associated quotepage.

Schedule actions for the initialize database functions no longer request a confirmation. so that these functions can be scheduled to run unattended. If you want a confirmation before executing such actions, include a Show Message action before the initialization action(s). When adding a Show Message Action, check the box titled "Schedule requires an OK to continue.". When the schedule is run, Investor/RT will prompt for OK or Cancel using your message text plus the words: "Press OK to

continue schedule ABC, where ABC is the schedule name. The Press OK... will not be appended to your message text if the Show Message action is the last action in the schedule. Press OK to continue running the remaining actions in the schedule. Press Cancel to skip the remaining actions.

QuotePage Export/Import was improved to handle the column highlight color and highlight state of each column.

Version 7.3 Rev 4, Released: August 5, 2004

New Conditional Operator Added to RTL

The RTL Language has been markedly improved by the addition of a new operator for conditional evaluation. The new operator is designed to allow formulas where one result is desired in some cases and another result in other cases. For example, suppose you want to write a custom indicator formula where the value of the custom indicator is the maximum close in 5 periods for bars that close higher than they opened, but for bars that close at or below their open, the value is to be the minimum close in 5 periods. This kind of conditional formula can be cleverly written as:

$$(CL > OP) * MAX(CL,5) + (CL <= OP) * MIN(CL, 5)$$

While this formula does do the job, it relies on the understanding that relational (true/false) expressions such as $(CL > OP)$ evaluate mathematically to 0.0 or 1.0 thus the multiplication by zero or one cancels out one part of the result and preserves the other. Another disadvantage of this technique is that it requires the comparison of the CL and OP twice, thus it is inefficient. In this example the two expressions that control the evaluation are $(CL > OP)$ vs. $(CL <= OP)$. This formulation is more error prone since you must take care to assure that all possible cases are covered. For example if you mistakenly wrote the formula as:

$$(CL > OP) * MAX(CL,5) + (CL < OP) * MIN(CL, 5)$$

the indicator would mistakenly evaluate to zero whenever the close equals the open since both $CL > OP$ and $CL < OP$ are false in that case and have a value of zero.

The new RTL "Conditional Operator" (the ? operator) addresses these concerns and allows conditional expressions to be written more succinctly, e.g.:

$$CL > OP ? MAX(CL,5) : MIN(CL,5)$$

The left operand of the ? operator is the conditional expression to be evaluated. The right side of the ? operator provides two alternatives (the "true" alternative, and the "false" alternative) separated by a colon. For custom indicators like this one, the expression $CL > OP$ is evaluated bar by bar; for each bar for which the expression is true, the first of the alternatives is the resulting value, otherwise the second alternative value is used.

The Conditional Operator can of course be used in scans and signals as well. For example:

```
SET(HIALARM, CL > MA ? MAX(MA,5) : MA )
```

This formula, run as a scan, will set the high price alarm level of the subject instruments conditionally, depending upon the relationship of the current price to some user-specified moving average. When the current price is above the moving average, the maximum value of that moving average during the preceding 5 periods is used to set the alarm, otherwise, the alarm is set to occur if price reaches or exceeds the moving average itself.

This formulation is equivalent to the more verbose "IF THEN ELSE" alternative:

```
IF (CL > MA) THEN SET(HIALARM, MAX(MA,5)) ELSE SET(HIALARM, MA)
```

In general, anywhere you want a numeric expression in RTL you can use a formulation of the form:

```
<conditional expression> ? <expressionA> : <expressionB>
```

where <conditional expression> is any RTL expression that can be evaluated as true or false, and the two alternative expressions are of arbitrary complexity. Unlike IF THEN ELSE, conditional expressions formed with ? and : can be nested. Be sure to use appropriate parentheses to guide the proper evaluation of more complex expressions. Here is an example of a nested conditional:

```
CL > OP ? MAX(CL,5) : ( CL < MID ? MIN(CL,5) : MIN(CL,3) )
```

This formula will compute the value of the indicator as MAX (CL,5) for each bar where CL > OP. For bars that close at or below the open, a second conditional evaluation occurs. For those bars, when the close is below the MID (the midpoint of the high-low range) the indicator result is MIN(CL,5), but closes above the midpoint of the range get MIN(CL,3).The entire expression above could be put into a scan that sets the value of a V# variable, i.e.

```
SET(V#33, CL > OP ? MAX(CL,5) : ( CL < MID ? MIN(CL,5) : MIN(CL,3) ) )
```

When formulating complex, possibly nested expressions such as this, use the "Check" button in the RTL setup window to review the evaluation steps Investor/RT will use when processing your formula. For the example above you will see something like this:

```
Parsing: CL > OP ? MAX(CL,5) : (CL < MID ? MIN(CL,5) : MIN(CL,3))
#1. Evaluate: T1=CL > OP
#2. Evaluate: T2=MAX(CL, 5)
#3. Evaluate: T3=CL < MID
#4. Evaluate: T4=MIN(CL, 5)
#5. Evaluate: T5=MIN(CL, 3)
#6. Evaluate: T6=T4 : T5
```

```
#7. Evaluate: T7=T3 ? T6
#8. Evaluate: T8=T2 : T7
#9. Result is: T9=T1 ? T8
```

If you review the steps carefully you can verify that each operator is paired with the right expressions as you intended. Use extra parentheses around your expressions both to improve readability and assure that your intent is clear.

The conditional operator also has some interesting uses when working with user text variables (T# variables). For example, the scan:

```
SET(T#1, CL >= MA ? "Above" : "Below")
```

will set the text variable T#1 to one of two strings depending on the expression $CL \geq MA$.

In a Signal employed in a trading system, it is sometimes desirable to include NOTE tokens in the signal formula to output textual data to the backtest detail report. Sometimes, different NOTE annotations are needed under different conditions. A conditional expression such as:

```
(POS_STATE = 0 ? NOTE_A : NOTE_B)
```

references two NOTE tokens with differing setups. When the trading system is out of the market (POS_STATE is zero) the NOTE_A annotation text will be output; NOTE_B will be output when the trading system is either long or short. Since a signal must be a true false expression, and since the conditional expression above is considered a numeric expression, you can append this expression to other signal criteria like this:

```
... AND (POS_STATE = 1 ? NOTE_A : NOTE_B) > 0
```

using AND to append it and adding the > 0 to make the appended expression a true false expression.

Setup Schedules: Duplicate Function for Schedules/Events

The Setup: Schedules window now has "Dup" (Duplicate) buttons for duplicating existing schedules, or duplicating events within a schedule. To make a duplicate of an existing schedule, first select the schedule name and click the "Dup" button under the schedule list. Investor/RT will prompt you to provide a name for the new schedule. The duplicated schedule will then appear at the bottom of the list of schedule. All actions of the originally selected schedule will be duplicated into the newly create schedule. This will enable you to easily take an existing schedule and make a copy of it before making revisions, or to server as a starting point for another new schedule. Similarly, any action within a schedule can be duplicated by selecting the action and clicking the "Dup" button under the action list. A duplicate copy of that action will then be added to the end of the existing list of actions for the

schedule. You may then edit the duplicated actions as needed. This new capability can take some of the tedium from the process of creating schedules with many of the same action types.

Import Export of a Layout

The new File: Export: Current Layout will create a text file containing definitions of all open exportable windows. These include all traditional chart windows, RTL setup windows, Trading System setup window, and QuotePage windows. The exported definition file will also contain all embedded RTL objects that are referenced by the open windows. This is a convenience function that enables the definitions of an entire workspace of charts, quotepages and RTL objects to be exported by one command. The exported file may be imported into another Investor/RT system using File: Import: Layout Definitions.

The Export Current Layout command will use the Import/Export Preferences to determine whether to prompt for the export file name or whether to display the resultant export text in a window after the export is complete. If the user elects not to be prompted for the export file name, the exported definitions will be saved in a file named layout.txt in the admin directory/folder.

Version 7.3 Rev 4 Fixes, Miscellaneous Enhancements

- The chart popup menu command, Export Data was improperly exporting indicator values as whole numbers in some cases. Investor/RT has been revised so that exported indicator data will use the display format of the instrument associated with the indicator except when the scale of the pane containing the indicator is using a "Custom Markings" display format (in which case that format is used).
- The Export command in the RTL Setup window will check the syntax of the RTL object before exporting the definition of the scan, signal, or custom indicator.
- The RTL tokens GL and GLPCT were not calculating properly for back tests of futures. This has been corrected.
- When using File: Import: Scan/Signal/CI to import an RTL object, the resulting RTL object will now be opened for viewing and/or editing after the import is completed. Note that only the main RTL object will be opened. For example, if you import a scan definition that references several other custom indicators or other scans, those subordinate RTL objects will be imported but only the "parent" scan will be opened for viewing.
- The Format Tab of the Custom Column Setup window has a new "Numeric Display Format" option for the custom column. Choosing "Instrument" from the list of formats will cause the resulting custom column to display its numeric value using the display format of the instrument in each row of the custom column.

Version 7.3 Rev 3, Released: July 27, 2004

Version 7.3 Rev 3 Fixes, Miscellaneous Enhancements

- When right-clicking (control-click on Macintosh) on a ticker symbol within an instrument selection list, the "Insert" item in the popup menu was inoperative. The Insert Menu item now prompts the user for a new ticker symbol to be added.
- The RTL rounding function ROU was rounding the subject number improperly when the number was negative. This has been corrected.
- The RTL statistic functions MIN, MAX, AVG, SUM, and STD now accept any arbitrary arithmetic expression as the second parameter indicating the period over which to do the statistic. For example MAX(HI, V#50 + 1) will take the current value of V#50, add one and use the resulting number as the number of periods to examine to find the maximum high price. Similarly MIN(CL, POS + 1) will give you the minimum close over N periods where N is determined by adding one to the result of the POS technical indicator.
- Chart annotation indicators, when attached to a specific date/time, were not visible in charts having tick or tick/bar periodicities. This has been corrected.
- Chart drawing tools for Trendlines, Parallel Trendlines, and Fibonacci Retracements were ineffective when drawing in panes containing only indicator(s). These tools now function properly in indicator-only panes.

Setup Schedules Window Enhancements

The Setup: Schedules window is now resizable. Resize this window vertically in order to see more schedule names and/or schedule actions at one time. The list of schedule names is now sorted alphabetically at startup, so you can effectively achieve control over the order of the schedule list by the way you assign schedule names. You can rename a schedule by selecting its name and clicking the Edit button beneath the schedule list. Edit the schedule name in the ensuing window and press OK. Note that newly created schedules are always added to the end of the schedule list at the left side of the window, and schedules will retain the same position in the list when they are renamed. However, when Investor/RT starts up the next time, the list of schedules will be sorted alphabetically by name.

If the Setup: Schedules window is resized, Investor/RT makes note of the new size. When you use the menu to open the Schedules window later, it will open at that same size. Investor/RT also keeps track of which schedule is selected so when you close and later reopen the Schedules window, that schedule and its associated actions will be selected.

The "New" button beneath the list of actions for a schedule is used to add a new action to a schedule. The ensuing "Add New Action" dialog box, by default, will open with the "Run Scan" action type selected and the list of available scans displayed. If instead, you first select an existing action in the list before clicking the New button, Investor/RT will open the "Add New Action..." window with that particular action as the starting point. This can make it more convenient when adding new actions. For example, suppose you have a schedule already setup that opens a few charts and you

wish to edit the schedule to add a few more "Open Chart..." actions. Click on one of the existing "Open Chart..." actions, then click the "New" button. The ensuing dialog box will appear with "Open Chart" already selected, so all you have to do is click to pick the chart name you want.

Enhanced Copy/Paste for Buttons, Technical Indicators

Chart Buttons do not lend themselves to the drag and drop feature that has long been used to copy indicators easily from one chart to another. This is because clicking on a button does not "select" the button as does a click on other indicators. For menu buttons, a click will popup a menu of user-specified choices; a click of a non-menu button will execute the button's purpose.

To address the need to easily copy a button from one chart to another Investor/RT 7.3 Rev 3 has an enhanced copy/paste facility. This is a general purpose facility, you can use standard copy/paste commands to copy and paste any single indicator from one chart window to another. When you "right-click" on a button, you will notice a new menu item "Copy this Button". When you choose this menu item, the button's definition will be copied to the "clipboard". You can then go to another chart window, right-click in a pane and choose "Paste".

You can even use this new facility to move buttons from one pane to another in the same chart. First you copy the button, then delete it from its original pane location (right-click on it and choose Delete...), then right-click in a different pane and choose Paste to add it there. If you have created a "Button Pane" at the top of the chart, however, all buttons added via the Add Button command will be added to that pane.

For other indicators, the Copy/Paste function works similarly. First you "select" an indicator by clicking on it, then use the Edit Menu's Copy command (shortcut Ctrl-C) to copy it, then activate another chart window and use the Edit Menu's Paste command (shortcut Ctrl-V) to paste the indicator into the chart. Various pop-up menus have been enhanced to add the Paste command. For example, you can right-click on any indicator and choose Copy from the indicator popup menu and you can right-click inside any chart and choose Paste from the Chart popup menu. Macintosh users will use Command-C and Command-V for copy/paste shortcuts, and Control-Click for right-clicking with a single-button mouse.

The Edit Menu's "Show Clipboard" command has been enhanced to show not only the "textual" content of the clipboard but also the indicator type and setup if there is an indicator on the clipboard.

When an indicator (other than a button) is pasted into a chart, it is selected. This means you can immediately press the enter/return key to "edit" the indicator's settings, or press the Delete key to remove the indicator from the chart if you wish.

Quote Page Statistics (QSTAT) Enhancement

The Quote Page Statistics indicator has a new statistic named "Percent True". This statistic is used in conjunction with the Signal Marker (SIGNAL) indicator to measure for each bar the percentage of the quote page's instruments for which the specified signal is true. For example, you could setup a Signal Marker preset that references the signal "CL > MA" where MA is the 200 period moving average. The QSTAT indicator setup to reference this signal with the Percent True statistic, will draw a line in a chart showing bar for bar, the percentage of the instruments in the specified quote page trading above their 200 period moving average.

Version 7.3 Rev 2, Released: July 15, 2004

Rev 2 Fixes, Miscellaneous Enhancements

- The MPD improvements introduced in version 7.3 Rev 1 have dramatically reduced the processing overhead of this powerful indicator. However, the faster MPD was in some cases loading insufficient data, e.g. when the MPD indicator was nested inside some other indicator, such as a moving average of an MPD. This has been corrected.
- The Times and Sales preference for multi-link color was not being honored when opening Time and Sales windows via layouts or otherwise. This has been corrected.
- Then using the Time and Sales Preferences window to edit the preferences of an open Time and Sales window, clicking either the "Save as Default" or the "Apply" button would have the effect of bringing the actual Time and Sales window to the front, thereby partially, or perhaps entirely, covering the preferences window itself. This has been corrected so that the preferences window will remain the top most window after an "Apply" or "Save as Default".
- A minor flaw in the Setup: Preferences: User Variables window was fixed. When clicking on various V# variables in the list, the title of the display format menu was not reflecting the correct number of the V# variable selected.
- Improved documentation for running multiple Investor/RT databases was added to the built-in help. To review this help topic, open Setup: Preferences: Database and press F1 (or click the help button). If you have web-based help enabled, Ctrl-click the Help button on the main toolbar to access this built-in help topic (Macintosh users: option-click).
- When the CI token is used in a scan/signal/custom indicator and the preferences for the CI token are accessed, Investor/RT was incorrectly hiding the "Edit" button. The Edit button is now visible so you can click it to inspect the details of the custom indicator setup.

Import Current Data Improvement

The Import function "Current Quotes/Other Data" can now accept an import format that does not include the "Ticker". When such an import is performed, Investor/RT checks the name of the file that is being imported and tries to determine if the file's name begins with a known ticker symbol. If so, the data in the file is imported into that ticker's designated fields (the data items specified in the format). This kind of import function can also be automated via a schedule using the schedule action

"Import Current Data". This new feature would typically be used to import data into V# or T# variables for some symbol from a single line input file produced by another program.

For example, NinjaTrader, a trade automation software product that works with Interactive Brokers and other brokerage services, produces a "feedback" file when a trade is placed. The feedback file's name begins with the ticker symbol involved and the contents of the file contain various fields of text and numeric data, including the trade price, size of position, etc. This new import feature can be used to import such data into Investor/RT so that running signals or trading system indicators can be aware of the status of the position for any ticker symbol.

Version 7.3 Revision 1, Released July 12, 2004

RTL User Text Variables

The RTL language has been extended to include user text variables that hold up to 30 characters of textual information. Each ticker symbol tracked by Investor/RT has its own set of 32 textual values. The RTL token names for these variables are T#1, T#2, ... T#32, analogous to the nomenclature for numeric V# variables. Like V#'s, any T# variable may be displayed in a quote page and may be included in a quote page format. When a T# column is present in a quote page, the cells in that column may be edited manually or updated with copy/paste operations, just as V# numeric values for any ticker symbol are adjusted in a quote page.

The 32 T# values for each ticker are retained in the Investor/RT database. The Import feature of Investor/RT supports importing of textual content into any of the 32 T# variables. Simply setup a quote page format that specifies the arrangement of the tab delimited data items in the incoming file and use the "Current Quotes/Other" import type to bring external ticker-specific textual data into one or more T# variables.

The RTL SET function can be used to clear or update the contents of any T# variable. For example, the following command in a scan:

```
SET(T#32, CLEAR)
```

will clear the text from T#32 for each instrument scanned. Setting can be conditional of course:

```
IF (BUYSIGNAL) THEN SET(T#11, "Buy Now!") ELSE SET(T#11, CLEAR);
```

Since T# variables can be used in chart annotations, you could, for example, have a chart annotation setup as "%TICKER at %CL %T#11". Thus the annotation will normally display just the ticker and current price but when T#11 is SET to "Buy Now", the annotation will update, showing that text in the chart window. Similarly, %T# tokens can be used in Signal Action message formats or in Chat Room or Email Alert message formats.

The SET command can not only be used to set a string constant into a T# variable (e.g. SET(T#1, "Hello")). The "string" can in fact be a message formatted with %RTL tokens, as in:

```
SET(V#1, MA) AND SET(T#20, "Buy %TICKER Below %V#1")
```

The moving average MA is first calculated, then the string "Buy %TICKER Below %V#1" is composed into something like "Buy AAPL Below 29.50" and this resultant string is set into the T#1 variable for display elsewhere in quotepages or annotations. You can even compose text from one or more T# variables:

```
SET(T#5, "%T#3 %T#4");
```

If, for a particular ticker symbol, T#3 is "hello" and T#4 is "world", this RTL formula will set T#5 to "hello world". If the resultant text is too long, it will be truncated to 30 characters by the SET operation.

The Setup: Preferences: User Variables window has been enhanced to include both V# and T# variables. Use this window to assign a quotepage column title for each T# variable to indicate its purpose.

The RTL Setup Window will show the current title for each T# (or V#) variable in the list of RTL tokens at the upper right of the window. If you right-click or double-click on a V# or T# token in this list, Investor/RT will open up the User Variable Preferences window, showing the setup for that particular V# or T# so you can conveniently enter a title and press OK. The RTL Setup window will then be updated to show the revised title.

T# variables can be scanned using character pattern matching, just as any other textual data token (such as USERDATA, or NAME). For example, the scan formula T#5 = "BUY*" will list all instruments whose T#5 value begins with the three letters BUY. The asterisk matches any string of zero or more characters while the ? will match any signal character. For example, T#5 = "*BUY*" will find instruments having BUY anywhere in their T#5 string. The pattern "?B??" will match a T# string having exactly 4 characters with the second character of the 4 being a B.

T# variables can be added directly to quotepage like any built-in column, or you can add a T# variable using a Custom Column if you wish to have more control over the color presentation of the text in quotepage cells. When a custom column references a built-in T# column, remember that the only "rule" type that you can use for text variables in the "Matches Text Pattern" rule. When you SET T# variables you can set a color code of some kind into the text that in turn is detected by the custom column and used to control the background/text color of the custom column cells. Here is a simple example. Consider a scan that runs periodically (the scan could run standalone, or the scan might be invoked by another custom column for that matter. Here is the scan formula:

```
IF (SET(V#1, MA) && CL > MA) THEN SET(T#1, "CL above %V#1")  
ELSE SET(T#1, "CL below %V#1")
```

The custom column for T#1 could have two rules, the first one is a "Matches Pattern" rule with pattern text set to **above**, i.e. any string containing the word above, with an associated color combination of white text on green background. The second rule would match for pattern **below** and when true the text will display in white text on red background.

MPD Performance Enhancement

The Mixed Periodicity Data (MPD) Indicator is one of, perhaps the, the most powerful tools in the comprehensive library of indicators offered by Investor/RT. When used in intra-day charts, especially those where tick and tick per bar periodicities are used either in the chart or in the MPD setup itself, the loading of such intra-day data prior to MPD calculation is especially burdensome on the computer's processor. This is especially true when the user is maintaining many days of tick data, or when dealing with huge numbers of ticks for the current session for very actively traded stocks for futures. When the MPD indicator is used in a chart that has a view period of "Last N Bars" or "Last N Hours" or "Last N Days", or even "begin to Present", Investor/RT 7.3.1 will fetch the bar data needed for MPD calculation from the most recent ticks working backwards until sufficient data is retrieved. This is especially efficient for recalculations in realtime since typically, only the last few bars are needed.

New RTL Token, DELAY, for use in HTTP Commands

Signal actions can be setup to issue http commands via your web browser. This feature can be employed to send http messages to AutoTrader software for issuing trading orders to Interactive Brokers. The new DELAY token can be included (as %DELAY) in the http command line to cause a small time delay before the http command is sent. This can be useful, perhaps necessary, when placing several consecutive orders using this facility. Then token %DELAY introduces a delay of one second. If DELAY is followed immediately by a numeric digit, e.g. %DELAY5, the number specifies the number of quarter seconds to delay, 5/4 or 1.25 seconds in this example. Similarly %DELAY2 will delay 2/4 or half a second. The %DELAY[n] token in the command line is removed before sending the resulting command line to the web browser.

New Drawing Option for Price Bands Indicator

A new "Style" option has been added to the Price Bands indicator called "Open Close Bar". This style is similar to the "Thin Line" and "Thick Line" options in that it take two custom indicators, and draws a vertical line (thin) between the two custom indicators (Price 1 and Price 2). Actually, this style is exactly like the "Thin Line" option with one addition. It draws a small line protruding from the left of the vertical line at Price 1 (representing the "open" price), and it draws a small line protruding to the right at Price 2 (representing the "close" price).

New RTL Function: PNZ (Test for Positive/Negative/Zero)

PNZ is an arithmetic function in the RTL language. It takes an arbitrary expression as its single parameter and it determines whether the expression is above, equal, or below zero, returning the result +1, 0, or -1 respectively. For example the custom indicator formula:

$$\text{PNZ}(\text{CL} - \text{MA_A}) + \text{PNZ}(\text{CL} - \text{MA_B})$$

will evaluate to +2 when CL is above both moving averages, or -2 when CL is below both moving averages, or +1 if the CL were above one MA and below the other. Note that:

$$\text{PNZ}(\text{expression1}) * (\text{expression1})$$

is arithmetically the same as ABS(expression1), the absolute value.

More complex conditional setting of variables can be done with greater brevity. For example, the scan:

```
IF V#27>0 THEN SET(V#28, exp1 - exp2 ) ELSE SET(V#28, exp2 - exp1);
```

can be expressed more simply as:

```
SET(V#28, PNZ(V#27) * (exp1 - exp2) );
```

There is a subtle difference between the two examples however. When V#27 is equal to zero, V#28 is set to exp2 - exp1 in the IF THEN ELSE example, while V#28 will be set to zero in the PNZ example.

User Variable Display Format Improvement

The Setup: Preferences: User Variables window now provides a new display format for user V# variables, called "Instrument" format. Instead of a fixed format for the user variable, any user variable can now be setup to use instead the display format of its associated instrument. When a V# variable has this format, the numeric values displayed in the quote page column for that V# will be shown using the price format of the instrument for each row. Chart annotations that include %V#n in the annotation text will similarly display V# values using the instrument display format of the instrument associated with the annotation. During backtesting the Show and Note command output will be similarly affected for V# variables setup this way.

Signal Actions and User Text Variables

A "Text to T#" checkbox in the Signal Action setup can be used to set the user designated text into a particular T# variable when the signal action triggers. Note that only the first 30 characters of the text will be set into the T# variable. This feature may be useful in updating chart annotations that use %T#n when signals trigger in charts for example.

Version 7.3, Released June 23, 2004

Major Enhancement: Three New Intraday Periodicities

Investor/RT now supports three new intraday periodicities. Unlike time interval bars where bars are formed over a fixed period of time, or tick bars where bars are formed to include a fixed number of trades, the new periodicities allow the Investor/RT user to monitor intraday bars where each bar represents:

- a fixed range of price movement.
- a fixed change in price since the opening price of the bar.
- a fixed amount of trading volume.

We will refer to the new periodicities as Range Bars, Change Bars, or Volume Bars. Range Bars are completed when the high minus the low price of the bar exceeds some threshold value. Change bars complete when the absolute distance between the current trade price and the open exceeds some threshold. Finally, volume bars complete when the accumulated trading volume since the bar began exceeds some threshold.

The new intraday periodicities can be used throughout Investor/RT, in charts of all kinds, even in backtesting, scanning, custom columns, etc. Technical analysis using built-in or custom indicators can be applied to range bars, change bars, and volume bars just like any other periodic data. The standard Periodicity Control that you click on to open the periodicity selection window, includes choices for the new intraday periodicities. Select the periodicity type you want and enter the threshold range, change or volume in the space provided.

The Button indicator has been enhanced to provide convenient switching among the new periodicities. For example, a menu button with the setup string, ".25R, .15C, 1000V" will provide a menu for switching among a .25 Range Bar, a .15 Change Bar, or a 1000 Volume Bar periodicity in the chart window.

DTN Satellite - DTN.IQ Integration

This major enhancement was introduced for testing in a revision to the 7.2 release. We repeat it here due to its importance. Investor/RT is the first software product to support dual usage of DTN.IQ for historical data access while simultaneously monitoring real-time market data using a DTN Satellite data feed. DTN.IQ historical server support is now a standard feature of the DTN version of Investor/RT for those users who have both a DTN satellite receiver and a DTN.IQ account with Internet access. In the DTN menu, choose Setup and enter your DTN.IQ user id and pin number in the spaces provided. DTN users may then use the Data Download window, or simply click the data download button in any chart window to retrieval daily or intraday historical data for any ticker symbol or quote page of ticker symbols. Users with dual DTN Satellite/DTN.IQ accounts also have the

flexibility to use the Reconfigure command in the File Menu, to run Investor/RT with DTN.IQ as the source for both realtime data flow as well as historical data access.

New Keyboard Shortcut for Marking Intraday

A new keyboard shortcut is available in the Setup: Preferences: Keyboard Shortcut window. The selection "Mark for Intraday" is located at the end of the list of Toolbar / Chart actions. The effect of this shortcut is to mark any instrument(s) in the front chart window for intraday monitoring. For example, if you setup F2 as "Mark for Intraday" and you open an intraday chart of IBM and see a warning in the chart window title saying "NOT MARKED INTRADAY!", you can then press F2 to mark IBM for intraday monitoring. The warning in the chart window title will disappear. Since Chart Buttons can invoke keyboard shortcuts also, you may use this new feature to create a "Mark Intraday" button in chart windows if desired.

New Drawing Options for Custom Indicators

In the preferences for the "Custom Indicator" indicator, there are three choices for how zero values are to be handled during the drawing of the indicator. The Connect All Values option simply means to draw the indicator line without any special consideration for zero values. The Connect Non-Zero Values option is equivalent to the option in earlier versions of Investor/RT for "When Drawing, Ignore Zero Values". This option results in drawing the indicator as if the zero values were not present at all, i.e. all non-zero values are connected by a line, the line being flat over periods of time when the indicator is zero. The third option, "Connect Consecutive Non-Zero Values", is new. It calls for the custom indicator drawing to be suppressed during periods when the indicator is zero, i.e. only consecutive non-zero values are connected. Consider for example the custom indicator $MA * (CL \geq MA)$, where MA is some moving average. This indicator will have the value zero during periods that the close of the bar is below the moving average; otherwise the indicator value is simply the MA itself. If you put this custom indicator into a chart pane by itself using the new (third) drawing option, the line will be visible only during periods that $CL \geq MA$. If you add the same moving average to the same pane directly using a different line drawing color, the overlaying effect of the MA and custom indicator will give you a two-color line effect with the MA values filling in the periods of time when $CL < MA$. A more detailed tutorial on utilizing this new drawing option to, in effect, provide a "PaintBars" feature for custom indicators is on the Linn Software web site at:

<http://www.linnsoft.com/tutorials/paintingLines.htm>

Slide Show Enhanced: Point & Figure, TLB, Renko Charts. Point and Figure, Three Line Break, and Renko Charts are now eligible for inclusion in the Investor/RT slide show feature.

For single chart slideshows, first open the PNF, TLB, or Renko chart, establishing it as the front chart window. Then open the quotepage containing the list of ticker symbols to use and initiate the slide show from the quotepage toolbar. A slideshow button will be added to the toolbar for these three

chart types in a future release. The new chart types may also be used in multi-chart slide shows in similar fashion.

New Schedule Action: Post Session

A new schedule action, Post Session, is now available as a "Database Function". The older Post History schedule action will perform posting of current data to the daily historical database for all sessions that have a posting time, but it will NOT post those sessions that have been setup for manual posting only. The new schedule action Post Session, allows finer control over which session(s) are to be posted via the schedule and also allows users who have manual posting setup for a session, to post such sessions(s) via a schedule.

Version 7.3 Fixes, Miscellaneous Enhancements.

- Traditional Chart view period settings that specify a starting time are now rounded down to the nearest minute. In prior versions, Investor/RT would round the time down to the nearest 5 minute multiple.
- Several bugs were corrected in the MetaStock importing functions of Investor/RT. Specifically, users of 3rd party data services that provide daily data in MetaStock format will now be able to import reliably.
- Enhancement 17 in Version 7.2, "RTL Numeric Comparisons Revised" outlines the rationale for a new method of doing arithmetic comparisons in RTL. The implementation of the new method was improved (fixed) and is no longer based on the display format of the instrument being evaluated. The revised method will more properly compensate for rounding errors introduced in mathematical computations in RTL.
- A bug was fixed in the computation of the Donchian Channels indicator.
- When editing the view period preferences for an open chart, changing the view period from "Last N Bars" to either "Begin to Present" or "Begin to End" would result in a re-display of the Last N Bars, rather than honoring the new beginning and ending date/time frame specified by the user. This bug has been fixed.
- Mouse feedback in pane titles and Info Box indicators reported the wrong date in monthly charts, a holiday related bug related to a trading holiday occurring on the last day of the month (U.S Memorial Day). The chart itself showed all bars correctly; indicator calculations were unaffected. This minor date display bug is fixed in version 7.3 monthly charts.
- Tick Bar charts forming in real-time were not accumulating incoming ticks while the tick bar chart was scrolled back in time. This serious bug is fixed in 7.3.
- The Profile technical indicator was enhanced to use the display format of the associated instrument when drawing price value labels in the chart.
- When downloading or importing Daily historical data for an instrument assigned to an overnight trading session, Investor/RT was mistakenly ignoring the daily bar for the current day. The current day's bar will now be accepted so long as the current time of day is AFTER the session ending time.

- When a user-defined Format containing one or more Custom Columns is used by a scan, and the scan produces (saves) a quote page using a name different than the name of the scan, Investor/RT was mistakenly substituting the "Ticker" column for each custom column in the resulting quote page. This has been corrected.
- The eSignal version was enhanced to show interim progress of large tick data downloads in the status message area of the main toolbar. The progress messages also appear in the message log.
- The myTrack version was improved in Rev 1 to support the Forex security type including intra-day and daily historical data downloads for instruments having Forex as the security type, e.g. ticker symbol USDJPY.
- A minor Automatic Scaling bug was fixed in Rev 1 so that the first visible bar of a tickbar chart would be fully visible (within the scale) if it happened to be at the extreme high or low of the visible bars in the chart.

Version 7.2 Revision 4 – Released in June, 2004

7.2 Rev 4 Fixes and Miscellaneous Enhancements.

- Traditional Chart view period settings that specify a starting time are now rounded down to the nearest minute. In prior versions, Investor/RT would round the time down to the nearest 5 minute multiple.
- Several bugs were corrected in the Metastock importing functions of Investor/RT. Specifically, users of 3rd party data services that provide daily data in Metastock format will now be able to import reliably.
- Enhancement "RTL Numeric Comparisons Revised " in Version 7.2, outlines the rationale for a new method of doing arithmetic comparisons in RTL. The implementation of the new method was improved/fixed and is no longer based on the display format of the instrument being evaluated. The revised method will more properly compensate for rounding errors introduced in mathematical computations in RTL.
- A bug was fixed in the computation of the Donchian Channels indicator.
- When editing the view period preferences for an open chart, changing the view period from "Last N Bars" to either "Begin to Present" or "Begin to End" would result in a re-display of the Last N Bars, rather than honoring the new beginning and ending date/time frame specified by the user. This bug has been fixed.

Version 7.2.3, Released May 28, 2004

DTN Satellite - DTN.IQ Integration.

Investor/RT is the first software product to support dual usage of DTN.IQ for historical data access while simultaneously monitoring real-time market data using a DTN Satellite data feed. DTN.IQ historical server support is now a standard feature of the DTN version of Investor/RT for those users who have both a DTN satellite receiver and a DTN.IQ account with Internet access. In the DTN menu, choose Setup and enter your DTN.IQ user id and pin number in the spaces provided. DTN users may

then use the Data Download window, or simply click the data download button in any chart window to retrieval daily or intra-day historical data for any ticker symbol or quote page of ticker symbols. Users with dual DTN Satellite/DTN.IQ accounts also have the flexibility to use the Reconfigure command in the File Menu, to run Investor/RT with DTN.IQ as the source for both realtime data flow as well as historical data access.

Custom Column Enhancement

When a custom column is setup to place its calculated result into a user variable, there is a new option for tracking that V# user variable historically. In the "Calculation" tab of the custom column setup window, check the box titled "Track User Variable Historically". In addition, the user must setup "Cash" type ticker symbols (instruments) of the form:

<ticker>(V#n) for each ticker whose V# values are to be tracked.

As a simple example, suppose you have a quote page containing MSFT, INTC, and AAPL along with a custom column setup to calculate some custom indicator and store the value in V#99 and track the user variable historically. The ticker symbols MSFT(V#99), INTC(V#99), and AAPL(V#99) can then be setup to hold the historical values of V#99 throughout the trading session. Note that the quote page may contain many more symbols, but Investor/RT will record the data for those tickers for which the <ticker>(V#99) ticker is defined.

Multi-Session Session Statistics

The Session Statistics indicator has been enhanced with a new "Multi-Session Statistic" option. When this option is checked, the user has 5 multi-session statistical results to choose from, including "Average of X Sessions", "Sum of X Sessions", "Max of X Sessions", "Min of X Sessions", and "Value X Sessions Back". These options work on top of the session statistic result chosen above ("Range of Price (Close) of First 30 Minutes", "Lowest Price of First 10 Bars", etc.). The user must also be given a place to provide the value of "X". As an example, if a Session Statistic of "Range of Price (Close) of First 30 Minutes" is chosen, and the "Multi-Session Statistic" option is checked, and the value provided for X is 5, the 5 options would provide the results below. Let's further assume that the ranges over the past 5 sessions (starting with most recent) were 2.50, 1.25, 1.50, 0.75, and 1.00.

Average of X Sessions - This would give you the average range of the first 30 minutes of each session, over the last 5 sessions. In the example above, the result would be $(2.50 + 1.50 + 1.75 + 0.75 + 1.00) / 5 = 1.50$

Sum of X Sessions - This would give you the sum of the ranges of the first 30 minutes of each session, over the last 5 sessions. In the example above, the result would be $(2.50 + 1.50 + 1.75 + 0.75 + 1.00) = 7.50$

Max of X Sessions - This would give you the maximum range of the first 30 minutes of each session, over the last 5 sessions. In the example above, the result would be 2.50.

Min of X Sessions - This would give you the minimum range of the first 30 minutes of each session, over the last 5 sessions. In the example above, the result would be 0.75.

Value X Sessions Back - This would give you the average range of the first 30 minutes of each session, over the last 5 sessions. In the example above, the result would actually be the range of the session prior to these 5 sessions (5 sessions back from the current session).

Price/Time Profile: New Features

Several features have been added to the Price/Time Profile charts. First, an option has been added that gives the user the ability to provide a "Row Height Range" in pixels. This range controls the minimum and maximum height of each row of letters (or blocks). These settings can also now be controlled directly from the keyboard, thereby simulating a "zooming" effect. Use the "Shift-Up" combination to zoom in, and the "Shift-Down" combination to zoom out. Using the up and down arrows alone continue to "scroll" the chart vertically. Also, each row can now be as small as 2 pixels high, allowing the user to fit much more vertically in the chart window. In order to achieve or prevent the rows from becoming this small, adjust the lower limit of the "Row Height Range".

An option was added to "Draw Blocks" as opposed to letters. This can be an effective option when combined with the "Rainbow" color, or the "Shading" option. Also, when the "Draw Blocks" option is checked, a "Block Width" setting is honored which controls the width (in pixels) of each block. This, in effect, gives the user a horizontal zooming capability to go along with the new vertical zooming discussed above. The Block Width can be adjusted directly from the keyboard using the "Ctrl-Up Arrow" (zoom in) or "Ctrl-Down Arrow" (zoom out) combinations.

Backtest Default Charting

When performing a backtest of a trading system named X, if the "Account Balance Chart" checkbox is checked in the backtest setup, a chart of the trading system ticker \$X is produced. Users who wish to customize the account balance chart in various ways can do so by revising the chart then right-clicking in the chart and issuing the Save As Default Chart command, thereby saving the customized version of the chart as the default for the ticker \$X. In the list of chart names, this chart will appear near the top, having a name of the form <\$X Chart> where \$X is the ticker symbol of the trading system, X being the name of the trading system. Whenever the trading system named X is backtested, this default chart for \$X will be shown at the conclusion of the backtest.

If the user has many different trading systems and wishes to customize the chart produced individually for each one, this technique enables such flexibility. However, if you want to have a single chart template that is used for all trading system account balance charts, there is now a method for accomplishing this without having to duplicate the same chart template over and over for each trading system. When producing a backtest account balance chart, Investor/RT now looks first to see if the particular trading system has a default chart and if so it uses it. For example if backtesting a trading system named MySystem, Investor/RT will first look for a chart named "<\$MySystem Chart>" and open that chart if it is defined. If the default chart for the specific trading

system is not found, Investor/RT will look to see if there is a "global default" for all trading systems, looking up the chart name "<Backtest Chart>". If this chart template is found, it will be used. The particular trading system ticker will be inserted into this chart. If neither the system-specific nor default backtesting chart is found, Investor/RT will create a simple chart of the trading system ticker.

7.2 Rev 3 Fixes and Miscellaneous Enhancements

A problem was reported with the RTL formula $\text{MAX}(\text{CCI}, \text{POS})$ where POS is the token for the "Position" technical indicator, setup to provide the position of each bar relative to the start of the session. The problem was that statistical tokens (MAX, MIN, AVG, STD, etc.) in RTL require either a numeric constant or a user variable as the second parameter, the parameter that specifies the number of bars to use in the MAX calculation. POS is a technical indicator thus the expression $\text{MAX}(\text{CCI}, \text{POS})$ could not be evaluated at all. This has been fixed by enhancing RTL so that a technical indicator can now be specified as the second parameter, the POS indicator being especially useful. For example, a signal marker indicator with the signal:

$\text{CCI} = \text{MAX}(\text{CCI}, \text{POS});$

with POS setup as "Bars From Start of Session", will mark every bar in the chart at which the CCI value makes a new high for the session.

- RTL generally supports the application of one indicator to another. For example, $\text{RAWK}(\text{CCI})$ will compute a raw stochastic of the CCI indicator. Internally, Investor/RT takes the CCI results and sets up the CCI data to look like an "instrument" so that the RAWK indicator can compute the stochastic of this "instrument" (the CCI). This works fine for RAWK and most other indicators but some indicators, e.g. the new SESST indicator were failing because the "instrument" was not fully setup with all session related information needed for the indicator. For example the custom indicator $\text{SESST}(\text{CCI})$ needs to know the session hours of the CCI data being operated upon but due to this bug, the session information was not being supplied, thus the indicator failed. This bug has been corrected now, so for example, if SESST is setup as the "Highest Price of the 1st 30 bars", $\text{SESSION}(\text{CCI})$ will compute the maximum CCI value obtained during the first 30 bars of session in the chart.
- The STAT technical indicator was erroneously limiting the number of bars or minutes in the user specified setup to 1440 (the number of one minute bars in a 24-hour period). This limitation has been removed.
- When a trading system is being optimized and the trading system contains rules that employ SHOW or NOTE commands, the optimization process was unnecessarily incurring most of the overhead of the SHOW and NOTE commands even though the SHOW or NOTE output is disabled during optimization. SHOW and NOTE commands are now ignored more quickly during the optimization process, resulting in faster optimization runs.

- If a user, unlicensed to use the trading system optimization feature, attempts to run an optimization using any ticker symbol other than \$DEMO, Investor/RT 7.2.2 and earlier would issue a fatal error and terminate. This has been corrected. Investor/RT is programmed to allow users to evaluate and experiment with unlicensed advanced features using the \$DEMO ticker, and will ignore requests to optimize when real ticker symbols are involved. The optimization report now includes messages about licensing the optimization feature when an unlicensed user performs an optimization run.
- Investor/RT has an internal limit on the number of scans, signals, and custom indicators that may be created. The limits are 500 scans, 1000 signals, and 1000 custom indicators. The limits are arbitrary; they have to do with the number of menu items we have allotted to each type of RTL object. The Investor/RT database can hold any number, but the size of Investor/RT menus have a fixed limit. Based on customer needs, these limits can be increased in the future if necessary. Version 7.2.2 and earlier versions of Investor/RT were not properly enforcing the limits, however. If more than 500 scans were created, Investor/RT would terminate with a fatal error. Subsequent startup attempts would also result in a fatal error as Investor/RT attempted to add the 501 scan names to a menu limited to 500 entries. This bug has now been fixed and appropriate messages are issued if the user attempts to exceed the 500 limit.
- When a ticker tape window is saved as part of a layout, the font family and font size, but not the font style (bold, italic, etc.), of the ticker tape display was being saved in the layout. Thus if a ticker tape originally having a bold font appears when the layout is opened later, the font will revert to the plain style. This has been corrected so that layouts retain the style of the font also. Note that existing layouts containing ticker tapes will have to be saved again if you want the ticker tape to open with a style other than plain.
- Export and Import of Chart Definitions were not including the "multilink" color preference. Charts exported by 7.2.3 and higher now include the multi-link color setting for the chart. If the multi-link color preference is present in a chart definition, version 7.2.3 will import it. If 7.2.3 imports a chart definition exported by 7.2.2 or earlier, the multilink color setting will default to "white", meaning that the chart is eligible to participate in all multi-linking actions.
- A minor bug was fixed having to do with the data feed "heartbeat" icon showing the red X even when the data feed reception was active. This condition could occur if the data feed connection was dropped and then reestablished.

Version 7.2 Revision 2, Released May 17, 2004

Traditional Chart Scroll Bar Improvements

Normally, when you click the left or right arrow icons within the traditional chart window's scrollbar, Investor/RT will scroll the chart one bar to the left or right. Investor/RT now recognizes the shift and ctrl keys (shift and option keys on Macintosh) and modifies the scrolling amount as follows:

- shift alone: scrolls 5 bars at a time per click.
- ctrl alone: scrolls 10 bars at a time per click.(option key on Macintosh)
- shift + ctrl: scrolls 20 bars at time per click.

Note that this behavior only applies to mouse clicks on the left or right arrow icons at either end of the traditional chart scrollbar. The left and right arrow keys on the keyboard can also be used to scroll the chart left or right. You may not use shift or ctrl with the keyboard arrow keys for scrolling since shift+arrow key is used instead to switch the window to a different chart template and ctrl+arrow key is used for switching the periodicity of the chart.

When viewing monthly charts, the arrow keys will now scroll the chart left or right 12 bars (one calendar) year at a time. For all other periodicities, the left and right arrow keys scroll the chart by N bars at a time where N is number of visible bars in the chart determined from the chart windows's width.

Chart Buttons for Scrolling N Bars

A new button purpose, "Scroll Chart", has been added allowing the Investor/RT user to create buttons or button menus for scrolling the chart left or right some number of bars. When setting up a chart scrolling button enter the desired scrolling action using an L or an R followed by the number of bars to scroll, e.g. L10 or R20. To create a menu of scrolling actions, enter a series of items with commas, e.g L10,L25,L100,R10,R25,R100.

RTL Numeric Comparisons Revised

The method Investor/RT uses when performing numeric comparisons in RTL has been revised in version 7.2 Rev 2. Investor/RT uses floating point numbers internally to hold market data and technical indicator calculated values. The RTL arithmetic comparison operators (<, >, =, !=, <= and >=) now take into account the display format of the instrument whose data is being evaluated in order to determine whether some value is equal, greater, or less than some other value. For example, a trading signal LO <= STOP might be evaluated with the LO value being 535.200012 and the STOP value having been set to 534.199951. Internally Investor/RT keeps all numbers to six significant digits. In this example the STOP is literally a larger value than the LO (signal is FALSE) but only slightly. In actuality the difference between the two numbers is only .000071 which is insignificant when you consider that the instrument prices are displayed in 999.99 format. In fact, When the values of STOP and TARGET are rounded for display with 2 decimal format, both values display as 534.20.

To enable Investor/RT to make more reasonable numeric comparisons between numbers, Version 7.2.2 now uses a comparison method that takes into account the display format of the instrument being evaluated by the signal or scan. In the example above Investor/RT will consider STOP and LO to be equal since they are with .0005 of each other. Thus the signal will trigger TRUE with those values. Similarly an instrument whose display format is 99.999 (3 decimals) will consider numbers within .00005 of each other to be "equal". For instruments such as \$INDU, whose value is normally displayed as a whole number or as 9999.9 format (1 decimal), values within .05 or .005 are evaluated as "equal" respectively. This improvement is designed to improve the detection of trading signals in situations where insignificant numeric differences between two values would otherwise fail to recognize two values as being "equal".

Version 7.2 Rev 2 Fixes and Miscellaneous Enhancements.

The Tick Data Limit Preference (see item #6 above) was not retaining its setting. This is fixed in 7.2.2.

When backtesting a trading system that has Signal Actions associated with REVERSE rules, Investor/RT will now execute the associated Signal Action only once. Internally, Investor/RT performs a REVERSE as a two step process, first exiting the current position, then opening a new position in the opposite direction. Prior to 7.1.2 the Signal Action for the REVERSE rule was being executed in both steps.

During backtesting, messages are placed into the detailed report each time the TARGET token is SET by the trading system. Prior to 7.2.2 only STOP sets were logged in the detail report.

The scroll right button on the traditional chart scrollbar was not working when the chart periodicity was Monthly. This has been corrected.

A bug was corrected in the MPD indicator involving the "Custom Statistical Result" options.

Custom Statistical results now work properly when an intraday MPD is used on a daily chart, scan, signal, or custom indicator.

A bug was fixed involving the use of the "Add Button" popup menu item in traditional chart windows. Attempting to use this function to create a button for a Profile indicator produced a fatal error. When the Add Button was used with certain other indicators a minor memory leak resulted. Both issues are now fixed.

The Fibonacci Extensions indicator has been updated so it may now be used in tickbar charts. The Fibonacci Retracements indicator time retracements and time extensions now work as well in charts where periodicity is set to N ticks per bar.

The Donchian Channels indicator was tweaked for improved calculation speed.

The Plug-in Indicator when used in intra-day charts, was not drawing the indicator for new bars added in real-time to the chart. This affects user written plug-ins as well as the Jurik Indicators that are implemented in Investor/RT as plug-ins. This bug has been corrected.

Version 7.2, Revision 1, Released May 5, 2004

Tick Data Limit Preference

A user preference has been added for disabling the built-in data limits normally imposed by Investor/RT. Tick Data and Bar Data are typically limited to one million ticks or bars. This limit rarely imposes any restriction on Investor/RT usage. However, when working with "tickbar" periodicities, e.g. 150 ticks per bar, it can take more than a million ticks to construct a series of tick bars of sufficient size for backtesting. See Setup: Preferences: Historical. Uncheck the checkbox at the bottom of the window if you wish Investor/RT to impose no limits on the amount of tick data that can be processed.

New Schedule Actions

Two new database utilities, added recently to the Control: Database Utilities menu, are now available as schedule actions. Schedules can be created to initialize the news database and/or the trading notes database.

Version 7.2 Rev 1 Fixes

- Overnight traded futures contracts, when charted using a session override to view only the day session trading, would sometimes show a distorted first bar (first bar of the day session). This is a long standing bug that has now been corrected.
- Mouse tracking in a weekly chart would report the wrong date when the week's trading ended on a Thursday because of a Friday trading holiday (e.g. Good Friday). The chart pane title and info box feedback now reports the correct date in such cases.
- When downloading historical data for multiple symbols at one time from Dial/Data (or using File: Import) with multiple chart windows open, Investor/RT was refreshing only the last downloaded/imported symbol's chart, leaving other charts still reflecting the pre-download data. During downloading (and importing) Investor/RT now updates each chart as new data is downloaded for the symbol in the chart.
- Macintosh Versions of Investor/RT were not honoring the "Quiet Mode" setting in Setup: Preferences: Sounds. When Quit Mode "On", Investor/RT for Macintosh will no longer play alerts or other sounds.
- The SBAR (Session Bar) token in RTL was giving the wrong value for the last bar in the session when the last bar's duration is less than the periodicity. When the total minutes in the session evenly divides the periodicity, the SBAR bar number of the last bar was correct, otherwise SBAR was reporting the same value for both the next to last (full duration) bar and the last (partial duration) bar. This is now corrected.
- Adding annotations to chart windows and using the alarm tool for setting alarm levels in the chart window would sometimes leave a text display box centered inside the chart window. Closing and reopening the chart was the only remedy. All text prompting messages are properly removed now after the alarm or annotation has been added.
- When closing quote pages that have no instruments (rows) Investor/RT will prompt the user asking whether to delete the quote page or keep it around as an empty quote page. This

prompt can become annoying when closing empty quotepages, frequently created by scans that find no results. The behavior has been changed so that this extra prompt will appear ONLY if the user has specified "Ask Me" in Setup: Preferences: General in the user preference for how to handle closing of quotepages that have been modified. So, if Always Save, or Always Discard is the user preference, the "Keep or Delete quotepage" prompt will no longer appear and the quotepage will be kept.

User Profile Text File

Questions or problem reports sent to support@linnsoft.com should always include the current user profile. The user profile text is sent automatically when you use the "Send Email" feature of Investor/RT to send your questions to support. Otherwise, you can use the "Copy User Profile" command in the Investor/RT Edit Menu to obtain the profile text on the clipboard for pasting into email messages composed with other email client software. If Investor/RT is not running, this can be inconvenient. In rare circumstances, e.g. a database problem, you may wish to email for assistance in conditions where Investor/RT will not startup properly. In such cases, you can simply attach the file named UserProfile.txt to your email message. This file can be found within the admin directory within the Investor/RT directory. By creating a shortcut or alias for this file, some email software will enable you to quickly attach the file by dragging and dropping the shortcut onto your email window. The UserProfile.txt file is updated with your current user profile info each time Investor/RT starts up and when Investor/RT terminates. You can inspect this file's contents at any time by using File: Open: File.

Signal Action Enhancement - http Commands

The Signal Action setup window has a new checkbox titled "Text to Browser". When this box is checked, the text in the text window is sent to your default web browser as an http command when the signal action is triggered. The text in the text window can be "parameterized" with RTL tokens so that the http command sent to the web browser has, for example, a ticker symbol or a V# variable value substituted into it. This simple enhancement has some powerful implications. Signal Action "presets" can be created and chart buttons created based on those presets to provide single click access to web research sites keyed to the ticker symbol in the chart. For example, create a Signal Action preset (name it "Yahoo Profile"), with the "Text to Browser" box checked and the text:

`http://finance.yahoo.com/q/pr?s=%TICKER`

Add a button to your chart window. The button purpose is "Execute Signal Action" and the Signal Action name is "Yahoo Profile". Now whenever you click the button, your web browser will show you the Yahoo Financial Profile page for whatever ticker is in the chart at the time.

Another way that this new feature may be used is for sending trading orders via AutoTrader, to Interactive Brokers. AutoTrader is a Java based program that uses the TWS API to communicate

trading orders to IB. Because it is Java-based, the software runs along with Investor/RT on either MS Windows or Macintosh OS X systems. For more information on AutoTrader:

<http://autotrader1.home.comcast.net/>

AutoTrader can receive trading orders from Investor/RT now using this new feature of Signal Actions since AutoTrader listens for certain http requests on your local machine. If you setup a Signal Action with this http command for example:

<http://localhost:7400/placeOrder?symbol=%TICKER&action=BUY&qty=%V#98&price=%V#99&orderType=limit>

then, when the signal action is executed (by a signal marker in a chart or by a signal action associated with a trading rule in a live trading system running in a chart, the ticker symbol, order quantity and limit price will be substituted into the http command above in place of %TICKER, %V#98 and %V#99 respectively and the http command will be routed to AutoTrader for submission to IB.

AutoTrader is free, donor supported software. If you find the program of value to you, a donation of \$60 is suggested. Donations are accepted via PayPal or credit card.

MS Excel DDE Linking Operational under Windows XP

The DDE (Dynamic Data Exchange) feature of Investor/RT has been improved and now works properly under Windows 2000 and Windows XP providing "hot links" between MS Excel spreadsheet cells and Investor/RT. The general format for Excel linkage to Investor/RT is:

=RT | ticker ! data-designator

where ticker is the ticker symbol. Enclose ticker in single quotes if the ticker symbols contains spaces or other non-alphabetic characters such as #, @, or \$.

Data-designators can be expressed as a data column id number or as a data column name. For example:

=RT | INTC ! Last

will setup the Excel worksheet cell to dynamically update as the last price changes. Each data column in Investor/RT also has a data column id number. To find the DDE data column id number for any column use the Setup: Preferences: Formats window. Pick the data column of interest in the list on the left and click the "Get Info" button to find the number of that column. For example, the 52WeekHigh data column has id number 21, while the Last data column has id number 2.

=RT | INTC ! Last and =RT | INTC ! 2 do the same thing.

=RT | MSFT ! 52Week and =RT | MSFT ! 21 do the same thing.

The Investor/RT DDE link now supports the "System" topic. Use "System" as the ticker symbol and "Version" as the data designator to obtain a description of the version of Investor/RT that is supplying the data and the data service in use, i.e.

=RT|System!Version

Trading Systems: V#

Variables can now be used for Rule Quantity. The Rule Quantity associated with each rule in a trading system can now be specified using V# variables. This gives the user the ability to dynamically control the quantity by setting V# variables within the system rules. As an example, a user may want to adjust the rule quantity based the number of consecutive losing or winning trades have occurred, or based on the time of day.

New Indicator: VWAP (Volume Weighted Avg. Price)

A new VWAP indicator has been added which provides the volume weighted average closing price. This indicator only works on intraday data. The indicator resets each day, beginning with a value equal to the closing price of the first bar. Each bar's price is then weighted using the volume of that bar/tick to result in an accumulated VWAP value as of each bar/tick throughout the day. The RTL token for the VWAP Indicator is VWAPI (the I stands for Indicator). There is a quote page column named VWAP and the RTL token for referring to this instrument property is VWAP. This column is updated by the Quote.com data service in real-time. Users of other data services can keep this column updated by running a scan periodically with the formula:

SET(VWAP, VWAPI)

When writing RTL formulas be sure that you understand the difference between VWAP and VWAPI. The token VWAPI is the Investor/RT calculated VWAP value, calculated by the new indicator. VWAP is a "transmitted" value for Quote.com users; the value is calculated by Quote.com and sent to Investor/RT via normal real-time data flow.

New Indicator: Session Statistics

A new Session Statistics indicator has been added to give the user an easy way to historically access statistical information related to the first or last period of the session. The Session Statistics preferences use the general format:

[Statistic] of [Price] of the [First/Last] X [Minutes/Bars] of the Session

The Statistic options include "Highest Price", "Lowest Price", "Range of Price", "High/Low Range", "Average Price", or "Sum of Price". The standard list of Prices is provided (Close, High, Low, Open, OHLC/4, etc.).

As an example, a user may want to access the "Highest High of the First 30 Minutes of the Session". This indicator makes that operation very quick and easy. The result will be as follows. Let's assume in our example we are looking at 10-minute data. On the first bar, the result will be the high of that first bar (first 10 minutes). On the second bar, the result would be the highest high of the first two bars (first 20 minutes). Then, on the third and remaining bars of the session, the result would be the high of the first 3 bars (first 30 minutes). Then on the first bar of the following session, the result will again reset to the highest high of that first bar, and everything starts over again. To see the effect, simply add the indicator to a chart.

Version 7.2, Released: April 15, 2004

DTN Satellite Data Service Supported Under Mac OS X

Investor/RT for Macintosh OS X now supports the DTN Satellite data service using the Ethernet capable D8080 Satellite Receiver Unit. DTN receiver unit models D7000 and D8000 are NOT supported under OS X, however, they continue to be supported using a serial port connection in the Macintosh Classic version of Investor/RT.

Under Mac OS X, just as under MS Windows, the DTN D8080 receiver unit requires a dedicated Ethernet card (NIC). The built-in Ethernet port of any G3 or G4 Macintosh can be used. The Ethernet port should be configured with a manual IP address of 10.100.116.140. Connect the Mac directly via an Ethernet cable to the D8080 and start feed.

Macintosh models with PCI expansion slots can be expanded with a second Ethernet card. The cost of an PCI Ethernet cards is typically under \$50. One such card is the MacSense Fast Ethernet Card FE-551. The FE-551 is purportedly one of the most popular Fast Ethernet PCI cards for the Macintosh. The FE-551 adds a Fast Ethernet port running at 10Mbps or 100Mbps. For more information see:

<http://www.macsense.com/Product/transceiver/fe551.html>.

Adding a second Ethernet card will enable data reception over the DTN Ethernet connection, while simultaneously using the built-in Ethernet port for internet access.

New Quotepage Format Preference

The Setup: Preferences: Formats window has a new checkbox titled "Auto-Size All Columns". Each quotepage or portfolio format by default will have this option turned off. If you turn this option on

for any format (and save the format), then Investor/RT will always "optimize" column widths whenever the format is applied to a quote page or portfolio. This option also affects the appearance of quote pages that are produced by a scan. If a scan specifies a particular format for the resulting quote page (instead of "automatic"), then this Auto-Size option will control whether the scan's resulting quote page is displayed using the fixed pixel widths for each column, or widths optimized to the data content of the quote page.

ZigZag Indicator, ZigZag Oscillator Improvements

The "Minimum Price Change" setting of the Zig Zag and Zig Zag Oscillator indicators can now be expressed in absolute dollars (\$) in addition to percent (%). A new "Result" option has been added to the Zig Zag Oscillator titled "Zig Zag Price Change". This result reflects the price change (possibly a negative value) of the current zigzag leg from the last extreme point.

Pivot Point Improvement

The pivot point indicator has been enhanced to allow the specification of an alternate ticker symbol to be used when obtaining historical data for use in calculating the pivot points. This setup may be useful to those who track overnight traded futures. During the day session, the pivots can be calculated from an alternate ticker symbol whose daily data reflects the open, high, low, close of prior sessions; even though the ticker symbol in the chart is the overnight trading ticker symbol whose daily data reflects the overnight trading range.

Fixes and Miscellaneous Enhancements

A bug was fixed in the trading system optimizer so that the same amount of historical data is used in the optimization that was used in the backtesting runs before optimizing.

A bug was fixed that caused a crash when adding a Trading System to a chart. The bug surfaced only if the default trading system preferences were established by choosing "Make Default" from an instance of some trading system indicator.

A new backtesting setup option was added, a checkbox titled "Allow Entry/Exit Prices Outside a Bar's High/Low Range". Normally, when Investor/RT enters or exits a trade at some computed price point, e.g. the TARGET, or some V# variable price point, the software makes sure that the trade entry or exit price is within the actual trading range of the bar when the signal occurred. In some circumstances, it is useful to backtest scenarios where the computed entry or exit price may fall outside the signaling bar's high/low range. When this checkbox is checked in the backtest setup, Investor/RT will honor the backtest computed price regardless and will insert a warning message in the detail log if this computed price happens to fall outside the valid price range of the bar. Nevertheless the backtest results will reflect gains/losses calculated using these out-of-range prices. When this checkbox is unchecked, the trading system uses the high price when the entry/exit price exceeds the high, and the low price of the bar when the entry/exit price is below that low.

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Version 7.1 Rev 5; Released: March 29, 2004

Time & Sales Windows Performance Improvements

Two new preference settings have been added to the Time & Sales Preferences to enable T&S displays to be handled more efficiently for instruments with massive numbers of ticks or those with very fast trading such as the ES futures. The first preference is called "Scroll Rate" expressed in seconds (and fractions of a second) that controls the frequency at which new ticks are scrolled into the window. The Scroll Rate preference may be left "unchecked" in which case every tick is scrolled into the T&S window the instant it arrives. When checked, and if a non-zero seconds number is specified, e.g. 1.25, Investor/RT will collect incoming ticks efficiently in real-time and will scroll the newly collected ticks into the T&S window every 1.25 seconds. Updating the window contents every second or so rather than "tick by tick" results in a major reduction in processing overhead for the time and sales window. While the time and sales window is open, the setting can be adjusted by

right-clicking in the window. The new scroll rate takes effect immediately. You can turn the Scroll Rate checkbox on or off at any time to suite your needs. For instruments that can trade at rates exceeding one trade per second, the Scroll Rate option will enable the time and sales window to show you the flow of ticks with substantially less processing overhead than the "dynamic" scrolling of ticks.

The second preference is the "All Trades or Last N Trades" option. When Last N Trades is checked, Investor/RT will initially load, for N set to 1000 for example, only the last 1000 ticks into the time and sales window when it is initially opened. After that, Investor/RT will allow the number of ticks collected and available for review to grow until there are 3 times N (3000) ticks. At that point, the window will cease allocating additional memory for new ticks. The ticks available for review will then be trimmed back to the last 1000 and tick collection/display will resume. When the 3000 tick slots are filled again, the process repeats. When the Last N Trades option is used, you can always scroll back and review at least the last N ticks, and often many more than that. This option is designed to conserve memory and reduce processing overhead associated with memory management overhead of huge tick data collections for actively trading instruments. If the All Trades choice is selected instead, the time and sales window will operate as it did before, allocating more memory as needed to enable you to scroll back through all ticks collected for the instrument. Note that the window title of the time and sales window shows the amount of memory in use.

Scan Result Quotepages Retain Preferences

When a scan opens (or updates) a quotepage with new scan results, Investor/RT now does a better job of retaining the user's preferences for the resulting quotepage. For example, highlighted data columns are retained as a scan runs periodically to update a quotepage. Each scan has an associated quotepage name, normally the same name as the scan itself. If desired, a different name may be specified in the setup window for the scan. If the scan's quotepage is not already open when the scan runs and the scan determines that there are results to display, Investor/RT will open the quotepage using the saved preferences (colors, column highlighting, sorting etc) for that quotepage. Thus each scan can now have its own result quotepage preferences if desired. Prior to this improvement, all scan result quotepage inherited the default quotepage preferences. These preferences were then updated to reflect the user's requested output format; however, there was no control over the color scheme and other quotepage properties on a scan by scan basis.

Miscellaneous Fixes and Minor Improvements

- The highlight status of each column in a quotepage is now retained when the quotepage is saved. The same improvement was made to remember highlighted columns in portfolio windows. To highlight a column in a quotepage or portfolio, right-click on the column heading and use the popup menu.
- In the RTL setup window, in the list of tokens on the right side of the window, Investor/RT now recognizes the right-click on a token name as a request to edit the preferences of the token. Formerly, a double-click was necessary to edit the preferences of a token.

- In the RTL setup window, the "T" button (Template Menu) has a new entry for adding a comment into the RTL formula. This menu choice insert the text / * comment * / into the RTL formula entry box at the cursor. You can then double-click on the word comment and begin typing the actual comment. Any text in RTL formulas preceded with a slash asterisk and ended with asterisk slash is treated as commentary.
- The Order Desk window was made resizable to enable more instruments or more open positions to be displayed if desired.
- The "Send Email" window now allows a user-specified destination email address. Choose "Other..." from the list of preset destination addresses and enter the address to whom the message should be sent. The window may now be used to send short messages to any destination.
- The Scheduler now supports new actions for deleting tickers in a quotepage, importing a list of tickers from a file, and restarting Investor/RT.
- A memory leak was fixed in the trading system backtesting function. Trading system rules that contained formulas of the form IND(expression) where IND is any technical indicator token and expression is another indicator token or some "array expression", were causing memory leaks during the backtesting process. Some examples of expressions having this side effect are: "LRS(BOLD)" or "MA(RSI)" or "RSI((HI + LO + CL * 2)/4)".
- The Setup: Preferences: Sessions window now has a checkbox in front of "Post Time" to enable the user to disable posting of selected sessions. A session with posting disabled will no longer participate in the "Record Closing Prices" command in the Control Menu. The only way to "Post" a session with no posting time specified is to use the Setup: Preferences: Sessions window's "Post Now" button with the specific session selected.

Version 7.1 Rev 3, Released: March 17, 2004

Highlighting of Current Price in Vertical Scale Area

A new traditional chart preference has been added to enable the current price of an instrument to be highlighted in the vertical scale area of the chart. The vertical scale "price box" has an inverted appearance with the background color being the scale text color and the price text drawn in the chart's background color. The highlighted price moves up and down dynamically as prices change, always displaying the last trade price of the instrument in the chart pane.

There is a global preference setting in Setup: Preferences: Charts: Traditional Charts in the "Options" tab that governs whether newly created charts will show the highlighted price in the vertical scale area. Initially, this new setting will default to on. This means that new charts you create will, by default, have the new price display. Existing charts saved prior to the introduction of this feature will not. For existing charts, this option can be adjusted on a chart by chart basis by accessing the any chart's preferences and adjusting the new checkbox in the "Options Tab".

In the MS Windows version of Investor/RT, users should be aware that the movement of the price display box in the scale area will be temporarily suspended while the user is operating a menu of choices related to a "list button" or "list edit button" anywhere in Investor/RT. The suspension is

necessary since any movement of a price box in any chart has an unfortunate side effect of dismissing such list selection menus.

This is a MS Windows specific side effect, Macintosh versions of Investor/RT are not affected. The actual price value displayed inside the price box will continue to update in realtime as price change during a list selection activity. Only the movement of the box up or down the scale is suspended momentarily while the menu selection is completed. If you click on a list or list edit button to make a menu selection but do not actually make a selection within 15 seconds, Investor/RT will allow price box movement to resume. The next price change that causes a price box movement will then dismiss the menu. In practice, selecting an item from a pull down menu list is something accomplished within a few seconds so most users will not notice any operational change. The user interface change here is that when vertical scale price highlighting is active in any open chart window, there is a possibility that a menu left open for more than 15 seconds will be dismissed. Should this occur, simply click the list button or list edit button again and make your selection.

New Backtesting Reports for Spreadsheet Use

A new checkbox labeled "Spreadsheet Reports" has been added to the "Backtest Report Options" section of the Backtest Setup window. This option generates three spreadsheet-friendly reports. They are designed to give the user the ability to quickly and easily manipulate (sort, etc.) the backtest results in external spreadsheet programs without first having to remove a lot of the extraneous text. These reports are provided in tab-delimited format, with a header row at the top.

The first report provides the same information as the "Detail Each Day/Trade/Bar" section of the Day by Day Report and is given a name of "TS_DAY_SS.txt" where TS is the name of the trading system. The second report provides the same information as the "Detail Report", and is given a name of "TS_DTL_SS.txt". The third report provides the same information as the "One Line Summary Report" and is given a name of "TS_OLS_SS.txt".

These reports are not displayed in Investor/RT when the backtest completes, but they are created and placed in the "Admin" folder. These tab-delimited reports can be opened easily in any spreadsheet program such as Excel. They can then be sorted quickly on columns such as profit, trades, date/time, etc.

DATE and TIME RTL Historical Tokens

RTL tokens DATE and TIME refer to the date and time of particular bars. These are historical tokens which means that can take a numeric qualifier, e.g. DATE.1 refers to the date of the previous bar, TIME.5 refers to the time of the bar 5 bars ago. Date and Time values are expressed as numbers of the form YYYYMMDD (date) and HHMM.SS (time). Note that TIME is typically zero for daily, weekly, monthly data. TIME is generally a whole number, e.g. 931 for the 9:31 a.m one minute bar. However, if periodicity is not a whole number of minutes, e.g. a 90 second periodicity, the TIME token value take on a fractional value where the numbers to the right of the decimal represent the number of

seconds, e.g. 931.30 or 934.30. The TIME token has been in the RTL language for awhile, sometimes called the "backtesting time" token. In it's current form TIME is more flexible since you can now make reference to the time of bars in the past using the .n historical qualifier in scans, signals and custom indicators.

Here is a simple example of using the DATE token to make sure you don't have any gaps in your daily historical data. Every Friday, after the close and after posting of historical data, you can run a scan on the .All Symbols quotepage with a formula such as:

```
DATE != 040312 AND DATE.5 != 040308;
```

Of course the numeric date values in the formula would have to change each week, but this simple scan, when run on Friday Mach 12, 2004 verifies that the last bar on file is indeed for March 12 and that the fifth daily bar back has the expected date of March 8, 2004 (Monday). The scan finds any symbols that may be missing bars for some reason. You can then use the data download window to fetch daily historical data on that list of symbols if needed.

You can use the expression DATE.n%100 to get the day of the month for the nth bar back.

```
Use (DATE.n/100)%100 to get the month number (1 thru 12) for the nth bar back
```

Using the TIME token similarly, TIME.n%100 gives the minute number (0 thru 59) for the nth bar back and TIME.n/100 gives the hour number for the nth bar back. If you need the seconds for the nth bar back, use (TIME.n * 100)%100. The seconds will be in the range 0 to 59.

Note that when using RTL with tick or ticks/bar periodicity, the bars will have times that correspond to the time of the last tick included in the bar.

The former implementation of TIME is now called BTIME for "Backtest Time". The BTIME token, now considered obsolete, cannot be qualified historically. Existing scans that reference TIME should work exactly as before.

Chart Scale Font Size Preference Added

The traditional chart preferences "Options" tab now has a Font Size preference (small, medium, or large). When using File: New: Chart to create a new chart window, the default setting for scaling font size will be used. Prior to this enhancement all new charts created using File: New: Chart were initially set to small font. Scale font size can still be modified for open charts on a pane by pane basis using the Scale Preferences window. The scale for all panes in a chart window can now be adjusted from the chart preferences "Options" tab.

Technical Indicator Presets and Recalculation Frequency

Enhancements were made to save the recalculation type and frequency for each technical indicator preset. Indicator presets are often used to create buttons in chart windows to toggle the indicator on/off. Prior to this enhancement, the indicator added to a chart always took on the "default" recalculation preference. To take advantage of this new feature, you must "re-save" any presets for which you want something other than the default recalculation frequency. To accomplish this, add the indicator to your chart, edit the indicator's preferences, setup the recalc option at the bottom of the indicator preferences window, and then use the "Preset" button at the bottom left of the window, choosing "Save As" and the preset name.

Related improvements were made to the Chart Definition Export feature of Investor/RT to assure that the recalculation preferences for preset indicators are exported in each chart definition. This improvement assures that when an Investor/RT user imports a chart definition including presets from another source, the recalculation preferences of the preset indicators are exactly the same as the source system. Prior to this improvement, presets imported from another source would default to the recipient's default recalculation preferences.

Setup: Instruments Keyboard Shortcuts

The Setup: Instruments window has been enhanced with a variety of keyboard shortcuts designed to enable this window to be used more effectively by power users without having to alternate between using the mouse and the keyboard. All of the shortcuts require holding down the Alt key (Apple/Command key on Macintosh) while striking a letter. Here are the things you can do now using the keyboard when the Setup: Instruments window is the focus (front) window:

- Alt-A** - Opens the Alarms Setup Window for the current ticker symbol.
- Alt-space** - Open an Instrument Selection window for choosing a ticker to operate upon. Continue typing the first few letters of the ticker you want until it is identified, then press the return/enter key to select the symbol and close the instrument selector. Pressing esc key dismissed the instrument selector. Alt-/ (Alt-slash) is equivalent to using the mouse to click the "..." button.
- Alt-S** - Opens the Session Setup window for the currently shown trading session. Alt-S is equivalent to using the mouse to click the "Session Setup" button.
- Alt-I** - Toggles the Monitor Intraday checkbox on/off. Alt-I is equivalent to using the mouse to check/uncheck the Monitor Intra-day checkbox.
- Alt-V** - The V is the v in "Advanced". Alt-V toggles the Advanced button, alternately showing and hiding the Advanced setup options. Alt-V is equivalent to using the mouse the click on the Advanced toggle button.
- Alt-D** - Delete the current ticker symbol (instrument). Alt-D is equivalent to click the "Delete" button with the mouse.
- Alt-C** - Cancels (dismisses) the Setup Instruments windows, just as the esc key does. Alt-C is equivalent to clicking the Cancel button with the mouse.
- Alt-M** - Modifies (or Adds) the current ticker symbols, just as the enter/return key does.

Quick Quote Window Keyboard Shortcuts

The quick quote window has been similarly enhanced to support Alt-Key shortcuts for operating each of the toggle buttons that reside in the upper left corner of the quick quote window. The quick quote window can be opened from the keyboard using Alt-/ (Command-/ on Macintosh). Then type the first few letters of the ticker to identify the instrument, then use for example, Alt-C to open a chart, or Alt-N to display the news for the instrument. Here is the complete list of shortcuts that are in effect when a quick quote window is the focus (front) window.

Alt-C	Chart the Instrument
Alt-S	Setup the Instrument
Alt-A	Alarms for the Instrument
Alt-N	News for the Instrument
Alt-T	Trading Notes for the Instrument
Alt-P	Portfolio Positions for the Instrument
Alt-I	Info on the Instrument
Alt-U	Quotepages for the instrument (note, Alt-Q is the Investor/RT Quit command).

Version 7.1, Released February 26, 2004

myTrack Tick Data Downloading

Users of the myTrack Edition of Investor/RT can now download historical tick data as needed for charting, backtesting, etc. Tick data downloading is supported either directly from charts having tick or ticks per bar (tickbar) periodicity, or from the data download window. For longer term historical tick data downloading it is recommended that downloading be down after market hours. Even multi-day tick data downloads during trading hours can take a long time to complete. The reception of the tick data is interwoven with ongoing reception of real-time quotes and the newly downloaded ticks are merged into the very few seconds as the current day's ticks are retrieved. Tick data downloading is necessary to refresh charts with tick and tick/bar, or time interval periodicities that are not whole numbers of minutes, e.g. a 30 second chart.

In doing the research to implement this capability, it was discovered that the myTrack specification now allows up to 700 requests to be active at one time, a substantial increase over the former limit of 300. myTrack users can thus track more symbols at one time, or can temporarily open larger quote pages to update current prices as needed.

Three New Database Utilities for News, Trading Notes

Two new initialization commands have been added to the Control: Database Utilities Menu. The Initialize Trading Notes command can be used to clear the contents of the trading notes database. A substantial number of trading notes can be created automatically over time by alarm conditions and backtesting runs that log position entry and exits as notes for the trading system symbol. The

Initialization can also repair a database that will not verify properly due to problems in the trading notes area in cases where restoring the most recent backup is a less desirable alternative than keeping the present database while losing all trading notes.

The Initialize News Database is comparable to using the "Delete All News and Compact Database" button in the Setup: Preferences: News window. However, this new Initialization command uses a faster method. The new method can also repair a database with problems in the news area in cases where restoring the most recent backup is a less desirable alternative than keeping the present database while losing all archived news.

A "Compress Trading Notes" utility function has been added. This utility will compact the trading notes database to minimal size while retaining trading notes for all ticker symbols except trading system ticker symbols. Each trading system has an associated trading system ticker symbol(instrument) with ticker symbol \$name, where name is the name of the trading system. These instruments are created automatically by Investor/RT during backtesting and are assigned security type "Cash". During backtesting trading notes may be added to this \$name instrument to record the actions of the trading system on specific bars during backtesting. Since these trading notes are of a temporary nature and can be recreated by rerunning the backtest, the compress trading notes utility will remove all such trading notes and compact the trading notes database. See the related item "Backtesting/Optimization Speed Increased" below for further information concerning trading notes for trading system symbols. If you want to preserve trading notes for trading system instrument during the compress process for any reason, change the security type of your trading system(s) instruments to a security type other than "Cash" and the notes will be preserved after compression.

Scheduling MetaStock Imports

"Import MetaStock Data" is a new "action" that can be added to a schedule. When setting up the action, you enter or browse to specify the path to a folder containing Daily Historical MetaStock Files you wish to be imported. All files in the designated folder will be imported and merged with any data already on file for each ticker. The designated folder must contain an XMASTER or MASTER file that serves as a directory for the historical files present in the folder.

Backtesting/Optimization Speed Increased

Recent stress testing of Investor/RT backtesting (and optimization) features revealed that the creation of trading notes for the trading system's ticker symbol adds substantial overhead to the backtesting process. While this overhead may not be noticeable when backtesting a single ticker symbol, increased backtesting times are especially evident when testing a large universe of symbols. The trading notes denote every trade entry and exit made on any symbol during the backtest run. A new checkbox option has been added to the backtest setup to make the production of trading notes optional. If the "Trading Note Each Trade" option is checked in the backtest setup, the chart produced by the backtest (if requested) has a trading notes indicator for marking the bars where trading activities occurred. By eliminating the production of the trading notes, substantial reductions

in backtest run times were observed. The trading notes production has thus been made an option in the Backtest Setup window. We recommend turning off the trading notes if you do not plan on using them. Your backtests, especially on large numbers of symbols will run substantially faster. Investor/RT now measures the time it takes to run the backtest and reports "Backtest Duration" at the top of the "Day by Day Report"

New RTL Tokens RWI, RWIL - Random Walk Indicator

The Random Walk Indicator produces a high and low line. In RTL the high line is the RWI token and the low line is RWIL token.

Random Walk Index

An issue is trending higher if the RWI of highs is greater than 1, while a downtrend is indicated if the RWI of lows is greater than 1.

The calculation of the RWI follows:

n = the period
ATR = Average Trading Range (over n periods)
SQRT= Square Root Function
RWI high = $(HI - LO.n) / ATR * n * SQRT(n)$
RWI low = $(HI.n - LO) / ATR * n * SQRT(n)$
RTL Tokens: RWI (RWI high) and RWIL (RWI low)

Trading System Development Improvements

There have been extensive improvements in the backtesting area in the 7.1 release.

Show Latest Reports Button

A button has been added to the "Backtest Output Options" of the Backtest Setup window. This button will recall the set of reports that were produced last time the backtest was run. The reports that will be shown will reflect those that are currently checked. This gives the user a convenient way to recall the last reports without having to either re-run the backtest, or perform a "File: Open" on each report.

New "Required Bars" Setting

The "Backtest Period" section of the Backtest Setup window now has a new "Bars Required" setting. Prior to this release, an additional 50 bars were unconditionally loaded prior to the beginning of the backtest period. The reason these 50 extra bars were loaded was in order to have properly calculated values for indicators that required additional bars. However, 50 bars could be excessive for some systems (resulting in more processing than was necessary), and too little data for other systems (resulting in invalid indicator values for certain indicators requiring more than 50 bars). The user can now specify how many bars are to be pre-loaded,

based on the requirements of the signals involved in the systems rules. Any existing systems or new systems will have an initial value of 50 bars.

Buy and Hold Statistics

The Day by Day report has been enhanced with Buy and Hold Statistics, both on an overall basis, as well as on a "per day" and a "per bar" basis. In the "Miscellaneous Stats" section of the report, Buy and Hold statistics are provided on both a \$ and % basis. "Buy & Hold (\$)" represents the cumulative \$ gain / loss of all the symbols tested over the period tested. "Buy & Hold (%)" represents the percent change of all the symbols tested, over the period tested. The quote page tested can be thought of as an index, and these buy and hold statistics can be thought of as the \$ gain and the % change over the period tested of that index.

Each individual day and bar now has two new columns providing the \$ and % buy and hold statistics for that day/bar. These buy and hold statistics, in combination with the "Market Bias" statistics, can be especially helpful in evaluating the performance of a system in relation to the cumulative performance of the symbols tested.

Consolidated Summary Report - Format Change

The format of the Consolidated Summary Report has changed in two ways. First, the data column now aligns itself on the decimal, as opposed to left aligned. This makes it easier to compare the magnitude of adjacent values. Also, negative numbers are now represented in parenthesis \$(40.25) as opposed to \$-40.25. This is consistent with the Day by Day report.

Detailed Report - Format Change

The format of the Detailed Report has changed to a more columnar representation. In prior releases, each trade action was explained in a sentence format such as "BUY STOP 100 RNWK to cover at 5.87 with a gain of \$12.25.". The information given in this action column has been split up into 6 smaller columns. These columns are not titled "Action", "Qty", "Symbol", "Price", "Total", and "Profit". By splitting the information into aligned columns, specific data is easier to locate and extract from the report, and can be better handled by an external spreadsheet tool such as Excel.

More Compact Reports

When backtesting a quote page of symbol, both the Detailed Report, as well as the Symbol Summary section of the Consolidated Summary Report present information on a symbol by symbol basis. In prior release, lines were included in these reports unnecessarily for symbols that did not produce any trades during the backtest period. This has been improved so that only symbols that produced at least one trade are listed in these reports. This enhancement reduces the size of the reports, and makes it quicker and easier to locate information within the reports.

New Chart Button Type for Changing Chart Appearance Settings

The chart "Button" indicator has been enhanced with a new button type that allows the user to quickly change the appearance of the button's chart based on the appearance settings of some other chart. See the complete list below of the chart appearance preferences that are applied.

The new chart button purpose setting is called "Chart Appearance". The button setup includes a single chart name or a comma delimited list of chart names (for a menu button). When the button is clicked or when a chart name is chosen from the button's menu, Investor/RT will extract certain appearance settings from that chart and apply them to the subject chart that owns the button. Any saved chart can serve as the source for the appearance settings. If you want, you can create your own set of "profile" charts, simple charts that serve as containers for the appearance settings you wish to apply elsewhere. You can take any existing chart that has the appearance you want and use the "Save As" command to save it under a name such as "Profile 1". You can eliminate all but one pane in the chart and eliminate all indicators if you like. All the appearance preferences can be hosted by a single pane chart having only one instrument. Note that once you have setup chart buttons that reference a particular chart name, e.g. Profile 1, you can make modifications to the appearance of Profile 1 later. After saving the changes for Profile 1, the modified settings will take effect the next time you use a button to switch to the Profile 1 appearance.

The appearance settings that are applied are listed below:

- Pixels Per Bar
- Lookahead Bars
- Chart Color Scheme (foreground/background color, gridline color, pane title background/foreground)
- Multi-link color
- Various appearance related settings:
 - gridlines on/off
 - hollow/solid upcandles
 - hollow/solid histogram
 - candle border on/off (and candle border color)
 - mouse feedback on/off

One click or menu selection from a chart appearance button can transform a chart's appearance quickly, saving the time required to perform multiple steps in a chart preferences window.

Version 7.0 Rev 2-5, Released February 18, 2004

Quotepage and Portfolio Format Improvements

Setup: Preferences: Formats now supports the specification of column widths for each column in a format. To view and/or edit the column width of any column in a format, select the column in the list on the right side and enter the column width into the list/edit box beneath the list. Notice that the list/edit box allows any number to be entered manually and in addition there is a pull down menu of

commonly used column widths as a convenience. Note that column widths can be specified for custom columns as well as the built-in columns. Column widths are specified in pixels. When a format is applied to a portfolio or quotepage using the "Change Format" operation, the resulting spreadsheet will then have precisely set column widths. This applies as well to quotepages produced by RTL scans where the scan setup calls for a specific quotepage format to be used in the resulting quotepage.

When viewing a portfolio or quotepage, issue the Save Format command (by right-clicking on any column title to access the menu) and the resulting format specification, including precise column widths will be captured in the resulting format.

Formats defined to Investor/RT prior to release 7.0.3 will have "default" column width values for each column in the format. If you wish to revise an existing format to include more precise column width preferences, here is a simple way to do it.

1. Open any quotepage or create a new one
2. Right-click on any column title and choose Change Format from the menu.
3. Choose the Format Name you wish to edit and it will be applied to the quotepage.
4. Make any column width adjustments you wish to make. The Optimize Column Widths command may be useful here also.
5. Right-click on any column title and choose Save Format.
6. Investor/RT will prompt for a name for the new format. Enter the name of the format (the SAME name from step 3 above).

The format will then be replaced with the revised column widths. This same technique can be used to save more precise column preferences for portfolios as well.

Trading Systems: Day-by-Day Backtesting Report

A new reporting option has been added to the "Backtest Setup" window of Trading Systems. This report provides statistics that are especially useful for intraday backtesting of a basket/quotepage of symbols over multiple day periods. It can also be very useful when testing a single symbol. In addition to cumulative results of profit, trades, and shares traded, the report breaks down the results into "Per Day", "Per Trade", "Per Share", and "Per Capital Traded" statistics. Additional statistics are provided including "Max Favorable Excursion", "Max Adverse Excursion", "Best Day", "Worst Day", "Winning Days", "Losing Days", and much more. Each day can also be detailed providing the profit, trades, and shares traded on each day. Furthermore, each exit bar (or all bars) can be detailed, showing shares traded on every bar, along with the profit resulting from those trades.

The report gives the user the ability to quickly see the average daily performance of a trading system over a period, along with the best and worst days over that period. It also provides a "Capital Required", giving the amount of capital (or buying power) that would have been required over the period tested in order to execute the system (on an entire basket of symbols if applicable). The "Max Favorable Excursion" and "Max Adverse Excursion" results report how far the balance moved in your favor, and against you, respectively. The report also provides the number of days tested, the number

of symbols tested, the total capital traded, the number of trades held overnight, the number of consecutive winning and losing days, the most and fewest trades in a day, the most and fewest trades on any one bar, and the best and worst exit bar.

DTN Satellite D8080 Receivers - Ethernet Support

Windows Users using DTN D8080 Satellite Receivers may now use Ethernet (TCP/IP) as the communications link to the receiver unit instead of a serial port. This feature should initially be considered as "beta". Further development work is underway to extend this capability to D8000 Satellite Receivers. Also, Ethernet connections to DTN Satellite receiver will be supported soon under Macintosh OS X version of Investor/RT. At present DTN Satellite users on Macintosh must run the "Classic" Macintosh version of Investor/RT and use a serial port to receive data.

The Ethernet connectivity offers much faster, reliable data transfer between the receiver and Investor/RT. To utilize this capability, users must install a dedicated network interface card (NIC) and use a "Ethernet Crossover Cable" to connect the DTN D8080 receiver to the NIC. Before using Investor/RT with the new DTN Ethernet settings, it is recommended that (Windows) users install the DTN supplied Chameleon 3.1 software and get it operational to verify proper installation and setup of the DTN unit for Ethernet communications.

Clearing Alarms from a Chart

The traditional chart popup menu (right-click in the chart) has been expanded include an "Alarm Setup" submenu with three choices:

- a. Using Mouse – this choice is equivalent to a click on the alarm button on the chart toolbar. The cursor changes to crosshairs and the Alarm Setup Tool is activated so you can click at the price level in the chart where you wish the alarm to be set.
- b. Using Window – this choice is equivalent to a Ctrl-click (option-click on Macintosh) on the alarm button on the chart toolbar. The Alarm setup window opens for the symbol selected in the chart.
- c. Clear – this choice is equivalent to a Shift-click on the alarm button on the chart toolbar. This new function clears (turns off) alarm monitoring of all types for the symbol selected in the chart window. A message to this effect appears in the status message area of the main toolbar. No other feedback will appear. Note that the high alarm, low alarm, and volume alarm values specified for the symbol will be retained for future reference; however, the monitoring flags for the symbol are set so that further monitoring for high, low, or volume alarm levels is discontinued.

Importing Intraday Data from other Time Zones

When importing historical data using File: Import: Data (with Import Type: Tick or Minute Bar Data), there is a time "Time Shift" option that can be used to shift each imported bar's date time stamp

forward or backward in time by some fixed hours and minutes offset. This feature will be useful to those who wish to import historical data that is time-stamped relative to some time zone other than their own. The time zone offset is specified in hh:mm format, e.g. -1:00 will time shift the incoming data one hour earlier. If only one number is present with no colon it is interpreted as the number of hours (plus or minus) to shift the imported bars). A list button menu is available or you can enter the shift amount in hh:mm format directly into the entry box.

User Variable Legend

Setup: Preferences: User Variables now has a "Legend" button which produces a text display listing user variables and their associated titles. The text window can be left open for on-screen reference. It may be printed by clicking the Print button on the main toolbar, or using the menu at the top of the Legend text window.

New Setup Options for Scans

Two new user preference settings have been added to scans: (a) Save QuotePage Option, and (b) Results QuotePage Name. These new preferences can be set by clicking the Setup button in the RTL Setup window. When the Save QuotePage checkbox is checked for a particular scan, the quotepage produced by the scan will be saved immediately. Otherwise, the results of the scan will be displayed without saving. Turning on the Save QuotePage checkbox means that the results of the scan will become immediately available to other scans or signals that make use of the QP = syntax to test for a particular instrument's membership in a designated quotepage. Another advantage of saving the results quotepage immediately is that when you close the quotepage you will not be prompted about whether to save to quotepage or not.

By default each scan lists its resulting instruments in a quotepage having the same name as the scan itself. You can now specify a different output quotepage name if you like by entering a name into the QP Name box. To revert back to the default behavior, leave the QP Name box blank and press OK.

The ability to save a scan results quotepage immediately and under a user-specified name is a feature that has been available in Investor/RT for some time when scans are run as scheduled actions. Now, these settings become properties of the scan itself. When a scan is executed as a Run Scan action in a schedule, the options specified in the schedule action will override the saved properties of the scan. If the Run Scan schedule action does not specify a "Save As..." option, the scan's saved preferences will be used to run the scan.

Chart Buttons for Adding Groups of Indicators

The Chart Button Indicator has been enhanced with a new button purpose called "Add/Remove Preset Group". This button purpose can be used to create a single chart button that toggles an entire group of technical indicator presets on/off. When creating a button of this kind, Investor/RT presents a list of group names that are eligible for use. Only groups of type "Preset" can be used. To create a

new group of type "Preset", use File: New: Group or click the Group button on the main toolbar and pick "Create New Group" from the ensuing list. When the "Add Group" window appears, be sure to specify the group type as "Preset". Once you have created one or more Preset groups, you can add technical indicator presets to the group using the "View/Edit/Delete Objects" window. To open this window click the Green Trashcan icon on the main toolbar or if you prefer deeply nested menus, choose Control: Data Management: Delete/Rename: Presets. When the window has Presets as the object type, you will see a list of all of your defined technical indicator presets. To add one to a group, select the preset, and click the Add to Group button. The Add to Group window will prompt you to supply the name of the group to which the selected preset is to be added. To remove a preset from a preset group, open the group using the Open Group button on the main toolbar (or choose File: Open: Group). When you see the members of any group listed, Ctrl+double-click on any member to remove it from the group. Confirmation will be requested. Having created one or more Preset Groups, you may then add chart button(s) that toggle the entire group on and off. For example, if you had a button setup for a preset group containing 3 moving average presets and a regression line preset, clicking the button will add all four indicators to the chart at once. Clicking the button again will remove all four indicators. This new facility can also be used to execute groups of "Signal Actions". While Signal Actions are not technical indicators per se, you may create presets for them and construct a group containing one or more signal action presets just like any other indicator. When a button is assigned to a preset group containing signal actions, each signal action is simple executed in turn.

Portfolio Improvements

The Investor/RT Portfolio data column "Asset Class" now shows the class number and the asset class name. See item 'Portfolio Asset Class Reporting Improvement above for more information on creating named asset classes for portfolios. The asset class cells are editable - you can change the class number and press enter to assign any position to a different class.

Also, a new portfolio data column has been added. Called "% of Total Value", this column shows the percentage value of each position of the portfolio value as a whole. Note that this percentage does not consider the "Cash" in the portfolio. It is a percentage of the "Total Value" for each open position.

Improved Toolbar Appearance

Cosmetic changes were made to the appearance of toolbar buttons in an effort to give the toolbars a cleaner less cluttered look. Buttons are now drawn without borders. The borders do appear when you mouse over a clickable button. Tool buttons (e.g. the trendline or fibonacci retracement tool on the charting toolbar) will show their border when they are activated for drawing. Toolbar background color and message box background color have been revised in the MS Windows version of Investor/RT to match the standard default background color used by Windows XP.

Additions to Day by Day Backtesting Report

Several new statistical results have been added to the Day by Day backtesting report, including:

- Total Net Profit Long
- Total Net Profit Short
- Avg Net Prof Long/Day
- Avg Net Prof Short/Day
- Total Long Trades
- Total Short Trades
- Avg Long Trades/Day
- Avg Short Trades/Day
- Total Market Bias - This statistic reflects the overall bullish/bearish bias of the system. A value of 25% represents that there were 25% more long trades than short trades, while a value of -40% or (40)% means that there were 40 % more short trades than long trades.
- Avg Daily Market Bias - The Daily Market Bias is computed as the % difference between the number of longs and shorts. These daily values are then averaged over all the days tested. A value of 0% means that there were exactly the same number of longs and shorts each day, while a value of 100% would mean that the system is either completely long, or completely short, each day (and therefore 100% biased). Unlike the Total Market Bias, this number is never negative. It simply reflects the average discrepancy between longs and shorts over all days tested.

The number of long and short trades is also now shown for each individual day. These statistics are designed to gauge the degree of "market-neutrality" of their system, both overall, and on a day by day basis.

Version 7.0 Rev 2, Released: January 6, 2004

DTN.IQ New Historical Data Server

Investor/RT now supports an improved historical data server for the DTN.IQ. This allows improved access to historical data of all periodicities for all types of instruments. The new server is faster and the data quality much better than the "legacy" server that Investor/RT used prior to this writing. The new history server supports daily, weekly monthly, tick data, and intra-day interval data downloading. If an instrument is marked for daily data retention, but not for weekly or monthly data retention, all historical requests (even those from weekly or monthly charts) will download daily bars for the desired time period. Investor/RT will form weekly or monthly bars as needed using the daily data. However, if an instrument is marked for weekly and/or monthly data retention and you download weekly data and/or monthly data, the requested weekly or monthly bars will be downloaded and stored in the Investor/RT database directly. Downloading is support either directly from within a chart window, or using the Data Download window.

Every download request made to the new DTN.IQ historical server results in the creation of a text file in the admin folder/directory. The name of the file will depend on the ticker symbol and the periodicity of the download. For daily, weekly, and monthly data requests, the file name will be TICKER_hist.txt where TICKER is the ticker symbol for the instrument. For intra-day interval data, e.g. 1-minute or 5-minute bars, the file name will be TICKER_bars.txt. The historical server also supports tick data downloading, in which case the file will be named TICKER_ticks.txt. Tick data downloads include trade price, trade size, and the bid and ask prices at the time of the trade.

Here is a sample download file:

-- Source: DTN.IQ. Investor/RT 7.0.1 Weekly Data Downloaded 12/10/03 12:50

CA	10/31/03	23	24.15	22.3	23.52	15341000	0
CA	11/07/03	23.48	24.1	23.22	23.3	15693454	0
CA	11/14/03	23.26	23.38	22.81	22.86	11155400	0
CA	11/21/03	22.76	22.96	22.1	22.55	14269200	0
CA	11/28/03	22.78	23.35	22.35	23.3	9934300	0
CA	12/05/03	23.6	24.01	23.2	23.34	26828800	0
CA	12/09/03	23.27	23.6	23.14	23.21	4018500	0

After the download is completed, affected charts are updated to reflect the newly downloaded data. If you wish to inspect the content of the data downloaded, use the File: Open: File command to pick the file you wish to view. Look for these files inside the admin directory/folder within the Investor/RT folder. Note that these download files may accumulate over time, especially if you are tracking many symbols. There is a command in the Control Menu for eliminating all temporary download files from the admin folder. The command is:

Control: Data Management: Delete(Rename): Temporary Files

If you wish, you can easily setup a scheduled action to delete these temporary files once a week at a prescribed time of day. See Setup: Schedules. The "Delete Temporary Files" action is one of the actions listed under "Database Functions" in list of schedulable actions.

Portfolio Asset Class Reporting Improvement

Investor/RT Portfolio positions can be assign an asset class number from 0 to 99 as a way of organizing (sorting) and reporting on portfolio percentages by asset class. The user may now provide asset class names for any of the 100 asset classes. This is accomplished by creating an ordinary text file named assetclasses.txt and placing this file into the admin folder/directory inside the Investor/RT startup folder/directory. Each line in the text file contains a 2-digit asset class number followed by a comma and the name you wish to assign to that asset class. For example if you use asset classes 1 through 6 to classify your positions, your assetclasses.txt file might look like this:

01,Technology
02,Retail

03,Precious Metals
04,Phamaceuticals
05,Growth Funds
06,Income Funds

Any asset class number that is not assigned a name will appear in the Asset Allocation report with the name "Class xx", where xx is the class number. To produce an Asset Allocation report for any portfolio, click the pie chart button on the portfolio toolbar. To edit asset class numbers in a portfolio, simply add the portfolio column "Asset Class" to the portfolio window and edit the values for your positions in that column.

Trading System Optimization by Ticker Symbol

A checkbox has been added to the Optimization window titled "Optimize Symbols". When checked, the symbols themselves will become optimization parameters. This feature is applicable only when the underlying Trading System is setup to backtest on a quote page (as opposed to a single symbol). Each optimization iteration will run on a single symbol instead of a quote page of symbols. The results will provide a column for "symbol" just as it does for any other optimization parameter. As an example, the sorted results may show that the combination of MSFT using V#1 of 10 and V#2 of 12 was the most favorable. In addition, the optimization will leave any optimized V# variables for each symbol with their optimal values for that symbol. In other words, V#1 for MSFT might be 10, while V#1 for INTC might be 13, etc. This gives the user the ability to optimize the values on a symbol by symbol basis, giving each symbol an independent set of optimized V# parameters that yields the most favorable trading results for that symbol.

Price Bands Indicator: New Band Styles

Two new styles choices have been added to the Price Band Indicator: "Thick Bar" and "Thin Bar". These new bar styles draw vertical bars between the two prices (Price 1 and Price 2). The color of these bars can be customized based on whether Price 1 is above or below Price 2. The Thin Bar is drawn with a minimal width of 1 pixel, while the Thick Bar is drawn using the Pixels/Bar width of the underlying chart. These new styles can be used to create customized candlesticks (one Thick Bar for the body and one Thin Bar for the candle wicks).

Backtesting: Commission Accounting Improved

Prior to Investor/RT 7.0 Rev. 2, backtesting commissions could be specified on a "Per Trade" basis, allowing the user to provide a single value for the Entry commission, and another single value for the Exit commission. Commission amounts may now be specified in the format "Per Trade, Per Share", in both the Entry and Exit commission boxes. For example, if the following was specified for the Entry commission:

5, 0.01

This would mean that a commission of \$5 per trade, plus \$0.01 per share, would be applied for trade entry. To specify a "Per Share" only commission, simply enter zero followed a comma and the per share amount. This would simply apply a commission of \$0.01 per share, with no "Per Trade" commission. Conversely, if one only one amount is entered that amount is considered to be the per trade commission amount.

Suppressing Posting of Historical Data

Some users have requested the ability to suppress the automatic posting of historical data that normally takes place at the end of each trading system. Effective with release 7.0.1 automatic posting will not place if the posting time is set to 12:00 a.m. (midnight) (i.e. 00:00 in 24-hour time).

Copying a Quotepage to the Clipboard

The current contents of any quotepage can be copied (tab-delimited) text to the clipboard using the File: Save: Save to Clipboard command. The text can then be pasted into any text document or into the cells of a spreadsheet. To make the availability of this feature more evident, a Copy to Clipboard command has been added to the quotepage "+" menu in the upper right corner of the quotepage window itself.

Improved Product Registration Method

Many Investor/RT users are now leasing the software with monthly billing and once-a-month re-registration. Registration codes are sent by email on the first business day of each month. In order to streamline the registration process, Investor/RT 7.0 introduces a simple one-step process designed to automate the transfer of registration details from the email to Investor/RT. To use the new method, simply use the Edit Menu in your email program to "Select All" text in the registration email and "Copy" the text to the clipboard. On MS Windows systems, this can be done quickly using the keyboard shortcuts Ctrl-A and Ctrl-C. Macintosh users enter Command-A then Command-C. Then go to Investor/RT and choose Register from the File Menu. If the Setup: Preferences: Registration window happens to be open already, you can instead click on a new button titled "Paste Registration".

Version 7.0, Released December, 2003

Trading System Optimization

Investor/RT Version 7.0 Rev 2 has two very significant innovations: trading system optimization and trading system deployment in chart windows. For more information on the latter, see Trading System Indicator below. The new trading system optimization feature enables a set of Investor/RT trading system rules to be iteratively backtested using a user-specified range of periodicities, or indicator setups in order to identify the optimal trading signal setups.

Optimization pertains to the ability to determine the combination of trading system parameters which results in the most favorable performance for that trading system. These optimization parameters include a variety of technical indicator periods, periodicity, stops, targets, and more.

The ability to use technical indicator periods (along with stops and targets) as optimization parameters is implemented in Investor/RT through User Variables (V# variables). The setup windows for certain technical indicators, e.g. moving averages, now accept a V# variable in place of an explicit number as a period. For example, the setup for a moving average can specify that the period of the moving average be V#5. When the moving average is evaluated as part of a trading signal, the period of the moving average will be obtained from user variable V#5. For instance, if V#5 was placed in the "Period" field of a Moving Average, and the value of V#5 for the corresponding symbol was 12, then a 12 period moving average would result. When the moving average preferences are viewed, the user will see "V#5" in the Period field. This concept is key to understanding optimization. By specifying certain technical indicator settings as variables in trading signals, the optimal value of those variables can be determined by the optimization feature.

Each optimization allows up to 8 V# variables to be used as parameters. Up to 6 are "stepped" parameters, while 2 can have "discrete" values. A stepped parameter has a format such as:

V#1 from 5 to 9 step 1

If this were the only parameter, the optimization would set V#1 to 5, run the trading system and record the results, set V#1 to 6, run the system again and record the results, and so on. The system would be run 5 times in this example. The results would then be sorted (ranked) by a user-specified measure and displayed.

A discrete parameter has a format such as V#2 – 5, 8, 13, 21

If both V#1 from the previous example and V#2 were used as parameters in the same optimization, the trading system would be executed once for every possible combination of V#1 and V#2, which in this case would be $5 \times 4 = 20$ iterations.

Periodicity can also be used as an optimization parameter. Periodicity may be expressed as either a "stepped" or "discrete" parameter. Periodicities of "Minutes", "Seconds", or "Ticks" may be used. As an example, if we added the periodicity as a stepped parameter with the following settings to the optimization discussed above "Minutes from 1 to 10 step 1", the optimization would now run $5 \times 4 \times 10 = 200$ iterations of the trading system, and provide the combination of V#1, V#2, and periodicity that resulted in the best performance.

The optimization results are displayed in tabular form. One column is displayed for each of the optimization parameters, along with columns for each of the desired results. Options for displayed results include:

➤ Avg Profit/Trade

- Avg % Gain/Trade
- Avg %Gain/Bar
- Gross Profit
- Net Profit
- Avg Win/Avg Loss
- % Profitable
- # Trades

Below these options is a "Sort by" selection list containing the same choices. The option chosen from this list will be used when sorting the results.

As a simple example, a moving average crossover system looks to enter a long position when a shorter term moving average crosses above a longer term moving average, and to exit the long position when the short term average falls below the long term average. In this trading system, there are two candidates for optimization parameters: the short term MA period and the long term MA period. This system will also involve a "stop", and will be optimized across a variety of "Minute" periodicities.

First the trading system must be created. Choose File: New: Trading System from menu bar. Give the trading system a name like "maCrossTS". The buy and sell signals will be created using three V# variables. These will in turn be used as optimization parameters along with periodicity. Click the "New" button next to "Signal:". Type in the following syntax for the buy signal...

$$MA_ST > MA_LT \text{ AND } MA_ST.1 \leq MA_LT.1$$

MA_ST will be the short term MA, while MA_LT will be the longer term MA. This signal detects when the shorter term MA crosses above the longer term MA (MA_ST is above MA_LT on the current bar, but was less than or equal to MA_LT on the previous bar). Click the "Save" button. Specify a Period of V#1 for MA_ST, and V#2 for MA_LT. Give the signal a name like "maCrossBuy".

Add a second signal for setting (and adjusting) the trailing stop. This can be referenced by a NO ACTION rule. The signal formula is:

$$SET(STOP, CL - V\#3)$$

STOP is a token used to hold trailing stop values during backtesting. The rule above will set a trailing stop at the closing price minus the value of V#3 during the execution of the system. As discussed later, V#3 will be used as an optimization parameter, varying the trailing stop from 2 cents to 10 cents.

Now, setup the exit rule using syntax similar to the buy signal:

$$CL \leq STOP \text{ OR } (MA\#1 < MA\#2 \text{ AND } MA\#1.1 \geq MA\#2.1)$$

Save this signal with a name like "maCrossExit". The system will exit if the stop is reached or the crossover occurs.

Now that the signals are created, return to the Trading System window. Create the following three rules:

If maCrossBuy then BUY 1000 at Last price

If maCrossSetStop then NO ACTION If maCrossExit then SELL 1000 at Last price

The periodicity is not really important here since the optimization will automatically set it.

Click the "Setup Backtest" button at the bottom. In this window, specify the symbol or quote page that you'd like to test, along with the backtesting period. Remember, the longer the viewing period, and the more symbols that are tested, the longer the optimization will take to execute. Also make sure the "Maximum position size for longs" is at least 1000 shares.

Now, click OK at the bottom of this "Backtest Setup" window, and click "Save" in the Trading System window. This trading system should now be ready to be optimized on V#1 (short term MA period), V#2 (long term MA period), V#3 (stop), and periodicity.

Choose "Setup: Optimization" from the menu bar to open the Optimization Setup window. Click on "New" and provide a name for the optimization setup, e.g. "maCrossOpt". For the trading system, choose the "maCrossTS" created earlier. For this example, setup the V#1 parameter (short term MA period) from 4 to 12 step 1, the V#2 parameter (long term MA period) from 13 to 22 step 1, the V#3 parameter (trailing stop distance) from 0.02 to 0.10 step 0.01, and the periodicity from 1 minute to 10 minutes step 1 minute. Check three of the stepped user variable parameters, and the one stepped periodicity option and fill in the proper values. On the right, checkmark the desired results along with the measure by which the table will be sorted. Each row of the table will represent an iteration/execution of the trading system.

To begin the optimization, click the "Optimize" button at the lower left corner of the window. The title bar of the optimization window provides feedback as the optimization progresses. The title updates after each iteration is completed and looks something like this:

(Esc key to stop) 10% (820/8200) [4,19,0.04,2] ~2:45 left [last 0.124, avg. 0.098]

This tells the user that the optimization is 10% complete, completed 820 of the 8200 iterations, currently testing the combination of [V#1=4, V#2=19, V#3=0.04, Periodicity = 2], there are approximately 2 minutes and 45 seconds left, the last iteration gave a result of 0.124 (based on what is specified in "Sort by") and the average result of the completed iterations is 0.093. The optimization can be terminated at any time by hitting the escape (Esc) key on the keyboard. If the optimization is interrupted, the results of the completed iterations will still be shown.

As of Investor/RT Version 7.0 Rev 5, the following technical indicator periods have been augmented to allow V# variables in various setups.

ADX (DX Period)	MACD (Signal)
ADX (Smoothing Period)	PNF (Box Size)
ADXR (ADXR Period)	PNF (Reversal Criteria)
ADXR (DX Period)	RSI (Momentum Period)
ADXR (Smoothing Period)	RSI (RSI Period)
BB (Moving Average Period)	RSI (Smoothing Period)
BB (Standard Deviations)	STOCH (Raw K Period)
Bear Power (Moving Average Period)	STOCH(Fast D Period)
BOP (Smoothing Period)	STOCH(Slow D Period)
Bull Power (Moving Average Period)	STAT (Period, Next N Periods)
CCI (CCI Period)	T3 (Period)
CCI (Smoothing Period)	TDREI (Period)
DI+/- (DI Interval)	TLB (Reversal Criteria)
EMA (Period)	TLBOSC (Reversal Criteria)
EMA (Shift Period)	TRIP (Three MA Periods)
LRA (MA Period)	TRIX (Triple Exponential Periods)
LRA (Regression Period)	True Range (Actual Range Period)
LRF (Forecast Period)	True Range (Smoothing Period)
LRF (MA Period)	TSI (Short Term, Long Term Period)
LRF (Regression Period)	VOL (Period)
LRF (Standard Deviations)	Volatility (Period)
LRS (MA Period)	Williams %R - WPR (Period)
LRS (Regression Period)	Zig Zag (Min. Price Change %)
MA (Period)	Zig Zag (Ref. Line %)
MA (Shift Period)	Zig Zag Oscillator (Min. Price Change %)
MACD (Long)	Zig Zag Oscillator (Ref. Line %)
MACD (Short)	

Indicators not in the list above can, of course, be used with trading systems, but their indicator settings will remain constant as the trading system is optimized.

The RTL Token CTX may be useful when formulating trading signals for backtesting and optimization. The CTX token provides a way to determine whether the evaluation of an RTL formula (scan, signal, or custom indicator) is taking place in the context of a backtest, or in the context of a backtest during optimization, or in the context of a quote page scan. This token may be useful in cases where you may want a trading signal to be computed or a V# variable to be set differently depending on the context. This makes it possible to write one signal instead of two to take the different context into account. For example, you may have a trading system that uses V#22 as a trailing stop value. If you have a trading rule that sets the value of V#22, this would present a problem if you were running an

optimization that tests various value for V#22 to determine the optimal value. Using the CTX token you can augment the trading rule by adding:

```
IF (CTX != CTX_OPTI) THEN SET(V#22, <expression>);
```

CTX_OPTI is one of several numeric constants added to RTL. Its value (2) is the value RTL will give for CTX when an optimization is the context. The expression CTX = 2 is equivalent but we encourage the use of the CTX_* constants to make the intent of the RTL formula clearer.

The numeric constant tokens that can be used for comparison with CTX are:

- CTX_BKTST – Context is a backtest, optimization is NOT in progress.
- CTX_OPTI - Context is a backtest, optimization in progress.
- CTX_QPSCAN – A quote page is being scanned using the scan or signal. This context does not apply to custom indicators.
- CTX_OTHER – This context is a catch all to indicate that the context is NOT one of the previous three.

Sounds Preferences: Quiet Mode

Setup: Preferences: Sounds has a checkbox titled "Quiet Mode". When checked Investor/RT will run as if all sound events were assigned to "no sound". You can use Setup: Preferences: Keyboard Shortcuts to define function keys that turn on, turn off, or "toggle" the quiet mode setting on/off. When a keyboard shortcut changes the quiet mode state, a message will appear in the main toolbar as feedback. If the resulting state is "Quiet Mode OFF", then Investor/RT will play the "General Error" sound to give you audible feedback that sounds are back on again. Since Chart buttons can be setup to execute any function key shortcut, it is also possible to add buttons to your chart(s) for turning sounds on or off, or toggling the current state.

Dial/Data Bulk Download of Ticker Symbol Lists

Dial/Data (and myTrack) users who perform Dial/Data closing quote bulk downloads using download types "Bulk Download, Stocks", "Bulk Download, Mutual Funds", "Bulk Download, Futures" can now review a listing of all of the ticker symbols included in these bulk downloads. Each time a bulk download is performed, Investor/RT will process the thousands of quotes in the downloaded bulk file, updating closing quotes for those tickers that are setup in Investor/RT. A byproduct of the bulk download is a text file named DialDataSymbols.txt that is stored within the symbols directory (folder). This text file can be opened using File: Open: File for viewing. It contains a list of every ticker whose closing quotes were included in the most recent bulk download. This file may be used to quickly define ALL of the symbols to Investor/RT. Note that at the time of this writing, the bulk stocks list includes approximately 8500 stocks and index tickers. The bulk mutual funds list is even larger, containing almost 20,000 mutual fund and money market fund tickers.

Auto Connect Option for Chat Rooms

The setup window for Chat Rooms now contains a checkbox preference titled "Automatically Connect to Chat Room". When this box is checked, whenever that chat room is opened, e.g. via the menu or main toolbar, or when opened as part of a layout, the connection to the chat room will be initiated immediately upon opening the window. If this setting is unchecked, the window will always open at the appropriate size and screen position, but the internet connection to the chat room will be deferred until you either click the "Connect" button displayed inside the window, or (if the window is the front window) you press the enter/return key.

RTL Setup Window Enhanced

The RTL Setup window now has a toggle button in the top left area of the window that can be used to expand and minimize the window. When minimized, the RTL setup window becomes a thin window showing just the menus of available scans, signals, or custom indicators along with a push button for an action. The action or purpose of the button depends on the RTL type that is selected. When the RTL type is "Scan", the button's title is "Scan". Clicking it runs the scan. Thus you can use this window in its minimal state to pick a scan and click to run it. You can, of course, have several of these minimized RTL windows open at one time so you can have scans you run often all setup and ready to run with a single click of the scan button.

Similarly, when the RTL type is set to "Signal", the button title is "Marker" and its purpose is to add the selected signal as a signal marker to the front chart window. If there is no chart window open, one will be opened for you using the default chart preferences and the signal marker will be added to it.

When the RTL type is "Custom Indicator" the button title is "Chart" and its purpose is to add the selected custom indicator to the front chart window. A chart will be created if necessary to show the custom indicator.

The RTL setup window can be sized even smaller than the standard minimal size if you like. When you do this, the title of the window is adjusted so the name of the selected scan, signal, or custom indicator is seen in the window title.

The toggle button will expand the RTL setup window from minimal to normal size. The action button formerly at the top left of the window returns to its normal position at the bottom of the standard sized RTL window. The toggle button operates similarly to the toggle button used in the Setup: Instruments window to show and hide the advanced settings for an instrument. It shows an arrow pointing right when the setup window is at minimal size. It shows an arrow pointing down when the window is expanded to show all of the controls.

New RTL Token: CTX – RTL Context

The CTX token provides a way to determine whether the evaluation of an RTL formula (scan, signal, or custom indicator) is taking place in the context of a backtest, or in the context of a backtest during optimization, or in the context of a quote page scan. This token may be useful in cases where you may want a trading signal to be computed or a V# variable to be set differently depending on the context. This makes it possible to write one signal instead of two to take the different context into account. For example, you may have a trading system that uses V#22 as a trailing stop value. If you have a trading rule that sets the value of V#22, this would present a problem if you were running an optimization to determine the optimal value of V#22. Using the CTX token you can augment the trading rule by adding:

```
IF (CTX != CTX_OPTI) THEN SET(V#22, <expression>);
```

CTX_OPTI is one of several numeric constants added to RTL. Its value (2) is the value RTL will give for CTX when an optimization is the context. The expression CTX = 2 is equivalent but we encourage the use of the CTX_* constants to make the intent of the RTL formula clearer.

The numeric constant tokens that can be used for comparison with CTX are:

- CTX_BKTST – Context is a backtest, optimization is NOT in progress.
- CTX_OPTI - Context is a backtest, optimization in progress.
- CTX_QPSCAN – A quote page is being scanned using the scan or signal. This context does not apply to custom indicators.
- CTX_OTHER – This context is a catch all to indicate that the context is NOT one of the previous three.

New RTL Tokens for Fractals: FRACU and FRACD

The tokens FRACU and FRACD signify the completion of Up Fractal and Down Fractal formations. To detect the completion of an Up Fractal formation, use the syntax FRACU = 1. To detect the completion of a Down Fractal formation, use the syntax FRACD = 1. Note that when the Fractals indicator is drawn in a chart window, the marker denoting the fractal formation is drawn at the actual peak or trough of the fractal formation. When testing for fractal formations using RTL however, you test for the bar that completes the formation, not the bar you see at the "center" of the formation in the chart. For example if you have a five bar fractal in a chart you will see a marker above the middle bar of the five bar series that represents the fractal formation. If you add a signal to the chart with the formula FRACU + FRACD > 0 you will see that signal's marker at the end of each five bar up or down fractal formation.

New Backtest Detailed Report of NOTE/SHOW Output

SHOW and NOTE tokens, when included in RTL signal formulas, cause output to be produced in the backtest detail report. These tokens provide an excellent way to "debug" a trading system since you can see the values of bar data, V# variables, and technical indicators in the detailed report for each bar tested during the backtest. Investor/RT now produces an additional report file, similar to the

detailed report, but containing only the specific lines of output produced by SHOW and NOTE statements. This additional report, called the User Notes Report will be displayed upon completion of the backtest only if the Detailed Report option is checked in the backtest setup. If a trading system's rules contain no SHOW/NOTE statements, or if the backtest produces no SHOW or NOTE output, the User Notes Report will be empty and will not be displayed.

New Indicator and RTL token: POS

The Position indicator (RTL token: POS) gives the user access to a variety of results relating to the position of a bar/tick within the session, or within the overall data series. The Position indicator can be especially useful in backtesting for closing positions on the last bar of the session (use "POS = 1" with result of "Bars From End of Session"). Each "Result" option is described in detail within the indicator setup window. Select any result and the detailed description will appear in the text box below.

Trading Orders within Signal Actions

Signal Actions can now include "Trading Orders". At present, a Trading Order can execute a simulated trade in a user-specified Investor/RT portfolio.

A Trading Order is a named collection of user-specified information that describes a trading action, e.g. "Buy 100 Shares at Market for Account 123456". A Signal Action can optionally include a trading order to be executed when the Signal Action is triggered. A Signal Action is associated with a Signal Marker indicator in an Investor/RT Chart. When the Signal Marker triggers on the current bar (or last completed bar) in the chart, the Signal Action will be executed. The Signal Action can then call for a trading order to be executed, among other things.

Each trading order has a "Destination" and an "Account" which specified where the trading order will be sent and to which account the order applies. Initially, the "Investor/RT" destination is supported, and the "Account" can be any Investor/RT portfolio. When a trading order is executed for an Investor/RT portfolio account, the order is "filled" immediately at the last trade price for the instrument in the chart that triggered the Signal Action (and in turn the Trade Order). The Investor/RT "Destination" thus provides a way for the Investor/RT user to "paper trade" their trading signals in realtime. Each Buy, Sell, Sell Short, Cover trading order causes the appropriate transaction to be made in the specified Investor/RT portfolio. The portfolio window itself provides real-time monitoring of the simulated trading gains and losses. The reporting facility of the Investor/RT portfolio provides an audit trail and performance report for all closed positions over various user-specified time periods.

In time, "Trading Orders" will be enhanced to support more destinations including real brokerage services, and intermediary software, such as Ninja Trader, a software product that handles orders for simulated or real trading via Interactive Brokers.

Improved Historical Data Retrieval

Internal improvements were made to the database retrieval functions in Investor/RT to speed up the retrieval of historical data when the "Last N Bars" of data are needed. The performance improvements at present apply to all periodicities: daily, weekly, monthly, tick, and tickbar, and any time interval periodicities, e.g. 1 minute, 15 seconds. The most significant speed improvement will be in the area of RTL related data retrieval, e.g. scans, signals, custom indicators and technical indicators that call upon them in charts, custom columns, backtesting, optimizations.

Note that if you have charts with a view period of "Last N Days" where N is typically much smaller than the number of days of data on file, you can speed up the opening of such charts by expressing the view period in bars instead of days. For example, a 5 minute chart with a view period of "Last 250 bars" will open faster than the same chart with "Last 2 Days" especially if you have say 6 months of intra-day data on file. The former chart grabs the last 250 bars from the end of the database while the latter has to search through all of the data on file to find the starting point for the data retrieval.

New Traditional Chart View Period Settings for Tick/TickBar

Prior to the development of "Last N Bar" retrieval capabilities (see item #11 above) traditional charts containing ticks or tickbars were limited to view period setting expressed in hours, e.g. "Last 4 hours". Tick and tickbar traditional charts can now have a view period expressed as "Last N ticks" or "Last N tickbars". Charts having this periodicity will open substantially faster than the "Last N hours" type in proportion to the number of days of tick or intraday interval data that is kept on the database.

Backtesting Improvement: Cost Basis for Futures

Investor/RT has been improved to enable the user to specify the margin requirement per contract for any future type. To setup this dollar amount, open the Setup: Futures window, choose the type of future you wish to update and click the "Setup" button. The "Futures Definition" window will open. Enter the margin requirement per contract and press OK. The margin amount specified for futures of this type will be used to compute a "cost basis" for each position taken during backtesting. This will provide a more realistic accounting of average position size when backtesting futures. If you attempt to run a backtest on a futures contract for which a margin requirement has not yet been setup, Investor/RT will prompt for the margin requirement, update the future definition, and continue the backtesting.

RTL Language Enhancement: Using V# variables as token qualifiers

Prior to version 7.0 historical qualifiers were required to be numeric constants, e.g. in the signal formula $CL.5 < MA.5$ the constant 5 is used to signify that the close is to be compared with the moving average 5 bars ago. Version 7.0 introduces variability for historical qualifiers using V# variables. Thus a signal or scan formula may be written as $CL.V\#99 < MA.V\#99$. When the signal is evaluated for a particular instrument, RTL looks up the present value of V#99 for that symbol and

uses that value as the historical qualifier. This feature is extremely valuable when formulating trading system signals for backtesting with optimization. The optimization setup and test various values for V#99 to determine which values are superior.

When the formulation <token>.V#<number> is used in an RTL expression, <number> must be a valid V# variable number. V# variable numbers begin with V#1 and have a maximum of V#512, although the maximum may be lower than V#512 depending upon the preference setting in Setup:
Preferences: User Variables.

When evaluating the formulation <token>.V#<number> The "value" of V#<number> must be zero or higher. If the value is not a whole number, just the whole number portion of the value is used, e.g. if V#99 is 5.9 when MA.V#99 is evaluated, the result is MA.5, MA five bars ago. Negative values for V# variables result is no qualification, e.g. if V#99 is -3.0 when MA.V#99 is evaluated, the result is simply MA, as if no qualifier were used at all.

Trading System Indicator

New RTL Token TARGET: Trading System Target Price

This token can be used in Signals designed to operate with trading systems. V# variables can be used to keep track of trading price, of course, but using TARGET explicitly in your trading signals can make your overall trading system rules more readable. TARGET is simply a built-in variable you can SET, e.g. SET(TARGET, expression). Similarly, a exit signal might be written:

CL >= TARGET; exit when target price is hit or exceeded

New RTL Token TSYS: Trading System Indicator.

New Schedule Actions for QuotePages

New action choices are available in the Setup: Schedules window. The list of actions is now shown in alphabetical order.

The "Recalc QuotePage" action causes the user specified quotepage to recalculate ALL custom column calculations for ALL instruments in the quotepage.

The "Sort QuotePage" action causes the user specified quotepage to be recalculated and sorted on the designated custom column name.

See 'New Scheduling Actions for Importing Data ' for further additions to the Schedule Actions list.

Import/Export of QuotePages and Trading Systems

The File Menu's Import and Export menu items now support import and export of quote pages and trading systems. File: Export can be used to export the definition of the front quote page window or trading system window. An export command is also available in the "+" menu at the upper right corner of each quote page. The trading system setup window now has an Export button also.

When exporting a quote page, the resulting definition text file will contain definitions for the quote page itself, plus definitions of all scan/signals, custom indicators, custom columns and technical indicator presets that are used directly or indirectly by the quote page. Quote page definition files also contain definitions for each instrument (symbol) in the quote page. The recipient of a quote page export file can import the file using File: Import: QuotePage. There is a new user preference in Setup: Preferences: Import/Export that controls whether or not any incoming ticker symbols that are not yet defined to Investor/RT will be added or ignored. If the "Ignore..." checkbox is checked, an imported quote page will show only those tickers that are already defined to Investor/RT on the recipient system. The quote page may even be empty if none of the exported symbols exist on the recipient system. If the "Ignore..." check box is unchecked, any ticker symbols in the quote page export will be added to the recipient system. Note that any custom columns imported this way may not be showing values until sufficient data has been downloaded or collected for the imported ticker symbols. Note also that after importing a quote page setup, you can use the quote page menu "Save Format" command to give a name to the format of a newly imported quote page. Thus, the format of an imported quote page can be easily applied to other existing or new quote pages using the user-specified name.

Trading system export files contain definition text for the trading system rules and preferences along with all signals and custom indicators that are referenced directly or indirectly by the trading system's rules. Trading systems can be imported using File: Import: Trading System.

Users of the Trading System Deployment (charting) feature of Investor/RT Professional can create charts containing the new Trading System Indicator. Exporting of charts containing a trading system indicator will create an export file containing the definitions of (a) the chart setup, (b) the trading system rules, (c) all signals used by the trading system or otherwise included in the chart, (d) all other RTL objects referenced by the chart, and (e) all technical indicator presets (setups) referenced by indicators in the chart, e.g. chart buttons. All of this definitional information can be imported into another Investor/RT system via this single export file.

With the addition of these import/export types, Investor/RT now has all of the capability needed to enable Investor/RT users to share sophisticated workspaces. Importable setups now include: charts, technical indicator presets, scans, signals, custom indicators, custom columns, quote pages, and trading systems. The export files are cross platform ASCII text files that can be used interchangeably by MS Windows and Apple Macintosh users of Investor/RT.

Tick Data Retention Override Feature Added

The History Retention Preferences window (Setup: Preferences: Historical) now permits each ticker symbol to have its own unique tick data retention preference. The global default retention period for tick data is specified at the top of the window. In the override section, you can select a ticker from the list and its current settings are shown. You may enter an override value for the number of days of tick data to be retained for any instrument. The number of days may be zero or any value less than or equal to the default Intra-day retention period. For example, you may have tick data retention set by default at 0 days, i.e. no tick data except for the current session, but then override selected ticker symbols for tick data retention as needed. This way you only incur the overhead of tick data retention on those symbols you override while most symbols will have their tick data compacted into bar data at the end of each trading session. Investor/RT users are advised to check the History Retention Preferences after upgrading to the 7.0 Release to verify that the default settings for intra-day and tick retention are set appropriately.

Note that the Intra-data default setting specifies the total number of days of intra-day data (either tick or bar data) that will be maintained by default for each instrument. The Tick Retention setting specifies how many of those days will be maintained as tick data before compaction into bar data begins. Thus the tick retention should always be less than or equal to the intra-day retention. The new override feature gives the Investor/RT user the flexibility to specify total intra-day and tick data retention settings uniquely for instruments of special interest.

The historical retention preferences for instruments can be shown in quotepage by adding the appropriate column names to the page setup. All of these column names begin with the word "Retain", e.g. "Retain Intra" and "Retain Tick" are the column names for the intra-day total retention and the tick data retention respectively. There are columns for daily, weekly, and monthly retention as well. These values are editable in the quotepage. So for example, you could open the .All Symbols quotepage, add Retain Intra and Retain Tick. Click on those columns to sort the page to quickly identify which symbols have the highest retention periods or which ones are different from your default setup.

Each of the five retention options (daily, weekly, monthly, intra, and tick) has a corresponding RTL token (HRD, HRW, HRM, HRI, and HRT, respectively) which may be used to scan for tickers having certain settings or to SET the preference setting using a scan. For example the scan:

```
IF TICKER = "ES*" THEN SET(HRT, 3) ELSE SET(HRT, 0);
```

Will set the tick data historical retention preference of all symbols (in the subject quotepage) to zero except those that begin with the two letters "ES". The ES instruments will retain 3 days of tick data.

Similar, the scan "HRT > HRI" could be used to see if there are any tickers whose tick retention exceeds the intra-day retention period, so that these may be corrected. Remember, the tick retention must be less than or equal to the intra-day overall retention period.

New Scheduling Actions for Importing Data

Schedules may now be used to automate the import of current quotation and/or historical data from user-specified text files. These new actions will be useful to those who wish to input current quotes or historical prices from other sources into Investor/RT on a periodic or once-a-day scheduled basis.

The "Import Current Data" action allows scheduled import of a user designated file name. The action setup includes the specification of a "format" to inform Investor/RT of the content and order of the incoming data fields. Current data flows immediately into the system for display in quote pages, portfolios, etc. Historical data is not affected by the import of current data, however, the price values imported via current quote import will be posted to the database at posting time of each trading session.

The "Import Daily Data" action is used the schedule import of daily historical bars from a single user-specified file. Again a format must be specified and this input format may include only the ticker, date, open, high, low, close, and optionally the open interest data items. Unlike current quote import, the daily historical bars are posted directly to the historical database. The input file can contain one or more lines per ticker and each line must contain the date of the bar data. If more than one line per symbol is included, the lines for a given symbol must be in ascending date sequence. If the most recent (last) line of data for a ticker symbol has a date that is more recent than the last updated date of the corresponding instrument in Investor/RT, the imported price and volume data will also update the instrument data displays (quote pages, portfolios, etc.)

Finally, the "Import Intraday Data" action is used to schedule import of historical intraday tick data or bar data of any periodicity from a single user-specified file. The "Date Time" data column must be part of the format specified and must of course contain not only the date but also the time of each line of tick data or bar data in the imported file.

All three of these import types are equivalent to using the corresponding functions in the File: Import window.

The import function in Investor/RT enables the user to import historical data of various time frames. In addition, ticker symbols and other instrument properties may be imported in a variety of formats as a means of defining new instruments to Investor/RT and/or defining quote pages.

Importing Ticker Symbols

Choose File>Import {Alt,Apple}+I

Choose "Ticker Symbols" as the Import Type.

Then choose one of the ticker symbol File Formats:

ASCII Text File

Stocks with Options List

TickerWatcher Quote File (Mac only)

Click Import and navigate to the appropriate file on your hard drive or desktop and select the file you wish to Import. A confirmation of the imported file will display on the Investor/RT main toolbar.

Importing Historical Data

Investor/RT supports importing of daily, weekly, monthly, or tick data. Weekly, monthly, and tick data imports are supported ONLY via ASCII text files. When daily or one of the other time frames is chosen, you must specify via the Import Format menu, how the data in the input file is arranged. If the desired format is not one of the formats available in the menu, close the Import window and go to Quote Page Preferences to create a new format. The new format name will appear in the menu when you open the Import window again.

Each line in the ASCII text file must have a date (or date/time). Dates may be specified in yymmdd format or mm/dd/yy format. When importing tick data Investor/RT accepts a time indication following the date, e.g. mm/dd/yy hh:mm:ss, or mm/dd/yy hh:mm. Usually, each line in the input text file contains the ticker symbol. Historical data for several tickers may be imported from a single file. If there is no ticker symbol in the format you use to import the data, Investor/RT will assume all data is for one ticker and will prompt the user to specify the symbol.

Daily historical import is not only supported via ASCII text files, but from several other more specialized sources. These choices appear in the File Type menu when Daily Historical Data is specified as the Import Type.

File Type: TickerWatcher (Macintosh Only) allows users of Linn Software's TickerWatcher product for Macintosh to import all daily historical data from the TickerWatcher history file into the Investor/RT database. Prior to importing the TickerWatcher daily data, the user must setup all of the ticker symbols in Investor/RT, usually by importing them as described above.

The 3 MetaStock entries under File Type are used to import data and/or ticker symbols stored in MetaStock format. These options will be useful to users of the MetaStock program who wish to bring data easily into Investor/RT, or to any user who has access to data stored in MetaStock format, e.g. data stored on CD ROM.

Importing Historical Data in MetaStock Format

Three MetaStock import options are provided under "Import File Type" when the Import Type is set to "Daily Historical Data". These options are (1) MetaStock List Symbols, (2) MetaStock One Symbol, and (3) MetaStock All Symbols.

MetaStock List Symbols allows the user to quickly create a quote page for the symbols (instruments) in a MetaStock directory. MetaStock data files are organized in folders (directories) which contain a ".dat" file for each security, and an index file called "MASTER" which contains a list of the instruments in the directory. Click Import and then select the "MASTER" file you wish to import. All symbols defined in the MetaStock Master File are then setup automatically in Investor/RT and a Quote Page is created for those instruments. You may provide your own name for the newly created quote page.

MetaStock One Symbol allows you to import the historical data for a single instrument from a MetaStock directory. Click Import and select the MetaStock Master file you want. You will then be asked to enter the ticker symbol to import. Type in the ticker symbol (in uppercase) and press OK. Investor/RT will search the MetaStock master file for the entered symbol and import its historical data. It is not necessary to pre-define the symbol. If the symbol is not yet defined, Investor/RT will define it automatically.

MetaStock All Symbols will define all of the instruments, create a quote page and bring in all of the historical data for each symbol into Investor/RT. Click Import and identify the Master file to import and Investor/RT does the rest.

The Momentum CD and the Glance Market Data CD for futures historical data, (see www.momentumcd.com) contain data in both MetaStock and ASCII text format. These CD ROMs, updated quarterly, provide a convenient source of long term historical data for use by Investor/RT users.

To Import Current Quotes

The Current Quotes Import, when used with ASCII text files allows for importing current prices and other properties for existing instruments. By specifying the input format name (see Setup: Preferences: Formats) the user controls how the input ASCII file is interpreted. Any of the following data fields may be present in the format:

- Ticker Symbol
- Date/Time (when importing price values)
- Security Name
- Open, High, Low, Last, Previous Close, Volume, Open Interest
- Alias Ticker (for Dial/Data downloading)
- User Custom (arbitrary user data)
- Expiration Date (mm/dd/yy format)
- Strike Price

The data in the input file must have each field separated by commas or tab characters.

Click File>Import {Alt,Apple}+I

Select ASCII Text File or TickerWatcher Quote File as the Import File Type. If importing Current Quotes from TickerWatcher, the selection for File Format becomes inactive. Investor/RT recognizes the file format for the TickerWatcher Quote File.

Trading System Indicator: Custom Bands

The Trading System Indicator (TSYS) now has a new custom band option. This option is labeled "Draw Band Between Values 2 and 3" and gives the user the ability to draw a solid or hollow band between any of the available price values. A typical usage for this new feature would be to draw a band between the system's stop and target values. Combining a "stop-target" band with a Profit Band (drawn between Entry and current price) produces a nice visual representation of the trading system's state, showing both historical and current state. This setup also works well when drawn behind an instrument, where the instrument is drawn as a connected line. The custom band also has a "hollow" option. When "hollow" is checked, only the borders of the band will be drawn for each bar.

Trading System Indicator: Executing Signal Actions

The setup window for the trading system indicator has a checkbox titled "Execute Trading System Signal Actions". When this box is checked, a trading system running in a chart will execute user-specified Signal Actions whenever a rule having an associated signal action signals "true" on the last completed bar in the chart.

The Trading System Definition window has been enhanced to allow any trading rule to have an associated signal action. Note that signal actions associated with trading rules have no bearing on backtesting or optimization of trading systems. The Signal Actions associated with trading system rules specify actions to be taken in the context of a trading system running inside an updating chart under control of a the trading system chart indicator.

To associate a Signal Action with a particular rule, follow these steps:

1. Click in the Trading Rules section of the Trading System Definition window to select a rule.
2. Click the "Signal Action" checkbox and choose a Signal Action from the list menu to the right of the Signal Action checkbox.
3. Click the "Modify Rule" button to apply the change to the rule.
4. Note that the text description of the rule now reflects the Signal Action name at the end.

To turn off a Signal Action for a particular rule, follow these steps:

1. Click on the rule.
2. Click to uncheck the Signal Action checkbox.
3. Click the Modify Rule button.
4. Note the text description of the rule no longer shows a Signal Action.

To the right of the button listing the Signal Actions there are buttons titled "... " and " + ". The "... " button is used to view (or edit) the setup of the selected Signal Action. The + button is used to create a new Signal Action. You will be prompted for a name for the Signal Action. The newly added Signal Action will then become the selected Signal Action for application to the currently selected rule. Click "Modify Rule" to associate the Signal Action with the rule.

Using this new facility, it is possible to operate fully automated trading systems or fully automated simulated trading systems inside Investor/RT charts using the Trading System Indicator. Automated trading systems can be created using Signal Actions that communicate with Ninja Trader software to submit brokerage orders. Simulated automated trading systems can be created using Signal Actions that have associated "Trading Orders" that open or close positions in Investor/RT Portfolios.

Selecting Investor/RT Database Location

The Backup Preferences window has been expanded and renamed "Database & Backup Preferences". This setup window is accessible using either Setup: Preferences: Backup or Setup: Preferences: Database. The window has a new section at the top titled "Database Location" where the user can quickly reconfigure Investor/RT to use an alternate database.

Database & Backup Preferences

The Investor/RT Database is a collection of 59 files stored in a directory (folder) named data_f. Many of these files are "inter-related", that is, some files contain information that associates that file's data with data in another file. For this reason, these files must generally be treated as a group. The 59 files must be backed up as a group. It is recommended that all Investor/RT users backup their database daily. You may choose to have your Investor/RT database backed up automatically each time Investor/RT starts or quits, and/or you can specify a time each day when the backup will be performed. You may also initiate a backup at any time by choosing Backup Database from the Database Utilities menu under the Control menu.

Setup: Preferences: Database or Setup: Preferences: Backup will open the Database & Backup Preferences window. This window is used to specify a variety of backup related options including the location (path) of the folder where the backup copies of the database file will be kept.

If you typically quit Investor/RT once at the end of each day, select the option to backup when Investor/RT quits. If you typically leave Investor/RT running for days or weeks without quitting, then select the option to backup every day at a specific time, at 8 p.m., for example. When Investor/RT makes a backup, it overwrites the previous backup, if any, in the designated backup folder. If you want multiple backup copies, you may change backup

locations and make additional backups at any time. Whenever you change backup locations, it is recommended that you immediately make a backup into the newly specified location.

Setting the Database Location

By default the Investor/RT database (the data_f folder) resides in the "startup" directory folder (the folder where the Investor/RT application resides). This database location is shown at the top of the Database & Backup Preferences window. Typically, the database location will look something like this:

MS Windows: C:\investrt\data_f	MS Windows: Macintosh OS X: Macintosh HD:Applications:InvestorRT Folder:data_f
Macintosh Classic: Macintosh HD:Investor/RT:data_f	

Advanced users of Investor/RT may wish to work with two or more Investor/RT databases. For example, one Investor/RT database might be used to do very long term backtesting and trading system development work, while another Investor/RT database housing only a few days of intra-day historical data might be used for real-time trading. Some users operate Investor/RT using a "ram disk" for improved performance. The "Database Location" setting can be changed by clicking the browse button to "pick" an alternate data_f folder containing the alternate database. To setup an alternate database we recommend that you create a parent folder, call it "dat" for example, and place the copy of data_f within it. We suggest a short folder name, like "dat" if you are using MS Windows. The total length in characters of the "path" to the database is limited in the MS Windows version of Investor/RT. The Investor/RT database files themselves (59 files as of the time of this writing) must reside in a folder named "data_f" to be recognized by Investor/RT as a valid database location. Furthermore, the parent volume or folder containing the data_f folder must also contain the Investor/RT database definition file. The database definition file has a file extension of .dbd; it can be found inside the Investor/RT startup directory. The Investor/RT database definition file is named irtdbXX.dbd where XX is a number, e.g. irtdb72.dbd. Copy this file into the dat folder where you place the data_f folder. You can place the "dat" directory folder anywhere you like on your hard drive, but it is recommended that alternate database folders be kept in the Investor/RT startup directory. If you need more than one, name them dat1, dat2, dat3, etc. for example, each one containing its own data_f folder folder and .dbd file. Note that the .dbd file in the Investor/RT startup directory/folder is updated from time to time when new releases of Investor/RT are issued. When a newly numbered dbd is issued, it must be copied to all "dat" folders that contain data_f folders. You will get an error message at startup if you try to run Investor/RT with an out of date .dbd file.

To switch Investor/RT to an alternate database, click "Browse" in the database location section of the setup window, navigate to the "dat" directory and choose the "data_f" directory within it. Investor/RT will not allow you to choose a directory unless it is named "data_f" since again, all Investor/RT databases must reside in a data_f folder. Investor/RT will then reconfigure itself to use the newly selected database and the startup or last session window layout will be opened for that database. In this example, if you then go to Setup: Preferences: Database you will note that the database location now reads:

MS Windows: C:\investrt\dat\data_f
Macintosh OS X: Macintosh HD:Applications:InvestorRT Folder:dat:data_f
Macintosh Classic: Macintosh HD:Investor/RT:dat:data_f

When switching databases, Investor/RT automatically switches the backup location to the default location for the new database (see below). This is done so that the backup files for the newly selected database will not be backed up the same former backup location for the other database. In this example the backup location will be changed to the backup_f directory folder inside the newly selected data_f directory folder.

Note that changing database location is an advanced feature of the software that is seldom needed by most users. Before experimenting with this feature assure that you have a backup of your original database(s), preferably on external media (CD ROM, ZIP Disk, etc.)

Setting the Backup Location

The default backup location for all database files is a folder (directory) named BACKUP_F located inside the DATA_F folder on your hard drive. You may specify an alternate backup location if you like. This is useful for those who wish to backup automatically to an alternate volume such as a zip drive or other backup medium.

Use the Browse button to select an alternate backup location. Do not type a path name into the backup location edit box, it will be set for you when you use the Browse button. Under Windows there must be at least one file inside a folder in order for you to choose it a backup location.

To Verify the Database is Okay

Choose "Verify Database" from the Database Utilities menu under the Control menu to spot check the validity of your database

Viewing the Backup Log

When Investor/RT makes a backup, it produces a backup report. If you need to restore your database from the backup, it is wise to first check this backup report to confirm that your most recent backup completed properly. To view the backup report choose File: Open: Backup Log.

Backing up the Database

You may backup your database at any time by choosing "Backup Database" from the Database Utilities menu under the Control menu.

Restoring a Backup - You may restore the Investor/RT database to the most recent backup by choosing "Restore Database" from the Database Utilities menu under the Control menu.

If Investor/RT quits unexpectedly such as during a power failure, it will perform a diagnostic on the next startup. In the unfortunate event that a system error, application failure, or power failure results in a damaged database, Investor/RT can automatically restore the backup.

When Investor/RT starts up, if it is determined that your database is damaged, you will be given the option to recover the database from the most recent backup. Investor/RT will allow you to continue using the damaged database if you choose to do so. Running with a damaged database gives you the opportunity of exporting historical data or saving quote pages that may not be present in the backup copy you have. In that event, automatic backup options are disabled to assure that the most recent backup is not overwritten by a backup of the damaged database. You may then restore the backup manually as described above.

Trading System Status Annotations in Charts

The text annotation indicator (Annotation) can now be used to display trading system specific RTL token values when a trading system indicator is present in the chart window. For example, an Annotation setup such as:

Entry: %ENTRY Current: %CL Target: %TARGET

Could be used to show a message in the chart window depicting the entry, target, and current price for the trading system in the chart window. The message text will show zero values for entry and target when the trading system is out of the market.

Trading System related tokens may also be used now in NOTE setups used within signals of a trading system during backtesting. For example the same NOTE setup above could be used in a trading signal tested on each bar to show entry, target and current price messages for each bar in the detailed report of a backtest.

Here is a list of trading system related tokens that may be used in Annotation setups or NOTE statements. In item #26 below, these token may also be used in custom indicator formulas.

ENTRY	Entry price of current position
STOP	Stop price
TARGET	Target price
GL	Gain/Loss (\$) of current position
GLPCT	Percentage Gain/Loss of current position
POS_STATE	Position State 1=Long, 2=Short, 0=No Trade Active
POS_SIZE	Position size, negative when short, zero when no trade active
POS_COST	Position cost (\$)
DAYSOPEN	Number of days the trade has been open
BARSOOPEN	Number of bars the trade has been open
MINOPEN	Number of minutes the trade has been open
TNUM	Trade number since the beginning of the charting period

Creating Custom Indicators using Trading System Tokens

The tokens list above may also be used to create custom indicator formulas. The resulting custom indicators can be added to a chart that also contains a trading system indicator. Similarly, if a chart is open running a trading system on a particular ticker symbol, variable trading system related data can be shown in a quotepage using custom column setups where each custom column uses a custom indicator that references trading system related tokens. For example, consider the custom indicator formula "CL – ENTRY", a measure of how far price has moved plus or minus from the entry price of a trade. If you have a chart window open with a trading system, you can setup a quotepage containing a custom column to show CL-ENTRY. Note that any ticker symbols in the quotepage that do not have a trading system indicator running will always have ENTRY of zero. If you wish to only show non zero distances from the entry price you can revise the CI formula to read:

$$(CL - ENTRY) * (POS_STATE \neq 0)$$

This formula will produce the result zero when POS_STATE is zero, otherwise it will calculate the distance between the current price and the entry price of the trade. In the custom column setup, color coding rules could be used to show a blank (nothing at all) when the CI is equal to zero, show the value with a green cell background when the CI is positive and a light red background when the CI is negative.

Volume Profile Improvement

A checkbox has been added to the Volume Profile preferences entitled "Count Only Price Changes". This option is available when the "Count Bars/Ticks" option is checked. When the "Count Bars/Ticks" option is checked, each bar/tick is assigned a volume of "1" instead of using the actual volume of the bar/tick. This way, each bar/tick gets equal weighting with respect to the profile. If you also check

the new "Count Only Price Changes" option, then each price will get a volume of "1" only when price changes to that price. For instance, if an symbol was trading at 10.01, and then a trade came in at 10.02, then 10.02 would have a volume of 1 added to it's profile bar. However, if trades continued to tick at 10.02, no additional volume would be added. If price then changed to 10.01, then back to 10.02, both those prices would get an additional volume of 1. Whenever price changes TO a certain price, that price gets a volume of 1. Here are two examples of trade sequences:

Sequence #1: 10.01, 10.02, 10.02, 10.02, 10.02, 10.02, 10.02, 10.02, 10.01, 10.01, 10.01, 10.01

Sequence #2: 10.01, 10.02, 10.01, 10.02, 10.01, 10.02, 10.01, 10.02, 10.01, 10.02, 10.01

In sequence #1, prices 10.01 and 10.02 would both have a volume of 1, while in SEQ2, both 10.01 and 10.02 prices would have a volume of 5.

Version 6.2 Rev 4, Released: October 1, 2003

Sounds Preferences: Quiet Mode

Setup: Preferences: Sounds has a checkbox titled "Quiet Mode". When checked Investor/RT will run as if all sound events were assigned to "no sound". You can use Setup: Preferences: Keyboard Shortcuts to define function keys that turn on, turn off, or "toggle" the quiet mode setting on/off. When a keyboard shortcut changes the quiet mode state, a message will appear in the main toolbar as feedback. If the resulting state is "Quiet Mode OFF", then Investor/RT will play the "General Error" sound to give you audible feedback that sounds are back on again. Since Chart buttons can be setup to execute any function key shortcut, it is also possible to add buttons to your chart(s) for turning sounds on or off, or toggling the current state.

Dial/Data Bulk Download of Ticker Symbol Lists

Dial/Data (and myTrack) users who perform Dial/Data closing quote bulk downloads using download types "Bulk Download, Stocks", "Bulk Download, Mutual Funds", "Bulk Download, Futures" can now review a listing of all of the ticker symbols included in these bulk downloads. Each time a bulk download is performed, Investor/RT will process the thousands of quotes in the downloaded bulk file, updating closing quotes for those tickers that are setup in Investor/RT. A byproduct of the bulk download is a text file named DialDataSymbols.txt that is stored within the symbols directory (folder). This text file can be opened using File: Open: File for viewing. It contains a list of every ticker whose closing quotes were included in the most recent bulk download. This file may be used to quickly define ALL of the symbols to Investor/RT. Note that at the time of this writing, the bulk stocks list includes approximately 8500 stocks and index tickers. The bulk mutual funds list is even larger, containing almost 20,000 mutual fund and money market fund tickers.

Auto Connect Option for Chat Rooms

The setup window for Chat Rooms now contains a checkbox preference titled "Automatically Connect to Chat Room". When this box is checked, whenever that chat room is opened, e.g. via the menu or main toolbar, or when opened as part of a layout, the connection to the chat room will be initiated immediately upon opening the window. If this setting is unchecked, the window will always open at the appropriate size and screen position, but the internet connection to the chat room will be deferred until you either click the "Connect" button displayed inside the window, or (if the window is the front window) you press the enter/return key.

Version 6.2.3, Released: September 17, 2003

Further Adjustments to Main Toolbar

As noted above, the Preferences button and Open Group button occupy the first two positions of the main toolbar. These are now followed immediately by the Open QuotePage, Open Chart, and Open RTL buttons. This change was made in view of the importance of these first five buttons and their frequency of usage.

Quick Setup Feature for Groups of Charts

To quickly create a "Group" of Traditional Charts, first use the Open Chart button to open the charts you want to form into a group. Then right-click (control-click on Macintosh) in any chart window and use the Add to Group submenu, choosing "Add All Open Charts to Group...". Investor/RT will prompt you with a list of group names. Pick the group you want and click OK. The names of all open traditional charts will then be added to the group you select.

Quick Setup Feature for Mixed Groups Various Window Types

The Add to Group command in the File Menu is now a submenu with three choices:

1. Add Front Window to Group.
2. Add All Open Charts to Group.
3. Add All Open Objects to Group.

Choice 2 has the same effect as the analogous command in the Chart popup menu described in the Quick Setup Feature for Groups of Charts above. Choice 3 enables you to quickly setup a mixed group of objects based on all windows open at the time. Once you have created such a mixed group of objects (windows), that group may be used to quickly open that set of windows at a later time, similar to a layout.

Investor/RT Chat Windows in Layouts

When a chat window (IRC Chat) is saved within a layout, opening that layout will restore the chat window and its associated setup information as before, however, the connection to the chat room will be deferred until the user explicitly clicks on a "Connect" button inside the newly opened

window. Before connecting the user can edit the preferences for the window, resize or reposition it, etc.

Note that if you have a chat window open when you quit Investor/RT, the chat window will be saved as part of the "Last Session Layout". The next time you startup Investor/RT, assuming you have no specific "Startup Layout" defined, the "Last Session Layout" will be opened automatically. The chat window will reopen without attempting to connect.

When you use the Open Menu or the Chat button on the main toolbar to open a chat room window, Investor/RT will open the window and immediately connect to the chat room. If you wish to open a chat room window without connecting, hold down the Ctrl key (option key on Macintosh) as you use the Open Menu or Chat Button. Click on the "Connect" button to initiate the connection to the chat room.

RTL token DAYS Improved for use in Backtesting

The DAYS token (Days Til Expiration) has been improved so it can be used during backtesting. As backtesting proceeds bar to bar, the value of DAYS changes to reflect the number of days from the bar being tested until the expiration date of the futures contract or option. The token DAYS requires that the quotepage column "Expiration Date" show a valid date for the instrument(s) backtested. When DAYS is used in a scan, the result is the number of days from the present date/time until the expiration date.

DTN.iQ Improvements

DTN.iQ version of Investor/RT now properly supports longer term intra-day downloads. Tick by tick historical data is available for download for the all during during the past 8 calendar days. Intra-day minute interval historical data is available going back 120 calendar days (approximately 90 trading days).

DTN.iQ now fills in the data columns "Prev Year Close" and the related data column "%Change YTD". The prior year closing price is available for use in the RTL language using the YRCL token. Thus the change year to date can be calculated using the RTL formula $(CL - YRCL)$, and the % Change Year to Data using the RTL formula $100 * (CL - YRCL) / YRCL$.

DTN.iQ now fills in the data column AVGVOL automatically when you connect.

Opening/Closing Groups Using Menu/Schedules/Shortcuts

The File Menu "Close" menu items is now a submenu that mirrors the Close menu items in the Windows menu. The Close submenu has a new item, "Group...". Thus File: Close: Group can be used to close all of the open windows that belong to a particular group. When you issue File: Close: Group, a list selection window appears with the names of all available groups, including system defined groups and subgroups.

The Preferences: Keyboard Shortcut window has been enhanced to allow keyboard shortcuts to be defined for opening and close particular groups. An "Open Group xxxxx" shortcut displays a list selection window showing the members of group xxxxx. You can then click the All button to open every object in the group, or make individual selection(s). The "Close Group xxxxx" shortcut will close all open windows that belong to Group xxxxx.

Similarly, Open Group xxxxx and Close Group xxxxx Actions are now available in Investor/RT Schedules. Thus you can schedule the opening and closing of groups of windows

Abbreviate Option for Chart Pane Indicator Feedback

Setup: Preferences: Charts: General has a new global option titled "Abbreviate Indicator Feedback in Pane Titles". When checked, indicator feedback while moving the mouse within traditional charts is abbreviated so that more indicator values can be viewed in the pane title bar(s).

Version 6.2.2, Released August 29, 2003

Improved Custom Instrument Setup Editing

When viewing a custom instrument definition in the Setup: Custom Instruments window, the user can click on a component item in the list at the right side of the window to select the component. This changes the title of the "-->" button, normally used to add components, to read "Modify". The user may then alter either the modifier or the price value for the selected component and click the modify button to change the component's setup. In the past, it was necessary to delete components and add them again in order to change the multiplier or price value. Note that after modifying a custom instrument setup, it is necessary to click the "Save" button or the "Save and Close" button to make the change permanent.

New RTL Token: LAST

The LAST token is provided principally for use in scans. The LAST token provides access to the most recent trade price of any instrument regardless of the periodicity of the scan. CL and CLOSE reference the closing price of the last bar of the desired periodicity. The CL value may in fact be different than LAST since LAST can be updated due to after-market trading. So the purpose of this token is to provide an unambiguous reference to the last trade price regardless of periodicity. The LAST token, like LAST1, LAST2, etc., cannot be referenced historically, i.e. LAST.1 is invalid, use CL.1 or CLOSE.1 instead.

Related to the addition of LAST, the CL, HI, LO, OP tokens (all "Historical Data" tokens) will now obtain their values from the Investor/RT database regardless of periodicity. In the past, scans run with daily periodicity would fetch daily bar data values from the quotepage values. Now, the values will be fetched by examining the database. This may make some daily periodicity scans run a bit slower than they formerly did. Using the tokens LAST, DAYHI, DAYLO, DAYOP, and DAYVO, scans

designed to run on current "quotepage" displayed values will run faster than they will if you use CL, HI, LO, OP, and VO tokens.

New RTL Tokens: STIME and BARLEFT

For any intra-day bar, STIME provides access to the "session time" expressed as the number of seconds that have expired in the trading session. This token is applicable only to intra-day periodicities. The BARLEFT token, when evaluated for the current bar, provides the number of seconds remaining until the time-based bar is completed. If the periodicity is "N ticks/bar", then the current bar's BARLEFT is the number of ticks it will take to complete the N tick bar.

Pair Wizard for Quick Custom Instrument Pair Setup

A new "Pair Wizard" window is provided to facilitate rapid setup of custom instrument pairs. A pair is a custom instrument, usually a "difference", that is defined as the sum, difference, or ratio of two instruments. Pairs may be defined using the general Setup: Custom Instrument window, but the Pair Wizard can now be used to streamline the process of creating a new pair.

The Pair Wizard window can be opened from the File Menu (File: New: Pair) or from the Setup Menu (Setup: Pair Wizard). There is also a new button for opening the "Pair Wizard" at the bottom of the general Custom Instrument setup window. Finally, if you create pairs often you should make a function key shortcut, e.g. F2 to issue the Setup: Pair Wizard command with a single keystroke. See Setup: Preferences: Keyboard Shortcuts.

A pair definition has the formula:

$$A * X \text{ operator } B * Y$$

Where X and Y are ticker symbols of the lead and lag component instruments of the pair and A and B are numbers (multipliers). A and B default to 1. The operator can be -, +, or / for differences, sums, and ratio pairs respectively. The pair wizard provides entry boxes for a, b, X and Y. Radio buttons change the operator to -, +, /.

Use the tab key to tab from a to X to b to Y and back to a again if necessary. Ticker symbols can be entered directly into X and Y boxes or you can leave the boxes blank and tab to have the software prompt you to select the ticker from a standard instrument selection list. Once the tickers have been entered press Save or Save and Close to add the new pair and view a chart of the pair.

A prompting message will appear if you enter tickers for either X or Y that are presently unknown to Investor/RT. Press "Add" to add the unknown ticker to the system as a stock. Newly created pairs will have ticker symbols of the form "X operator Y" (no spaces) where operator is -, +, or / and X and Y are the tickers of the components. When the a and b multipliers have a value other than 1, the name of the pair custom instrument will show the actual formula of the pair. For example, the ticker IBM-

MSFT might have a name such as IBM – 3*MSFT indicating that pair is defined as the last price of IBM minus 3 times the last price of MSFT.

After setting up a pair custom instrument you can call up the pair for further editing at any time by right-clicking on the pair ticker in a quote page or some other instrument selector, and choosing Setup. The custom instrument setup window now supports editing of multipliers and price values in component setups. Simply click to select a component in the list on the right, then change the multiplier and/or the price value and press the "Modify" button.

Revised Naming Convention for RTL tokens

When entering RTL tokens for indicators either the underscore character `_` or the pound sign `#` can be used as a delimiter to form a token suffix, e.g. MA#01 > MA#02. Investor/RT will interpret this formula as two MA tokens named MA#01 and MA#2 and prompt you for setup information for the moving averages. Prior to 6.2 only the underscore could be used in this way, e.g. MA_A < MA_B.

The `#` is also a special character in RTL that can be used to form a token that contains numeric digits. Any token that ends with one or more digits MUST have a `#` before the ending digits, e.g. V#1, the built-in user variable token, or MA#50 a user-specified MA token where the 50 may indicate the MA is a 50 period moving average. Note that when a token name ends with a `#` and some digits, you MUST use a period to enter a bars back qualifier, e.g. MA#50.1 is the previous bar of the MA#50 moving average, while MA#501 would be treated as a new MA token altogether with the name MA#501.

New Revert Command for Charts and QuotePages

Traditional charts and quote pages now have a "Revert" command. Revert is in the File Menu and it also appears in the chart popup menu as well as the quote page "+" menu. The Revert command essentially reverts the chart or quote page back to its last saved state. So if you open a chart for example, and change various preferences or add indicators, the Revert command will restore the chart to its original form. For quote pages, any unsaved preference changes, format changes or row/column modification will be reverted to the last saved definition of the quote page.

There is one exception. Reverting a chart does not remove any indicators that may have been added with a scope of "This Chart, This Instrument". If you have Investor/RT setup to add trendline based indicators using this scope, those indicators will remain even after any other changes are reverted back to their original state.

Main Toolbar Button Order Revised

The "Setup Preferences" and "Open Group" Main Toolbar Buttons have been moved to the far left of the main toolbar. Access to preferences windows is more convenient using this toolbar button rather than the Setup Menu. A click on the preferences button displays the preferences topic menu

immediately, whereas using the Setup Menu requires a click in the menu bar and further mouse movement(s) to reveal the Preferences submenu. New users and some veteran Investor/RT users may now "discover" this more convenient button since it is in a more prominent and accessible location than before.

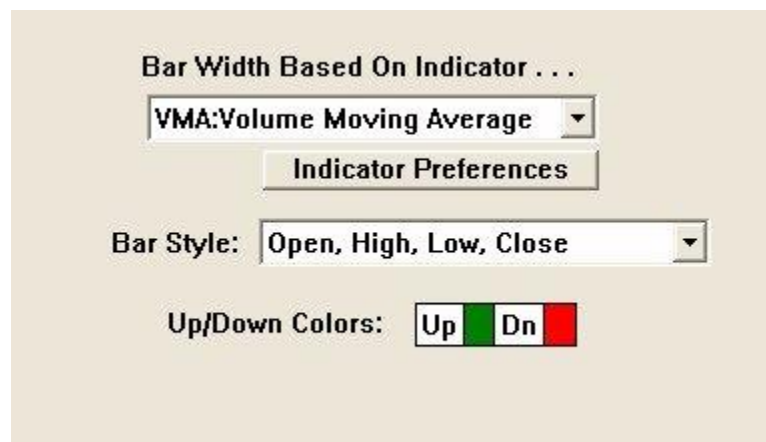
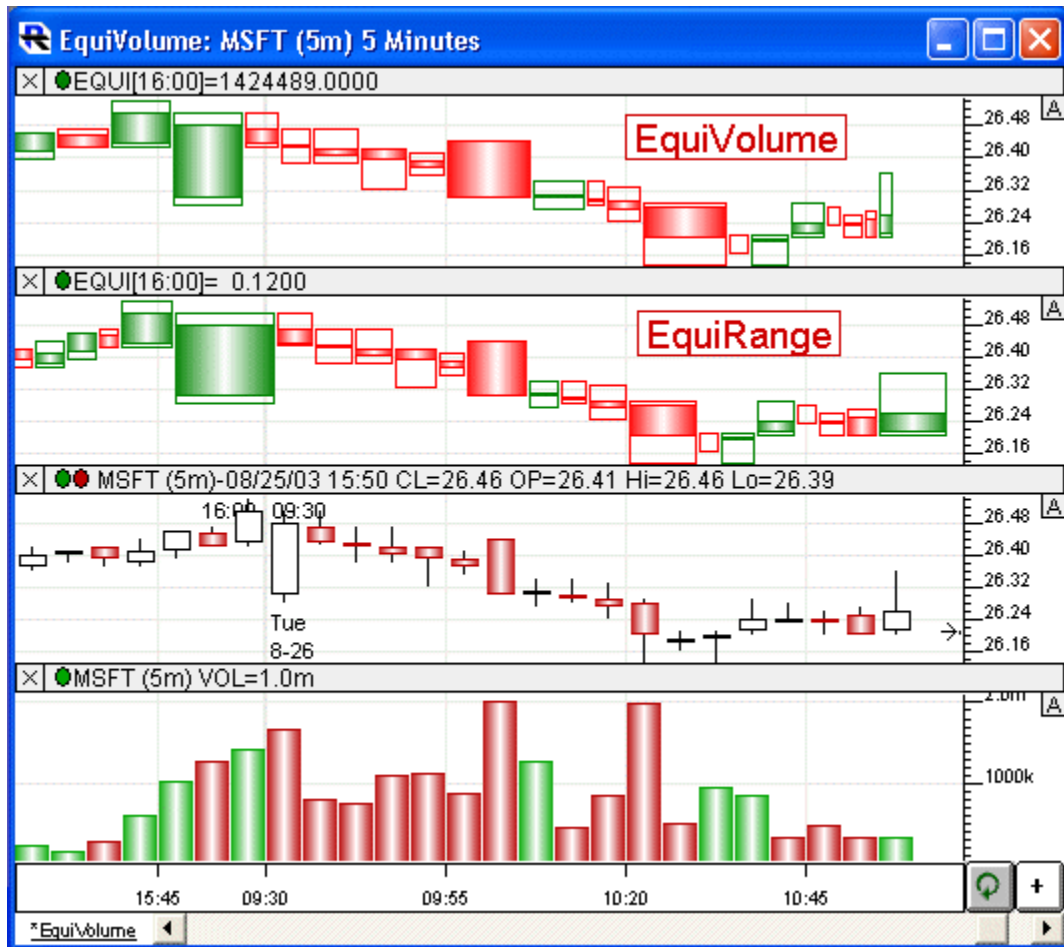
As an alternative to the preferences popup menu, the Alt-Y keyboard shortcut (command-Y on Macintosh) displays a standard selection list window with the most recently referenced preferences topic highlighted. Pressing Alt-Y followed immediately by the enter key opens that same window again. The standard list selector also responds to keyboard characters by selecting the preference topic that begins with that letter, e.g. the three keystroke sequence, Alt-Y, Q, and enter key, will open the QuotePage default preferences window. When more than one preferences topic in the list begins with the same letter, pressing that same letter again advances the selection to the next topic whose name begins with that letter. The up and down arrow keys are also recognized.

The preferences list selection window can also be accessed quickly with the mouse by shift-clicking or right-clicking on the preferences button on the main toolbar. Power User Tip: If the Ctrl-key (Option-Key on Macintosh) is held down while shift-clicking or right-clicking on the Preferences button, the most recently opened Preferences topic window will be opened immediately, bypassing the selection list altogether.

Just to the right of the Preferences button is the Open Group button. It provides quick access to recently referenced charts, quotepages, other recently opened windows, and any user defined groups. The Groups button, like the Preferences button, is now in a more prominent toolbar position in consideration of the importance and frequency of usage of this powerful new feature.

New Indicator: Equi-Indicator (EquiVolume)

The "Equi-Indicator" is a flexible implementation of the more common EquiVolume indicator. While the EquiVolume indicator bases the width of each bar on the volume of that bar (wider bars for larger volumes), the Equi-Indicator allows the user to base the width of each bar on the magnitude of any indicator. For example, the user may choose to base the width of the bars on the range (height) of the bars. This would be accomplished by basing the Equi-Indicator on the indicator "Custom Indicator" with the syntax of the custom indicator being "HI - LO" or simply "HLR". Similarly, the width could be based on the number of ticks in the bar, the distance of price from a moving average, or the CCI or RSI value, to list just a few possibilities.



Bar Width Based On Indicator

The resulting values indicator selected in this list box (along with the preferences specified for that indicator) control the width of the Equi-Indicator bars. In the example above, the volume

(VMA) indicator is selected. Therefore, the greater the volume for the bar, the wider the bar. This configuration is more commonly known as an EquiVolume indicator.

Indicator Preferences

Clicking this button will bring up the preferences of the selected indicator, and allow the user to adjust them.

Bar Style

Three "Bar Styles" are available: "Open, High, Low, Close", "High, Low, Close", and "Close, Previous Close". These control the prices that are represented in the bars. These options are discussed further in the description section below.

Up/Down Colors

These colors are used when drawing the body of the bar, based on whether it is an up or down bar.

As another example, the user may choose to base the width of the bars on the range (height) of the bars. This can be seen in pane 2 of the chart above (**EquiRange**). This would be accomplished by basing the Equi-Indicator on the indicator "Custom Indicator" with the syntax of the custom indicator being "HI - LO". Similarly, the width could be based on the number of ticks in the bar, the distance of price from a moving average, or the CCI or RSI value

There are three different "**Bar Styles**", which are each described below. While the style controls the prices and color schemes of the bar, the width is always controlled by the magnitude of the selected indicator.

Open, High, Low, Close

This style is similar in concept to candlesticks, in that the the open, high, low, and close are all represented, and the color of the body reflects whether the bar closed higher than the open. This style can be seen in the chart above in both panes 1 and 2.

High, Low, Close

This style shows only the high, low, and close of each bar, and the color reflects whether the close is greater or less than the previous close. If the current close is greater than the previous close, it is considered an up bar and the up color is used. If the close is less than the previous close, it is considered a down bar and the down color is used. If it is a down bar, the area between the high and close is painted. If it is an up bar, the area between the low and close is painted.

Close, Previous Close

This style simply depicts the relationship between the close and the previous close. A box is drawn between the close and the previous close (with a width based on the value of the

selected indicator). If close is greater than previous close, the box is drawn in the up color. If close is less than previous close, the box is drawn in the down color.

The Equi-Indicator is not available in the Investor/RT RTL Language. It is recommended to use the token of the underlying indicator instead.

Scrolling Tick and TickBar Traditional Charts

Traditional charts with periodicities expressed as one or more ticks per bar now feature a scrollbar whenever there are more bars available to display than will fit in the chart window at the current pixels per bar setting. When a ticks/bar (tick bar) chart is scrolled back in time to review bars in the past, the chart continues to collect new bars in real-time, however, there will be NO automatic scrolling until you return the scrollbar to the far right (current time) position. If you have a tick bar chart open that does not appear to be updating for some reason, this could be the reason. Simply press the "End" key to scroll back to the current time (the right "End" of the chart), or drag the scrollbar thumb (elevator) and slide to the far right and the chart will resume real-time updating and auto-scrolling as new bars are formed. Tick bar charts, like charts of any other periodicity, can also be scrolled using the Page Up, Page Down, Left Arrow, or Right Arrow keys on the keyboard.

Version 6.2.1, Released August 14, 2003

New Calculation Methods for Bull Power/Bear Power

The Bull Power and Bear Power indicators, formerly based solely on the "Elder-Ray" calculation method, have been enhanced to support two additional methods. These are the "Livshin" method and the "Gimelfarb" method.

Elder-Ray Method

LO - MA

Livshin Method

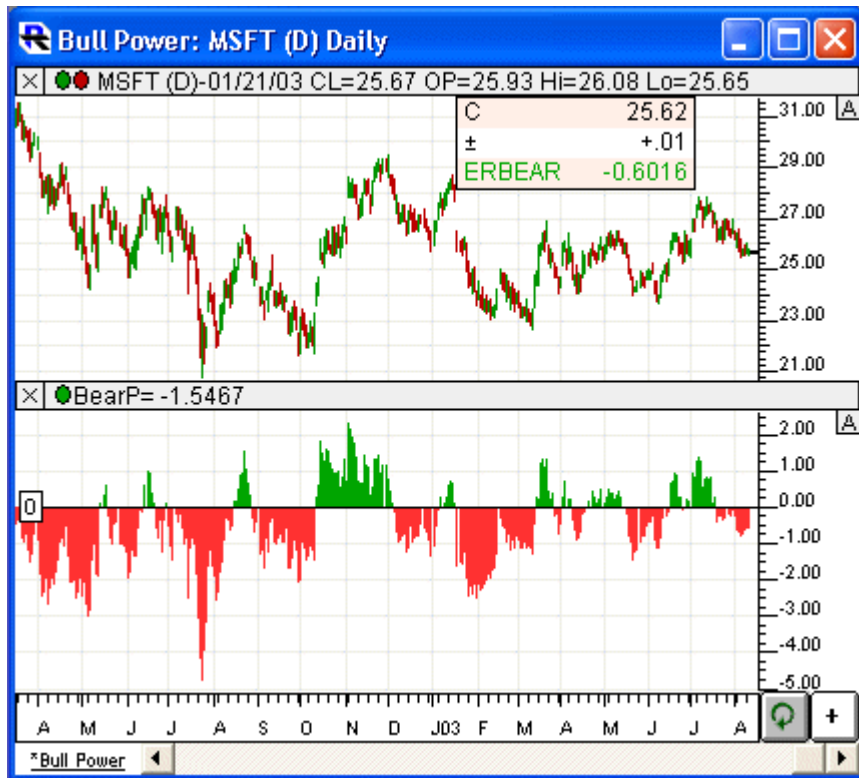
Average of the following three values:

- 1) $OP - LO$
- 2) $HI - CL$
- 3) $MAX(OP - CL, 0.0)$

The resulting average is the raw Bear Power value. It can be optionally smoothed by specifying a Moving Average period greater than 1.

Gimelfarb Method

The Gimelfarb is "path-based" and discussed further below.



Method:

Moving Average

Type:

Period:

Price:

Draw as:

Method

Three computation methods are available: Elder-Ray, Livshin, and Gimelfarb. The calculations of each can be seen above in the "Formula" section, and a more detailed discussion of each can be found below in the "Description" section.

Moving Average

The Moving Average takes on different meanings depending on which method is chosen.

Elder-Ray

The Moving Average result is subtracted from the high price to give the Bear Power result.

Livshin/Gimelfarb

The Moving Average is used to optionally smooth the resulting raw Bear Power value. For no smoothing, a Period of 1 should be specified.

Type

Type of smoothing used to compute the Moving Average.

Period

Period used to compute the Moving Average.

Price

Price value used as input for the Moving Average. The "Price" is only visible and relevant for the Elder-Ray Method (For Livshin and Gimelfarb, the Moving Average is just used to smooth the raw Bear Power value).

Draw as

Style and color(s) used to draw the resulting Bear Power in a chart.

Description of Elder-Ray Method

"Elder-Ray" is a technical analysis method developed in 1989 by Dr. Alexander Elder. Dr. Elder, a medical doctor by training, chose the name "Elder-Ray" as a parallel to "X-Ray", since the purpose of the analysis is to look beneath the surface of the market. An exponential moving average (EMA, 13-period) and two other technical indicators, called Bull Power and Bear Power are used in the analysis.

Bull Power is simply the difference between the high of each bar and the EMA, while Bear Power is the difference between the low of each bar and the EMA. Both indicators are usually drawn as oscillators (histograms). Bears are strongest when Bear Power is most negative. Bulls are strongest when Bull Power is most positive. The Investor/RT implementation of Bear and Bull power allow you to select other moving average types if you like and to alter the averaging period as well. Elder uses 13-period exponential averages. For a complete discussion of Elder-Ray, see Dr. Elder's text, "Trading for a Living", pp 220-227.

To setup an Investor/RT chart for Elder Ray analysis, create a bar chart of daily periodicity and add a 13-period exponential moving average to the bar chart pane. Then add both Bull Power and Bear Power technical indicators, each to a new pane, below the instrument pane. Save the chart as "Elder-Ray Daily" for future reference.

Elder describes four conditions for the strongest buy signal:

1. The trend is up, i.e. the EMA is sloping upward.

2. Bear Power is negative but is rising.
3. The latest peak in Bull Power is higher than the previous peak.
4. Bear Power is rising from a bullish divergence.

A bullish divergence here would be a period when price is declining to a new low while the Bear Power makes a higher (less negative, less bearish) bottom and begins rising.

Description of the Livshin Method

Technician Igor Livshin defined Bear Power as the average of the following three values:

1. The ability of bears to reduce the price from the opening price to the lowest price.
(HI - OP)
2. The ability of bears to reduce the price from the highest price to the closing price.
(HI - CL)
3. The ability of bears to reduce the price from the opening price to the closing price.
(OP - CL if OP > CL, zero otherwise)

He goes a step further to define his "Balance of Market Power" (BMP) to be the difference between the Bull Power and the Bear Power (BULLP - BEARP).

The Investor/RT Bear Power indicator gives the user the ability to optionally smooth these resulting raw Bear Power values. If no smoothing is desired, specify a smoothing (MA) period of 1.

Description of the Gimelfarb Method

Technician Vadim Gimelfarb derived a method of computing Bear Power which was based on determining a *maximum* movement achieved by the bears. Five prices are considered in the evaluation: Open (OP), High (HI), Low (LO), Close (CL) and Previous Close (CL.1). From Previous Close to Close, there are a potential of 4 movements between prices, from CL.1, to OP, then to HI/LO, then to LO/HI, then to CL. The key is to determine whether the HI or LO occurred first. This is determined using the following rules:

- If **OP > CL**: we assume LO occurred first. (Since it's closer to OP than it is to CL)
- If **OP < CL**: we assume HI occurred first. (Since it's closer to OP than it is to CL)
- If **OP = CL AND HI - CL > CL - LO**: we assume the LO occurred first. (maximum price movement was gained by the side that was more successful at the close)
- If **OP = CL AND HI - CL < CL - LO**: we assume the HI occurred first. (same logic as above)
- If **OP = CL AND HI - CL = CL - LO AND CL < CL.1**: we assume the HI occurred first. (maximum price movement was gained by the side that was more successful at the close in relation to previous day's closing price)
- If **OP = CL AND HI - CL = CL - LO AND CL > CL.1**: we assume the LO occurred first. (same logic as above)

- If **OP = CL AND HI - CL = CL - LO AND CL = CL.1**: Bull and Bear Powers are equal at this point (no logical path, just use HI - OP for value).

The Bear Power is then find the maximum "bearish" (downward) single price movement. If the path from CL.1 to OP is downward, and the path then continues downward from OP to LO, then the price movement from CL.1 to LO is considered as one single price movement. If, on the other hand, the path moves from CL.1 down to OP then up to HI, then two movements are considered separately, a bearish movement from CL.1 to OP followed by a bullish movement from OP to HI.

The Investor/RT Bear Power indicator gives the user the ability to optionally smooth these resulting raw Bear Power values. If no smoothing is desired, specify a smoothing (MA) period of 1.

The Bear Power Moving Average Period can be adjusted directly from the keyboard without having to open up the preferences window. Just select the indicator and then hit the up or down keys on your keyboard to adjust the period. The up arrow key increases the period by 1 while the down arrow key decreases the periods by 1.

Token: BEARP

The Bear Power indicator can be referenced in the RTL language using the token BEARP. To create a custom indicator that represents the moving average of the difference between the Bull Power and Bear Power:

MA(BULLP - BEARP)

Version 6.2, Released: August 4, 2003

Performance Improvements

Calculating technical indicator values, whether the indicator is used in a chart or in an RTL formula, or referenced by a custom column, is a major factor in overall system performance. The ability of Investor/RT to tend to the incoming real-time data in a timely fashion can be impacted by computationally intensive indicators, especially if they are setup to recalculate tick by tick or on every price change. In version 6.2 the indicator recalculation methods used by Investor/RT have been optimized using a variety of techniques to minimize the amount of calculation time spent on the initial calculation of charted indicators. As real-time price updates occur or new bars are formed in the chart, the recalculation of indicators has been streamlined to focus the recalculation on just the last bar, or last two bars when a bar is added. The result of this optimization work is a dramatic reduction in computer processor usage for indicator recalculation. Many indicators now recalculate in less than one millisecond as can be seen by examining any chart's "calculation statistics" (choose "Calculation Statistics from the chart's right-click menu).

Investor/RT has very flexible recalculation frequency controls for technical indicators that essentially enable the user to control how often each indicator's last bar values will be recalculated. The performance improvements in version 6.2 will permit tick by tick or "every price change"

recalculation frequencies to be used for many indicators. Indicators that were formerly limited, for example, once a minute, might now be recalculated every few seconds with no performance impact.

Listed below in alphabetical order are the technical indicators that have been optimized:

- Accumulation Distribution
- ADX and ADXR
- Arms Ease of Movement
- Aroon
- Automatic Trendlines
- Balance of Power
- Bollinger Bands
- Candle Codes
- Candlestick Pattern Recognition
- CCI
- Center of Gravity
- Color Study
- Custom Indicators
- Detrended Oscillator
- Directional Indicator DI+/DI-
- Elder Force Index
- Fisher Transform
- Keltner Channels
- Linear Regression Acceleration
- Linear Regression Forecast
- Linear Regression Slope
- MACD
- Momentum
- Moving Averages of All Types
- MPD Mixed Periodicity Data
- Normalization
- Oscillator and Summation
- Paintbars
- QuotePage Statistics
- Random Walk Indicator
- Range Expansion Index
- Rate of Change, Rate of Change Summation
- Relative Vigor Index
- RSI
- Signal Markers
- Signal Statistics
- Stochastics
- Time Series Forecast
- Triple Smoothing
- TRIX
- True Range Index
- Ultimate Oscillator
- Volatility
- Volume and Open Interest (averages)
- Volume/Price Percent Change
- Williams %R
- Williams AD

Groups: Organizing Charts, QuotePages, Signals, etc.

A Group is simply a named collection of objects and (possibly) other groups, called subgroups. Objects are things you work with in Investor/RT, e.g. charts, quotepages, scans, signals, custom indicators, preset, etc. Groups give the Investor/RT user a facility for organizing collections of objects into named categories and subcategories. Instead of going through a list of 200 chart names looking for the one you want, you can setup one or more groups with appropriate names to hold shorter lists of charts.

At the highest level there is an unnamed group which is the collection of all the top level groups. Each top level group can in turn have any number of subgroups. There are (at present) four pre-defined top level groups. These are named:

<p>.Recent Charts .Recent Items .Recent QuotePages .Recent RTL</p>

These are system-defined groups which, like system-defined quote pages, have names beginning with a period. These groups are used by Investor/RT to keep track of various objects you have opened or closed recently. For example, each time you open a scan or signal or custom indicator, the name of the object is added to the .Recent RTL group. Similarly, recently referenced charts and quote pages are listed in the .Recent Charts and .Recent QuotePages groups, respectively. The .Recent Items group keeps track of the last objects you have opened regardless of type. When viewing lists of objects in groups, Investor/RT will list the objects in "last-in-first-out" (LIFO) order, e.g. the most recently opened chart will be listed first in the .Recent Charts group. Setup: Preferences: Groups opens a window where you can specify how many items to maintain in each of the four .Recent groups. You specify here whether you wish the .Recent groups to list items that you have recently opened, or only those you have recently closed, or those that you have either opened or closed recently.

Creating Groups and Subgroups

The groups concept is well integrated into the Investor/RT user interface. First, there is a Groups button on the main toolbar. Its icon looks like a file folder. Clicking this button shows you a list of your groups including the system defined .Recent groups. These are all called "top level" groups. Right-clicking the Groups button on the main toolbar opens the "Add Group" window. When creating a new group using this window, you can specify if the group is to be a subgroup and if so, the group to which it will belong. There is also a checkbox for specifying that the members of the new group should be listed alphabetically. If you uncheck this checkbox, the items will be listed in the order that the members were added to the group, with the most recently added member listed first.

The File Menu has group-related menu items in various places:

- File: New: Group – opens a window for defining a new group/subgroup.
- File: Open: Group (Alt-4) - lists the top level groups.
- File: Open: Recent Items – lists the items in the .Recent Items group.
- File: Add to Group - opens a window for adding the front object to a group.

The Open Menu has a Groups submenu. It lists all of the top level groups, e.g. Open: Group: .Recent Charts will show the list of recently opened chart objects.

When you click on a button on the main toolbar to open a quote page a chart or an RTL object (scan/signal/custom indicator) Investor/RT will present a selection list of names. At the top of the list will be the appropriate .Recent group name, e.g. the group name .Recent Charts will

appear at the top of the list of charts you can open. Double-click on the .Recent group name and the selection list will be replaced by the list of items in that .Recent group.

The Delete/Rename facility allows you to view, rename or delete groups. It also has a powerful "Add to Group" facility for quickly adding lists of objects of various types to a particular group. See the section Using the Delete/Rename Window to Setup Groups below for details.

Traditional chart windows and quotepages have "Add to Group" commands in their popup menus. To add a particular chart to a group, open the chart, right-click in the chart and choose Add to Group. A dialog box will appear listing the group names. Pick the group and click OK to add the chart to that group. Note that the dialog box has both Apply and OK buttons. You can add any chart to several groups by clicking Apply, then changing the group, and applying again, until you are finished. For quotepages, click the "+" button in the upper right corner of the quotepage above the vertical scrollbar and choose Add to Group. All other types of objects are added to groups using the File: Add to Group... command (or the Delete/Rename window as discussed below). First open the object, e.g. a scan or signal, and choose File: Add to Group to add that scan or signal to one or more groups. Note that the File: Add to Group... command always operates on the front window.

Navigating Groups

When you click the Groups button on the main toolbar (Alt-4 is the built-in shortcut) you will see a standard Investor/RT selection window showing you all of top level groups. At the top of the list is a special item titled " ...Create New Group" you can click on to add a new group.

Double-click any group name (or select the group name and click OK or Apply to "open" that group. The list selection window will then show the contents of the selected group. The name of the group whose members are listed appears in the lists window title. Items in the list can of three types:

Command Items

Listed first and prefaced with ...

SubGroup Names

Subgroup names are shown in brackets (Windows) or are prefixed with bullet (Macintosh) to distinguish them from member objects.

Object

Listed last, e.g. chart names, quotepage names, the member objects of the group.

Double-clicking an item in the list or selecting it and clicking Apply or OK "opens" that object. If the object is a chart name, that named chart window will open. If it is already open, it will be

brought to the front. If the object is a subgroup, the list selector will "navigate" down a level to show you the contents of that subgroup. Only one list selection window can be open at a time.

When viewing the contents of a group in a list selector, Investor/RT adds one or more command item as choices at the top of the list. The command items are:

Add to Group

Used for adding the front window to the listed user-defined group. This command does not appear when a .Recent group is listed.

Create New Subgroup

Used to add a new subgroup to the listed user-defined group. This command does not appear when a .Recent group is listed.

View Parent Group

Used to navigate up one level to the parent group of the listed subgroup. This command does not appear when viewing the list of top level groups since there is no parent group.

You can double-click on any of these command items to initiate the effect, or select the command with the keyboard or with a single click and then click Apply or OK.

When viewing a list that contains one or more member objects you can click the "All" button at the bottom of the list to open each of the listed objects.

Deleting Objects and Groups

A future release of Investor/RT will introduce a special window for organizing, renaming, and deleting groups and objects from groups. In version 6.2 any object or group can be deleted by selecting it in the list selection window and holding down the ctrl-key while clicking Apply or OK. Macintosh users hold down the option key instead. You can also ctrl-double-click to delete an object or a group from the list. Confirmation will be requested when deleting a group. Deleting a group implies that all of its subgroups will be deleted as well. The delete/rename window, discussed below can also be used to delete groups.

Using Keyboard Shortcuts Setup: Preferences:

Keyboard Shortcuts can be used to assign a function key combination for opening any particular group. For example, you could setup F2 to "Open: Group: .Recent Charts". Whenever you wish to re-open (or bring to front) a chart you opened earlier, just press F2 and the list of recent charts will appear. Double-click on the chart name you want and it will appear. Note that "opening a group" means simply to show you the contents

of the group in a list selection window so you can selectively open one, several, or all of the objects in the displayed list. To open one object in the list simply double-click it. To open several items in the list, select each item in turn and click Apply. To open all of the items in the list, click the All button. The list selector can also be navigated with the up and down arrow keys on the keyboard to move the highlighted selection up or down. When a name or command is highlighted, press enter to "OK" that item or press shift-enter to "Apply" that item, leaving the list visible for another selection. When a list selection window is in front, you can type a character on the keyboard to advance to the first name in the list beginning with that letter.

Using the Delete/Rename Window to Setup Groups.

The Delete/Rename facility is accessed by clicking the Green Trash icon on the main toolbar (or via the Control: Data Management submenu). This window can be used to view, delete, or rename many kinds of Investor/RT objects. This window has a new "Add to Group" button just below the "View" button. You can select one or more objects of any type in the list of object names (on the left) and add them to any group by clicking the Add to Group button. You will be prompted to pick the group to which the item(s) will be added. The Delete/Rename window now lists "Group" as one of the types of objects. Choose "Group" from the "Object Type" menu and the list box on the left will list the name of all groups. Each top level group and each subgroup, regardless of level is listed. You can delete groups by selecting one or more of them and clicking the Delete button at the right. Renaming of groups will be supported in a future release of Investor/RT.

Another interesting use of the Delete/Rename window is to use it as an always available selector for your groups. Open the Delete/Rename window, choose Groups as the object type. Then resize the window so that only the list of group names is visible. Position the window at some convenient location. Whenever you wish to access any of your groups or any of the .Recent Groups, simply double click on the group's name. A list selection window will popup showing you the contents of that group.

Scrolling: PNF, Price/Time Profile, and Volume Profile

A scrolling technique has been implemented for Point and Figure (PNF), Price/Time Profile (PTP), and Volume Profile (VP) Charts. Scrolling will only be available when the chart window is not big enough to display the data it contains. Vertical scrolling is done using the up and down arrow keys on the keyboard. For PTP and VP charts, the up and down arrow keys will scroll one bar (row) at a time. For PNF charts, the up and down arrow keys will scroll one box size at a time.

Horizontal scrolling was also implemented for PNF charts. To scroll back in time, press the left arrow key on the keyboard. The chart will scroll back one column each time the left arrow key is pressed. To scroll forward in time, use the right arrow key.

Viewing Data Feed Status

With the introduction of "Groups" into Investor/RT the "Feed Status" button on the main toolbar has been replaced by the Groups button. The Feed Status display is not a frequently used feature and quick access to groups was deemed to be a more useful purpose on the main toolbar. For quick access to the feed status display you can do any of the following:

- A. Right-click on the main toolbar feed heartbeat button (Macintosh users: control-click)
- B. Choose "Status" from the data feed menu.
- C. Setup a function key shortcut for "Open: Feed Status"

Exchange Specific Trade Monitoring with eSignal

eSignal uses a convention where stocks ticker symbols suffixed with an equal sign and an exchange code letter will provide real-time and intra-day historical data based exclusively on the designated exchange, e.g. the ticker IBM=N will only carry trades that occur on the NYSE. This feature is very useful to "pair traders" for example, where custom instrument ratios or spreads on NYSE stocks are often used. By using =N suffixed ticker symbols as the components of the pair, the custom instrument will in turn reflect only the trades that occur on the NYSE. If you use IBM=N it is also useful to be able to view daily/weekly/monthly charts of the same ticker, however eSignal's historical server does not provide daily data on such tickers. Thus Investor/RT has been enhanced so that daily bar data requests for tickers like IBM=N will be passed to eSignal as IBM, without the =N suffix. When the daily bars come into Investor/RT from the eSignal historical server, they will be stored with IBM=N suffixed ticker. This makes it possible to track exchange suffixed ticker in any periodicity with ease.

Custom Instrument Setup Improvements

The Setup: Custom Instruments window has been enhanced to provide for quicker selection of an existing custom instrument for viewing or editing. As you type letters into the custom ticker entry box, if a custom instrument symbol is formed, the window responds by showing the setup for the custom instrument you typed in. Further, to the right of the custom ticker entry box is a small button with 3 periods as the button title. Clicking this button pops up an instrument selection window listing all of the custom instruments that are presently defined to Investor/RT. Double-click any custom instrument in the list (or select a row and press enter) to select that that custom instrument for viewing or editing. The popup window is a standard instrument selector window, but it only lists custom instrument tickers. This means you can

type the first letter or two of the custom instrument you want to identify it and then press enter to select it. Press esc to dismiss the selector window without doing anything.

Canceling charting tool drawing

If you click the right-mouse button inside a traditional chart window while any drawing tool is active Investor/RT will cancel the drawing operation (even if it is in progress) and deactivate the drawing tool returning you to the arrow cursor. Note that after deactivating the tool, another right-click will be required to popup the chart menu, the normal function of the right-click. The message "Drawing Tool Canceled" will appear in the message area of the main toolbar.

Macintosh users with a single button mouse can control-click to deactivate the drawing tool and cancel the drawing operation. Note the pressing the esc key on the keyboard has the same effect as a right-mouse click when a drawing tool is active.

New RTL Tokens – OPEN, HIGH, LOW, CLOSE & VOL

RTL has long used the 2 character tokens OP, HI, LO, CL, and VO for referencing bar data items open, high, low, close, and volume, respectively. If you wish you can now use the full spellings OPEN, HIGH, LOW, CLOSE, and VOL interchangeably with their two letter abbreviated counterparts. For example, the scan $HI - LO > 3 \text{ AND } CL > OP$ and $CL.1 > CL$ can be written equivalently (and less cryptically) in long form as:

HIGH – LOW > 3 AND CLOSE > OPEN and CLOSE.1 > CLOSE;

Running Multiple Instances of Investor/RT

Multiple instances of Investor/RT can be run simultaneously by installing the software multiple times, each into its own directory folder. Each instance of Investor/RT will be launched from its own directory folder and will operate independently using its own database stored within that folder. A new preference setting has been added to the Setup: Preferences: General window allowing each running instance of Investor/RT to have its own user-specified "task window title". The user-specified text will be appended to "IRT " and the resulting title will appear in the title bar of the Investor/RT task window in the MS Windows versions of Investor/RT. The instance specific name will be viewable in the MS Windows task bar and in the "Alt-Tab" window as you switch among running applications.

MPD Custom Results

Several new "Custom Statistical Results" have been added to the Mixed Periodicity Indicator. These custom results give the user the ability to see what's "inside" of a bar, by giving access to data of a smaller periodicity or timeframe. For instance, on a 1-minute chart, you can get a look inside each 1-minute bar at the tick data that composed it. Similarly, you could look inside each

30-minute bar at the 1-minute bars that composed it, or inside each monthly bar at each daily bar that composed it.

The new custom results include Sum, Average, Maximum, Minimum, First, Last, and Count. Each result is further explained below. As a relatively example, let's assume we have added MPD (with Mix Periodicity: 1-minute) to a 10-minute chart. One specific 10-minute bars has the following characteristics: High = 99.5, Low = 98.8, Open = 99.0, Close = 99.3. In the MPD, we'll choose a Data Source of "Instrument Data: Close". "Align Data To Proper Date/Times" is also checked. Each 10-minute bar is composed of 10 1-minute bars. Therefore, within our 10-minute bar above, we have 10 1-minute bars with the following closing prices: 99.1, 99.3, 99.2, 99.1, 98.9, 98.8, 99.1, 99.4, 99.5, and 99.3.

Sum

Sums all the "data" values within the bar. In the example above, each 10-minute bar is composed of 10 1-minute bars. The closing price of the 10 1-minute bars would be summed for a result of:

$$99.1 + 99.3 + 99.2 + 99.1 + 98.9 + 98.8 + 99.1 + 99.4 + 99.5 + 99.3 = 991.7$$

Average

Averages all the data values within the bar. In the example above, each 10-minute bar is composed of 10 1-minute bars. The closing price of the 10 1-minute bars would be averaged for a result of:

$$(99.1 + 99.3 + 99.2 + 99.1 + 98.9 + 98.8 + 99.1 + 99.4 + 99.5 + 99.3) / 10 = 99.17$$

Maximum

The Maximum of all the data values within the bar. In the example above, the maximum value is 99.5 (which corresponds with the "high" price of the 10-minute bar).

Minimum

The Minimum of all the data values within the bar. In the example above, the minimum value is 98.8 (which corresponds with the "low" price of the 10-minute bar).

First

The first data value within the bar. In the example above, the first value is 99.1 (the closing price of the first 1-minute bar within the 10-minute timeframe). Notice that this first value (99.1) did not match the opening price of the 10-minute bar (99.0). If, however, a data source of "Instrument Data: Open" would have been chosen, then these two values would have matched at 99.0.

Last

The last data value within the bar. In the example above, the last value is 99.3 (the closing price of the last 1-minute bar within the 10-minute timeframe). Notice that this last value does match the closing price of the 10-minute bar.

Count

Count of all the data values that exist within the bar. In the above example, the count is 10, and the count would always be 10 in this case on all bars except the current forming bar (for which the value will build from 1 to 10 as the bar forms). This custom result might be more effective when using an MPD periodicity of "tick", providing the ability to "count" the number of ticks inside each 1-minute bar, each 15-second bar, each 30-minute bar, or even each Daily bar.

Although the example above is relatively straightforward, the ways in which these new results can be used are essentially countless. Instead of a data source of "close", a user can choose any technical indicator, including volume or custom indicators, or any other instrument data, including custom prices. Also, the ability to "Mix Ticker" remains, giving the user to count to display the number of times MSFT ticked inside each 1-minute bar of INTC, on a 1-minute chart, for instance.

Here are some other examples of how MPD could be used with the new custom results.

- Show the highest (maximum) volume of all the ticks (trades) within each 15-second or 1-minute bar. The "Maximum" result would be used with a periodicity of "Tick" and a data source of "Instrument Data: Volume".
- Show the number of ticks that were used to compose any time-based bar (1-minute for example). The "Count" result would be used with a periodicity of "Tick" and a data source of "Instrument Data: Close" (data source is really irrelevant here, but using this one would be most efficient).
- Show the average of the closing prices all the daily bars that compose a monthly (or weekly) bar. The "Average" result would be used with a periodicity of "Daily" and a data source of "Instrument Data: Close".

Groups Included in Cross Reference Report

The database cross reference report (see Control Menu: Database Utilities) now includes listings of each member object cross referenced to the name of the group to which each member belongs.

Groups Included Selection Lists

Appropriate group names are listed at the top of various selection lists. For example, clicking the chart button on the main toolbar opens a selection list of available charts. The names of all

top level groups that can contain charts are listed at the top. This includes the ".Recent Charts" group, the ".Recent Items" group, and any user defined top level groups that can contain charts. In this example, the user defined group names could be either "Mixed" groups or groups setup specifically to contain charts. Group names are also listed in the quote page selection list, portfolio, scans, signals, custom indicators, etc. Double-clicking on a group name shows the members within the group.

ZigZag and ZigZag Oscillator Supported in Tick/Bar Charts

These two indicators are now supported in traditional tick charts and ticks per bar periodicity charts.

Adding Preset Annotations to Charts Using Buttons

Chart buttons may now be created for the purpose of adding annotations quickly to a specific bar in a chart. Here are the steps:

1. Using the Annotation preferences, setup the annotation text, colors, etc. and check the box titled "Attach to Bar:". Save the preferences as a preset using the Preset menu button at the bottom of the Annotation setup window.
2. Add a "Button" indicator to the chart and set the purpose of the button to "Add/Remove Preset Indicator". From the list of preset names, choose the preset saved in step 1 above.

When you click this button in the chart window, Investor/RT will notice that the annotation to be added to the chart is to be attached to a particular bar, so the annotation drawing tool will be activated automatically so the user can then click on the bar to which the annotation will be attached. If the charting toolbar is visible, you will notice that the Annotation tool will be "depressed", to indicate it is active. The cursor will change to the annotation cursor (a pencil with some text next to it), and a prompting message will appear temporarily in the chart window saying "Click where you wish to place the annotation". When you click the mouse while pointing to a particular bar in the chart window, an edit box will appear there showing the text of the annotation (the text you specified in the annotation preset). You may edit the text if you wish, and/or press the enter key to complete the process. The annotation text is then attached to the subject bar. It will scroll with the bar as the chart window scrolls automatically or under user control.

Note that Annotation presets can also be assigned to chart buttons with the "Attach to Bar" option unchecked. When such a button is pressed, Investor/RT will not activate the annotation drawing tool since there is no need to specify a bar location. Instead, the particular annotation preset will be added "as is" and centered in the chart window pane. If the button's annotation is already present, it will be removed from the chart. This kind of annotation preset button may

be useful for quickly toggling a text note on or off in the chart. The text may be just a message of some kind or it could be an RTL tokenized string that you only want to be visible at certain times.

Note that there are two distinct behaviors depending on whether the annotation preset is setup to be attached to a particular bar or not. Attached annotations always activate the annotation drawing tool and always add a new annotation to the chart. When the Annotation drawing tool is activated and you change your mind about adding the annotation, press the esc key or click the right-mouse button to cancel the operation without adding an annotation. Annotation presets that are not setup for attachment to a particular bar are toggled on or off in the chart.

Regression Line: Labeling Options Added

The preferences for the linear regression indicator has a "Label" option with various choices for labeling the end points of the regression line. When a regression line with labels is selected (highlighted) in a chart window, using the left/right arrow keys on the keyboard to move the regression line end points causes the labels to update dynamically as the indicator changes location in the chart.

Vertical Reference Line: Repeating Option Added

Vertical reference lines have a new "Repeat every <N> <Period>" option. The preferences window allows <N> to be set to any number and <Period> to be set to Bars, Minutes, or Days. When Repeat Every N Days is specified, a checkbox titled "Consider Weekend Days" can be checked if you wish non trading days to be included in the Every N Days repetition, otherwise only trading days are considered.

Traditional Chart New Popup Menu for Indicators

Prior to Version 6.2, right-clicking on an indicator in a traditional chart would open the setup for the indicator to enable the user to edit the properties of the indicator. In Version 6.2, the right-click (control-click on Macintosh) instead pops up a short menu for operating on the indicator. The choices are:

Add Button

A button is added to the chart window for the selected indicator. See item "Automatic Button Setup for Indicators" below for details.

Duplicate

A duplicate of the selected indicator is created. For "stand alone" type indicators (e.g. MACD, RSI, CCI) the duplicate appears in a new pane at the bottom of the chart window. For "overlay" indicators (e.g. MA, Trendlines, etc.) the duplicate is added to the same pane as the original. In either case, the preferences for the duplicated indicator will appear so you can adjust them immediately to distinguish the newly added indicator from the original. When duplicating, the resulting duplicate indicator becomes the "selection" in the chart window, thus the arrow keys (up/down/left/right) on the keyboard can be used afterwards for many indicators to make preference adjustments. When duplicating Info Boxes or Annotations, both of which are "overlay" indicators, the duplicated indicator is drawn slight offset from the original so it is visually apparent that a duplicate is present. The arrows keys can be used to move the Info Box or Annotation in any direction. For all other overlay type indicators, the duplicate will be coincident with the original unless you change some preference setting that alters the drawing of the indicator to make it different than the original. If you duplicate an indicator and change your mind and wish to delete it, simply cancel the preferences dialog and press the delete key on the keyboard (or click the green trash icon on the chart toolbar) to delete the selected (duplicate) indicator.

Delete

The selected indicator is removed from the chart.

Edit

The preferences window for the selected indicator will open. Double-clicking on an indicator will open the preferences for the indicator also.

Export Data

The data values of the indicator are exported to a text file and the text file is opened for viewing. The user is prompted for the name and location for the export text file.

Show Data

The data values of the indicator are displayed in a text window. The display is the same as that produced by the Export Data command, the only difference is that there is no prompting for the export file name and location.

Bring to Front

The selected indicator will be drawn on top of all other graphic elements in the chart window. The pane drawing order can also be edited by right-clicking on the pane title.

Send to Back

The selected indicator will be drawn first, before (behind) any of the other graphic elements in the chart window. The pane drawing order can also be edited by right-clicking on the pane title.

Help

The help topic for the selected indicator is displayed. Help is a submenu with three choices for viewing either the built-in help topic or the web site help page for the indicator, or both.

Automatic Button Setup for Indicators

When you right-click on an indicator and choose "Add Button", Investor/RT will make a technical indicator preset using the preferences of the selected indicator and a button will be added to the chart window for toggling the selected indicator on or off. This new feature saves several setup steps, making it a snap to quickly add buttons to your charts for any indicators present in the chart. The added button will have a default title of the indicator "token", e.g. MA for moving averages, MACD, CCI, etc. You can right-click on the button and choose "Edit this Button" to color code the button or give it a more descriptive title if you wish. The "presets" that are automatically created by this convenience function are assigned unique names that include an indication of the preferences for the indicator. For example, if you right-click on a moving average line and choose Add Button, the MA button that is then added to the chart will be associated with a Moving Average preset having a name like "Button SC10" indicating the preset was created for use with a button and the preset preferences are for a simple 10 period MA on the closing price. Note that the presets that are created in this way are available for use in other areas of Investor/RT, just like any user defined preset.

There is also an "Add Button" command in the more general right-click popup menu that appears when you right-click on "white space" in the chart window. Thus you can for example, either click to select an indicator, or press "Tab" repeatedly until the indicator you want is highlighted, then right-click anywhere and choose Add Button to create a button for the selected technical indicator.

Export Indicator Values Feature Enhanced

Right-click on an indicator in a traditional chart and choose "Export" to create a text file showing the values of the indicator for each bar. The export text file now shows all of the values for multi-valued indicators, e.g. MACD, Stochastics, etc. Formerly only the primary value was shown for each bar. The export function can also be invoked by selecting the indicator and choosing "Export Indicator Data" from the chart popup menu.

Volume Profile Scrolling and Other Enhancements

An option has been added to the Volume Profile chart titled "Minimum Bar Height". This controls the minimum height (in pixels) that each bar is drawn. In prior version, the minimum height was a constant 2 pixels. Now that scrolling has been implemented (see below), the user may want to limit the minimum size of each bar. In general, the bars sizes are dynamic, and expand vertically to fit the full height of the window. As the window is enlarged vertically, the bars will increase in height. Conversely, if the window height is reduced, or as more prices are reached and therefore more bars created, the height of each bar will be reduced. This new setting limits the reduced size to a minimum height in pixels.

Scrolling is now available in Volume Profile and Price/Time Profile charts via the up and down arrow keys on the keyboard. If the chart has grown too large to fit into the existing window, the user can scroll up or down to see the remainder of the chart. The up arrow key scrolls up one bar and the down key scrolls down one bar at a time. The "Page Up" key scrolls the chart up one full page, while the "Page Down" key scrolls the chart down one full page. Similarly, the "Home" key scrolls the chart to the top, while the "End" key scrolls the profile chart to the bottom.

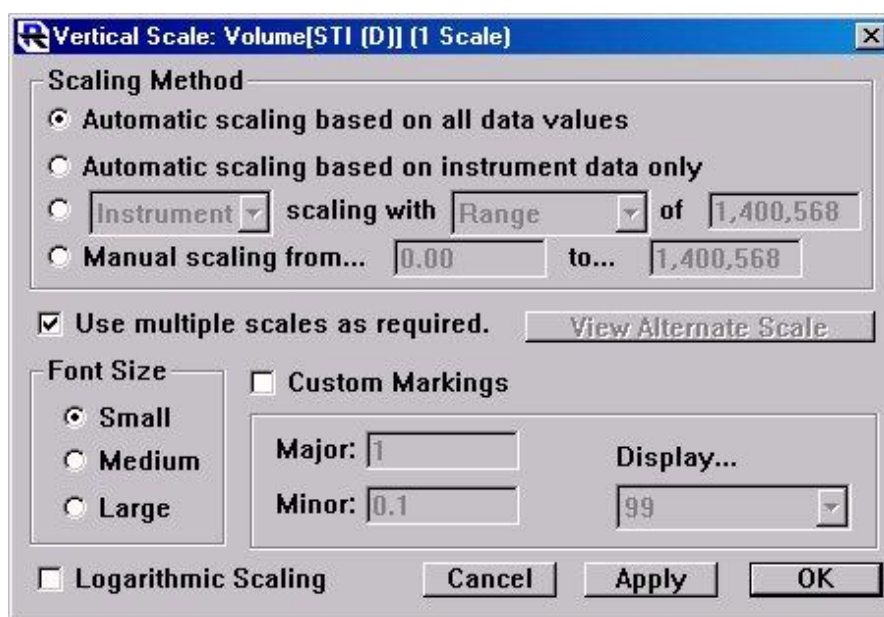
Chart Crosshairs Tool Improved

The crosshairs tool has been improved to eliminate occasional trace lines. The price value of the crosshair displayed in the vertical scale area of the chart is sometimes obscured by scale prices. For this reason, the price value is now also displayed at the top of the vertical crosshair along with the date and time of the bar. The crosshair tool can be turned on/off in any of three ways:

- A. Click the crosshair button in the charting toolbar.
- B. Press a function key assigned to the crosshair tool. Use Setup: Preferences: Keyboard Shortcuts to define the shortcut key.
- C. Hold down the Shift and Ctrl keys while moving the mouse pointer inside any traditional chart window to invoke crosshairs. The crosshairs will disappear when you release the keyboard keys and move the mouse. Note: Macintosh users hold down shift and option keys.

The price value shown for the crosshairs is now shown in the same format (precision) as the vertical scale value. The format of the vertical scale is determined automatically by the software based on the display format of the instrument(s) in the pane or the values of the indicators in the pane. The scale display format can also be user-specified in the scale preferences by checking the "Custom Marking" checkbox and selecting a display format from the Display menu. To access the scale preferences, right-click in the vertical scale area of the chart.

Value in Chart	Meaning in Preference Box
A	Automatic Scaling based on all data values
O	Automatic Scaling based on instrument data only
RA	Automatic Scaling with XXX of XXX
RM	Manual Scaling with XXX of XXX
RI	Instrument Scaling with XXX of XXX
M	Manual Scaling
=	Any letter with a = under the letters means that "Using Multiple Scales as required" is turned on



Version 6.1 Rev 5, Released: June 12, 2003

Maintenance Items 6.1.5.

The Setup: Custom Instruments window has been improved to more clearly show the list of components of each custom instrument. As you type letters into the custom instrument ticker symbol entry box, Investor/RT will now recognize the custom instrument ticker and show its setup automatically. A bug was corrected in the data generation process for custom instruments specifically dealing with "pairs" (differences) where the value of the spread between two instruments is a negative numbers. The process of generating more precise daily bars by examining intra-day data for the component instruments now works properly when the spread is negative.

eSignal Level II (Montage) displays are operative once again in Investor/RT. Investor/RT also now supports Level II bid/ask displays for OTC Bulletin Board stocks in the eSignal version.

The quotepage popup menu (accessed by right-clicking on a ticker symbol) now has an Insert command for inserting a new row in the quotepage just below the clicked row. The same popup menu can be used in portfolio windows to add a new position to a portfolio. It simply calls up the "order desk" window for entering a new position.

Various minor bugs were fixed in the area of chart definition export and import. One significant fix/improvement is that exported RTL and chart definition now carry setup information for any ticker symbols referenced by the RTL formula or the chart. Upon importing, these tickers are defined automatically on the recipient's systems before importing the RTL or chart definitions, thus eliminating prompting messages about undefined tickers. If the imported ticker symbol is not a valid ticker for the particular data feed being used by the recipient, the correct ticker must be substituted into the chart, of course. Any RTL formulas that make reference to a particular ticker, e.g. CL(\$INDU) will have to be manually adjusted after imported if the target ticker is inappropriate for the data service in use.

Finally, an obscure bug was fixed in the Windows version of Investor/RT having to do with chart saving. If a traditional chart was modified in some way, and then minimized, closing the window while it was minimized was causing the chart to be saved with incorrect screen coordinates. Thus upon re-opening the chart later, the chart's overall size and pane sizes would be distorted. This bug could also occur when quitting Investor/RT if modified minimized charts were open since quitting closes the window and can save those charts depending on preference settings. The preference setting in Setup: Preferences: General titled "When Closing Modified Charts and QuotePages" also had to be set to "Save the Changes" or "Ask Me" for this bug to surface. Of course, if "Discard the Changes" was chosen, the modified chart would not be saved and thus the chart would reopen later in its last saved state. Investor/RT now correctly saves the chart using the normal "restored" window coordinates.

Info Box Improvements

The Info Box in intra-day charts now displays both the date and time on one line when the box is setup to track the mouse pointer. Scrolling an intra-day chart containing an Info Box pegged to the mouse causes the Info Box to show the date and time of the last (right-most) bar in new visible period. This helps to "see where you are" when scrolling. The date and time row in the Info Box is now optional.

Price/Time Profile Improvements

The Price/Time Profile (sometimes referred to as "market profile") has two new display options. In the setup, there is a checkbox titled "yzabc". This options causes the time labeling to begin with the letter Y instead of the usual A, so that the first 2 30 minute time periods are labeled Y and Z, followed by the A B C time periods.

The other option checkbox is titled "x 3". This option divides each time period into three columns of ten minutes each showing the price levels reached in each ten-minute period comprising one 30-minute period.

Chart Annotation Coloring

The chart Annotation indicator has a new "Alternating Colors" option. In the setup, check the "Use Alternating Colors" checkbox and specify alternate foreground (text) and background colors. As the text of the annotation updates in the chart window, the text color and background will alternate between the normal and alternate set of colors, thus providing some visual feedback each time the annotation changes. If the instrument associated with the annotation is trading rapidly, many times per second, the annotation will alternate colors at most every three quarters of a second. Uncheck the "Use Alternating Colors" checkbox to disable this visual effect.

Confirming Signal Actions

The "Run Scan" option in Signal Actions has been revised. Instead of running a scan, Investor/RT now tests (runs) a signal (or any scan that has been enabled for use as a signal) and conditionally executes the Signal Action if the confirming signal is true. If the confirming signal is false, no further actions occur. Note that the sound associated with the signal action is played regardless. If the confirming signal is false, Investor/RT shows a message in the status message area of main toolbar (and in the message log) indicating that the signal action was not performed because the confirming signal failed. If the purpose of the signal (or scan) is simply to SET some user V# variables, then note that SET statements always evaluate as TRUE. Thus a signal composed only of SET statements strung together with AND will always "confirm" the signal action.

Bring to Front Menu Enhancement

Bring to Front is a submenu of the Windows Menu in Investor/RT. It lists the names of all open windows; choosing a window from the list brings that window to the front of all other open windows. Holding down the Ctrl Key while choosing a window has the added effect of centering the window. The centering takes place according to the centering percentages specified in Setup: Preferences: General. To make this new feature more visible to new users, the first menu item in the Bring to Front Menu reads " -- Ctrl-click to Center Window -- ", followed by the list of menu items for the open windows. Choosing this first menu item brings up a dialog box explaining the purpose of the Ctrl Key in more detail. Macintosh versions of IRT use Option-click rather than Ctrl-click to center.

Downloading Custom Instruments

The data download window can be used to download historical data for any list of instruments in a quote page. When downloading a quote page containing a mixture of regular instruments and custom instruments, Investor/RT will ignore the custom instruments and request data only for the regular instruments in the quote page. As a special case, if you make a data download request for historical data on a quote page that contains only custom instruments, Investor/RT will generate historical data for each custom instrument in that quote page. For example, performing a historical download on the ".Custom Instruments" quote page will regenerate the historical data for every custom instrument defined to Investor/RT.

Version 6.1 Rev 4 Enhancements, Released June, 2003

Maintenance Items 6.1.4.

Corrections were made having to do with intra-day charting of instruments assigned to overnight trading sessions in the period immediately following the 2003 Memorial Day Holiday. A bug was corrected in the myTrack version of Investor/RT, also holiday related, that caused intra-day downloads to skip date for date prior to the holiday.

Version 6.1 Rev 3 Enhancements – May 23, 2003

Executing Signal Actions with Chart Buttons

The chart "Button" indicator now has the ability to execute any pre-defined "Signal Action" (an action). Choose "Execute Signal Action" as the "Purpose" of the button and select one of the Actions listed. All Signal Action buttons are push buttons, and can have a custom title. If you have Signal Actions that communicate buy or sell orders to your broker (using the "Text to File" feature of the actions) then you can create say a green background "BUY" button and a red background "SELL" button for the appropriate signal actions. The instrument (ticker symbol) in the chart window with the button is the "subject" of the signal action.

Note that Signal Actions are "presets" for the Signal Action indicator and thus each defined signal action appears in the list of technical indicator presets when you create buttons with the purpose of "Add/Remove Preset Indicator". Setting up an indicator preset button and assigning it a Signal Action as the preset has the same effect as using the new button purpose "Execute Signal Action". However you setup the button, the effect is to execute that Signal Action when the button is clicked.

Executing Actions with Confirmation. When you click a signal action button in a chart a prompting window appears listing you the name of the signal action, the chart name, and the ticker symbol that will be the subject of the action. The prompting message says, "To Confirm,

press "OK". Click the "OK" button (or press the enter key) to execute the signal action; click the "Cancel" button (or press the esc key) to dismiss the prompt without taking any action.

Executing Actions without Confirmation. Hold down the Ctrl key as you click on a signal action button to execute the signal action immediately, bypassing the confirmation prompting message. Macintosh users will hold down the Option key instead.

When setting up Buttons for executing Signal Actions, or when setting up Technical Indicator Preset buttons in general, the setup dialog has been improved by adding a "Edit" button to the right of the list of Signal Actions or Presets List. Pressing the Edit button brings up the preferences for the particular action or indicator preset. You may use this feature to view the setup of any action or preset. If you make changes to the setup and click OK, the preset definition is updated. Click Cancel or press the esc key to dismiss the setup window without saving the changes.

Enhanced Signal Action Setup and Testing

New Signal Actions can be created in two ways: (1) in the Technical Indicator dialog, choose the Signal Marker Indicator, check the Action checkbox and click "New". Another method is to select the "Signal Action" indicator directly in the list of technical indicators, setup the action preferences as you like, then click on the Preset button at the bottom and choose New. You will be asked to provide a name for the Signal Action Preset. The action name you enter will then be listed in the list of actions you may utilize in Button or Signal Marker setups.

The Signal Action setup window in Version 6.1.3 has been enhanced. The "Test Text" button is designed to enable the user to simulate the triggering of the signal action in a controlled test. The text is first formatted and presented in a notification box. Investor/RT then prompts for confirmation before it writes the text to the designated file (when the "text to file" option is check marked). The write to file can be cancelled by pressing the Cancel button or the esc key on the keyboard. Finally, the text is written to the designated chat room if appropriate. If the write to file confirmation results in a "Cancel", the action terminates and nothing will be written to the chat room either.

There is also a new button named "View" to the right of the entry box for the filename. When the "Text to File" option is checked, clicking the View button opens a window displaying the contents of the user specified file. This may be useful during testing to confirm that the file was updated properly.

Signal Action Log

Each time a Signal Action executes, an entry is added to a text file named "SignalActionLog.txt" in the admin directory. Each entry is time stamped. The contents of this file can be inspected at any time using File: Open: Signal Action Log. You can also open and display the file using File:

Open: File. Use Setup: Keyboard Shortcuts to define a keyboard function-key shortcut for opening the Signal Action Log. Deleting this file or removing it from the admin directory will cause Investor/RT to create a new log file the next time a signal action is triggered. Note that the signal action log is updated each time the "Test Text" button is used to test an action, or a Signal Action button is pressed, or when a Signal Marker indicator triggers a signal action in a chart.

Multi-Linking Options for Time and Sales

Time and Sales windows in Version 6.1.2 and earlier always participate in multi-linking operations. Version 6.1.3 adds a "Multi-Link Color" option to the time and sales preferences. Like chart multi-linking colors, black means that the windows does not participate in any multi-link operations at all. White means that it participates in all multi-link operations (as it did in 6.1.2 and earlier). Other colors are used to associate the time and sales with one or more chart windows that have the same multi-link color. For example, if you have two charts open, both with red color code, and you set the time and sales window to red, then any multi-linking operation involving the two red charts will also affect the time and sales, while multi-linking other chart windows having differing color multi-link colors will have no effect on the time and sales.

Editing Custom Column Values in a QuotePage

Custom Columns in QuotePages that are setup with type "Built-in QuotePage Column" can now be edited when appropriate, that is, whenever the associated built-in column is an editable column. For example, if the custom column displays a particular V# variable value, the displayed value can be edited just as the built-in V# data column can be edited to revise the value of the associated V# variable for that row.

Selective Tick Data Filtering

The tick data filtering capability introduced in Version 6.0 (see item #6. Tick Filtering Feature Added, in the 6.0 What's New) is a global option. When this feature is on, all incoming tick data is filtered based on the user specified change and/or percentage change from the last tick. Reports are that this feature is working well and has eliminated most if not all bad ticks for many. Some users have reported that certain special tickers like \$ADV and \$DECL, the advances and declining issues have high variability percentage wise from tick to tick and that some quotes on such indexes are filtered out as a result. To address this issue Investor/RT now supports an option in the Setup: Instruments window (Advanced section) to enable the user to turn off tick data filtering for any instrument.

Version 6.1 Rev. 2, Released: May 12, 2003

Signal Markers and Signal Actions

The Signal Marker Indicator setup now allows the specification of a named "Signal Action" that is to be executed when the signal triggers true on the current bar. Signal Actions are defined independently. The Signal Marker setup shows a list of existing signal action names. "New" and "Edit" buttons are present to enable the creation of new signal actions or the viewing/editing of any existing signal action.

A Signal Action is a specification of one or more actions that are to be performed when a signal is triggered. The Signal Action setup has checkboxes for playing a particular sound or running a particular schedule for example. Formerly these specifications were shown explicitly in the Signal Marker setup window. Now, the Signal Marker simply refers to a the Signal Action by name and the Signal Action contains all of the detailed specification of what actions are to be performed.

The Signal Action setup has a large text entry box into which you can enter any arbitrary text message up to 255 characters in length. The text can also contain %TOKENS as in the "Annotation" indicator. %TOKENS are replaced with actual values. There are three actions that can be performed on this text:

- a. Display the text in a notification window.
- b. Display the text in a named Chat Room.
- c. Write (or append) the text to a text file.

When the notification window option is checked and a signal triggers the signal action, Investor/RT will construct a message, replacing any valid %TOKENS with the values for the particular ticker symbol that triggered the action, and display the resulting message in a notification window. For example, if the text reads:

`%TICKER – BUY SIGNAL at %CL Bid/Ask is %BID,%ASK Time %TIME`

and the signal action is triggered on IBM, a message window will appear showing text in the form:

`IBM – BUY SIGNAL at 86.25 Bid/Ask is 86.00,86.75 Time 10:33:20`

Similarly, if the "Text to Chat" checkbox is checked, the text message will be sent to the chat room specified in the signal action.

Finally, there is the "Text to File" option. When this is checked, the signal action enables entry boxes for specifying the filename and the path to the file where the text message is to be written. A "Browse" button is provided to the right of the path for convenience in selecting the folder/directory where the file will be written. Normally, the text of the message will be written to the filename specified, replacing the previous file by that name or creating a new file if

needed. If you wish to "append" the text as a new line to the file, then enter the file name preceded with a plus sign. For example, enter a file name of "+signal_log.txt" and specify the path (folder) where the file will be placed. Then any messages generated by the signal action will be listed one after another in the text file named "signal_log.txt". The signal_log.txt file can be inspected at any time using File: Open: File.

The new "Signal Action" specification in Investor/RT 6.1 replaces the former checkboxes for alerts and running schedules that were present in prior versions of Investor/RT. When upgrading to this new version, Investor/RT will automatically create signal actions with names of the form "Action N" (where N is a number) and assign them to your signal marker indicators. For example, if you formerly had a signal marker that that specified an alert sound and a schedule to run when the signal triggered, upon upgrading to Version 6.1.2, the setup for the signal marker might show simply "Action 11" as the named action for the signal. If you click the "Edit" button to the right of the Action list, you will see the setup for Action 11 and find the same sound and schedule setups are you had before.

Signal Markers: Completed Bars Option

Normally Signal Markers trigger the associated signal action when the signal indicates "TRUE" on the last bar in the chart. During market hours, the last bar in the chart is a bar in progress. Sometimes it is important that the signal not trigger until the bar is completed. One way to accomplish this is to write the signal in a way that it signals true when the previous bar has some particular condition. There is now a checkbox in the Signal Marker setup titled "Signal Completed Bars Only". When this box is checked the signal marker will draw markers only on completed bars (the last partial bar will never be marked) and the signal action associated with the signal markers will be performed only when the signal is true for the last completed bar. Visually, this will be the next to last bar in the chart once the bar is complete. When this checkbox is left unchecked, Investor/RT will draw signal markers on all bars, including the partial bar being formed during market hours. The signal action will be performed when the signal evaluates as true for the partial bar. Furthermore, the signal action will be performed at most once per bar. Once the signal has triggered for the partial bar once, the signal may in fact become false then true again before the bar completes but the signal action will not be repeated until the Next bar begins forming.

RTL Setup Enhancements

The RTL setup window for Scans, Signals, and Custom Indicator now accepts multi-line input and user comments embedded anywhere within the RTL expression. When entering a formula, pressing the return or enter key creates a new line in the text window. Comments can be included anywhere by beginning the comment with / * and ending it with * /. Formatting RTL expressions in this way can make them easy to read. For example a signal formula such as:

```
HLR > 1 AND CL - LO > .75 * HLR AND CL > MA AND CL.1 < MA
```

Can now be formatted like this:

```
HLR > 1      /* today's high-low range is more than a dollar */  
AND CL – LO > .75 * HLR /* current bar is in top quartile of today's range */  
AND CL > MA /* and price is now above the 20 period moving average */  
AND CL.1 < MA /* price was below MA in the previous bar */
```

The `/* comment */` method can be used to selectively "comment out" any section of the formula easily. For example, suppose you want to test the signal above but temporarily suspend the requirement that HLR be greater than 1.

```
/* HLR > 1 AND today's high-low range is more than a dollar */  
CL – LO > .75 * HLR /* current bar is in top quartile of today's range */  
AND CL > MA /* and price is now above the 20 period moving average */  
AND CL.1 < MA /* and price was below the MA in the previous bar */
```

Note that the entire first line of the formula is now a comment and that the "AND" has been moved up to the first line. To reactivate, the first condition later, just move the `/*` at the beginning of the first line to the right of the "AND", i.e.

```
HLR > 1 AND /* today's high-low range is more than a dollar */
```

NOTE: We have included a space between the slash and asterisk in the examples above for illustration purposes only. Without the space between them, the comment text would not be visible in this help topic since the same slash-asterisk technique is used for commentary by the software that processes this help text. When including comments in RTL formulas begin the comment with a slash followed immediately by an asterisk and end the comment with an asterisk followed immediately by a slash.

When the RTL setup window is set to define a Signal, a new button is present at the bottom of the window titled "Marker". Clicking the Marker button tells Investor/RT to insert the current signal into the front chart window. This is similar to the "Chart" button when the RTL window is set to define custom indicators. The marker will be added to the front chart if one is open, or Investor/RT will create a new chart window and add the marker to it. This feature makes it easy to test signals during the development process, eliminating the need to open a chart window and manually add a signal marker to it to test a new signal. Note also that modifying the signal formula and pressing the Save button causes the signal marker(s) for that signal to update wherever they are present in open chart windows. Thus you can now easily add the marker to a chart and refine the signal iteratively by pressing the Save button periodically to see the charting effect.

Note that when entering formulas into the RTL setup window, pressing the return or enter key allows you to continue typing on a new line in the entry window. In prior versions of

Investor/RT, the return or enter key was accepted as a command to run the scan for example. In version 6.1, you can hold down either the shift or ctrl key (option key on Macintosh) when pressing return or enter. For scans, shift-enter runs the scan. For signals and custom indicators shift-enter checks the formula's syntax. Ctrl-enter is the same as shift-enter.

Scheduling Download of Tick Data

The schedule action "Download Data" now supports Daily, 1-minute, and tick data downloads. Tick data downloading is support by DTN.IQ, eSignal, and Quote.com Investor/RT versions.

Maintenance Issues

Efficiency improvements were made to the RTL runtime system that should result in faster calculation of some scans, signals, and custom indicators.

DTN.IQ Treasury Futures historical data now download properly again

Futures of type FV, TU and TY were adversely affected by a format change for these instruments in the changeover from InterQuote to DTN.IQ. Also, a bug was fixed that was causing Investor/RT for DTN.IQ to download one less day of intra-day bars than requested in some cases.

New Result for Signal Statistics: Price At Next Signal

This new SSTAT result gives the price of the bar on which the next signal is TRUE. This result only changes when a TRUE signal occurs, and will then remain constant across FALSE signals. The indicator looks forward to the next bar for which the signal triggered, and displays the "price" of that bar.

Version 6.1 Rev 1, Released: April 30, 2003

Further Enhancement of Price Bands Indicator

The Price Bands Indicator was further enhanced to enable the bands to be computed historically.

Maintenance Issues

Several bug fixes and maintenance issues were addressed in the Rev 1 Version 6.1. A bug was corrected that was causing the new BFE token to calculate incorrectly when the token was used in a custom indicator. A more serious bug was fixed that caused Investor/RT to fail when attempting to save a chart definition when the subject chart contained an MPD indicator that referenced a custom indicator. The Save Layout window now positions itself properly for multi-

monitor users. The RTL token AVGVOL is now updated automatically whenever daily historical data is downloaded for any instrument. This improvement makes importing chart definitions from other users work better when the imported chart references an instrument formerly undefined on the recipient's Investor/RT system and the chart contains signal markers that make reference to the AVGVOL token. A bug was fixed in the drawing tool for Fibonacci Extensions that was making the tool work improperly after the first use of the tool. Various windows and menus that still made reference to "Trading Signals" were corrected to use the term "Signals" instead.

Version 6.1, Released: April 24, 2003

Chart Definition Export and Import

The Save Chart Definition (chart export) feature of Investor/RT has been enhanced significantly. The chart definition file created by this process now includes definitions for all scans, signals, and custom indicators that are directly or indirectly used by the subject chart. In addition, more detailed information about the chart setup is saved so that a saved chart definition can fully replicate the precise appearance of the chart on another user's Investor/RT system.

To import a chart definition text file, use File: Open: File and select the file. During the import process the user will be prompted regarding adding ticker symbols that were referenced in the chart definition. In addition, any scans, signals, or custom indicators that come in with the imported chart that have names that are already in use on the recipients system will elicit a prompting message. The responses will include "Leave" or "Replace". Choose Leave to leave the existing definition of the scan, signal, or custom indicator, i.e. skip the import. Choose Replace to continue importing the scan, signal, or custom indicator. The imported definition will replace the existing scan, signal or custom indicator. Some chart definition file for particularly complex Investor/RT charts may contain literally dozens of scans, signals, and/or custom indicators. If you wish to "Leave All" or "Replace All" existing scans, signals, custom indicators click the "More" button to see more options. The dialog will show choices to Replace All and Leave All. Choosing either of these choices will continue the import with no further prompting. A shortcut, using the shift key, is available for invoking the Leave All or Replace All options. Hold down the shift key on the keyboard while clicking Leave or Replace.

Note that the chart definition may contain a number of chart buttons that will appear in various chart panes according to the definition. Some of these buttons may represent global buttons (setup with scope "All Charts") on the Investor/RT system that created the chart definition file. Such buttons will NOT become global "All Chart" buttons on the recipient's Investor/RT system. For obvious reasons, the buttons that cone in with a chart definition will appear in the resulting imported chart as local button with scope "This Chart, Any Instrument". If you wish the button to become global on your system after importing, then simply adjust the scope of the button, i.e. right-click on any button, choose Edit, then adjust the scope at the bottom of the button setup window. Note also, that after importing a chart that contains buttons, any "global" (All

Charts) buttons that are defined on the importing Investor/RT system will then be added to the resulting chart. Thus the resulting chart may possibly contain more buttons than the chart on the senders Investor/RT system.

Scan/Signal/CI Export and Import

Similar enhancements were made to the Save As... function for saving definitions of Scans, Signals, and Custom Indicators. The definition file will contain definitions of all scans, signals, and custom indicators that are directly or indirectly referenced by the subject scan, signal, or custom indicator. For example, a custom indicator may reference one or more other custom indicators, and these in turn may include technical indicator setups that reference other scans, signals, or custom indicators. When you save such a definition, the export file will automatically contain everything needed to utilize that custom indicator on the recipient user's Investor/RT system. In the past, each scan, signal and custom indicator definition had to be saved individually and imported individually by the recipient.

New Chart Button Purpose: Run Schedule

Chart buttons may now be created for the purpose of running schedules. When setting up the button, choose "Run Schedule" as the button purpose. For push buttons enter the name of the schedule you wish to run when the button is clicked. For menu buttons, you can explicitly name 2 or more schedules, or you can simply enter a question mark instead of entering schedule names. When you click a chart menu button that has been setup with ?, Investor/RT will show a menu of ALL defined schedules when you click the button.

New Schedule Actions

The Setup Schedules window has been enhanced with a number of new actions for manipulating chart windows. The new actions can be setup to operate on a particular chart name or on the front most chart window regardless of its name:

Execute Chart Button

This action performs the function (purpose) of the Button preset specified. Before you can schedule a button you must create a "preset" for the button that describes the button purpose. Go to Setup: Preferences: Charts: Technical Indicator, setup the button preferences to perform the desired action and then click the Preset button at the bottom and choose New. Name the preset. Back in the Setup: Schedules window, click New to add a new action to your schedule, choose Execute Chart Button as the Action, then specify the name of the button preset you wish to execute. This feature enables you to perform literally any action or series of actions that can be done by chart buttons, as a series of scheduled actions.

Add Preset

The Add Preset action adds the specified technical indicator preset to the specified chart. The preset can be any technical indicator you wish to add to a chart. The specified indicator will be added to the chart only if it is not already present with the same preferences. If you designate that the indicator preset is to be added to a specific chart name, the chart will be opened if necessary and the indicator will be added to it.

Remove Preset

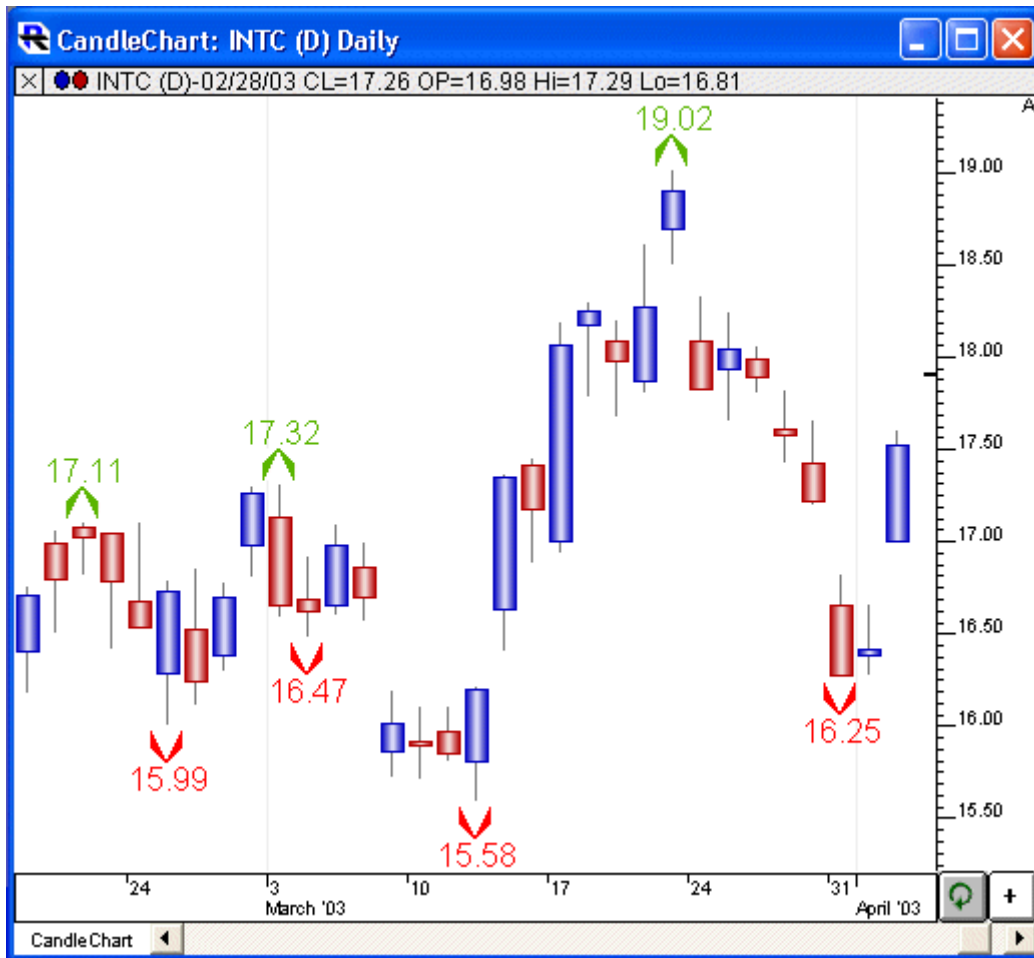
The preset indicator will be removed from the designated chart if present.

Toggle Preset

The present indicator will be added to the designated chart if it is not already preset. If the same indicator is already present with the same preferences, the indicator will be removed.

New Technical Indicator: Fractals

The Investor/RT Fractal indicator is based upon the "Bill Williams Fractal" in the book "Trading Chaos" by Bill Williams, PhD. A fractal is an entry technique that is traditionally defined as "a bar that has two preceding and two following bars with lower highs (or lower lows, on a down move)". Several different varieties of up and down bar 5-bar fractal formations can be seen below. The Fractal indicator result can not yet be accessed in the RTL language. Keyboard Adjustment is not currently available for the Profile indicator.



Above is a Daily Candlestick Chart of Intel Corporation (INTC). The Fractal indicator is drawn overlaying the INTC candles, using the preferences seen below.

Bars Involved:

Up Fractals:

Down Fractals:

Label Markers With Stop Price
 Stop Price Is Outside Fractal Extreme

Only Label When Fractal Markers Are Selected

Label Only The Selected Marker When Selected

Reference Line At Selected Marker Stop Price

Label Font:

Bars Involved

The number of bars required in order for a fractal to be considered complete. Traditionally, fractals involve 5 bars. A 5-bar up fractal defines a pattern where one bar is preceded 2 bars with lower highs and followed by 2 bars with lower highs (deviations exist and are discussed below). Other options include 3, 7, 9, 11, 13, 15, 17, or 19 bars.

Up Fractal

Marker size, style, and position for up fractals. Up fractals occur when a bar high exceeds the high of a given number of preceding and following bars.

Down Fractal

Marker size, style, and position for down fractals. Down fractals occur when a bar low is lower than the low of a given number of preceding and following bars.

Label Markers With Stop Price

If this box is checked, the markers will be labeled with the "Stop Price". The Stop Price value is dictated by the following preference.

Stop Price is ___ Outside Fractal Extreme

The "Fractal Extreme" is the high price of an up fractal, or the low price of a down fractal. If a value of 0.25 outside fractal extreme is specified, and an up fractal occurs with a high of 875.50, then the marker will be labeled with a stop price of 875.75. Similarly, if a down fractal occurred with a low price of 860.25, then the down fractal marker would be labeled with a stop price of 860.00. On up fractals, the stop price is generally placed one "tick" above the high price, and the stop is considered a "Buy Stop" in which a long position should be entered when price returns to that stop price. On down fractals, the stop price is generally placed one "tick" below the low price, and the stop is considered a "Sell Stop" in which a short position should be entered when price returns to that stop price.

Only Label When Fractal Markers Are Selected

If this checkbox is checked, the marker labels will only appear when the indicator/markers are selected. This can reduce clutter in the chart, and draw labels only when needed.

Label Only The Selected Marker When Selected

If this checkbox is checked, then only the marker that was selected will be labeled. If this checkbox is unchecked, all labels will be shown when markers are selected (provided that option is turned on as well).

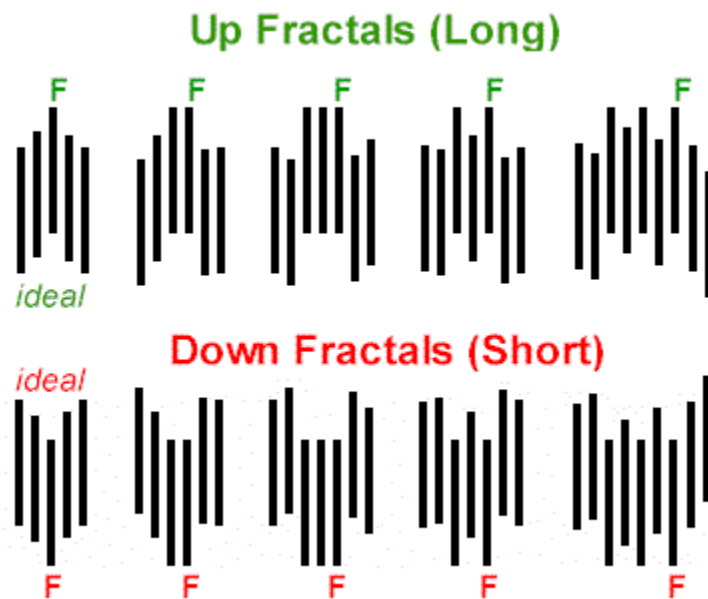
Reference Line At Selected Marker Stop Price

If this option is checked, a reference line will be drawn at the markers stop price when that marker is selected.

Label Font

This controls the font, size, and style of the marker label.

A fractal is an entry technique that is traditionally defined as "a bar that has two preceding and two following bars with lower highs (or lower lows, on a down move)". Several different varieties of up and down bar 5-bar fractal formations can be seen below.



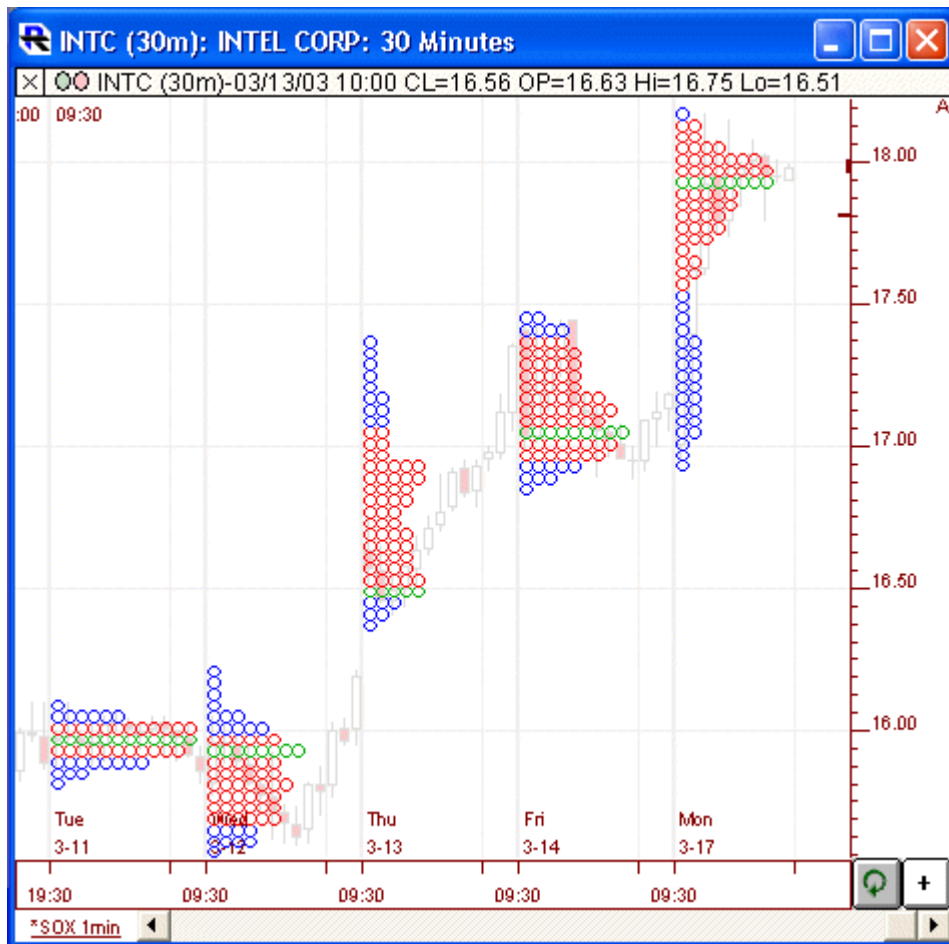
Profile Indicator Enhancement

A new Profile indicator has been added to the growing list of indicators available in Investor/RT. The Profile indicator is a close relative of the existing Price/Time Profile standalone chart type. Profiles allow the user to overlay a price-based profile over a traditional intraday chart. The Profile provides a "Price/Row" preference which dictates the height of each row. The width of each resulting row will represent how many bars during the session in which that row's price range was touched. If the periodicity of the chart is 5-minute, and the width of a row is 3 bars wide, then the range of three of the 5-minute bars for that session actually overlapped the price range of that row.

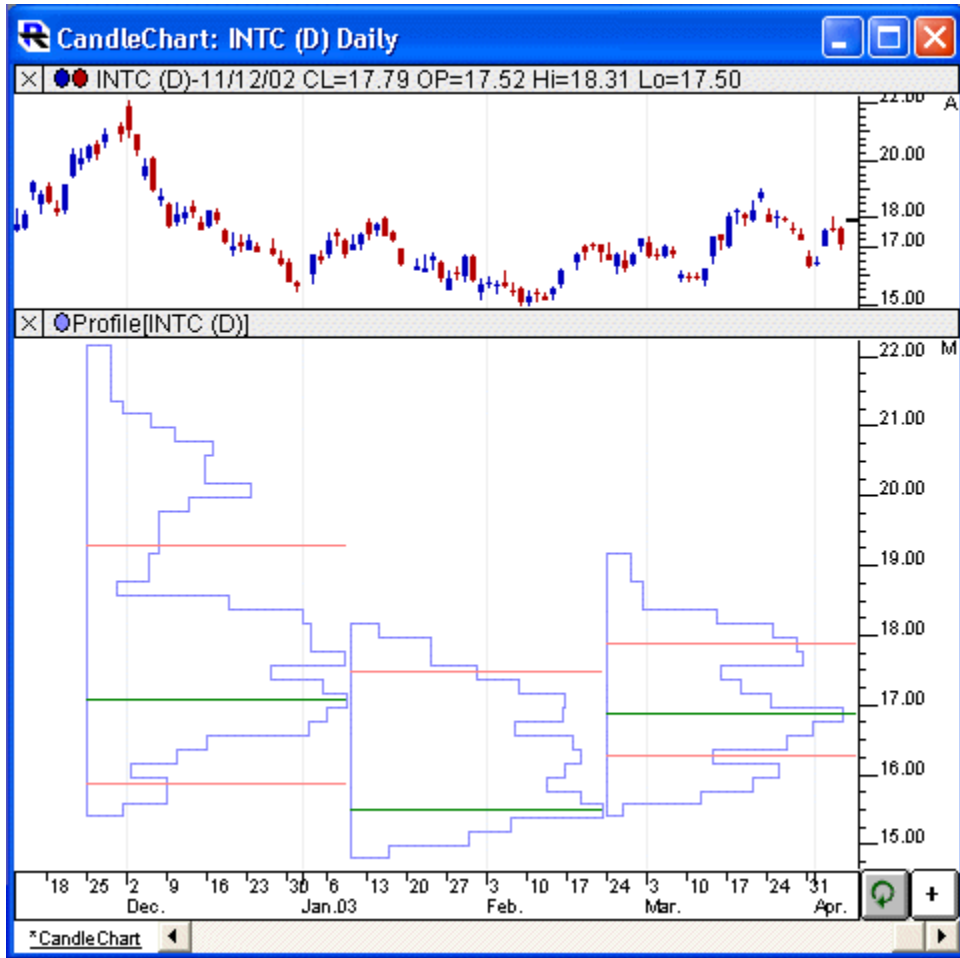
The widest row is called the Point of Control (POC). The Value Area (VA) is commonly considered the area in which 70% of the price action transpired. This percent level is adjustable, as some prefer to use alternate VA % levels such as 80%. Options for drawing the current and previous POC and VA lines are provided in the Profile preferences. Another option dictates how

many sessions for which the Profile will be computed and displayed. The Profile may be drawn as Solid or Hollow Blocks, Solid or Hollow Ovals, Dots, or Lines. A "Hide Profile" checkbox gives the user the ability to hide the actual profile and draw only current and/or previous POD and VA lines. The "Current" and "Previous" POC and VA lines are also optional, as well as VA and POC labeling.

The Profile indicator result can be accessed in the RTL language with the token PROF. When the Profile is used in the context of a scan, signal, or custom indicator, a "Result" option is presented at the bottom of the preferences window, which dictates what value will result from the PROF token. The "Result" options include "Upper VA (Curr)", "Upper VA (Prev)", "Lower VA (Curr)", "Lower VA (Prev)", "POC (Curr)", and "POC (Prev)".



Above is a 30-Minute Candlestick Chart of Intel Corporation (INTC). The Profile indicator is drawn overlaying the INTC candles.



Above is a Daily Candlestick Chart of Intel Corporation (INTC). The Profile indicator is drawn overlaying the INTC candles, using the preferences below.

Price and **Volume** Profile Hide Profile

Compute Last **3** Profiles **Blue**

Price/Row (Height) Automatic Custom: **0.2**

Time/Profile (Width) Automatic **Every** Custom: **30** **Days**

Current Previous

Point of Control: **Green** **Green**

Value Area: **Red** **Red** **70** %

Label VA and POC

Std Dev Based VA

Draw As: **Hollowgram**

Price and Time/Volume

This option controls whether "time" or "volume" is used when computing the profile(s). If "time" is used, the width of each row in the profile represents the number of bars (over profile period/width) which hit the price range of that row. If "volume" is used, the width of each row represents the volume traded in that row's price range.

Hide Profile

If this checkbox is checked, the actual profile itself will not be drawn, allowing the user to draw the VA and POC lines alone.

Compute Last ___ Profiles

This option controls how many profiles (sessions) are computed and drawn in the chart. The color control to the right controls the color of the rows outside the value area.

Price/Row (Height)

This option controls the "height" of each row of the profile, or the range of prices which each row represents. If a value of 0.04 is specified, for instance, then potential rows would include 0.00 to 0.04, 0.04 to 0.08, ..., 25.08 to 25.12, ..., 100.40 to 100.44, etc. If "Automatic" is selected, Investor/RT will use a reasonable height based on the trading range of the instrument and the timeframe involved.

Price/Row (Height)

This option controls the period of time which each profile covers. The "Automatic" option is chosen, a period of "last 100 days" will be used for daily, weekly, and monthly periodicities, while a period of "every 1 day" will be used for intraday periodicities.

Current

This checkbox controls whether the current VA and POC lines will be drawn.

Previous

This checkbox controls whether the previous VA and POC lines will be drawn.

Value Area

This controls the color, style, and width of the current and previous value area lines. The value to the right dictates the % level of the Value Area. The most common value area setting is 70%.

Point of Control

This controls the color, style, and width of the current and previous point of control (POC) lines.

Std Dev Based VA

If this checkbox is checked, the POC will represent the volume/time-based average price, while the VA will be computed using a 70% standard deviation band based off of the average price POC.

Label VA and POC

This checkbox controls whether the prices of the VA and POC lines will be labeled.

Draw As

This controls the drawing style used to draw the profiles. Choices include "Solid Boxes", "Hollow Boxes", "Solid Ovals", "Hollow Ovals", "Dots", and "Lines". When the PROF token is used in a scan, this control will change to one labeled "Result:" with options of "Upper VA (Curr)", "Upper VA (Prev)", "Lower VA (Curr)", "Lower VA (Prev)", "POC (Curr)", and "POC (Prev)".

Paint Bar Indicator Enhancements

The Paint Bar indicator was enhanced to allow more flexibility when painting bars based on custom indicator results. Prior to the 6.1 release, custom indicator painting was limited to optionally painting one color if the CI was greater than zero, another color if the CI was less than zero, and a third color if the CI was equal to zero. This limited the user to custom indicators that oscillated about zero. In this release, options were added to allow the user to choose to paint one color if the CI is $<$ or $\leq X$, another color if the CI is $>$ or $\geq Y$, and a third color if the CI is between X and Y. This gives the user the flexibility to paint three distinct ranges of values for the CI, and does not limit to only painting based on the CI's relation to zero. For instance, the user may have a custom indicator that represents the difference (HI - LO). They may choose to paint the bars green if the range is above 3, red if below 1, and gray if between 1 and 3.

Vertical Reference Line Enhancement

A new "Horizontal Position" option was added to the Vertical Reference Line indicator to give the user more control over where the vertical line is drawn horizontally in relation to the bar. Horizontal Position options include "Left of Bar", "Center of Bar", and "Right of Bar". Prior to Version 6.1, vertical reference lines were unconditionally drawn to the left of the bar.

Mouse Wheel Support (Windows)

For Windows users we have added support for mouse wheel scrolling to many Investor/RT window types. The mouse wheel can be used to scroll portfolio, quote pages, and all "text" type windows, e.g. the message log window and chat windows. Certain setup windows also report appropriately to mouse wheel movements. The RTL Setup window scrolls the list of RTL tokens up and down. The Add Technical Indicator and Setup Technical Indicator window scrolls the list of indicators. Holding down the Ctrl key causes each click of the mouse wheel to scroll more, i.e. hold down the ctrl key while you operate the mouse wheel to scroll up and down more rapidly in quote page, portfolios, and text windows. Finally for chart windows, the motion of the scroll wheel zooms the chart in and out by modifying the "pixels per bar" setting, this is similar to the effect you get using the up/down arrow keys on the keyboard to adjust the chart.

This special mouse wheel handling is in effect by default. Some users may have special mouse driver software that provides mouse wheel capabilities customized by the user. If the new mouse wheel support in Investor/RT interferes with those capabilities, you can turn off Investor/RT mouse wheel handling by unchecking the checkbox in the Setup: Preferences: General window.

Main Tool "Scan" Button Revised

The button on the main toolbar formerly known as the "Scan Button" has been enhanced to provide more general access to RTL objects of all types. The button's image has been changed. Henceforth, it will be called the "RTL Button" to indicate its expanded purpose. Clicking the button pops up a menu with four choices for accessing Scans, Signals, Custom Indicators, and Trading Systems. Choose the type of RTL object you wish to open or create and a list of objects of that type will appear in a standard list selection window. From there you can open any or all RTL objects of the chosen type in the usual fashion. Choose "New", the top item in the selection list to create a new RTL object of the chosen type. For convenience in creating new RTL objects, right-click the RTL Button on the main toolbar (Macintosh users: control + click). The popup menu will then read "New Scan", "New Signal", "New Custom Indicator", "New Trading System". Make your selection and Investor/RT will open the setup window immediately for creating a new object of the desired type, bypassing the object selection window.

Related improvements were made to the setup windows for scans, signals, and custom indicators to consolidate these into a single convenient window for viewing and creating RTL objects. Henceforth this window will be called the RTL Setup window. In the upper left corner of the RTL Setup window is a button menu with choices for Scan, Signal, and Custom Indicator. Now you can view and create scans, signals, and custom indicators from the same window. A shortcut for opening the RTL Setup window is to shift-click on the RTL button on the main toolbar. The RTL set window opens immediately, bypassing both the popup menu and the list selection window. From there you can select the type of RTL object you want.

New File Menu Item - Run Schedule

The Run Schedule command in the File Menu presents a standard selection window listing all defined schedules. Double-click a schedule name to run it, or select a schedule and click OK. More than one schedule can be run by selecting each schedule you wish to run in turn and clicking the Apply button. This command makes it more convenient to run a schedule without opening the Setup: Schedules window, similar to the Run Scan command in the File Menu.

Using Investor/RT "Offline"

A new menu item named "Work Offline" has been added to the data feed menu. The purpose of the command is to place Investor/RT into "offline" status on occasions when the user does not have a data feed or internet connection available, or does not wish to initiate any connections for some period of time. When Investor/RT is in offline status no "automatic downloads" will be initiated, nor will there be any prompting when opening chart windows about connecting to the data feed.

When working offline, there are three ways to place Investor/RT back into normal status:

- a) Choose Work Offline (again) from the data feed menu.
- b) Choose "Start Data" from the data feed menu.
- c) Click the Start Feed button on the Main Toolbar.

The data feed menu will show a checkmark in front of the menu item "Work Offline" when Investor/RT is in offline status. Choosing this menu item toggles the checkmark and the state between offline and normal status.

When you quit Investor/RT while in offline status, Investor/RT will continue to be in the offline status when you start up Investor/RT again. A message will appear at startup to remind you that Investor/RT is offline.

The "heartbeat" indicator button at the right end of the main toolbar will show a "blank" image when Investor/RT is in offline status. Click on the heartbeat button for more information.

Presentation Mode

A global option has been added to Investor/RT, called "Presentation Mode". When Investor/RT is put into Presentation Mode, certain graphical objects, like candlestick bodies, histograms, custom profiles, and renko chart boxes, are drawn with a shading effect. While this mode can be more aesthetically pleasing, it is not recommended for continuous use. Drawing objects in this mode is generally more processor intensive. Thus this feature should be used sparingly, for creating screenshots, or when reviewing charts after market hours. Presentation Mode can be quickly turned on or off by right-clicking in the message area of the main toolbar, and selecting "Presentation Mode". A "Presentation Mode" checkbox is also available in the "Setup:

Preferences: General" window. The shaded effect will generally be noticeable only when drawing rectangles that are at least eight pixels wide. For instance, the shaded effect will be noticeable on candlestick bodies if the "Pixels/Bar" setting found in the Chart Preferences (General Tab) is at least eight. If there are other areas of the software that you would like to see visually enhanced in "Presentation Mode", please email your suggestions to support@linnsoft.com.

Rounded Boxes Option for PNF/Renko Charts and Indicators

The Point and Figure/Renko Charts and Indicators were enhanced to provide a new "Rounded Boxes" option. If this option is checked, the boxes will be formed and rounded multiples of box size, starting at zero. If this option is unchecked, the first box will be created at precisely the first price that is processed. For example, assume the box size is 1.00. If "Rounded Boxes" is checked, then boxes will be placed at prices 1.00, 2.00, ..., 51.00, 52.00, etc. This is how Investor/RT has worked prior to this release. On the other hand, if "Rounded Boxes" is unchecked, and the first price processed (opening price) is 58.26, then the first box will appear at 58.26, and subsequent boxes will form at prices like 59.26, 60.26, 57.26, etc. Using the "Rounded Boxes" option can give your chart a cleaner look and feel, but sacrifices a small amount of precision at the very start.

Create Custom Profile Menu Item in QuotePage Popup Menu

A menu item has been added to the QuotePage Popup Menu called "Create Custom Profile". The QuotePage popup appears when the user right-clicks on any column heading, or clicks on the black "+" in the upper right corner of the quotepage (Mac users control+click). When this menu item is chosen, a Custom Profile chart will be created, using the target quotepage, along with all other default Custom Profile preferences. The Custom Profile will be given the same name as the quotepage by default. The new menu item essentially provides a way to jump quickly from any open quotepage to a graphical Custom Profile representation of that quotepage.

DTN.IQ (InterQuote) Version Enhanced

The DTN.IQ (InterQuote) Version of Investor/RT now supports the longer term intra-day historical data capabilities of the DTN.IQ data service. Specifically, the most recent 10 days of tick data are available for downloading. Minute interval data may be downloaded for the last 120 days. All windows, menus, and messages in Investor/RT now use the name DTN.IQ rather than InterQuote to identify this data service.

RTL Setup Window Enhanced

The RTL Setup window has been rearranged slightly to enable the formula (syntax) entry area to occupy the entire width of the window. Buttons formerly to the right of the formula area are

now positioned at the bottom on the window. Buttons for "Save As" and "Export" functions were added to make these features more visible and accessible. Formerly it was necessary to use the menu bar (e.g. File: Save: Save As or File: Export: Scan/Signal Definition) to invoke these features. The RTL setup window can be resized horizontally and/or vertically to enlarge the size of the formula entry area to view more lengthy formulas.

RTL Formula Entry Enhancements

The RTL formula (syntax) checking process has been improved in several ways to facilitate entry of RTL scan, signal, and custom indicator formulas. The improvements are designed to facilitate entry of technical indicator tokens in cases where multiple tokens are needed for the same technical indicator. In addition, the improvements enable the user to extend the technical indicator tokens available for use in RTL formulas through the use of pre-defined technical indicator "presets". RTL technical indicator tokens can reference other scans, signal, and custom indicators directly by name.

Using Token Suffixes

Consider a scan to identify instruments whose 20 period simple moving average has just crossed above the 100 period simple moving average. To formulate this scan prior to these improvement you would first add the MA token twice to the list on the right using the ==> button. When you do this, Investor/RT will prompt for the setup for each MA. You must then assure that each MA related token has a unique name so you can refer to the different moving averages in the scan formula. You might assign the token name MA_twenty to the first MA token and MA_hundred to the second token. Then the scan formula can then be entered:

MA_twenty.1 < MA_hundred.1 AND MA_twenty > MA_hundred;

Notice the way the tokens are named in this example. First there is a "real" token MA followed by an underscore and then some arbitrary characters that make the token unique. This convention for naming tokens is appealing because it makes clear that the token is in fact an MA and the underscore provides a visual separator between the real token and the suffix for improved readability, just as the period is used to visually separate the entire token from the numeric qualifier .1. The improvements made to the RTL formula setup are based on this technical indicator naming convention. When technical indicator tokens are entered directly into a formula without pre-defining them, Investor/RT will now do much of the setup work for you. The new convention can be summarized as follows:

When entering a technical indicator token, you can enter either:

- a. the actual token in upper case, e.g. MA, RAWK, CI

- b. the actual token in lower or mixed case, e.g. ma, rawk, ci
- c. the actual token in mixed case followed by a "suffix". The suffix always begins with an underscore followed by a series of letters, e.g. ma_st, ma_longterm, RAWK_one, RAWK_two

More succinctly, any technical indicator token can be entered in mixed case optionally followed by a suffix that begins with an underscore character. When you enter a formula using this convention Investor/RT will do much or all of the token setup work. To see the effect, open the RTL Setup Window (Setup: Scan or Setup: Signal). The setup window will appear with the formula area blank and no tokens listed on the right. Enter the following formula into the entry area:

```
ma_twenty.1 < ma_hundred.1 and ma_twenty > ma_hundred;
```

Press the "Check" button. Investor/RT will respond by adding MA_twenty and MA_hundred automatically to the list on the right. Both of these token names will be setup as MA tokens. Investor/RT will prompt you with the MA preferences window so you can setup each token with the appropriate moving average period. The MA setup dialog will show text such as "Preferences for RTL Token MA_twenty" to indicate the name of the token to which the setup pertains.

Using Indicator Presets as RTL Tokens

Suppose that you use 20 and 100 period moving averages often in scans, signals, and custom indicators. If so, you may have setup MA presets for 20 and 100 period presets. Investor/RT uses the suffix naming convention described above to identify references to technical indicator presets. This enables any preset to be referenced directly in the RTL language. The rule for referencing presets is as follows:

If an RTL technical indicator token has a suffix (e.g. _twenty) and there is a preset defined for that indicator that has the same suffix, then the preset indicator preferences will be automatically associated with the RTL token without user prompting.

Suppose for example that you create presets for the moving average indicator with names like "mySimpleMA_twenty" and "mySimpleMA_hundred". To create presets, go to any setup window for an indicator, set the preferences as you wish to record them, click on the Preset button and choose "New". You will be prompted for a name for each preset. When naming a preset that you may wish to use in RTL, put the suffix you want to use at the end of the prefix name. In this case, we named our two MA presets with suffixes _twenty and _hundred.

With the presets defined, the entry of technical indicator tokens can proceed without pre-defining the tokens and without user prompting. Open a new scan setup window and enter the formula:

ma_twenty.1 < ma_hundred.1 and ma_twenty > ma_hundred;

When you then press the "Check" (or "Scan" or "Save") button Investor/RT will automatically create the two MA tokens giving them names ma_twenty and ma_hundred. The setups for these two indicators will be obtained from the MA presets found with the same suffixes. The scan is fully specified with no user prompting windows. In essence, the creation of indicator presets with suffixed names makes the suffix visible to the RTL language. Note that the same suffix can be used in names of various indicators. For example, you could have a MA preset and an RSI preset both having names suffixed with "_twenty". Thus you can write ma_twenty or rsi_twenty and Investor/RT will correctly obtain the preset preferences without user prompting.

In the event no preset is found with the appropriate suffix, Investor/RT will also check to see if it can find a preset having a full name that exactly matches the suffix following after the underscore. For example, if you make a preset named emaTen to refer to a MA token with a setup of 10 period exponential moving average, then the token MA_emaTen can be used to refer to that MA preset. The full name of the preset follows the underscore. Note that comparisons are case sensitive, thus MA_ematen would not be recognized as a reference to the preset, while ma_emaTen and MA_emaTen will work. The token before the underscore is not case sensitive, but the suffix must match exactly.

How presets are named is up to each individual user. If you use short preset names, like emaTen or stochRSI, you can refer to those presets using RTL tokens using the full name. Longer names are more descriptive but would be laborious to enter and hard to remember. With longer preset name, an underscore suffix on the longer name gives you a shorter handle for referring to the preset.

Referencing Scan, Signal, Custom Indicator Names

The indicator tokens SCAN and CI follow the same conventions described above for technical indicator tokens. If you have a custom indicator named "StochasticRSI" you can create a preset for this CI and name it "myStochasticRSI_srsi" for example. Once this preset is defined, the token CI_srsi (or ci_srsi) will be recognized in RTL formulas. When creating a new custom indicator formula it is often useful to refer to other custom indicators or scans (signals). Presets may not exist for each custom indicator, so Investor/RT handles the CI and SCAN tokens further when no matching preset is found. The rule is as follows:

A SCAN or CI token, when followed by a suffix, will be associated with the scan or ci preset having that same suffix. If there is none, the scan or ci token will be associated with the scan, signal, or custom indicator whose full name matches the suffix. If there is

none with that name, the user will be prompted to name the associated scan, signal or custom indicator.

Suppose for example you have two custom indicators with names: StochasticRSI and SpecialAverage, a signal named "myBuySignal", and a CI preset for StochasticRSI named myStochasticRSI_srsi. Here are a few RTL tokens for making reference to these:

CI_myBuySignal	(no prompt)
ci_myBuySignal	(no prompt)
ci_mybuysignal	(user will be prompted since the name match is case sensitive)
ci_srsi	(no prompt, reference StochasticRSI via the preset)
ci_StochasticRSI	(no prompt, references StochasticRSI directly by name)
scan_myBuySignal	(no prompt)

When entering formulas, it may sometimes be useful to review a list of all defined custom indicator names or signal/scan names as an aid to entering the correct spelling of the name or suffix. This can be accomplished by clicking the RTL button on the main toolbar. Choose Open Custom Indicator from the ensuing popup menu to see a list of all custom indicators. The list of names can be dismissed at any time without actually opening anything by clicking the close box in the window title bar.

Note that the special handling of RTL technical indicator tokens that have an underscore suffix is a formula writing convention that speeds entry and setup of RTL formulas. The RTL language itself has not changed. You can still setup indicator tokens in advance of entering your formula syntax and you can assign names to tokens with or without an underscore suffix. All scans, signals, and custom indicators correctly setup before these improvements will continue to function as before.

Traditional Charts: New General Preferences.

Setup: Preferences: Charts: General has several new checkboxes. They are:

- When Printing Charts, Stretch the Chart to Fill the Page
- When Printing Charts, Print Background & Scale in Black and White
- Show Instrument Name in Chart Window Title Bar

Checkbox (a) specifies whether you wish traditional charts to be stretched to fit the printed page. If this checkbox is checked the printed chart will fill the entire printed page, otherwise the aspect ratio of the chart on the screen will be maintained when printing. To see the difference, print any chart with and without the checkbox checked.

Checkbox (b) specifies that the screen background color and scale color will be set to white background, black scale text whenever the traditional charts are printed. The other contents of

the chart are printed in their normal screen color. This option will be extended to the non-traditional chart types as well in future updates to Investor/RT.

Checkbox (c) specifies whether traditional charts containing a single instrument will show the full instrument name (the security name) in the window title bar. Prior to Version 6.0 this was always the case, but in Version 6.0, the traditional chart window title format was revised to show the name of the chart itself (the saved name of the chart) rather than the name of the instrument within the chart. If this checkbox is checked, the window title will show the name of the chart, the ticker symbol and security name followed by the periodicity of the chart. Note that the traditional chart window title will usually begin with the name of the chart. The exception is when the chart window is narrow. In this case, the window title will begin with the ticker symbol first. This will be helpful when using the chart wizard to review many thumbnail sized charts. Each small chart window will at least show the ticker symbol to identify the chart.

New Indicator: Price Bands

A new technical indicator called "Price Bands" has been added. Price Bands are horizontal bands across the chart, drawn between two prices. The first price (Price 1) is determined by a user-specified custom indicator. The second price (Price 2) can also be determined by a custom indicator, or it can be set to a certain distance (price or percent) "Above", "Below", or "Above and Below", Price 1. The Price Band draws from the left edge of the chart, to the right edge of the chart, with the top and bottom of the band being dictated by the selections for Price 1 and Price 2. As an example, you may create two custom indicators that represent the previous session's high, and the previous session's low (using syntax "MPD"). These two custom indicators can then be used to draw a Price Band on an intraday chart that shades the area representing the previous session's trading range. Similarly, you could create a custom indicator that represented the highest high of the past 10 bars (using STAT). By setting Price 1 to this custom indicator and Price 2 to "1% Below Price 1", a Price Band would be drawn from the highest high of past 10 bars, down to 1% below that highest high.

The Price Band indicator can be selected by clicking on the very top or bottom of the rectangle that forms the band (by clicking on either Price 1 or Price 2). The Price Band acts just like all other technical indicators in that it can be drawn in front of or behind any other element (indicator or instrument) in the chart pane. Price Bands are also not limited to being drawn with instruments, but they can also be drawn along with standalone indicators. For instance, Price Bands could be drawn in the MACD pane representing the area from the highest MACD value over the last 20 bars, down to 10 points below this highest value. Or one could use the Price Pane to simply draw between two constant prices. To obtain a constant numeric value from a custom indicator, simply use the syntax "VAR" and setup the VAR token with whatever numeric value you'd like, or use the syntax "10.5 + HI*0". In other words, a number by itself (syntax like "10.5") is not allowed in RTL. A token must be present somewhere in the syntax.

New RTL Tokens: BFE and BCNT

The token BFE (Bars From End) returns a whole number indicating the distance in bars that the current bars is from the end of the data collection. For example, in a signal marker you may use a signal with the formula:

$$\text{BFE} > 0 \text{ AND } \text{BFE} < 6 \text{ AND } \langle \text{any expression} \rangle$$

Where $\langle \text{any expression} \rangle$ represents the actual signal expression you wish to mark on the chart. The condition $\text{BFE} > 0$ will exclude the last bar since the last bar of the chart will have BFE of zero. The condition $\text{BFE} < 6$ means that the signal will always be false for bars are 6 or more bars from the end. This has the effect of showing signal markets on the last 5 completed bars, but never on the current bar (until it completes), and never on any earlier bars.

The token BCNT (Bar Count) replaces for former token BTCNT (Backtest Bar Count). During backtesting BCNT is the number of bars in the backtesting data series, the same value BTCNT used to provide. In charts, BCNT is the number of bars in the chart. If you add the expression " $\text{BCNT} > 10 \text{ AND}$ " at the beginning of a signal, the signal will never be true until at least 10 bars of data are present in the chart.

The BFE and BCNT tokens can be used together to determine how far (in bars) the current bar is from the beginning of the time series. The expression:

$$\text{BCNT} - \text{BFE}$$

will give you a number from 1 to BCNT, the number of bars plus 1 from the beginning of the data series. For example, if there are 100 bars in the chart, then BCNT will equal 100. The last bar (most recent bar) will have BFE of zero, thus $\text{BCNT} - \text{BFE}$ will be 100. The first (oldest) bar in the chart will have BFE equal to 99, since it is 99 bars following it. Thus $\text{BCNT} - \text{BFE}$ will be 1. So if you want to exclude a backtesting signal or signal market in a chart from triggering until at least 25 bars have gone by, use:

$$\text{BCNT} - \text{BFE} > 25 \text{ AND } \langle \text{any expression} \rangle$$

New Custom Instrument Setup Option

When setting up custom instruments there is a new checkbox option titled "Monitor Only When Session is Open". Check this box if you wish updating of the custom instrument to end when the session closes. When this box is unchecked, any pricing change in any of the component instruments of the custom instrument will cause the value of the custom instrument to be updated.

Version 6.0, Released: March 19, 2003

Setting Alarms in Charts Using the Mouse

The Setup Alarms button on the charting toolbar has been enhanced to enable quicker and easier alarm level setting with a few clicks of the mouse. Investor/RT 6.0 adds an improved method for quickly setting high and low price alarm levels with a click of the mouse. The "Setup Alarms" button on the charting toolbar has been enhanced to make alarm level setting faster and easier. Clicking this chart toolbar button in versions of Investor/RT prior to 6.0 caused the Setup Alarms window to open. Instead, this toolbar button now activates the "Alarm Setup Tool" and turns on cross hairs. A prompting message appears in the center of the chart window instructing you to click to set a high or low alarm level. As the mouse pointer is moved inside the chart window, price level readout appear on the horizontal cross hair.

Position the mouse pointer at the price level where you want to be alerted and click the mouse. If the clicked price level is below the last trade price of the instrument in the chart, the low alarm level for that instrument is set to the new level. Conversely, if the price level of the mouse click is above the current price, the high alarm level is set accordingly. Alarm monitoring at the new level goes into effect immediately. The new alarm level is also reflected immediately in quote pages and charts (e.g. high or low alarm reference lines). Each time you use the tool to set an alarm level an appropriate message will appear briefly in the center of the chart window and in the status message area of the main toolbar. Here is a sample message:

"Low alarm level for "IBM" was set to 79.25"

Such messages are also recorded to the message log in case you wish to review them later (File: Open: Message Log). Like all chart drawing tools in Investor/RT, the Alarm Setup Tool is turned off after the alarm level is set. However, if you hold down the shift key as you click, the tool and cross hairs remain active so that another alarm level can be set. For example, if you wish to set both high and low alarm levels for some instrument in a chart, activate the Alarm Setup Tool, shift-click below the current price where you want the low alarm then click (without shift) above the current price to set the high alarm level and turn off the tool.

Note that only the vertical position (price level) of the mouse pointer is considered in determining the price to set for the alarm level. The mouse pointer can be anywhere inside the chart window pane containing the instrument whose alarm level(s) are to be set.

If you activate the alarm setup tool and change your mind, you can turn the tool off without setting any alarm levels by clicking the Alarm Setup button again on the chart toolbar. The prompting message in the center of the chart will disappear when you turn of the tool.

If you find that you use this tool often, add the Alarm Setup toolbar button to the chart as a "Button". The button will then be accessible when the charting toolbar is hidden or closed.

The former function of the Alarm Setup button, opening the Setup Alarms window, is still available in two ways. First, if you hold down the Ctrl key when clicking on the Alarm Setup button the Setup Alarms window opens instead of activating the Alarm Setup Tool. Secondly, whenever the Alarm Setup tool is activated, holding down the Ctrl key as you click to set an alarm, causes the alarm level to be set and the alarm setup window to open afterwards. In smaller chart windows in particular the resolution of the vertical scale may be such that the click does not give you precisely the alarm level you wanted. The alarm setup window may then be used for adjusting the alarm level, or to change the setting for which price (bid, ask or last) to test against the alarm levels, or to set up automatic "step" increments for alarm monitoring. After making any adjustments, press return/enter key to save them, or dismiss the window with the esc key.

If you want to quickly set an alarm and the chart toolbar is not handy and you do not have a Setup Alarms convenience button inside the chart, you can also activate the alarm setup tool by right-clicking in the chart window and choosing "Set Alarm Levels" from the popup menu. The menu item in the popup menu works just like the chart toolbar button. Hold down the Ctrl key while choosing "Set Alarm Levels" and you get the Setup Alarms window, otherwise cross hairs are turned on and the Alarm Setup Tool awaits your next click.

In summary:

Click the Alarm Setup button to activate the Alarm Setup Tool.

Ctrl-click the Alarm Setup button to open the Setup Alarms Window.

When the Alarm Setup Tool is active:

Click to set an alarm above or below the last trade price.

Shift-click to set an alarm and leave the Alarm Setup Tool active.

Ctrl-click to set an alarm and open the Setup Alarms Window.

In the discussion above "Ctrl" refers to the "option key" on Macintosh computers. Right-click refers to "control-click" on Macintosh systems with a single button mouse.

Chart Buttons for Scaling Adjustments

Buttons and button menus can be added to chart window panes for making scaling adjustments to that pane's vertical scale. The "text" of the button is a code that tells Investor/RT how to adjust the scale. For example, a "Change Scaling" button with a text code of "LOG" will toggle logarithmic scaling on/off when you click the button, while "Auto" will switch the chart pane to automatic scaling. The text codes are not case sensitive, i.e. a scaling button of "Auto", "AUTO" or "auto" will set the scaling to automatic. "Manual", "Man", or simply "M" will set the scale to manual and will open the vertical scaling preferences window so you can set the manual range there.

Range based scaling options take a three or four letter code followed by a colon and a number, e.g. RAR:10. All range based scaling codes begin with R (for range based). The second letter can

be either A or I for automatic or instrument only ranged based. Last one or two letters indicate the type of scaling, e.g. L for "Last N bars", or "S" for slope, or "R" for range. Thus, RAR:10 means "Range-based automatic scaling with a range of 10 units on the vertical scale. RAL:50 means "Range-based automatic scaling using the last 50 bars", while "RIL:30" means "Range-based instrument only scaling using the instruments last 30 bars."

Menu buttons can be created by listing a series of scaling codes separated by commas, e.g.

Auto, Man, Inst, RAR:10, RAR:20, RIL:20

Here is a complete list of the scaling codes:

- Auto - automatic scaling, can be abbreviated with just letter "A"
- Man - manual scaling, opens dialog box, abbreviated "M"
- Inst - instrument only auto scaling, abbreviated "I"
- Log - toggle logarithmic scaling on/off
- Alt - switch to the next alternate scale
- RAR:n - range-based auto scaling using range of n
- RAPU:n- - range-based auto scaling using n pixels/unit
- RAPP:n - range-based auto scaling using n percent of price
- RARP:n - range-based auto scaling using n percent of range
- RAS:n - range-based auto scaling using slope of n
- RAL:n - range-based auto scaling using last n bars
- RIR:n - range-based instrument scaling using range of n
- RIPU:n - range-based instrument scaling using n pixels/unit
- RIPP:n - range-based instrument scaling using n percent of price
- RIRP:n - range-based instrument scaling using n percent of range
- RIS:n - range-based instrument scaling using slope of n
- RIL:n - range-based instrument scaling using last n bars

Minimized Windows in Layouts

Investor/RT now fully supports minimized windows in layouts. If a window of any kind (chart, quotepage, etc.) is minimized when a layout is saved, Investor/RT will obtain the normal (non-minimized) rectangular coordinates of that window and save those coordinates in the layout. Investor/RT will also make note that the window was in the minimized state when the layout was saved. When the layout is opened later, e.g. at startup or using the Open: Layout command, Investor/RT will initially open each window in its normal position. Each layout window that was minimized when the layout was saved will then be minimized. When you subsequently click the "Restore" button for a minimized layout window, the window will open to its normal position. For chart windows in particular this means all saved pane sizes will appear correctly when the window is restored to its normal size and position.

Layouts that have been created using Investor/RT Version 5.9.7 or earlier, will not support this new handling of minimized windows until the layout is saved again. You can open any existing layout, position the windows as you like them, then minimize any windows you like and save the layout under the same name to replace the layout definition. From that point on opening the layout will operate as described above with regard to minimized windows.

There are differences in the way "minimized" windows work depending upon whether you are using the Windows or Macintosh OS X version of Investor/RT. Minimized windows are not supported in the Classic Macintosh version of Investor/RT. In the Windows environment, minimized windows appear as small rectangular placeholders at the bottom of the Investor/RT task window workspace. Under Macintosh OS X, minimized windows appears as icons on the "Dock".

The Windows version of Investor/RT also handles "Maximized" windows in similar fashion to minimized ones, i.e. if a window is maximized when the layout is saved, upon reopening the layout, the window will initially be opened in its normal position and then maximized. Thus when you click to "Restore" the maximized window it will return to its normal position.

New Commands in Windows Menu

Two new commands have been added to the Windows menu in Investor/RT. The "Minimize All" command minimizes all Investor/RT windows that can be minimized. Some Investor/RT windows, like preference windows, message boxes, and the like cannot be minimized. Most content windows, e.g. charts of all kinds, quote pages, portfolios, etc. can be minimized. Here is a way to utilize this command. Create an array of chart windows, say 6 charts and tile them so they are all of equal size and cover the entire monitor (use the Tile command in the Windows menu). Then issue the Minimize All command, followed by the Save: Save as Layout command. When you open that layout later you will add six windows to your workspace all of them minimized. You can then activate the particular window you wish to view by clicking the Restore button (Windows) or clicking on the icon for the window in the "Dock" (Macintosh OS X), or you can use the Bring to Front submenu (see below). The restored window will open to its original tiled position, the position it was in before being minimized when the layout was created.

A "Restore All" command in the Windows menu will restore all minimized windows to their normal positions.

The Bring to Front submenu under the Windows menu has been enhanced so that when choosing a window title from the menu, if that window is minimized, it will be "restored" to its normal position before being brought forward as the front window. This is a decided improvement over prior releases in which Bring to Front selections would have no apparent effect when the chosen window was minimized.

New Indicator: (Logarithmic) Spirals

The Spiral (also known as the "Logarithmic Spiral") provides a link between price and time analysis, and can help in forecasting both price and time. Similar to indicators such as Fibonacci Retracements, Fibonacci Arcs, and Gann Angles, the Spirals indicator is based off a trendline which connects a significant high with a significant low. The spiral can be drawn in a clockwise and/or counter-clockwise direction originating from the endpoint of the trendline. To add the Spiral indicator to a chart, use the new Spirals tool on the charting toolbar. After activating the tool, mouse down and drag a trendline to connect any two points in the chart just as with the retracement tool.

Tick Filtering Feature Added

Tick filtering can be turned on using Setup: Preferences: General. The format for the filtering preferences is:

Ignore ticks with move \geq X and percent change \geq Y

The values for X and Y need not be integral, e.g. X = .5 and Y = 3.3 would cause Investor/RT to filter out incoming ticks which differ from the preceding tick in price by more than 50 cents where the distance in price from the prior tick exceeds 3.3 percent.

RTL token BADTK can be used to reference the number of bad ticks filtered out for any instrument. For example, run the scan formula "BADTK > 0" to see a list of tickers with one or more bad ticks and the bad tick count for each one.

Deleting All Trading Notes

The trading notes window has been improved by the addition of a Delete All button. This button can be used to eliminate all trading notes on file for the selected ticker symbol. Confirmation is requested if there is more than one trading note on file for the ticker.

Database Cross Reference Utility

A new function has been added to the Database Utilities submenu of the Control Menu. The "Cross Reference Report" command produces a text file listing the usage of all instruments and technical indicators in charts, scans, trading signals, and custom indicators. The report is in a columnar format designed to be opened using MS Excel or some other spreadsheet application. Once open in a spreadsheet, the report can be sorted by column in various ways to show, for example, all charts, scans, signals, and custom indicators that reference a particular indicator.

The report contains a series of lines, each line indicating a relationship between one "object" and a referencing object. The following kinds of relationships are included in the report:

Technical Indicators in Charts
 Instruments in Charts
 Scans In Charts (via Scan/Signal Marker indicator)
 Signals In Charts (via Scan/Signal Marker indicator)
 Custom Indicators Graphed in Charts
 Custom Indicators in Charts (referenced by the Color Markers indicator)
 Scans/Signals in Charts (referenced by the Color Markers indicator)
 Scans/Signals in Charts (referenced by System Simulator indicator)
 Scans/Signals in Charts (referenced by Signal Statistics indicator)
 Custom Indicators in Charts (referenced by Paintbars indicator)
 Technical Indicators in Chart (as technical indicator preset buttons)
 Instruments in Scans/Signals/Custom Indicators
 Technical Indicators in Scans/Signals/Custom Indicators
 V# User Variables in Scans/Signals/Custom Indicators
 V# User Variables (referenced by Reference Line indicator)
 Instruments in Quote Pages
 Instruments in Portfolios
 Instruments used in Custom Instruments
 Instruments in Quick Quotes
 Signals in Trading Systems

Additional relationships of interest will be added in future releases.

Dynamic Instrument in Charts using Custom Profiles

A new feature of Custom Profile charts have allows the custom profile to dynamically feed instruments into Traditional Charts. Custom Profile charts are designed to display extreme sorted levels of data, like "highest 10 in percent change in a given quotepage" or "lowest 20 in volume in a given quotepage" or, more generally "highest/lowest X in value Y in quotepage Z", where X is any number of instruments to be displayed, Y is the value on which the instruments are to be evaluated and ranked, and Z is the quotepage from which to obtain the list of candidate instruments. In all cases, the result of the ranking is a profile of instruments, with the extreme lowest or highest value at the top of the profile. A new option within the Custom Profile preferences labeled "Substitute Instrument X into chart Y" allows the custom profile to dynamically feed the instrument which is in the Xth position from the top of the profile into any named chart. The instrument in the named chart will be updated each time the profile is recalculated. The recalculation of the custom profile is controlled by the "Recalculate Every X Minutes" option within the custom profile preferences. Recalculation can occur automatically as often as every 6 seconds (0.10 minutes).

Multiple custom profile charts may be used to control multiple traditional charts. For instance, you might have 3 different custom profiles open, each calculating the same value, with one feeding the instrument #1 in to one chart, another feeding instrument #2 into another chart,

and another feeding instrument #3 into a 3rd chart. So the result is three traditional charts dynamically showing the top three instruments based on your criteria. Since custom profile rankings can be performed using Custom Indicators, this new feature enables automatic charting based on custom indicator rankings.

Custom Indicators - Ignore Zeroes Option

With some creative use of the RTL language, this new feature with the "Custom Indicator" preferences can be very powerful. The feature is provided using a new checkbox labeled "When Drawing, Ignore Zero Values". When this option is turned on, lines will be drawn only between "non-zero" values. Bars for which the custom indicator result is 0 are ignored for drawing purposes. This provides the ability to have lines connecting data values on non-consecutive bars, skipping over the zero value bars.

This concept will be better understood after considering a few examples. In the following simple custom indicator:

$$(CL > OP) * CL$$

This custom indicator will result in either "CL" or "0" for each bar. If $CL > OP$ is TRUE, then the expression $(CL > OP)$ evaluates to "1", and the final result is simply "1*CL" or "CL". On the other hand, if $CL > OP$ is FALSE, then the expression $(CL > OP)$ evaluates to "0", and the final result is therefore "0*CL" or "0". Since approximately half (or more) bars will have a result of "0", we want to exclude those values from consideration when actually drawing the custom indicator line within the chart. In other words, we only want to connect the closing prices (CL) of the bars for which the closing price is greater than the opening prices. To provide a more general expression:

$$(EXPRESSION) * (VALUE)$$

Where EXPRESSION can be any logical (TRUE/FALSE) expression (including $SCAN = 1$), and VALUE can be any arithmetic expression (including CI). A more useful example might be a custom indicator that would connect MSH (or Market Structure Highs):

$$(HI.1 > HI.2 \text{ AND } MA < HI.1) * (HI)$$

The token MA in this case is used to look ahead one bar. MA should be setup as a 1 period simple MA of high, shifted left 1 bar. Similar, MSLs can be connected using the following custom indicator:

$$(LO.1 < LO.2 \text{ AND } MA > LO.1) * (LO)$$

In this case, the MA would be setup the same except for the "high" price should be changed to a price of "low".

Trading Holidays Enhancement

Investor/RT uses a file named Holidays.txt located in the admin directory/folder to determine which trading sessions have trading holidays on which dates. By default, the Holidays.txt file included in Investor/RT installers specifies "global" (all sessions) holidays for all U.S. Market holidays for the year or two ahead. Users who track instruments that trade on exchanges outside the U.S. must revise the Holidays.txt file to distinguish between U.S. session holidays and trading holidays specific to international exchange sessions. This subject is discussed in detail in the Help Topic "What's New in Version 5.6", item #27 Session Specific Trading Holidays.

Investor/RT update installers will install the latest default holidays.txt file each time you update to a new release. It has therefore been necessary for users who have customized their holidays.txt file to assure that they reinstate their own customized holidays.txt file after each installation. Effective with the next release of Investor/RT, users can permanently override the holidays.txt file normally used by Investor/RT by placing their own holidays file in the admin directory/folder under the filename "myholidays.txt". All users who now have customized holidays.txt file should duplicate the current holidays.txt file and name the duplicate myholidays.txt.

At startup Investor/RT will first look for myholidays.txt and if present, these override holiday definitions will be used. If there is no myholidays.txt file present in the admin folder, the standard holidays.txt file will be used. This will enable Investor/RT installers to update the standard holidays.txt file as time goes on without disturbing the user's customized holiday settings. It will be the responsibility of the user to periodically inspect the myholidays.txt file contents and keep it up-to-date.

Price/Time Profile Scrolling

The left and right arrow keys on the keyboard will now scroll the price/time profile chart forward/backward one day (session) at a time.

MACD Indicator Enhancements

The MACD preferences have been enhanced to provide more flexibility over both calculation and display. Three independent moving average types are now specifiable: one for the short term moving average, the long term moving average, and the signal moving average. In the past, all three moving averages were calculated using the same moving average type. Also, the short and long term moving average now have independent "price" choices. In the past, both shared the same price type. This added flexibility provides for calculations such as the difference between the short term exponential average of the high and the long term weighted moving average of the low. To use the "classic" MACD indicator, specify the same moving average type and price.

In addition, the Signal and MACD drawing options, presented when the "oscillator" option is unchecked, have their own independent drawing styles. One may choose to draw the MACD as a solid histogram, with the Signal as a continuous line overlaying the histogram. The drawing of the Signal or MACD lines/histograms is also optional. In the past, when "oscillator" was unchecked, both the Signal and the MACD lines would be drawn unconditionally. In Investor/RT 6.0 and higher either or both may be drawn, depending on which are checked.

Schedules Triggered by Trading Signals

The Scan/Signal Marker indicator has been enhanced to provide the option of running a particular schedule when the scan or trading signal is true on the current bar. Prior to Investor/RT Version 6, the user had the option to alert with a sound, or with a notification window. By allowing associating the alert with the running of a schedule, trading signals now have access to all the flexibility that schedules allow. Scheduled actions include sounding alert sounds, emailing QuotePages, opening charts, printing, running keyboard shortcuts, and much more. As with other alert options in Scan Markers, the running of the schedule will occur at most once per bar. If the signal fires multiple times per bar, the schedule will be run only the first time the signal fires for that bar.

Setup Instruments Window Improved

The Setup: Instruments window has been divided into basic and advanced sections. The advanced settings can be viewed by clicking a disclose button at the lower left of the basic setup window. A "Cancel" button and a "Help" button were added. Investor/RT makes note of the state of the setup window (basic or expanded with advanced settings) when you close the window and will reopen the window to the same size the next time you request it. The keyboard shortcut Alt-A (Command-A on Macintosh) will open the window. The esc key is equivalent to clicking the Cancel button to dismiss the window. The enter key is equivalent to pressing the rightmost of the four buttons in the basic setup section of the window. This rightmost button can be titled "Add" or "Modify" or "Close" depending on the contents of the ticker symbol entry box.

New Drawing Style: Stepped Lines

Many technical indicators have an option for drawing style. These include Continuous Line, Connected Line, Solid Histogram, Hollow Histogram, Custom Histogram, and Two Line Color. A new drawing style appears in this list in version 6.0 called "Stepped Line". A Stepped Line is composed of only vertical and horizontal lines. The small horizontal line across each bar represents the indicators value on that bar, and the small vertical lines connecting these horizontal lines represent the difference between each bars value (change). Stepped Lines have two colors, one color for the horizontal lines, and a second color for the vertical lines. This new drawing method makes it easier to visualize the change from bar to bar of an indicators

value by observing the height and direction of each vertical line. Stepped lines also make it easier to pinpoint the exact price level of the indicator, via a more pronounced horizontal line segment at each price level.

MA (Moving Average) Indicator Enhancements

The Moving Average (MA) and Exponential Moving Average (EMA) indicators have been enhanced by providing options for drawing type. This enhancement will open up MA and EMA lines to be drawn as Two Color Lines, Stepped Lines, and Histograms. These advanced drawing type options, which already exist in a number of indicators including Custom Indicators, will be rolled out to many others in the near future. If an indicator currently does not support these drawing options, it still may be possible to implement the drawing of this indicator by first create a Custom Indicator that simply represents the indicators value. The drawing types are then available to Custom Indicators.

New Technical Indicator: Profile

A new Profile indicator has been added to the growing list of indicators available in Investor/RT. The Profile indicator is a close relative of the existing Price/Time Profile standalone chart type. Profiles allow the user to overlay a price-based profile over a traditional intraday chart. The Profile provides a "Price/Row" preference which dictates the height of each row. The width of each resulting row will represent how many bars during the session in which that row's price range was touched. If the periodicity of the chart is 5-minute, and the width of a row is 3 bars wide, then the range of three of the 5-minute bars for that session actually overlapped the price range of that row.

The widest row is called the Point of Control (POC). The Value Area (VA) is commonly considered the area in which 70% of the price action transpired. This percent level is adjustable, as some prefer to use alternate VA % levels such as 80%. Options for drawing the current and previous POC and VA lines are provided in the Profile preferences. Another option dictates how many sessions for which the Profile will be computed and displayed. The Profile may be drawn as Solid or Hollow Blocks, Solid or Hollow Ovals, Dots, or Lines. A "Hide Profile" checkbox gives the user the ability to hide the actual profile and draw only current and/or previous POD and VA lines. The "Current" and "Previous" POC and VA lines are also optional, as well as VA and POC labeling.

The scan token to reference the Profiles indicator results is "PROF". When the Profile is used in the context of a scan, signal, or custom indicator, a "Result" option is presented at the bottom of the preferences window, which dictates what value will result from the PROF token. The "Result" options include "Upper VA (Curr)", "Upper VA (Prev)", "Lower VA (Curr)", "Lower VA (Prev)", "POC (Curr)", and "POC (Prev)".

Using "Custom Prices" in "Custom Instrument" Definitions

When setting up a custom instrument, each component of the custom instrument references a "Value" of some instrument. Supported values include: last, bid, ask, high, low, and other more specialized values. The Value used can also be a particular V# user variable value of the component instrument. However, when V# values are referenced by a custom instrument, the V# values must be independently set, by a periodically run scan for example.

In Investor/RT Version 6, the notion of "Value" has been extended more generally to include custom indicator formulas expressed in the RTL language. The formula must be formed by references to instrument properties or the current OHLC prices. No references to historical value, e.g. CL.1, or technical indicators is supported.

This is accomplished using one of the "Custom Prices", P1 through P8 as the Value choice when setting up a custom instrument. Each custom price P1 – P8 is associated with a custom indicator which provides the formula for computing the custom price (value). For example, a simple custom indicator such as:

$(CL + CL + HI + LO)/4$; (close weighted average price)

might be used as the custom price value when computing the sum, difference, or ratio between two instruments. First create the custom indicator and save it. Then go to Setup: Preferences: Prices-Custom and setup one of the eight custom prices with the name of this custom indicator. Then use that Pn custom price as the value choice when defining the components of any custom instrument.

Only current properties and the current values of OP, HI, LO, CL, and VO can be used in the formula. References to current prices of specific instruments can be included, e.g.

$(CL(IBM)/CL(MSFT) * CL)$; (a dynamic ratio multiplier)

is a custom price value that computes the current ratio of the current price of IBM and MSFT and uses that ratio as a multiplier times the current price of the component instrument.

Color Markers in Tick/Bar Charts

The color marker indicator can now be used in traditional charts having periodicity tick or N ticks per bar (Tick Bar Charts).

Technical Indicator Preset Buttons and Drawing Tools

Buttons can be added to traditional charts with a purpose of "Add/Remove Preset Indicator". Such buttons provide a convenient way to "toggle" an indicator on and off using a predefined setup. The Preset name specified in the button setup provides all of the indicator settings. This feature of Investor/RT works very well for most indicators, those with instrument independent settings, e.g. Moving Average, MACD, RSI, etc.

A few indicators, however, have date/time or other settings that are very specific to an instrument. For example consider a trendline from some significant high to a significant low. Since the trendline setup needs the specific dates to use when drawing the trendline, a preset which specifies those dates in advance is of little value. All of the technical indicators that are date/price dependent have a drawing tool on the chart toolbar. To draw a trendline, for example, you click on the trendline drawing tool, use the mouse to connect two significant points in the chart, and the default trendline preferences are used to draw the trendline with the color and line width and other options.

Investor/RT 6.0 incorporates improved behavior of indicator preset buttons for those indicator presets that have drawing tools on the chart toolbar. When you click on a Preset Button in the chart for such an indicator, Investor/RT will first attempt to find an indicator with that identical setup and if present, the indicator will be deleted. If no matching indicator is found, Investor/RT will determine if the preferences of the preset are sufficient to draw the indicator. If so, the indicator will be added to the chart. If not IRT will activate the corresponding drawing tool for the indicator and will set the drawing preferences so that upon completion of the drawing activity using the mouse, the preset settings of the button will be used to add the new indicator to the chart. This new method opens up the possibility of have several "trendline" preset buttons for example. You could have one button for drawing red trendlines, another for drawing green trendlines. When you click either preset button, the trendline drawing tool is activated. After drawing the line connecting the two points in the chart, the trendline will be drawn using the setup (red or green) of the preset button you used to initiate the trendline drawing tool.

There are three indicators (Reference Lines, Linear Regression, and Fibonacci Retracements) that have setup options that "automate" the drawing of the indicator. For example, a regression line setup may have the "Automatic Using Last N Bars" option turned on. This preset will cause the regression indicator to be added immediately to the chart, whereas a regression preset with the "Automatic..." option turned off would invoke the regression line drawing tool. A similar option exists for an automated Fibonacci Retracement indicator using the "Automatic Using Last N bars" option. For Reference Lines, the line drawing tool is activated only when the reference line preset calls for a "Specific Price" level. Other options that peg the reference line to a particular price value such as high, or low price will cause the reference line to be added immediately when you click the preset button.

There are rare cases where a "non-automated" setup for some indicator may in fact be saved as a preset and assigned to a button. In such cases it would be unnecessary (and even inconvenient) to invoke a drawing tool rather than adding the indicator immediately. In such cases, the user can "force" a preset to be added immediately to the chart by holding down the ctrl key (option key on Macintosh) when clicking on the preset button. The ctrl key tells Investor/RT to add the preset indicator to the chart immediately regardless of the indicator type and settings of the preset. Some users might use the ctrl-click method to quickly add some indicator and then use the keyboard or mouse to adjust it, for example.

Here is a list of indicators for which preset buttons activate the corresponding drawing tool (unless the ctrl key is held down when clicking the button)

- Andrews Pitchfork
- Fibonacci Arcs
- Fibonacci Extensions
- Fibonacci Projections
- Fibonacci Retracements (with the "Automatic" option unchecked)
- Fibonacci Time Zones
- Gann Angles
- Reference Lines, Horizontal (with Price Source set to "Specific Price")
- Regression Lines (with the "Automatic" option unchecked)
- Spirals (Logarithmic Spirals)
- Trendlines
- Vertical Reference Lines

Traditional Chart Viewing Period Enhancements

Improvements were made in Version 6.0 to enable traditional charts with view periods ending on a specific date/time to be dynamically updated during market hours IF the specific ending date/time is "in the future". For example, you can setup a chart with a viewing period of "1 day ending mm/dd/yy hh:mm", where the mm/dd/yy specifies the current date and hh:mm specifies the session ending time. Such charts will show blank space, as you would expect, for all bars beyond the current time of day. The current bar will update dynamically, new bars will fill the chart from left to right as time passes. This contrasts with charts that have viewing periods of "Last N days" or "Begin to Present", where the current bar is positioned at the right and data shifts to left as time passes. The look ahead bars setting does not apply to charts that have a specific ending date time. Charts that have a specific ending date time "in the past" are, by definition, static charts, i.e. the arrival of new trades does not affect them since all data lies in the past.

Copying QuotePages and Portfolios to the Clipboard

A new Save menu item and some new keyboard shortcuts now make it possible to quickly copy the entire textual content of a quote page or portfolio to the clipboard. Use the File: Save: Save to Clipboard command from the menu bar. Two new "Save" actions were added to the Setup: Keyboard Shortcuts window: "Save: Object as Text" and "Save: Object Text to Clipboard". The "Save: Object as Text" shortcut function prompts the user for the output file name where the text will be saved. Save Object Text to Clipboard displays the clipboard showing the textual content of the front window. At present the "Save: Object Text to Clipboard" function (and the new menu item) only operate on quote page and portfolio windows. The text of the quote page or portfolio cells is placed on the clipboard in "tab-delimited text" format. This means that the clipboard contents can be pasted directly into MS Excel spreadsheets with a Ctrl-V (Paste) command.

These new features will be especially useful as a means of quickly transferring the results of a scan to MS Excel. Suppose F2 is setup as the "Save: Object Text to Clipboard" shortcut. A scan runs and a quote page opens showing the data for the instruments found by the scan. Press F2 to populate the clipboard, then Alt-Tab to switch to the MS Excel application and press Ctrl-V to paste the list of tickers and other data into a spreadsheet.

MPD "Bars Back" Option

A new option has been added to the MPD (Mixed Periodicity Data) indicator to allow the user to access data any number of bars in the past. The preference is implemented via a checkbox labeled "Bars Back" and an edit box where the number of bars back is specified. As an example, a user may wish to access the previous day (session) high on an intraday, 5-minute chart. In the past, in order to do something like this, it was necessary to first create a custom indicator with the syntax "HI.1", and then use the custom indicator as the data source within the MPD preferences. In an effort to eliminate the need for this extra, time-consuming, step of creating a custom indicator, the "bars back" option was added. Now, the previous day's high can be accessed by simply specifying "Mix Periodicity: Daily", "Data Source: Instrument Data: High", "1 Bars Back", and "Stretch" checked. No more need to create a custom indicator. This new method is not only less time consuming during setup, but also more efficient internally. This method could be used to access the low two days ago, yesterday's moving average, yesterday's close, the CCI three days ago, etc., all without the use of an intermediate custom indicator.

Chart Grid Lines and the Paintbar Indicator

Traditional charts containing a Paintbars indicator will display grid lines properly in Investor/RT 6.0. In prior releases, one of the disadvantages of using the paintbars indicator for chart background painting was that grid lines were overlaid by the background painting.

The Paint Bars indicator is a powerful tool for highlighting individual bars or groups of bars within a traditional chart. Normally, the bars in a traditional bar chart are drawn in one of two

colors: an up color (typically green) and a down color (typically red). When a bar closes above the close of the previous bar, the bar is drawn using the up color, otherwise the bar is drawn in the down color.

When a Paint Bars indicator is added to a traditional bar chart window, you can elect to paint the actual bars or highlight the normal bars with specific background color(s) if some "condition" is true. The "condition" is specified by selecting a particular scan, trading signal, or custom indicator. For each bar in the chart, a scan or trading signal is either TRUE or FALSE. You can choose specific colors for both the true condition and the false condition. If a custom indicator is chosen as the painting criterion, then the custom indicator has an arithmetic value corresponding to each bar in the chart. Thus, three color choices are provided for positive, negative, and zero values of the indicator.

Here is a simple example. Suppose you wanted your intra-day bar charts to highlight periods of time during which the instrument is trading above the moving average of closing prices for the preceding 10 periods. First, create a "scan" named "Above MA" with the RTL formula:

$$CL > MA$$

Where the MA moving average token is defined as a 10 period simple moving average.

Open an intra-day bar chart of some instrument and add a "Paint Bars" indicator to the chart. Setup the paint bars indicator to use the scan named "Above MA" created above. Specify "Paint Background" using the menu at the bottom of the Paint Bars setup window. Place a checkmark in the box to the left of the "TRUE" condition color box, then click on the color and pick a highlighting color for the TRUE condition. You could also specify a different color for the FALSE condition, but in this example, leave the checkbox to the left of the FALSE condition color box unchecked. Then click OK to add the Paint Bars indicator to the bar chart. You will see all bars that closed above the moving average are highlighted with the TRUE color chosen above.

To change the settings for a paint bars indicator, click the Edit Chart Element button on the charting toolbar and select the "Paint Above_MA" graph element. The setup window for the paint bars indicator will appear. Change the menu to read "Paint Bars" instead of "Paint Background". Change the TRUE condition color if you like to something different than the normal up/down colors you see in the chart, e.g. blue. Then click the Apply button to observe the effect (without closing the settings window). Notice that now the bars themselves are painted blue whenever the close is above the MA while other bars are painted normally using the up/down colors.

If you click the "Add Technicals to Chart" button, Investor/RT will determine which technical indicators are being used by the paint bar criterion. In this example, the MA technical indicator used in the "Above MA" scan will be added to the chart so you can verify visually that the highlighted bars do indeed close above the moving average.

Note that only one Paint Bars indicator should be added to a chart pane. If you add more than one, the first one will be used. To change the scan, signal, or custom indicator used to paint the bars, first delete the existing paint bars indicator. Then, add a new one using a different scan, signal, or custom indicator.

If you revise the meaning of a particular scan, signal, or custom indicator that is currently being used to paint bars in one or more bar chart windows, the chart will update dynamically to reflect the revised meaning. In our example above, if you open the scan "Above MA" (using the Open: Scan command) and revise the MA token, changing it from a ten period to a twenty period moving average, and click the Save button, the chart window will re-paint automatically to highlight the bars closing above the 20-period moving average.

Note that the paint bars indicator will paint bars, candlesticks, or line-segments in the specified colors if the "paint bars" (rather than the "paint background") option is selected. Please be aware that the painting of candlesticks overrides the classical definition of candlestick colors. It is therefore recommended that when using paint bars with a candlestick chart, that the candlesticks use the "Hollow up candle" option so that it will be visually apparent which candles closed higher than they opened and which closed lower. Alternatively, there will be no possibility of confusion if the "paint background" option is selected since the candlesticks will then be drawn using their normal up-candle and down-candle colors.

New "Paint Background" Option Added Prior to version 5.7.1, the Paint Bars Indicator had two drawing options: "Paint Bars" and "Paint Background". The "Paint Background" option painted the background of the bar/candle/line/histogram from the top of the chart pane to the bottom of the chart pane. This option has been renamed "Paint Background (Top to Bottom)" and a third option has been added labeled "Paint Background (High to Low)". This new option limits the drawing of the background to the high/low range of the bar itself. This new option gives the same information as the former "Paint Background", but uses much less painted real estate in providing that information. This new style works properly when applied to any instrument drawing style (histogram, line, etc).

Version 5.9 Rev 7, Released: February 6, 2003

Intra-day Data Compression

When compressing the intra-day historical database (see Control Menu), Investor/RT by default will discard all intra-day data that is on the database for those instruments that are NOT marked for intra-day data retention. Some Investor/RT users have requested the ability to retain intra-day historical data after compression for all instruments, regardless of their intra-day monitoring/retention status. This is now an option in Setup: Preferences: Historical Data. At the bottom of the window there is now section titled "When Compressing...Delete Intraday data for all instruments not marked for intra-day". This checkbox is checked by default.

If you wish intra-day data to be retained on all instruments when compressing, uncheck this checkbox.

Support for Jurik Research Indicators

Investor/RT now supports four popular technical indicators available under license from Jurik Research (<http://www.jurikres.com/catalog/catalog.htm#technical>). These include JMA, a responsive (no lag) moving average, RSX a smoothed no lag variation of the classic RSI indicator. VEL a price momentum indicator, and DMX a variation of the classic DI+/DI-/ADX indicator suite. Each of these indicators is accessed in Investor/RT as a "Plug-in". If an Investor/RT user has licensed these indicators from Jurik you can add any of these to your charts or use them in scans, signals and custom indicators using the PLUGIN token.

New Technical Indicator: Darvas Box (RTL: DBOX)

This new indicator implements the trading methods of Nicolas Darvas. This indicator is experimental at this time. More information is available at the Linn Software web site:

<http://www.linnsoft.com/tour/techind/darvas.htm>

Volume Profile Enhancements

Volume Profile charts have been enhanced to provide the ability to use custom prices with Intraday Data. Before version 5.9.7, the "Use Price for last X days" option was limited only to daily data. Now, the user has the option of using "Daily Bars" or "Intraday Bars". When "Intraday Bars" are chosen, the user then can specify the number of minutes per bar that will be used. The "Assign each bar a volume of 1" option now applies to both "Daily" and "Intraday" options. As a quick example of how this might be used, let's say you wanted to profile the RSI on 5-minute bars over the last 2 days using a \$10 range. In other words, show how many 5-minute bars the instrument spent with an RSI between 0-10, 10-20, 20-30, etc, over the last 2 days (or however many days you wish).

First, you create a custom indicator that represents your RSI value (syntax of the custom indicator would just be "RSI"). Then, go to "Setup: Preferences: Price, Custom" and assign a custom price to your new custom indicator that represents the RSI. Now, in the volume profile preferences, specify a range of "10", and check "Use P1:RSI for last 2 days or Intraday Bars, 5-minutes". Also check the "Assign each bar a volume of 1" checkbox. These settings should produce your profile. You could repeat this process with any custom indicator (or other price option) and any number of minute bars (or daily bars), over any number of days.

PriceTime Cycles (Shapes) Indicator Enhanced

Two new "shapes" have been added to the PriceTime Cycles (Shapes) indicator: Horizontal Zone and Vertical Zone. The Horizontal Zone option will use the price along with the height to draw a strip from the left side to the right side of the chart pane. Similarly, the Vertical Zone will use the Date/Time along with the width to draw a strip from the top to the bottom of the chart pane. These shapes are most effective when the "solid" checkbox is checked in the PriceTime preferences. As an example of how this might be used, a user might want to paint the region from \$50 to \$51 on his chart. This would be done with a horizontal zone with a price of 50 and a height of 1 (and with the "solid" checkbox checked).

The keyboard adjustment shortcuts can be used to help place the zones more precisely. The zones should be drawn behind all other elements in the chart (at bottom of element list: shift-click in scale to see this list). Proper setting of the "vertical step" option in PriceTime preferences can also facilitate use of the keyboard shortcuts.

Maintenance Issues. Version 5.9.7 contains corrections itemized below

- When a daily chart is scrolled back to some prior date you can now "replay" the data beyond that point bar-by-bar by clicking the right scrollbar arrow. A bug was fixed that caused some clicks on the right arrow to be ignored. Replay scrolling is also supported in intra-day charts: scroll the chart back to the starting date/time you want to replay and click the right arrow to bring each new bar and associated technical indicator lines into view.
- Dial/Data bulk downloads operate properly again when invoked by a schedule.
- Using the Data Download button in a traditional chart window would sometimes cause a fatal error to occur with the message "Nil ctl in datectrl...". This bug is fixed. It was first introduced in version 5.9.5.
- Downloading daily historical data in the Quote.com version of Investor/RT was failing to update the last two (most current) daily bars in some cases. This has been corrected.
- When an Exponential Moving Average (EMA) is included in a chart the pane title is now color coded properly with the actual color of the EMA line.
- When a custom indicator is used within a scan, signal, or another custom indicator, it is possible to use a qualifier to refer to the value of that CI in previous bars, e.g. CI.1 or CI.5. An obscure bug was discovered that was causing Investor/RT to ignore the qualifier when determining the number of bars of data necessary to compute the CI. If there happens to be another indicator referenced in the same expression that called for more data, e.g. a 10 period moving average MA token, then the bug has no effect since more than ample bars are loaded to compute the CI. However, in very simple cases, e.g. a CI

formula like "HI.1 + 1", and a trivial scan such as CI.1 > 0, the bug would cause fewer bars of data to be loaded than were needed, resulting in zero values for the CI. Interestingly, this bug surfaces only in the most simple, almost trivial case which may help to explain why it has gone undetected for so many years. This bug is fixed in 5.9.7.

Version 5.9 Rev 6, Released: January 30, 2003

New Chart Button Type

Chart Buttons can now activate any keyboard shortcut that is defined in Setup: Preferences: Keyboard Shortcuts. When setting up the chart button, choose "Shortcut Key" as the button purpose. Then enter the shortcut key name. You can copy/paste the shortcut name from the "Legend" window if you wish. To see the names of keyboard shortcuts that are presently defined to Investor/RT go to Setup: Preferences: Keyboard Shortcuts and click the Legend button. The shortcut name must include the capital letter F followed by a number, e.g. F10. You may prefix the name with modifier words, e.g. Shift-Ctrl-F9. When creating a menu of shortcut keys just list the shortcut names separated by a comma, e.g. F2,Shift-F2,Ctrl-F2 to create a three entry menu. If you wish you can prefix the shortcut descriptor with arbitrary text followed by a color so that your menu choices are more descriptive. For example, the following text will create a more descriptive menu for the same shortcut keys:

Open Chart A: F2,Run Scan ABC: Shift-F2,Open Quote Page XYZ: Ctrl-F2

If you create a shortcut button (not a menu) with a long description, e.g. "Verify Historical Data: Shft-Ctrl-F2", by default the button face text will be the entire string. In such case it is recommended that you provide a brief custom title for the button, e.g. "VerHist" or "VHD" to keep the button width smaller. When you point the mouse at a button, the full text description will appear in a help tip window.

Note that the descriptor for the shortcut key follows the colon and the text must end with the capital letter F followed by the function key number.

Function keys F1 through F24 are available even though F13 through F24 are typically not present on most keyboards. The F13 and higher shortcut key names can be assigned to those shortcuts that will only be invoked from chart buttons.

The ability to invoke keyboard shortcuts from chart buttons opens up many new possibilities. Buttons in charts can now run scans or initiate schedules. Buttons can be present for opening quote pages, charts, and other window types, or to perform various database management and utility functions. In fact, you may wish to simply create special "chart" windows whose sole purpose is to serve as a container for an array of shortcut buttons to make it convenient to access various Investor/RT functions with a single click.

New RTL Token IAA (Indicator Adjusted Average)

The Indicator Adjusted Average technical indicator has been added to RTL with the token IAA.

Version 5.9 Rev 5, Released: January 23, 2003

Maintenance Issues

Version 5.9 Rev 5 is a maintenance update to fix a chart date display problem related to trading holidays. The improvements made to the Data Download window (see item Data Download Improved above) had some unintended side effects and corrections were made to remedy this. Finally, the multi-linking color coding scheme introduced in 5.9 Rev 4 (see item Multi Linking Enhancements above) was corrected so that multi-linking can be accomplished from quote pages.

Version 5.9 Rev 4, Released: January 21, 2003

Multi-Linking Enhancements

The multi-link feature of Investor/RT has been enhanced to allow multi-linking to occur more selectively. A related set of traditional charts can be setup with a common multi-link color code so that a multi-link operation will affect only those charts.

Multi-Linking is the term used in Investor/RT to refer to changing the setup of various chart windows simultaneously to show a different instrument. More generally, multi-linking can also change the ticker symbol for NASD Level II windows, Quick Quote windows, and Time and Sales windows.

When you double-click on a ticker symbol in a quote page, Investor/RT performs the action specified as a user preference in Setup: Preferences: Charts: General. One of the radio button choices there is to "Multi-Link: Substitute ticker symbol into all Charts, T&S. Lvl2.". Thus a multi-link can be initiated by a double-click of the mouse when this is your preference. Alternatively, you can right-click on a ticker symbol in a quote page and choose Multi-Link from the popup menu.

A third way to multi-link is activate a chart (make the chart the front window) and begin typing a new ticker symbol. A dialog box comes up to assist you in identifying the ticker to be inserted into the chart in question. At the lower left corner of this window is a "Multi-Link" checkbox. When checked, the selected symbol (instrument) will be inserted into the chart window in question when you click OK (or press the enter key) and a multi-link will be performed.

Prior to Investor/RT Version 5.9.4, multi-linking acts on all open chart windows with the exception of those traditional charts that are marked as "locked". Beginning in Version 5.9.4 multi-linking can be more selective when deciding which chart windows to update. Each traditional chart window now has a "Multi-Link" color button in the lower right corner of the

chart. The button is a small rectangle with the character "+" on its face. The background color of the + button indicates the "Multi-Link Color" of that particular chart window. Clicking on the + Button pops up a menu for changing the multi-link color code for the chart.

When the multi-link color for a chart is black, the chart is locked, i.e. it does not participate in any multi-link operations. The white multi-link color also has special meaning: the chart will participate in ALL multi-link operations. All chart setups saved prior to version 5.9.4 will initially have a multi-link color code of either white or black: black if they were marked as "locked", or white otherwise. All non-traditional chart types, e.g. Point & Figure charts, Volume Profile Charts, etc. will have a white color code initially.

When you perform a multi-link operation by typing a new instrument into a chart, Investor/RT will note the multi-link color code of the chart being updated and will multi-link the same instrument into all charts that have the same color code plus any others having the white color code. Any chart with a black multi-link color code and all other charts having a differing color code will not be affected.

Note that you can change the instrument of any locked (black) chart by entering a new instrument ticker, but only that one chart will be affected. Note also that if you multi-link the instrument of a chart having white multi-link color, only the other white color charts will be affected. For traditional charts the multi-link color coding scheme essentially replaces the "locked" checkbox in the chart preferences. When you change a traditional chart's multi-link link code to something other than black, the chart's "locked" checkbox is implicitly turned off. Similarly if you go to the chart preferences and check the locked checkbox, the multi-link color of the chart will change to black to indicate it is locked out of any multi-link action.

If a multi-link operation is performed from a quote page, Investor/RT determines which multi-link color to look for by inspecting the current (frontmost) chart window. For example, suppose you have a quote page and seven charts open, one black, three with color code set to red and three set to green. If you activate a "green" chart, then double-click in the quote page, all green charts will be updated with the specified instrument. Similarly, by first selecting (activating) a red color coded chart, the quote page multi-link will affect only the "red" charts.

The + button occupies the space formerly used by the "Red Cross" button in earlier versions of Investor/RT. For this reason we have retained the former functions of the Red Cross button as options using keyboard modifier keys. Shift-clicking on the + Button toggles the chart's toolbar on and off just as the Red Cross button did formerly. Ctrl-clicking or right-clicking on the + button pops up the same menu formerly associated with the "Red Cross" button.

The multi-link color coding feature can be exploited very effectively using "Buttons" in your charts. Buttons can be added to a chart window for the purpose of multi-linking a specific symbol into the chart and its associated color coded charts. Any button setup as a ticker button or a ticker symbol menu button can be a multi-link button. To setup a button as a multi-link button, add a plus sign to the end of the ticker symbol in the Button setup, e.g. MSFT+. A

button for MSFT+ when clicked does a "multi-link" of MSFT into the chart containing the button and all other charts associated with this chart via the multi-link color code. You can also add plus signs to the end of ticker symbols in a menu button setup. Choosing such an entry from a menu performs a multi-link instead of inserting the ticker into only the button's chart. Another way to multi-link using chart buttons is to hold down the shift key when you click on a ticker button. If shift is down when you click on a ticker button or when you choose from a ticker menu button, Investor/RT reverses the meaning, that is, if the button is a plain button, shift-click performs a multi-link. If the button is a multi-link button (e.g. IBM+) then shift-clicking on it will NOT do the multilink, it will only insert the symbol into the button's chart window.

Improved RTL Statistical Functions (MIN, MAX, etc.)

The MIN, MAX, AVG, SUM, and STD statistical function tokens in the RTL language now permit the first parameter to be a qualified historical token. For example, MAX(HI, 5) and MAX(HI.2, 5) where formerly treated the same, each give the maximum high in last five periods. Investor/RT now recognizes the historical qualifier in MAX(HI.2, 5) and now yields the max high beginning two periods ago and looking back five periods.

Improved Custom Instrument Daily Data Generation

When generating historical data for custom instruments, Investor/RT now uses an improved method to more accurately determine the daily open/high/low/close for those day for which intra-day data is available for the components of the custom instruments. Formerly, daily bars were generated using only the daily historical data of the underlying components of the custom instrument.

Multiple Monitor Related Improvements

Users with multiple monitors that are logically "stacked vertically" will find a new preference in Setup: Preferences: General. The settings for centering windows have been improved to include a vertical as well as a horizontal percentage. For example in a four monitor setup where Investor/RT uses all four monitors in a 2 by 2 arrangement, use a setting of %25 to center windows vertically on the "top" monitor, or a setting of 75% to center windows vertically on the bottom monitor.

New Result Options for Signal Statistics (SSTAT)

Data Download Window Improved

Drawing Trendlines with Slope in Degrees

Labeling Trendline Slope in Degrees

Version 5.9 Rev 3, Released: Jan. 6, 2003

Time and Sales Bid/Ask Sizes

Three new data columns are available for display in time and sales windows: bid size, ask size, and +/- . Access the time and sales preferences by right-clicking in the time and sales window to activate these columns. Note that Investor/RT does not retain bid and ask sizes nor the +/- values historically. These columns will show values only for the realtime collected ticks displayed in the time and sales window. The values when present will accurately reflect the bid/ask sizes and direction at the time each trade occurred. If you close a time and sales window and open it again later, all bid/ask size and +/- cells will initially be empty and will begin filling in for new ticks only.

Delete Historical Data Improvements

The Delete: Historical Data facility (in the Control Menu under Data Management) has been improved to more easily enable deletion of all data before or after a specified date.

Scan Quote Page Display Improved

Scans that run continuously on a schedule repeatedly replace the quote page of scan results with the current result. This replacement of the scan quote page was formerly done by deleting the former window and creating a new one to replace it. Investor/RT has been improved to recognize when the scan result quote page is already open and to replace the window contents without creating a new window. This results in less screen flicker and less interference with user interface activities when such scans run.

Backtesting: Rule Quantity "All"

Recently Investor/RT backtesting was improved to allow closing of a portion of an open position (see "Closing Partial Positions In Backtesting" in the help topic "What's New in 5.8"). User experience with this new feature has indicated a need to specify an exit rule quantify of "All" to exit the remainder of a position regardless of the number of shares/contracts or dollar size remaining in the position. The rule quantify popup list now has "All" as the first choice in the list. When an exit rule specifies "All" as the rule quantity and the rule is triggered, the remainder of the position will be closed out regardless of whether the position size is expressed in dollars or shares/contracts and regardless of whether the position size is the entire position opened or some remainder due to partial closing rules triggered earlier. Note that "All" can be used as well to open a new position. The position size in this case will be obtained from the backtest setup maximum position size specified by the user.

Maintenance Issues

Version 5.9 Rev 2 and 3 reflect a variety of fixes and general maintenance. DTN users will find support for a new market status indicator (quote page column "Mkt Status"). A trading holiday

related bug was fixed that caused daily charts to report the wrong date for 12/31/2002 when pointing at the bar. Rare crash bugs were fixed in the IWA, MPD, and QSTAT indicators. Chart buttons referencing automatic trendlines now toggle the trendline on/off properly. A crash bug was fixed concerning the use of presets for buttons and info box indicators in charts. An obscure (and rare) bug concerning downloading data from myTrack when the user incorrectly specifies the "posting days" for the trading session was fixed. User error messaging was improved in a variety of area. When updating to 5.9 Rev 3 from 5.9 Rev 1 or earlier the "Print Prefs" file is automatically deleted. The presence of this file was causing a crash at startup when upgrading. Custom Column setup window now has built-in help. A rare crash bug in the "Instrument Selector" was fixed. Time and Sales windows opened as part of a layout were being opened with a cell selected for editing. This prevented new ticks from updating the time and sales display. A cell is no longer selected so that updating begins immediately. When using Setup: Preferences: Quote Page, if the resulting preferences were applied to all or all open quote pages, the column widths of each affected quote page were incorrectly set very wide. This has been corrected. However, any quote pages affected by this bug will have to be corrected individually using the "Optimize Column Widths" command in the quote page popup menu or toolbar. When any one of the four "pin to..." toolbar positioning options is used, Investor/RT now correctly keeps the entire toolbar visible when its associated window is close to the edge of the screen. A bug was fixed in the portfolio cash adjustment function that prevented a "Set New Balance" operation from properly updating the portfolio cash balance. RTL token LRF was sometimes returning the value of the regression line when the token setup called for the value of either the upper or lower band. This has been corrected.

Version 5.9 Rev 2, Released: Dec. 20, 2002

myTrack Startup Quote Fix

Version 5.8 Rev 3 released in November 2002 changed the way Investor/RT timestamps each incoming trade for charting purposes. Formerly, the local computer clock time was used to time stamp each tick. Version 5.8.3 began using the myTrack transmitted trade time (adjusted to the local user's time zone). This change enabled Investor/RT charts to more accurately reflect the precise trading times of each intra-day bar. Unfortunately however, this change introduced an unintended side effect concerning the startup quote Investor/RT receives from myTrack for each instrument. When Investor/RT connects to myTrack it requests a current quote for all active instruments. This quote contains "background" information such as the current trading session open price, high and low price thus far in the session, 52 week high and low, etc. The time stamp of this quote, being earlier in time than the latest real-time trade, resulted in Investor/RT disregarding the data as an "out of sequence trade". The symptoms of this problem include incorrect open prices, incorrect high/lows. If Investor/RT was running at the open, the software would compute it's own open price and keep track of the intra-day high and lows thereby masking the problem. However, anyone starting Investor/RT after the open would be more likely to have an incorrect open, high, or low price. Version 5.9 Rev 2 corrected this

problem. It properly updates the open, high, and low when the startup quotes come in from myTrack.

Support for eSignal International Exchanges Historical Data

The eSignal version of Investor/RT now supports the International Tick Server, enabling eSignal users who track issues trading on international exchanges to obtain historical tick data and minute bar data for those issues. This feature is activated automatically in Investor/RT if you define ticker symbols that trade on international exchanges. This feature should be considered experimental at this time. Please report any problems to support@linnsoft.com.

eSignal Intra-day Historical Data Improvements

Investor/RT for eSignal has been improved for better performance when downloading intra-day tick data or minute bar data from the eSignal tick server(s). The Feed Status window for eSignal has been updated to show the number of days or intra-day data available for downloading at the present time. This number typically will be 30 to 60 days. If you initiate a download request from a chart window, Investor/RT will automatically trim back the requested period so it falls within the number of days shown in the feed status window. When using the Data Download window make sure the number of days of intra-day data requested does not exceed the number shown in the feed status window.

Version 5.9 Rev 1, Released: Dec. 16, 2002

Using Font Styles. Fonts for Investor/RT quote pages have always supported various styles (bold, italic, underline, etc.)

The font name, font size, and font style are all saved properties of each quote page. Support for styles elsewhere in Investor/RT has not included "style", only the font name and font size. Investor/RT Version 5.9 now supports retention of font styles generally. For example, the font setup for both the Annotation and Info Box indicators in charts now retain the style. Time and sales, news, view/edit, and text window font style preferences are now retained. When viewing text windows, e.g. message log, backtesting reports, etc. the menu button at the top left of the text window has a Style submenu.

Charting Custom Instrument Components

When viewing charts of custom instruments it may be desirable to quickly call up charts on the underlying component instrument of the custom instrument. A command has been added to the chart popup menu for this purpose. Right-click in the chart window and choose Chart Components to open default charts on each of the component instruments that make up the custom instrument in the chart. The new menu item has not effect unless the instrument in the chart is a custom instrument. The charts that will appear will be in the format dictated by the default chart in Setup: Preferences: Charts: General.

Quote Page Statistics Indicator (QSTAT)

This new indicator allows the user to calculate a variety of statistical results for any quote page of symbols, on any available technical indicator. The current list of available statistical results include Average, Sum, Maximum, Minimum, Percent of Average, Percent of Total, Percent Difference from Average, Relative Strength, Instruments with Data (Bars). For instance, you can calculate the average volume for a quote page of symbols that contains the Nasdaq 100. You can calculate the average percent change on a quote page that contains the S&P 500. You can calculate the maximum, minimum, average, or total spread on a quote page that contains all optionable stocks. You can calculate the average (maximum, minimum) MACD (RSI, CCI, FASTD) for a quote page that contains the DJI 30. You can calculate how many instruments in a quote page evaluated TRUE for a given condition (using scan as the indicator). The possible combinations are expansive. As this indicator can be added to a chart, these values can be seen historically for all of the past bars. In order for this to work accurately, you must ensure that you have complete data on each of the symbols in the quote page. You can verify this after adding the Quote Page Statistic indicator (QStat) to your chart by pointing to each bar. The feedback you see for each bar in the pane title for QStat will show how many symbols in the quote page had bars on file for that time slot.

Let's call our chosen indicator result "IND". A brief description of each statistical result option follows.

Average: This represents the average of IND for all the instruments in the quote page.

Sum: This represents the total summed values of IND for all the instruments in the quote page.

Maximum: This represents the maximum value of IND for all the instruments in the quote page.

Minimum: This represents the minimum value of IND for all the instruments in the quote page.

Percent of Average: This represents the percentage of the underlying instruments IND value compared to the Average. $(100 * IND / Average)$

Percent of Total: This represents the percentage of the underlying instruments IND value compared to the Total. $(100 * IND / Total)$

Percent Difference from Average: This represents the percentage difference of the underlying instruments IND value compared to the Average. $(100 * (IND - Average) / Average)$

Relative Strength, Instruments with Data (Bars): This represents the percentage of IND between the Minimum and Maximum values. This value will always be between 0 (at lowest

end of range of values) and 100 (at highest end of range of values). $(100 * (IND - Minimum) / (Maximum - Minimum))$

Notice that the first four options (and the last option) apply to the quote page as a whole, while the next four options apply to the specific instrument as it relates in some aspect to the cumulative values of the group (quote page).

Quote page Statistics can also be accessed in the RTL language using the token QSTAT. This gives the user access to QSTAT in custom indicator, scan, and custom columns. But adding QSTAT to a custom column, you can quickly see how each instrument in a quote page performed relative to the performance of the overall quote page using any available indicator (including custom indicators and scans) as a basis.

Downloading Historical Data using Schedules

A new action has been added to Schedules called "Download Data". The action gives the user the ability to schedule a download of either 1-minute or daily data, on any quote page, for any number of days. Since the schedule can be setup to be run using a shortcut key, it gives the user the ability to quickly download a given amount of data on a quote page by simply pressing a key.

Here is one scenario where this new action could be very useful. Let's say you have a large quote page of 3000 stocks which you like to run a scan on each day to narrow your intraday watch list down to 50 or so stocks. You can setup two schedules, and run them in the morning or evening while the session is closed. The first schedule will simply download the last 1 day of daily data on your large quote page. This schedule would have the single action of "Download Data - Daily - 1 Day". Once this schedule has completed, you'd run your second schedule. This schedule will begin by running a scan that unmarks all symbols for intraday monitoring (Run Scan - "!SET(MON, -MON_INTRA)"). You'll run this scan on your ".All Symbols" quote page. It then initializes the intraday database to help keep the database size to a minimum (Database Functions: Initialize Intraday Database). It will then run the scan which results in a smaller quote page for intraday watch (Run Scan - ???). This can be an scan you wish which runs on daily data to narrow your 3000 symbol quote page down to a manageable intraday group. It then saves this resulting quote page (Keyboard Shortcut - you'll have to first create a keyboard shortcut that does "Save: Current Object" and use this. It can then run a scan that marks all the symbols in this smaller quote page for intraday monitoring (Run Scan - "!SET(MON, MON_INTRA)"). You'll run this scan on the quote page that resulted from the previous scan. It will then download 6 days of 1-minute bars to prime each of those instruments for analysis (Download Data - 1-minute - Last 6 days).

Initializing Databases using Schedules

Two options have been added to the "Database Functions" action of schedules: "Initialize D/W/M Database" and "Initialize Intraday Database". These functions remove all "daily weekly monthly" or intraday data from the database. These scheduled actions can be used to keep the database size to a minimum. They are especially useful for users whose intraday watch lists change from day to day, and need to delete all intraday data each day, and download fresh on the new list of symbols (see help title "Download Data Scheduled Action" for additional information).

New RTL Token: AMA – Adaptive Moving Average

The Adaptive Moving Average indicator now has the token AMA in the RTL language. Adaptive Moving Average were formerly possible using the MA token, but the AMA token provides more specific control over the preferences for the adaptive moving average than was possible using MA.

New RTL Tokens for Backtesting: BTBAR, BTCNT

Two tokens were added to the RTL language to enable backtesting signals to consider which bar number is being tested. BTBAR is the bar number being tested. BTBAR will be 1 for the first bar tested during the backtest. BTCNT is the bar number of the last bar to be backtested. Thus a signal that includes the expression $BTBAR = 1$ would be true only when the very first bar is being tested. Similarly, the signal $BTBAR = BTCNT$ would be true only when the last bar is being tested. These tokens have to purpose except during backtesting.

Show Open Price Option for Scan/Signal Markers

The "Show Price" feature of the Scan/Signal Markers indicator has been enhanced to allow the user to show the "Open" price on marked bars. This new option is added to the existing options of showing "Close", "High", "Low", and "DateTime".

Instrument Only Option for Range Based Scaling

All Range-Based Scaling options now have the option to be "Instrument Only". In the vertical scale preferences (double-click in the vertical scale to access these preferences), the third Scaling Method is range-based scaling. To turn on "Instrument Only" for this method, just select "Instrument" from the first list (which also includes "Automatic" and "Manual" options). This "Instrument Only" method is used to force the chart pane to consider only the data of the instrument, and exclude any indicators which may scale outside the range of the instrument and skew the pane's scale.

myTrack Industry Group Data Column

Users of the myTrack data service will notice that the data column "Industry" now shows a myTrack-transmitted textual value for each stock. This text is useful in scans to find stocks that belong to a particular industry group. For example, the scan `INDUST = "SOFTWR"` will list all stocks Investor/RT is tracking that are in the "computer software" industry group. "SOFTWR" is simply the myTrack-transmitted value for this group.

Version 5.9, Released November 27, 2002

Quote Page Popup Menu Improvements

The "Plus Button" in the upper right corner of each quote page, formerly used to toggle the quote page toolbar on and off, can be click to choose from a popup menu of quote page functions. The menu pops up over the "Toggle Toolbar" item to make the former purpose of the button just as accessible. The menu has items for saving or changing the quote page format, for saving the quote page or creating a new quote page, or for changing the window to another quote page. You can also get to the quote page preferences window quickly or call up the "Add to Quote Page window, a helper window to ease the setup of quote pages. The menu item at the bottom of the new popup menu, "Mouse Shortcuts", opens a help topic with further details on using the mouse to perform useful functions within a quote page. The popup menu obtained by right-clicking on any quote page column has been reorganized with column specific functions listed at the top (add column, delete column, resize column, etc.

New Chart Button for Setting User Data

The Chart Button indicator has been enhanced to add a new button purpose: Set User Data. A Set User Data button has an associated word or phrase. Clicking the button inserts that word into the User Data of the instrument in the chart. For example, one way to use this new facility is to add buttons to the chart with the words BUY, or SELL. As you quickly cycle through charts in a slide show, you can click the appropriate button to "mark" certain instruments as BUY or SELL just by clicking the appropriate button. After you review all you charts you can easily obtain a list of all of the BUY stocks by running the scan: `USERDATA = "BUY"`, or the SELL stocks with scan `USERDATA = "SELL"`.

Set User Data menu buttons are available as well, e.g. setup one button as a menu button and use "BUY,SELL,NEUTRAL" as the button text to get three menu choices for setting the instrument's user data.

If the text of a Set User Data button begins with a plus sign, e.g. +BUY, then the text BUY will be appended to the user data text that already exists for the instrument. If the text begins with a question mark, Investor/RT will prompt you to enter the user data text. The prompting window will show the existing user data for the instrument so you can replace it entirely, edit it, or append text to it as you wish. If the text begins with something other than + or ?, Investor/RT will replace the current user data with the text specified for the button.

When using this facility it may be useful to add an Annotation box to the chart window with the annotation text %USERDATA. This will cause the current user data of each instrument to appear as text in the chart window as you switch tickers.

New Indicator: Fibonacci Extensions

A new indicator called Fibonacci Extensions has been added to Investor/RT. A drawing tool button for this indicator is on the chart toolbar. The Fibonacci Extensions tool is similar to the Fibonacci Retracements tool. The Fibonacci Extensions indicator requires a third point. The extensions and retracement levels are drawn from this third point, but based upon the distance between the first two points. A common use of this tool is to first connect two points that represent the endpoints of a major trend (or wave). Then choose the third point to be the endpoint of a retracement of that trend. Extensions are then drawn in the direction of the initial trend, from the third point, using the distance between points one and two as a basis for the extension levels. For example, suppose the initial trendline moved in price from 100 (point 1) to 110 (point 2). Then, price retraced to 105. The 0% extension line would then be drawn at 105 ($105 + 0\% * (110 - 100)$). A 100% extension line would be drawn at 115 ($105 + 100\% * (110 - 100)$). A 50% extension line would be drawn at 110 ($105 + 50\% * (110 - 100)$)...and so on.

The Fibonacci Extensions toolbar button and drawing tool work much like the Andrew's Pitchfork drawing tool. First, click on the Fibonacci Extension button on the toolbar. Then, click three times, once on each of the points that are involved in the Fibonacci Extension. The first click should be on the starting point of the initial trendline. The second click should be on the ending point of the initial trendline. The third click should be on the ending bar of the retracement period.

As with Fibonacci Retracements, there is a great deal of flexibility for all three price points (Begin, End, and Extend Prices). Each price level can have "Use Bar" or "Use Price" selected. If "Use Bar" is selected, the endpoints will snap to the extreme prices of the corresponding bars. If "Use Price" is selected, the exact price at each mouse click point will be used.

Fibonacci Extension share the same flexibility as Fibonacci Retracements regarding "Show Price", "Show %", "Extend Left", "Extend Right", "Text on Right", etc. Also, both retracements and extensions in both time and price may be drawn.

New Documentation: What's New Reference

We have prepared a new document called the What's New Reference. This Adobe Acrobat Reader (PDF) file is a compendium of all of the What's New help topics. The document is at this time more than 200 pages long. It has a detailed, searchable table of contents. Clicking on a table of contents entry takes you directly to the text of the corresponding item. Further, the entire document is searchable by keyword or phrase. It is an excellent way to look up a

description of some feature and all of the enhancements made to that feature in ensuing releases of Investor/RT. The document can be downloaded from www.linnsoft.com/dl. Scroll down to the bottom of the Quick Download Center web page and click to download the Windows (.zip) or Macintosh (.sit) file. This document will be updated periodically as new releases of Investor/RT are issued on an ongoing basis.

Marking/Unmarking Instruments for Intra-day

"Mark Intra-day" button on the quote page toolbar can now be used to either mark or unmark an entire quote page of instruments for intra-day data monitoring. Clicking this toolbar button with no particular row (ticker) selected elicits a dialog asking if you wish to either Mark or Unmark all instruments in the quote page. Clicking "Cancel" dismisses the dialog with no action. Click "Mark" or "Unmark" to cause every instrument in the quote page to be marked or unmarked for intra-day monitoring.

Chart Button Improvements

Chart buttons add convenient push buttons and menu buttons to any chart window. As the use of this feature has become more extensive, some Investor/RT users have found that too many buttons present in the same chart window pane can obscure the actual graphs within the pane. Investor/RT now has a convenient way to create a "button pane" if desired. By placing all (or most) of your buttons in a dedicated pane, they will not interfere with the instrument and indicator graphics in other panes.

To create a button pane, right-click on any existing button and choose "All to Button Pane". All of the buttons in the pane will be moved to a new pane at the top of the chart window. This pane will NOT have a pane title bar, thus the buttons will appear just like a toolbar strip across the top of the chart window. When adding new button to the chart, direct them to this button pane to keep all chart buttons arranged neatly at the top of the window.

Arranging the order (left to right sequence) of buttons within a pane has been made much easier. When a chart pane contains two or more buttons, right-click on any button in the pane and choose "Adjust Order...", the last item in the menu. The Order Chart Pane Elements window will appear, listing all of the graphic elements in the pane, including all of the buttons. Each button in the list will begin with BUTN. Make sure that the Apply All Changes Immediately check box is checked, so that as you adjust the top to bottom order of the BUTN's in the list, the changes are immediately reflected visually in the button arrangement in the chart window itself. You can move the Order Pane... window off to the size to you can see how the arrangement actions affect the appearance of the buttons arrayed in the chart pane. The buttons will be drawn from left to right using the top to bottom order shown in the Order Pane... window. Note that some buttons may be designated as "Display at Top" buttons. You can have a mixture of buttons in a pane, some arrayed at the top of the pane and others arrayed at the bottom of the pane. If you have one of more "Button Panes" in the chart, each

button pane will be sized tall enough to show only a single row of buttons. There is no top/bottom distinction for buttons in a button pane. Note also, that a button pane may have some unused blank space to the right of the array of buttons in the pane. There is no restriction on how you use this space. You can add more buttons as needed or add an annotation indicator to display some values of interest there for example.

Quote Page Sorting Lock

A quote page preferences checkbox titled "Disable Sort" has been added to enable the user to lock a quote page so its row order may not be changed. This option will be useful for quote pages when the arrangement of rows in the page is important to the user. For example, you may have a list of custom instruments in a quote page, each followed by the component instruments of the custom instrument. Sorting such pages by any column would undo the careful ordering of the rows. Checking the "Disable Sort" checkbox will lock the row order so any attempt to sort the page, e.g. by clicking on any column title, will issue a prompting message informing the user that the page has sorting disabled. One of the buttons in the prompting message is "Enable" so you can unlock the quote page to enable sorting if you wish. The "Plus Button" in the upper right corner of each quote page, formerly used to toggle the quote page toolbar on and off, can be click to choose from a popup menu of quote page functions. The menu pops up over the "Toggle Toolbar" item to make the former purpose of the button just as accessible. The menu has items for saving or changing the quote page format, for saving the quote page or creating a new quote page, or for changing the window to another quote page. You can also get to the quote page preferences window quickly or call up the "Add to Quote Page window, a helper window to ease the setup of quote pages. The menu item at the bottom of the new popup menu, "Mouse Shortcuts", opens a help topic with further details on using the mouse to perform useful functions within a quote page. The popup menu obtained by right-clicking on any quote page column has been reorganized with column specific functions listed at the top (add column, delete column, resize column, etc.

Intra-day Crosshairs Tool Improved

Improvements were made to the chart crosshair tool to eliminate crosshair residue when moving the crosshairs in actively updating intra-day charts. The crosshairs can be activated using the button on the charting toolbar, or by holding down the shift and ctrl keys as you move the mouse pointer around inside a traditional chart window. Macintosh users hold down the shift and option keys to call for crosshairs.

Version 5.8.5, Released November 13, 2002

Two Color Lines For Oscillating Indicators

A new drawing style has been added to oscillator style indicators called "Two Color Line". The colors of "two color lines" will reflect the preference setting in "Setup Preferences: Charts:

General" labeled "Color Histograms Based On". If "Rising/Falling" is selected, then two color lines will be drawn in one color when the value of the indicator rises, and the other color when the value falls. If "Positive/Negative Values" is selected, then two color lines will be drawn in one color when above the 0 (or other reference level) and the other color when below 0 (or other reference level). Two color line works a little differently for Custom Indicators. If a value is specified for either "Reference Line" or "Extreme Levels +/-", then that value will be used to determine what the colored levels. For instance, if the custom indicator oscillates between -100 and 100, and a value of 70 is specified, the extreme levels above 70 and below -70 will be painted in the second color.

New Result for TLB Oscillator: Skips

A new custom result has been added to the Three Line Break Oscillator titled "Skips (Bars In Line)". Skips represents the number of bars that have been spent in the current line of the three line break. High values for skips can represent stalls and warning signs that it may be time to exit the position in the direction of the TLB. The value for Skips is always 1 or greater. On the initial creation of a line, the value will be 1. The value will then increase by one for every subsequent bar in which a new line is not formed (while price remains within the current line).

Paint Bars Indicator Selection

The Paint Bar indicator has been enhanced so that it is clear when it is the selected element in the chart, whether the Paint Bars is setup to paint the actual bar, paint high to low, or paint top to bottom. The selection is also clear regardless of whether the Paint Bar indicator is applied to bars, candles, histogram, or line style instruments. When tabbing through elements in a chart, when a Paint Bar becomes the selected element, the painted bars, candles, or line segments will become bold. If the Paint Bar is setup to paint high to low, or top to bottom, then the painted columns will become hollow. Once the Paint Bar indicator is selected, the Enter key may be hit to bring up the preference window, or the delete key may be hit to delete the indicator (this works the same for all indicators/instruments within a traditional chart).

Version 5.8.4, Released November 6, 2002

New RTL Tokens: SPB, TPB, VAU, VAD

SPB and TPB are properties that enable testing of the "seconds per bar" or the "ticks per bar" based on the periodicity of the scan or chart. VAU and VAD provide the upper and low values of the Value Area indicator.

Momentum CD-ROM Support

The Data Download window once again fully supports automatic lookup and import of daily historical data from the 5 year and 14 year Momentum CD-ROM in MetaStock Format. Note the

MetaStock Format CD-ROM is supported on both the Windows and Macintosh platforms. Momentum also publishes an "ascii text file" format CD-ROM. Data can be imported manually from the ascii CD-ROM. Only the MetaStock Format is supported as a "server" data source in the data download window. For more information on the Momentum CD visit <http://www.momentumcd.com>.

UK Stocks myTrack Tick Volume Fix

MyTrack users following equities that trade on the London exchange using the myTrack data service will find that Investor/RT now properly reports the trade volume of each trade. Unlike US Stocks, Investor/RT no longer multiplies the transmitted trade volume by 100.

Version 5.8.3, Released October 29, 2002

Tick Bar Periodicity and "Special" Indicators

Traditional charts with periodicity based on a fixed number of ticks per bar (tick or tickbar charts) can now operate with several indicators and their associated drawing tools not previously supported. These include:

- Trendlines
- Parallel Trendlines
- Regression Lines
- Fibonacci Retracements
- Scan/Signal Markers
- Rectangle (Owl)

Backtest Report "Divider" Option

The backtest setup window has a new menu with five choices for the type of output divider to be used when producing reports. The default is a long line of asterisks. Options include long and short lines of asterisks or hyphens, or just a blank line between report sections.

New RTL token SBAR (Session Bar Number)

The SBAR token can be used in scans, signals, and custom indicators to give you the ordinal bar number of the bar being evaluated. The first bar of each new trading session is assigned a value of 1. This token takes into account the intra-day session start and stop times of the instrument being evaluated, thus it is applicable only to intra-day periodicities. SBAR is zero when periodicity is daily, weekly, or monthly. The SBAR indicator is evaluated using the time stamp of the bar (the ending time of the bar) relative to the start and stop times of session. So in a one minute chart with session starting at 9:30, the bar at 9:31 will have SBAR of 1, while the bar at 10:00 will have SBAR of 30, regardless of how many one minute bars are actually on file for that period. Sometimes, the bar data may be missing bars, for example, if a stock had a delayed

opening and the first trade occurred at say 9:35:30, the bar ending at 9:36 would be the first bar of the session but its SBAR value would be 5 nevertheless. For this reason the BARNO token, previously used on in backtesting, has been given an expanded role. BARNO is the "physical" ordinal bar number of the session. So in our delayed opening example, the BARNO of the 9:36 bar would be 1 because it is the first actual bar of the session, while the SBAR number would be 6 since it is the 6th one minute time period of the session.

Setting up Custom Instruments

A checkbox has been added to the Custom Instrument Setup window for marking custom instruments for intra-day data monitoring and data retention. Formerly, this option had to be adjusted in a less convenient manner using the Setup: Instruments window.

Closing Partial Positions in Backtesting

The Investor/RT backtesting system has been enhanced to allow SELL and COVERSHORT rules to sell or cover all or a portion of the position. Formerly, these rule types could only be used to close the entire position. Thus you can backtest trading systems that take partial profits based on one signal and exit all or the remainder of the position under either the same or some other signal.

The POS_SIZE token can be useful in coding signals that consider the size of the position currently held. The "Qty" is now an accepted input when specifying the setup for SELL and COVERSHORT rules. If the quantity of a SELL or COVERSHORT rule exceeds the position size, the entire position is closed.

Toolbar Activation

Investor/RT now remembers the state of the main toolbar and all other object toolbars when it quits. At startup, the state of each toolbar is reestablished. For example, if you have explicitly turned off the charting toolbar before quitting, upon startup Investor/RT will keep the charting toolbar hidden until you specifically request it.

The Toolbar submenu in the Windows Menu can be used to enable or disable any or all Investor/RT toolbars. This submenu now shows check marks in front of the names of the enabled toolbars. When a toolbar is enabled, this means that opening its associated window type causes the toolbar to appear. If you choose an item from the Toolbar menu the checkmark is toggled on/off to the opposite setting.

For quote pages and portfolios, the toolbar can also be toggled on or off by clicking the small plus sign just above the vertical scroll bar located in the upper right corner of the window. For all chart window types, the chart's popup menu has a toggle toolbar command. Toolbars for other window types can be activated or turned off using the Toolbar submenu of the Windows

menu. The alt-H (command-H on Macintosh) keyboard shortcut alternately shows and hides the main toolbar and the toolbar associated with the front window.

Choosing an Indicator

When adding an indicator to a traditional chart using the Add Indicator window, or when choosing an indicator for setting default preferences, Investor/RT now displays a "Choose Indicator" panel on the right and the list of all available indicators on the left. If you are familiar with the indicator you wish to add or edit, type the first letter of the indicator and the list of indicators will scroll to that alphabetical section. The Choose Indicator panel also has an array of letter buttons. You can click on any button to scroll the indicator list to the desired section. When you move the mouse pointer over any button (without clicking), Investor/RT shows a list of indicators whose names begin with that letter in a text box beneath the letter buttons. This technique can be used to search for the indicator you want without scrolling the indicator list. When you see an indicator of interest, click on the button to go to that section of the list. Once you are scrolled into the list of indicators, if you wish to return to the Choose Indicator panel, tap the spacebar. This scrolls the list back to the top item, which is "Choose Indicator".

The Choose Indicator panel will be especially useful to new users of Investor/RT who are unfamiliar with the wide array of technical indicators and drawing tools available in the software.

New "Fresh Start" Option for PNF/TLB/Renko Indicators

A new "Fresh Start" checkbox has been added to four indicators:

- Point and Figure
- Three Line Break
- TLB Oscillator
- Renko indicator

This option forces the indicators to start fresh upon each new trading session. If fresh start is unchecked, Investor/RT considers gaps that may occur from session to session. These gaps can result in exaggerated reversal requirements. By starting fresh each session, the indicators reflect only the current session's data. The "fresh start" option may eventually become an option for other Investor/RT indicators.

New Indicator: Renko Stand alone

Renko charts have been a part of Investor/RT for several months as an option in PNF charts. A Renko Indicator has been added for use in traditional charts. It provides a way for the Renko boxes to be viewed and stretched across a time based chart. This allows the user to see exactly which bars were used to create each Renko box. Renko Charts are essentially PNF charts with a reversal criteria of 1, and with each box drawn in a separate column (while PNF draws X and O

letters instead of boxes, and stacks them vertically). RENKO is also available in the RTL language for use in scans, trading signals, and custom indicators.

New "Use High/Low" Option Added To System Simulator

A checkbox titled "Use High/Low For Targets/Stops" has been added to the System Simulator indicator. This option checks the high and low prices when determining if a target or a stop/trailing stop level was reached. If this option is unchecked, only the closing price will be used to determine if the target/stops were reached.

Version 5.8 Enhancements, Released October 10, 2002

Quote Pages, Formats, and Custom Columns

Version 5.8 makes it possible to create quote page formats containing one or more "custom columns". Such formats can be created using Setup: Preferences: Formats. Notice that all custom columns are listed in the list of "Available Items" that can be added to any format. All custom columns are listed prefixed with \$CC: followed by the name of the custom column to distinguish them from the built-in data columns.

If you already have a quote page setup with custom columns and you wish to save that page's list of columns as a format, simply right-click on any column title in the quote page and choose "Save Format...". Macintosh users with a one-button mouse use control-click. You will be prompted for a name for the format and the Setup: Preferences: Format window will then show the newly saved format.

Right clicking on any column title in a quote page now offers a change format command in the resulting popup menu. A list of format names appears. You can pick any format name and click Apply or OK to change to the selected format. The Change Format button on the quote page toolbar can also be used for this purpose.

One of the interesting side-benefits of being able to include custom columns in formats is that the resulting format can be used as the output format for any scan's output quote page. For example, if you run a scan that includes RSI criteria, you could specify an output format that includes an RSI custom column that color-codes various RSI levels appropriately in the resulting quotepage.

Chart Popup Menu Enhanced: Drawing Tools

Right clicking in a traditional chart window invokes a popup menu containing a new "Draw" submenu. The Draw submenu enables you to activate any of the 15 drawing tools on the chart

toolbar. For example, choose Draw-->Reference Line-Horizontal to activate the reference line tool. The cursor will change to a pencil. Click at the price level at which you wish the reference line to be drawn. The drawing tool is turned off after adding the new reference line unless you hold down the shift key when clicking. The shift key tells Investor/RT to keep the tool active so you can continue adding another line. All drawing tools work this way with the shift key.

User Variables as Chart Reference Lines User V#

Variables are often used in conjunction with horizontal reference lines to establish key reference price levels. The value of the V# variable can be revised by the user manually by editing the number in a quote page or the V# value can be computed using a custom column or a scan that runs periodically. The quote page and charting components of Investor/RT now feature better synchronization of V# variables and Reference Lines. Specially, when you edit a V# variable in a quote page, any open chart windows containing reference lines pegged to that V# variable will be redrawn instantly to reflect the new price level entered. Conversely, if you drag and drop a reference line within a chart to some other price level and the reference line is pegged to a particular V# variable, the value of the V# variable will be updated to reflect the new value resulting from the drag operation. If a quote page containing a V# variable as a column happens to be open when you adjust a reference line pegged to that V# variable, the quote page will update instantly to show the revised value of the V# variable (for the row containing the charted instrument).

Updating Technical Indicator Presets

A new submenu item has been added to the Preset popup menu to make it faster and easier to update the preferences of an existing preset. The "Replace Preset" submenu lists the existing preset names for the indicator being edited. Choose the preset you wish to update and the current indicator settings will be applied to that preset. In prior versions, it was necessary to do a "Create Preset" and (carefully) type in the exact name of the preset to be replaced.

Candlestick Patterns: Dark Cloud Cover and Piercing Line

A Dark Cloud Cover candle pattern is a bearish reversal signal. In an uptrend a long up candle is followed by a down candle that opens above the up candle high. It then closes well into the up candle real body. In Investor/RT 5.8 we have revised the pattern matching to require that the current candle close "inside" the prior candle body range and below the midpoint of that range. If the current down candle closed outside the previous candle body this is technically known as a bearish engulfing pattern and should not have been flagged as a dark cloud cover. Prior to version 5.8, Investor/RT flagged the pattern as both a dark cloud and a bearish engulfing pattern.

A similar revision was made to the Piercing Line Pattern: In a downtrend, a long down candle is followed by a gap lower during the next period. The next period then has a long up candle, which extends past the midpoint of the previous candle real body. This bullish signal will now be triggered only when the current candle closes within the prior candle body price range and above the midpoint of that range.

New RTL Tokens: LAST#1, LAST#2, LAST#3 & TVOL#1, TVOL#2, TVOL#3

Six new tokens have been added to the RTL language to enable access to the previous three trade prices and trade volumes at those prices. These tokens are NOT available historically. They can be used in real-time scanning or real-time custom column calculations. They should not be referenced in backtesting signals, as these values are available only as instantaneous values during the live trading session. For example, the following scan can be run regardless of periodicity to find issues that have been rising steadily in price:

```
CL > LAST#1 and LAST#1 > LAST#2 and LAST#2 > LAST#3;
```

Note that these six new tokens have names that end with a number. The general rule in Investor/RT is that token names cannot end with a numeric digit. The exception is that any token that has a # as part of the token name can have 1 or more numeric digits immediately following the # as part of the token name. Thus V#99 (user variable 99) is a valid token, as is LAST#3. If you have several MA tokens (say 5, 10 and 20 period moving averages) in a scan you can call them MA#5, MA#10 and MA#20. Then you can qualify them historically by suffixing the token with a period and the qualifier, e.g. MA#5.1 is the previous bar value of MA#5, the five period moving averages.

Daybar Chart Enhanced

The Day Bar Chart has been enhanced with several new features. A new option has been added to transform the single bar into an intraday bar based on a user specified number of minutes (last X minutes). If, for instance, "last 10 minutes" was specified, then the bar will reflect the most recent 10 minutes of data. This window of data will move once per minute, at the end of each minute interval. For instance, between 11:09 and 11:10, the 10 minute bar will show data starting from 11:00 up to the most recent tick. Once 11:10 comes, the start time will move to 11:01 and remain there until 11:11, at which time it will move one minute ahead to 11:02.

Also, two new time options were added. A checkbox labeled "Show Time With Open and Close" gives the user the option to see the times at which the opening and closing ticks occurred, in addition to the option to show the time that the high and low occurred. Also, checkboxes labeled "Hide Hour" and "Hide Seconds" give the user the option to decrease the width of the time label if hour or seconds is not desired. Also, the ability to show seconds with the time is a new feature in 5.8.

Backtesting Reporting Improvements

The backtesting report formatting has been improved and several new statistics have been added to the consolidated report. The consolidated report now appears at the beginning of the report, followed by the summary reports for each instrument tested. These reports are best viewed in a "mono-spaced" font so that the report columns line up properly. Investor/RT will now use a standard mono-space font to display these reports regardless of the user font setting in Setup: Preferences: General. Backtesting reports are now displayed without word wrap to avoid distorting the report formatting. If you change the font or increase the font size (using the menu control in the upper left corner of the report) you may resize the report window wider to see the full text of each line in the report.

The new backtesting statistical measures include:

- Avg Gain/Trade Total gain (or loss if negative) divided by the total number of trades made.
- Avg Position Size Average size of all positions entered during the backtest.
- Avg % Gain/Trade Average Gain/Trade times 100 divided by the average position size.
- Avg % Gain/Bar Average % Gain/Trade divided by the average bars per trade.

New Chart Style: Day Change Candles

A new chart style has been added to traditional charts called "Day Change Candle". The prices of these candles (open, high, low, and close) are computed by subtracting the previous day's close from the actual prices. For instance, if we refer to the previous day's close as DAYCL.1, then the high of each bar will be HI - DAYCL.1, while the low of each bar will be LO - DAYCL.1, etc. In other words, the prices will reflect the actual change from a single price (the previous day's close). The shape of the candles will be almost identical to the shape of standard candles. The difference will be in the scale values, as well as the gaps between the last bar of each day and the first bar of each day.

Permanently Hiding Main Toolbar

You can hide the main toolbar by right clicking (Mac users control click) in the message area of the toolbar and choosing Hide Toolbar from the popup menu. If you quit Investor/RT with the main toolbar hidden, the main toolbar will remain hidden the next time you startup.

SSTAT (Signal Statistics) Six New Result Options

Six new results options were added to the Signal Statistics (SSTAT) indicator. Each of the result options described below is based on the idea that a good measure of a signal is the favorable

versus adverse price action that takes place in the bars immediately following the signal. The new result options help to measure the price potential, in both the favorable and adverse direction, over the period that follows the signal.

Maximum Gain Since Signal

Then maximum potential gain, based on the highest high achieved since the signal occurred relative to the entry price on the signaled bar. This result provides a value on each bar following the signal, and resets at each signal.

Maximum Loss Since Signal

Then maximum potential loss, based on the lowest low achieved since the signal occurred relative to the entry price on the signaled bar. This result provides a value on each bar following the signal, and resets at each signal.

Max Favorable Excursion

Look Ahead This result looks ahead from the signaled based on the period specified, and finds the maximum potential gain achieved over that period, based on the highest high reached during the period. This result appears only on the signaled bars, showing a value of 0 on all other bars.

Max Adverse Excursion - Look Ahead

This result looks ahead from the signaled based on the period specified, and finds the maximum potential loss achieved over that period, based on the lowest low reached during the period. This result appears only on the signaled bars, showing a value of 0 on all other bars.

MFE Period - Bars to MFE

This result shows how many bars forward from the signal at which the MFE (Maximum Favorable Excursion) price was reached. In other words, it represents how many bars from the signaled bar that the highest high occurred over the period specified.

MAE Period - Bars to MAE

This result shows how many bars forward from the signal at which the MAE (Maximum Adverse Excursion) price was reached. In other words, it represents how many bars from the signaled bar that the lowest low occurred over the period specified.

Info Box: New Indicator Pane Option

An Info Box can be setup within a chart pane to show (1) all technical indicator values (2) a particular pane's indicator values, or (3) no indicator values. In the Info Box setup window, when "One Pane's Indicators" is chosen, the user may specify "AUTO" which means "use the pane that the info box resides in", or a particular pane number. Thus you could have an info box

in pane #1 that shows the values of several indicators in Pane #3 by choosing 3 as the pane number. This add more flexibility when setting up info box technical indicator content.

STAT (Scan Statistics) Enhancement.

The STAT (Statistics) Indicator has been enhanced to provide more flexibility when this function is used in intra-day charts and scans. Specifically, when you call for say a Maximum High or a Minimum Low and specify a "From" date/time, Investor/RT now permits you to specify that the max high or min low is to be obtained with from that time to present or from that time forward for a specific duration or time expressed in bars or minutes. For example, you could setup a STAT token to find the Maximum High from the current trading session start time plus 30 minutes. This gives you the high of that 30-minute period regardless of the intra-day periodicity in use. In prior versions of Investor/RT, the "From" date/time option always implied from the date/time specified "to present". This new option will be useful to Investor/RT users who track overnight session data and want to grab the high or low for the day session trading period only. Just specify the day session start time and the amount of time following that from which to obtain the statistic.

Adjusting V# Column Properties in a Quote Page

If you have one or more V# user variable as columns in a quote page you can easily adjust the column title or the precision of the display format by right clicking on any cell in the V# column. Macintosh users control-click. This takes you to the Setup: Preferences: User Variables window for that V# user variable. Make the adjustments and click OK. The quote page will then reflect the changes.

Selecting Indicators in a Chart

Selecting an indicator in a chart is usually quite easy, just click on the indicator line and the line becomes "selected". The line is drawn thicker as visual feedback that the selection was made. If you have a "Select Object" sound setup in the Sounds preferences panel then that sound is played as well. Sometimes, a chart filled with many indicators can become congested to the extent that selecting a particular indicator becomes difficult. In such cases, you can of course use the tab key to cycle the selection one by one through the indicators in the chart until the line you want becomes highlighted (thicker). This can be tedious, however, if there are many indicators in the chart.

Investor/RT 5.8 introduces a new chart element selection method that will be useful in such cases. If you hold down the ctrl key (or option key on Macintosh) while you move the mouse pointer inside a chart pane, as the pointer passes over any indicator line or instrument in the pane, that line or instrument will become selected. As you continue to move the mouse "off" of that indicator, the element will no longer be selected. Further, the main toolbar status message area will provide feedback as you move the mouse pointer, showing the name of the element

that is currently selected. When the mouse pointer is not pointing to any particular chart element, the message "No Selection" will be displayed.

So for example, if you want to select a particular indicator line to edit the properties of the indicator, move the mouse (with ctrl key down) in the vicinity of the line until the line becomes selected. Then right-click or press the enter key to see the selected indicator's preferences, or press the Delete key to eliminate the indicator.

This new tool provides an excellent way to experiment and learn through experience where the mouse pointer must be placed in order to obtain a selection for any particular indicator.

New Technical Indicator: Fisher Transform (RTL: FISH)

Fisher Transform (FISH) is based on the article "Using The Fisher Transform" by John Ehlers that will be available in the November 2002 issue of Stocks and Commodities Magazine. FISH has sharp and distinct turning points that occur in a timely fashion. It is based on the assumption that prices do not have a Gaussian probability density function (PDF), but you can create a nearly Gaussian PDF for prices by normalizing price, or an indicator such as RSI, and applying the Fisher Transform. The resulting peak swings clearly identify price reversals.

$$FISH = 0.5 * \text{LOG}((1 + \text{Value}) / (1 - \text{Value})) + 0.5 * FISH.1$$

$$\text{Value} = 0.33 * 2 * ((\text{Price} - \text{MinLo}) / (\text{MaxHi} - \text{MinLo}) - 0.5) + 0.67 * \text{Value}.1$$

MinLo = Min(Lo, Period)

MaxHi = Max(Hi, Period)

Price = User Specified (Hi+Lo/2 is recommended)

Period = User Specified (10 is recommended)



Preferences



Price - Price value used as input for the computation. Options include Open, Close, High, Low, $HI+LO/2$, $HI+LO+CL/3$, $O+H+L+C/4$, %Change, or $OP+CL/2$.

Period - Period used to compute the maximum high and minimum low in the calculation above.

Keyboard Adjustment

The Fisher Transform period can be adjusted directly from the keyboard without having to open up the preferences window. Just select the indicator and then hit the up or down keys on your keyboard to adjust the period. The up arrow key increases the period by 1 while the down arrow key decreases the periods by 1.

RTL Token . . . FISH

The Fisher Transform can be referenced in the RTL language using the token FISH. To scan for the bullish signal (swing low) of the FISH turning up below the -1 line, use the following syntax:

$$\text{FISH} < -1 \text{ AND FISH} > \text{FISH.1 AND FISH.1} \leq \text{FISH.2}$$

And to scan for the bearish signal (swing high) of FISH turning down above the 1 line, use the following syntax:

$$\text{FISH} > 1 \text{ AND FISH} < \text{FISH.1 AND FISH.1} \geq \text{FISH.2}$$

Using the escape (esc) key

The escape key (esc) is used consistently throughout Investor/RT as a shortcut for dismissing (closing) the front window. When prompting dialogs appear, hitting the esc key is equivalent to clicking the "cancel" button in the dialog box (if present). Preferences windows, quote pages, charts, portfolios, etc. can all be closed with the esc key.

In Version 5.8, the esc key has an additional purpose when the front window happens to be a chart, quote page, portfolio, view/edit, or time & sales window. When any of these windows are in front, hitting the esc key will first eliminate the "selection" in the window. If there is no selection, the window will be closed. So, for example, if you have just clicked into a chart to select an indicator and you selected the wrong indicator you can esc the remove the selection. The esc key is also now used in chart window to "turn off" the drawing tool if one is active. For example, if you active the trendline drawing tool, the cursor changes to a pencil to denote the drawing tool is active. The esc key turns off the tool, returning the cursor to the normal arrow cursor. Only when (a) there is no selection and (b) no drawing tool is active, does hitting the escape key dismiss the chart window.

If you are editing a cell within a quote page, portfolio, or other "spreadsheet" type window in Investor/RT, pressing the escape key will restore the cell to its original value and remove the selection from the cell. Once the selection is removed, a second escape key will close (dismiss) the window.

Tick and TickBar Charting Improved

Those using charts having a periodicity of tick (1 tick per "bar") or TickBar (N ticks per bar) will notice a big change in Version 5.8. Ticks or tick bars used to be drawn in the chart in accordance with a fixed time scale horizontal axis. The display of these kinds of charts has now been greatly simplified and "de-coupled" from the time axis so that the ticks or tick bars are drawn compactly, one after another. The time stamp of each tick bar will be the time of the last trade

making up that bar. The time axis will be labeled, but the time spacing will not necessarily be even since the time between bars (or ticks) depends on the velocity of trading which usually varies throughout the trading session.

Charts having a tick bar or tick periodicity can no longer be mixed with "minute interval" charts. There is no longer a fixed time axis in such charts. Most technical indicators can be added to tick and tick bar charts. Some indicators, such as trend lines, whose implementation currently requires a fixed time axis, cannot be used with tick or tick bar charts. Some of these restrictions will be lifted in time as we re-implement the special case indicators using the new time independent horizontal axis needed to present tick bar and tick charts compactly.

Mixing two or more TickBar periodicity instruments in the same chart window, will give you a nice looking chart, but remember, the time axis is no longer fixed and the times of the bars will not necessarily "match" up. The amount of time it takes to produce a bar of one instrument will rarely if ever be the same amount of time to form a tickbar of the other instrument. You could even mix a 50 TickBar chart of an instrument with a 30 TickBar chart of another instrument. Both sets of tick bars would be right aligned in the chart window and associated technical indicators will line up with the instrument bars, but the bars of the two instruments themselves will rarely have the same time. The labels on the horizontal time axis will reflect the times of the bars of the primary instrument in the chart. The primary instrument is the first instrument found in the highest pane that is higher in the pane order than any other instrument in that pane.

Another key restriction on tick bar and tick charting is that horizontal scrolling is not (yet) supported. The number of tickbars shown in the chart can be expanded and contracted by changing the chart window size, or by adjusting the pixels per bar setting using the up/down arrow keys on the keyboard. Lookahead bars are supported in tick and tickbar charts. If you wish to examine tick bars or tick charts for a period of time in the past you can easily do so by setting the chart's view period to the desired ending time. The chart will then show tick bars derived from the ticks leading up to that user-specified ending time. Charts with a specific ending time are "static" charts, i.e. they do not update further in response to incoming data

Buttons for Changing Chart Style

A new button purpose, "Change the Chart Style" has been added. Chart buttons of this type can be created as pushbuttons or menu buttons. Each of the styles supported by Investor/RT has a two letter abbreviation that can be used to identify the style(s) associated with a particular button, e.g. CA for candlestick, or BA for bar, or LI for line. When the change style purpose is selected, the setup window for the button will show a menu of available styles. Choosing a style from the menu will add that style to the entry box defining the pushbutton or menu button. To create a menu button for quickly changing the chart from bar to line to candle, enter the styles codes as:

BA,LI,CA

or

Bar,Candle,Line

NOTE: Investor/RT uses the first two letters of the word (not case sensitive) to identify the style you want

Adding Sounds in Mac OS X Version

The Macintosh Classic version makes all sounds in the "System" file available for use in Investor/RT alerts and other places (see Setup: Preferences: Sounds). Under Macintosh OS X there are no system sounds, just a few sounds included by Investor/RT directly. You can add more sounds, including your own custom sounds to Investor/RT by dropping "snd" files into the sounds folder inside the Investor/RT Folder. The name of the sound file should not exceed 32 characters. The file must be of type "sfil" and must contain a valid Macintosh "snd" resource. Several sample sound files are included in the latest Investor/RT installer for OS X.

Macintosh OS X – Support for Dual Processors, Jaguar

The Macintosh OS X Version of Investor/RT is now compatible with OS 10.1.x and OS X 10.2.x (Jaguar). Recent improvements to the cross-platform software development tools Linn Software uses have eliminated a problem when Investor/RT is running on dual-processor hardware.

Custom Price Types Using Custom Indicators

A powerful new feature has been added to Investor/RT to allow the user to access Custom Indicator values anywhere that the "Price Type" options are available. Throughout Investor/RT, you will find places where lists of prices are presented. These prices include market data prices such as Close, High, Low, Open, and computed prices values such as $Hi+Lo/2$ or $Op + Hi + Lo + Cl/4$, etc. These price lists are found in many technical indicator setup windows, in the instrument setup window, in Point and Figure, Three Line Break, and Volume Profile Chart preferences, and many other places. Anywhere you see a price option, there will be eight new custom prices at the end of the price type list. Each of the custom price types in the list can be assigned to any Custom Indicator you have created. A new preferences window is available (see Setup Preferences: Prices, Custom). This window allows you to assign each Custom Price to a Custom Indicator (PriceOne through PriceEight). In price list menus, you will see menu items of the form "P1:CI_Name" where "CI_Name" is the name of the Custom Indicator. These Custom Prices will open up new possibilities for existing technical indicators (such as SSTAT, SSIM), and will enhance the charting capabilities of Investor/RT in many way (e.g. Point & Figure, Three-Line Break, Volume Profile).

Volume Histogram for PNF and TLB Charts

Point and Figure and Three Line Break charts have been enhanced with an option to show volume histograms for each column/line. A checkbox in the the PNF/TLB preference windows labeled "Show Volume" is used to select this new feature. When checked, a volume bar will be drawn behind each PNF/TLB column depicting the amount of volume traded during formation of the respective column.

New Scaling Option for Traditional Charts

A new option, "Use Last X Bars", has been added to the vertical scaling preferences. This option allows the user to specify automatic scaling based on any number of the most recent bars in the chart. For instance, if "Last 20 Bars" was specified, the chart would automatically scale based on the maximum and minimum data values of the last 20 bars only. This option is built into the range based scaling option. To access this option, check "Automatic range-based" scaling based on "Last X Bars". Then specify the number of bars on which you'd like your scaling to be based in the box to the right.

Two New Result Options for Signal Statistics (SSTAT)

The list of result types for the Signal Statistics indicator continues to grow. Two new results have been added:

- Bars From Signal To Highest Price
- Bars From Signal To Lowest Price

These result types give the number of bars from the signal to the highest price since the signal (or lowest price since the signal). They may be useful in identifying divergences.

Selecting Elements in Charts

Some minor changes have been made to the way candlesticks are selected in charts. Investor/RT now requires that the mouse pointer be aimed at a candlestick body when you click to select an instrument graphed as candlesticks. Formerly, a click anywhere in the high/low range of the candle would select the instrument. The intent of this change is to eliminate false selections of the instrument when the user's intent is to click to select a technical indicator. When there is a click in the chart, Investor/RT always tries to first to determine if the click is on an indicator in the chart pane. If not, instruments are considered. So for example, if you have a technical indicator line that happens to run through a candle wick, a click that misses the indicator will only select the instrument if the click was within the candle body (open to close range).

When clicking in the chart to select an element, if you accidentally select an element you did not intend to select, pressing the esc key will remove the selection (see item #18 above). Of course, you can always simply click again to replace former selection with a new one. It is not necessary to de-select before clicking again.

Changing Periodicity Use the Keyboard

When a traditional chart window is the front window, typing alphabetic letters causes Investor/RT to open a dialog for switching the ticker symbol in the chart. In similar fashion, typing numeric digits opens the Periodicity Selection window. The digits you type are interpreted as the periodicity you want; press the enter key to switch to the entered periodicity. For example, if the chart is presently in 5 minute periodicity and you want to change it to 15 minute, just type the digit 1, then the digit 5, then press enter. The first digit you type causes the dialog to appear and the second digit (5) is added to the right of the 1 giving 15. Press enter and the chart switches to 15.

Tick/TickBar vs. Minute Bars The digits you type are interpreted as minutes or the number of ticks per bar depending on the state of the chart when you begin typing. If the chart is currently in ticks per bar, you can change to a different ticks per bar by typing the number and pressing enter. Similar if the chart is displaying some minute interval (or even daily/weekly/monthly) and you begin typing digits, the digits are interpreted as minutes. As you type you can also, of course enter a colon followed by the number of seconds, e.g. 1:30 to get a one minute and 30 second bar.

Letter Codes Once the periodicity selection window is open you can type special alphabetic letters (D, W, M, I, or T). The letters can be typed in lower or upper case. D, W, or M, switch the chart to Daily, Weekly, or Monthly, respectively. So, if you have an intra-day chart open and you wish to change it quickly to Daily, type any numeric digit followed immediately with D, and hit enter (e.g. 1D<enter>) and the chart will switch to Daily Periodicity. Note that the only reason for typing the numeric digit first is to cause the Periodicity Selection window to appear. Typing a T switches to "Ticks per Bar" so you can continue entering the number of ticks per bar you want. Similarly, type M to switch to time per bar, so you can enter the minutes (and seconds if you like) of time for the bar.

If you are adjusting minutes per bar or ticks per bar in intra-day charts, this new capability makes it a snap to manipulate the periodicity of the chart rapidly with the numeric keypad at the right side of the keyboard. Just enter the digits and press the Enter key on the numeric keypad.

On the Windows platform, once the periodicity selection window appears and the focus is directed to the minutes or ticks per bar entry box, you may use the up and down arrow keys on the keyboard to pick a periodicity from the built-in list of choices.

Finally, pressing the <esc> key causes Investor/RT to dismiss the periodicity selection window without making any change to the chart's periodicity.

New RTL Token: DAYW (Day of Week)

The RTL token DAYW can be used to create day of week conditional scans, signals, or custom indicators. DAYW evaluates to a number between 0 and 6 with 0=Sunday, 1=Monday, 2=Tuesday, etc. The DAYW can be used in trading signals when backtesting to base trading actions on the day of the week.

Reference Lines and Scaling

An option checkbox was added at the bottom of the "Reference Line" indicator. It is titled "Include Reference Line when Auto-Scaling". The purpose of this option is to specify whether you want the value of the horizontal reference line to be included when computing the range of values shown in the vertical scale. When checked, the reference line value will be included thus making the reference line visible in the resulting automatically scaled window pane. If unchecked, the value of the reference line will not be considered, thus the reference line may appear or not depending on its value. The default preference can be set in Setup: Preferences: Charts: Technical Indicator: Reference Line. Each instance of the indicator can be adjusted individually by right-clicking on the reference line in the chart or using the Edit Chart Element button on the chart toolbar.

By default, all horizontal reference line setups created before version 5.8 in charts or indicator presets have this option unchecked, i.e. the line will NOT be included in scaling decisions. You must explicitly turn on the checkbox to force the line's value to be considered in scaling decisions. Reference lines created in the future using the horizontal reference line drawing tool will take on the default setting specified in Setup: Preferences: Charts: Technical Indicators.

New Result Options For Zig Zag Oscillator

A "Results" option has been added to the Zig Zag Oscillator indicator. This option will default to "Zig Zag Percent Change" which is the result that Zig Zag Oscillator has given in prior releases of Investor/RT. Four new choices provide access to a variety of data elements regarding the Zig Zag Oscillator. Each result option is discussed below:

Zig Zag Percent Change

This result represents the percent change of the current price (close) from the previous pivot price.

Retracement Level

This result represents the retracement level of current price in respect to the last leg of the Zig Zag.

Pivot Price

This result represents the price of the last zig zag pivot point.

Previous Pivot Price

This result represents the price of the next to last zig zag pivot point.

Direction

This result represents the direction of the current Zig Zag leg. A value of 1 represents the current leg is upward trending, while a value of 0 represents that the current leg is downward trending.

Renko Chart Improvements

Renko Charts have been improved to draw in the classic box style, as opposed to using the X's and O's that Point and Figure charts use. Renko charts can be created by simply clicking the "Renko Chart" checkbox option in the preferences of Point and Figure Charts. A Renko Chart indicator can be simulated in traditional charts by simply adding the Point and Figure indicator with a Reversal Criteria of 1.

Improved Indicator/Preset Preferences

Validation Investor/RT 5.8 incorporates improved validation of technical indicator preferences and preset preferences before using them to add indicators to charts. The improved method will eliminate side-effects when a particular indicator is enhanced in the future to include new options. Presets or chart setups that already exist for indicators in such cases will now be assigned proper default values for the newly added settings whether or not user the actually opens the setup for the indicator. Further, preset preferences will be updated automatically on the database if necessary. The new preferences management feature will assure that ongoing enhancement or refinements to existing indicators will not give rise to unexpected side-effects to charts and presets that were created and saved before upgrading to a new release.

Version 5.7 Enhancements, Initial Release*Vertical Scaling Improvements*

Vertical scaling options for traditional charts have been substantially improved in this release. New features include logarithmic scaling, range-based scaling, user-specified scaling interval markings.

Custom Instrument Data Generator

Investor/RT now has the ability to derive historical data of any periodicity for a custom instrument using the historical data of the components of the custom instrument. Custom Instrument data generation is accomplished in a chart window by clicking the data download button in the lower right corner of the chart window. Investor/RT will notice if the instrument in the chart is a custom instrument and will derive historical data for the chart's periodicity and viewing period. If automatic data downloading is turned on, simply inserting a custom instrument into the chart will cause data to be generated for the custom instrument. Similarly, you may use the Data Download window, accessible from the main toolbar, to request data generation for a particular custom instrument. First specify "Historical Data" as the download type and select the periodicity and starting date. Use the "One Instrument" box to specify the custom instrument. Note that data is generated for the custom instrument using the data currently on file for each component instrument. The data download window can also be used to generate data for a list of custom instruments in a quote page. This feature only applies to quote pages that consist entirely of custom instrument tickers. The built-in system defined quote page, ".Custom Instruments", is one such quote page. You may create user-defined quote pages listing any number of custom instruments and reference such pages from the data download window to generate historical data for the entire list.

Investor/RT uses precise date/time synchronization during the data generation process so that the "price" of each component is determined for each bar, even when the time series of each component do not completely overlap or when there are gaps in the time series of one or more of the components. The generated historical data will begin with the first date/time that all component instruments have in common for the desired periodicity. Generation will proceed forward in time to the current time based on the periodicity specified. The "session" of the custom instrument is used to determine the time span of each day's trading when producing historical bars.

The data produced by this process is a time series of prices. For daily charting, the resulting instrument data is best viewed as a line or connected line since there is no open, high, low to use for drawing bars or candlesticks. When generating intra-day data, we recommend using one minute periodicity in the data download window so that the output time series will have a value for each minute. When viewing this data in one minute charts, view it as a line. Higher periodicities, e.g. five minute can be viewed as bars or candles since Investor/RT produces open, high, low, last five minute bars from the one minute data.

New Traditional Charting Styles % Change Bars, Lines, Candles

Three new charting styles have been added for traditional charting, including % Change Candles, % Change Bars, and % Change Line. With these styles, prices are transformed into percent change values. These percent change values are based on the percent change from the closing price of the first bar in the chart (which is based on the viewing period in chart preferences). If we call this base price "BASE", and the current price "PRICE", then each value will be computed

as follows: $100 * (PRICE - BASE) / BASE$. BASE will be a constant throughout the chart for each candle/bar/line element. For % Change Candles and % Change Bars, the open, high, low, and close values are all computed using this % change method. In order for a technical indicator to use these "% Change" prices, the user must specify a "price" within the technical indicator preferences of "% Change". For instance, in order to overlay a moving average on top of % Change Candles, the user must specify a price of "% Change" within the MA Preferences window. Not all indicators have the price option available to them, so not all indicators will work in this way. By default, the indicators will operate on the true price values of the instrument.

New Options Added to MPD (Mixed Periodicity Data)

The Mixed Periodicity Data indicator has been enhanced with two new options. First, a checkbox has been added labeled "Mix Instrument" which allows the user to access another ticker (in addition to another periodicity). If this checkbox is checked, a text box is enabled where the user must type in the ticker symbol desired (case sensitive). MPD will then access the data for the periodicity and the selected instrument. The data is right aligned to fit the actual data in the chart. Another option has been added to MPD as a checkbox labeled "Stretch data to proper date/times". When this checkbox is checked, the data is expanded to match the actual date/times of the underlying instrument in the chart. One use of this option would be to draw tiered vertical reference lines at the high or low of the day, within an intraday chart. To do so, open an intraday chart and add MPD with the preferences "Daily", "High", and check "Stretch". Similarly, the 30-minute high horizontal lines could be overlaid on a 1-minute chart.

Order Execution via myTrack Brokerage

Investor/RT users with myTrack brokerage accounts will soon be able to place trades directly from Investor/RT. The order execution software has been in private beta testing for several weeks and is now ready for public beta testing to any interested Investor/RT myTrack users upon request. To request access to Investor/RT Version 5.7 with myTrack order desk enabled please email support@linnsoft.com and instructions for obtaining the installer will follow.

On Balance Volume Improvements

On Balance Volume (OBV) was enhanced with several new options. A checkbox labeled "Cumulative" was added. The "Cumulative" option forces the OBV to consider all previous data when calculating, as opposed to only the previous period. The OBV values accumulate throughout the chart. If the "Cumulative" option is unchecked, the user may specify a period over which the OBV will be calculated.

A new "Normalized" checkbox option is available which results in an oscillator that ranges between extreme values of -100 and +100. The OBV is normalized by first dividing the result by

the total volume, and then multiplying by 100. When "Cumulative" is checked, the total volume is the sum of the volume of all previous bars. When "Cumulative" is unchecked, the total volume is the sum of the volume of the bars in the previous period. A normalized result of +100 would mean that each bar over the period was an up bar, and therefore all volume was considered up volume. Similarly, a value of -100 would mean that each bar over the period was an down bar, and therefore all volume was considered down volume. A value of 0 would represent an even mixture of up volume and down volume over the period.

Also, the OBV can now be drawn as a histogram (hollow or solid) or a line (continuous or connected).

OBV Formulas based on the options selected:

Not Cumulative, Not Normalized

$$\text{SUM}\{\text{UVOL, Period}\} - \text{SUM}\{\text{DVOL, Period}\}$$

Cumulative, Not Normalized

$$\text{SUM}\{\text{UVOL}\} - \text{SUM}\{\text{DVOL}\}$$

Cumulative, Normalized

$$100 * (\text{SUM}\{\text{UVOL}\} - \text{SUM}\{\text{DVOL}\}) / \text{SUM}\{\text{VOL}\}$$

Not Cumulative, Normalized

$$100 * (\text{SUM}\{\text{UVOL, Period}\} - \text{SUM}\{\text{DVOL, Period}\}) / \text{SUM}\{\text{VOL, Period}\}$$

Center of Gravity (COG) Drawing Options Added

The Center Of Gravity (COG) indicator was enhanced to provide drawing options of histogram (hollow or solid) or line (continuous or connected).

Chart Slide Show Improvements

The traditional chart slide show feature has been revised so that it "locks on" to the front chart when you start the show. The slide show proceeds with that same chart even if you open new chart windows and/or activate (bring to front) other chart windows. When the slide show is paused (stopped) by pressing the pause button on the slide show control window, the slide show releases its associated chart window. When you resume the slide show it will once again lock onto whatever chart window is in front. If you close the subject chart while a slide show is in progress, the slide show will continue with the next front chart window it finds. If there is none, Investor/RT will prompt you to select a chart from the list of saved chart objects. The slide show control window title now shows the title "Slide Show in Progress" when it is active. The slide show delay between charts is specified in Setup: Preferences: Charts: General.

Custom Instrument Improvements

The Custom Instrument Setup window has been enhanced to facilitate automatic generation of historical data when you define or modify the definition of any custom instrument. If the box titled "Generate historical data on save" is checked when you save the custom instrument definition, Investor/RT will generate both daily and intra-day data using the historical data then on file for the underlying components of the custom instruments (see item #2 above).

A "Save and Close" button has been added to the window. This button has the combined effect of saving the custom instrument definition, generating historical data if requested, and closing the setup window.

A View Chart button has been added to facilitate viewing a chart of the custom instrument currently being setup. For example, you could define a new custom instrument, click Save to save it and generate historical data, then click View Chart to see a chart, revise the definition, save again, view the revised chart, etc.

The instrument selector has some features that may be of interest when working in the Custom Instrument Setup window. If you right-click on the ticker or name column title in the instrument selector, a popup menu appears for changing the list of tickers in the selector. You can, for example, choose ".Custom Instruments" and the instrument selector will list all of (just) your custom instruments. If you double-click on any custom instrument ticker in the instrument select, the definition of that custom instrument will be displayed in the setup window. Double-clicking on an custom instrument is equivalent to single-clicking to select a custom instrument and then clicking the "Select" button. Thus you can double-click on any custom instrument and then click view chart to see both the definition and chart window.

Finally, a new button titled "View Custom Instrument Summary" has been added to the bottom of the custom instrument setup window. Clicking this button opens a text window showing the formulas for all of the custom instruments defined to Investor/RT. Here is a sample of what the text window looks like:

```
Custom Instrument: Testing 456, Session 6
TEST456 = 5.41522 MSFT+ 0.577433 CA+ 7.33491
CSCO+ 0.331131 NTAP+ 0.48169
-----
Custom Instrument: My Index, Session 6 MYINDEX =
ADBE+CA+COMPX+CSCO+IBM+IP+JNPR+MSFT+NEWP+NTAP+ORCL+QQQ+SBUX+T+VN
O
-----
Custom Instrument: Ratio plus a constant, Session 6
CAIBM = 4 CA+IBM+ 15.5 +INDU(lo)
-----
Custom Instrument: Focus Stock Index, Session 6
```


$\begin{aligned} \$\text{FOCUS} = & \\ & \text{ADBE} + \text{CSCO} + \text{ORCL} + \text{QQQ} + \text{IBM} + \text{T} + \text{CA} + \text{MSFT} + \text{SBUX} + \text{VNO} + \text{JNPR} + \text{NTAP} \\ & \text{-----} \end{aligned}$

Note that multipliers of 1.0 are implied when the multiplier is not shown. A number followed by a ticker means that number times the price of that ticker. The close price is implied if the ticker is not followed by a price indicator, i.e. INDU means the last price of INDU while INDU(lo) means the low price of INDU. When the price indicator is 1.0, the multiplier becomes a constant so its value is listed in the formula without a ticker. See the third example above.

Candle/Bar/Histogram Borders In 5.7 Beta 1

We changed the drawing of candlestick charts to add a thin border around the candle, along with drawing the candle wicks in that same border color. The border color was formerly based on the scale color. We have made this border color optional, and given the user control over the color of that border. There is a new checkbox in the chart preferences window titled "Candle/Bar Border" (between the candle and bar color controls). To the right of this checkbox is a color control which specifies the border color. If this checkbox is checked, candles borders and wicks will be drawn in the color specified to the right of the checkbox. If this checkbox is unchecked, candles will be drawn without borders.

The border option was expanded to include not only candlesticks, but also bars and histogram style instrument drawing. The same rules apply. When the "border" checkbox is checked, the bars or histogram will be drawn with a border in the color specified. If the checkbox is unchecked, no border will be drawn.

New Instrument Drawing Styles: Wickless Candles and Bi-Color Line

Wickless Candles

The body of the candle (a rectangle) is drawn vertically representing the close at one extreme and the open at the other. The wicks (highs and lows) are not drawn. The same rules that apply to drawing Candlesticks and % Change Candles will also apply to Wickless Candles. Borders will be drawn if applicable, and the fill color will be representative of up or down candles. The "Hollow Up Candles" option also applies to Wickless Candles.

Bi-Color Line

The "Bi-Color Line" style is very similar to the "Continuous Line" style except it uses two colors. Each line segment, connecting prices, will be drawn based on whether price increased or decreased from the previous price. If price increases, the segment will be drawn in the up color. If price decreases, the segment will be drawn in the down color.

All drawing styles, including the new ones, work hand in hand with the "Paint Bars" indicator. Regardless of whether the style is histogram, line, candle, or bar, or any derivation of these, the Paint Bar color will be represented.

Borders will not be drawn, even when turned on, under certain pixel/bar settings. Each drawing style needs a certain minimum pixels/bar of space in order to have room to accommodate the borders and still clearly see the colors within. For Candlestick and histogram styles, borders will be drawn at 6 pixels/bar and higher. For bars, borders will be drawn at 23 pixels/bar and higher. Also, borders will not be drawn under the following circumstances: the chart is a candlestick chart, the chart contains a "Paint Bars" indicator, and the "Hollow Up Candles" option is checked. Under those circumstances, hollow candles that should be painted MUST paint the border in order to differentiate the candle. Therefore, these candles will not be drawn with a border.

Custom Horizontal Scale Markings

An option has been added to the traditional chart preferences to allow the user to control the spacing of the horizontal scale markings on intraday charts. The option is a checkbox that reads "Custom Markings Every X [Bars/Minutes]". The user may choose increments of minutes or bars for the spacing. This option only applies to intraday (x-minute) charts. If the checkbox is checked, the horizontal scale markings, which are labeled with time and associated with vertical gridlines (if applicable), will be drawn at the user specified distance. A marking will always be drawn prior to the first bar of each trading session. If the user specifies a custom marking interval of every 20-bars on a 3-minute chart, then the first marking will occur at the 20th bar of the day, or 60 minutes into the session. Subsequent markings will be drawn every 60 minutes throughout the session.

If there is insufficient room to draw the markings at the interval specified (based on the pixels/bar setting), Investor/RT will then double the interval until it has room to draw the time associated with the marking in the horizontal scale. If the user would like for the chart to draw markings as frequently as there is room, then a setting of "every 1 bars" should be specified. If, however, the user would prefer to see only one marking per session, at the session open, then a setting of "every 999 bars" should be specified. If the custom marking option is unchecked, then Investor/RT automatically decides on a reasonable interval for drawing the horizontal scale markings.

Trading System Simulator

An indicator named "System Simulator" (SSIM) has been added to Investor/RT. SSIM gives the user the ability to quickly chart a simple trading system.

Mixed Periodicity Data (MPD) Enhancements

MPD has been enhanced to mix more than just periodicity, and the mixing of periodicity is now optional. MPD can now mix any or all of the following three: periodicity, ticker, and data source (either instrument data or indicator results). A checkbox has been placed in front of the "Mix Periodicity" control to give the user control over whether or not periodicity is mixed. If this checkbox is unchecked, the periodicity of the underlying instrument (in chart or scan) will be used. Mixing the ticker symbol is also optional. If the "Mix Ticker" checkbox is unchecked, the underlying instrument will be used. If the checkbox is checked, then the user can specify the ticker symbol from which data will be drawn (case sensitive). The data source can now be either "instrument data" or "indicator data". Instrument data includes price and/or volume options such as high, low, ohlc/4, etc. The indicator option gives the user access to any of the built-in indicators, including custom indicators. The "Indicator Preferences" button allows the user to specify the preferences for the indicator selected.

The MPD data is built by first retrieving the data based on combination of ticker and periodicity settings specified. Then this data is used to compute the final result based on the data source chosen. The results may then be "stretched to proper data/times" if applicable, and if the periodicity is mixed.

Custom Indicator Enhancement

A checkbox has been added to the Custom Indicator dialog titled "Oscillate About". This option is provided for oscillator/histogram style custom indicators that oscillate around a value other than 0. If this checkbox is checked, the resulting histogram will be drawn to oscillate about the value specified, instead of oscillating about 0 (the default).

Histogram Style Enhanced

Several enhancements were made to the "Histogram" instrument drawing style of Traditional Charts. First, two colors are provided to allow for both an up and down color. The histogram will be drawn in the up color when the value increases, and in the down color when the value decreases. Also, a "Price" option is provided to give the user control over which price the histograms will be based upon. Histograms honor the new "Border" color option in the chart preferences. If the "Border" option is checked, a thin border in the color specified will be drawn around the histogram blocks. The borders are drawn on y when the pixels/bar is six or higher.

Improved Charting Preferences Setup

The Traditional Chart Preferences window has been redesigned as a much smaller window with a "tabbed" user interface. Charting Preferences are divided into four groups each having a tab at the top of the preferences window. This same window design appears when you access Setup: Preferences: Charts: Traditional Charts for setting up "default" preferences, as well as

when you access the preferences for a particular chart. The four tabs are named "General", "View Period", "Colors", and "Options".

General Tab

Allows you to modify the chart style (line, bar, candle, etc.), the periodicity, the pixels per bar, and the chart name. In the default preferences window, you can specify the default dimensions for traditional chart windows.

View Period Tab

Includes periodicity along with the "Look Ahead Bars" count. For particular chart, this tab specifies the viewing period start and ending times of the chart. In the default preferences window, this tab is where you specify the default number of bars to view when changing periodicities.

Colors Tab

This tab consolidates all color preferences into a compact window. Checkboxes are provided adjacent to the grid line color and the border color controls to enable you to turn on/off grid line and border options. The options are also present in the Options Tab.

Option Tab

This includes all of the "checkbox" options for traditional charts such as the hollow candle and hollow histogram options, the border and grid line options, chart lock, etc. The new horizontal scale markings option is also in this tab.

The new chart preferences window can be quickly accessed by right clicking in the horizontal (time) scale of any traditional chart. Macintosh users will control-click instead. The window "remembers" which tab was most recently referenced and will open with that tab selected. Due to its smaller size, the preferences window can be conveniently positioned to the side of a chart so you can vary settings and click "Apply" to see the effects before dismissing the window. When you first open the new window, if the tab you want is not visible you can either click on the desired tab using the mouse or tap the space bar repeatedly to cycle through the tabs until the desired tab is visible.

Bar Time Intervals in Seconds

Version 5.7 generalizes the notion of time-based bar charting by enabling charting and analysis of time intervals expressed in minutes, seconds, or minutes and seconds. Throughout Investor/RT, the standard "Periodicity Control" is used to display a periodicity value, e.g. 1 minute, 5 minute, Daily, Tick, 15 Ticks, etc. Clicking on a Periodicity control (or right-clicking in a chart and choosing "Periodicity" from the popup menu) opens the Periodicity Selection window. This window has been revised in Version 5.7 to enable entry of the time per bar in

minutes : seconds format. At the left side of the Periodicity Selection window, convenience buttons labeled "15s", "20s" and "30s" have been added for quickly selecting a periodicity of 15-seconds, 20-seconds or 30-seconds. At the right side of the window there are two radio buttons, one for choosing an intra-day periodicity based on a fixed period of time ("Time per Bar") and the other for choosing a periodicity based on a fixed number of ticks ("Ticks Per Bar").

When "Time per Bar" is selected, there is an entry box titled "Minutes : Seconds" for specifying the time allotted to each bar. Whole numbers entered into this box are considered to be minutes. Numbers entered to the right of a colon are treated as seconds. The number of seconds need not be less than 60 (e.g. 1:30 is equivalent to 0:90). The box has a pull down menu listing a variety of periodicities (e.g. 0:30, 1:00, 1:30, 2:00, 2:30, 3, 5, etc.). Any number of minutes can be entered into the box followed by a colon and any number of seconds. As you enter minutes and seconds, the title of the Periodicity Selection window changes to show the resulting periodicity. Here are some sample entries and the resulting periodicity value (displayed in the window title):

1 Minute	
5 Minutes	
:75 75 Secs (1:15)	
1:20	80 Secs (1:20)
0:30	30 Seconds
:15 15 Seconds	

To request N minute bars, simply enter any whole number of minutes. Investor/RT will add ":00" to your entered number automatically as you type. The periodicity control will show the chosen periodicity as "N Minutes" whenever the periodicity is a multiple of 60 seconds. If the periodicity is not a multiple of 60 seconds, the periodicity control will show "N Seconds" whenever the number of seconds is less than 60 and will show "N Secs (mm:ss)" whenever the periodicity is above 60 seconds.

When "Ticks Per Bar" is selected there are two entry boxes available, one for entering the number of ticks per bar, the other for indicating the seconds of resolution when drawing the chart. A value of 1 tick per bar is the "Tick" (tick data) periodicity. Values above 1 are called "Tick Bars", bars that are composed of some fixed number of ticks.

Charting Periodicities that are not multiples of 60 seconds require that Investor/RT have access to tick by tick data to compose the bars. If you have elected to compress tick data into N-minute bars after 0 days, then tick data will not be available after the close for reviewing charts of such periodicities. See Setup: Preferences: Historical to adjust the compact option. We suggest you retain a day or two of tick data if you desire to view second-interval charts for more than the current trading session.

New RTL Token: ZIG (Zig Zag Indicator)

The Investor/RT RTL language has access to the Zig Zag indicator using the token "ZIG". In the language, ZIG represents the % change level that the current Zig Zag leg has achieved. By qualifying the ZIG token, the user can access the % change level that was achieved by previous legs of the Zig Zag indicator. For instance, ZIG.1 would represent the % change level reached by the next to last leg, while ZIG.2 would represent the % change level reached by the leg prior to that. ZIG.1 and ZIG.2 could never have a smaller magnitude than the "minimum price change (%)" specified in the preferences, since these legs have already been validated to the percent change level.

ZIG, however, may not yet have reached its required threshold. The following scan would test the current leg for validation on a 10 % change Zig Zag:

ZIG >= 10 OR ZIG <= -10

The following scan will find those instruments that have just recently been validated:

(ZIG > 10 AND ZIG < 10.5) OR (ZIG.1 > 10 AND ZIG.1 < 10.5 AND ZIG > 0.5)

The first part of this scan, "ZIG > 10 AND ZIG < 10.5", finds any instruments whose current leg is between the 10 and 10.5% levels. The second part of the scan, ZIG.1 > 10 AND ZIG.1 < 10.5 AND ZIG > 0.5, finds instruments whose current leg is actually a very small negative value, but whose recently validated leg is between 10 and 10.5%. The Zig Zag indicator can now be selected by clicking on an endpoint of any trendline that composes it.

Shape Drawing Tool Added

The "Price Time Cycles" indicator has been more appropriately renamed the "Shape" indicator, and assigned a button on the chart toolbar. The toolbar button makes it easier to add a Shape to the desired location on a chart. The button depicts a red square and a blue circle, and is fourth from the bottom in the right column. First, click on the toolbar button and the cursor will change to a pencil with a square beside it. Drag a rectangle in the chart around the region you would like to place your Shape. Once the Shape is in place, it can be moved by dragging the small dot which is either in the center, or lower left corner of the shape (depending on whether "Center on Coordinates" is checked in the Shape preferences).

It is recommended that you then work with the Shape indicator preferences to come up with combination you of settings you would use most often. To open up the preferences for the Shape, just double-click on the small dot on the Shape indicator. Some may prefer a rectangle while others prefer a square. Some like blue repeating rectangles while others just want a single green ellipse. Once you've settled on your preferences, you should make this your default settings. Again, open up the preference window, and choose "Presets: Make Default".

Now, each time you use the toolbar to add a Shape to your chart, the shape will inherit these default settings.

There are a number of ways to adjust the Shape indicator directly from the keyboard. A detailed table on these options, along with other information on the Shape indicator, can be found at:

See <http://www.linnsoft.com/tour/techind/shape.htm>

Keyboard Shortcut for Scan/Signal/CI-Based

Indicators For any indicator built upon a scan, signal, or custom indicator, the user can quickly access the underlying scan, signal, or custom indicator using a keyboard shortcut. First, select the indicator in the chart, then press the keyboard combination "Ctrl-Up Arrow" (Option Up-Arrow on Macintosh). The setup window for the underlying scan, signal, or custom indicator will appear, allowing you to make adjustments to the syntax. Click "Save" to apply the change to the chart. This shortcut saves several steps formerly required to make such changes. The indicators to which this shortcut applies are: Scan/Signal Markers, Custom Indicators, PaintBars, Scan Statistics, System Simulator, and Color Markers. System Simulator actually involves two scans/signals. In order to adjust the "Entry" scan/signal, use "Ctrl-Up Arrow". In order to adjust the "Exit" scan/signal, use "Ctrl-Down Arrow". On Macintosh use the Option key for "Ctrl".

Volume Profile Enhancements

Volume Profile Charts have been enhanced with a new checkbox labeled "give each bar a volume of 1". This option is only available (active) when the "Use Price for last X days" (use daily data) option is checked. When "give each bar a volume of 1" is checked, each day will contribute a volume of only 1 to the histogram, instead of the actual realized daily volume. This has the effect of giving each day equal weighting. This new option can be combined with the new price type (CL – CL.1) to provide a bell shaped distribution curve of the daily change in price. By assigning each bar a "volume" of 1, and using change (CL – CL.1) as the underlying price, the histogram show the number of bars (days) at each range of change. For instance, if you choose to display the last 500 days, with a range of 0.50, then the column showing 0 to 0.50 might be 26, representing 26 of the 500 days had a change (from previous close) between 0 and 0.50.

New Price Options

Four new price options have been added to the list of price options that appear throughout Investor/RT (instrument setup, technical indicator preferences, etc.). The four price options are listed below with a brief explanation of each:

CL – OP (Change from open)

CL – CL.1 (Change from previous close)
CL – DAYOP (Change from open of session)
CL – DAYCL (Change from previous session close)

While the tokens CL and OP represent the close and opening prices of the current bar, CL.1 represents the closing price of the previous bar, and DAYOP and DAYCL represent the opening and closing prices of the session (day). DAYOP and DAYCL values will change only once per session (day). CL – DAYOP represents the change in price from the opening price of the session. While CL will constantly change throughout the session, DAYOP stays constant and only changes on the first bar of each day. CL – DAYOP will essentially reset to 0 each session, and build from there. CL – DAYCL will reset to the daily gap. If price does not gap, then CL – DAYCL will reset to 0. However, if price gaps up 2 for instance, then CL – DAYCL will begin the first bar of the day at a value of 2.

Custom Histogram Drawing Style

Many existing indicators, including Custom Indicators and Statistics, provide several options for drawing style, including Connected Line, Continuous Line, Solid Histogram, and Hollow Histogram. A fifth option has now been added to this list called "Custom Histogram". Custom histogram has two new features. First, the user is given control over a constant width for the histogram bars. The width can be anywhere from 1 to 10 pixels. While solid and hollow histograms have a dynamic width that changes based on the pixels per bar setting (in chart preferences), custom histograms have a fixed width, independent of the pixels per bar. Also, if multiple custom histograms exist (overlaid) within the same window pane, they will automatically be stacked horizontally in a way that allows them all to be visible. For instance, if 3 custom histograms were added to a single window pane, each with a width of 3 pixels, and the chart was setup with 9 pixels per bar, then the histogram bars would line up side by side, and each would be clearly visible.

Horizontal Reference Line "Repeating" Option

A new option has been added to horizontal reference lines giving the user the ability to repeat the reference line throughout the chart at a specified distance apart. The preference is a checkbox labeled "Repeat every ____". As an example, if the reference line was drawn with "Specific Price: 50.0" and the repeating option was checked with a setting "Repeat every 2", then reference lines would be drawn at 50, 52, 54, etc., as well as at 48, 46, 44, etc. The repeating reference lines will exhibit the same characteristics as the primary (base) reference line (color, hide price, compact, show text, etc.). This new option can be used to draw customized horizontal gridlines throughout any chart pane. If you prefer not to show any text (label) on the reference lines, then check "Hide Price" checkbox and uncheck the "Draw Text" checkbox.

Version 5.7 Rev 1

Info Box Indicator for Traditional Charts

A new indicator titled "Info Box" has been added that provides a tabular display of an instrument's market data and optionally, the values of technical indicators displayed in the chart window.

Button Indicator Supports N Second or N Tick Periodicity

You can now add Periodicity buttons and Periodicity menu buttons that reference periodicities expressed in seconds or number of ticks (tickbar). Specify the periodicities in any of the following formats when setting up the button preferences (where dd represents one or more numeric digits:

Minutes and Seconds:	dd:dd
Seconds	0:dd (or simply :dd)
Seconds lower case)	dds (e.g. 30s, 45 s, s must be
TickBars	ddt (e.g. 25t or 50 t)

Improved Exception Handling in Macintosh OS X

Version Investor/RT for OS X now handles system errors in the same way as the MS Windows version. A "Fatal Error" message appears giving an error code and location. When you the OK button, Investor/RT closes the database properly and stops the data feed properly before quitting. The improved exception handling means that it is not necessary to perform a Database Verify upon restarting the program after a fatal error or some kind. Please report all Fatal Errors to support@linnsoft.com. After starting Investor/RT up again the text of the fatal error message can be copied from the Message Log (File: Open: Message Log) for pasting into an email message.

Printing Batches of Charts using a Slide Show

The slide show toolbar now has a "Printer" icon at the right end. This button is used to turn on and off batch printing of charts during slide shows. When the button icon is a printer with a red slash through it, slide show printing is OFF. This is the default. Click the button to toggle between on and off. When the button icon is the printer icon (no red slash), starting a slide show causes each chart that appears during the slide show to be printed (including the first one that was visible when you start the slide show).

On the Windows platform, if you have a default printer setup, the printing takes place without user interaction. This new feature is not at present as useful on the Macintosh platform since the Macintosh printing function necessitates clicking a print button in an ensuing dialog box to

confirm the print operation. Under MS Windows with a default printer specified this feature can print a batch of charts for the tickers in any quote page unattended. If you have multi-linking enabled for the slide show, only the front most chart window is printed for each ticker in the slide show.

eSignal/myTrack Trade Time Stamping

Investor/RT since its introduction has time stamped each incoming trade with the local time per the computer clock. This method was adopted many years ago when the actual time that a trade occurred was not always available from the data source or because the time given was insufficiently precise. Investor/RT by design displays time based intra-day charts in the time zone of the user. Of course, this local time zone is not necessarily the time zone in which the trades occur. For these reasons, the time of the local computer clock at the instant the trade report is received was used as a reliable method of time stamping the time series of trades.

This approach has some significant disadvantages. First, if the computer clock is not set exactly accurately to the second, the time stamps will be "off" by the amount the computer clock is "off". Further, the trade may have actually occurred several seconds before the trade report is received by Investor/RT. If a trade that occurs at 9:34:59 is received and time stamped by Investor/RT at 9:35:01 even a small 2 second delay in recording the trade can effect the formation of bars when an extreme price happens to occur very close to the time a bar ends or begins. When you download historical intra-day data from the data service, the bars supplied are bars formed using actual trade times. Thus, refreshing an intra-day chart often results in different bar formations. The solution to these problems is to use the data feed supplied actual trade time, adjusted to the local time zone, to record each trade, rather than the computer clock time.

This has been done, initially for the eSignal and myTrack versions of Investor/RT in version 5.7. We expect to continue work in this area to revise all supported data services to handle trade recording this way. With this change the reception and charting of real-time data should yield the same bar/candle formations regardless of whether the data was downloaded after the fact or whether the data shown in the chart has been captured in real-time. The computer clock is still used to determine the "current" time of day so it is still important that the computer clock be set accurately to the second.

Zig Zag Enhancements

Two new options were added to the "Zig Zag" indicator preferences. First, a new checkbox labeled "Draw reference lines at X %" was added. This allows for the drawing of reference lines on each leg of the Zig Zag, at a user-specified % change level from the base of the leg. A common level for this option would be to draw the reference lines at the same % change level as specified in the "Minimum Percent Change" setting. This way, the user can quickly see when

each leg of the Zig Zag has met its minimum percent change requirement, and how far prices moved past that level.

Also, a new "labeling" option was added, giving the user the ability to label each leg of the trendline. This option is implemented using a list box. The first selection in the list box is "No label". The next 11 selections allow for displaying beginning and/or ending price, change or percent change of each leg, bars spent in each leg, or several combinations (% change and bars, etc). A recommended setting for Zig Zag would be to display the % change of each leg, or maybe the % change and the number of bars (% change and bars). With these two new options, the user can get a clearer representation of when each leg meets its minimum required % change, and exactly how far that level is exceeded.

Zig Zag Oscillator – New Indicator

A new indicator called "Zig Zag Oscillator" has been added. This indicator provides a way of viewing the Zig Zag information in a different form, oscillating about 0. The indicator represents the percent change at each bar of the current price from the base price of the current Zig Zag leg. When the Zig Zag is currently in an uptrend state, the Zig Zag Oscillator will be above 0. Similarly, when the Zig Zag is in a downtrend state, the oscillator will be below 0. Optionally, reference lines may be drawn at any percent change level. If a reference line value of 10% is specified, reference lines will be drawn at both 10% and -10%. It is common to draw the reference lines at the same level as the minimum percent change level, in order to clearly see when prices have reached the minimum required level.

New "Paint Background" Option Added Prior to version 5.7.1

The Paint Bars Indicator had two drawing options: "Paint Bars" and "Paint Background". The "Paint Background" option painted the background of the bar/candle/line/histogram from the top of the chart pane to the bottom of the chart pane. This option has been renamed "Paint Background (Top to Bottom)" and a third option has been added labeled "Paint Background (High to Low)". This new option limits the drawing of the background to the high/low range of the bar itself. This new option gives the same information as the former "Paint Background", but uses much less painted real estate in providing that information. This new style works properly when applied to any instrument drawing style (histogram, line, etc).

Trendlines - New Labeling Option

A new labeling option has been added to the Trendline indicator, providing the ability to label each trendline. A variety of labeling options are presented in a list box in the preferences for the trendline. The first selection in the list box is "No label". Each existing trendline should default to this option, resulting in no label and no change when upgrading. The next 11 selections allow for displaying beginning and/or ending prices, change or percent change of the trendline, bars spent in the trendline, or several combinations (% change and bars, etc). These

new labeling options allow the user to quickly see the endpoint prices of the trendline, how much price changes within the trendline, the slope of the trendline (in price/bar) and/or how many bars are spanned in the trendline.

The new trendline labeling capability has been implemented in both the Trendline and Zig Zag indicators in of release 5.7.1. Other trendline-based indicators will gain this feature in a future update. If you have a suggestion for indicators you feel would benefit from this labeling option, please email your suggestion to support@linnsoft.com.

"State" Option for System Simulator (SSIM)

A new "Result" option has been added to the System Simulator (SSIM) indicator called "State (In=1, Out=0)". When the system is in a position (either long or short), the result is 1, and when the system is not in a position (exited), the result is 0.

"Period" Option for System Simulator (SSIM)

A new option has been added to System Simulator that allows the user to specify how many bars will be included in the evaluation. The option is labeled "Evaluate Last X Bars". As an example, if the user specifies a setting of "Evaluate last 30 bars", then only the last 30 bars will be used for SSIM. The results will all be zero up until the 30th bar back from the most current bar.

"Compress" Option added to MPD

A "Compress (Filter Out Zero Value)" option has been added to the Mixed Periodicity Data (MPD) indicator. This option simply filters out any results of 0, and then right aligns the remaining results.

Version 5.7 Rev 2

MS Windows Version Color Selector Improved

Clicking on a "color selection control" in any Investor/RT setup window now pops up a smaller standard MS Windows color pallet centered where the mouse was clicked. Formerly, the pallet opened in the far upper left corner of the screen. The standard color pallet contains 48 standard color selections plus 16 user-customizable color choices. A "Define Custom Colors" button is available for expanding the pallet to full size so that custom colors may be created. If you shift-click on any Investor/RT color selection control, the MS Windows color pallet opens immediately to the full size for custom setup. To define a custom color:

1. Click on any one of the 16 custom color rectangles to select the one you wish to setup.
2. Click inside the color spectrum at the right to specify the basic color.

3. Optionally click inside the intensity strip to lighten or darken the color.
4. Click the "Add to Custom Colors" button to set the resulting color into the selected custom color rectangle.

Any changes you make to the MS Windows custom colors will be saved permanently in the Investor/RT database so these colors will always be available for color selection in the future. Prior to 5.7.1 custom color changes were discarded when you quit Investor/RT.

Info Box Tool

An Info Box has been added to the charting toolbar. Click once to select the tool, then click the mouse anywhere inside the chart to insert an "Info Box" into the chart. The Info Box will be positioned with its upper left corner at the spot where you clicked inside the chart window. The properties of the box will be the default properties specified in the Setup: Preferences: Charts: Technical Indicators window for the Info Box. The position of the Info Box within the chart window can be changed either by dragging and dropping (new in 5.7.2) or by using the keyboard shortcuts described in item #26 above.

Another technique for quickly adding or removing an Info Box is to create an Info Box "Button". First create a preset for the Info Box preferences you wish the button to use. Then add a Button to the chart setup with purpose "Add a Preset Indicator...". Pick the preset for the Info Box. The resulting button will be titled "INFO". Clicking the button to add the Info Box to the chart or remove it if present. You can override the button title and background color of course.

Quote Page Column: Reception Time (Rec Time)

The "Date Time" and "Time" data columns in a quote page now reflect the data feed provided "trade time" of the most recently received quote. This is true initially for the myTrack and eSignal data feeds. Other feeds will follow in the weeks ahead. A new data column named "Rec Time", short for reception time or received time, shows the time of day that the last quote or trade report was received according to the computer clock. Thus if you are seeing 10:40:34 as the "Time" and 10:40:38 as the Rec Time, and your computer clock is accurate to the precise second, this indicates a lag of four seconds between the time the trade occurred and the time the trade was received and processed by Investor/RT. The data column called "Lag" can be added to a quote page to show this lag time, the difference between the time Investor/RT received the quote and the trade reportedly occurred. Please be advised that the lag time is not necessarily a reflection of the data service in use. If Investor/RT is very busy computing technical indicators or doing running an intra-day scan, raw data from the data service can be received and queued for processing. The Rec Time is the time at which such queued data is actually processed and posted into the quote page. Thus the lag be reflect time spent "in transit" to Investor/RT plus any time spent waiting to be processed within Investor/RT.

Portfolio Reports Improvements

A number of new "time periods" have been added to the portfolio reports setup window. The reporting periods supported originally were: this year, this quarter, this month, this week, today, last year and all years. The new reporting periods added are: yesterday, last week, last month, and last quarter. The new reporting periods make it easy to compare results of this month to date vs. last month, this week to date vs. last week, etc.

Date Time Control Improvements

The Date Time control used in the Data Download window and the setup window for the DV function has been improved. The control now provides for explicit user setup of the session number to be used when setting up relative times such as "Session Start" and "Session Stop". Also, time values entered by the user are "aligned" to the end of the most recently closes session if the time specified is outside normal trading hours. Formerly, there was no user control over which session to use; session 0 was used by default for all time alignments. Obviously the session setup is only applicable when specifying date times for intra-day purposes. The menu of choices for the "Time" component of the Date Time shows the session that is being used for time alignment purposes. A new menu choice named "Specify Session..." at the bottom of the Time menu elicits a prompt for revising the session number to use. This enhancement makes the DV token in the RTL language much more functional for users who track issues in a variety of international markets with much different session times.

Referencing Scans/Signals/Custom Indicators in other Scans/Signals/Custom Indicators

The RTL tokens SCAN and CI have been generalized so that either of them can be used within the definition of any scan, signal, or custom indicator. Prior to version 5.7.2, a scan (or signal) could refer to another scan or signal or custom indicator, but custom indicators could not reference other custom indicators or scan/signals. A positive side effect is that the use of SCAN and CI tokens within scans/signals/custom indicators is considerably more efficient in terms of computation resource usage. Preliminary testing on a few "worst case" examples showed at least 50 times faster evaluation of the scan using the new implementation. This change affects the way you use the SCAN token inside the definition of another scan or custom indicator. Specifically, the SCAN token is now considered an arithmetic value just like MA or any technical indicator. The SCAN token's arithmetic value will be 0.0 or 1.0 (zero for FALSE, one for TRUE). Thus if you have tokens SCANa, SCANb, and SCANc, each setup to reference a different scan, if you want to test for all three scan conditions being true you would write:

$SCANa + SCANb + SCANc = 3$

If you wanted to test for any two or more of the conditions true you would write:

$SCANa + SCANb + SCANc \geq 2$

If you wanted to test for any two (but only two) of the conditions true you would write:

$$\text{SCANa} + \text{SCANb} + \text{SCANc} = 2$$

Notice the use of the arithmetic addition operator (+) rather than the logical AND operator here.

You can use a SCAN token anywhere you can use a technical indicator token, just remember that the values for each bar will be either zero or one. For example you can write a scan:

$$\text{SUM}(\text{SCAN}, 20) > 5$$

To find all instrument for which scan condition SCAN has been true more than 5 times during the last 20 periods.

Paint Bars Improvements

The Paint Bars indicator has been enhanced to add a new painting option called "Paint Background (High to Low)". In contrast to the option "Paint Background (Top to Bottom)", this new painting option uses the specified scan/signal/ci criteria to paint just the background behind the high to low price range for each bar. Further, you can now added multiple paintbars of different kinds to the same paint and Investor/RT will merge the painting effects correctly. You could have one paintbars setup to paint the entire background is a special way under some condition, another to paint the high – low background also under some other condition, and a third to paint the actual bar or candlestick in a special way under a third condition.

"Histogram Coloring"Options added to Volume Analysis Indicator

The Volume Analysis indicator histogram now has three different coloring options: Rising/Falling Prices, Rising/Falling Volume, Above/Below Average. The "Rising/Falling Prices" option uses the up color when price increases, and the down color when price decreases or remains the same. The "Rising/Falling Volume" similarly uses the up color when volume increases, and the down color when volume decreases or remains the same. The "Above/Below Average" option uses the up color when the volume is above the average of the volume of the previous 20 bars, and the down color when volume is below this average. These coloring options are used for the solid, hollow, and custom histogram drawing options.

Scan Marker Positioning Option: "Top of Chart"

Scan markers can now be positioned at the top of the chart window pane, in addition to the existing options of "Beneath Low", "Above High", and "Bottom of Chart".

Chart Buttons for Adjusting Pixels per Bar

The "Button" indicator has been enhanced to add another "purpose", changing the pixels per bar property of the chart window. Either a Menu Button listing several pixels/bar numbers or a single pixels/bar number button can be added to charts. This button purpose makes it more convenient and faster to make quick adjustments to the pixels per bar without using the keyboard arrow keys. For example, you could have a button with 6 and 60 choices for quickly zooming in (6 pixels) or zooming out (60 pixels) a chart.

If you prefix the number of pixels per bar with a plus or minus sign, Investor/RT will take this to mean "increase" (+) or "decrease" (-) the current pixels per bar. For example, a pixels per bar menu with four menu items can be defined as:

+4,-4,16,60

The first choice increments pixels/bar by 4, the second decrements by 4, the third and fourth choices set pixels/bar directly to 16 or 60 respectively.

Version 5.7 Rev 3

Further Info Box Improvements

The info box can now be dragged and dropped into position within the chart window pane. Formerly, the info box could only be moved using the keyboard shortcuts described in item #26 above. The Info box can be dragged and dropped into another pane only if you mouse down in the upper right corner to begin the drag, otherwise the box can only be moved within the same pane.

The state of the info box (mouse pointer, current bar, previous bar) is now visually indicated by an underlined letter code in the upper left corner (M for mouse pointer, C for current bar, P for prior bar). Clicking on the letter code changes the state of the info box. This makes it convenient to change the state without having to open the preferences for the info box. When technical indicators are present in the info box, there is a 4th state called "Legend" indicated by an "L" in the upper left corner. When the info box is in Legend state, each technical indicator row in the box shows the textual description of the indicator present in that row. This can be useful when you have several indicators with the same token title. The info box is temporarily displayed a bit wider so you can read more of the legend text. Click in the upper left corner to go back to the normal state you prefer after viewing the legend texts.

When Custom Indicators (CI), scans (SCAN), and SDK plug-in indicators (DLL) are present in the info box, Investor/RT now shows the first four letters of the associated custom indicator, scan,

or plug-in. If you are in doubt about the row title tokens, use the legend display described above to see the full description of the row's indicator.

Repeating Vertical Reference Lines

Vertical reference lines now have a "Repeat" option. The vertical reference lines can be repeated going forward from the initial line, every N bars or every N minutes. This option can be used to view custom time reference lines as some constant time interval. You may wish to turn off the chart's standard gridlines.

Fibonacci Retracements: New Price Options

Two new price options, "Open" and "Previous Close" are available in the Fibonacci Retracement indicator when the "Use Variable" option is used for specifying the beginning and or ending price of the retracement. These are especially useful in the context of "Price Projections" as you can base your price projections off the open or previous close. When the "Use Variable" price option is employed, the base trendline of the retracement correctly attaches to the properly price value (Open, High, Low, Previous Close) for the starting and ending bar of the retracement period.

Drawing Options for CCI, RSI, TRIX, OBOI Oscillators

These four technical indicators, formerly shown in charts as lines, now have five choices for drawing the indicator results: Connected Line, Continuous Line, Solid Histogram, Hollow Histogram and Custom Histogram.

MPD, IWA, IAA Indicators:

Improved Access to RTL Indicators MPD, IWA, and IAA are technical indicators that use another indicator in their calculations. In Investor/RT 5.7 Rev 3, the way these indicators reference other indicators has been improved to use the RTL indicator references. This makes it possible to reference the individual component results of various indicators that have multiple results. For example, MPD can now reference the SLOWD component of the stochastics indicator, or the upper Bollinger Band (BOLU) or the lower band of the Keltner Channels Indicator, etc.

Version 5.6 Enhancements

Chart Button Titles and Colors

Any chart button that is not a menu can now have a user-specified background color. To adjust the button color, right-click on the button to access the setup, check the "Custom Color" checkbox and pick the background color you want. The button title color is black so lighter

background colors work best. Menu buttons for tickers and periodicities have a standard icon appearance and cannot have a custom color background. Non-menu buttons have a default title based on what they do. You can use a custom title if you wish by checking the "Custom Title" checkbox and entering your own title text. Note that a single space or two as the button title results in a button with a blank title. The number of spaces controls the width of the button in this case. Thus you can have very small color coded buttons that do various things in the chart. Pointing the mouse pointer at a blank button will popup a tip window telling you what the button does.

##TICKERS Revisited

Investor/RT has long had a feature for creating a "group ticker" that refers to a quote page, e.g. an industry group quote page. To setup a group ticker, create a "Cash" type ticker symbol using Setup: Instruments. The ticker symbol must begin with ## followed by any letters you like. Tickers in I/RT can be up to 23 characters long. The NAME associated with the ## ticker should be the name of the quote page you wish the ## ticker to refer to. For example, create ##FOCUS with a name of "Focus Stocks", where "Focus Stocks" is the name of a quote page. If you then insert the instrument ##FOCUS as a row in some other quote page, the ##FOCUS ticker becomes a "link" to the "Focus Stocks" quote page. Double-clicking on a ## ticker in any quote page causes Investor/RT to open the associated quote page for that ## ticker. Again, the association is made using the "Name" of the ## ticker, the "Name" of the ## ticker must exactly match the name of some quote page. You can use this feature to construct ## tickers for both user quote pages and/or built-in System quote page.

In Version 5.6 we have further enhanced the ## ticker feature to facilitate setting up of custom instruments representing a "sum" of all the tickers in a quote page. In Setup: Custom Instruments, when defining a "Sum", if you include a ##ticker as a component of the sum, ALL of the tickers in the quote page associated with that ## ticker will be added to the sum automatically. You can use a constant number as the "multiplier" for each ticker or you can enter V#n (where n is the user variable number) as the multiplier. If you name a V# variable as the source of the "multiplier", Investor/RT will use the V#n value of each instrument at that time to "weight" each of the tickers added to the "sum". This means that you must pre-specify the V#n values, either by calculating them using a scan, or perhaps by entering the weighting factors manually using a quote page for data entry.

Version 5.6 also support easy "merging" of quote pages using ## tickers. Suppose you have two ## tickers, ##LISTA and ##LISTB that refer to two quote pages, "Quote Page A" and "Quote Page B". If you wish to create a new quote page that contains all of the tickers from either list, you can do the following:

File: New: Quote Page to make an empty quote page.

Click the "Add Instruments to QP" button to open the "Add to Quote Page" window listing all available tickers.

Add ##LISTA and ##LISTB to the new quote page by double-clicking on ##LISTA and ##LISTB in the "Add to Quote Page" list.

Notice that the "Add to Quote Page" window has been enhanced so that adding a ##ticker causes ALL of the tickers in the associated quote page to be added to the destination quote page. Thus by creating ## cash ticker for each of your quote pages you can:

- Link from one quote page to another by double-clicking on a ## ticker.
- Easily setup custom instruments to create indexes for your quote pages.
- Easily add the ticker list from any quote page to another using the "Add to Quote Page" window.

Volume Weighted Moving Average

A new smoothing type has been added to the growing list available in Investor/RT. The Volume Weighted Moving Average weights the price of each bar with the volume of that bar. In this way, bars with higher volume will be more heavily weighted in the computation of the average. For example, a 5-period VWMA first sum the product of the volume and the price for each of the last 5 bars. This product is then divided by the sum of the volumes to give the resulting average. Many indicators in Investor/RT allow the user to specify the smoothing type. The "Volume Weighted" option can now be found at the bottom of the list of smoothing types. The VWMA can also be accessed in the scan language by simply using the token "MA" and choosing for the smoothing type of the MA to be "Volume Weighted".

New Tom DeMark Indicator: TD Sequential

A new indicator has been added to Investor/RT, called TD Sequential (TDSEQ). Tom Demark Indicators

TDSEQ is based on an indicator described in the book "Demark on Daytrading Options" by Thomas Demark and Thomas DeMark, Jr. TDSEQ helps identify low-risk price reversal zones when the market has reached a point of exhaustion.

TDSEQ involves 3 distinct phases, one of which is optional. The 3 phases are Setup, Intersection, and Countdown. Intersection is considered optional, and can be turned off in the TDSEQ preferences window. Each stage begins upon the completion of the previous stage.

Investor/RT gives the user the flexibility to specify the lookback and completion periods for both the setup and countdown phases. DeMark recommends using the defaults of 9 for the setup period, 4 for setup lookback, 13 for the countdown period, and 2 for the countdown lookback.

DeMark devotes 50 pages to the description of TD Sequential in his book in Chapter 6. For a complete explanation, it is recommended that you read the book. More information on TDSEQ

will be available soon on our web site tour at <http://www.linnsoft.com/tour/techind/tdseq.htm>.

The TD Sequential indicator can be accessed in the RTL language using the token TDSEQ.

New Tom DeMark Indicator: TD Combo

A new indicator has been added to Investor/RT, called TD Combo (TDCOM). TDCOM is based on an indicator described in the book "Demark on Daytrading Options" by Thomas Demark and Thomas DeMark, Jr. TDCOM helps identify low-risk price reversal zones when the market has reached a point of exhaustion.

TDCOM operates very similarly to TDSEQ, except the rules are much stricter. TDCOM is made up of only two phases, Setup and Countdown, and eliminates the TDSEQ phase of Intersection. Upon completion of the setup phase and the countdown phase, the market has most often reached a point of exhaustion and is prone for a reversal.

Investor/RT gives the user the flexibility to specify the lookback and completion periods for both the setup and countdown phases. DeMark recommends using the defaults of 9 for the setup period, 4 for setup lookback, 13 for the countdown period, and 2 for the countdown lookback.

DeMark devotes over 50 pages to the description of TD Combo in his book in Chapter 6. For a complete explanation, it is recommended that you read the book. More information on TDCOM will be available soon on our web site tour at <http://www.linnsoft.com/tour/techind/tdcom.htm>.

The TD Combo indicator can be accessed in the RTL language using the token TDCOM.

New Indicator: Trend Intensity Index (RTL: TII).

A new indicator has been added to Investor/RT, called Trend Intensity Index (TII). TII is based on an article by M. H. Pee that will be available in the June 2002 issue of Stocks and Commodities Magazine. TII is used to indicate the strength of the current trend in the market. The stronger the current trend, the more likely the market will continue moving in the current direction. It is recommended to enter the market during a strong trend and ride it until TII shows signs of a reversal, at which time you should abandon your position and prepare to enter in the opposite direction.

Pee recommends using a major period of 60 and a minor period of 30. Assuming these settings, TII is calculated as follows. The 60 bar simple moving average (MA) is computed. The deviation between the closing price and this computed average for each of the last 30 bars is computed (CL - MA). Positive deviations (CL > MA) are summed to give SDPOS. Negative deviations (CL <

MA) are summed to give SDNEG. Then, the 30 period TII is calculated as $100 * SDPLUS / (SDPLUS - SDMINUS)$.

TII ranges from a lower limit of 0 to an upper limit of 100

A TII value above 50 signals an uptrend.

A TII value of 80 means that 80% of the total deviations are up.

When TII falls below 50, a downtrend is likely in place.

50 represents a level that is trend-neutral.

The closer TII is to 100, the stronger the current uptrend.

The closer TII is to 0, the stronger the current downtrend.

It is recommended to enter a long trade on the open of the following bar when TII is above 80. The following scan would detect this condition:

`TII > 80 AND TII.1 <= 80`

It is recommended to enter a short trade on the open of the following bar when the TII falls below 20. The following scan would detect this condition.

`TII < 20 AND TII.1 >= 20`

It is also recommended by Pee to remain in the position until a signal in the opposite direction occurs. The Trend Intensity Index can be accessed in the RTL language using the token TII.

More information on TII is available on our web site tour at <http://www.linnsoft.com/tour/techind/tii.htm>.

New Indicator: Center of Gravity (RTL: COG)

A new indicator has been added to Investor/RT, called Center of Gravity (COG).

COG is an oscillator based on an article by John F. Ehlers on page 20 of the May 2002 issue of Stocks and Commodities Magazine. COG has essentially zero lag and enables clear identification of turning points. This indicator is a result of Ehler's research into adaptive filters.

The Investor/RT implementation of COG includes an option to "Volume Weight" the oscillator. When this option is checked, volume will be used in addition to price to weight the indicator. More information on COG is available on our web site tour at: <http://www.linnsoft.com/tour/techind/cog.htm>

You can refer to the Stocks & Commodities article for additional computational and interpretational information. The Center Of Gravity indicator can be accessed in the RTL language using the token COG.

Cumulative Volume Analysis

The Volume Analysis technical indicator has been enhanced with an "Accumulate Intraday Volume" checkbox option. When this checkbox is checked, volume will be accumulated throughout the day on intraday charts. For instance, on a 5-minute chart, the Volume Analysis study would generally display the volume of each 5-minute bar. With the "Accumulate" checkbox checked, the study will instead display the total volume for the day (session) as of that bar (including the volume of that 5-minute bar). So the first bar of the session will simply display the volume of that first 5-minute bar. The 5th 5-minute bar of the session will display the total volume of the first 25 minutes. The last bar of the session will display the total volume of the day. The effect you'll see on a chart will be a study which continually builds throughout the day towards the total daily volume, and then resets back to zero for the next session.

Volume Weighted MACD Option Added

When the Volume Weighted option is checked the moving average type used in the MACD calculation is volume weighted. See "Volume Weighted Moving Average" above for further details.

Using Investor/RT with eSignal delayed and end-of-day services

Investor/RT Version 5.6 contains a fix that enables Investor/RT to retrieve historical data of any periodicity using an eSignal end-of-day or eSignal delayed-data account. Prior to version 5.6 such downloading was only permitted for real-time eSignal accounts.

Retracement-Based Stochastics

The classic Lane Stochastics calculation method dictates that the RawK represent the position of current price in relation to a recent range. This position is measured as the percentage of the distance from the low to the high. If the low of the period was 50 and the high was 70, then a current price of 65 would represent RawK of 75% while a current price of 55 would represent a RawK of 25%. From a retracement perspective, Stochastics always assumes that the high occurred first, the trend was a downtrend, and retracement is now occurring back towards the high. The RawK of the Stochastics indicator is not smart enough to know which came first, the high or the low. The "Retracement Based" checkbox in the Stochastics preferences gives the RawK value this knowledge, and therefore results in a value that represents the true retracement percentage based on the RawK period specified. This option is very similar to the "auto-retracement" option of the Fibonacci Retracement study, except it gives the ability to view the values historically, and to reference them historically in the RTL language.

Custom Instrument Calculation Frequency

“##TICKERS Revisited” above describes some enhancements designed to make it easy to setup a custom instrument having all of the tickers in a quote page as components. A custom instrument that is setup as the sum of say 40 other instruments has the potential to use a great deal of processing time to recalculate the value of the custom instrument every time any one of the 40 underlying instruments trades. In version 5.6, custom instruments of type "sum" that have more than two components, are limited to a recalculation frequency of 3 seconds or 20 times per minute. This change will make it possible to monitor even the most demanding index calculations. We plan further enhancements to make the recalculation frequency a user-specified setting similar to the way technical indicators recalculation options are specified.

Multiple Periodicity Charts Daily/Weekly/Monthly

The Multiple Periodicity capability of traditional charts has been expanded to include combining Daily, Weekly, and Monthly periodicities. Now, weekly and monthly bars can be overlaid on daily charts, and then indicators can be associated to any of the 3 periodicities. More information on Multi-Periodicity Charting can be found at <http://www.linnsoft.com/tour/multiPerCharts.htm>.

Version 5.6, Revision 1

Tom DeMark Indicators Licensing Issues

The Tom Demark indicators TD Sequential and TD Combo are trademarked by Market Studies Incorporated d/b/a DeMark Indicators. We are in discussions with the DeMark organization about licensing issues. In the meantime we have removed these indicators from Investor/RT at the request of the DeMark organization.

Version 5.6, Revision 2 released May 14, 2002

New Indicator: Signal Statistics

The Signal Statistics indicator (SSTAT) allows for statistical calculations on signals, including summation, consecutive signals, frequency, bars since last signal, change since last signal, and more. SSTAT allows the user to select any existing scan or signal, and a statistical result to calculate on that scan/signal.

The new Signal Statistics indicator (SSTAT) allows for statistical calculations on signals, including summation, consecutive signals, frequency, bars since last signal, change since last signal, and

more. SSTAT allows the user to select any existing scan or signal, and any custom statistical result to calculate on that scan/signal.

Currently, the available statistical results are:

Sum of Consecutive Signals

This result will give the number of consecutive signals that have occurred, whether TRUE or FALSE signals. For instance, a value of +7 represents 7 consecutive TRUE signals. If the underlying scan is $CL > CL.1$, then this value of +7 represents 7 consecutive increasing closes. Conversely, using the same example scan, a value of -5 would represent 7 consecutive bars where the CL was less than or equal to the previous CL. There is also an option for "Subtract 1 For FALSE Signals". If this option is not checked, the result will always be positive, and will just be reset to 0 when a FALSE signal occurs. If this option is checked, each consecutive FALSE signal will subtract 1 from the result. When the signal first changes from FALSE to TRUE, the result is always 1, and will then build with each consecutive TRUE signal. When the signal changes from TRUE to FALSE, the value will be -1 if "subtract" is checked, or 0 if "subtract" is unchecked. If "subtract" is checked, each consecutive FALSE signal will continue to build in the negative direction. If "subtract" is unchecked, each FALSE signal will keep the result at 0 until a TRUE signal gets things going back into the positive direction.

Sum of All Signals

This result works exactly as the "Summation of Consecutive Signals" option discussed above, except that the result does not reset when the signal reverses. In other words, if the result is currently +7, and a FALSE signal occurs, then the result becomes either +6 or +7 depending on whether the "subtract" option is checked, whereas the result would have become either -1 or 0 with the "Consecutive" option.

Bars Since Last Signal

This result option gives the number of bars since the scan/signal last hit TRUE. This result is always positive or 0. A value of 0 means the scan hit on the current bar (or that a TRUE signal hasn't occurred yet). A value of 12 means that the signal last hit TRUE 12 bars back, followed by 11 bars of FALSE signals.

Running Total

This option keeps a running total of both the TRUE and FALSE signals. If a TRUE signal occurs, the result will be a positive number representing the total number of TRUE signals that have occurred as of that bar, including that bar. If a FALSE signal occurs, the result will be a negative number representing the total number of FALSE signals that have occurred as of that bar, including that bar.

Frequency Over Recent Period

When this result option is selected, a "period" preference is presented. The result is number of times the signal hit TRUE over the period specified. For instance, if the period was 20, and the result was 5, this would indicate that the signal was TRUE 5 of the previous 20 bars, and FALSE on the other 15.

Percent Of Recent Period

This option is similar to the "Frequency Over Recent Period" option, except it returns a percentage of bars for which the signal hit TRUE. For instance, if the period was 40, and the result was 20%, this would indicate that 20% of the 40 bars (or 8 bars) were TRUE, while 80%, or 32, were FALSE.

Percent Of All Bars

This option gives a result that represents the percentage of all previous bars, including current bar, for which the scan/signal was TRUE. When viewing this indicator in a chart, each bar, moving right, will be considering one additional bar than the bar to its left. And the rightmost (current) bar in the chart will be considering all bars. Each bar is considering itself and all bars to its left. The number of bars in the chart is dictated by the "Viewing Period" setting in the Chart Preferences.

Price At Last Signal

This result gives the closing price of the bar on which the scan/signal last was TRUE. This result only changes when a TRUE signal occurs, and will then remain constant across FALSE signals. This option could be useful in scans or trading signals in combination with the "Bars Since Last Signal" option.

Change Since Last Signal

This result gives the change in price since the last TRUE signal occurred. This value will become 0 when a TRUE signal occurs, and then will build in either direction on FALSE signals as the price changes since the last TRUE signal.

Sum Of Session Signals (Intraday)

This result only applies to intraday charts/data. The result on each bar is the sum of all TRUE signals that have occurred as of that bar (including that bar) during the current session. The result will reset to 0 at the beginning of each session and will build by increments of 1 each time a new signal occurs.

Profit/Loss - Look Ahead

This result uses the specified period to calculate a look ahead profit/loss value for each TRUE signal. For instance, if the period was 20, then each time a TRUE signal occurred, then the result would be the price 20 bars ahead, minus the price of the current bar. This option allows you to peek into the future with historical data to see how your

signals would perform given a specific period of time. If there are insufficient bars ahead of the signaled bar, then the profit/loss will be computed based on the last bar (price of last bar minus price of signaled bar).

Plug-in Indicators

An Investor/RT "plug-in" is a computer program for calculating a technical indicator or trading signal. Plug-in indicators are not built into Investor/RT directly, they are developed (programmed) externally by Investor/RT users having the requisite computer programming skills, or they may be developed by third party software vendors who wish to market proprietary technical indicators and/or trading signals to Investor/RT users. To develop plug-in indicators, you use the Investor/RT Software Developer Kit (SDK) discussed in "Investor/RT Software Developer Kit (SDK)" below.

Typically, plug-ins are written in either the C or C++ programming language. On the Windows platform, plug-ins are implemented as "Dynamic Link Libraries" (DLL's). On the Macintosh platform, plug-ins are developed as "Shared Libraries" (shlb files). These DLL or shlb files are placed into the "plugins" directory/folder located inside the Investor/RT startup folder. At startup, Investor/RT inspects the plugins directory/folder and creates a list of the DLL's or shlb files located there. Just like any of the built-in indicators, each plug-in becomes available for use in Investor/RT.

Programmers interested in developing plug-in indicators for use in Investor/RT may acquire the "Investor/RT Software Developer's Kit (SDK)". The Investor/RT SDK contains complete instructions for developing I/RT plug-ins, along with sample code for both Windows and Macintosh platforms. Interested parties must execute a non-disclosure agreement (NDA). The SDK is available at no additional charge to all licensed users of Investor/RT. Linn Software will provide developer support by email and telephone consultation on a fee basis to SDK users.

Using Plug-in Indicators

To demonstrate how these indicators are implemented, we will use Investor/RT's sample plug-in called "IRTSAMPLE".

Windows users: In the "plugins" directory, locate the file called IRTSAMPLE.DLL. This file contains the programming for this simple indicator (IRTSAMPLE computes two simple moving averages of user-specified periods and produces a signal for each bar where the two moving averages crossover on another.).

Macintosh users: In the "plugins" folder, locate the file called IRTSAMPLE. Get Info will show the file's type to be "Shared Library".

Go to Setup: Preferences: Charts: Technical Indicators. From the list of indicators, select "Plug-in Indicator" and view the settings. A list of available plug-ins is shown at the top.

Select "IRTSAMPLE" from the list and the description of the plug-in will appear in the scrollable text box. This text is supplied to Investor/RT by the plug-in itself. It is used to convey a description of what the plug-in does and how to enter any required user parameters. The Parameters entry box accepts up to 80 characters of arbitrary text that is made available to the plug-in for the purpose of setting preferences for the indicator.

In this simple example, IRTSAMPLE expects the user to enter two numbers into the parameter box indicating the desired periods of the simple moving averages.

A plug-in indicator can be drawn as a continuous line, a connected line or as a solid/hollow histogram. Signals computed by a plug-in appear on the chart as "markers" showing each bar where the signal is true. A color control allows specification of the line or histogram color properties. If the plug-in requests it, two optional reference line checkboxes are provided, similar to the setup for Investor/RT custom indicators. In this example the plug-in does not require reference lines.

Adding a Plug-in Indicator to a Chart

To add a plug-in indicator to the current chart window, click the "Add Technical Indicator" button on the chart's toolbar and select "Plug-in Indicator". Choose IRTSAMPLE from the list and enter the desired period into the parameter box. By default, all plug-in indicators are graphed in a new pane. To overlay the indicator on the instrument data, select the pane before adding the indicator, or simply drag and drop the indicator later. Press OK and the plug-in will be added to the chart. The Plug-in settings are edited in the same way as any indicator. To access the settings, right-click (or command click) on the line, change the parameters and click OK.

Using Plug-in Indicators in Scans, Signals, or Custom Indicators

Any plug-in indicator can be used as a token in the RTL language. In the setup window for scans, signals or custom indicators, select "PLUGIN" from the list of available tokens. The setup for the Plug-in Indicator will appear. Choose the IRTSAMPLE plug-in, set the period parameters and press OK. In the list of token on the right, a token called PLUGIN will appear. You can rename the token, e.g., call it SMA for "simple moving average". When using several plug-in indicators within the same scan, signal or custom indicator, you must give each one a unique token name to be able to reference each plug-in in your formula. When a plug-in calculates more than one array results as in this example, the scan setup window for the plug-in has a menu button with which to specify which of the array results to reference. If you wish to reference just the signal array for example, you would specify array3 since array1 and array2 represent the two simple moving average. If you have a plug-in that calculates multiple arrays and you wish to reference more than one of the resulting arrays, you will have to add the PLUGIN indicator two (or more) times to the scan, specifying a different array for each instance and specifying a

unique name for each plug-in token to you can reference them unambiguously in the scan formula.

Plug-in indicators have exactly the same functionality as built-in indicators. The only difference is that the computation is programmed externally and "linked" into the Investor/RT system using the plug-in mechanism.

Using Plug-ins in Custom Columns

Plug-in indicators can be used as the source for custom columns in quote pages. By setting up the custom column as the technical indicator "Plug-in Indicator", the indicator can be referenced directly. You can also create custom columns that reference the results of scans and/or custom indicators using the plug-in's capabilities.

Investor/RT Software Developer Kit (SDK)

The Investor/RT SDK consists of developer documentation, header files, and sample C/C++ code illustrating how to build "plug-ins" for Investor/RT. See item #16 above for a description of how Investor/RT users setup and utilize plug-in indicators. The SDK is inherently "cross-platform", supporting both Windows and Macintosh software development. In most cases, any C/C++ plug-in programmed as a Windows Dynamic Link Library (DLL) can be made available as a Macintosh compatible "Shared Library" (shlb type file) with only minor source code modifications. Interested parties must execute a non-disclosure agreement (NDA). The SDK is available at no additional charge to all licensed users of Investor/RT. Linn Software will provide developer support by email and telephone consultation on a fee basis to SDK users.

Oscillator Added to Center Of Gravity

An oscillator option has been added to the Center of Gravity indicator. This oscillator represents the difference between the COG and the Signal line (or COG.1) multiplied by 100. When the oscillator crosses the zero line in the upward direction, it represents the COG turning upward, and should therefore be considered a bullish signal. When the oscillator crosses the zero line in the downward direction, it represents the COG turning downward, and should therefore be considered a bearish signal. The reason the oscillator value is multiplied by 100 is for scaling purposes. The oscillator is really nothing more than the change in the COG multiplied by 100.

New Options Added To Parabolic SAR

Two new parameters have been added to the Parabolic SAR indicator to give the user more control. The ""Initial/Incremental Step" parameter has been separated into two separate settings. Also, a "crossover increment" setting has been added. When this value is greater than 0, the price must cross over the SAR line by that incremental amount before causing a reversal.

This can help eliminate whipsaws. By default, after upgrading, the Initial and Incremental Step parameters should both be set to the previous "Initial/Incremental Step" value. Also, the new "crossover increment" will be initialized to 0. With these settings, the SAR will calculate exactly as it did before. You should see no changes to your existing SAR unless you change the settings.

Version 5.6, Rev 3: May 24, 2002

Portfolio Refresh Option

The portfolio window has a refresh option similar to the quote page refresh option introduced recently. Portfolios can update dynamically (tick by tick) or you can specify a frequency in seconds for the portfolio to recalculate to reflect current pricing. Using the refresh option for portfolios and quote pages can considerably reduce the amount of processing needed to keep these windows updated in real-time.

Chaikin Money Flow Indicator (RTL: CMF)

A new indicator has been added to Investor/RT, called Chaikin Money Flow (CMF). Developed by Marc Chaikin, the Chaikin Money Flow indicator (CMF) is calculated by summing Accumulation Distribution over the given period and then dividing by the sum of volume over the given period, as can be seen in the formula section above. A period of 21 is recommended. The volume is essentially nothing more than volume times change divided by range.

A positive CMF value signals accumulation, while a negative CMF value signals distribution. A reference line is drawn at zero to help quickly identify accumulation/distribution regions. The further the distance from the zero reference line, the stronger the signal.

It is recommended to go long if a breakout above resistance is supported by Chaikin Money Flow staying above zero, while it is recommended to go short if a breakout below support is confirmed by negative Chaikin Money Flow. It is also recommended to go long on bullish divergence, and short on bearish divergence.

If Chaikin Money Flow greater than zero, it is an indication of buying pressure and accumulation. The longer the oscillator can remain above zero, the stronger the evidence of accumulation. Extended periods of accumulation or buying pressure are bullish and indicate that sentiment towards the security remains positive. Not only should the oscillator remain above zero, but it should also be able to increase and attain a certain level. The more positive the reading is, the more evidence of buying pressure and accumulation.

Keyboard Adjustment

The period of the CMF indicator can be adjusted directly from the keyboard without opening up the preference window. First, select the indicator, then use the up and down arrow keys to adjust the CMF Period up or down by 1.

RTL Token CMF

The RTL Token for the Chaikin Money Flow indicator is CMF. To find instances where the CMF has crossed above zero (into bullish territory), use the following scan/signal:

$$\text{CMF} > 0 \text{ AND } \text{CMF}.1 \leq 0$$

Similarly, to find instances where CMF has crossed below zero (into bearish territory), use the following scan/signal:

$$\text{CMF} < 0 \text{ AND } \text{CMF}.1 \geq 0$$

Chart Export and Import

Traditional Chart window setups can now be saved (exported) to a text file. The resulting text file contains sufficient information to re-create the chart setup, including window and pane sizes, instrument preferences, indicator preferences, etc. To save (export) a chart window as a text file, right-click in the chart window and choose Save: Chart Export File from the pop-up menu. Investor/RT will prompt you for a file name and location to place the file and a comment. The resulting text file can be emailed or published on a web site to enable other Investor/RT users to import the chart definition into their own Investor/RT systems. To import a chart export file, use the Open command in the File Menu, (File: Open: File) and select the text file. Investor/RT will inspect the file and determine if it is a chart definition file and if so, the chart will be created. You can then make any adjustments you wish to the chart and Save the chart to permanently add it to your system.

During the import process Investor/RT will ask if you wish to be prompted for indicator setups. If you reply "No", then the chart will be setup using the same preferences as the exporter of the file. If you reply "Prompt" then the setup dialog for each indicator in the chart definition will appear so you can choose your own preferences.

When a chart is imported, the chart is first opened for viewing WITHOUT any of the "preset" indicators, e.g. buttons and other instrument specific indicators. This is done so that you can see the chart setup exactly as the exporter uses it. The chart WILL contain the preset indicators used by the exporter of the file. You can choose to leave these in the chart if you wish or delete them. If you save the chart (File: Save), close and then reopen the chart, you will see the chart along with all of your preset indicators. Note that all indicator that initially appear when you import (open) a chart definition file will be saved with the chart with scope "This Chart, Any

Instrument". If you wish any of the indicators to have a different scope than that on your system you must adjust the scope preference for each indicator before saving the chart.

This new facility has a number of important uses

- Investor/RT users can share chart setups with one another easily.
- Investor/RT users who have a charting question or problem to report can email the chart setup to support.
- Linn Software intends to include sample chart setups for downloading from the www.linnosoft.com web site.
- At some point we may add a "charts" folders to the Investor/RT installation and distribute a variety of chart export files in this folder.

New Price Type/Quote Page Column: H+L+C+C/4

A new price type, $(\text{High} + \text{Low} + \text{Close} + \text{Close})/4$ is available for use in technical indicators that accept a price type specification. This price average disregards the open price and weights the average more heavily on the closing price by counting it twice. The new price type can also be used a built-in column in quote pages.

New Signal Statistic type: Price Before/After Last Signal.

This statistic works identically to "Price At Last Signal" except a period is provided to allow access to the price of bars before or after the signaled bar. A period of 0 will cause this result to be identical to "Price At Last Bar". A period of 10, for instance, will cause the result to be the price of the 10th bar preceding the signaled bar. A negative value may be specified to access bars following the signaled bar. For instance, a period of -5 with a price of "High" would result in the high of the 5th bar following the signaled bar. The result will only change bars that signal TRUE, and then hold that value until the next signal.

Chart Pane Element Ordering Saved

Recently Investor/RT has gained new flexibility for adjusting the order of elements in traditional chart window panes. Right-click on a pane title to access the element ordering window to make adjustments. In 5.6 Rev 3 the order of the elements is also retained permanently when you save the chart window. When you reopen the chart later, the pane order will be exactly the same as it was when the chart was last saved. Prior to 5.6 Rev 3, the order was not restored exactly in all cases. Pane ordering affects the appearance of chart windows since the values or elements at the top of the list are seen first (from left to right) in the pane title and the elements at the top are drawn last graphically, causing them to appear more "above" in the chart.

Quote.com Sector/Industry Option

Quote.com supplies textual values for both Industry group and Sector for equities. Some users have indicated that they prefer to use their own classification scheme for their stocks and have elected to do so by importing these data items for each stock from another source. If you do this, there is now a checkbox in the Quote.com data feed preferences window that will turn off the automatic updating of these items from the data feed so that the imported values will not be disturbed.

Alternate Calculation Option for True Range

A new checkbox has been added to the True Range Indicator labeled "Actual Range of Last X Bars (MaxHI – MinLO)". When this checkbox is checked, the result will be the actual trading range over the bars specified. For instance, if a period 10 is specified, then the result will be the highest high over the last 10 bars minus the lowest low over the last 10 bars. If a smoothing period greater than 1 is specified, then the resulting actual range values will be smoothed accordingly.

Version 5.6, Rev 4: May 31, 2002

Chart Panning Delay Option.

Setup: Preferences: Charts: General now has a checkbox and entry box for specifying whether you want to delay activating the chart panning tool when you mouse down inside a traditional chart window. If the checkbox is not checked any mouse down in a chart window that does not "select" some element will activate the chart panning tool instantly so you can drag the chart immediately in any direction. If the checkbox is checked then the software will delay the specified number of seconds (e.g. 1.25 seconds) before activating the panning tool. The default for new users of I/RT will be to delay 1.25 seconds. This setting avoids accidental panning of the chart when you click in the chart. This can happen for example, when you click to select an indicator and "miss". Such accidental panning will put the chart into manual scaling mode. It is recommended that you specify at least a small delay, even .5 seconds, so that "missed" clicks do not have this unintended side-effect.

Session-Specific Trading Holidays

Trading holidays can now be made specific to a particular trading session rather than global for all sessions. This new feature will be of interest to users of Investor/RT who monitor both U.S. and international exchanges. When the U.S. has a trading holiday, the markets in Europe are often open for trading and vice versa. Thus, this feature enables the user to specify holidays that are specific only to the instruments that are assigned to a particular trading session (or sessions) but no others.

At present, the specification of holidays is accomplished by editing a text file named "Holidays.txt" located in the admin folder/directory inside the Investor/RT folder/directory. The file was formerly named "Holidays" with no file name extension. The .txt extension was added in this release to make it easier for Windows users to edit this file with Notepad by double-clicking on it. Alternatively, you can open the file using the File: Open command in Investor/RT, make changes to the file and use File: Save to save it.

Each line in the file specifies a date, the name of the holiday, and a code indicating whether the holiday is global (code H), or whether the holiday is specific to a particular session number. Here are some sample lines in the Holidays.txt file:

```
-Year 2002 Trading Holidays  
020527,H,Memorial Day  
020704,H,Independence Day  
020902,H,Labor Day  
021128,H,Thanksgiving Day  
021225,H,Christmas Day
```

Lines that begin with a hyphen are comments, other lines have the format:

```
yymmdd,code,holiday name
```

Be careful. The two digit year number must come first, then the month, then the day. Dates are always six numeric digits followed immediately by a comma. The code can be the letter H (it must be capital H) to designate a global (all sessions) holiday. The example above is from our default holidays.txt file. It is setup for U.S. Trading Holidays for all sessions. An Investor/RT user in Europe who tracks U.S. stocks in session 0 and European exchanges using other session(s), can edit the holiday.txt file as follows:

```
-Year 2002 Trading Holidays  
020527,0,US Memorial Day  
020704,0,US Independence Day  
020902,0,US Labor Day  
021128,0,US Thanksgiving Day  
021225,H,Christmas Day
```

These adjustments limit the holidays (except Christmas) to session 0 instruments. All other trading sessions are considered open on those days.

The dates in the holidays.txt file must be in ascending date sequence. You may include the same date two or more times if you wish to declare that same date a holiday for two or more sessions, e.g.:

-Year 2002 Trading Holidays
020527,0,US Memorial Day
020527,1,US Memorial Day
020704,0,US Independence Day
020704,1,US Independence Day
020902,0,US Labor Day
020902,1,US Labor Day
021128,0,US Thanksgiving Day
021128,1,US Thanksgiving Day
021225,H,Christmas Day

In this example of U.S. holidays May 27, July 4, Sep 2, and 11/28, Investor/RT considers sessions 0 and 1 to have a trading holiday while all other sessions are considered open on those dates. Note that it is important to leave past holidays in the file since Investor/RT uses this information to eliminate those days from traditional charts.

On the actual date of a holiday, the System Status window will show the text "HOLIDAY" as the status of each affected session.

New Indicator: Mixed Periodicity Data (RTL: MPD)

myTrack Trading Holiday Improvements

Further work was done on the myTrack version of Investor/RT to improve the handling of post holiday historical data downloading. Historical intra-day data from myTrack does not include the actual date for the data, only the time of each intra-day bar. Investor/RT now does a better job of inferring the date of each collection of intra-day bars by considering trading holidays. Further, we have eliminated all error message dialogs for myTrack error messages. Instead, any error messages are briefly shown in the status message area of the main toolbar. They are also recorded in the "Message Log" for future reference (File: Open: Message Log).

Tick and Tickbar Charting and "Seconds Per Bar"

The periodicity setup window has been revised so that when Tick or Tickbar (N Ticks per Bar) periodicity is selected, the user can specify a screen resolution factor called "Seconds/Bar". Since Investor/RT uses a fixed time horizontal axis and since ticks and tickbars are spaced out according to the time the ticks occurred or the tickbar was completed, the seconds/bar setting adjustment can improve the spacing of ticks and tickbars in traditional chart windows.

For example, a 60 tickbar chart of Computer Associates (NYSE: CA) on May 30, 2002 shows a new tickbar forming every six minutes or so. A 60 tick bar of Intel or Microsoft would form

much more rapidly. So in the CA tickbar chart, setting the seconds per bar to 360 caused the 60 tickbar chart to display with closely spaced tickbars. A similar chart of Intel displays nicely at 30 seconds per bar.

The ticks per bar and seconds per bar settings can be dynamically adjusted using the keyboard. First click on the tickbar instrument graph (line, bar, candle) to select it. Then hold down the shift key while using the up/down arrow keys to adjust the seconds/bar. The shift-up arrow increases the seconds/bar thus bringing the tickbars closer together. Shift-down arrow does the opposite. Press and hold the arrow key down for continuous adjustment.

Similarly, hold down the ctrl key while using the arrows keys to increase or decrease the ticks per bar setting. As you make these keyboard adjustments, the chart window title updates to show the current values for ticks/bar and seconds/bar.

If neither the shift nor the ctrl-key is held down, the keyboard arrow keys adjust the pixels per bar setting. Macintosh users use the option key for ctrl.

File: Export is a Sub-Menu

The File: Export menu has been expanded into a sub-menu with five choices for what to export. Formerly, this command was used only for exporting historical data. File: Export: Historical Data is one of the choices and still has the same keyboard shortcut (Ctrl-E under MS Windows, and Command-E under Macintosh OS).

Other menu choices are provided for exporting chart definitions, scan/signal definitions, and custom indicator definitions and trading system definitions. File: Export: Chart operates on the current (front) traditional chart window, exporting the definition of that chart to a text file. See item "Chart Export and Import" above for more information about this new feature. Similarly, File: Export: Scan/Signal and File: Export: Custom Indicator and File: Export Trading System all require that the Scan, Signal, Custom Indicator, or Trading System setup window be the front window. Note that these File: Export commands are the equivalent of File: Save as Text. Either one saves a text file that contains the appropriate object definition text. The resulting text file can be opened using File: Open, to import the definition into another Investor/RT system. This feature was added to make it clear that these objects are "exportable". Trading Systems are exportable but not importable at present.

Chaikin Money Flow, Smoothing Option

The result of the Chaikin Money Flow calculation can be optional smoothed by specifying a smoothing period and moving average type in the setup. In charts either the CMF period or the smoothing period can be dynamically adjusted using the keyboard. Select the indicator by clicking on it, then hold down the shift key while using the up/down arrow keys to adjust the CMF period. Cntl key down and use the arrow keys to adjust the smoothing period.

Version 5.6, Rev 5: June 4, 2002

More on Session-Specific Trading Holiday

The introduction of session-specific holidays (above) necessitated simple but widespread revisions to Investor/RT date/time manipulation functions. A bug slipped by our testing of this new facility and it has been corrected in Version 5.6 Rev 5. The error affected charting of instruments assigned to sessions other than session 0, where session 0 was defined as having a recent session-specific holiday in the holidays.txt file.

Editing Closed Portfolio Positions

The Investor/RT portfolio management feature enables editing of most open position data items in the portfolio window itself by simply editing the cells in the portfolio spreadsheet. However, once a position is closed, the position information is not long present in the portfolio window. The Portfolio Reports tool on the portfolio toolbar can be used to view summary or detailed reports of closed positions, but this information could not be edited in any way to correct data entry mistakes, etc. Version 5.6 Rev 5 introduces a closed position editing facility for this purpose. To access the new feature first click on the "Portfolio Reports" button on the toolbar. When the portfolio window appears, choose the time period of interest (this year, this quarter, this month, this week, etc.) and click the new "Edit Closed Positions" button. An editing window will appear listing all of the closed positions by closing date. The list can be displayed sorted by ticker or closing date as desired. As you select any position in this list, its information appears in edit boxes to the right. The following items can be adjusted:

Position Type (Long or Short)
Open Date/Time and Close Date/Time
Open Quantity and Closed Quantity
Open Price and Close Price (per share or per contract)
Commission Amount
Text Description (up to 32 characters)

After making changes press the Apply button to save the changes; you can then continue editing other closed positions. Click OK to save the changes and dismiss the window. A button is provided for deleting the selected closed position so it will no longer appear on the summary or detailed closed position reports. The delete function will be supported in a future release.

Version 5.5 Enhancements, initial release

All User Variables Saved in Database

Prior to Version 5.5, users variables V#1 through V#6 were the only user variables whose values were kept permanently in the Investor/RT database. All other user variables were considered "temporary" and their values were set to zero each time Investor/RT started. In Version 5.5, all user variables, V#1 through V#512 are retained on the Investor/RT database so you can now rely on these values being retained when you quit the program.

View, Rename, Delete Window Enhanced

The View, Rename, Delete window is now resizable allowing you to see more items at one time or to widen the list of objects when viewing longer names. Technical indicator presets are now sorted alphabetically like all of the other object types. A pushbutton labeled ">" was added to the right of the object type menu for quickly cycling through the list of object types and the associated list of names for each object type.

View, Rename, Delete Window can be opened in a variety of ways. First, it can be opened using the Control Menu. The Delete menu item is under the Data Management submenu. It is more convenient to use the main toolbar. When you click the trash can icon on the main toolbar, Investor/RT looks to see if the front window is an object you can delete (or rename), e.g. a chart window, and if so it asks "Is it okay to delete ...?". If you click the Delete button in reply, the chart window is closed and deleted from the Investor/RT database. If you click "Rename", the View, Rename, Delete Window opens. If you click the trash can icon on the main toolbar with no window open or with the front window containing an object that cannot be deleted, then the View, Rename, Delete window opens immediately without any prompting. Similarly, shift-click on the trash can button on the main toolbar, to open the window immediately. This window has gained more functionality over time and has become a very useful facility for reviewing the objects you have saved in the Investor/RT database, renaming or deleting items as you wish.

RTL access to Historical Retention Periods

Investor/RT maintains a default historical data retention period for daily, weekly, monthly and intra-day historical data. In addition, each instrument can either take the default settings or have an override period different from the default. Setting the defaults and overrides for an instrument can be accomplished in Setup: Preferences: Historical. In version 5.5 tokens for these settings have been added to the RTL language and new quote page columns are now available to display the retentions periods for each instrument in a quote page. The RTL tokens are HRD, HRW, HRM, HRI for "Historical Retention" Daily, Weekly, Monthly, Intra-day respectively. The quote page columns have column titles that begin with "Retain", e.g. "Retain Intraday".

While this feature may not be widely used, it does enable the historical retention preference setup to be automated using scans and the SET command. For example, suppose the default intra-day retention period is 10 days, but you wish to adjust all of your futures contracts so that 60 days of intra-day data will be retained while leaving all other instrument types using the default of 10 days. While such an operation can be done manually using the Setup: Preferences window, it can more easily be accomplished using a simple scan:

```
IF (SECTYPE = SEC_FUTURE) THEN SET(HRI, 60) ELSE SET(HRI, 0)
```

Notice that setting HRI to zero means to set the intra-day retention to the default value. Scans can similarly be used to find which instruments have certain retention properties, e.g.

```
HRI != 10
```

Assuming 10 is the default HRI value, this scan finds all instruments that currently have an intra-day retention period different than the default value of 10, i.e. it finds all of the overridden instruments.

Quote Page Refresh Options

Investor/RT 5.5 introduces a new quote page option for update frequency. Two options are provided in the preferences, (1) dynamic and (2) Every N seconds.

Dynamic

Dynamic updating simply means that every incoming tick for a visible ticker in the quote page will be reflected in the quote page as the tick arrives. This is how earlier releases of Investor/RT have always worked. Dynamic updating of quote pages consumes considerable resources, especially for quote page where many more instruments are present than are visible. Even when a few very active issues are present in a smaller quote page, a great deal of unnecessary processing may be taking place when say 20 or 30 updates are hitting the quote page every second or so.

“Update Every N Seconds”

Update Every N Seconds option to reduce the screen flicker and processing overhead associated with active quote page updating. Some Investor/RT users have a quote page of several hundred instruments open essentially for the purpose of "watching" (activating) that list of instruments with the data service. Such pages may be even minimized much of the time. Setting such pages to update every 60 seconds can eliminate a major drain on the processor.

New RTL Tokens BPS, MPB, MPS. BPS

These provide the number of bars in the trading session based on the session of the instrument. MPB provides the number of minutes in a bar. MPS provides the number of minutes in the trading session of the instrument.

Signal/Signal Marker Enhancements

You can now specify an offset in pixels to be used when a scan/signal marker is drawn in the chart. This option will be useful if you have several marker indicators in the same chart window pane. By giving each one a distinct offset, the markers will "stagger" when two or more signals happen to true for the same bar. The offset can be set manually in the setup or you can select the marker in the chart window and use the keyboard up/down arrow keys to adjust the offset. The left and right arrow keys can be used to shift the marker placement left and right. A "Show Price" checkbox is provided for further annotating the marker with either the last, high, low or date/time of the bar on which the signal triggered.

Color Marker Enhancement

The Color Markers indicator now has a "Vertical Line" choice for the shape of the marker.

Custom Profile Enhancements

Custom Profile Chart preferences now have a manual scaling option for the horizontal scale. Minimum scale value and maximum can be independently adjusted. Double-clicking on a ticker in a custom profile performs multi-linking properly when the "double-click" action preferences calls for multi-linking.

Fibonacci Retracement "Live" Options

The preferences for Fibonacci Retracements has a "Live" checkbox. When checked Investor/RT draws a line at the right showing the actual percent retracement level of the current bar.

Bar Count Option for Scans/Signals/Custom Indicators

Scans, trading signals, and custom indicator setups now have a user preference for the number of bars of data to be used to calculate the formula. The default setting is "Automatic" meaning that Investor/RT will determine how many bars of data are needed based on an examination of the formula tokens and technical indicator setups. There is also an "All Data" choice meaning that all data on file for the instrument will be used. Finally, you can specify a specific number of bars to be made available to the scan calculation. Here is an example that may help clarify how this new Bars Option is used. Consider a scan (5 minute periodicity) that looks for $CL > EMA$ where EMA is a nine period exponential moving average. If you specify Automatic, Investor/RT

will attempt to fetch nine 5-minute bars. If you specify 20 bars as the bar option, Investor/RT will attempt to fetch 20 bars even though it only needs 9 to actually compute the EMA. If there are 9 or more bars available, those bars, but no more than 20 will be made available to the scan for calculation. Generally speaking the calculation will take less processing time if the automatic setting is used since only the minimal number of bars will be used in the calculation. Some indicators, like EMA, can benefit from more bars since there are cumulative effects in their calculations.

The new bar option can also make scans run much more efficiently in some circumstances. Suppose you have a scan that uses the DV token to fetch the closing price at a particular time early in the trading session. When the DV token is used in a scan, Investor/RT by default fetches all data on file for the periodicity involved and searches that (possibly large) data collection for the bar it needs. However, if you know that the bar you are looking for is always in the current trading session you may specify a specific number of bars, e.g. 390 one-minute bars. This will tell Investor/RT to look at the most recent 390 bars instead of the thousands of bars you may have on file for prior trading sessions. Thus this scan will run considerably faster, especially if DV is used in conjunction with other more mathematically complex indicator calculations since indicators utilize the increased numbers of bars also.

In the scan setup window, pressing the check button will show you the number of bars Investor/RT has determined are needed for calculation. If you specify an overriding bar count that is less than the calculated requirement, the calculated requirement will always be used.

Version 5.5 Enhancements, revision 1

UserData Text Length Increased

The "User Data" column now supports arbitrary user text up to 255 characters in length. Formerly, this quote page column was limited to only 23 characters. The expanded textual data can be displayed in quote pages and chart annotations, and the content of this textual field can be searched using RTL text pattern matching.

Multi-line User Data in Quote Pages

In order to view longer text content in the user data field in quote pages, we have added a "multi-line display" option for quote pages. When multi-line display is in effect for a quote page containing the "User Data" column, any row in the page that contains user data text that is too long to be displayed in the cell will cause that row to expand in height to show up to 3 lines of word wrapped textual content at one time. You can, of course, widen the column to show more text at one time. If you wish to edit the content of a user data cell, clicking in the cell will display scrollbars inside the cell so you can scroll longer texts into view for editing in place. This field now supports paste of up to 256 characters from the clipboard. For example, you can use the

Web Research feature of Investor/RT to grab textual commentary from web pages and paste these into the user data field so they will show up in your quote pages.

New Quote Page Columns, Sector, Industry

Two new textual quote page columns and corresponding RTL tokens have been added for organizing tickers by sector and industry group. The RTL tokens are SECTOR and INDUST. These text columns are filled by the Quote.com data service (see below for download instructions), or these fields can be setup by manually entering text into these columns in a quote page. File: Import (Current Quotes/Other Data) also supports importing text into these fields if you can obtain industry/sector data in an ascii text file. The columns can then be used to sort quote pages by industry or sector, or you can use the RTL tokens to qualify scans based on industry or sector. For example, the scan:

```
CL > MA AND SECTOR = "*Technology*"
```

Will list all instruments having the word "technology" anywhere in the sector description that also closed above the moving average specified by MA.

Quote.com Download Options Added

Users of the Quote.com service have two new options in the Data Download window. Download types "Company Names" and "Fundamental Data" are now supported. The Company Names download can be used to fetch the instrument description (security name) and the industry and sector where applicable for individual tickers or a list of tickers in some quote page. This feature provides names for futures, options, and indexes also. The Fundamental Data downloaded retrieves a variety of fundamental items for any list of stocks. These include the following data items, all of which have corresponding RTL tokens:

- Money Flow
- VWAP
- Dividend
- Beta
- Float
- Shares Outstanding
- Institutional Ownership
- Cash Flow per Share
- Return on Equity
- Return on Assets
- Gross Margin
- Revenue per Employee
- Earnings per Share
- Revenue Growth Rate
- Book Value per Share
- PE Ratio
- Dividend Yield
- EPS Growth Rate
- Industry Code.

The fundamental download also fills in the instrument name, industry and sector names. This feature works best after Investor/RT has been connected to Quote.com for a minute or so and the subject quote page has been opened already.

New Backtesting RTL Token TNUM (Trade Number)

The RTL token TNUM can be used in a Trading Signal to determine, during backtesting, how many trades have been entered into for the instrument being backtested. TNUM will be zero at the beginning of the backtest for each instrument indicating no trades have taken place yet. Each entry into a new long or new short position will cause TNUM to be incremented by one. If a "Buy More" or "Sell More" rule is triggered to add to an existing position, TNUM is not incremented. This token enables a trading system to consider whether any trades have yet been executed during the backtest of the instrument and/or how many trades the system has triggered thus far.

Clearing User Data

The SET command can be used in a scan to clear (eliminate) the user data for all instruments in any quote page. Use the scan formula:

```
SET(USERDATA, CLEAR)
```

The CLEAR token is a special numeric constant token added to RTL just for this purpose (the SET command needs a numeric value even though USERDATA is a textual, not a numeric, token. Investor/RT responds by eliminating the USERDATA text for each instrument in the scan subject quote page. The numeric value for CLEAR is 25327 which just happens to spell out C L E A R on the telephone keypad. Setting USERDATA with any other value has no effect on the USERDATA.

USERDATA can be imported into a quote page from an ascii text file. Use File: Import. Set the import type to "Current Quotes/Other Data" and specify an import format containing, for example, ticker and user data. The text file would look like this:

```
AAPL,user data for apple computer  
MSFT,user data for microsoft, inc.  
IBM,user data for ibm corporation
```

The user data in the import file can be up to 256 characters in length, but the text cannot contain either commas or tab characters. If a comma or tab is present in the user data text, Investor/RT will not import text past that point for that instrument. In the example above the user data imported for MSFT would be "user data for Microsoft". The ", inc." would be dropped.

CCI Commodity Channel Index Algorithm Revised

The CCI indicator calculation involves the calculation of a typical price each bar. The method Investor/RT has been using for this involved averaging the highest high and lowest low in the CCI period with the close of each bar. This typical price is then further used in the calculation. For details see the description of the CCI indicator on the Linn Software web site. To bring Investor/RT into conformity with Donald R. Lambert's original writings, the algorithm has been

revised to use High + Low + Close of each bar as the typical price. This change results in CCI values that match CCI calculations we have cross checked with other sources.

Oscillator Option Added to Parabolic SAR Indicator

A new checkbox labeled "SAR Oscillator (CL - SAR)" has been added to the Parabolic SAR Indicator preferences. When this option is checked, the oscillator will be drawn as a histogram that oscillates about 0. The oscillator represents the difference between the closing price and the SAR indicator value. SAR rules would dictate entering into a long position when the oscillator crosses above 0, and reversing into a short position when the oscillator crosses below 0.

Version 5.5 Enhancements, Revision 2

Trading Holiday Charting Fixes

Repairs were made in the 5.5 Rev 2 Version to fix problems related to elimination of trading holidays from intra-day charts. The mouse feedback function now works properly when pointing the mouse to a period of time following a trading holiday. Intra-day downloading problems were corrected as well.

Exporting Technical Indicator Values

The traditional chart popup menu has a new menu item "Export Indicator", used to export the time series of values for the selected technical indicator to a text file. The text file will contain a ticker, date/time stamp, and a numeric value of the indicator at that date/time. The ticker symbol in the export file will be in the form XXXX_YYYY where XXXX is the ticker of the underlying instrument and YYYY is a token representing the indicator exported. For example if you have a five minute chart of IBM with a moving average indicator, select the indicator by clicking on the moving average line, then right-click in the chart to access the popup menu and choose "Export Indicator". The exported text file will show the five minute values of the moving average. The exported ticker in each line of the exported file will be IBM_MA, in this example. You can export any technical indicator value series this way, including custom indicators. The data can be imported into IRT (using File: Import) for further study using other indicators. You must define the ticker IBM_MA to Investor/RT before importing. We suggest you use "Cash" as the security type of the imported instrument so that Investor/RT will not request data from your data service on such instruments. The export file can, of course, be opened directly by Excel for further analysis also.

New Database Utility Functions

New database initialization utility functions have been added to the Control: Database Utilities menu. These utilities can be used to eliminate all intra-day, or daily/weekly/monthly data from

the database, i.e. to start with a clean historical database. The advantage of these utility functions is that they work properly even on a corrupted database. So if you find yourself with a corrupted database and no backup, these utilities may be able to restore integrity to the database if the corruption was related to historical data. All other database content (tickers, charts, scans, quote pages, etc.) is unaffected by these utility functions, only the historical data is wiped clean.

Traditional Chart Session Labeling Option

Intra-day traditional charts have a vertical line marking the beginning of each session. These session marker lines are labeled at the top and bottom showing the day of the week, the day of the month, the session ending time (at the left) and the session begin time. If you do not wish these text labels to appear in any of your intra-day charts for some reason, you can uncheck a box in Setup: Preferences: Charts: General. The session marker lines will then appear sans text labels.

Version 5.5 Enhancements, Revision 3

New Quote Page Columns for Last Three Trades

Six new quote page data columns are available for display of the previous three trades. Three columns are available for showing the last three trade prices and three columns showing the last three trade sizes (tick volume). The column names are Last.1, Last.2, Last.3, Tick Volume.1, Tick Volume.2, and Tick Volume.3. When displayed along with the “Last” and “Tick Volume” data columns, a quote page can now show you the current and previous three trades and sizes.

Custom Instrument Spread Calculation

Custom Instruments defined as spreads (the difference) between two component instruments, will not begin ticking at the session open until both components have opened. This calculation change eliminates spurious ticks of the custom instrument at the open when one of the components has not yet begun trading.

Short Interest, RTL Token SINT Added

Short Interest is available for display in quote pages and can be referenced in RTL using the token SINT. This data value is quoted by myTrack and Quote.com data feeds.

Fixed Export Technical Indicator Function

The Export Indicator feature now works properly in the Windows version of Investor/RT. See ‘Exporting Technical Indicator Values’ above for details.

Startup Investor/RT Window Placement Improved

In the Windows version of Investor/RT, when you quit, Investor/RT now remembers the normal restored position of the overall Investor/RT window (called the task window) as well as the “maximized” status of the window. Upon restart, the task window is restored to the maximized state if appropriate. In addition, the task window now has a proper “restored” position, so you can restore the window to its normal position by clicking the restore button in the upper right corner of the task window. If the task window was not maximized when you quit, then it will be restored to normal status at the precise window coordinates it had when you last quit.

This enhancement will be most appreciated by those who run Windows with multiple monitors and/or those that use the “maximize” and “restore” buttons often to adjust the Investor/RT task window size. In prior versions of Investor/RT, if you quit with the task window maximized, at the next startup the task window’s normal “restored” size was not available. In fact, the restored size was formerly set the same as the maximized size, thus the restore button had no effect. This new technique also fixes a bug that caused a non-maximized Investor/RT task window to be created slightly smaller at startup than it was when you last quit.

Finally, if you quit while the Investor/RT task window is minimized, at the next startup Investor/RT will open in its normal restored (non-maximized) coordinates. To quit Investor/RT while it is minimized on the task bar, right-click on the Investor/RT icon on the task bar and choose “Close”.

Last N Bars in Scan Markers/Custom Indicators

Investor/RT 5.5 now honors the “Evaluate the Last N Bars” options in the Scan/Signal Marker indicator. The bar account can be set to All or some fewer number of bars to reduce processing requirements for the calculation. Similar “Last N Bars” options have also been added to the Custom Indicator and Paint Bars technical indicators.

TSI and MACD Multiply by 100 Option

The True Strength Index and MACD technical indicator setups now have a “Multiply by 100” checkbox. The values of the indicator are simply multiplied by 100 for scaling purposes if this box is checked.

Horizontal Reference Hide Price Option

Displaying the actual price value of a horizontal reference line is now optional. Checking the Hide Price checkbox causes the line to be drawn without any numeric annotation.

Linear Regression Use High/Low Option For Raff Channels

The Linear Regression indicator now has a new option titled “Use Hi/Lo”. This option is only visible when the “Raff Channels” option is checked. Without this option, the Raff Channels will be computed using only the closing prices of the bars. With this option checked, the high and low extremes will be considered. The Raff Channels multiple is computed by finding the maximum distance from the regression line to the price (either close, or hi/lo).

CCI Modified CCI Option

After making adjustments to the CCI study in our last release, we’ve had several clients request that they’d still like to access the previous computation method. We’ve made this available again with through a checkbox labeled “Modified CCI” in the CCI indicator preferences.

Donchian Channels Consider Closing Prices Option

Donchian Channels traditionally consider the extreme highs and lows. We’ve added an option titled “Consider Closing Prices Only”. This option causes the channels to be constructed based on highest and lowest closing prices over the period. High and low prices of each bar are not considered. For example, 15-period Donchian Channels with the “Consider Closing Prices Only” option turned on, would provide channels representing the highest close of last 15 bars, and lowest close of last 15 bars.

Zig Zag “Use High/Low” Option

A new option titled “Use High/Low” has been added to the Zig Zag indicator. This option causes the trendlines to be computed based on extreme highs and lows, as opposed to closing prices only.

Ordering Chart Elements in a Pane

Traditional chart windowpane titles show the values of the instrument(s) and indicator(s) for each bar as you move the mouse within the chart window. The pane title is often insufficiently wide to show every instrument and indicator value. The order of the chart elements within the pane governs the order in which the values are displayed. The only mechanism heretofore to adjust the element order within the pane was a shift-click in the vertical scale area to “cycles” the elements in the pane, moving the first element shown in the pane title to the end.

In Version 5.5, a more flexible method of ordering pane titles has been added. The “Order Chart Pane Elements” window can be accessed in three ways:

- Using the chart window popup menu, choose Add/Delete/Edit -> Element Order
- Shift-click in the vertical scale area of the pane.
- Right-click on the title bar of the pane you wish to order.

A window appears listing the elements within the pane in the order that values are displayed in the pane title. To move an element, select it and click the Top, Bottom, Up, or Down buttons. Double-clicking on an element both selects it and moves it to the top of the list. Shift-clicking does the same. Ctrl-clicking an element (option-click on Macintosh) selects the elements and moves it to the bottom of the list. A “Cycle” button is also provided. It does what “shift-click” in the scale area used to do, that is, it moves the top element to the bottom, make the second item the new top element. The ordering window is displayed just below the pane title bar so you can click “Apply” at anytime to see how the revised pane title bar will look without having to move the window out of the way.

Custom Indicator Lookback Period Added

A new option has been added to the Custom Indicator preferences titled “Calculate Last X Bars”. This option allows the use to dictate how far back the custom indicator is drawn. For instance, “Calculate Last 15 Bars” will cause the custom indicator to be drawn on only the last 15 periods. This new option can help eliminate clutter on charts by limiting the drawing to as few as the last 2 bars. This lookback period can be adjusted directly from the keyboard. Simply select the indicator, and hit the right or left arrow keys on the keyboard to adjust the period down or up by 1. Scan/Signal Markers, Color Markers, and PaintBars indicators all have similar lookback periods associated with them. The lookback periods for Color Markers and PaintBars can be adjusted from the keyboard just like the Custom Indicator period. To adjust the lookback period for scan/signal makers, hold down the shift key while hitting the left or right arrow keys.

Inverse Option for Williams %R

The Williams %R produces values in the range 0 to 100. Some users may prefer to see the value $100 - WRP$ graphed in their charts so that overbought conditions appears as peaks and oversold conditions appear as valleys. A checkbox is provided to invert the formula in this way.

New Statistic function, Mean Deviation

The Statistics (STAT) Indicator now supports “Mean Deviation”. The mean deviation for some period is the average absolute difference from the mean (average) for each bar in the period. It is a measure of volatility during the period.

Version 5.4 Enhancements, Initial Release on March 1, 2002

Multi-periodicity chart windows

You can now mix intraday periodicities within Traditional Charts. You may add as many instruments as you like to a chart, each instrument having its own periodicity. Any indicator added to a chart can then be attached to any instrument/periodicity combination. For instance, you may have a 1-minute candle chart of INTC. You can then click on the "Add Instrument" button on the chart toolbar, and choose INTC again, but this time choose "5-minute" as the periodicity, and you can choose to draw this INTC as a bar. You'll then have 5-minute INTC bars overlaying 1-minute INTC candles. You can drag the instruments into their own chart window pane, or overlay them in the same pane. Both sets of bars/candles will update dynamically, tick by tick. Now, when adding a new indicator to this chart, you can choose whether to attach it to the 5-minute INTC or the 1-minute INTC. When you click on the "Add Indicator" button in the chart toolbar (or just hit Insert on your keyboard), you'll see an "Associated Instrument" choice in the lower left corner of the Add Indicator window. The 5-minute INTC will show up as "INTC(AUTO:0:5)" while the 1-minute INTC will show up as "INTC(AUTO:0:1)". The last number in parenthesis represents the periodicity of the instrument (The first two represent the exchange and session). Choose the instrument/periodicity combination to which you would like to add the indicator before adding it.

When switching the periodicity of a chart that contains instruments of multiple periodicities, any instrument whose periodicity matched the original periodicity of the chart (before changing) will also be changed. If the periodicity of the instrument did not match the periodicity of the original chart, then that instrument's periodicity will not be changed. Using our example above, if we had a 1-minute chart containing 1-minute candles of INTC and 5-minute bars of INTC, and the periodicity of the chart was change to 3-minutes, then the 1-minute candles would change to 3-minute candles, while the 5-minute bars would remain 5-minute bars.

You'll now see the periodicity in parenthesis next to the ticker symbol throughout the chart, in the form TICKER (periodicity). For example, the 5-minute INTC bars would show up as "INTC (5)". You will be able to identify which indicator is associated with which instrument/periodicity combination with this notation.

You are not limited to adding the same symbol multiple times. You could also add 30-minute MSFT candles to the same chart, or a 15-minute connected line of INDU. Each time you add an instrument, you can now specify a unique periodicity for that instrument. In that sense, the chart has a periodicity, and each instrument has its own periodicity. If you are not interested in using multiple periodicity charts, do not let this confuse you. The program will operate just as it has before if you do not elect to add additional instruments with periodicities that vary from the periodicity of the chart. By default, the periodicity that will be displayed in the "Add Instrument" window will be the same as the periodicity of the underlying chart.

Chart Calculation Statistics

A new command has been added to the chart popup menu called "Calc Statistics". This command displays a summary of the technical indicators in the chart window along with calculation counts and average calculation times for each indicator.

Improved Setup of Quote Pages

When entering or editing a ticker into a quote page, pressing the enter (return) key causes the entry or edit to be completed and a new empty row is inserted for further entry. For example, here are the steps to create (or add) tickers to a quote page:

- (a) File: New: Quote Page
- (b) Press the Insert Key to establish a new row with focus on the ticker cell
- (c) IBM <enter> MSFT<enter> AAPL <enter> INTC <enter> CSCO <shift+enter>
- (d) Save the quote page with the five new rows

NOTE: <Shift+enter> will terminate the entry process without inserting another blank row. No row will remain selected. If you press <enter> when an empty ticker cell is being edited, the focus is removed from the ticker cell. No row is inserted.

The File: New: Quote Page command now opens a new untitled quote page with just a few blank rows. The "Add Symbols to Quote Page" helper window is no longer opened automatically. If you wish to use this window to identify and add tickers to any quote page, click the "Add Instruments to Quote Page" button on the quote page toolbar to bring up the instrument selection window.

Chat Window scrolling Improved

The Investor/RT Chat Window now has a scrollbar. When you are scrolled back reviewing previous chat messages, new incoming messages are added but the chat window does not scroll automatically. Scroll back to the bottom to resume auto scrolling of each new incoming chat message. Keyboard scrolling keys are supported (Home, End, Page Up, Page Dn, ctrl-Home, ctrl-End).

Send E-Mail Improvements

The Send E-Mail window has been improved. The text of the email message now has a scrollbar. The list of supported email destinations is more apparent.

Scrollbars for RTL formulas

The scan/signal/custom indicator setup window now has a scrollbar for the formula entry text box. When entering long formulas it formerly was necessary to resize the setup window larger to see the full text of the formula.

Default Scope Revision

The default "Scope" for trendlines and Fibonacci indicators has been changed to "This chart, this instrument". All other indicators have a default scope of "This chart, any instrument". To see the effect, open a chart and draw a trendline. Change the instrument in the chart to some other instrument and the trendline will disappear. Change back to the original instrument and the trendline will appear again. The revision in default scope for trendlines and other instrument specific indicators eliminates the need to edit the preferences for the indicator after drawing it.

NOTE: This feature has been made optional because the implementation of "Instrument specific" default scope may conflict with the new "multi-periodicity" chart feature describe in item #1 above. If you want the default scope for Trendlines, Fibonnaci studies, Gann Angles, and the Andrew Pitchfork study to "this instrument" then check the checkbox at the bottom of Setup: Preferences: Charts: General. If you are working with multi-periodicity charts it is recommended that you do not use this option, at least for the time being.

IF THEN ELSE improved

The RTL handling of IF THEN ELSE statements has been fixed to allow compound expressions for the THEN and ELSE clause. For example:

```
IF (CL < MA) THEN (SET(COLOR, COLOR_PINK) and SET(V#1, MA-CL)) ELSE (SET(COLOR, COLOR_LTBLUE) AND SET(V#1, CL - MA));
```

NOTE: The use of parentheses to bracket the entire expression following the THEN and ELSE tokens. Only one IF THEN ELSE statement can be used within an RTL formula. This restriction may be lifted in a later release.

Chart Annotation Improvements

The annotation charting tool has been enhanced with two new RTL tokens that can be used in annotation texts to display either the time remaining in the current intra-day bar or the percent complete of the current intra-day bar. The RTL tokens are named BARLEFT and BARPCT. To see how these are used, open a five-minute chart and add an annotation using the text:

%BARLEFT left. Bar is %BARPCT%% complete.

Each time a new trade or bid/ask change occurs in the chart, the annotation will update, displaying something like this:

02:24 left. Bar is 51% complete.

The preferences for the annotation indicator have been improved to clarify that RTL tokens can be used, prefixed with the % character, in the text of annotations. A menu list of RTL tokens useful in annotations is provided. Choosing a token from the list causes the token to be inserted at the end of the annotation text. Finally, when using V# variables in annotation texts (e.g. %V#1), Investor/RT now displays the numeric value of the V# variable using the display format specified by the user in Setup: User Variables. Prior to 5.4, all V# variables in annotations were displayed in 99.99999 format.

Setup: Instruments improved

Setup Instruments has been moved to the top of the Setup Menu. Keyboard shortcut remains Alt-A (Command-A on Macintosh). A checkbox has been added to the left of the "Requested Exchange" menu button. When the checkbox is checked, the Requested Exchange menu becomes enabled so you can define new instruments with a requested exchange other than AUTO, or modify the requested exchange of an existing instrument. In most cases, instruments should have an requested exchange of AUTO (automatic). There are data feed specific special cases like QQQ in the Quote.com version of Investor/RT. QQQ must be defined with a requested exchange of AMEX to quote properly in the Quote.com version of Investor/RT. Similarly, the requested exchange must be specified for Canadian issues in the Quote.com version of Investor/RT. When it is necessary to adjust the requested exchange, some users may find the Setup: Instrument windows quicker than opening a quote page, adding the "Exchange Requested" column and editing the cell directly.

New Indicator, RTL Token: TLB Oscillator

This new technical indicator brings more powerful three-line break analysis to the RTL language. Use the TLBOSC token in scans. The indicator can be configured in a variety of ways to provide feedback on the state of three-line break analysis for any instrument.

Auto Trendline Tokens Added to RTL

Auto Uptrend (TLU) and Auto Downtrend (TLD) tokens have been added to the RTL language. The value of these tokens will represent the value of the steepest automated trendline at the current bar. Each token uses the preferences of the Automatic Trendline indicator. These tokens can be helpful in finding instruments that may be breaking through the trend. For instance, you may run the following scan...

CL <= TLU OR CL >= TLD

To find instrument that have either broken above the auto-downtrend or broken below the auto-uptrend.

Chart Pan Tool Improved

Hold down the shift key while panning a chart. When you release the mouse, the chart will automatically snap back to auto-scaling. This technique is useful when you wish to temporarily pan the chart to inspect the values of trendlines or reference lines that may be off screen. Since auto-scaling is reinstated when you release the mouse there is no need to click in the upper right corner of the chart pane to return to auto-scaling. The "shift pan" is also useful when you want to make a horizontal adjustment in the "look ahead" period of the chart without affecting the vertical scaling of the chart. Other internal improvements were made so that chart window clicking will not result in manual scaling mode when panning is not intended. When you mouse down in a chart window in some white space area of a pane, the cursor will change to the hand cursor immediately, but the pan will not begin until you have moved the mouse pointer a small but definitive distance from the mouse down point. If you find a chart pane is in manual scaling mode as indicated by the M displayed in the upper right corner of the pane, you can quickly auto-scale the chart by shift panning a small distance. This may be more convenient than clicking on the M in some cases.

Volume Profile/Market Profile Enhancement

Volume Profile charts have been enhanced to consider up to 30 session of intraday data when composing the profile. Prior to version 5.4, the profile was limited to 4 sessions. In the Volume Profile preferences, this functionality is found in the "Use ticks and 1 minute bars from current session and previous X sessions."

Market Profile charts have been enhanced to consider up to 30 sessions of intraday data when composing the profile, in addition to allowing historical viewing of Market Profile charts. Prior to version 5.4, the profile was limited to 9 sessions. In the Market Profile preferences, this functionality is found in the "Show X days ending Y days back". X represents how many days will be profiled, and Y represents how many days back the chart will end. Y should be set to 0 for live (non-historical) Market Profile charts. But if you would like to see the profiles for the previous month, for instance, you may choose to "Show 20 days, beginning 13 days back".

Auto-Fibonacci Retracement Token added to RTL (FIBR)

The Auto-Fibonacci Retracement study has been added to the RTL language in the form of the token FIBR. The FIBR token represents the % retracement level based on an automated trendline connected the high and low extremes of the retracement period specified in the

preferences. The only preference that is used for the FIBR token is the auto-retracement period. If a period of 50 is specified, for instance, then Investor/RT looks back over the past 50 bars and finds the highest high and lowest low and constructs trendline between these two. Then, the FIBR result is computed as the percent that the current price has retraced from the endpoint of the trendline vertically back toward the starting point.

This value has also been added to the standard Fibonacci Retracement study on charts. You can have a dynamic line at the current price showing the percent the current price has retraced in a text box (80%, 55.5%, etc). To turn this feature on in the Fibonacci Retracement study, make sure the "Extend Right" and "Text on Right" checkboxes are both checked.

Invisible option for instrument charts

A new traditional chart type named "Invisible" has been added. When you designate an instrument as "invisible" the bar data for instrument is not displayed. This option may be useful when the same instrument is present in a chart multiple times, each time with a different periodicity. By designating some of the instruments as invisible, you can setup the chart to display only one periodicity. Technical indicators derived from the invisible instrument periodic data will be display but not the instrument bar data itself. The invisible "chart type" is available as a choice when you add a new instrument to a chart. The chart type can be changed at any time using the chart popup menu or by using the Edit button on the chart toolbar.

Two-button Mouse

Using a two-button mouse on Macintosh Investor/RT has been enhanced to support the right-click capability of two button mice. The OS X version supports two button mice directly. On OS 9, two button mice require a Macintosh driver for the mouse that passes the mouse click in as either a command-click or a control-click.

Linear Regression Tool Enhanced

The Linear Regression study (tool) has been enhanced to provide an option for fixing the beginning date/time of the regression line. The "Bars back" option allows the regression line to be calculated using a fixed number of bars back to the present bar. This new option allows the beginning date/time to be fixed so the number of bars used in the regression analysis increases as time marches on. Keyboard shortcuts are provided for moving the starting point left and right once the study is in the chart.

Box Size in Point and Figure Analysis

Regarding box size...some of you may not know that each instrument has it's own "Box Size". You can view the box size of any instrument but adding the "Box Size" column to a quote page. The way this instrument property was used in the past was somewhat confusing, but I've

modified its use to make things clear. Instead of going into the confusing story of how it was used, let me tell you how you can use it in 5.4.3 forward.

Box Size is a property that should be unique to the target symbol...that is the reason for giving each symbol it's own box size. A symbol that trades at 1500 might have a box size of 1, while a symbol that trades at 30 may have a box size of 0.25. There are two ways to SET the box size of a symbol. You can edit the appropriate cell directly in a quotepage, or you can use run a scan that set's the box size for a whole list of instruments at once. For instance, if you wanted to set the box size of an entire quotepage to 0.25, you would run this scan on your target quotepage...

```
SET(BOX, 0.25)
```

However, if you wanted to set the box size based on the current price of the instrument you might do this:

```
SET(BOX, ROU(CL / 200, 0.05) )
```

This will set the box size to the current price divide by 200...then rounded to the nearest nickel.... You may want to tweak it to you preferences, maybe dividing by 100 and rounding to the nearest dime, etc.

```
SET(BOX, ROU(CL / 100) 0.10 )
```

You're not required to set the box size, however. We have now added an option to all PNF Charts, PNF Indicators, and PNF tokens, to give you the option of using the box size of the underlying instrument, or using the box size you specify in the chart or indicator preferences. The checkbox is labeled "Use Box Size of Instrument". If this checkbox is checked, then the box size of the underlying instrument will be used when calculating the PNF columns. If this column is unchecked, then you will be able to supply your own box size in the preferences.

Here are a few instances where this "Use Box Size of Instrument" can really come in handy. Let's say you are running a scan on a quotepage of 200 symbols to look for reversals, but you don't want to use the same box size for all 200....you want to base it on price. You can first run a scan that sets the box size (as we discussed above). Then you can run a scan using a PNF token setup for "Use Box Size of Instrument"....and each PNF value will be evaluated with the underlying box size of the instrument...instead of using the same box size for each one (which would happen if the checkbox is unchecked). Also, if you have a PNF chart open...and you like to switch symbols frequently by just typing the symbols into the chart, or double-clicking on the symbol in a quotepage...but you don't want to use the same box size for each symbol...there now is a checkbox in the PNF Chart preferences for "Use Box Size of Instrument". When this is checked...changing the symbol in the chart will change the box size of the chart to reflect the box size of the new symbol. The same would apply if you had a PNF indicator added to a traditional chart... You have the same option here. You may want to run you SET scan every day to reflect the current price...or maybe just schedule it to run every morning before the open.

Charting Holidays

Investor/RT has been enhanced to remove holidays from intra-day charts. Trading holidays will no longer appear as "white space" in intra-day charts. Abbreviated trading sessions will show white space for that portion of the normal trading session during which no trading occurs. The myTrack and InterQuote versions of Investor/RT have been improved to eliminate "no data" messages during intra-day data downloads in the period immediately following a trading holiday. The data import process has been improved to filter out any incoming data that is (incorrectly) targeted for a trading holiday. Overall, the Investor/RT user experience in the day(s) immediately following a weekday trading holiday is much improved.

Keyboard Shortcuts for Indicator Presets

Keyboard shortcuts can now be defined to add or remove any technical indicator preset from the current chart window. In the past, the add/remove shortcuts could only add or remove the default setup for any indicator. Now you can define and reference as many setups for the same indicator as you wish. For example, you could have F2, F3, and F4 setup for 5, 10, and 15 period moving averages. First setup the presets using Setup: Preferences: Charts: Technical Indicators. Then use Setup: Preferences: Keyboard Shortcuts to define the shortcuts, use "Add" as the action and choose "Indicator Preset" as the type. A list of indicator presets will then be displayed.

Exponential Moving Averages with Fractional Periods

Exponential Moving Average has been added as a separate technical indicator and has the token EMA in the RTL language. The setup for EMA allows the user to specify a non-integral "period" for the exponential smoothing. The general purpose MA indicator in Investor/RT supports only whole numbers for periods.

Linear Regression Oscillator (New LRF Option)

The Linear Regression Oscillator represents the number of standard deviations of current price from the linear regression line. A value of 2 means that price is currently 2 standard deviations above the linear regression line (using the regression period specified...ending on that bar). A value of -1.5 means price is currently 1 1/2 standard deviations below the regression line. This option has been added as a "Linear Regression Oscillator" checkbox to the LRF indicator. When drawn, reference lines are automatically drawn at -2, -1, 0, 1, and 2 standard deviations. It is recommended that the Linear Regression Oscillator be drawn in a separate pane from price data. The Linear Regression Oscillator tells how far the current price has deviated from the regression trendline, in units of standard deviations, or how far the price has deviated from the general trend established by the regression analysis (using the period specified).

Normalized Options Added to LRS and LRA Indicators

A new option has been added to Linear Regression Slope (LRS) for normalizing the resulting value. If the "x 100 / Price (Normalize)" option is checked, then the resulting value will be divided by 100, and then multiplied by the price of that bar. This normalizes the data for the sake of comparison among instruments that trade in different price ranges. If you are interested in using this study to compare slopes between instruments, it's important that this normalizing option be used. The difference between the normalized slope and the raw slope is similar to the difference between percent change (normalized), and change (unnormalized). If you're comparing two instruments, one that's trading at 200 and another that's trading at 10, then it's not fair to compare the change in price, although the normalized value of percent change does give us a fair basis of comparison.

The normalized slope value essentially gives us the percent change in price per bar of the regression (best fit) line. If the normalized slope is 0.10, then the regression line is rising at a rate of 0.10% per bar. Similarly, a normalized slope of -0.25 would indicate that the line that best fits the last N bars of data is falling at the rate of 0.25% per bar.

An option has also been added to Linear Regression Acceleration (LRA) for normalizing the resulting value. If the "x 100 / Price (Normalize)" option is checked, then the resulting value will be the change in normalized slope per bar. This normalizes the data for the sake of comparison among instruments that trade in different price ranges. If you are interested in using this study to compare acceleration between instruments, it's important that this normalizing option be used. The difference between the normalized acceleration and the raw acceleration is similar to the difference between percent change (normalized), and change (unnormalized). If you are comparing two instruments, one that is trading at 200 and another that is trading at 10, then it is inappropriate to compare the absolute change in price. However, the normalized value, percent change, does provide a good basis for comparing the relative price moves of the instruments, independent of the actual price levels of each instrument.

The normalized acceleration value essentially gives us the change in the normalized slope of the regression (best fit) line, from bar to bar. When the normalized acceleration is 0.10, the regression line normalized slope is rising at a rate of 0.10 per bar. Similarly, a normalized acceleration of -0.25 would indicate that the normalized slope of the line that best fits the last N bars of data is falling at the rate of 0.25 per bar. For example, if the normalized slope of the last bar was 0.25 (meaning the regression line ending on that bar rises at a rate of 0.25% per bar on average), and the normalized slope of the current bar was 0.27, then the normalized acceleration of the current bar would $0.27 - 0.25 = 0.02$. A positive acceleration value does not equate to a positive slope, simply to an increasing slope. Similarly, a negative acceleration equates to a decreasing slope.

Indicator Preset Buttons Enhanced

When setting up a chart Button as to represent a technical indicator preset, there is a new menu of choices for where to place the indicator in the chart window. The five choices for pane placement are:

Default Pane

Means to let Investor/RT decide where to place the indicator based on the indicator's type. Some indicators, like moving averages, Bollinger Bands, etc. are "overlay" indicators and will always be placed in the pane containing the instrument. Other indicators like RSI, MACD, etc. have a price scale much different than the instrument and are by default put into a newly created pane.

Create a New Pane

Means that the preset indicator will always be placed into a new pane regardless of its type

Overlay the Instrument

Means that the preset indicator will always be directed to the pane of the instrument regardless of its type.

Overlay the Same Indicator

Means that Investor/RT will search the chart to see if there is another indicator present of the same kind, e.g. RSI. If there is one, the new preset will be added to the same pane. So for example, if you had presets for several RSI setups, choosing this placement option would superimpose all RSI presets into a single pane. If the default placement (choice 1) was used, each RSI would go into its own pane.

Add to Indicator-Only Pane

Means that Investor/RT will look for a chart pane that contains only indicator(s) and no instrument and add the preset to that pane if so, otherwise the indicator will go into a new pane.

When a preset button resides in a chart, the button itself has an associated instrument. This is an important consideration when there are multiple instruments in the chart or multiple periodicities of the same instrument. The instrument/periodicity that the button is associated with is the instrument that the preset will be associated with. However, when you click on a preset Button Investor/RT does look to see if you have first selected some other instrument in the chart window (by clicking on it or tabbing to it) and if so, the preset indicator will be added to the instrument that is selected and NOT to the instrument that is associated with the Button itself.

Trading Notes Enhancements

The appearance of the Trading Notes window has been improved. Both scrollbars for the instrument selector at the top left are now visible and a vertical scrollbar has been added to the note text display box for scrolling longer notes when needed. Setup: Preferences: Keyboard shortcuts can now be used to define a function key for opening the Trading Notes window. For example, if F2 is the Open: Trading Notes function key, then the key sequence:

<F2>IBM<enter>

NOTE: Will open the trading notes window, pick IBM from the list of instruments and bring up a prompting box for entering a new note for IBM. Type in the note text and press <enter> again to add the note. A new "Paste" button is available in this prompting box. The paste button is for creating note(s) from text you have copied to the clipboard elsewhere. Since trading notes are limited to 255 characters, the "Paste" button will add the text on the clipboard into multiple notes as required. As an example of how to effectively use this new facility, suppose you used the Web Research feature of Investor/RT to find an analyst report on Microsoft, ticker MSFT. First you select the text you wish from the report and copy it to the clipboard

Then return to Investor/RT and enter the following keystrokes:

<F2>MSFT<enter><ALT-P>

Here's what happens: <F2> opens the trading notes window, MSFT selects Microsoft from the instrument list, <enter> brings up the note entry prompt. Finally <ALT-P> clicks the "Paste" button in that dialog (Macintosh users would use <CMD-P> instead). If the text of the clipboard were say 700 characters long, three trading notes would then be added for MSFT, two of length 255 and the last segment of the report text in the third note.

Pressing the esc key can dismiss the Trading Notes window. If the Delete key is pressed when a note is selected, the note is deleted and the selection moves to the next earlier note. Thus you can delete a series of older notes by selecting the first note you wish to eliminate and then pressing the Delete Key multiple times. On Macintosh keyboards the Delete key is actually the shifted Help key, not the key labeled "delete" which functions as the backspace key.

More Keyboard Shortcuts Setup: Preferences

Keyboard Shortcuts has been enhanced to add several new types to the "Open" Action. Specifically you can now define keyboard shortcuts to open trading notes or a particular custom indicator, custom column, or trading signal.

Renko Charts Option Added to Point and Figure Charts

A new checkbox has been added to PNF charts labeled "Renko" which essentially transforms the PNF chart into a Renko Chart. Renko Charts are very similar to PNF charts. Actually, if you take a PNF chart having a reversal criteria of 1, and then stretch each column out so that every X or O has its own separate column, then the result will be a Renko Chart. The result is a series of diagonals going up and down, with X's on the upward diagonals and O's on the downward diagonals. When the "Renko" checkbox is checked in the preferences, you'll notice that the "Reversal Criteria" control is disabled because Renko charts always use a Reversal Criteria of one.

Market Profile Historical Period Expanded

The historical reach of market profile charts has been expanded to reach any data in the past, as long as that data is available within Investor/RT. The setting "Use Last X days starting Y days back" formerly limited the Y value to a maximum of 30, but now has been expanded to allow any value to be typed in directly.

Raff Channels Added To Linear Regression

A new channel method has been added to the Linear Regression study called Raff Channels. If the Raff Channels checkbox is checked a different method will be used to compute the bands. Developed by Gilbert Raff, this method finds the maximum distance between any closing price and the regression line. This distance is then used as the basis for the channels. The channels are drawn parallel to the regression line, at a distance above and below the line equal to the maximum distance computed. The upper channel is then used for support, while the lower channel is used for resistance. Again, you can specify multiple levels, separated by commas. The levels will be used as multipliers of the standard Raff channels. To simply draw the standard Raff channels, specify multipliers of 1 for both the above and below channels.

Scan/Signal Markers - New Shifting Option

The Scan/Signal Marker technical indicator now has a shifting option. This option allows the user to draw the signals any number of bars left or right of the bar on which the actual signal occurred. A line is drawn from the shifted signals back to the bar on which the signal occurred to make it clear that the marker has been shifted for visual effect.

Accessing View/Edit Historical Data

The popup menu available in quote pages, portfolios, quick quotes, etc. by right-clicking on a ticker now has a View/Edit submenu for quickly calling up all of the historical data on file for the ticker for viewing. The submenu has choices for daily/weekly/monthly/1 min and 5 min bars and an "Other..." menu item for choosing any other periodicity. The new submenu is accessible

from quote pages and portfolios and any instrument selection list appearing elsewhere in the system.

Version 5.3 Enhancements, released January 23, 2002

Custom Quote Page Columns

Custom Quote Page Columns allow the Investor/RT user to harness the power of the RTL language to display and test calculated values in quote pages. Any scan, trading signal, or custom indicator can be added to a quote page as a custom column. In addition, any of the built-in quote page columns can be used to define a custom column for color coding and formatting the data according to user preferences. Any technical indicator available for use in the RTL language can be made into a custom column by simply creating a custom indicator containing that sole indicator token.

Any number of custom columns may be defined. Once defined and given a name, the custom column can be added to any number of quote pages. Custom columns saved with a quote page will reappear in the same columnar position and width when the quote page is opened, just like built-in columns.

Each column has a user specified column heading (title). The title may be the same as the name of the column but this is not required. Each column can be assigned a specific display format (e.g. 99, 99.999, 32nds, etc.), and, for custom indicators, scans, and signals, a variety of options are provided to control the frequency of calculation of the formula underlying the column's displayed values.

Each column can have a list of "rules" which govern the foreground and background colors used to display the column values. A rule can test for TRUE or FALSE, for example, when a scan or trading signal is used. For custom indicators, rules can test for ranges of numeric values. For each rule, the user can specify colors and optionally, a textual message to be displayed in the quote page cell when the rule is true for that row (instrument) in the quote page.

The rules for a custom column can also specify sounds, charts, and schedules that will be triggered whenever a given rule is determined to be true for a row in the quote page. For example, a custom column may be created to display the state of a scan that tests for RSI breaking from below 70 to above 70. The custom column can be setup with a rule that makes a particular sound and opens a chart named "RSI Chart" whenever the scan detects an RSI break above 70. Further, the rule could prescribe a bright red background and yellow lettering to be used to display the message "RSI ALERT" in the quote page cell when the breaks occurs. If the condition is detected on say IBM, then you would first hear the sound and note the bright red message in IBM's quote page row, then the chart named "RSI Chart" would open, showing the

chart of the instrument that caused the alert. The chart would typically be setup to show the same RSI indicator used in the custom column plus any other technical indicators of interest.

Each custom column that invokes a scan, signal, or custom indicator calculation has its own periodicity. The column's periodicity it used to do the calculations, overriding the periodicity of the scan or signal itself, similar to the way Scan/Signal Markers use the periodicity of the chart in which the markers are created. This makes it possible to have say, 1-minute, 5-minute, 30-minute and daily "Stochastics" displayed side by side in a quote page as custom columns. Using similar color coding rules in each column makes a powerful visual indicator when two or more of the columns take on values of interest.

Custom Column User Interface

The Custom Column Setup Window (the setup window) can be opened using Setup: Custom Column, or by using File: New: Custom Column. Once one more custom columns are created and saved, specific custom column setups can be accessed using the Open: Custom Column menu showing the names of all custom columns on file. When a custom column setup is modified and saved by clicking either the OK or Apply button in the setup window, all open quote pages that contain the particular column take on the new definition immediately. Use the Apply button to leave the setup window open so you can observe the visually effect of your changes before dismissing the setup window. If you have a quote page open with one or more custom columns in it, you can access the setup for the custom column by right-clicking (control-click on Macintosh) on any custom column row in the quote page. The setup window has a menu of all custom columns at the top so once open, you can switch to any other custom column you wish to inspect it or make modifications.

The setup window has a four-tab interface.

Type Tab

The 'type' tab is used to define whether the custom column is an override of a built-in data column or a scan/signal/custom indicator. When a scan, signal, or custom indicator is chosen, it's full formula and any comments are shown in the window. Choose the built-in column/scan/signal/custom indicator from the list button provided or operate the ">>" button to cycle through the items in the list. The "Type" tab includes the periodicity to be used when a scan, signal or custom indicator is selected source of the column's data. Convenience buttons are provided for creating or editing scans, signals, or custom indicators. Note that when editing a scan, signal, or custom indicator, saving the object causes all custom columns that reference that scan/signal/custom indicator to be updated to used the revised definition.

Format Tab

The "Format" tab provides a simple user interface for specifying the column title to be used in the quote page for this custom column, and the display format and default

colors to be used. All cells will have the specified default color scheme unless a rule ("Rules" tab) causes the color coding to be changed.

Rules Tab

The "Rules" tab is a spreadsheet containing up to nine rules that may be applied to the value of the custom column. The best way to explain the rules spreadsheet is to go step by step through a simple example. Suppose we want to create the rules for a custom column based on a custom indicator with the formula:

$$100 * (CL - LO) / (HI - LO)$$

This is, of course, the current bar raw stochastic (RawK). It takes on values from 0 to 100. In our example we will add rules to color code extreme values (over 70 and under 30), leaving those values between 30 and 70 at the default colors. We will add a special rule with a sound and a chart when the stochastic goes over 98.

Under the rules spreadsheet is a menu of "operators". The operators can be shown in either English or mathematical symbols only according to your preference. Toggle between the two by checking and unchecking the box to the left of the operator menu.

Choose "Is Less than X" and click "Add Rule" to add a rule with that operator. Fill in the value for X in the spreadsheet, in this case 30. Adjust the foreground and background colors for this rule by clicking in the color cells.

Next choose "Is Greater than X" and click "Add Rule" to add a second rule to the sheet. Set X to 70 in this case and set the colors. Clicking the color cell gives you the "native" Windows or Macintosh "color picker". If you prefer to use the Investor/RT standard color picker, ctrl-click (Windows) or option-click (Macintosh). A shortcut: if you wish to change every cell in a color column to the same color, e.g. black as the foreground color, then shift-click on any cell and when your selection is completed, the chosen color will be set accordingly for all rules.

Finally, click "Add Rule" again to add a third ("Is Greater Than") rule specifying X as 98. Choose a distinctive color-coding for this rule and enter the text "NEAR HI" in the text cell for the third rule. To specify a sound for this condition, click in the "Sound" cell for the third row and pick from the presented list of sounds. You can add your own sounds into the sounds directory within the Investor/RT directory if you like.

Other notes on the Rules tab: If you make a mistake or wish to eliminate a rule click on the row to select it and click the "Delete Rule" button. The "Move Rule" button enables the order of the rows to be arranged by moving the selected row "down one" in the list. When a rule is at the bottom of the list of rules, clicking "Move Rule" moves to back up to the top of the list. Note that every rule is tested and the actions associated with the rule are performed for every rule that tests true. With regard to color and text values,

the last true rule's color and text message will appear in the quote page cell. This is why rule arrangement is important.

The "Schedule" column in the rules spreadsheet is used just like the "Chart" column. Click on the cell to pick from a list of schedules. When a particular rule is TRUE, the schedule will be run.

Once you have specified a sound, chart, or schedule for a rule, if you wish to eliminate it, simply shift-click on the cell to reset it to "none".

Calculation Tab

The "Calculation" tab is only applicable when the custom column is associated with a scan, a signal, or a custom indicator. Because these formulas can be demanding on computer processing resources, options are provided for controlling the frequency of calculation of indicators. Investor/RT keeps separate tabs on each instrument in the quote page so it can manage the calculation independently on each row in the quote page. The calculation options should look familiar; they are the same ones used to control the rate of calculation of technical indicators in charts. While "tick by tick" is available, we recommend using every 1, or every 2 seconds instead, especially if the quote page will contain very active instruments like the ES and NQ futures or QQQ.

When the custom column setup is complete, click OK and you will be prompted to provide a name for the custom column. Provide a descriptive name like "Today's RawK", for example.

Adding Custom Columns to a Quote Page

Once one or more custom columns have been defined, you can add them to any existing quote page by right clicking (control click on Macintosh) on the column title row of the quote page. Choose "Add Custom Column" from the popup menu. To remove a custom column from any quote page, simply drag the custom column title heading off the title row and drop it into the body of the quote page. Custom Columns that exist in a quote page are saved with the quote page when you click the Save button on the quote page toolbar or use File: Save to save the quote page. Custom columns can be used with either system defined or user-define quote pages. Because system defined quote pages can easily contain hundreds or thousands of ticker symbols we recommend you get familiar with this powerful new feature of Investor/RT using user-defined quote pages with a limited number of instrument rows. It is wise to create and test your custom columns using small quote pages until they operate as you intend before putting them in more populous quote pages.

Modify Custom Columns

Once you have one or more custom columns operating in a quote page you may wish to make adjustments to the behavior of the custom column. You can edit any custom column using the Open: Custom Column menu. If the quote page is open, right click in any cell of the custom column to open its setup window. You can adjust things like column title, rule colors, etc. and press the Apply button to save the changes and see them reflected in the open quote page(s) that contain the column. In addition, you can entirely change the setup of the custom column if you wish by choosing a different custom indicator, or you can edit the custom indicator itself (using the Edit Cust Ind button in the "Type" tab). When you edit the custom indicator associated with a custom column you can revise the formula and/or revise the setups for technical indicators used in the custom indicator formula. When you then click Save to save your custom indicator setup, the changes are reflected immediately in all open quote page(s) that contain custom column(s) that reference the revised custom indicator.

Chart Session Override

Prior to version 5.3 all traditional charts used the trading hours of the session associated with the instrument in the chart to determine the span of trading hours to display in intra-day charts. This method allows for great flexibility in tracking a variety of instruments each with differing trading hours. The charts adjust to the trading hours of whatever instrument in being charted. However, this method also make it somewhat difficult (and even confusing to new users of Investor/RT) to change a chart from viewing the regular trading hours to viewing the overnight trading in the same instrument.

To simplify this we have made a number of changes to the preferences for chart windows to enable the chart itself to have an "override session". When a chart has an override session, the time span dictated by the chart's session is used to show the data. When a chart does not have an override session, the session of the instrument itself is used to guide the charting process as before. To activate a chart override session for a particular chart, access the chart's preferences, check the "override" checkbox and select a session from the list. To return to the instrument's session, uncheck the override checkbox.

To avoid using the dialog box, you can create "Chart Buttons" for switching chart sessions just as you can create buttons for changing periodicity and ticker symbol. The "Button" indicator has been enhanced in version 5.3 to add this third kind of button. Suppose you have session 31 set up as an "overnight (24 hour) session" and session 0 is your normal "Day Session". Add two buttons to the chart (press insert key and select "Button"). The first button would have a specification of "31:24H", the second "0:RTH". Note the colon separates the session number and the button label you wish to appear on the face of the button. Two buttons in the chart window would then appear having "24H" and "RTH" as their titles. Clicking these buttons switches the chart's "view" between the two sessions. If you want these session button to

appear in every chart you use in Investor/RT, then edit the button setups and choose "All Chart, Any Instrument" as the "Scope" of the button.

In addition to the session override enhancement, we have simplified the default preferences for traditional charts. Setup: Preferences: Charts: Traditional Chart now has an improved way to specify the default viewing periods for various kinds of periodicities (tick, minute interval, daily, weekly, monthly). The default preferences can specify either a number of units of time (hours, days, weeks, months, years) or the view period can be expressed simply as a fixed number of bars (from the present back in time) for each periodicity type. The bars method will be preferred by many (for the intra-day minute intervals case especially) since changing the periodicity of the chart will not affect the number of bars displayed, i.e. the amount of time displayed in an intra-day interval chart will expand with the number of minutes in the periodicity.

Island Book Display (Quote.com)

The Level II window in the Quote.com version of Investor/RT can be used to view the "Island Book" for any instrument. In the ticker symbol entry box at the top of the window, enter "ISLD:QQQ" for example, to see the Island book for QQQ. Enter QQQ alone and press return to go back to NASDAQ Level II. The Level II window can also be used to view regional exchange bid/ask/sizes for NYSE listed stocks as well.

Time and Sales Improvements

The Time and Sales window now has a user option for suppressing the display of the date, i.e. only the time of each tick is shown in HH:MM:SS format. When reviewing tick data spanning multiple dates the "Date" checkbox can be checked to see both date and time. In addition, improvements were made to "remember" the column widths of each column in the time and sales window (and all view/edit windows for that matter). Once you have adjusted the column widths of a time and sales window to your liking, right-click in the window and click "Save as Default" to make those widths your default settings.

New RTL token: UTICKR for underlying ticker

The token UTICKR was added to the RTL language to enable scans for options having a particular underlying symbol, e.g. the scan:

UTICKR = "MSFT" and STRIKE > 50

Would find all options setup in Investor/RT having MSFT as the underlying ticker symbol and strike price over \$50

Chart Buttons For Changing Sessions

As mentioned in item #2 above, the Button indicator for traditional charts has been enhanced to add the ability to switch the chart's override session. To create a session button in your charts, add a button indicator, set the "Purpose" of the button to "Change the Session...". In the entry box enter one or more session button specifications separated by commas. Multiple specifications are appropriate for "Menu" style buttons. Each specification has the format dd:label, where dd is the session number and label is the text you wish to appear either in the menu or on the face of the button. For example, the specification 31:Globex for a single session pushbutton would result in a button titled "Globex". Clicking the button in the chart switches the charts override session to Session #31. If you enter 99 instead of a real session number, the purpose of the button will be to return the chart to the regular trading hours dictated by the session of the instrument in the chart. A specification like "99:RTH" has this effect. If you wish to have a chart session menu button, enter a specification like:

99:RTH, 0:Stocks, 3:Grains, 31:Globex

This results in a button having four menu choices: RTH, Stocks, Grains, and Globex

Fatal Error Diagnostics Improved

Our goal at Linn Software has always been to provide quality software for use by active traders and investors. This means that product stability and reliability are very important to us. Investor/RT can be 99% bug free and yet some users who happen to use a particular technical indicator in a certain way, with a particular ticker symbol and/or with a particular data feed may experience repeated fatal errors due to an isolated bug in the software. Our goal is to eliminate any and all sources of product instability.

To this end, in version 5.3 we have added additional fatal error diagnostics designed to identify whether a technical indicator calculation was in process when the error occurred and if so, which indicator was being calculated, which instrument was involved, and how many bars of data were present. If you encounter any fatal error message like this, it will be logged into the "Message Log" so that after starting Investor/RT up again you can use File: Open: Message Log to view the error message and copy/paste it into an email to support@linnsoft.com. Our hope is that the improved diagnostics will enable us to quickly identify indicator related errors, reproduce them and fix them. Sometimes a fatal error involving an indicator is the result of a particular set of preferences in use in the indicator calculation. Please try to include this information when you email a fatal error report. If you do not use the built-in email feature of Investor/RT to send the message, then please include your user profile as well.

Close Alarms Menu Item In Window Menu

The Close submenu in the Window menu now has an "Alarms" menu item. This command closes all open Alarm windows. If you wish to review the list of instruments for which an alarm has triggered open the ".Alarms" quote page.

Backtesting With CONFIRM Rules

Version 5.3 fixes a long-standing bug in backtesting having to do with more complex trading systems that utilize "CONFIRM" rules. When CONFIRM is the action for a rule and the rule tests true for some bar, the next rule is then tested as confirmation. This feature is designed to enable you to test a signal only when some other signal has already been determined to be true. This makes backtesting more efficient as well since the rule after the CONFIRM rule is tested only if the CONFIRM rule preceding it tests true.

When a CONFIRM rule tests false, the backtest is supposed to skip over the rule following the CONFIRM. Actually, you can have a series of two or more confirm rule in a row, so the skipping continues until the confirm sequence ends. Then the backtesting continues with the next rule for the current bar. The bug was in the "skipping" process. It had the effect of skipping all of the rules following any false confirm rule, thus moving on to the next bars without testing the remainder of the rules for that bar. If a CONFIRM rule and its companion rule(s) are at the end of the rule list, the bug would have no apparent effect, but obviously if you had a CONFIRM rule followed by other actionable rules in your trading system, this bug could cause signals to be missed. The 5.3 release fixes the problem so that CONFIRM rules are processed correctly.

Importing V# Values Using Text Files

Data values from outside sources for each ticker can now be imported into user assigned V# variables so that the data can be used for reference in quote pages, scans, etc. The data values must be numeric data. To import numeric values simply setup a format using Setup: Formats. For example, suppose you had a text file in the following format:

```
AAPL,1.11,2.22,3.33 IBM,4.44,5.55,6.66 MSFT,7.77,8.88,9.99 Etc.
```

Each line in the file in this example contains a ticker symbol followed by three numbers, all fields separated by commas (or tabs). Setup a format and name it "Import Three Numbers". The format could be "ticker, V#1, V#2, V#3" for example. Then use File: Import to import the data. Specify "Current Quotes/Other Data" as the Import Type. Specify "Import Three Numbers" as the format to use. When you import the data, variable V#1 will receive the value 1.11 for AAPL, 4.44 for IBM, and 7.77 for MSFT.

Note that the Import format you use can include any V# variables, V#1 through V#512. However, only V#1 through V#6 are saved permanently on the database when you Quit

Investor/RT. V#7 through V#512 can be used as temporary variables for holding imported data, but these variable are reset to zero when you quit.

If you want to preserve the value of V# variables higher than V#7 when you quit, simply create a quote page format containing the ticker followed by V#1 variable columns you wish to preserve. Open the .All Symbols quote page and put the .All Symbols page into this format. Then Issue the File: Save as Text command to save all of the data as a text file. This text file can be imported back into Investor/RT at a later time using File: Import as described above. The format you used to "Save as Text" is the format you should specify when you import. Thus, this new capability to import V# variables makes it possible to extend Investor/RT to save all of your V# variables permanently with a little setup work.

Deleting Custom Columns

Custom Columns, just like charts, quote pages, scans, and other Investor/RT "objects" can now be deleted (or renamed) using the Delete/Rename feature. When you delete a custom column using this facility, Investor/RT will automatically remove the column for any open quote pages in which it resides.

XLK And QQQ Option Chains

The option generator (Setup: Equity and Index Options) has been improved to generate chains of XLK and QQQ options at \$1 strike price increments.

Chart Switching Feature Added

Traditional charts have a new feature designed to enable fast switching from one chart definition to another. In the lower right corner of each traditional chart window is the "Chart Name", the name by which the chart is listed in the chart selection list. If you click on the chart name, Investor/RT will pop up a list of chart names, select one and click ok, or simply double-click on any chart name to switch the current window to the selected chart. If the selected chart is not a "traditional chart", however, the selected chart will be opened in a new window.

Feed Time And Delay Quote Page Columns

These columns are now supported in the Quote.com version of Investor/RT. Delay shows the delay in minutes for the instrument. Zero means "real-time". Feed Time shows the feed transmitted time that the last trade took place. You can compare this with the "Date Time" or "Time" to see if there is a difference. The data column "Lag" shows the difference between the clock time when the trade was received and the feed time. Hopefully the "lag" seconds is a small number.

Technical Indicator Custom Columns

Custom Columns can be created directly for all RTL technical indicators. Prior to this enhancement it was necessary to create a custom indicator that referenced a technical indicator to accomplish this. In the "Type" tab of the Custom Column setup window, check the "Technical Indicator" radio button. Choose an indicator from the list provided. The preferences for the selected indicator will initially be the default settings (as set in Setup: Prefs: Charts: Technical Indicators). Change the preferences for the indicator by clicking the Setup button. If there are any "presets" defined for the chosen indicator you can change the settings to a preset by clicking the "Use Preset" button. A list of presets for the indicator will appear when you click this button.

Candlestick Pattern Custom Columns

You can create a custom column that will report whether certain candlestick patterns are true for the instruments in a quote page. Setup the custom column as a "technical indicator" column. Choose "CPR: Candlestick Pattern Recognition" as the indicator. Click Setup and choose one more patterns to test. Setup an "Is True" rule using the "Rules" tab to display TRUE or your own text message when the indicator is true. For example, if you were looking for Doji's, you could create a custom column to test this one pattern and have the custom column display "DOJI" whenever that pattern occurs for the instrument. Each custom column can have its own periodicity, so you can easily create multiple columns looking for candlestick pattern(s) in various periodicities.

Testing Multiple Custom Column Conditions

Each custom column, whether it references a built-in column, a scan or signal, a custom indicator or a technical indicator has a value for each instrument that changes over time. Scans and trading signals are true/false expressions that have a numeric value of 1.0 (true) or 0.0 (false). If you want to make the calculated value of some custom column available to other scans/signals/custom indicators (and hence to other custom columns) then you can specify a V# user variable for the custom column using the "Calculation" tab of the Custom Column setup window. Suppose, for example you had three custom columns each showing some moving average. You could use, say V#10 for one moving average column, V#11 for another, and V#12 for the third one. The values for V#10, V#11, and V#12 will change dynamically as the custom columns are recalculated. Thus, you can rely on these value to create a custom indicator such as:

$$(CL > V\#10) + (CL > V\#11) + (CL > V\#12)$$

Make another custom column to show the value of this custom indicator. The formula will evaluate to 3 if an instrument's last price is above all three moving averages, 2 if above only two moving averages. A zero value indicates the last price is below all three moving averages. Rules for each value 0,1,2, and 3 can then color code the custom column. Notice there is very

little processing involved in evaluating this custom column since all of the moving averages are pre-calculated and available via the V# user variables. This is a very powerful mechanism. Any custom column calculation can essentially pass its results using a user variable to any other column, which in turn considers the V# variable in its own formula. Note that the calculation order of cells for each row in a quote page is left to right, thus the custom columns should be arranged in such a way that any dependent columns be to the right of the column(s) that produce the V# results it needs. Note also that any custom indicator or scan/signal can also include SET statements in their formulas. User variables set in this fashion are similarly available to other calculations going on in other custom columns within any open quote pages.

Macintosh OS X and Multi-threading

The Macintosh OS X version of Investor/RT supports multi-threaded data feed streaming. This performance-enhancing feature has long been incorporated into the Windows versions of Investor/RT. Streaming market data is processed in parallel with the main Investor/RT application. This speeds up overall throughput and ensures that data acquisition continues even during periods of heavy processing loads. The Macintosh OS X version is better able to "keep up with the feed" in real-time and the feed processing thread eliminates or substantially reduces dropped connections. Both the myTrack and InterQuote data services are supported with this new facility under Mac OS X. The Dial/Data version of Investor/RT is also available under OS X but does not require multi-threading services. This feature supports either single or dual processor Macintosh computers. Some Mac PowerPC computers more than four years old, e.g. 6100/7100/8100 models, do not support multi-threading due to hardware limitations. All G3/G4 Desktops, PowerBooks, iBooks and iMacs are compatible. Macintosh users running OS 9 can take advantage of the improved performance of the OS X version as well. The OS X version of Investor/RT is developed using Apple "Carbon" technology. The application will run natively under OS 9 and will exhibit the improved data feed access performance due to multi-threading. For information on upgrading Investor/RT licenses for OS X please contact sales@linnsoft.com.

Importing and Exporting V# User Variables

The Import facility (File Menu) has been enhanced to allow values for any V# user variable to be imported. For example, externally acquired fundamental data or calculated data of any kind could be imported in this fashion. Then the imported V# values for each instrument can be used in scans, custom indicators, signals, etc. Use the "Current Quotes" option when importing. Create a "Format" that includes the ticker and the V# variables to be imported. Note that at present only V#1 through V#6 values are retained permanently for each instrument on the database when Investor/RT quits. Thus, values imported for other V# variables must be re-imported when Investor/RT starts up again. In fact, you could use the import format to open the .all symbols quote page in this format, then save the page as text. This will save the ticker and each V# value to a text file that can be easily imported at any future time those values are needed for some purpose. Note that "exporting" V# values is not accomplished using File: Export. File: Export is for exporting historical data of any periodicity. File: Save: Save as Text is

used to save a quote page of instrument data as a text file. Saved quote page text files can be imported using File: Import.

Price Time Cycles Indicator

The Price Time Cycles indicator is a flexible tool that allows repeating shapes to be drawn in price and time throughout the chart. A base shape is positioned based on a set of price and date/time coordinates. These coordinates dictate the lower left corner or center of the base shape. The size of the shape is dictated by the height and width parameters. Height is given in units of price, while width uses units of bars. The base shape can be repeated continuously throughout the chart by checking the "repeating" checkbox. The repeating shapes can be spaced both vertically and horizontally. The spacing is dictated by the Vertical Spacing and Horizontal Spacing parameters in the preferences. Again, vertical space uses units of price while horizontal space uses units of bars. A spacing of 0 will compact adjacent shapes so that they touch.

Concentric multiples of the base shape and repeated shapes may also be drawn. To do this, check the "Concentric Multiples" checkbox, and specify the multiples which you would like drawn. The multiples may be separated with either a comma or a space. (eg. 0.5, 2, 3)

If the PriceTime Cycles is setup with the "repeating" checkbox checked, then the base shape will stand out as slightly bolder than the other shapes. If the "Center on Coordinates" checkbox is unchecked, the lower left corner of the base shape will be marked with a small circle, representing the price and time coordinates on which the PriceTime Cycles indicator is based, otherwise, the center of the base shape will be marked with a circle.

Draw Shape(s)

Check the shapes you would like drawn. Choices include Ellipse, Rectangle, and X.

Repeating

Check this option if you would like your shape repeated throughout the chart window. The identical shape will be duplicated using the horizontal and vertical spacing option.

Solid

If this option is checked, the shape(s) will be filled in with the shape color.

Center on Coordinates

If this option is checked, the base shape will be drawn centered around the coordinates supplied. If this option is unchecked, the base shapes lower left corner will be anchored on the coordinates.

Label

This option is only valid when the pattern is repeating. If this option is checked, each shape will be labeled with X, Y coordinates relative to the base shape. For instance, the shape just to the left of the base shape will be labeled (-1, 0) while the shape two positions above the base shape will be labeled (0, 2).

Price

Price at which to draw the base shape. If "Center on Coordinates" is checked, this price will dictate the vertical center of the base shape, otherwise, it will dictate the price of the lower edge of the base shape.

Date/Time

Date/Time at which to draw the base shape. If "Center on Coordinates" is checked, this date/time will dictate the horizontal center of the base shape, otherwise, it will dictate the price/time of the left edge of the base shape.

Color

Color, style, and thickness of the shape lines.

Height

Height, in dollars, of the shape(s).

Width

Width, in bars, of the shape(s).

Vertical Spacing

Space vertically, in dollars, between the repeating shapes. This option only applies when the "repeating" checkbox is checked.

Horizontal Spacing

Space horizontally, in bars, between the repeating shapes. This option only applies when the "repeating" checkbox is checked..

Concentric Multiples

If this option is checked, the user may specify comma separated values in the field to the right. These values will be used to draw shapes sharing the same center, but heights and widths will be multiplied by the values specified. For instance, a

value of 2 will result in an additional concentric shape with twice the height and width of the base shape, while a value of 0.5 will result in an additional concentric shape with half the height and width of the base shape.

Vertical Step

This option allows the user to specify the vertical step that will be used when adjusting the PriceTime Cycles indicator using the up and down arrows on the keyboard, as described below. This vertical step will be used for adjusting the height, position, and vertical spacing. If a value is not specified here, then Investor/RT will determine its own step based on the price range in the chart.

Keyboard Adjustment

It can be rather difficult to adjust the shapes to the desired settings using the preferences window. This problem is solved by giving the user complete control of parameter adjustment using the keyboard. You can adjust many of the properties of the PriceTime Cycles indicator directly from the keyboard. Below is a table summarizing the keyboard strokes along with the resulting actions:

<u>Keyboard Combination - Resulting Action</u>

Up Arrow - Moves entire shape up Down Arrow - Moves entire shape down.

Right Arrow - Moves entire shape right one bar.

Left Arrow - Moves entire shape left one bar.

Shift-Up Arrow - Moves top of shape up.

Shift-Down Arrow - Moves top of shape down.

Ctrl-Up Arrow - Moves bottom of shape up.

Ctrl-Down Arrow - Moves bottom of shape down.

Shift-Right Arrow - Moves left side of shape right.

Shift-Left Arrow - Moves left side of shape left.

Ctrl-Right Arrow - Moves right side of shape right.

Ctrl-Left Arrow - Moves right side of shape right.

Ctrl-Shift-Up Arrow - Increases Vertical Spacing.

Ctrl-Shift-Down Arrow - Decreases Vertical Spacing.

Ctrl-Shift-Right Arrow - Increases Horizontal Spacing.

Ctrl-Shift-Left Arrow - Decreases Horizontal Spacing.

Deleting Custom Columns and Presets

The Delete/Rename window now supports view/renaming/deleting of both custom columns and technical indicator presets. When a custom column is deleted, it will be removed from all quote pages in which it resides, including all open quote pages. To access the Delete Rename

window, click the Delete/Rename button (green trash can) on the main toolbar and click the "Rename" button if prompted. The window is also accessible using the Control Menu under the Data Management submenu.

Trend Detection Index

The Trend Detection Index (TDI) was introduced by M. H. Pee. TDI is used to detect when a trend has begun and when it has come to an end. The TDI can be used as a stand-alone indicator or combined with others; it will perform well in detecting the beginning of trends. TDI should be used in conjunction with protective stops as well as trailing stops. These stops are required to protect against large losses when the indicator generates a losing trade. The TDI can trade a diverse portfolio of markets profitably over many years, using the same parameters throughout.

Calculating the TDI

```
Mom = Price - Price[Period]
MomAbs = Abs(Mom)
MomSum = Sum(Mom, Period)
MomSumAbs = Abs(MomSum)
MomAbsSum = Sum(MomAbs, Period)
MomAbsSum2 = Sum(MomAbs, Period * 2)
TDI = MomSumAbs - (MomAbsSum2 - MomAbsSum)
```

TDI Preferences

Price -Price data used as input to the indicator.
Period -Period used in TDI formula, as seen in the formula section above.
Trend Detection Index -Check this box, and use this color control, if you would like to draw the TDI line.
Direction Indicator - Check this box, and use this color control, if you would like to draw the DI line.

To calculate the 20-day trend detection index, first find the value of the momentum indicator. After the market closes, calculate today's 20-day momentum by subtracting the close 20 days ago from that of today. Next, find the 20-day absolute momentum, which is defined as the absolute value of today's 20-day momentum. More details can be found in the formula section above.

The trend detection index will signal a trend if it shows a positive value and a consolidation if it shows a negative value. As a trend-follower, the position should be entered in the direction of the trend when the TDI is positive. To determine the current direction of the trend, the direction indicator can be used, which is defined as the sum of the 20-day momentum of the last 20 days. An uptrend is signaled by a positive direction indicator value, whereas a

downtrend is signaled by a negative value. Basically, it comes down to this: Enter long tomorrow at the open if both the TDI and direction indicator are positive after today's close or enter short at the open if the TDI is positive and the direction indicator is negative. TDI can be referenced in the Investor/RT RTL language using the token TDI.

Keyboard Adjustment

You can adjust the TDI period directly from the keyboard without having to open up the TDI preferences window. Just select the TDI indicator in the chart (either by tabbing to the indicator or by clicking on it), and then simply hit the up arrow on they keyboard to increase the period by one, and the down arrow on the keyboard to decrease the period by 1.

Trend Continuation Factor

The Trend Continuation Factor (TCF) was introduced by M. H. Pee. It was created to help identify the trend, and it's direction.

Calculating the TCF

```
IF (CL > CL.1)
+Change = CL - CL.1
-Change = 0
ELSE
+Change = 0
-Change = CL.1 - CL

IF (+Change = 0)
+CF = 0
-CF = -Change + -CF.1
ELSE
+CF = +Change + +CF.1
-CF = 0

TCF+ = SUM(+Change, n) - SUM(-CF, n)
TCF- = SUM(-Change, n) - SUM(+CF, n) where n = period
```

Preferences

Price

Price data used as input to the indicator.

Period

Period used in TDI formula, as seen in the formula section above.

TCF+

Check this box, and use this color control, if you would like to draw the TCF+ line, or the Positive Trend Continuation Factor.

TCF-

Check this box, and use this color control, if you would like to draw the TCF- line, or the Negative Trend Continuation Factor.

Positive values of either the Positive Trend Continuation Factor (TCF+) and the Negative Trend Continuation Factor (TCF-) indicate the presence of a strong trend. Positive values of TCF+ indicate a strong uptrend, while positive values of TCF- indicate a strong downtrend. TCF+ and TCF- cannot both be positive at the same time, since both an uptrend and a downtrend cannot occur simultaneously. Both can be negative. If both are negative, this signifies consolidation, or the absence of a trend. It is recommended to enter long positions when the TCF+ value is positive, and enter short positions when the TCF- value is positive.

Keyboard Adjustment

You can adjust the TCF period directly from the keyboard without having to open up the TCF preferences window. Just select the TCF indicator in the chart (either by tabbing to the indicator or by clicking on it), and then simply hit the up arrow on the keyboard to increase the period by one, and the down arrow on the keyboard to decrease the period by 1.

Main Toolbar Quote Setup

Right-click in the main toolbar status message area and choose Quote Setup to establish tickers whose current change in price will periodically (once a minute) display briefly as a message in the main toolbar message area. If a modifier key (shift or ctrl, Macintosh option key) is depressed when the menu choice is made, the setup window will not open and the current display of quotes will be refreshed in the main toolbar. This is a new shortcut that saves you the trouble of opening the setup window and pressing the Show Now button simply to refresh the quotes.

Testing for Portfolio membership in RTL

The PFO token in RTL can be used in a scan to determine if the instrument being tested belongs to a particular portfolio or not, or whether the instrument being tested belongs to a portfolio whose name matches some pattern. Suppose you have portfolios named "Tech1", "Tech2", "Tech123" and "HiTech". Here are some sample scans with a comment explaining them:

```
PFO = "Tech1"; Find instruments held in portfolio Tech1
```

```
PFO = "Tech1" OR PFO = "Tech123"; Find instruments in either Tech1 or Tech123
```

PFO = "Tech*"; Find instruments held in a portfolio whose name begins with Tech

PFO = "Tech1 AND PFO != "Tech123"; Find instruments held in Tech1 but not in Tech123"

PFO = "*Tech*"; Find instruments held in any portfolio with Tech in the name

PFO = "Tech?"; Find instruments held in any portfolio whose name begins with Tech and is followed by one and only one character. In this example, instruments in Tech1 or Tech2 would qualify, while instruments in Tech123 would not.

Security Name Data Column Updating

Data services transmit security names for the instruments being tracked by Investor/RT. Some clients prefer to enter their own names, or even use the security name field to put codes or notes of various kinds after the name. So, we have adopted a method whereby the user can designate that the security name is okay as is and should not be updated by the data service. Place an exclamation point as the last character of the name and the name will not be updated again. Any security name text that does not end with ! is eligible for replacement by the officially transmitted security name as published by the data service.

Renaming Custom Columns

The delete rename facility has been fixed so that custom columns can be renamed.

eSignal Pre/Post Market Charting

Investor/RT now requests pre and post market "FORMT" historical data when downloading intra-day data. If you wish this data to be included in your charts, scans, back tests, etc. then adjust the session times for the instrument's session to include the pre and post market hours of interest.

New Chart Button Types

In Version 5.3 chart buttons can be used as single-click buttons or menu buttons for changing the ticker symbol, periodicity, or the override session of a chart window. In 5.3 Rev 1 two more button types are available: Chart Toolbar Buttons, and Technical Indicator Preset buttons.

Chart Toolbar Buttons

Chart Toolbar Buttons enable you to have any of the 24 charting toolbar buttons embedded directly in the chart. These are icon buttons with the same graphic images as the buttons on the chart toolbar. This feature enables you to put your most often used

toolbar buttons into the chart window, eliminating or reducing the need to have the full charting toolbar visible. For example, if you typically draw many Trendlines and Fibonacci Retracements, the toolbar buttons for these drawing tools can be added to your chart(s). By specifying the "Scope" of the buttons to be "All Chart, Any Instrument", toolbar buttons can be made available for all chart windows automatically.

Technical Indicator Preset Buttons

Technical Indicator Preset Buttons enable you to create single-click buttons for adding (or removing) preset technical indicators to the chart. A preset, is a collection of settings for some technical indicator that is saved under a user specified name. Presets can be easily created from any technical indicator setup window by operating the Presets Menu, choosing the "Save Current Prefs As..." menu item. Once you have created presets for the indicators you use, indicator preset buttons can be added to the chart. Preset Buttons act as "toggle buttons", that is, when you click a preset button, I/RT will check to see if the associated preset is already present in the chart window. If not, a new technical indicator with those settings is added to the chart. If the preset does exist, the indicator is removed from the chart. Thus you can click once to see the indicator. click again to remove it. Preset buttons are small with a short "token" title on the face, e.g. MA for moving averages, MACD, CCI, BB for Bollinger Bands, etc. Pointing the mouse at a preset button activates a tool tip window showing the user specified name of the indicator preset. This facility makes it very easy to setup an array of buttons for the indicators you like to use with the settings you typically use. Indicators can be added or removed with a single click. This can reduce the clutter when many indicators are present in the same pane.

When combined with ticker, periodicity, and session buttons, these two new button types enable you to essentially pre load your chart windows with a row buttons customized to the way you use the chart to watch the market, Operations that in the past required access to the toolbar and/or dialog boxes can now be completed with single-clicks or quick menu choices directly from the chart itself.

RAND-Random Number Function added to RTL

A new function, RAND, has been added to the RTL language. It takes two values, a lower range and an upper range as input and produces a random integral number in that range. For example, RAND(1,100) produces a random number between 1 and 100. RAND(-1, 1) would randomly take on integral values +1, -1, and zero.

Donchian Channel Indicator Added

Upper Band = $\text{MAX}(\text{HI}, n)$ Lower Band = $\text{MIN}(\text{LO}, n)$ Middle Band = $(\text{Upper Band} + \text{Lower Band}) / 2$

NOTE: If the "Include Current Bar" checkbox is uncheck, then only the previous n bars are considered, otherwise, the current bar and previous n-1 bars are considered in the calculation of the band values.

The Presentation



Above is a Daily Chart of Microsoft (INTC). The upper band of the Donchian Channel is show in purple, with the lower band in blue and the middle band in gold.

The Preferences

The image shows a settings window for a Donchian Channel indicator. At the top, there is a 'Period' label followed by a text box containing the number '20' and a dropdown arrow. Below this, there are three rows of settings, each with a checked checkbox and a color/line style selector. The first row is 'Upper Band' with a purple color swatch and a solid line style. The second row is 'Middle Band' with a yellow-green color swatch and a solid line style. The third row is 'Lower Band' with a blue color swatch and a solid line style. At the bottom, there is an unchecked checkbox labeled 'Include Current Bar'.

Period

Period considered when determining the channel values.

Upper Band

If this checkbox is checked, the upper band will be drawn in the color and line style specified to the right.

Lower Band

If this checkbox is checked, the lower band will be drawn in the color and line style specified to the right.

Middle Band

If this checkbox is checked, the middle band will be drawn in the color and line style specified to the right.

Include Current Bar

If this checkbox is unchecked, then only the previous n bars are considered, otherwise, the current bar and previous $n-1$ bars are considered in the calculation of the band values. For traditional Donchian Channels, this checkbox should remain unchecked, allowing you to see when the price breaks through the channel.

The Donchian Channel is a simple trend following breakout system. The Donchian Channel works well in trending markets, but doesn't work well in a sideways channel. The signals derived from the Price Channel are based on the following basic rules:

- When price closes above the Donchian Channel, buy long and cover short positions.
- When price closes below the Donchian Channel, sell short and liquidate long positions.

The Donchian Channel indicator is not meant to catch tops or bottoms, only trends. Trend traders may want to extend the standard 4 week period to 8 weeks in order to wait for significant trend signals, while others may shorten the period to a more sensitive 1 or 2 weeks for liquidation purposes.

Keyboard Adjustment

You can adjust the period of the Donchian Channel by using the keyboard. To increase the period, select the indicator and use the up arrow on your keyboard. To decrease, select and hit the down arrow on your keyboard.

Linear Regression Channels

The Linear Regression Forecast indicator has been enhanced with a "channels" options. Upper and lower channels (bands) can be drawn at a user-specified offset from the linear regression lines. The offset is expressed in standard deviations.

Scan/Signal Marker Text Option

You can now annotate scan/signal markers with user specified text. In the setup for Scan/Signal Markers, check the "Text" checkbox and fill in the text box. Text placement will depend on the placement options of the marker itself.

Version 5.2 Enhancements, released November 28, 2001

New Options for "Scope" of Chart Indicators

Prior to Version 5.2, every technical indicator added to a chart is specific to that chart window. Every chart window in Investor/RT is a "template". That is, you can switch a different instrument into any chart and all of the technical indicators within the chart are automatically associated with the new instrument. In Version 5.2 we have considerably expanded the flexibility of technical indicators by enabling them to be designated either as "instrument specific indicators" or "all chart indicators" (or both).

An "instrument specific" indicator is one you wish to appear in your chart(s) only when a specific instrument is present in the chart. Trendlines, Gann Time Series and various Fibonacci indicators are good candidates to be made instrument specific since the settings of these indicators are very much dependent upon the price and time relationship of a particular instrument.

An "All Charts" Indicator is one that you want to appear in all chart windows. The new periodicity and ticker buttons are excellent candidates to be designated as "all charts" indicators. The idea is you set them up only once, designate them as "All Chart" and from that point on, every chart window you open will automatically get the same consistent array of convenient push buttons and menu buttons. An "All Charts" indicator can be present in every chart regardless of instrument or in all charts that contain a specific instrument.

You designate an indicator as "Instrument Specific" or "All Charts" by editing its settings in any chart window. In other words you have to first add the indicator to any chart window, get it setup the way you want it. Then you can right-click on the indicator to select it, or tab to it in the chart and press enter to edit the indicator. You will notice a four choice menu titled "Scope". There are four scopes to choose from:

This Chart - Any Instrument

This is the default setting when a new indicator is added to a chart. The indicator is not specific to any instrument, but it is specific to the particular chart window in which it resides. Prior to Version 5.2 all indicators behaved this way, there were no other options. Cases 2, 3, 4, new in Version 5.2, are discussed.

This Chart - This Instrument

When only the Instrument Specific checkbox is checked, Investor/RT treats the indicator as specific to the particular chart window in which it was created and further, the indicator will appear in the window ONLY when a particular instrument is present in the chart window. Be sure to save your chart and assign it a permanent name before designating any indicators in the chart as instrument specific. Such indicators are not saved with the chart as they used to be. Instead, Investor/RT determines each time you open the chart or change the instrument in the chart whether to add the indicator. So for example, you might designate instrument specific trendlines in a particular chart window. Changing the instrument in the chart either removes or adds the indicator automatically depending on the instrument. The key benefit of this kind of indicator setup is that for the particular chart window, you can cycle through a series of tickers manually or using a slide show and the various instrument specific trendlines, Fibonacci indicators, etc. are shown with the instrument specific settings they had when the indicator was created.

All Charts - Any Instrument

Sometimes, an indicator is so generally useful that you wish it to appear in every one of your chart windows regardless of the instruments involved. The convenient ticker and periodicity buttons are a good example. Another would be a basic volume histogram and an accompanying volume moving average, or perhaps a few common moving average that always appear.

All Charts - This Instrument

Sometimes you may wish to designate an indicator as not only instrument specific but "All Charts" as well. This means that every chart window containing the particular instrument will get the trendline automatically. For example, you may have four chart windows open of the same instrument but of differing intra-day periodicities. You draw a trendline on any one of the intra-day charts. You can then call up the settings for the trendline and choose "All Charts, This Instrument" and click OK. All four charts will then show the very same trendline anchored at the same date/time positions. This applies to all price time based indicators in Investor/RT such as Fibonacci Arcs, Projections, and Retracements.

A few things to note about these new indicator types:

When you insert a new ticker into a chart window, all instrument specific indicators for the new instrument will be added to the chart. You can still have chart specific indicators in addition to the automatic indicators.

When you delete an "All Charts" indicator from any chart, it is deleted globally. It disappears from All Charts in which it current resides. The indicator will not appear again when you open new chart window.

If you have an All Charts indicator in a particular chart and you edit it's properties so it is no longer an "All Charts" or an "Instrument Specific" indicator, the indicator will be removed from all charts, just as it you had selected and deleted it.

If you have an indicator, e.g. a Fibonacci retracement, and you make it an "All Charts" (when it was not before), the indicator will then appear automatically in all open chart windows unless it is instrument-specific in which case it only appears in those charts holding the same instrument as the original indicator.

When you drag and drop an indicator within the chart to adjust its settings, the update is reflect in all window in which the indicator appears. For example, if you drag and either end of a trendline, or Fibonacci retracement, or a reference line or vertical reference line, the drag operation is immediately reflected in all chart windows showing that indicator.

If you use the keyboard shortcuts for adjusting certain indicators, like trendlines, the updates are immediately reflected in other charts when appropriate. When a technical indicator is selected (highlighted) in the chart, the 4 arrow keys can be used to move the indicator. Shift key and Ctrl key can be used in combination with the four arrow keys to reposition either the left or right end of trendlines, retracement swing lines, etc. When an indicator has a scope of "All Charts" and is visible in two or more chart windows, the indicators move in tandem as keyboard positioning takes place.

Chart Panning Tool

In Version 5.1 we introduced a vertical scale option that calls for a chart pane to be auto-scaled considering only the data values of the instrument. Auto-scaling based on all graphic elements in the pane, including all technical indicators, is also available. When instrument-only scaling is in effect, it is common for reference lines, trendlines, and other technical indicators like long term moving averages to be "off screen" since the vertical scale only spans the range of prices realized by the instrument itself. Version 5.2 introduces a new tool on the charting toolbar, the pan tool. The pan tool allows you to easily move the graphic elements in the chart up or down, left or right, using the mouse, in order to bring off-screen indicators fully into view.

Activate the pan tool by clicking on the "hand" icon in the chart toolbar. The mouse cursor turns into a hand. Place the mouse pointer anywhere inside a chart pane, mouse down and hold the mouse down while moving the pane in any direction. Vertical movements cause the price scale to move as you glide the mouse up or down. Similarly, horizontal movements shift the time axis as you glide the mouse left or right. The panning tool remains active as long as the "hand" icon is depressed in the toolbar.

Panning the chart in this way is very useful for temporarily bringing a reference line or trendline, or some other indicator that lies outside the normal price scale into view. Notice that after completing a pan operation, the vertical scale is always in "Manual Scale" mode, that is, the price scale has been set to particular values based on your mouse movements. We have added a visual indicator to the upper right corner of every chart pane to quickly inform you of the scaling status. The visual indicator is simply the letter M for manual scaling, A for full auto scaling, and O for Only Instrument scaling. After a pan operation, the indicator letter will always read M for manual scaling. To return to auto scaling, simply click the mouse on the indicator letter. Each click will alternate between Auto (A) scaling and (O) Only Instrument Scaling. This new feature eliminates the need to use the Vertical Scale preferences panel to turn on auto or instrument-only scaling. The scaling indicator also tells you at a glance whether more than once scale is available in the pane. For example, if you had an RSI and an a candlestick chart inside the same pane, Investor/RT would use two scales. When more than one scale is in effect the letter indicator has a plus sign after the letter, e.g. A+ means auto-scaling, multiple scales in effect.

Panning the chart is also available, even when the panning tool is not activated on the toolbar. The key is to mouse down in a "white space" area of the chart so your mouse down will not be misinterpreted as a click to select a particular graphic element in the chart. When you mouse down in white space and keep the mouse down, you will notice that the arrow cursor changes to the hand cursor. Keep the mouse button down as you glide the mouse to pan the chart window.

The only difference between using the pan tool in this way vs. activating the pan tool using the toolbar, is that when the pan tool is active on the toolbar you can mouse down anywhere at all in the chart to pan the image. When the pan tool is not explicitly active on the toolbar, then a

mouse down inside the pane causes I/RT to first determine if the mouse down is on a particular indicator or instrument graph and if so that element becomes selected and available for dragging where appropriate. If I/RT cannot select any element in the pane based on your mouse down, panning becomes active automatically as you keep the mouse down and drag.

Color Marker Indicator

This new indicator provides a flexible, colorful, compact method for displaying signal markers on charts. The signals can be based on the results of Scans, Trading Signals, or Custom Indicators. For Scans and Trading Signal, color options are given for both TRUE and FALSE results. For Custom Indicators, color options are given for three different user specified price ranges. Four shape options are currently available, including rectangle, oval, up arrow, and down arrow. The color marker for each bar has the same width as the bar. The height and position in the window is user customizable. The markers can be offset any distance from the top or bottom of the pane, or it can be drawn the full length of the pane. If the marker is offset from the top or bottom, it can also be given a user-specified height. Height and offset options can be specified in three units: pixels, percentage of the bar width, or percentage of the window pane height.

Color Markers can be dragged between panes, maintaining their relative position in the pane. Markers can also be adjusted using the keyboard. To move the markers up or down, select the marker by clicking on it, and then use the up and down arrow keys on the keyboard. To adjust the height of the markers, hold down the shift key while hitting the up and down arrow keys on your keyboard. These shortcut keys make it much easier to tweak your markers to the correct height and position.

Color Markers give the user the ability to place multiple signal markers into a small amount of space. The markers can be stacked at the top or bottom of the instruments window pane, can be stacked in their own window pane, or can each have it's own pane. To stack several markers on top of one another, you would just add them in succession, increasing the offset each time. For instance, you may choose a height of 8 pixels. You could then add your first marker at an offset of 0 pixels from the top. Your next marker would then be added at an offset of 8 pixels from the top, the third at an offset of 16 from the top. This would stack 3 markers on the top of the pane, each with a height of 8 pixels. You can add as many markers to each pane as you wish, or you may choose to add only one marker per pane that is relevant only to the indicator in that pane.

Pivot Point Indicator - Historical Viewing Option

A new option has been added to the Pivot Point study to allow for the viewing of historical daily pivot levels on intraday charts. When the "Use Daily" options is selected, you can then specify how many bars back you would like to base the calculation of your pivot levels. For instance, if you chose 1 bar back, you would see yesterday's pivot levels. Conversely, if you specify -1, you

would see tomorrow's pivot levels. You will only be able to view tomorrow's pivot levels if your pivot level calculations do not rely on the current day's data (only previous days data). This historical option also works with weekly and monthly options.

You can adjust the day on which the pivot levels are based using the right and left arrow keys on your keyboard. To move one day back, simply select your pivot indicator in the chart and hit the left arrow on your keyboard. The Pivot Point line will give feedback as to which day the pivot levels are based upon. To move the pivot study back towards the present, simply select and use the right arrow key on your keyboard.

Fibonacci Retracements - Absolute Price Retracement Option

A new checkbox in the lower right hand corner of the Fibonacci Retracement preferences allows the user to setup the study to use absolute price Retracements as opposed to percentage Retracements. Typically, the Fibonacci retracement interprets the levels as percentage levels on which to draw retracement lines. With the absolute price retracement option checked, the retracement lines will be drawn at absolute price distances from the endpoint. This option in combination with the Price Projection option gives the user to draw multiple horizontal reference lines at specific price levels throughout the chart.

Fibonacci Retracements

Maintained Across Periodicities Fibonacci Retracements now maintain their high or low prices and positions properly when switching periodicities, regardless of the price sources specified. In the past, when using the "Use Bar" option, switching intraday periodicities could sometimes result in slightly altering the price of the endpoints. Now, when switching from a 10-minute chart to a 1-minute chart, for instance, the endpoints will maintain their high and low positions, and attach themselves to the proper 1-minute bars which contain those highs and lows. Switching back to a 10-minute chart will again maintain the original 10-minute prices and endpoints.

Chart Button Enhancements

Chart buttons have been further enhanced in version 5.2 to allow buttons to be "small, medium, or large". This is a global option specified in Setup: Preferences: Charts: Technical Indicators: Buttons. The "large" size is the size used universally in Version 5.1. We have removed the restriction that ticker symbol buttons (and menus) use capitalized ticker symbols. If the small button size is used, lower case ticker symbols are recommended. The first letter of the periodicity (daily, weekly, monthly, or tick) maybe be capitalized or now as you like. If you have a series of button indicators that you wish to appear in every chart, designate each button as "All Charts, Any Instrument" using the new indicator "Scope" feature discussed in item #1 above. Once you do this, any chart you open or create in the future will have the these ticker and periodicity buttons.

What's New in Investor/RT 5.1
Release 5.1 Rev 1 November 15,
2001

Version 5.1 Enhancements, released November 15, 2001

Scheduling Dial/Data Downloads

Dial/Data current quotes download is a new action under the action category "Database Functions". The user can specify a quote page for the download. This feature will be useful to Dial/Data and myTrack users in automating the updating of closing prices as a regularly scheduled event.

\$DEMO

Simulated data generator. Investor/RT provides a test data generator via the special ticker symbol \$DEMO. \$DEMO can be setup as a stock, future, index, or option, and can be assigned to whatever trading session you like. During the trading hours of its associated session, \$DEMO trades once per second with random incremental price moves. When \$DEMO is present in a chart, clicking the download (refresh) button in lower right corner of the chart window generates new random data for the visible viewing period. If you have automatic downloading turned on \$DEMO will generate new data as needed to fill the chart window. Similarly, requesting daily, weekly, monthly or intra-day downloads of any minute interval using the Download Data window creates random sample data for the requested download period. You can use \$DEMO anywhere you can use any other real ticker symbol, e.g. in charts (all types), quote pages, time and sales windows, quick quote windows, ticker tapes, portfolios, backtesting, etc. Non intra-day sample data is always generated as daily bars so that daily, weekly, and monthly charts will all reflect the same data. Similarly, downloading one minute bars will cause all minute interval charts to reflect the same data regardless of interval.

This feature operates in all versions of Investor/RT including the demonstration version and does not require an internet connection or an active data feed. Real-time ticks of \$DEMO will be generated once a second. You can turn off \$DEMO intra-day ticks processing by either deleting the symbol or by setting its security type to Unknown, by reassigning the \$DEMO instrument to a session that is closed. When the \$DEMO security type is set to unknown, no live ticks will be generated but charting functions and data creation via the download button will still be effective. Charts will not update live unless the security type of \$DEMO is set to stock, future, option, index, future option, etc.

By default the initial price of \$DEMO is 100. If you adjust the trading price in a quote page, the simulated trades will pick up from there. If you reset the last price of \$DEMO to zero in a quote page, the next tick starts off at 100 with \$DEMO reset to security type stock. Downloading

intra-day data causes all tick data to be discarded and fresh sample data to be generated using 100 as the starting price.

An effort has been made to make the tick flow realistic. Randomly, two-thirds of all trades will be unchanged ticks, 1/6 up-ticks and 1/6 down-ticks. As we receive feedback from Investor/RT users regarding this feature we expect a user preferences window for \$DEMO to be added in the future so that, for example, you could simulate up trending markets, down trending, etc. When \$DEMO is setup as a stock, random trading volume is assigned to each tick, bid, ask, and bid and ask sizes are also simulated.

There are numerous uses for this new facility.

1. Generating long term sample data for testing trading systems
2. A tool for experimentation with studies, drawing tools, trading signals, etc.
3. New or prospective users of Investor/RT can learn to use the software using \$DEMO any time of day for demonstration or educational purposes.
4. A testing tool for literally any facet of Investor/RT that uses historical data of any periodicity.

Text window improvements

IRT text windows (news, message log, backtesting reports, etc.) now contain a toolbar button in the upper left along with the name of the file or report being viewed. The toolbar provides access to editing commands (cut, copy, paste, etc.), font and size selections for the text, plus some useful command such as "open" and "mail". The open command allow you to select another file to view, the mail command takes the text selected in the window and emails it using the built-in email feature of Investor/RT. You are given a change to address the email (to address defaults to support@linnsoft.com) and type in a subject before actually sending the mail. The Mail All command selects all the text in the window and mails it. All standard editing shortcuts now operate within text window (ctrl-X for cut, ctrl-V for paste, ctrl-C for copy). Mac users use the command key instead of ctrl, of course.

Live Message Log Window

The message log is a text window that can be opened using the File Menu or by double-clicking on the main toolbar message area. Many messages that appear only briefly on the main toolbar are logged. Any new messages that arrive are now added to the text window at the bottom. Using the Mail command cited in "Text window improvements" above, you can now select messages in the message log window and easily mail them to support with a single command.

Version 5.1 Maintenance and Fixes

- Maintenance specific to InterQuote: A bug was fixed in the InterQuote version for Windows that prevented NASD Level II data reception. Downloading of daily historical

data for indices is now fully supported. Downloading of historical data for Canadian stocks is now supported. The user must set the requested exchange code for any Canadian stocks to either TSE or CAN in order to download daily historical data.

- A bug in the myTrack version that affected European users downloading futures intraday data was corrected. The problem was related to the translation of U.S. time-stamped bar data to time zones at GMT + 0 and eastward where the bar data in question passes over midnight.
- Some maintenance was done on the QFeed version, now called the Quote.com version of Investor/RT, to enable reception of several dozen items of fundamental data on equities.
- Some maintenance was done on the eSignal version to enable proper operation of Investor/RT with the eSignal servers using a proxy server. Also, a bug was fixed that was causing an unnecessary disconnect and reconnect to data manager at startup.
- The "Draw Bands Only" option for the Bollinger Bands technical indicator now omits the drawing of the moving average center line as it should.
- Traditional charting of instruments belonging to overnight trading sessions (sessions that span midnight) has received some attention and a few minor bugs have been fixed.
- The reference line price point $(\text{open} + \text{close})/2$ now works properly.
- A bug was fixed in Setup: Trading Systems window where double-clicking in a blank area of the trading rule action list would cause a fatal error.
- Some problems having to do with scans and custom indicators were fixed so that technical indicator tokens operate more consistently when applied to other technical indicators. For example, the custom indicator BOLU(MFI) could be used to apply the Bollinger Band calculation to the Money Flow Index. Further nesting of indicators is now supported more fully, e.g. MA(BOLU(RSI)) would yield a custom indicator showing an upper Bollinger band of the RSI indicator, then smoothed by the moving average specified by MA. Technical indicator tokens in RTL can also be qualified by a price designator. For example, the token MA performs a moving average of the subject instrument according to the price option setup in the preferences for the MA token itself. If you write MA(HI) or MA(MID) you instead get the MA calculation applied to the specified price of the instrument regardless of what the MA specifications say. MA(MID) is equivalent to writing MA((HI+LO+CL)/3). Note that the price designator can be qualified, e.g. MA(CL.5) will apply the MA function to the closing prices of the subject instrument shifted left 5 bars.

Chart Buttons Feature Added

Chart Buttons enable you to add push buttons or menu buttons to any chart window. The buttons enable you to quickly change either the ticker symbol or the periodicity of the chart in which the button resides. Buttons can be added to any window pane in a chart window, using the "Add Indicator" toolbar button.

Adding Shortcut Buttons to Charts

The Setup for the "Button" indicator allows you to specify whether the purpose of the button is to change chart periodicity or to change the instrument in the chart. Further, you can specify whether the button will operate as a push button or whether it will activate a popup menu. If you choose the "Menu" option, you can enter two or more menu items separated by commas, otherwise you enter only one ticker symbol or periodicity. For example, to create a menu button of your favorite instruments your item list may look something like this:

```
IBM,APPL,MSFT,QQQ,INDU
```

Note that the list is comma separated, spaces are optional. If one of the items in the list begins with a hyphen then the menu item will appear as a separator line in the resulting menu.

Similarly, a periodicity menu button could be created like this:

- Tick,1,3,13,60,-,Daily,Weekly,Monthly

Note the separator between the intra-day and Daily/Weekly/Monthly periodicities.

To create a button for just one ticker, check "Push Button" instead of "Menu Button", and enter the ticker symbol in the space provided.

After a button is in place in the chart window, click on it to choose from the popup menu. If the button is not a menu, then it's face will show the ticker symbol or periodicity it represents. Clicking on it will simply switch the ticker or periodicity to that shown on the face of the button.

If you right-click on a button (use command-click if Macintosh) then you will see a popup menu allowing you to edit the button, delete the button, or add a new button. Menu buttons show an icon image indicating the presence of a menu. Specific ticker or periodicity buttons show the ticker or periodicity on the face of the button.

Using this handy feature you can easily create a user interface that has just those tickers and/or periodicities that you use in your trading. You can then easily switch to exactly what you want with a single click or quick menu selection. If you add buttons to your default chart, then all of your charts will appear with the same set of convenient button. Note that every saved chart in

Investor/RT can have its own unique set of buttons if you like since buttons are "saved" with the chart just like any other indicator.

Version 5.1, Revision 1 Enhancements

Chart Buttons Enhancements

Buttons now resize appropriately when you change the ticker or periodicity. Different icons are used for periodicity vs. ticker menu buttons. Deleting a button shifts the other buttons over. A bug was fixed that caused problems when button help was active. To edit a button, right-click on it and choose "Edit". The Edit Button window appears, showing an image of the button to remind you wish button you are editing being edited. In the Edit button window, if you make a change and click Apply, the button is updated on the chart itself and the image in the Edit Button window also reflects the change. Two new special button types have been added.

Ticker Prompt

Any ticker symbol button that has a ticker ending with a question mark is a ticker prompting button (the ticker could be simply ? or ??? or whatever, any text you want ending with a question mark. Clicking on a ticker prompt button causes a simple prompting dialog box to appear into which you can type a ticker symbol and press the enter key. The dialog auto capitalizes as you type the symbol. The key here is that the ticker you type in can be either an existing ticker or a brand new ticker symbol previously unknown to Investor/RT. When you press the enter key, if Investor/RT determines that the ticker is not yet defined to the system, a new instrument will be created, inserted into the chart and a download from the historical server will be initiated automatically. In essence, the prompting button gives you the ability to type in tickers without regard to whether those symbols have been setup. New instruments will be created as required. Investor/RT will attempt to ascertain the security type by inspecting the ticker, e.g. tickers with digits or the myTrack `grave character in them are setup as Futures, otherwise Stock is the security type.

Multi-link Button

Any button setup as a ticker symbol or a ticker symbol menu button can be a multi-link button. To make the button a multi-link button simply add a plus sign to the end of the ticker, e.g. MSFT+. A button for MSFT+ when clicked does a "multi-link" of MSFT into all unlocked chart windows. You can add plus signs to the end of ticker in a menu as well so that choosing such an entry from a menu performs a multi-link instead of just inserting the ticker into button's chart window alone. Another way to multi-link using chart buttons is by using the shift key when you click. If the shift key is down when you click on a ticker button or when you choose from a ticker menu button, Investor/RT reverses the meaning, that is, if the button is a plain button, shift-click performs a multi-link. If a button is a multi-link button (e.g. IBM+) then shift-clicking on it will NOT do the multi-link, it will only insert the symbol into the button's chart window alone.

Chart Auto Scaling Enhancement

Right-click in the vertical scale area of a traditional chart to access the vertical scale settings. A new auto scaling option is provided, titled "Automatic Scaling based on instrument data only". When this auto scaling option is chosen, Investor/RT figures the vertical scale bounds for panes containing instruments using only the high/low extremes of the instrument itself. Technical indicators are not considered in the scale determination. This forces the focus of the chart to be on the price range of the instrument. Indicators that happen to have values in that price range will show as they normally do, while indicators with values outside the instrument's data range will not be visible.

Chart Price Scale Font Size Option added

The vertical scale settings window also has a "Small/Medium/Large" choice box for the font size to be used when drawing the price values on the vertical axis. Each pane in the chart can have its own setting. The font size used in the top most pane of the chart is also used when drawing the time scale horizontal axis. When the pixels per bar setting is very small (below 3) Investor/RT forces small font size in the horizontal scale drawing.

Dynamic PNF Chart box size using a scan

Users of Point and Figure charts know that you can calculate and assign a specific value for the PNF box size for each instrument. That way, when you change instruments in a PNF chart, the box size of the instrument changes to reflect the new instrument. This is accomplished using the SET(BOXSIZE, ...) command in a scan. When box size is set this way in a scan, Investor/RT now checks to see if there is a PNF chart window already open for the ticker(s) as their box sizes are set and each of the open PNF charts is recalculated and displayed using the new box size.

Adding new instruments using the instrument selector

The "instrument selector" is a miniature spreadsheet showing lists of tickers that are setup within Investor/RT. The instrument selector appears a various places in the program, including the quick quote window, the order desk, the chart "replace instrument" window, etc. The instrument selector has been improved so that pressing the insert key on the keyboard prompts for entry of a new ticker. The prompting dialog is the same dialog mentioned in item "Chart Buttons Enhancements" above in connection with the use of "ticker prompt buttons" in traditional charts. You can enter a brand new ticker, previously undefined to Investor/RT, and the instrument selector responds by adding a new instrument to the system and that new instrument becomes the current selection in the instrument selector. Note that when entering brand new ticker symbols you can optionally follow the new ticker with a comma and the session number to use for the new instrument. If the ticker is not followed by a session number

then the default session specified in Setup: Preferences: Instruments is used for the new instrument.

RTL tokens for logarithms

RTL now includes two functions for calculating the logarithm of some expression. LOG(expression) calculates the natural logarithm of expression, while LOGT(expression) calculates the base 10 logarithm of expression.

S&P 500 Ticker List updated

The import file listing the stocks in the S&P 500 Index has been updated. The file is named S&P500 and is located in the symbols directory/folder. Use File: Import with Import Type set to "Ticker Symbols" to add these tickers and create a quote page containing these 500 stocks in Investor/RT.

Chart Viewing Period drawing

The "Viewing Period" is a property of each chart. It expresses the date/time range for the chart. Live intra-day charts have a view period expressed either as "begin date/time to present" or more commonly "Last N Days". In either case, there is a specific date/time at which the chart "begins". Bar data in the chart will always begin on or after that begin date/time and proceed to the present. In the past, Investor/RT chart drawing functions would draw the chart window the same for time periods BEFORE the view period begin date/time as after. This has been a source of some confusion. A chart will NEVER show any bars before the view period begin date/time, even if that data is available in the Investor/RT database. To make this more evident visually, Investor/RT 5.1 Rev 1 draws grid lines and time scale values only for the range of date/times reflected by the view period preferences. If the chart has a view period of say "Last 2" days, all bar data on file for the past 2 trading sessions will show in the window. If you adjust the pixels per bar so that more than 2 days of "time" is visible in the chart window, you will notice the new visual effect. A thin vertical line drawn in the scale color marks the beginning date/time of the viewing period. No grid lines or time scale notations are shown to the left of this line. This makes it clearer that no bar data should be expected before the view period's beginning date/time. If there is sufficient room to the left of the view period begin time, a message indicating the view period's beginning date/time is displayed in the blank area of the chart.

Fractional Years in View Period

Traditional chart preferences "Last N Years" viewing period option now supports entry of fractional years, e.g. use 1.5 for a year and a half.

New Technical Indicator

T3 This is a new smoothing indicator. It uses multiple exponential averages and is designed to be more responsive to price moves. More information will be provided in the help system and on the Linn Software web site in the tour section.

New Technical Indicator: Relative Vigor Index

This is a new oscillator that is described in the forthcoming January 2002 issue of Stocks and Commodities Magazine. More information will be provided in the help system and the on the Linn Software web site in the tour section.

New Technical Indicator: Value Area

The Value Area Indicator provides an automated band representing the volume-weighted Value Area. The Value Area bands represent the prices between which a certain percent of the volume was traded. The Value Area preferences have a setting for "Standard Deviations". A standard deviation setting of 1 will result in bands containing 68% of the volume. A standard deviation of 2 will result in bands containing 95% of the volume. The Value Area is of special interest to Market Profile users, and will give these users a way to depict this Value Area on a chart. The Value Area may be drawn using the current sessions data, the previous sessions data, or both. In addition to the bands, the value area indicator also draws a horizontal reference line at the volume-weighted average price based on the session specified. To select the Value area indicator, click (or double-click) on the horizontal line representing the volume-weighted average price (the middle line).

New Technical Indicator: Price Projections

The Fibonacci Retracement tool has been enhanced to provide a new Price Projection option. This option allows the user to specify one price, and automatically draw multiple horizontal lines any percent level above or below that price. A new checkbox in the Fibonacci Retracements preferences entitled "PriceProj" turns on this option. When Price Projections are turned on, the indicator only considers the ending price specified, and uses the percent levels specified in order to create horizontal lines those percentages up and/or down from the end price. The base line (price) can be dragged up or down and the corresponding percent reference lines will be recalculated and redrawn accordingly.

New Technical Indicator: Bar Lines

The Horizontal Reference line tool has been enhanced with a new option entitled "Bar Lines". This option gives the user an automated tool that draws horizontal reference lines at 6 levels: current open, current high, current low, previous open, previous high, previous low. This option comes with a periodicity control that dictates the periodicity of the bars used to determine the current and previous levels. For instance, if you specify a periodicity of "Daily",

then your previous open will be the open of the previous day, and your current high will be the high of today. If you specify a periodicity of 30 minutes, then your previous low will be the low of the previous 30 minute bar, while your current open will be the open of the current 30 minute bar. Each horizontal reference line is labeled with a description and value. (eg. 33.75 PrevOp) This option also comes with an additional color, allowing the user to specify different color for current versus previous lines.

Version 5.0 , released September 7, 2001

User Variables enhancements

Prior to version 5.0, there were a limited number of V# variables (user variables) for use in scans and trading signals, and some technical indicators. The number of user variables in Version 5.0 is now a user preference in Setup: Preferences: User Variables. The minimum number of user variables is six, V#1 through V#6. The maximum number is 512, V#1 through V#512. Each user variable can be given a name (used in quote page column titles) and a display format. It is recommended that you quit Investor/RT and start again when you increase the number of user variables. Memory usage for user variables is now dynamic. This means, for example, if you specify 100 user variables and you are tracking say 300 symbols, the memory space used to hold the V# data is allocated only as needed. User variables can be set by editing the variable's cell in a quote page or by using a SET statement in a scan. So if you run a scan to SET(V#100, ...) and the scan looks at 50 of your 300 symbols, memory for user variables is allocated only for those 50 symbols. Note that V#1 thru V#6 are always allocated for every symbol. These first six user variables are "persistent", that is, they retain their values after quitting and starting Investor/RT again. Various menus and lists in Investor/RT that display V# variable choices have all been enhanced to show the V# variables called for in Setup: Preferences: User Variables.

New Technical Indicator: Rate of Change Summation

Rate of change is a price momentum indicator. It is a simple calculation of the current price divided by the price some number of periods ago. For example, if the current price is 50 and the price 30 days ago was 40, then the 30-day rate of change is $50/40$ or 1.25. The result is multiplied 100 and the resulting line oscillates around the 100 reference line.

The Rate of Change Summation is a summation of the rate of change for each bar calculated as follows:

The summation begins at zero. For each bar, the rate of change is calculated and added to the summation. Whenever the summation is positive (above 100) and the next bar is also positive, the summation increases, but when a negative rate of change is encountered, the summation is zeroed and we begin accumulating successive negative (below 100) rates of change. When the summation is negative (below 100) and a positive rate of change is encountered, the summation is zeroed and we begin

accumulating positive rates of change again. The result is an oscillator that is above 100 and rising during periods of successive positive rates of change. The oscillator immediately goes below 100 and continues falling during periods of successive negative rates of change.

New Technical Indicator: Aroon.Click

The Aroon indicator was developed by Tushar Chande in 1995. Aroon is used to measure the presence and strength of trends.

Aroon can be drawn either as two lines, the AroonUp and AroonDown, or an Aroon Oscillator representing the difference between the AroonUp and the AroonDown lines. The AroonUp and AroonDown lines oscillate between 0 and 100, while the Aroon Oscillator oscillates between -100 and +100.

AroonUp for a given time period is calculated by determining how much time (on a percentage basis) elapsed between the start of the time period and the point at which the highest closing price during that time period occurred. AroonUp will be 100 when the instrument is setting new highs for the period. Conversely, AroonUp will be 0 if the instrument has continually dropped throughout the period. AroonDown is calculated in a similar manner, expect looking for lows as opposed to highs.

Chande states that when AroonUp and AroonDown are moving lower in close proximity, it signals a consolidation phase is under way and no strong trend is evident. When AroonUp dips below 50, it indicates that the current trend has lost its upward momentum. Similarly, when AroonDown dips below 50, the current downtrend has lost its momentum. Values above 70 indicate a strong trend in the same direction as the Aroon (up or down) is under way. Values below 30 indicate that a strong trend in the opposite direction is underway.

The Aroon Oscillator signals an upward trend is underway when it is above zero and a downward trend is underway when it falls below zero. The farther away the oscillator is from the zero line, the stronger the trend.

The Aroon Indicator is calculated as follows:

$$\text{AroonUp} = 100 * (\text{Period} - \text{PeriodHigh}) / \text{Period}$$
 where... PeriodHigh = Number of bars since highest high of the Period
$$\text{AroonDown} = 100 * (\text{Period} - \text{PeriodLow}) / \text{Period}$$
 where... PeriodLow = Number of bars since lowest low of the Period
$$\text{AroonOscillator} = \text{AroonUp} - \text{AroonDown}$$

New Technical Indicator: ZigZag

The Zig Zag Indicator is a series of trendlines that connect significant tops and bottoms on a price chart. The Minimum Price Change parameter specifies the percentage that the price must move in order to form a new "zig" or "zag" line.

The Zig Zag Indicator can be used to identify potential chart patterns and Elliot Wave formations. The turning points of the indicator can be labeled in a variety of ways.

Fibonacci Retracement Enhancements

Fibonacci Retracements are displayed by first drawing a trendline between two extreme points, for example, a trough and opposing peak. A series of nine horizontal lines are drawn intersecting the trendline at the Fibonacci levels of 0.0 percent, 23.6 percent, 38.2 percent, 50 percent, 61.8 percent, 100 percent, 161.8 percent, 261.8 percent, and 423.6 percent.

After a significant move, (either up or down), prices will often retrace a significant portion (if not all) of the original move. As prices retrace, support and resistance levels often occur at or near the Fibonacci Retracement levels.

Retracement Price Source

The user has a great deal of flexibility and automation available in determining the endpoints of the retracement trendline. Four options are available. "Use Specific Bars" option allows the user to specify the date/times of the bars that will be used for the retracement trendline. The prices will be determined based on the high of the higher bar, and the low of the lower bar. "Use Specific Prices" allows the user to use specific prices as trendline endpoints, independent of the highs and lows of the actual bar data. "Use Variables" allows the user to link the trendline endpoints to different variables, including the High and Low of the day, or any of the custom V# variables. By giving the user access to the V# custom variables, the user may set the endpoints to essentially any data accessible using RTL. "Automatic Retracement Using last X bars" provides for an auto-fib retracement capability and is discussed further below.

Automatic Fibonacci Retracments

If you select the "Use last X bars" option, then your Fibonacci trendline becomes automated and can then change dynamically as new prices come into the chart. The Fibonacci trendline will be drawn from the highest high over the period specified to the lowest low, and the resulting retracement levels will then be draw respectively. The trendline, and thus the retracement levels, can change with each new tick and each new bar. The Begin and End date-times will be ignored in this situation, as the indicator always be based on the most recent period of bars. As a new bar comes into the picture for consideration, an old one is no longer considered.

Price/Time Retracements/Expansions

There are now options available for not only Price Retracements, but also Price Expansions, Time Retracements, and Time Expansion, or a combination of any or all of the four. Price Retracements will work in the classic fashion of vertically retracing based on the price extremes of the trendline, using the percent levels specified. Price Expansions will use the same percent levels to create "expansion" lines, expanding vertically beyond the trendline and working in the opposite direction from retracements. Time Retracements and Expansions work similarly to Price Retracements and Expansions except they work horizontally on time as opposed to vertically on price. Time Retracement lines will be draw vertically retracing back into the trendline using the percent levels specified, while Time Expansions will draw vertically expanding forward in time past the end of the trendline, also using the percent levels specified. Both the Retracement and Expansion list boxes give you the option of drawing "Time", "Price", "Both", or "Neither".

Keyboard Adjustment

The keyboard can be used to move the Fibonacci points to the right and left. First, click on the chart. Then hit the tab key repeatedly until you notice your Fibonacci Retracement lines are selected. Then, press the right or left arrow keys on your keyboard to move the entire Fibonacci line right or left one bar. To move the trendline up or down, press the up and down arrows on the keyboard. If you would like to move only the endpoint, then hold down the Ctrl key while pressing the right or left arrow keys. If you would like to move only the beginning point, then hold down the Shift key while pressing the right or left arrow keys.

New RTL Functions: SMIN and SMAX

Two new functions, SMIN and SMAX (scalar min and max) have been added to RTL to facilitate evaluating the minimum or maximum of two values. Unlike MIN(expression, period) which finds the minimum value of the array of values specified by expression, the SMIN and SMAX functions take two expressions as parameters and returns the lesser or greater of the two. For example the expression SMAX(CL.1, HI) evaluates to the greater of the previous bar's close and the high of the current bar.

Import Enhancement: European Date Format

The File Import window has been enhanced with a new checkbox for specifying "Euro Date Format". When this checkbox is checked, imported dates included in current quotes, tick data or historical bar data will be processed in day/month/year format rather than the month/day/year format. This new option gives our international Investor/RT users the ability to import market data from other sources that use day-month-year order. Note that the year can be a two-digit or four-digit number. Note that if no slashes are present in the date and the "Euro Date" option is checked, the date will be interpreted as yyddmm (six digit dates) or

yyyymmdd (eight digit dates). When the "Euro Date" check box is not checked, slash-less dates are interpreted as yymmdd or yyyyymmdd.

Chart Annotation Text Increased

Chart annotation text was formerly limited to only 40 characters of text. In Version 5, textual comments (or RTL formulas) of up to 256 characters are permitted. Chart annotations are "one line" text displays. Therefore the amount of actual text that will fit in a chart window depends on the width of the chart window and the font and size used for the annotation. This enhancement gives you more flexibility when adding detailed notes to chart windows.

Tracking up-tick volume and down-tick volume

Investor/RT has long had the ability to display tick count, up ticks, down ticks, the up minus down ticks, and the up/down tick ratio. Version 5.0 adds "Up Tick Volume" and "Down Tick Volume" data columns. For equities, these data values update in real-time. Each time an up or down tick occurs, the tick volume (no. of shares traded) for that trade is added to the up tick volume or down tick volume respectively. New tokens have been added to the RTL (scan) language. UPTV and DNTV are "primitive" tokens that represent the current value of "Up Tick Volume" and "Down Tick Volume". If you want to track, say the ratio of UPTV to DNTV over time, simply use a periodically scheduled scan with the formula: SET(V#1, UPTV/DNTV). Run the scan every minute or every 30 seconds or whatever. Then to see a historical chart of the tick volume ratio simply create special tickers of the form XXXX(V#1) for each ticker you wish to monitor historically where XXXX is the ticker of the underlying stock.

Like, "Up Ticks" and "Down Ticks", the up and down tick volume counters are set to zero automatically at the open of each trading system. Alternatively, you can set these counters to zero using a scan. The formula would be SET(UPTV, 0) AND SET(DNTV,0).

Time and Sales tick volume filter

The time and sales preferences window now has an entry box where you can specify the minimum trade volume for a trade to be displayed in the time and sales spreadsheet. A related improvement is that attempting to open a time and sales window when there are no ticks available to display, now asks if you would like to download ticks. Response choices are "Yes", "No", and "Cancel". "Yes" downloads tick data and "No" opens an empty time and sales window that will begin showing trades as they arrive.

Oscillator drawing options expanded

Improvements have been made to certain oscillator type indicators to provide four choices for drawing the oscillator: (1) Continuous Line, (2) Connected Line, (3) Solid Histogram, and (4) Hollow Histogram. Initially these drawing modes are available in four indicators: Volume, Open

Interest, MACD, and Mesa Adaptive MA (MAMA). Additional indicators will have these drawing choices in futures releases of Investor/RT.

Pivot Point Enhancements

The Pivot Point technical indicator works best in markets with a wide daily trading range (high volatility). The study uses the previous day high, low, close, and open price to generate a pivot, two support levels, and two resistance levels. The checkbox "Use Daily Data" allows the user to use daily data as the source of pivot point calculation, even in an intraday chart. This is generally the preferred method.

Price crossing the pivot on an up move is a bullish event; a cross below the pivot on a down move is a bearish event. Once a bullish indication has registered the study offers two resistance levels for the price to test. If the first resistance is penetrated price can be expected to test the second resistance. The same idea holds true for the support levels on a downward cross of the pivot point.

The Pivot Point, Support and Resistance formulas follow:

$PP = (High + Low + CL.1) / 3$; other options available - see preferences
1st Res = $2 * PP - Low$; where Low is based on preference selection
2nd Res = $PP + (High - Low)$; where High is based on preference selection
3rd Res = $2 * PP + (High - 2 * Low)$
1st Sup = $2 * PP - High$
2nd Sup = $PP - (High - Low)$
3rd Sup = $2 * PP - (2 * High - Low)$

Choosing a Pivot Point The user now has a great deal of flexibility available in selecting what data will be used in calculating the pivot point and the support and resistance levels. Some of the pivot point options include:

$$(High + Low) / 2 \quad (High + Low + CL.1) / 3 \quad (High + Low + CL.1 + OP) / 4$$

The expression CL.1 represents the closing price of the previous day, while the expression OP represents the opening price of the current day or session. Notice that each expression has two common components, High and Low. The values used for the High and Low will in turn be based upon what is selected from the list box in the preferences. Some choices available for High include:

HI.1 HI MAX(HI, HI.1) MAX(HI, HI.1, HI.1) V#1 V#2 V#3 . . .

Whatever expression is selected here will be substituted for "High" in the equation for Pivot Point, as well as the equations for support and resistance levels. Similar, whatever expression is chosen in the "Low" listbox will be substituted for "Low" in all equations.

As an example, assume the user chose the following options:

Pivot Point: $(\text{High} + \text{Low} + \text{CL.1}) / 3$ High: HI.1 Low: $\text{MIN}(\text{LO}, \text{LO.1})$

Then the resulting equations for Pivot Point and 1st Support and Resistance would be:

Pivot Point: $(\text{HI.1} + \text{MIN}(\text{LO}, \text{LO.1}) + \text{CL.1}) / 3$ 1st Support: $2 * \text{PP} - \text{HI.1}$ 1st Resistance: $2 * \text{PP} - \text{MIN}(\text{LO}, \text{LO.1})$

New method of positioning rows in quote pages

When a row is selected in a quote page the arrow keys on the keyboard can be used to move the focus to the next row above or below the selected row. The symbols remain in the same order, only the selected row changes.

However, if you use the shift or ctrl key (option key on Macintosh) then the focus stays on the same row but the row itself is moved up or down. The shift key in combination with the arrow keys moves the selected row up one or down one position just like clicking on the up arrow toolbar button. The row remains selected so you can press the arrow key repeatedly to move the selected symbol several positions up or down. The ctrl key (option key if Macintosh) has the effect of moving the selected row immediately to the top position or bottom position. These new keyboard commands now make it very easy to arrange the order of symbols in a quote page. Before this enhancement, repetitive clicking on the toolbar buttons was required to accomplish this.

Linear Regression Indicator Enhancement

You can now request multiple standard deviation lines offset above and below the linear regression line by entering a comma delimited list of standard deviation numbers into the appropriate edit boxes in the setup dialog. For example, in the "Standard Deviation Above" entry box, enter 1.5, 1.75, and 2.0 to see three lines offset above the regression line at the specified number of standard deviations.

Trendline Enhancements

Multiple parallel trendlines lines can now be specified. The parallel trendline drawing tool now adds the parallel lines to the base trendline, thus moving the base trendline causes all parallel trendlines to move in tandem.

To draw a trend line, first activate trend line drawing by depressing the Trend Line tool. The "button" will remain visually depressed to denote that trend line drawing mode has been selected. The cursor changes immediately to a pencil. Position the mouse and press down to start the trend line. Drag to position the trend line and release the mouse to add the trend line

to the chart. To disable trend line drawing, click the trend line tool icon. The cursor will return to the standard arrow.

Attempting to draw a trend line in a chart sub window that contains only technical indicators results in an error message. If you have a chart containing two or more instruments, as long as each instrument resides in its own sub-window, you may draw as many trend lines as you like on each instrument. If you have two or more instruments in the SAME sub window, any trend lines drawn in the sub window will be associated with the first instrument in the sub window.

Trend Lines can be adjusted using the mouse. Click the mouse at one end of the trendline and drag. Trend Lines are anchored at one end as you move the other end of the trend line to its new position. You can duplicate a trend line by dragging with the `cntl` (option on Macintosh) key down. The original line remains the same as before the drag.

Multiple parallel lines may be drawn both above and below the base trendline. The parallel line text boxes accept multiple percent values if desired, separated by a space or a comma (eg. "3.2, 4.5, 7.1"). The distance of each parallel line from the base trendline is determined using a percent level. The percent level represents a percentage of the price where the base trendline begins. For instance, a parallel line drawn 1% above a trendline that has a beginning point of \$50 would be drawn exactly 50 cents above the base trendline at all points. The parallel lines may also be repeated any number of times. In the example above, repeating the parallel line 4 times would result in additional lines \$1.00(2%), \$1.50(3%), \$2.00(4%), and \$2.50(5%) above our base trendline, for a total of 5 parallel lines above. These parallel lines may also be mirrored on the opposite site of the trendline. Using the example above, parallel lines would also be drawn at 1%, 2%, 3%, 4%, and 5% below our base trendlines. The trendline furthest below would begin at \$47.50 and remain \$2.50(5%) below the base trendline at all points. If you prefer to see parallel lines on your trendlines by default, you may do so by adjusting an existing trendline to display the desired parallel lines (repeating, mirrored, etc.), and then click the "Make Default" button at the bottom of the trendline preferences window. The base trendline, parallel lines above, and parallel lines below, each have their own color preferences. The one color checkbox forces all lines to use the trendline color.

New Labeling Options

A new labeling option has been added to the Trendline indicator, providing the ability to label each trendline. A variety of labeling options are presented in a list box in the preferences for the trendline. The first selection in the list box is "No label". Each existing trendline should default to this option, resulting in no label and no change when upgrading. The next 11 selections allow for displaying beginning and/or ending prices, change or percent change of the trendline, bars spent in the trendline, or several combinations (% change and bars, etc). These new labeling options allow the user to quickly see the endpoint prices of the trendline, how much price changes within the trendline, the slope of the trendline (in price/bar) and/or how many bars are spanned in the trendline.

The new trendline labeling capability has been implemented in both the Trendline and Zig Zag indicators in of release 5.7.1. Other trendline-based indicators will gain this feature in a future update. If you have a suggestion for indicators you feel would benefit from this labeling option, please email your suggestion to support@linnsoft.com.

Andrew's Pitchfork Enhanced

Additional tines may be added to the Pitchfork by checking the "Draw Additional Tines" checkbox and by specifying the multiple(s) in the "Tine Multiple(s)" checkbox. Each multiple represents a multiple of the distance from the base trendline to the standard tines. By definition, the standard tines will be drawn at a multiple of 1. To add two additional tines on each side, equally spaced, specify "2, 3" as the tine multiples. Separate the multiples using a comma or a space. They may be whole or decimal numbers.

Custom Instrument Enhanced

Components of custom instruments can now make reference to several new data fields, plus any V# variable. Choices for the "Price" value used in a custom instrument component now include:

- Up Ticks
- Up Tick Volume (see "Tracking up tick volume and down tick volume " above)
- Dn Ticks
- Dn Tick Volume (see "Tracking up tick volume and down tick volume" above)
- All V# variables

Using this new feature is it possible, for example, to define a custom instrument that tracks the ratio of Up Tick Volume to Down Tick Volume during the trading session. The resulting instrument can then be further analyzed using any of the Investor/RT technical indicators. Similarly, this enhancement opens up literally any user defined computation to tracking as an instrument using references to V# variables. By setting up a scan to periodically calculate some V# variable for one or more instruments, you can then define a custom instrument that sums the V# values for the instrument(s) and track the resulting summation.

Technical Indicator Presets Feature added.Prior to Version 5.0

Default preferences for technical indicator were limited to one set of default settings per indicator. Setup: Preferences: Charts: Traditional Charts: Technical Indicators was (and still is) the place to specify your favorite settings for each of the indicators you utilize. Often it is desirable to have several sets of preferences per indicator, especially with some of the more complex indicators where there may be many useful combinations of settings that are often used. The only way to "save" such combinations, prior to Version 5.0, was to create different

chart windows each have the indicator configured in a different fashion, thus changing to an alternate set of preferences in such cases would involve opening a different chart windows.

Version 5.0 introduces the concept of technical indicator "presets". A preset is a named set of preference settings for a particular indicator. In general, you may create as many presets per indicator as you wish. Once an indicator is added to chart, the "edit" dialog for changing the preferences for the indicator will provide a list of all of the presets you have created for the indicator, thus enabling you to configure the indicator quickly to another set of preferences.

eSignal Pre/Post Market charting

eSignal users can now chart pre and post market (FormT) trading activity. To activate this feature in your charts, simply adjust the session start and stop times for the US Stocks session using Setup: Preferences: Sessions. During the pre and post market hours included in your session setup, incoming FormT trades will be reported in any open chart windows and time and sales windows.

International time zone issues resolved

Investor/RT users in Australia and Singapore have found it necessary to run their computers set to New York time to avoid confusing Investor/RT. The reason for the confusion is that the US Stock market in such local time zones begins trading for the week very late Monday evening. The Monday session in New York closes at 5:00 a.m. or so Tuesday morning. In local time, the US Stocks session appears to Investor/RT as an overnight session with posting days Tuesday to Saturday (no posting on Sundays and Mondays). Much of Investor/RT time management software was originally built with a bias toward US and European times zones where the US Markets open and close on the same calendar day and the non-posting (weekend) days are considered to be Saturday and Sunday.

This issue has been addressed in Version 5.0. Users in time zones of GMT+8 or higher (Beijing and eastward to New Zealand) can now operate Investor/RT with their local time zone specified in Setup: Preferences: Sessions. The computer clock must be set to local time. When setting up session preferences, indicate the start and stop times expressed in local time, e.g. US Stocks start at 10:30 p.m. and stop 5:00 a.m., and choose Tuesday through Saturday as the "Posting Days". The choice of posting days is very important since in essence this setting is used by Investor/RT to detect whether you are in the GMT+8 part of the world.

Changing Scan/Signal Markers, Custom Indicators, Paint Bars

Scan/Signal markers, Custom Indicators, and Paint Bars are all technical indicators that have setting to indicate which scan, signal or custom indicator is to be used in the chart window. Prior to Version 5.0 adjusting the preferences of an existing indicator of this kind did not allow you to change the name of the scan or indicator, just the markers or other preferences for the

indicator. For example, to revise a "paint bars" to use a different scan or custom indicator to paint the bars, it was necessary to remove the paint bars indicator from the chart and add a new one with the new criteria. This has been addressed in Version 5. You can access the settings for any of these indicators and change the choice of scan or custom indicator, at any time and the chart updates immediately.

New Data Editing Tool for Traditional Charts

A new tool has been added to the charting toolbar. Located next to Andrew's Pitchfork, the tool button looks like a candlestick with a red X through it. Pointing at the button shows the tool tip "Edit/Delete Bar/Tick Data". Select the tool by clicking on it. The button to appear depressed while the tool is active. Like the zoom tool you can use this one to lasso a group of bars or ticks you wish to edit, or simply click on any specific tick or bar to edit the data for that one tick or bar. The resulting bar or tick data appears in a standard "View/Edit (Time and Sales)" spreadsheet window. Unlike normal time and sales windows, view/edit windows opened using the editing tool do not update to reflect incoming ticks.

Charting tools cursors enhanced

When traditional chart tools are activated, moving the mouse inside the chart window now shows a cursor shape that is specific to the particular tool that is being used.

Import/Export Preferences panels added

Setup: Preferences: Import gives the user the option to turn on/off data validation when importing historical data.

Trendlines on indicators

In earlier releases of Investor/RT, trendlines had to be drawn inside window panes that contained instrument data. This restriction has been relaxed so that trendlines can now be drawn inside panes containing a technical indicator. Note that trendline alerts are supported ONLY on trendlines drawn in panes with an instrument graph alerting you to price movements of the instrument relative to the trendline. Drawing trendline on indicators, at present, is for visualization purposes only. Further enhancement may change this, of course. Note also that when a trendline is drawn in a pane with one or more indicators, multiple scales cannot be used. Only a single scale can be used since the trendline must use the same scale as the indicator(s) to be of any use.

Pivot Point Enhancements

Options have been added for using weekly or monthly historical data to calculate the pivot points, support, and resistance levels. Intermediate support and resistance levels have been

added. These are called R0.5, R1.5, R2.5, S0.5, S1.5, and S2.5. These levels are simply the midpoints of the normal support and resistance lines. There are now a total of six support levels and six resistance levels in the pivot point indicator. Each new midpoint support/resistance line is drawn in the same color as the level above it, for example. The S1.5 line, which is the midpoint of the S1 and S2 support level, is drawn in the same color as the S2 line.

New Scheduler Action: Send Quote Page to ChatRoom

The list of ticker symbols in a quote page, typically produced by a periodically running scan, can now be sent as text to a chatroom using a schedule. If the quote page is empty, nothing is sent. If a scan inside a schedule produces some "hits", the next step in the schedule could be to Send the quote page to a designed chatroom.

Vertical reference line enhancement

Vertical Reference Lines now have an option to "Draw Every Day at Specified Time". This option applies to the line when drawn in an intraday chart. When checked, the line is drawn multiple times as the specified time for each trading session visible in the chart.

Backtesting Output controls

Checkboxes have been added to the Backtest Setup window to enable the user to specify which reports/chart to produce when a backtest is run. Each trading system has its own independent settings for outputs.

Main toolbar quote feature enhanced

Investor/RT has a feature that periodically displays the change for the day in the Dow Jones Industrials Avg, the NASD Combined Composite, and the S&P 500 Index in the main toolbar status message area. The tickers for these indexes must, of course, be defined to Investor/RT, and these tickers vary depending on the data service. Here is a list, by data service, of the three tickers that must be defined in order to activate this feature:

Data Feed	Industrials	NASC Composite	S&P 500
BMI	INDU	@CCO	SPX
Dial/Data	*DWI X	*OTC	*SPX
DTN	INDU	COMPX	INX
eSignal	\$INDU	\$COMPQ	\$SPX
InterQuote	INDU.X	COMPX.X	INX.X0
MyTrack	DJI	COMPX	SPX
QFeed	INDU	COMPX	SPX.X
Signal	\$INDU	\$COMPQ	\$SPX

In version 5.0 this feature has been enhanced by introducing a preferences window (Setup: Preferences: Main Toolbar) in which you override these default symbols. You may choose up to four tickers for display.

Traditional chart pane resizing shortcuts added

Prior to Investor/RT version 5.0 double-clicking on any pane title in a traditional chart would maximize that pane, but the only way to easily make all panes visible again was to ctrl-click in a pane title to redraw all panes equally sized. This was sometimes inconvenient, for example, if you preferred to have one of your panes larger than the others. To address this we have improved the pane resizing shortcuts as follows:

1. Double-clicking on any pane title maximizes that pane.
2. Double-clicking on the maximized pane title bar restores all window panes to the proportions that existed before the maximization(s).
3. Holding down the ctrl key (option key for Macintosh) while double-clicking on any pane title sizes all panes equally (same as before 5.0).
4. Holding down the shift key while double-clicking on any pane title sizes the panes so the two thirds of the window is devoted to the pane(s) that contain instrument graphs and one third is devoted to pane(s) containing technical indicators only.
5. Holding down both the shift and ctrl (shift + option for Macintosh) while double-clicking on a pane title sizes the panes so that half of the window is devoted to the pane(s) that contain instrument graphs and half is devoted to pane(s) containing technical indicators only.

Pane sizing commands have also been added to the chart popup menu to make these features more visible and to enable panes to be easily resize without using the keyboard. This enhancement makes it very easy to quickly maximize any pane in a chart by simply double-clicking on its title bar and then restore the chart quickly to its former state by double-clicking again on the same title bar.

Multi-Link option when typing tickers into charts

When a traditional chart window is in front, typing characters brings up a dialog for identifying a new instrument to insert into the current chart. This window has been enhanced to offer a "multi-link" option. If the "Multi-link" checkbox in the lower left corner of the window is checked, the identified ticker symbol is inserted into all open charts, time & sales, and Level II windows. The state of this multi-link option is remembered so that once checked, all you have to do to multi-link a new ticker is to type the ticker (with a chart in front) and press the enter key.

New Scan Tokens: NUM, SEQ, HITS

New scan tokens have been added to allow a scan to access the number of instruments being scanned (NUM), the sequence number of the instrument being scanned (SEQ), and the number of instruments so far that have passed the scan (HITS). When scanning a quote page containing N instruments, NUM will be the number N, SEQ will be 1 for the first instrument scanned, 2 for the second instrument, and N for the last instrument scanned. HITS will start with a value of zero and will increment by one each time some instrument's data yields a TRUE for the scan formula. HITS and SEQ can never exceed the value of NUM. Thus SEQ/NUM tells you the percentage of the quote page that has been processed. A simple scan like:

SEQ/NUM < .33

Will produce a new quote page containing the first third of the source quote page.
Similarly:

(any scan formula) AND HITS <= 10

Will always return the first 10 (or fewer) instruments that meet the scan formula criteria specified.

Crosshairs fixed

Traditional chart crosshairs now function properly regardless of the chart's background color. Prior to Version 5.0, some color combination, especially black backgrounds, made the crosshairs invisible or hard to see.

Order Desk Preferences dialog added

In anticipation of adding support for various direct access brokerages service to Investor/RT, an Order Desk Preferences dialog has been added to Setup: Preferences. At present, the only purpose of this dialog is to designate that the Investor/RT Order Desk is to be used whenever "Place Trade" is clicked on the main toolbar or via a menu. MyTrack Order Desk is a valid choice for users of the myTrack version of Investor/RT. At present the myTrack Order Desk is available only for "simulated trading". At some future date, real trading via the myTrack order may be enabled. Users of myTrack who do not wish to use the myTrack order desk should choose "Investor/RT Order Desk" in the Order Desk Preferences to route "Place Trade" requests to the built-in order desk for maintaining the Investor/RT portfolios.

TDREI (DeMark Range Expansion Index) added to RT

The TDREI token is now available in the RTL Language for accessing the values of the Tom DeMark Range Expansion Index.

Main Toolbar Popup Menu enhanced

The main toolbar popup menu is accessed by right-clicking (control-clicking on Macintosh) in the messages area of the main toolbar. Two new items have been added to the popup. One is a checkable item for turning on (and off) tool button help. Selecting "Button Help" from the menu when the menu item is unchecked turns on button help. Selecting the same menu item when it is check marked, turns off tool button help. The second addition is a menu item named "Quote Setup". This choice opens the Setup: Preferences: Toolbar Quotes window where you can specify which instruments are to be quoted periodically in the main toolbar message area. Note that double-clicking in the message area of the main toolbar has the effect of displaying the message log, same as choosing "Message Log" from the popup menu.

Backtesting Enhancement

When trading rules call for a specific dollar amount, e.g. On "signal" BUY \$10,000 at last price", Investor/RT formerly would purchase as many shares as possible in round lots of 100 shares. In Version 5.0 there is now a user setting that controls the size of a "lot", when purchasing stock. For example, if the lot size were set to 100 then the backtest would proceed just as it has in versions of Investor/RT prior to 5.0. But if a lot size of 10 were specified, the number of shares purchased would be calculated using blocks of 10 instead of 100, typically resulting in a total purchase price closer to \$10,000 in this case. A lot size of 1 simply buys the maximum number of whole shares that can be bought for \$10,000. Any whole number can be specified as the lot size in the backtest setup window.

Version 5.0 Rev 1 Enhancements, released Sept 24, 2001

Web Research Menu and Control Panel

Investor/RT's Web Resource feature has been greatly enhanced in version 5.0 Rev 1. Now, users can create as many customized links as they want, and access them using the quotepage popup menu, keyboard shortcuts, schedules, and a new Web Research Control Panel window (discussed below). Scheduled web research gives the user the ability to popup as many ticker symbol specific web pages as desired (each in their own browser window) by simply clicking a ticker symbol in a quotepage, then hitting a shortcut key. This feature is discussed further below.

Custom links can be created by going to "Setup Prefs: Web Research". Links can be created, edited, deleted or tested at the bottom of this page. Each link has a name and a URL, or web address. In the URL field, specify the web address that you would like to access when clicking on the corresponding name. Many web sites have ticker symbol specific information. If you access one of these pages, and closely inspect the web address, you will notice that in many cases, the ticker symbols are imbedded somewhere in the address. And by simply editing that ticker to another one, you can access ticker specific information on any ticker. If your Internet

address requires the specification of a ticker symbol, then insert three asterisks (***) in the URL where the ticker symbol is to go. Then, the ticker symbol that you right click on will automatically be inserted into the address when accessed.

For example, if you go to the Island site <http://htmlgritch.island.com> and enter the ticker symbol INTC, and click "Get Quote", you will get the following web address...

<http://htmlgritch.island.com/SERVICE/QUOTE?STOCK=INTC>

And the result is a level II page for INTC. In order to access level II on any other stock, you would simply substitute the ticker symbol in for INTC. Therefore, in order to create your custom link in Investor/RT, you would just insert *** in place of INTC, and Investor/RT will automatically plug in the ticker symbol when appropriate. The Link preferences would look like this...

Name: Island Level II

URL: http://htmlgritch.island.com/SERVICE/QUOTE?STOCK=****

Once you've created your link, it can be used in a variety of ways: Web Research Popup Menus, Web Research Control Pane, Shortcut Keys, and Schedules.

Web Research Popup Menus

One way to access your links is through the popup menu accessible by right-clicking (control-click on Mac) on a ticker symbol in quotepage. The menu item is titled "Web Research". The first element in the Web Research menu is titled "Control Panel", which we will discuss below. The next two items are user customizable submenus. The titles of these submenus and the elements in each submenu can be configured using the "Setup Preferences: Web Research" window. This window is also accessible by choosing the "Setup" choice at the end of either custom submenu list. When a link is chosen from the submenu, the web browser will come up and access the appropriate web site. If a *** was involved in the link, then the ticker symbol will be substituted in the URL and the resulting web page will be ticker symbol specific. Unfortunately, this feature is not yet fully implemented on the Mac due to limitations we are encountering with the number of popup menu levels. We hope to have that resolved by next release.

Web Research Control Panel

This window can be accessed by clicking on the "Control Panel" button on the Web Resource Preferences window, or by choose "Control Panel" from the quotepage Web Research menu of the quotepage popup menu, or by "Web Research" from the chart popup menu. This window is setup identical to the custom menus, and can be edited by clicking the "Setup" button at the bottom of the window. If the link related to the

button involves a ticker symbol, the ticker symbol should be inserted in the field labeled "Ticker" at the top.

Web Research Keyboard Shortcut

A new keyboard shortcut has been added titled "Web Research". When selected, the available custom links are listed below. The selected link will be opened when the shortcut key is activated. The ticker symbol will be pulled from whatever object is front most in Investor/RT. If a chart in the front, the ticker symbol will be pulled from the chart. If a quote page or portfolio is in front, then the selected ticker symbol will be used in the link.

Scheduling Web Research

Web Research has also been added as a new action for schedules. The action is similar to the way web research keyboard shortcuts work. By providing the ability to open web links as scheduled actions, the user can now open as many ticker symbol specific web pages (all in separate browser windows) as desired with one click. Simply create a schedule that is activated by say the F4 key. Then add as many web research actions as you like, each one opening up a new web research link. Then, for example, click on INTC in a quote page; press the F4 key, and many distinct web pages relating to INTC will appear.

Backtesting Enhancements

Trading system development has been enhanced with the addition of two new rule "Actions". A "NONE" action (no action) rule is a rule whose signal is evaluated for each bar during the backtest, but no action is taken. Such rules typically will be used for housekeeping work such as setting stops, displaying values using the SHOW token, or setting V# variables. Note that the signal associated with a NONE action may take into account the state of the backtest (long, short, out of market). For example, if you wanted to set a STOP if you are long but not when short, then the signal might be something like:

```
IF (POS_STATE = POS_LONG) THEN SET(STOP, ENTRY - 3)

or

IF (POS_STATE = POS_LONG) THEN (SET(V#1, expression1) AND SET(V#2, expression2))
```

The second new rule type is called TEST. A TEST rule is very similar to a NONE rule in that no action is taken after the signal is evaluated. TEST rules will often be used for SHOW statements and other diagnostic work. TEST rules will be ignored during the backtest unless the user has designated to run the backtest in "TEST Mode". This is accomplished in the Backtest Setup dialog. Once a trading system is debugged and working properly, the TEST rules can be turned off by unchecking the "TEST Mode" checkbox. This way, SHOW statements and other diagnostic

calculations you may have put into your trading system during the development phase can be isolated from the actual trading signals themselves. The diagnostic output produced by the SHOW statements can then be turned on or off at will by checking a single checkbox, without having to edit the text of any rules.

TEST and NONE no action rules will often contain SHOW statements used to display the numeric value of any technical indicators or market data items as the backtest proceeds from bar to bar. For example, the signal:

```
SHOW(OP) and SHOW(HI) and SHOW(LO) and SHOW(CL)
```

Would produce four lines of diagnostic output for each bar tested during the backtest. To enable more powerful diagnostic messaging during backtesting, the Annotation indicator (from IRT's charting system) has been added to the RTL language. The token is NOTE. The NOTE token is simply a way to output instrument specific values to the backtesting detail report. Typically, the NOTE token (considered a "logical" token not an arithmetic one) could be added to an existing rule's signal, e.g.

```
NOTE and MACD.1 < 0 and MACD > 0
```

Or, the NOTE can be isolated into a NONE or TEST rule as simply:

```
NOTE = TRUE
```

The NOTE token is always evaluated as TRUE. The NOTE token, like any other technical token can be qualified, e.g. a TEST rule may look like:

```
NOTE.1 and NOTE.2 and NOTE.0
```

The NOTE can be setup as a string of text plus instrument specific RTL tokens preceded by the % percent sign. For example, the NOTE text of:

```
%TICKER at %CL, HI=%HI LO=%LO
```

displays messages like the following in the backtesting detail report:

```
IBM at 104.50, HI=105.75 LO=104.00
```

When you qualify a NOTE, e.g. NOTE.1, the values displayed will be for the preceding bar. This applies to historical tokens like %OP, %HI, %LO, %CL, %VO, %OI. It does not apply to V# variables. A NOTE text that contains "%V#1" for example will display the current value of V#1 for the instrument regardless of the qualifier.

Using SHOW and NOTE tokens inside signals that are used to form TEST or NONE action rules provides the user with a powerful diagnostic capability to see step-by-step for each bar why the trading system is performing the way it is.

Quote Page/Portfolio Formats enhanced

The Setup: Preferences: Formats window has been enhanced. The use of "Notebook" tabs has been eliminated because this feature did not work properly on the Macintosh platform. Radio buttons appear at the top of the window for choosing between quote page and portfolio formats. Multiple columns can be moved or removed now. Single date columns can now be moved up one, down one, to the top or to the bottom of the list by clicking the appropriate buttons. The overall window has been enlarged somewhat so you can see more data columns at one time.

New Quote Page Column for Trading Notes

Add the column named "Notes" to a quotepage and it will show the number of trading notes on file for each instrument. The "Notes" cell will be blank if there are no trading notes for the symbol in that quote page row. Double-clicking on the Notes cell for some row in the quote page opens the trading notes window for the instrument in that row. A new RTL token, TNC (Trading Note Count) has been added so you can scan for instruments having some number of trading notes. For example the scan "TNC > 0" would find all instruments having at least one trading note.

Scan setup enhancements

The row of buttons that appears above the entry area in the setup window for scans, custom indicators, and trading signals has a slightly new look and three new buttons. There is a menu button titled "N" for adding digits into the formula, a V# button for inserting the characters V# into the formula, and finally, a new "Templates" button titled "T". Clicking the T button pops up a short menu of templates you can insert into your formula. For example, you can choose "Break Above", the following text will be inserted into the formula at the current insertion point:

(token.1 < VAR and token >= VAR)

This is a template for the condition that some indicator moves from below a value to above that value. You must, of course, change the text "token" to be the actual token (e.g. RSI) that you want to test. You can do this manually by typing in the text or you can select the word "token" in the text then choose RSI (or whatever) from the Tokens menu. The selected token (e.g. RSI) will replace the formerly selected text. VAR is the token of a variable whose value is set in token list in the upper right part of the window, or if you want to hard-code the value right into the formula, simply edit VAR changing it to 70 or whatever value you wish. Here is a complete list of

the templates available in the templates menu followed by the text that will be inserted into the formula at the insertion point:

Break Above (token.1 < VAR and token >= VAR)
Break Below (token.1 > VAR and token <= VAR)
Cross Above (tokenA.1 < tokenB.1 and tokenA >= tokenB)
Cross Below (tokenA.1 > tokenB.1 and tokenA <= tokenB)
IF-THEN-ELSE IF (exp) THEN (exp) ELSE (exp)
SET SET(property , exp)
SHOW SHOW(exp)

These buttons/menus are designed to enable you to quickly express a formula using only the mouse. Suppose, for example, you wanted to add the text "AND SHOW(V#1)" to the end of some scan:

1. Click the & button
2. Choose SHOW from the templates menu button
3. Double-click on "exp" to select it.
4. Click the V# button to change exp to "V#"
5. Choose 1 from the N number button menu.

Note that all of the buttons in the setup window now have button help. If the button help becomes bothersome, right click in the main toolbar message area and choose the check marked "Button Help" menu item to turn off the help feedback.

Scan scheduling enhancements

The setup window for scans now has a "Setup" button (formerly named "auto scan"). The Setup button opens a "Scan Setup and Scheduling" window in which you can specify a message and/or alert sound to be used when the scan locates one or more instruments satisfying the

scan criteria. The window has a "Create Schedule" button, available only when the scan you are working on has been saved. Clicking the Create Schedule button creates a schedule containing the "run scan" action for the saved scan being setup.

Balance of Power (BOP) indicator added

Balance of Power has been added to Investor/RT, both for charting and for use in scans, custom indicators, and signals (token BOP). Balance of Power is a simple indicator given by the formula:

$$(CL - OP)/(HI - LO)$$

It is an oscillator from plus one to minus one. The BOP can optionally be smoothed with a moving average, and can be drawn as a line, connected line, or a hollow or solid 2-color histogram.

Version 5.0 Rev 2 Enhancements, released Oct 4, 2001

RTL Syntax Improvements

RTL has been enhanced to enable any technical indicator token to operate on a fixed instrument's price data. For example, if you wish to compare the performance of a list of NASD stocks over some period with the performance of QQQ over the same period you could use the DSV (Date Specific Value) token in a scan as follows:

$$CL/DSV > CL(QQQ)/DSV(CL(QQQ))$$

Where DSV is setup to get the closing price on a particular date in the past. The expression CL/DSV calculates the ratio of the current close of each instrument with the close on that specific date. Similarly CL(QQQ) gives the current last price of QQQ while DSV(CL(QQQ)) gives the value of QQQ on the specific date. Expression like DSV(CL(QQQ)) were not possible prior to 5.0 Rev 2 Investor/RT.

New Statistics Indicators (STAT)

Four new statistical functions have been added to the STAT (Statistics) token in RTL. These are Skew, Kurtosis, Higher and Lower. The Statistic indicator can be graphed directly on charts or used in scans under the STAT token.

Skew and Kurtosis

These are similar to standard deviation statistical measures.

Higher and Lower

These are functions that calculate the previous Higher price (higher open, higher close, higher high, etc.) or calculate the number of bars back to a previous higher price in the past. Lower does the analogous computation, looking for lower prices in the past for any bar.

Horizontal Reference Line Improvements

The power of the horizontal reference line tool has been increased markedly by allowing a reference line's value to be the result of any custom indicator calculation. As price changes occur, the custom indicator value is recalculated and the resulting value for the current (most recent) bar is used to adjust the vertical position of the reference line. A "Compact" option has been added. It affects the way the reference line is drawn. When the Compact checkbox is checked, the reference line is drawn only to the right of the last bar in the chart. This option, when combined with the "look ahead" view period option for charts, has the effect of adding a price display box to the right of the last bar that moves according to some price value or custom indicator value.

Custom Indicator Charting Enhancement

Drawing options have been extended to custom indicators to enable CI's to be draws as lines, connected lines, solid or hollow histograms. In addition, the Custom Indicator Technical Indicator setup window now shows the syntax of the indicator. When a Custom Indicator is added to a chart, Investor/RT now allows the indicator to be changed on the fly to another custom indicator using the setup window. Finally, two reference line values have been added to the setup window to make it convenience to add reference lines when the CI is added to a chart.

Scan/Signal Marker Enhancement

Scan/Signal Marker Technical Indicator setup window has also been enhanced to show the syntax of the scan. Like Custom Indicators, Scan/Signal Markers can be switched on the fly to another scan or trading signal suing the setup window.

PNF/TLB Reversal Price Added To RTL

The PNF and TLB tokens in the RTL language have been enhanced to allow scanning on "Reversal Price". When Reversal Price is selected as the Column Data Element, the token (PNF of TLB) is evaluated as the reversal price level for each bar. This enables scans and trading signal to consider the reversal price in PNF and TLB analysis.

Making Color Selections

Clicking on a color control in Investor/RT now brings up the "native" Windows or Macintosh color selection dialog. If you prefer to former color pallet window showing a 16 by 16 array of color choices, then right click on the color control instead (control-click on Macintosh).

Version 5.0 Rev 3 Enhancements, Oct 18, 2001

Fibonacci Retracements Improvements

Recently, Fibonacci Retracements were enhanced to allow the use of "Specific Prices", "Specific Bars", "User Variables", or "Automation" in determining the price levels of the begin and end points of the base trendline. The limitation was that when you choose one of those four settings, both of the begin and end points were forced to use that setting. Now, the interface has been enhanced to allow the end point to use its own choice of "Specific Prices", "Specific Bars", or "User Variables", while the begin point has its own choice and group of settings. This allows an even greater degree of flexibility when determining the price levels of the Retracement study.

Trendline Improvements

The trendline study now has an additional option to "Extend to Past". This option causes the trendline to be extended to the left of the beginning point of the trendline. This options is in addition to the current "Project to Present" option for extending the trendline to the right.

Slide Show Toolbar Addition

A new toggle button has been added to the slide show toolbar to make it more convenient to switch between single chart and multi-chart slide shows. The new button appears at the right end of the toolbar and displays the letter M or S. M is shown when multi-chart slide show mode is in effect. Clicking the M button changes the button to S and vice versa (S means single chart slide show). When multi-chart slide show is in effect, advancing the slide show to the next ticker causes all open unlocked charts to be updated with the new symbol. When single chart slide show mode is in effect, only the front (active) chart window advances.

QQQ option setup feature added

The "Setup Equity and Index Options" window has been improved to facilitate generation of QQQ options. In the past, since QQQ was a special case with strike prices at every \$1 increment, Investor/RT was not capable of generating QQQ option symbols. Now, the strike prices are handled correctly and the option prefix is determined dynamically based on the value of each options strike price. Investor/RT will determine the correct prefix regardless of the prefix entered into the setup window. This window also handles QQQ strike price range

specifications, 30-50 for example, to generate options instruments with strikes or 30, 31, 32,..., 50.

Maintenance and Fixes

Several problems, including a few fatal error bugs, were corrected in this release. Editing or deleting ticks or bars in the View/Edit window no longer produces a fatal error. Using a custom indicator as the basis for a horizontal reference line no longer leaks memory. Renaming custom indicators no longer causes fatal errors saving charts that reference the indicator under the former name. Using the Next Window (ctrl-tab) command while editing the properties of a technical indicator no longer produces a fatal error. The Send E-Mail window can be used again to subscribe/unsubscribe or send email to the Linn Software Discussion Group. New Chat windows no longer open partially "off screen".

Version 5.0 Rev 4 Enhancements, released Oct 24, 2001

Point & Figure, Three Line Break enhancement

PNF and TLB charts can now be setup to use a variety of price values to produce the chart. Formerly, the close price was the used. Computed price points such as $HI+LO/2$ or $HI+LO+CL/3$ can now be used to compute PNF and TLB charts.

Scanning weekly/monthly data improved

Scans using weekly and monthly periodicity are now possible even if weekly or monthly data retention is off for an instrument. If weekly or monthly retention is off, then running a scan will derive the necessary weekly or monthly bars from the daily data on file for the instrument at the time the scan is run.

Editing alarms levels in quote pages

When changing the value of the high or low alarm level in a quote page, Investor/RT now automatically updates any chart windows for the affected instrument that happen to contain a reference line associated with the alarm level.

Scan error reporting improved

Occasionally a technical indicator calculation will fail during a scan even though the instrument appears to have enough data to calculate the indicator. Such errors used to stop the scan process altogether. Now Investor/RT has been improved to skip the offending instrument and continue with the scan. Upon completion, Investor/RT will display the number of instruments scanned, the number of instruments not tested at all due to insufficient data, and the number of instruments with data that reported failures in calculation.

Charting instruments not marked for intra-day data retention

When attempting to open an intra-day periodicity chart of an instrument that is not marked for intra-day data retention, Investor/RT used to present a dialog box warning you of this fact and giving you the opportunity to switch the chart to daily or proceed. In version 5.0 Rev 4, this dialog warning box has been eliminated and a warning message appears in the status message area of the main toolbar. The chart will open to the desired intra-day periodicity and the instrument in question will remain unmarked for intra-day retention. The instrument's live data will be collected in the chart window and will be discarded when you close the chart window or change to a different periodicity.

New price option: $(OP + CL)/2$ Candle body midpoint

A new calculated price point, the average of the open and close, sometimes called the candle body midpoint, has been added as a standard price selection in various technical indicators, line charts, point & figure, three line break charts, etc.

Setup Scan added to Setup Menu

The Setup Menu now has a Scan menu item for completeness. Setup: Scan, Setup: Custom Indicator, and Setup: Trading Signal are now all-available from the Setup Menu.

Backtesting using REVERSE rules

REVERSE rules in trading systems are now tested if the backtest is aside the market, i.e. a trading signal to buy could either initiate a new long position or reverse a short and go long. Similarly a reverse and go short reverse rule can now initiate a new short position. Prior to version 5.0 Rev 4, Investor/RT only considered a REVERSE and go short rule if the trading system was already long. A REVERSE and go long rule was considered only when the trading system was already short. If you include a REVERSE (and go long) in your trading system and you do not want the rule to initiate new long position then add the expression (POS_STATE = POS_SHORT) AND... to the beginning of the rules' trading signal. This will ensure that the REVERSE rule will trigger an action only when you are already short. Similarly use (POS_STATE = POS_LONG) AND ... in trading signals if you do not want the rule to initiate new positions.

Investor/RT 4.9 , Release 4.9 Final June 15, 2001

View/Edit and Time/Sales Preferences

Setup: Preferences: Time & Sales can be used to setup default preferences for View/Edit and Time/Sales windows. If you have a V/E or T/S window open, you can access the preferences by right-clicking (control-click if Macintosh) inside the window itself. Clicking the "plus sign" button just above the scrollbar in a V/E or T/S window causes the data column widths to be optimized.

Dial/Data Daily auto-downloading option

Clients with a Dial/Data account (including all clients using myTrack) can specify that auto-downloading of daily data use Dial/Data rather than the real-time server in use. To activate this feature go to Setup: Preferences: Dial/Data.

Auto-Trendlines Enhanced

The automatic trend line indicator determines the current up trend and down trend line and draws them. Trend lines may also be drawn manually using the drawing tool on the charting toolbar, but this indicator does it automatically. The user specifies the number of periods to "look back" from the present to determine where to place the trend lines.

The up trend line connects the lowest low in the user specified period with the next lowest low preceding the highest high for which the trend line is not penetrated.

The down trend line connects the highest high in the period with the next highest high preceding the lowest low for which the down trend line is not penetrated.

The user may specify the colors and whether to draw either the up, the down trend, or both.

In some cases, depending on the historical pricing of a particular issue, there may not be a valid up or down trend for the user specified period.

This indicator can be applied multiple times to the same chart window. For example, in a daily chart, you could add auto trend lines for periods of 500, 250, and 60, to see long term, intermediate term and short term trends in your charts.

Auto trend lines are especially useful in slide shows. As the slide show advances from one issue to the next, the current trend lines for the issues are calculated and drawn automatically. This is not possible with manually drawn trend lines.

Fibonacci Indicators Enhanced

The three existing Fibonacci Indicators have been enhanced, and a fourth Fibonacci study, Fibonacci Time Zones, has been added.

The Fibonacci Arcs and Projections now give the user the ability to customize up to 8 Fibonacci percent levels, each with its own line color, width, and style. The Fibonacci Retracement indicator gives the user up to 8 customizable percent levels, each again with its own custom color, thickness, and style. And similarly, Fibonacci Time Zones provides 8 customized zone levels.

Fibonacci Retracements also have several additional new options. A new checkbox entitled "Use Last ___ Bars" give the user an "Auto-Retracement" capability. For instance, if the user check this option and chose a value of "50" bars on a 1-minute chart, then an automated trendline connecting the high and low of the past 50 1-minute bars would be used as the base trendline for all retracement levels. A checkbox entitled "extend" gives the user the option of extending his retracement lines to the right edge of the chart, or limiting the line to the range of the base trendline (between the Begin and End date/times). A "Show %" checkbox gives the user the option of showing the percent level in an annotation box on the left side of each retracement line. A "Show Price" checkbox gives the user the option of showing the price in an annotation box on the left side of each retracement line.

The base trendline of Fibonacci Arcs, Projections, and Retracements can now be dragged precisely by simply dragging the small dot on either end of the line to a new position. The trendline will snap to the high or low of the bar to which it is dragged, depending on the relationship of that bars closing price to the closing price of the opposite points bar.

New Indicator: Fibonacci Time Zones

Use this tool on the chart toolbar to draw vertical (date/time) reference lines at fibonacci intervals from some starting date/time. Set the desired time increments in Setup: Preferences: Charts: Technical Indicators. To use the tool, click in the chart toolbar to activate the fibonacci time zone tool then position the mouse at the starting bar in the chart and click.

New Indicator: Gann Angles

William Gann (1878-1955) developed a unique combination of geometric and mathematical principles, which he applied to trading stocks and commodities. The proportional relationship of time to price was the basis for much of Gann's work.

Price and time come together in Gann angles, which project trend lines from important tops or bottoms. All of Gann's angles are quoted in price to time relations, (i.e., 1 x 8). Translated, this means move 1 unit of time to the right and 8 units of price, up or down. The angle representing price and time in balance is 45 degrees (1 x 1, price to time). To Gann, this was the most important angle. Other important angles, in order of importance are: 2 x 1 and 1 x 2, 4 x 1 and 1 x 4, 8 x 1 and 1 x 8. These lines are drawn down from the top or up from the bottom.

The keyboard can be used to move the Gann Angles begin and end points left and right. First, click on the chart. Then hit the tab key repeatedly until you notice your Fibonacci Retracement lines are selected. Then, press the right or left arrow keys on your keyboard to move both the begin and end points right or left one bar. If you would like to move only the endpoint, then hold down the Ctrl key while pressing the right or left arrow keys. If you would like to move only the beginning point, then hold down the Shift key while pressing the right or left arrow keys. You can also drag the begin and endpoints of the 1x1 angle to other positions on the chart.

New Indicator: Elastic Volume Weighted Moving Average

The Elastic Volume Weighted Moving Average (eVWMA) is a statistical measure using the volume to define the period of the moving average. It incorporates volume information in a natural and logical way. The eVWMA can be looked at as an approximation to the average price paid per share. The ability to "Use Average Volume" as your volume period, makes this indicator both symbol-independent and timeframe independent. This allows the use to switch both timeframe and symbol without having to change the volume period.

The eVWMA is calculated as follows:

$$eVWMA = [(N - v) * eVWMA.1 + v*p] / N$$
 where... p = price v = volume of bar N = volume period

A more complete description of the eVWMA can be found on page 52 of the June 2001 issue of Stocks and Commodities Magazine.

Adjusting indicator position and preferences via keyboard

This topic will provide valuable insight into...

- Selecting technical indicators in charts, using both the keyboard and the mouse.
- Moving technical indicators, both by dragging with the mouse, or by using the keyboard.
- Editing technical indicators, using the preferences windows, the keyboard, or the mouse.
- Removing technical indicators from a chart.
- Bringing technical indicator to the front of other chart elements.
- For additional information on individual technical indicators, also see the Technical Indicator Tour.

Selecting Technical Indicators

The key to adjusting technical indicators is first being able to select the indicator in the chart. There are two ways to accomplish this. You may select the indicator by either clicking on it with the mouse, or by using the "tab" key on your keyboard. The keyboard method is a good option when either you find it difficult to select the indicator with the mouse, you prefer not to use the mouse when not necessary, or the indicator isn't currently visible in the chart window.

To select the indicator using the keyboard, simply click anywhere in the chart, and then hit the "tab" key repeatedly until you notice that your desired indicator is selected. Different indicators undergo different transformations when selected, but in general, they will take on a more inflated appearance. Trendlines will become thicker. Moving averages will become thicker with rings. Etc. Each time you hit the "tab" key, a new indicator will be selected. If you mistakenly tab past your desired indicator, you may Shift-tab to go back to it. As you cycle through selected elements in your chart, you will receive feedback in the Investor/RT message bar of which element is selected.

To select your indicator with the mouse, simply click somewhere on the indicator itself. The indicator should inflate slightly to indicate that it is selected. If you find it difficult to select the indicator by clicking, or you don't see your indicator in the window, use the tab key method above.

Moving Technical Indicators

Now that we know how to select an indicator, let's discuss how to move it around in the chart. There are two classes of indicators involved in this discussion. One class can be dragged to different positions within a window pane. Indicators in this class would include Trendlines, Fibonacci Retracements, Gann Angles, Horizontal and Vertical Reference lines, Annotations, Regression lines, etc. The second class can be dragged into a different window pane, but cannot be dragged to a different position within the same window pane. This class would include most of the indicators, moving averages, stochastics, MACD, and all other indicators which compute values at each bar.

For either class, you would drag by simply clicking on the indicator and holding the mouse down while you drag the indicator to a new position. For indicators which can be dragged between panes, you would either drag the indicator from one pane to another, or drag the indicator into the horizontal scale along the bottom of the chart to create its own pane. After dragging an indicator into a pane with another indicator or price data, you may want to double click in the vertical scale along the right to bring up the scaling preferences to verify they are set as you wish.

To move indicators, such as trendlines, around within the same window pane, you may either use the keyboard or the mouse. Let's use trendlines as an example. Trendlines

have small circles at each end representing the drag points. To drag either end of the trendline to a different position, just click on that end of the trendline, and hold the mouse down while dragging the endpoint to its new position.

Similarly, you may use the keyboard to move the trendline. First, select the trendline using one of the methods discussed above. Now, with the trendline selected, you may use the up, down, right, and left arrows on your keyboard to move the trendline around. For instance, pressing the right arrow button once will move both the beginning and ending points on the trendline one bar to the right. If you prefer to move only the beginning point, you must hold down the shift key while pressing the right arrow. If you wish to adjust only the end point, hold down the Ctrl key while pressing the arrows.

Editing Technical Indicator

You can edit technical indicator properties through the preferences window or directly from the keyboard. The most common way to edit a technical indicator's properties is by bringing up the "Update" window for that indicator. There are three ways to accomplish this. The first way, is to select the technical indicator using the methods described above, and then press the "Enter" key on your keyboard. The Update window will appear. You can edit any associated properties and hit Apply or OK. The apply option gives you the ability to apply changes repeatedly without closing the window. You can also access the Update window by double-clicking on the technical indicator. And finally, you can access the Update window by clicking on the "Edit a chart element" button in the chart toolbar.

Many indicators which involve a period, like moving averages or stochastics, may be adjusted directly from the keyboard.

Removing Technical Indicators

There are two ways to remove a technical indicator from a chart window. The easiest way is to just select the indicator, using one of the methods described above, and then hit the "delete" key on your keyboard. Alternatively, you can click on the green trashcan icon on the charting toolbar, select the element you would like to delete, and then click "OK". If you would like to delete multiple elements from the chart, you can select the element in the list, click the "Apply" button, and then repeat the process. Also, clicking the "X" in the upper right hand corner of the chart window pane removes that window pane. In 4.9.5 and later, clicking that "X" in the main window pane, will remove all technical indicators from that pane and leave the instrument data in the pane.

Bringing Technical Indicators to the Front of other Chart Elements

The drawing order is dictated by the order of elements you see in the chart pane title bar. The element that is first in that list is the one that will be drawn front-most in the window pane. In order to adjust this order, just shift-click in the vertical scale of the window pane. This action will cause the front-most element to be moved to the back, and all other elements to be moved up one position. You may have to shift-click multiple times to get the desired element to the front of your window.

eSignal FOREX charting now supported

New Indicator: Parabolic SAR (Stop and Reverse)

The Parabolic SAR, developed by Welles Wilder, is used to set trailing price stops. SAR refers to "Stop-And-Reversal". It is designed to create exit points for both long and short positions in such a way that it allows for reactions or fluctuations at the beginning of the position, but accelerates upward (for long positions) or downward (for short positions) as the movement tops out. Parabolic SAR is plotted around the price chart similar to a moving average. The basics behind the formula for computing the SAR values can be found above.

The Parabolic SAR provides excellent exit points. You should close long positions when the price falls below the SAR and close short positions when the price rises above the SAR.

If you are long (i.e., the price is above the SAR), the SAR will move up every day, regardless of the direction the price is moving. The amount the SAR moves up depends on the amount that prices move.

Wilder suggests using this indicator in a trending (or directional) market. If the security is trending up, then one might only take long positions. If the security is trending down, one might only take short positions.

Parabolic SAR is calculated as follows:

If Long... $SAR = (HI.1 - SAR.1) \times AF + SAR.1$ Wilder's acceleration factor (AF) is 0.02 for the initial calculation. Thereafter the AF is increased 0.02 every period there is a New High made. If a new high is not made then the AF is not increased from the last SAR. This continues until the AF reaches 0.2. Once the AF reaches 0.2 it stays at that value for all future SAR calculations until the trade is stopped out.

If Short... $SAR = (LO.1 - SAR.1) \times AF - SAR.1$ The AF is initially 0.02 and changes by 0.02 intervals until it is 0.2 but the change in the AF is made only after each New Low of a period is made. The AF is never increased above 0.2.

Rules of Advancement... The SAR is never advanced into the previous period's range or the current period's range.

If Long using daily data: Never move tomorrow's applicable SAR above yesterday's or today's low. If the calculated SAR is higher than either of these lows then use the lower low of these two days as the SAR and use this value for SAR calculation for the next day.

If Short using daily data: Never move the SAR below the high of yesterday or today. If the calculated SAR is lower than either of these values then use the higher high of these as the SAR for the day and for the future calculation for the following day's SAR.

Return to Technical Indicator window

New RTL tokens: EVW, OSC, and SAR

These recently added technical indicators are now available for use in scans, custom indicators, and trading signals.

New Indicator: Indicator Adjusted Average

The Investor/RT indicator entitled "Indicator Adjusted Average" allows the user to create a Moving Average whose period varies within a specified range and is determined based on the value of any other selected indicator within that indicator's range. The indicator used to control the variance of the moving average period can be any of the 80+ predefined indicators or even a custom indicator created using the Investor/RT RTL language. The preferences for the Indicator Adjusted Average can be seen above.

The development of the Indicator Adjusted Average was inspired by the article entitled "Variable Interval Moving Average" in the July 2001 issue of Stocks and Commodities Magazine. The best way to simulate the Variable Interval Moving Average is to use a Volatility Indicator as the underlying indicator in the Indicator Adjusted Average study, and assign a range of periods from 10 to 50.

The range of maximum and minimum volatility values will be calculated, and then compared to the volatility values for each bar to decide which period between the maximum / minimum range will be used to compute the moving average for that bar. The Indicator Adjusted Average may also be used in the Investor/RT Scan language to automatically search for crossovers or breakouts. The scan token is IAA.

The IAA calculation is as follows:

$IAA = MA(\text{Price, Simple, } n)$ where... $n = \text{IND} * (\text{maxN} - \text{minN}) / (\text{maxIND} - \text{minIND})$ $\text{maxN} =$ Maximum Period $\text{minN} =$ Minimum Period $\text{IND} =$ Indicator Value at current bar $\text{maxIND} =$ Maximum Indicator Value in chart $\text{minIND} =$ Minimum Indicator Value in chart

New "Make Default" button when adjusting indicator preferences

When adjusting preferences for a particular technical indicator in a chart, you can now click a "Make Default" button if you want the current settings for that specific indicator to become your default preference when adding that indicator to other charts in the future. The feature is designed to allow you to experiment with settings in a chart and then easily set the resulting settings as the default without having to go back to Setup: Preferences...

Annotation Indicator enhanced

Chart Indicator selection, dragging, and dropping improved

See Adjusting indicator position and preferences via keyboard above.

New Pivot Point option to use daily data in intra-day charts

Improved "dotted line" drawing in traditional charts

Improved Rectangle technical indicator

The Owl is a newsletter published periodically by Dr. Russell A. Lockhart. Linn Software, Inc. has taken some of the methodologies described in The Owl and encapsulated them in a technical indicator. To date, The Owl indicator is heavily based on discussions of the April 2001 edition (Vol. 2, Num. 4) of The Owl. This topic discusses the following...

- Adding The Owl to a chart...
- Adjusting the Position of The Owl...
- Adjusting the Preferences of The Owl..
- Maintaining a 1x1 (45°) state for the Base Rectangle...
- Adjusting the Position of the Floating Arcs...
- Creating Space on the Right Side of The Owl Chart...

The following topic will help you with the understand and operation of The Owl...

Adding The Owl to a chart

The Owl was built on top of the rectangle tool that pre-existed in Investor/RT. This base rectangle dictates how the remaining options of The Owl are drawn. On a 1-minute chart, it is recommended that you draw the rectangle around the first 30 bars of the

day. To draw the base rectangle, click on the "Rectangle / The Owl" button in the chart toolbar (the cursor will change into a pencil), and then simply drag your rectangle around the bars you wish to include in the base rectangle. This is done by clicking on a position in the chart and holding the mouse down while dragging the cursor to create the rectangle. Now you may want to adjust your rectangle position. We will discuss this in the next section. Adjusting the Position of The Owl... In a 1-minute chart, Dr. Lockhart recommends that you wrap your rectangle around the first 30 minute bars of the current trading day. Of course this can only be done after the first 30 minutes have transpired. You may, however, add your rectangle before the first 30 minutes and adjust it as time moves on. There are several ways to adjust the position of your rectangle. This adjustment only refers to horizontal adjustment of the rectangle, as the vertical height of the rectangle is dictated by the high and low of the period it contains. One way to adjust the rectangle position is with the keyboard. First, select the base rectangle by clicking somewhere on it. Now, the following keyboard combinations have these results... Keyboard Stroke (Resulting Action)

- Right Arrow (Moves both the right and left sides of the rectangle to the right one bar)
- Left Arrow (Moves both the right and left sides of the rectangle to the left one bar)
- Shift - Right Arrow (Moves the left side of the rectangle to the right one bar)
- Shift - Left Arrow (Moves the right side of the rectangle to the left one bar)
- Ctrl - Right Arrow (Moves the right side of the rectangle to the right one bar)
- Ctrl - Left Arrow (Moves the left side of the rectangle to the left one bar)

Another way to adjust the position of The Owl is by adjusting the Start and End Date/Time control in the preferences window. The Start Date/Time represents the date and time of the left side of the base rectangle. The rectangle side will be drawn just to the left of the bar this date/time represents. Similarly, the right side of the rectangle will be drawn just to the right of the bar the end date/time represents.

Adjusting the Preferences of The Owl

The rectangle may not yet have The Owl appearance. This is accomplished in the preferences of the rectangle. First, select the base rectangle by clicking somewhere on it, and then hit the "Enter" key on your keyboard. A preference window should appear. Once you check "The Owl" checkbox, you will have several additional options available to you. Let's discuss each preference individually. For additional information on these options, you may want to refer to the April 2001 edition of The Owl.

Base Rectangle

This allows you to adjust the color, line thickness, and line type of base rectangle. Clicking on the colored square will bring up the Investor/RT color

picker. You can control-click on this colored square to get the native OS color selector.

Price/Time Grids

The Price/Time Grids are grids built by replicating the base rectangle both horizontally and vertically throughout the chart. The checkbox to the left allows you to turn this option on and off. You may also adjust the line color, thickness, and style.

Diagonals

Diagonals connect the intersections of the Price/Time Grids. The checkbox to the left allows you to turn this option on and off. You may also adjust the line color, thickness, and style.

Arcs

Three Arcs are drawn. The first Arc is drawn around the base rectangle using the length of the rectangles diagonal as the radius. The other two Arcs also this same radius. One Arc is attached to the high price. The other Arc is attached to a low price. We will discuss below the method for moving the high and low Arcs. The checkbox to the left allows you to turn Arcs on and off. You may also adjust the line color, thickness, and style.

Auto Arcs

If you check the Auto Arc checkbox, Investor/RT will try to find a significant high and low for you, and automatically draw the Arcs from this position. These Arcs will may be adjusted automatically throughout the day as new highs and lows are formed.

Diagonal Grids

Diagonal Grids form squares grids throughout the chart using the Arc radius (or base rectangle diagonal length) as the length of it's sides. The checkbox to the left allows you to turn Diagonal Grids on and off. You may also adjust the line color, thickness, and style.

Gann

The Gann option draws the following Gann Angles: 1x1, 1x2, 1x4, 1x8, 1x16. The angles are drawn downward starting at the upper left corner of the base rectangle, and upward starting at the lower left corner of the base rectangle. The checkbox to the left allows you to turn Gann Angles on and off. You may also adjust the line color, thickness, and style.

Once you have your preferences setup like you wish, with some reasonable colors, line widths, line types, etc., it is highly recommended that you click the Make Default button

below the preferences window. This will ensure that you will retain these same settings the next time you use the Rectangle/Owl button on the charting toolbar to draw a rectangle in a chart.

Maintaining a 1x1 (45°) state for the Base Rectangle... This indicates 30 bars x \$6.80, forming an angle of 45.0 degrees. This is a measure of the actual angle of the diagonal, which you are ideally trying to lock in at 45° (1x1). Now, there are a few things inherent in the Investor/RT charting system that may adjust your angle as the day proceeds...as you may have already noticed. These include...

- adjusting the pixels per bar (width of each bar) in the chart preferences...
- adjusting the chart (or chart window pane) size vertically
- adjusting the vertical scale settings
- scrolling back or forth horizontally in the chart (with auto-scaling turned on)
- new bars entering into the right side of the chart while old bars leave the left side, causing new highs/lows.

So what is the best way to lock your 30 bar square into a 1x1 (45°) square shape? Here are some suggestions...

After the first 30 minutes have passed, and you are able to draw your square around the first 30 1-minute bars of the day, double-click in the vertical scale to bring up the vertical scale preferences, and check "Manual Scaling" and select a reasonable range that you think should take you through the day. (like 1450 to 1480. for example). Later in the day, you can adjust this range, but should always keep the same spread between the high and low. This will insure that scrolling motions and new bars coming into chart won't affect our square shape. Now, we need to make other adjustments to get our square as close to possible to 45°. First, adjust the pixels per bar (you can do this by clicking in blank space on the chart and then using the up and down arrows on your keyboard, or bring up the chart preferences and adjusting there), until you have something somewhat close to 45° along with a reasonable bar size. Now, you can adjust the chart height vertically to fine tune the degrees. Once you have it fine tuned, just sit back and watch as the owl monitor the day.

Adjusting the Position of the Floating Arcs

If you would like to manually move your floating arcs, you can do so with your keyboard. First, select The Owl by clicking somewhere on the base rectangle. Now, the following keyboard combinations will have these results...

Keyboard Stroke (Resulting Action)

- Up Arrow (Moves both the high and low Arcs to the right one bar)
- Down Arrow (Moves both the high and low Arcs to the left one bar)

- Shift - Up Arrow (Moves the high arc to the right one bar)
- Shift - Down Arrow (Moves the high arc to the left one bar)
- Ctrl - Up Arrow (Moves the low arc to the right one bar)
- Ctrl - Down Arrow (Moves the low arc to the left one bar)

Creating Space on the Right Side of The Owl Chart

The Owl indicator often requires looking into the future to see where the Gann Angles, Arcs, Gridlines, and Diagonals, project the price/time action. Investor/RT (4.9.5 and later) allows the user to specify a "Look Ahead" period. This Look Ahead period specifies the number of bars into the future that the chart will reflect. It will create in essence a margin to the right of the most current bar, between the bar and the vertical scale.

In order to adjust this Look Ahead period, first bring up your chart preferences. You can do this by either double-clicking in the horizontal scale, clicking on the chart preferences button in the charting toolbar, or right-clicking in the chart (cmd-click on Mac) and choose "Preferences: Chart". In the Viewing Period section of the chart preferences window, you should choose either "Begin to End" or "Last X Days". When either of these are chosen, a "Look Ahead ___ Bars" option will appear. A common suggestion here would be 20 bars, but this will vary depending on other characteristics of your particular chart.

TIME token can now be used in scans and custom indicators

TIME was formerly useful only when backtesting. When used within a scan, TIME evaluates to the time of day of the bar being tested expressed as a whole number in the form hhmm (e.g. TIME >= 1315 tests for the time being 1:15 pm or later).

CUSIP can be imported

This feature was added to enable users tracking many futures contracts to quickly update the CUSIP data for each future. CUSIP data is used to assign a futures contract to the "perpetual" futures instruments.

"Owl" Indicator in Rectangle Tool further enhanced

See Improved Rectangle technical indicator above.

Ultimate Oscillator technical indicator added

The Ultimate Oscillator was designed by Larry Williams in an attempt to improve on the premature buy and sell signals he observed in other available oscillators. It is documented in the April, 1985 issue of Technical Analysis of Stocks & Commodities. The calculation of the

oscillator can be seen below. The Ultimate Oscillator combines three oscillators that represent short-, intermediate- and long-term market cycles (7-, 14-, & 28-periods are recommended). Mr. Williams' theory is there is a bullish divergence when price makes a lower low that is not confirmed by a lower low in the UltOsc. A bearish divergence occurs when price makes a higher high that is not confirmed by a higher high in the UltOsc. A bullish divergence occurs when price makes a lower low that is not confirmed by a lower low in the oscillator. A bearish divergence occurs when price makes a higher high that is not confirmed by a higher high in the oscillator. Williams suggests the following regarding buy and sell signals.

Buy on positive divergence where the low of the oscillator has dipped below 30. Sell on negative divergence where the high has exceeded 50. Close long positions when the oscillator exceeds 70. Close short positions when the oscillator goes below 30.

The Ultimate Oscillator Calculation follows:

if (Y1 = 0 or Y2 = 0 or Y3 = 0) UltOsc = 0 else UltOsc = ((X1 / Y1) * 4 + (X2 / Y2) * 2 + (X3 / Y3)) / 7 where X1 = Average (Close - TrueLow, period1) X2 = Average (Close - TrueLow, period2) X3 = Average (Close - TrueLow, period3) Y1 = Average (TrueRange, period1) Y2 = Average (TrueRange, period2) Y3 = Average (TrueRange, period3)

Linear Regression Acceleration technical indicator

The Linear Regression Acceleration indicator provides the acceleration at each bar of theoretical regression lines which would end at that bar using the period specified. First, the data, based on the price selected, is smoothed using the moving average period and type. If you prefer no smoothing, choose a period of 1 here. The resulting data is then used to form regression lines ending at each bar, using the regression period specified. The linear regression acceleration of each bars regression line is then recorded as the change in slope of the regression line from the slope of the regression line of the previous bar. For instance, using the preferences specified above, the raw closing price would be used (smoothing period of 1). Then, using that resulting data, for each bar, we would use that bar and the previous 8 bars (9 total) to form a regression line. The LRA of that bar is then recorded as the difference between that regression lines slope and the slope of the regression line of the previous bar.. The same calculation is done for each bar and then plotted in the chart, as a histogram or a line.

All chart types can now be locked to prevent multi-link changes

Formerly, only traditional charts could be locked so there will not participate in "multi-linking" requests. Now, Day Bar, Raw Tick, Point and Figure, and all other non-traditional charts have a "lock" checkbox in the preferences for the chart for this purpose.

Candlestick option added to Day Bar chart

Day Bar charts can now be "Day Candles" by checking an checkbox in the preferences for the chart.

New technical indicator and drawing tool: Andrew's Pitchfork

Andrews' Pitchfork is a line study consisting of three parallel trendlines based on three user selected points in time. This tool was developed by Dr. Alan Andrews. This upper and lower tines of the pitchfork provide support and resistance levels.

The first trendline begins at the left-most point selected (either a major peak or trough) and is drawn so it passes directly between the two right-most points. This line is the "handle" of the pitchfork. The second and third trendlines are then drawn beginning at the two right-most points (a major peak and a major trough) and are drawn parallel to the first line. These lines are the "tines" of the pitchfork.

Andrew's Pitchfork can be quickly added to a chart by first clicking on the Pitchfork button in the charting toolbar. Then, click three times in the chart, first on the bar on which the pitchfork handle should begin, second, on the bar where the high tine should begin, and third on the bar where the low tine should begin. Any of these three points on the pitchfork may then be adjusted by simply clicking on the point, and then clicking on the bar to which you would like that point moved.

The keyboard can be used to move the Pitchfork points to the right and left. First, click on the chart. Then hit the tab key repeatedly until you notice your Andrew's Pitchfork is selected. Then, press the right or left arrow keys on your keyboard to move beginning handle point to the right and left one bar at a time. If you would like to move the base of the first tine, then hold down the Shift key while pressing the right or left arrow keys. If you would like to move the base of the second tine, then hold down the Ctrl key while pressing the right or left arrow keys.

Additional tines may be added to the Pitchfork by checking the "Draw Additional Tines" checkbox and by specifying the multiple(s) in the "Tine Multiple(s)" checkbox. Each multiple represents a multiple of the distance from the base trendline to the standard tines. By definition, the standard tines will be drawn at a multiple of 1. If you would like to add two additional tines on each side, equally spaced, then you would specify "2, 3" as the tine multiples. The multiples can be separated by a comma or a space and they may be whole or decimal numbers.

Traditional chart close pane behavior revised

When you click the "x" box at the left edge of a traditional chart window pane title bar, Investor/RT now responds as follows:

1. If the pane contains only technical indicators, the indicators are removed from the chart window and the pane closes.
2. If the pane contains technical indicators along with one or more instruments, the indicators are removed but the pane remains open displaying only the instrument graphs.
3. If the pane contains only one or more instruments a warning message will prompt for removing the first instrument from the pane. Note that removing the one and only instrument from the overall chart effectively closes the chart window.

Traditional chart view period enhancement: look ahead period

Traditional chart windows can now have an optional "look ahead" period expressed as a number of bars. This option applies to charts having a view period of "Last N Days", "Last N hours", or "Begin to Present". The number of bars specified by the user is added to the view period, thereby allowing trendlines, Fibonacci indicators, Gann angles, etc. to extend into the future. The default look ahead period for new charts can be specified using Setup: Preferences: Charts: Traditional Charts. The look ahead period for a specific chart can then be revised using the chart's preference window. The look ahead period is expressed in bars, so if you change periodicities, the number of bars into the future will remain constant.

View/Edit, Time & Sales improvements

The View/Edit (Time & Sales) window has been further improved to provide immediate updating of open chart windows when ticks or bars are edited in the window, e.g. when correcting a bad tick. Formerly, the open charts for the symbol in question were not updated until the V/E or T/S window was closed. Editing or deleting ticks after sorting is now working properly as well.

New RTL tokens: DAYM and MONTH

These new tokens allow you to test for the day of the month (DAYM) or the month of the year (MONTH) in scans, signals, and custom indicators. DAYM evaluates to the day number in the range 1 to 31. MONTH yields a value 1 to 12. The DAY token yields a number 0 to 6 representing the day of the week (0 = Sunday, 1 = Monday, etc.).

Adjusting horizontal and vertical scaling using the mouse

Improvements have been made to facilitate using the mouse to manipulate the horizontal (time) scaling and the vertical (price) scaling.

Vertical scaling by default is automatic, that is, the scale minimum and maximum price values are obtained automatically by examining the price values of the instrument(s) in each chart

pane as well as associated indicators. Manually scaling can be set by right-clicking (control-click on Macintosh) in the vertical scale area to access the Vertical Scale Setup window. A faster way to adjust the scale values and turn on manual scaling is to mouse down and drag the mouse up or down in the vertical scale area of the chart pane. Where the mouse down (left mouse button) occurs affects the action when you drag the mouse. If you mouse down in the left hand side of the vertical scale area, the "Hand" cursor appears. Dragging the hand adjusts either the minimum or maximum scale value. Mouse down in the upper half of the pane to adjust the maximum scale value, in the lower half of the pane to adjust the minimum scale value. Mouse down in the right hand side of the vertical scale area displays the "Vertical Resize" cursor. Dragging the resize cursor adjusts both minimum and maximum values, increasing both values in tandem as you drag upward, decreasing both values in tandem as you drag downward. Note that after dragging, the scale is set to manual mode-scale adjustments will be required to observe price action outside the newly set minimum and maximum scale values.

Adjusting the horizontal scale with the mouse is done similarly. Mouse down in the horizontal (time) scale area of the chart to get the "Horizontal Resize" cursor. Drag left to increase the spacing between bars, drag right to decrease (compact) the spacing.

Finally, if you hold down the shift key while dragging the mouse in the horizontal scale area Investor/RT adds or subtracts "future look ahead" time to/from the chart window. Drag left to add more look ahead time. Drag right to decrease the amount of look ahead time.

Assigning shortcut keys to schedules (macros)

Improvements have been made to the schedule setup window to make it much easier to assign a keyboard shortcut to any schedule. Formerly, it was necessary to use Setup: Preferences: Keyboard Shortcuts to define a shortcut key and associate it with a particular schedule name. Now, in the Setup: Schedules window, when you click "New" to create a new schedule, or "Edit" to edit the properties of an existing schedule, the ensuing dialog box contains a "Shortcut Key" section for assigning a shortcut key to the schedule. Since schedules can be multi-step action sequences, this new feature makes it clearer that schedules can be used to create "macros", i.e. single keystrokes that initiate a series of Investor/RT actions. Schedules, of course, can also be run periodically or at particular times as well, or a schedule need not be "scheduled" at all, but run only in response to a shortcut key. A button is provided in the schedule setup for displaying the current list of all shortcuts (the "legend"). A "Delete" button is provided for removing a shortcut key for the schedule.

Investor/RT 4.8, Release 4.8 Rev 7: April 6, 2001

Simulated trade execution via myTrade for equities and options

myTrack users will soon gain the ability to execute trades for stocks and options directly from Investor/RT. In an effort to thoroughly test our trade execution software before enabling real trading, Investor/RT 4.8 supports simulated trading via myTrack. Click on the "Place a trade" icon in the main toolbar to access the trading window. Choose "myTrack Simulated Trading" as the broker and use the Accounts menu to create a simulated trading account. Once your account has been established you can begin placing buy and sell orders through the myTrack simulated trading (contest) broker. Simulated trading accounts are initialized with \$200,000 of "play money". When real trading is enabled in the near future, the same trading window will be used to do actual trading through myTrade, the only difference will be the selection of a real trading account instead of a simulated trading account number.

MyTrack users who wish to open trading accounts can do so at the myTrack web site. Note that the simulated trade execution feature is only available in the myTrack version of Investor/RT and is considered "beta test" at this stage even though version 4.8 is in general, a normal release. Trade execution solutions for users of other data services are under development at this time.

Note that myTrack users will be routed to the new order desk window for myTrade when they choose "Place Trade" from any popup menu or when they click on the "Place Trade" icon on the main toolbar or portfolio toolbar. Formerly, these actions opened the Investor/RT Portfolio Order Desk window for entering positions into portfolios. To access the portfolio order desk window, hold down the shift key when choosing "Place Trade" or when clicking on the Place Trade icon on any toolbar.

It is recommended that you define a keyboard shortcut for accessing the order desk window. For example you could define F2 as "Open: Trading Desk". If you then press F2 at any time, the myTrack trading window will appear. If you have a row in a quote page, portfolio, or quick quote window selected, the order desk window will be setup for submitting a trade on the selected ticker symbol. Same for chart window-just click on a chart to activate it (making it the front window) then press F2 to submit a trade for the ticker in that chart. If a traditional chart is in front when you hit F2 then Investor/RT will check to see if a particular instrument is selected in the chart and if so setup the trade on that ticker, otherwise the first instrument in the chart is the subject of the trade. Note that all trades require another click to confirm the trade before sending it to myTrack. Note that the alarm window has a place trade button in it so when a price alarm is triggered a single click gets you into the trading window with the alarmed symbol inserted as the stock or option you wish to buy or sell.

Multiple Paintbar indicators per chart pane

Investor/RT 4.8 enables multiple instances of the "Paintbar" indicator within a single chart windowpane. If more than one paintbar indicator is assigned to a pane, the indicators are evaluated in the order the indicators are listed in the pane title. Any bar that is not painted by

the first paintbar specification is eligible for painting by the second paintbar, and so on. This implies that each paintbar should only paint one condition, e.g. the TRUE condition, painting some bars and not others. If a paintbar indicator specifies that both true and false conditions should be painted, any other paintbars in the pane will have no effect since all bars will have already been painted.

New RTL Tokens: DAYHI, DAYLO, DAYOP, DAYVO

When running scans having DAILY periodicity, the tokens OP, HI, LO and VO provide the scan with the current open, high, low and volume of the trading session. When running intra-day scans, OP, HI, LO, and VO provide access to the open, high, low, and volume of the most recent intra-day bar, not the price value for the entire session. To make it more convenient to consider the session open, high, low, and volume within intra-day scans, we have added DAYOP, DAYHI, DAYLO, and DAYVO tokens to the RTL language. In effect these new tokens evaluate to whatever is shown in the quote page during intra-day trading hours. When writing scans that you may wish to run on both daily and intra-day periodicities at different times, it is recommended that you use DAYHI, DAYLO, DAYOP and DAYVO to refer to the entire session values rather than HI, LO, OP and VO. At present the new tokens work properly for real-time scans and custom indicators, not within trading signals used for backtesting purposes. Use the DAYxx tokens for backtesting signals is an area for future development.

Saving quote pages as text using a schedule

The saving of all open quote pages as text files can now be automated using a schedule. The scheduled event will trigger the action "Database Function" and the selected function will be "Save Quote Pages as Text". This function is provided as a means of exporting current quotation data as text files periodically so that other programs can conveniently gain access to this data. The files are saved under a name incorporating the quote page name and are placed into the admin directory/folder.

myTrack intra-day download limit is 15 days

myTrack has increased the intra-day historical downloading period to 15 days. Formerly the limit was five days. MyTrack users who wish to take advantage of longer term intra-day downloads are reminded to adjust the "viewing period" preferences of applicable charts from five days to fifteen days, otherwise the data in the chart will be clipped off after five days even though the data for longer periods is available for display.

InterQuote now quotes Canadian stocks

A glitch in Investor/RT 4.7 prevented proper reception of real-time quotes for stocks trading on Toronto, Montreal, Alberta, and Vancouver stock exchanges. Canadian ticker symbols are suffixed with a lower case letter to indicate the exchange, e.g. XYZt would be the ticker for

stock XYZ trading on the Toronto exchange. Investor/RT 4.8 for InterQuote will now properly receive quotes on Canadian issues suffixed with t, m, a, and v for Toronto, Montreal, Alberta, and Vancouver respectively.

Mouse price position feedback in charts

When a chart window is open, moving the mouse within the a chart pane causes the realized prices for open, high, low, close, etc. to be displayed in the window title. Sometimes it is desirable to point the mouse at a certain price level and obtain the price at the mouse pointer even when that price has not been realized by the underlying instrument or indicator(s) in the chart. This is now possible in Investor/RT 4.8. As the mouse pointer moves up and down within any pane, the actual price value at the tip of the mouse pointer is displayed dynamically in the main toolbar message area.

IF-THEN-ELSE constructs added to RTL language

IF, THEN, and ELSE tokens have been added to RTL language to enable conditional evaluation of scans, signals and custom indicators. The basic format of an IF statement in RTL is as follows:

```
IF (expression) THEN (expression) ELSE (expression)
```

Or simply:

```
IF (expression) THEN (expression)
```

For example, suppose who wished to set the highlight color of every instrument (in quote pages) to a special color based on whether the instrument is trading above or below some moving average. You can setup a schedule to run the following scan once a minute:

```
IF (CL > MA) THEN SET(COLOR, COLOR_LTBLUE) ELSE SET(COLOR, COLOR_WHITE)
```

Note that, at least for now, you cannot "nest" an if-then-else expression inside another one, but you can use compound if-then-else expressions connected with AND or OR, e.g.:

```
IF (CL > MA) THEN (expression) ELSE (expression) AND IF (RSI > 80) THEN (expression) ELSE (expression).
```

Perpetual Futures Maintenance

Setup: Preferences: Instruments now has a new checkbox for specifying whether or not Investor/RT should automatically maintain the association of perpetual futures instruments with the most active underlying futures contract. In prior releases, this was an automatic function and there was no way to turn it off. The criteria Investor/RT uses to determine the appropriate contact to maintain the perpetual instrument is to pick the contract with the greatest open interest. Some futures traders have expressed a desire to exercise more control over when to change over the perpetual. By unchecking the checkbox, the responsibility of associating the desired futures contract with the "perpetual" instrument lies solely with the user. This is accomplished by editing the CUSIP data column of the desired contract so it contains the ticker of the perpetual instrument. For example, if you are tracking Swiss Franc futures (perpetual ticker SF*) and the contract you wish to associate with the perpetual instrument is SF1H, then set the CUSIP of SF1H to "SF*". The CUSIP data column is used for this purpose since futures contracts do not have CUSIP numbers. Add the data column CUSIP to your ".Futures" quote page so you can clearly see which of the current trading contacts is tied to the perpetual symbol. Note that only one contract should be associated with the perpetual, otherwise, the perpetual price will reflect the price of the contract listed last alphabetically for the future type in question.

New Chart Viewing feature

The right and left arrow keyboard keys have a variety of uses when a chart window is the front window. Different meanings are assigned to the left and right arrow keys depending on which modifier keys are held down. The shift and ctrl keys (shift and option keys for Mac users) are the two modifier keys.

If no modifier keys are held down, the left and right arrow keys simply scroll the chart left or right along the horizontal time axis.

If the ctrl key (option key on Mac) is held down, the periodicity of the chart is changed.

If the shift key is held down, the chart is replaced entirely with the NEXT (right arrow) or PRIOR (left arrow) traditional chart in the list of available saved charts.

New in 4.8 is the ability to cycle through all of the saved charts in turn while retaining the same ticker in each chart. Most saved charts are saved with a different ticker symbol. When cycling through all of the charts in your list of saved charts using the shift-left-arrow or shift-right-arrow method, each chart typically appears with whatever ticker was saved with each chart. In 4.8 if you hold down both the shift and ctrl keys (shift and option keys on Mac), Investor/RT will cycle through the saved charts while retaining the same ticker as you move from chart to chart. The same rule applies when using the left and right arrow icons on the charting toolbar. If you hold down the shift key while using these toolbar buttons, Investor/RT will retain the same ticker symbol while moving left or right through the list of saved chart windows.

Naming V# column headings

A new facility has been added to Setup: Preferences to permit the user to provide column headings and numeric displays format preferences for each of the twenty V#n variables available in the RTL Language. Choose Setup: Preferences: User Variables. Pick a particular V# variable, enter a column heading and adjust the display format for that V# variable. Click Apply to save the changes and leave the window open for further changes or click OK to save the changes and close the window. It is recommended but not required that you include the V# variable's name as part of the column title. For example if you use V#9 as an exponential moving average then you could assign it a column heading of "V#9-Exp MA" or "Exp MA V9". This assures that you easily see which V# variable is used for each column.

V# variables in portfolios

V#n variables are now available for display as columns in portfolios as well as quote pages. To add a column to a portfolio, right-click (control-click if Mac) on any column heading and pick "Add New Column" from the popup menu. The twenty V# variables are all listed (under V) in the alphabetical list of available columns. The current column title, if assigned, will be shown in the list of columns as well. Note that at most 30 columns can be present in a portfolio (or quote page) so you may have to remove an unneeded column before you can add a new one.

V# variables user editing

When a V# user variable is present in either a quote page or portfolio, the numbers are editable. This enables you to use V# variables for user entered values, e.g. a hand-entered "target price". This opens up lots of new possibilities for scans that incorporate V# variables, reference lines based on V# variables, etc. Formerly, V# variables could take on a value only when the V# variable was the subject of a SET command in a scan.

myTrack Market Pulse Reports expanded

The Market Pulse command in the myTrack menu now offers a variety of new market pulse reports. Some reports that formerly did not function properly do now. The reports can be requested for today's market, yesterday's market, or "after market".

User-specified "Web Info" links

The instrument contextual popup menu has a WebInfo submenu for directing your web browser to a specific URL. Seven built-in web URLs for accessing ticker specific information are available. Now, there are three "custom" URLs that may be user specified. Setup: Preferences: Mail & Internet is the place where these user-specified URLs and an associated "name" are specified. The specified name appears in the Web Info Menu. If the URL you use accepts a ticker

symbol, use *** within the URL address to designate where you wish Investor/RT to place the ticker symbol that you clicked-on when using the contextual menu. Here are some examples you may wish to add to your Web Info Menu:

http://www.quicken.aol.com/investments/quotes/?symbol=***

http://quote.fool.com/uberdata.asp?Symbols=***

http://tscquote.thestreet.com/StockQuotes.jhtml?tkr=***

Mouse price feedback preference

The mouse price feedback feature is now an option that can be turned on or off for individual traditional charts. To turn on mouse feedback for a particular chart, access the preferences for the chart and check the "Mouse Feedback" checkbox (below the Viewing Period). When this option is on for a particular chart, the price value and time value of the current mouse position appears in the main toolbar message area as you move the mouse within the chart window. If the mouse feedback is off for a chart you can temporarily get this feedback by holding down the ctrl key (option key on Macintosh) while moving the mouse. Note that ctrl and shift both down calls for the crosshairs to be shown temporarily, while the ctrl key alone activates mouse price feedback temporarily. See item #7 above for more information on this feature.

Note that Setup: Preferences: Charts: Traditional Charts is the place for specifying the default value for mouse feedback for newly created charts. This window can also be used to turn on or off the mouse feedback option for all of your saved charts. By default this option is OFF for all charts saved prior to the release of 4.8 Rev 3.

Automatic charts when alarms trigger

When an alarm occurs, there is now an option to open a user-specified chart window for the alarmed instrument. See Setup: Preferences: Alarms and check the box for "Open a chart..." in the section titled "When an Alarm Occurs". Notice that the chart specified can be any kind of chart window: traditional, point & figure, daybar, raw tick etc. The ticker causing the alarm will be inserted into the chart window. Note also that the chart will open on screen at the position the chart was in when it was saved rather than being centered in the screen. For example, you could create a chart named "Alarm Chart" and size and position it in one corner of your screen and save it. If "Alarm Chart" is then specified as the chart to open when alarms occur, the chart will always appear in it's corner position.

Next Layout, Previous Layout commands, shortcuts

Two commands have been added to the Windows menu to enable you the quickly advance forward or backward through all defined layouts. The "Next Layout" command and the "Prior Layout" command can also be invoked using keyboard shortcuts defined in Setup: Preferences: Keyboard Shortcuts.

Auto-scrolling via the scroll-bar

All spreadsheet-like windows or spreadsheet lists embedded within Investor/RT windows now feature "dynamic scrolling" as the user drags the "thumb" inside the scrollbar control. Quote pages, portfolios, time and sales, view/edit, quick quote windows and all "instrument selection lists" in Investor/RT now operate this way.

Sorting quote pages with mouse click

Clicking (once) on a sort column in a quote page now sorts the quote page. Clicking a second time on the same column sorts the page in the opposite direction. Shift-click and ctrl-click (option-click for Macintosh) still perform ascending or descending sorts as before. A simple click toggles the sort between ascending and descending. Clicking on a non-sort column does nothing-a message will appear in the message area of the main toolbar telling you the column is not a sort column.

One side effect of the easier sort capability is that we have discontinued the "double-click" action for quote page columns. Double-clicking a column formerly adjusted the column's width. Now, it is necessary to right-click (control-click on Macintosh) on the column and choose "Resize Column" to perform a re-size.

Emailing quote pages

A new action called "Email Quote Page" has been added to the list of actions that can be performed by a schedule. When this action is added to a schedule, you pick the quote page and specify the email address to which the quote page should be sent. When the schedule is run, Investor/RT will temporarily open the designated quote page, send an email containing the text of the quote page in accordance with its saved column format, and then close the window. To use this feature, you must first setup Internet and Mail preferences with a valid reply address and a valid SMTP server address. Note that AOL cannot be specified as a SMTP server.

Stochastics smoothing type now user specified

The stochastics technical indicator has been enhanced to allow the user to set the type of moving average to be used when calculating the FASTD and SLOWD lines. Prior to 4.8 Rev 4, Investor/RT used an exponential moving average. Users who employ stochastics in scans, signal, and charts will have to access the settings for these stochastic indicators and specify "exponential" in order to retain the same calculations as 4.8 Rev 3 and earlier. Also, use Setup: Preferences: Charts: Technical Indicators: Stochastics to specify the preferred moving average type.

eSignal new Fundamental Data Columns now supported

Several new fundamental data items are now supported in the eSignal version of Investor/RT. The following items are now supported (listed by quote page column heading):

- 52WeekHighDate
- 52WeekLowDate
- CUSIP#
- EPS Growth Rate 5 years (EPS Trend Growth Rate in eSignal)
- Histor Rel PE Ratio (Historical Relative PE Ratio)
- TickTrend (e.g. ++++ showing last 4 ticks)
- TickCount
- SOES Size

New Technical Indicator: Indicator Weighted Average

Investor/RT has a flexible new technical indicator in its library of built-in studies called the "Indicator Weighted Average" (the RTL token is IWA). The IWA is simply a moving average that is weighted using another indicator. The weighting can be based on any of the built-in indicators in the Investor/RT library, or any user-defined custom indicators. The IWA gives the user control over the period, the price data to be weight-averaged (close, high, low, open, hi +lo/2, ohlc/4, etc.), and the indicator used to weight the data. When you choose a weighting indicator, you specify the preferences relevant to that indicator. The IWA makes it easy to create a volume weighted moving average (VWAP), for example. Using IWA, Investor/RT users can develop an unlimited array of weighted moving averages and use them in scans, charts, trading signals, and backtests. For more information, visit this page at the LinnSoft web site:

<http://www.linnsoft.com/tour/techind/iwa.htm>

Daily Historical Data Downloading bug fix

Users of eSignal, myTrack, and InterQuote attempting to download daily historical data were unable to download more than a few days of data. Investor/RT was incorrectly applying intra-day downloading day limits to the daily download process. This bug was eliminated in 4.8 Rev 4.

Using Moving Averages (MA token) in RTL

The "Shift" preference for the Moving Average technical indicator allows the moving average line to be shifted left or right some user-specified number of bars when drawing the moving average in a chart. This option can now be used when specifying the properties of a MA token in the setup window for Scans, Trading Signals, and Custom Indicators.

Point & Figure box size data column added

A new editable data column called "Box Size" can be added to quote pages showing the user-specified box size to be used when the particular instrument is charted in a Point and Figure chart. If the box size of an instrument is zero, then the default box size specified in Setup: Preferences: Charts: Point & Figure is used. The RTL token BOX can be used to set the box size for any list of instruments by running a scan containing a SET command, e.g.:

```
IF (CL < 30) THEN SET(BOX, .5) ELSE SET(BOX, 1.0)
```

The instrument specific box size can also be revised individually for any instrument by editing the instrument's box size cell in any quote page.

Multi-link when double-clicking in Quote Page

Setup: Preferences: Charts: General now has a third option for the desired action when "double-clicking on ticker symbols in a quote page". The new action is to "multi-link" the instrument, i.e. insert the instrument into all unlocked charts (and other instrument specific windows) just as the "Multi-link" command does in the quote page popup menu.

Sorting Quote Pages on any column

All quote page columns are now sort columns. Sort the quote page on any column by using the sort buttons on the quote page toolbar or by clicking on the column title in the quote page. Clicking on the column title once will sort in one order, clicking again will sort in reverse order. Shift-clicking on a column title always sorts in ascending sequence, while ctrl-clicking (option-clicking on Macintosh) always sorts in descending sequence.

In addition the quote page can now be automatically sorted on any column when it is opened by setting the sort preference in the Preferences for the quote page window. Further, the Chart Wizard can sort a target quote page by any column prior to producing its arrays of charts windows. Formerly, all of these sorting actions were limited to selective "sort columns", the sort capabilities now apply to any and all columns in a quote page.

Sorting Portfolios with single click

Portfolio windows, like quote pages can now be sorted on any column by clicking once on any column title. The first click sorts in one sequence and another click sorts in reverse sequence. The shift or ctrl key can be used just as described above for quote pages (shift and option keys are used instead on the Macintosh platform).

Bid/Ask Implied Volatility

New data columns for Bid Implied Volatility and Ask Implied Volatility have been added. These two calculated data columns shows the Implied Volatility of an option based on either the bid or ask price instead of the last price of the option. The new data columns can be referenced in RTL using the tokens IVOLATB and IVOLATA for bid and ask implied volatility, respectively. The normal (last) implied volatility has the token IVOLAT in RTL.

Portfolio Default format added

When creating new portfolios, Investor/RT now looks for a portfolio format named "Portfolio Default" and, if present, this column format is used as the initial display format of the new portfolio. To create or modify the meaning of "Portfolio Default" format, use Setup: Preferences: Formats; be sure to set the "Portfolio Format" tab (not the quote page format tab) when defining this special format. If "Portfolio Default" format is not defined to Investor/RT, the software will use an internal default format.

Traditional chart crosshairs feedback improved

As you move the crosshairs in a traditional chart, the current price level and date/time are now shown within the chart window.

Dragging reference lines to set hi/lo alarm levels

When a reference line indicator is present in a traditional chart pegged to either the High Alarm or Low Alarm value of the charted instrument, dragging the reference line within the chart window causes the new price value of the line to update the corresponding alarm level for the instrument. Dragging such a reference line also clears the previously triggered alarm, if any, so that monitoring for price penetration of the new alarm level takes place on the next trade.

Quote page/portfolio printing font preference added

Setup: Preferences: Quote Page has a new preference setting for "Printing Font and Size". This setting is global. It specifies the font and size to be used whenever portfolios or quote pages are printed.

View/Edit (Time & Sales) windows sorting added

Any column in a view/edit or time and sales window can be used to sort the rows of data by simply clicking on the column title. Each click in a column reverses the sort from ascending to descending, just as they do in quote pages and portfolio windows. This sorting feature can be a valuable aid in finding "bad ticks" in t time and sales windows-just click on the Last column and

the abnormal tick will sort up to the top where it can be deleted. After sorting, the view/edit can be put back in normal time sequence by clicking on the Date/Time column title.

Custom Profile memory leak fixed

When a Custom Profile window was setup to use a custom indicator to produce the profile, Investor/RT was leaking memory. If the Custom Profile was set to recalculate frequently this could result in substantial memory loss. This bug has been fixed in 4.8.6.

Repeating Quote Pages, popup menu fixed

When a quote page is in "repeating" format (multiple symbols per row), the popup menu obtained by right-clicking on a ticker symbol was incorrectly using the leftmost ticker in the row, rather than the actual ticker right-clicked upon. This bug is fixed in 4.8 Rev 6.

Toolbar Save/Save as using shift key

Various toolbars (charts, quote pages) having a Save button can now be used to perform a "Save as" by holding down the shift key while pressing the Save button. This works the same as the "Save" button in the Scan setup window. A dialog box appears prompting for a new name for the item to be saved.

NASD Level II preference enhancements

Level II windows can now be presented in any font and size. Right-click in any Level II window to access the preferences or choose Setup: Preferences: NASD Level II. A "highlight market maker column" preference setting controls the appearance of the market maker column in the Level II display. When checked the market makers appear in gray with a raised 3D effect (the former default appearance). When un-checked, the market makers appear color-coded just like their corresponding bids or asks are colored. Investor/RT now remembers the window size and column spacing for Level II windows. Window size and column spacing are global options. If you change any level II window's size or spacing and close the window, those settings become the default for any new level II windows opened in the future. By adjusting the font/size, revising the column widths, and resizing the window smaller, Level II windows can now be viewed in a much smaller screen space than in earlier versions of Investor/RT.

New Keyboard Shortcut - Cycling Through Window Groups

Investor/RT now allows the user to group certain windows (charts, quote pages, portfolios) and then use a single shortcut key to cycle through the open windows in that group. Let's say, for instance, that you have two groups of 6 charts. In each group, you stack the windows right on top of one another. And you want to be able to cycle through each group of charts independently of any other windows that may be open. You can now do this with a shortcut

key. The windows are grouped based on their names. You can choose to define "groups" of charts by naming them so they use a common prefix or suffix in their names. For example you could create a group of custom profile windows (charts) naming each one with a name that begins with "CP_" (CP_Chart1, CH_Chart2, etc.). Go to "Setup Preferences: Keyboard Shortcuts", and choose say, "F4". Now, for your Action, choose "Next Window: Named Group". Below, you will be presented with the choice of whether you want to match the first or last characters, along with how many characters you want to match. A common choice might be the first 3 characters. Now, windows can be grouped by simply naming them with the same first three characters. We'll now rename all the charts in one of our first group of charts to all start with "AB_" and we'll rename all the charts in our second group to start with "YZ_". You can rename charts easily using the "Delete/Rename" button in the main toolbar. Now, you can simply click on one of the charts in a group and start hitting the "F4" key. It will cycle through only the charts in your named group. Investor/RT simply notes the prefix of the front-most chart and locates the next open chart that begins with the same 3 characters in this example. Similarly, you can click on the front chart in your second group of chart, and hit "F4" to cycle through only the second group. You may now create as many groups as you like, starting with the same 3 characters. You may also choose to create a second shortcut key that may match by the last 3 letters in the name in order to create a secondary grouping scheme. You may also group charts, quote pages, and portfolios together, as long as they have the same common naming convention specified in the shortcut settings.

New technical indicator-Correlation Coefficient

The Correlation Coefficient is a versatile pattern matching technical indicator. See <http://www.linnsoft.com/tour/techind/coco.htm> for more information on the Correlation Coefficient indicator, including screen shots of charts and setup windows for this indicator.

The Formula

Calculating the Mean

$$E(X) = (X_1 + \dots + X_N) / N$$

Calculating the Variance

$$V(X) = (X_1^2 + \dots + X_N^2) / N - (E(X))^2$$

Calculating the Covariance

$$COV(X,Y) = (X_1Y_1 + \dots + X_NY_N) / N - E(X)E(Y)$$

Calculating the Correlation Coefficient

$$COCO = COV(X,Y) / \text{SQRT}(V(X)V(Y))$$

The Presentation



Above is a Daily Line Chart of Real Networks (RNWK - Purple) and Nasdaq (\$COMPX - Green). The bold blue line in the lower window pane represents the Correlation Coefficient as specified in the preferences below. Horizontal reference lines are automatically drawn at -1, 0, and 1.

The Preferences . . .

[. . . more](#)

[on Preferences](#)

Ticker	Name	+
\$COMPX	NASDAQ COME	▲
\$DVOL	NYSE DOWN V	▼
\$INDU	DOW JONES I	▼
\$INX	S&P 500 IND	▼
\$ISSU	NYSE ADVANC	▼
\$NYA.X	NYSE COMPOS	▼

Price:

Period:

Use Ticker as Pattern

Pattern Specs

Start Date:

Scaling Factor:

Rel to: \$COMPX Correlation Line.....

Price - Price data of the ticker symbol in the chart that will be used in comparison.

Period -Number of bars to be used in computing the correlation coefficient.

Use Ticker as Pattern - If this box is checked, then the "Pattern Specs" below it will be relevant, otherwise, those settings will not be used. This specifies whether the data will be compared against a specific pattern, or against all the data of the underlying ticker.

Start Date - The starting date for the underlying pattern. The pattern will be based off daily closing prices, beginning on this date and going forward the number of periods specified above.

Scaling Factor - If you would like to scale your pattern up or down, you can do so by specifying values other than 1 here.

Rel to - The ticker symbol which will be used for comparison in computing the correlation coefficient.

Correlation Line - Color and width of the correlation line in the chart.

The Description

The Correlation Coefficient is a very versatile pattern matching technical indicator. By definition, the correlation coefficient is a statistic that is used to measure goodness-to-fit. We will be using it to compare actual price data against either specific chart patterns, or other price data. The correlation coefficient ranges in value between 1 and -1. A value of 1 represents a perfect correlation, while a value of -1 represents an inverted correlation. A value of zero represents no correlation at all. The correlation coefficient is a normalized indicator, meaning the actual values of the price or pattern data are not important, only the shapes of the patterns and charts.

Investor/RT's implementation of the correlation coefficient can be used in a couple of ways. First, you may choose to use a specific pattern of data, represented by any user-specified number of prices. For instance, you may choose to create a head and shoulders pattern using 20 consecutive prices. You may then add the correlation coefficient to your chart using this pattern, and the data points on the correlation line will represent how closely the previous 20 bars back from that point correlated with your specified pattern. You may also choose to scale your pattern up or down. This will be discussed further below.

Alternatively, you may choose to simply compare two [instruments](#) to see how closely those two instruments correlate to one another. Again, you would specify a period of bars for which to compute the correlation. The resulting correlation coefficient on your chart would then represent how closely the two instruments correlated over time.

Now let's move from the "What" to the "How".

We'll start with correlating the data of two instruments. Let's say, for instance, you wanted to see how closely several Nasdaq stocks correlated to the Nasdaq Index itself. First, you would open a traditional daily chart on one of the symbols you are interested in. Now, click the "Add Technical Indicator" button in the charting toolbar, and then choose "Correlation Coefficient" as the indicator. In the list on the left, we are going to want to choose the ticker for the Nasdaq Index (\$COMPX in my case). For price, we'll choose "Close" and for period, we'll choose "10". These are both up to you, but this way, we will be correlating the last 10 closing prices for the two instruments. We want to uncheck the checkbox "Use Ticker as Pattern". This should disable the "Pattern Specs" preferences, as these are irrelevant in our case. Now, choose a line color, style, and thickness using the color control, and click "OK". Your resulting line now shows you, for each day, how closely the two instruments correlated based on the prior 10 days. Again, 1 means perfect correlation while zero means no correlation. The correlation coefficient would work equally well, with periodicities such as 1-minute, 3-minute, weekly, etc. Just keep in mind that you need data on both instruments in order for this indicator to function. You may now simply switch the instrument in the chart to another Nasdaq stock to quickly see how well others correlated with the Nasdaq Index.

Now let's discuss correlating the price data with a specific pattern. In its current implementation, here is how you specify what pattern to use. The pattern will use the daily closing prices of a user-specified instrument. The specific daily bars to use are specified with the "Start Date" and "Period" fields in the preferences. The daily bars will be drawn from the instrument chosen in the list on the left. The pattern will begin at the "Start Date" and will go forward from there number of periods specified. You may either choose to a pattern you see for a ticker already in your system, or you may choose to create your own user-defined ticker symbol and import your own pattern data. Let's say you have create a ticker symbol called "HDNSLD" (for head and shoulders) and have imported 20 daily bars beginning 01/16/01. The closing prices of these daily bars represent the prices of your pattern. In the indicator preferences, you would then choose HDNSLD from the list of instruments on the left, choose "01/16/01" as the Start Date, and choose "20" as the period. You also must check the "Use Ticker as Pattern" checkbox. For now, just choose a Scaling Factor of 1. Click "OK". Your resulting line represents how closely your pattern was correlated in the actual price data based on the previous 20 bars from each data point.

The Scaling Factor is provided in order to stretch or compact your pattern. For instance, if you wanted to stretch your head and shoulder pattern out over twice as many bars (40), you would specify 2 as your Scaling Factor. Similarly, if you would like to compact your pattern to only span 1/3 as many bars, you would specify 1/3 in the scaling factor. The scaling factor and starting dates are only relevant when you are using a ticker as a pattern, not when you are correlating two instruments completely.

Technical indicator chart recalculation performance improvement

Investor/RT Version 4.8.7 introduces a user preference for technical indicators within chart window that controls the frequency of recalculation of each indicator as new trades (ticks)

arrive. Prior to this release Investor/RT recalculates indicators on every new tick. Four recalculation options are now available:

1. Recalculate on every price change (i.e. only when last price changes).
2. Recalculate every N ticks. Where N is any whole number.
3. Recalculate every N seconds.
4. Recalculate every N minutes.

By default, new charts and all charts saved prior to 4.8.7 are initially set to recalculate on every price change. To fine tune a chart you can adjust the setting for each indicator by editing the indicator and setting the preferred calculation frequency. Save the chart after making changes if you want this new setting to become permanent when the chart is opened again. When you edit a technical indicator setup in a chart (right click on the indicator), Investor/RT now shows you how many times the indicator has been calculated and the time of the last recalculation.

If the periodicity of a chart is tick-by-tick, this option does not apply. All indicators are recalculated tick-by-tick as new ticks are added to the tick charts. If the periodicity of a chart is N-minutes, then all indicators will always be recalculated every N-minutes when the current bar is completed and a new bar is started. The new recalculation options affect the frequency of recalculation within the N-minute period before the bar is complete.

Miscellaneous technical indicator enhancements

Bollinger Bands now have a preference setting for the moving average type. Formerly simple moving average was always used. A color preference was added so that the moving average line can be a different color than the bands if you like. The Pivot Point study was improved to allow the pivot point to be calculated using $(HI + LO + CL)/4$ or $(HI + LO + CL)/3$ or $(HI + LO)/2$. Formerly $(HI + LO + CL)/3$ was always used. Further pivot point enhancement work is under weigh for our next update.

Three Line Break/Point & Figure enhancements

The Three Line Break and Point and Figure Charts have been enhanced to accommodate two new viewing period settings based on the recommendation of Dr. Russell A. Lockhart. These viewing periods are entitled "Fresh Start" and "Carry Over" and apply only to Intraday periodicities. Fresh Start uses the opening prices as the first price processed, and then processes the closing price of each bar thereafter. Carry Over uses the closing price of the last bar of the previous day as the first price processed, and then processes the closing price of each bar thereafter.

eSignal (Data Manager) Level II fix

Level II bid/ask prices and some level I prices are now being sent by DBC using new transmission formats. This change was related to "decimalization" and required changes in Investor/RT to properly receive Level II prices for some issues.

TRUE and FALSE tokens added to RTL Language

TRUE and FALSE can now be used in the RTL language. These are simply numeric constants for 1 and 0 respectively.

Investor/RT 4.7, Release 4.7 Rev 1: November 10, 2000

Major New Feature: Setup: Schedules

Investor/RT 4.7 provides a significant new feature in its ability to automate user-specified sequences of actions, called "Schedules".

What is a Schedule?

A Schedule is a user-specified list of actions that are to be performed in a prescribed sequence at prescribed times. Investor/RT allows the user to define any number of schedules and to specify any number of actions for each schedule. A Schedule can be made "inactive". This means that its actions are performed only when the user issues an explicit command to "run the schedule". Alternatively, a schedule can be setup to run periodically or at certain fixed times during the day.

When and how often can schedules be run?

Periodic schedules run at some periodic interval within the trading hours of a particular trading session. The interval is user-specified as some number of seconds, minutes, or hours. Periodic schedules begin running at a user specified starting time. This starting time can be any fixed time within the trading hours of the particular session for the schedule. In other words the first run time of a periodic schedule can be at the open of the session or any valid time within the session trading hours.

Alternatively, schedules can be setup to run at a specific time (or times) during the day, independently of trading session hours. One, two, or three fixed times can be specified for any schedule. Note that a schedule can be run periodically and at specific fixed times. For example, a schedule can be setup to run every five minutes during a trading session, and then once more 15 minutes after the session closes.

What kinds of actions can be performed within a schedule?

Each schedule can have one or more actions. If more than one action is defined within a schedule, the order of the actions as shown in the Schedule Setup window (see below) is the sequential order that the actions will be performed. An action can be any of the following:

1. Run a particular scan.
2. Backtest a particular trading system.
3. Open or close a particular chart.
4. Open or close a particular quote page.
5. Open or close a particular portfolio.
6. Open or close a particular quick quote.
7. Open a particular layout.
8. Open a particular chat room.
9. Play a particular sound.
10. Show a message and/or prompt for an OK or Cancel.
11. Execute a particular Keyboard Shortcut.
12. Pause a number of seconds.
13. Perform a particular database function (backup, verify, compress, etc.).

What about Auto Scans?

Prior to Investor/RT 4.7, the "auto scan" feature was the only way to run a particular scan at some periodic interval. The Schedules feature provides this functionality in an improved way. First, the periodic running of the scan is done without having to leave the scan's window open. Second, you can easily stop or start a periodic scan by opening the Schedule setup window and marking the schedule as "inactive" or "active". Third, a schedule can include a list of actions; you are not limited to a single scan. For example, a schedule can run one scan using daily periodicity, then run a second scan using one minute data to further examine the properties of the issues identified by the first scan, and so on.

What kind of messages can be displayed by a schedule?

Messages can be any arbitrary text including, if desired, RTL tokens for displaying market data for a particular instrument. For example, a "Show Message" action with user-specified text of "\$INDU %CL %CH High=%HI, Low=%LO" would display a formatted message where the RTL tokens %CL, %CH, %HI and %LO are replaced by the current price, change, high and low of the Dow Jones Industrial average each time the message is displayed. Messages are displayed in the message area of the main toolbar. Optionally, the user can specify that the "Message requires an OK to continue". If this option is chosen, the message text is presented in a dialog box containing both OK and

Cancel buttons. If OK is clicked, the schedule continues running the next action in sequence. If Cancel is clicked, the remainder of the schedule is bypassed.

Why include a Keyboard Shortcut action in a schedule?

The Investor/RT Keyboard Shortcut facility (see Setup: Preferences: Keyboard Shortcuts) allows the user to assign a meaning to any function key on the keyboard (with or without modifier keys). Keyboard shortcuts can be setup for any button on any toolbar in Investor/RT, adding (or removing) specific technical indicators to charts, starting slide shows, etc. Any shortcut can be invoked as an action within a schedule. For example, one can easily create a schedule to run at a certain time each day to perform a scan, open the resulting quote page of instruments identified by the scan, open a particular chart window, and start a slide show automatically on the instruments selected by the scan.

How is a schedule defined to Investor/RT?

To create a new schedule, choose Setup: Schedules. The Schedule Setup window will appear showing all schedules on the left. When a particular schedule is selected in the list, the associated actions for that schedule appear in the list on the right. Schedules and actions may be added by clicking the New button, deleted by pressing the Delete button, edited by pressing the Edit button, or run by pressing the "Run Now" button. For actions, there are buttons for moving the selected action to the top, bottom, up one, or down one, in the list of actions for the associated schedule. The actions for a schedule will be run in the top to bottom order shown in the Schedule Setup window.

How is a schedule or action made active or inactive?

Schedules and actions can be made inactive by editing them and check marking the "Inactive" check box in the edit window. To edit a schedule or action, simply select its name in the list and click the Edit button. Double-clicking on a schedule or action name edits the item as well. A shortcut for activating or deactivating a schedule or action is to ctrl-double-click on the schedule name or action name in the list (on Macintosh use option-double-click). Schedules and actions that are "inactive" have their names displayed with an asterisk (*) prefix. When a schedule is active, revising the list of actions for the schedule takes effect the next time the schedule is run.

How can I test a schedule?

Open the Schedule Setup window, select a schedule (even an inactive one) and click on the "Run Now" button beneath the schedules list. Each active action in the schedule will then be run in sequence. Inactive actions within a schedule are NOT executed when

running a schedule. To test an action within a schedule (even an inactive action), select the action's name and click the "Run Now" button beneath the actions list.

Days of the week

Each active schedule is run at the user-specified interval or at the specific times Monday through Friday by default. If you wish the schedule to run only on specific days of the week, use the checkboxes in the Edit Schedule window to indicate which days to run the schedule. Note that periodic schedules will only run when the associated trading session is open for trading regardless of which days you have checked. Schedules that run at fixed times can run at those times on any or all days of the week if desired.

Improved date/time control

Investor/RT 4.7 introduces a new, more powerful "date/time" control mechanism. A "date/time control" is a rectangular area within a window in which the user specifies a date and optionally, a time. The new date/time control is initially used in the File: Export window and the Data Download window. In both instances, two of the new date/time controls are used to specify a starting date and an ending date for the export or download. Like the original date/time control, the new one can express dates and times in absolute terms, e.g. May 23, 1999 at 10:30 am. The new control provides considerably more flexibility by enable the specification of relative dates and times. For example, the starting date for a download can now be expressed as "6 months ago", or "1 year ago", or "5 days ago". Dates can also be specified as beginning at some relative time, e.g. "beginning of week", "beginning of month", "beginning of quarter", or "beginning of year". Dates can also be specified generally as a number of "bars ago". Depending on the periodicity the control automatically calculates the date based on the bar count.

To experiment with the new control, open the Data Download window and specify "Historical Download". The two date/time controls will appear, labeled "From" and "To". Notice that if the periodicity is daily, weekly, or monthly, only the date portion of the control is visible. When intra-day periodicities are chosen, the time portion appears. Click the down arrow at the left of the date or time to pick from a menu of date/time choices. The menu choices are intuitive. For example, if you want to download six months of daily data, set the periodicity to daily, set the "from" date to "6 months back" and the "to" date to "present date". To download today's one minute bars, set the periodicity to "1 minute", set the from date/time to "Current Date/Beginning of Session" and the "to" date/time to "Current Date/Current Time" (NOTE: choose "Now" from the date menu to get current date and current time together).

New moving average type: Modified MA

A simple moving average for n-periods is the sum of the prices in the period divided by n.

The weighted moving average gives more importance to the prices closest to the current price in calculating the moving average. For example, a ten day weighted moving average gives the current price a weight of 10, the previous price a weight of 9, ...the 9th previous price a weight of 1.

The exponential moving average is calculated as follows:

$$\text{EMA} = (\text{current price} - \text{EMAp}) K + \text{EMAp}$$

where EMAp is the exponential average for the previous period and

$$K = 2/(n+1)$$

An n-term Wilder moving average is similar to a simple moving average but it only takes into account the current and 1 previous price. The average is calculated as follows:

$$\text{Wilder Average} = \text{current price} + (n-1) * \text{previous price} / n$$

The Modified Moving Average is an algebraic technique which makes averages more responsive to price movements. The average includes a sloping factor to help it catch up with the rising or falling value of the security.

Calculation Follows:

Y = Modified Moving Average

N = Number of Periods used

T = total of last N values of the security:

$$T = y + y[1] + y[2] + y[n-1]$$

S = Sum of Security Weighted Values

$$S = ((N-1)/2 * y + ((N-3)/2 * y[1] + ((N-5)/2 * y[2] + \dots + ((N-(2*N-1))/2) * y[N-1])$$

$$Y = T/N + (6*S) / ((N+1) * N)$$

On the web at:

<http://www.linnsoft.com/tour/techind/mma.htm>

Delete/Rename button added to main toolbar

Prior to Investor/RT 4.7, the "Delete" command was hidden several menu layers down in the Control Menu. Most new users of Investor/RT were hard pressed to find out how to delete charts, quote pages, and the like. To make deleting things easier and more obvious, a delete/rename button in the form of a green trash can icon has been added to the main toolbar. The action taken when this button is clicked depends on which window is in front at

the time. If a chart, quote page, portfolio, quick quote, scan, custom indicator, trading signal, or trading system window is in front, Investor/RT will ask if you really want to delete that object and if so, the object is deleted from the database. The deletion is not undoable so read the prompt before clicking "Delete" in the prompting dialog box. If some other window is open, Investor/RT will open the general-purpose "Delete/Rename" window, the same window you get if you use the Control Menu to access the delete function. If you want to delete something and do not wish to be bothered by the prompting message, click the main toolbar trashcan while holding down the ctrl key (option key on Macintosh). The one exception to this is a portfolio window; Investor/RT will always prompt for confirmation when deleting portfolios. If you hold down the shift-key while clicking the main toolbar trash can icon, Investor/RT will immediately bring up the general purpose Delete/Rename window rather than prompting you about deleting the front-most window.

The general purpose Delete/Rename window allows you to delete or rename one or more objects of some type. First select the type (e.g. chart, quote page, etc.) and Investor/RT will show a list of the saved objects of that type. Select individual objects or a range of consecutive objects by clicking and shift-clicking to expand the select (or press the Select All button to select all objects in the list. Then press Delete button or the Rename button to individually delete or rename each object. You will be prompted to confirm each deletion or to supply a new name for each object in turn. The prompting dialog has both a "Skip" button and a "Cancel" button. Cancel will terminate the operation, while Skip will skip the current object and move on to the next selected object in the list.

Custom Indicator efficiency improved

Improvements were made in version 4.7 to reduce the calculation overhead required when custom indicators are used within intra-day charts. Such charts are updated tick by tick. On very active issues this was causing excessive calculations to be performed to keep the custom indicator in sync with the latest price(s). When new intra-day bars are added to a chart, e.g. upon conclusion of the intra-day interval, custom indicators are recalculated in their entirety. Ticks that arrive in-between cause only a recalculation of the last intra-day bar's custom indicator(s).

Windows platform improvement to list and list edit controls

So-called "list button" controls in various Investor/RT windows have been improved to display many more choices than before. A list button is a control with a down arrow to the right for selecting from a drop down menu of available choices. Prior to 4.7, list buttons displayed only six choices with other choices available only by operating a scrollbar. In most windows, the full list of menu choices is now displayed with no need to scroll. The Macintosh version of Investor/RT has always displayed the full list of choices when operating list button controls.

Relative Strength (token RS) added to RTL language

Three Line Break (TLB) added to RTL Language

Scans, trading signals and custom indicators can now make reference to relative strength and three line break conditions.

Improvement to DV token (Date Specific Value)

The DV indicator in the RTL language has been improved to incorporate the new "date/time control" discussed above in item #2. Specifically, relative times can now be specified for the date/time at which a particular market price is to be retrieved. For example, you can configure a DV token to get the "close" for the current date, one hour back. This kind of relative time specification is independent of periodicity, so if you run a scan with one-minute data or 30 minute data, Investor/RT will find the value in question based on one hour back from the current time of day. This is especially important when scans are embedded with chart windows as markers. Investor/RT can find the appropriate value as the periodicity of the chart changes. One consequence of this new feature is that scans which include the DV function must be edited to specify the date/time using the new date control.

Improvement to STAT token (Statistics)

The new date/time control has also been incorporated into the STAT indicator. STAT can now be setup to calculate min, max, average, etc. either for a fixed number of periods or "for all bars since a specified date time". The "since" option allows the user to specify a date/time using the new date/time control which means relative dates and times can be used. For example, suppose you have a signal that needs to consider the average closing price for all minute bars since the current trading session began. The STAT indicator would specify "Current Date, Session Open" as the "since" date/time. Prior to 4.7, it was required that a fixed number of bars-back be specified. This improvement means that a variable number of bars will be considered, depending on how much time has elapsed in the trading session.

Statistics technical indicator for charting

Prior to 4.7, the Statistics indicator was used only in the RTL language (via the STAT token) for statistical calculations. Now, the Statistics indicator can be added to charts directly just like any other technical indicators. For example adding a Statistics indicator specifying "maximum close in 30 periods" to a chart typically shows a stair step line as new 30 period highs are reached. Adding the STAT indicators used in scans to charts helps you to visualize how the STAT function is changing value over time.

Revised meaning of unqualified historical tokens

A change was made in the RTL language to clarify and make consistent the meaning of "unqualified historical tokens". Historical tokens (OP, HI, LO, CL, etc.) when written "as is" with no trailing number (qualifier) are always treated as if the token were suffixed with a zero qualifier, e.g. CL, CLO, and CL.0 are all synonymous. CL.0 (or CL alone) always means "the closing price of the most recent bar" regardless of periodicity. For example, when HI is used in a scan run with periodicity of one minute, HI is the high price of the most recent one-minute bar. Note that this value may be higher, lower, the same as the daily bar high. When running intra-day scans or backtesting with an intra-day periodicity, if the trading signal or scan needs to reference the high of the current trading day rather than the high of a particular intra-day bar, use the STAT token to get the Max High since current date/session open. When running scans with Daily periodicity, of course, OP, HI, LO, CL are always the current day's open, high, low, or close price at the time the scan runs.

Remove technical indicators using keyboard shortcuts

The keyboard shortcuts feature has been enhanced to add a "Remove" action for specific technical indicators. For example, you could setup F2 to mean "Add MACD" and shift-F2 to mean "Remove MACD". Then, with a chart open, press F2 for quick view of the MACD for the instrument, then press shift-F2 to remove it. Here is another example--some users employ lots of trendlines and fall victim to trendline clutter after awhile. Add a shortcut for "Remove Trendline", say F3, then press F3 (repeatedly if necessary) to clean up a cluttered chart when appropriate. This is much easier and faster than having to select each trendline individually and delete it.

Run schedules using keyboard shortcuts

Keyboard shortcuts can be defined for running a particular schedule (see item #1 above for more information on schedules). Since a schedule can include actions to perform keyboard shortcuts, this enables you to define one shortcut key what executes two or more other shortcuts keys in sequence. If a schedule is run in response to a keyboard short and the schedule contains an action that performs the same shortcut that invoked the schedule in the first place, Investor/RT will detect the situation and skip the self-referencing shortcut action.

SHOW function added to RTL Language

The SHOW function is designed to facilitate testing of scans and trading signals. The SHOW function takes any RTL expression and displays the numeric value of the expression. If a SHOW is used in a scan or a custom indicator, the diagnostic output goes into the "Message Log". You can then view the output using File: Open: Message Log (or by double-clicking in the main toolbar message area). When a SHOW function is used in a trading signal, the output goes into the backtesting detail report so the evaluation of the expression can be seen at each bar during

a backtest. More than one SHOW function can be included in a scan, custom indicator, or trading signal. The SHOW function always evaluates as TRUE. For example, the trading signal:

```
SHOW((HI + LO)/2) and SHOW(CL) and CL >= (HI + LO)/2;
```

would evaluate as TRUE whenever the closing price is above the midpoint of the high/low range. The values of the midpoint and the closing prices for each bar would be displayed in the detail output if this signal were used in a trading system.

New Three Line Break (TLB) and Point & Figure (PNF) Technical Indicators

This is an exciting new feature for users of three line break and point and figure charts. Essentially, this enhancement enables three line break and point and figure charts to be embedded into any traditional chart. When a TLB or PNF indicator is added to a traditional chart, there is an option to "Expand" the indicator so that it matches the fixed time axis of the traditional chart. Thus you can see the breaks and reversals superimposed "in time" with traditional bar charts and technical indicators. When the "Expand" option is not checked, the breaks and reversals are shown in condensed time. That is, the time axis of the traditional chart window has no relationship with the TLB or PNF bars in this case. This feature allows traditional charting and analysis plus three line break and point and figure analysis to be carried out within a single chart window.

New Schedule actions: start/stop data, print and others

Several new "actions" can now be added to schedules:

1. Start Data
2. Stop Data
3. Print
4. Close Window
5. Close All Windows
6. Activate Schedule
7. Inactivate Schedule

The Start Data action will be of interest to Internet data feed users. Investor/RT has an option to "automatically reconnect" to Internet data feeds if the software detects a loss of data flow. In some circumstances, however, the automatic reconnect will fail due to a connection error of some kind and the data feed will end up in a "stopped" state. Create a schedule with a Start Data action and set it up to run every two minutes during a trading session. Each time the schedule runs, if the data feed is operating normally, nothing is done, but if the feed has been stopped due to an error or some kind, the schedules "start data" action will trigger another attempt to re-connect to the data service. Similarly, schedules can include a command to stop (disconnect) from the data service, e.g. after the close of trading.

The Activate/Inactivate Schedule actions give you the ability to control other schedules by turning them on or off. As a simple example, suppose you have a scan you wish to run every five minutes during a trading session, but you do not wish the scan to run between 12:00 noon and 1 pm. Create Schedule_A to run the scan every five minutes for the trading session. Then create a Schedule_B that runs once a day at 12 noon; its only action is to "Inactivate Schedule_A". Finally, create a Schedule_C that runs once a day at 1 pm with the action "Activate Schedule_A". You can, of course, activate and inactive many schedules by adding multiple actions to a schedule to exercise more complex control over which schedules to run at any given period of time.

New Schedule options added

Two options have been added to the scheduling feature of Investor/RT. First, there is an option to defer the running of periodic schedule for one or more minutes after startup. If this option is selected, Investor/RT will not begin running periodic interval schedules until the specified number of minutes has elapsed since Investor/RT started execution. This option is designed to enable the user to have a few minutes after startup to setup various things before schedules begin running on their own. The second option is a checkbox in the Schedule Setup window to "Suspend All Schedules". When this box is checked all automatic initiation of schedules is suspended until the box is unchecked again. If the "Suspend All Schedules" option is off and the "defer" option is not selected, then schedules will begin running automatically at startup as appropriate. As an "emergency startup procedure", Investor/RT will "Suspend All Schedules" if the ctrl-key is held down (option key if Macintosh) during the startup process. In this case, it will necessary to open the Schedule Setup window and uncheck the "Suspend All" checkbox for schedules to begin running again.

Shift-click in traditional chart vertical scale area.

Within traditional chart windows, a shift-click in the vertical scale area of any window pane instructs Investor/RT to rotate the "drawing order" of the graph elements within the pane. For example, suppose you have a bar chart, a moving average, and a Point and Figure chart within the same pane, in that order. This means that the bar chart is drawn first, then the moving average line is drawn on top of the bars, then the PNF display is drawn on top of that. If you shift-click in the vertical scale area, the first element in the pane (the bar chart) will be moved to the end of the list. Thus the MA, then the PNF, and finally the bar chart will be drawn. To best way to visualize this useful feature is to put a bar or candlestick chart and two or more indicators into a pane and shift-click repeatedly to see the visual effect. Another benefit of this feature is that the graph element values shown in the pane title bar are reordered as well.

Trendline/Reference Line Alerts

Trendline alerts have been a feature of Investor/RT for some time. This feature has been extended to (horizontal) reference lines. Reference lines in a traditional chart with the alert

option check-marked will show a message alert box (and play an optional sound) if the price of the associated instrument falls below or rises above the reference line. When you use the mouse to adjust the level of a reference line, Investor/RT will determine if the new reference line price value is either above or below the current price and will then alert you if the current price hits or crosses over the reference line price from either direction. The user can specify the sound to be played when a reference line or trendline break occurs. This is a new feature for trendline alerts. In the settings for the trendline and reference line indicators, a menu of sounds is available. One of the choices is "<Default Alarm Sounds>". If selected, IRT will play either the "High Alarm Sound" or the "Low Alarm Sound" as specified in Setup: Preferences: Sounds when the current price reaches or crosses over from below or above, respectively. In the case of Reference Lines, the user may also specify a short text title for the reference line. This title will appear in the text of the alert message window when a reference line alert triggers.

Dial/Data bulk download using Schedules

Three Dial/Data bulk download commands have been added to the list of "Database Functions" that can be selected as actions in a schedule. Note that bulk downloading requires that the user either be using the either the Dial/Data or myTrack version of Investor/RT or have a Dial/Data account for use in conjunction with some other data service. The bulk downloads will be requested for the current day so these actions should only be used in schedules that run well after the close of trading. Typically bulk downloads are available from Dial/Data by 6 PM Eastern Time after the close of trading.

Using keyboard shortcuts to cycle through windows

Keyboard shortcuts can now be defined for cycling through specific kinds of windows. In Setup: Preferences: Keyboard Shortcuts, pick "Next Window" as the action, then pick the desired window type from the list, e.g. All Window, Traditional Charts, All Charts, etc. This new capability is especially useful when you have several charts or quote pages "stacked" on top of one another and you want to view them one at a time by simply pressing one function key on the keyboard. Furthermore, since keyboard shortcuts can be included in a schedule, you can easily setup a shortcut to cycle through your charts or other windows types at some designated periodic interval during certain times of the day.

Bid/ask markers on traditional intra-day charts

Intra-day traditional charts now show the current bid/ask-spread as a vertical line hugging the vertical scale. The price of the last trade is shown as a tick mark on the left of the vertical scale axis. Prior to version 4.7 the bid, ask, and last prices were shown using small rectangular markers that were more difficult to see.

Bear Power/Bull Power (Elder-Ray) indicators added

Bear Power and Bull Power are oscillators described in Alexander Elder's book "Trading for a Living", pp 123-125. The Elder-Ray Bull Power indicator is the difference between the current bar high and an exponential moving average. Bear Power is the difference between the current bar low and the EMA (usually negative). Elder uses a 13-period exponential moving average plotted as a histogram in his examples. These indicators have been added to the RTL language (tokens: BEARP and BULLP) to enable scanning and backtesting using these indicators.

Paint Bars indicator

A powerful new technical indicator named "Paint Bars" has been added. Its purpose is to enable certain bars or periods of time to be highlighted in traditional chart windows based on any criteria that can be expressed as an RTL scan, trading signal or custom indicator.

The Paint Bars indicator is a powerful tool for highlighting individual bars or groups of bars within a traditional chart. Normally, the bars in a traditional bar chart are drawn in one of two colors: an up color (typically green) and a down color (typically red). When a bar closes above the close of the previous bar, the bar is drawn using the up color, otherwise the bar is drawn in the down color.

When a Paint Bars indicator is added to a traditional bar chart window, you can elect to paint the actual bars or highlight the normal bars with specific background color(s) if some "condition" is true. The "condition" is specified by selecting a particular scan, trading signal, or custom indicator. For each bar in the chart, a scan or trading signal is either TRUE or FALSE. You can choose specific colors for both the true condition and the false condition. If a custom indicator is chosen as the painting criterion, then the custom indicator has an arithmetic value corresponding to each bar in the chart. Thus, three color choices are provided for positive, negative, and zero values of the indicator.

Here is a simple example. Suppose you wanted your intra-day bar charts to highlight periods of time during which the instrument is trading above the moving average of closing prices for the preceding 10 periods. First, create a "scan" named "Above MA" with the RTL formula:

$$CL > MA$$

Where the MA moving average token is defined as a 10 period simple moving average.

Open an intra-day bar chart of some instrument and add a "Paint Bars" indicator to the chart. Setup the paint bars indicator to use the scan named "Above MA" created above. Specify "Paint Background" using the menu at the bottom of the Paint Bars setup window. Place a checkmark in the box to the left of the "TRUE" condition color box, then click on the color and pick a highlighting color for the TRUE condition. You could also specify a

different color for the FALSE condition, but in this example, leave the checkbox to the left of the FALSE condition color box unchecked. Then click OK to add the Paint Bars indicator to the bar chart. You will see all bars that closed above the moving average are highlighted with the TRUE color chosen above.

To change the settings for a paint bars indicator, click the Edit Chart Element button on the charting toolbar and select the "Paint Above_MA" graph element. The setup window for the paint bars indicator will appear. Change the menu to read "Paint Bars" instead of "Paint Background". Change the TRUE condition color if you like to something different than the normal up/down colors you see in the chart, e.g. blue. Then click the Apply button to observe the effect (without closing the settings window). Notice that now the bars themselves are painted blue whenever the close is above the MA while other bars are painted normally using the up/down colors.

If you click the "Add Technicals to Chart" button, Investor/RT will determine which technical indicators are being used by the paint bar criterion. In this example, the MA technical indicator used in the "Above MA" scan will be added to the chart so you can verify visually that the highlighted bars do indeed close above the moving average.

Note that only one Paint Bars indicator should be added to a chart pane. If you add more than one, the first one will be used. To change the scan, signal, or custom indicator used to paint the bars, first delete the existing paint bars indicator. Then, add a new one using a different scan, signal, or custom indicator.

If you revise the meaning of a particular scan, signal, or custom indicator that is currently being used to paint bars in one or more bar chart windows, the chart will update dynamically to reflect the revised meaning. In our example above, if you open the scan "Above MA" (using the Open: Scan command) and revise the MA token, changing it from a ten period to a twenty period moving average, and click the Save button, the chart window will re-paint automatically to highlight the bars closing above the 20-period moving average.

Note that the paint bars indicator will paint bars, candlesticks, or line-segments in the specified colors if the "paint bars" (rather than the "paint background") option is selected. Please be aware that the painting of candlesticks overrides the classical definition of candlestick colors. It is therefore recommended that when using paint bars with a candlestick chart, that the candlesticks use the "Hollow up candle" option so that it will be visually apparent which candles closed higher than they opened and which closed lower. Alternatively, there will be no possibility of confusion if the "paint background" option is selected since the candlesticks will then be drawn using their normal up-candle and down-candle colors.

New "Paint Background" Option Added Prior to version 5.7.1, the Paint Bars Indicator had two drawing options: "Paint Bars" and "Paint Background". The "Paint Background" option painted the background of the bar/candle/line/histogram from the top of the chart

pane to the bottom of the chart pane. This option has been renamed "Paint Background (Top to Bottom)" and a third option has been added labeled "Paint Background (High to Low)". This new option limits the drawing of the background to the high/low range of the bar itself. This new option gives the same information as the former "Paint Background", but uses much less painted real estate in providing that information. This new style works properly when applied to any instrument drawing style (histogram, line, etc).

Histograms are painted in two colors

Various technical indicators and all custom indicators that are drawn in histogram format, now have two color choices, an up color and down color. When the oscillator is rising in value the histogram bar is drawn using the up color, otherwise the down color is used. This change makes it easier to spot a change in slope in an oscillator. MACD, Bull Power, Bear Power, Elder Force Index, Detrended Oscillator, Momentum, and custom indicator histograms have this new capability.

Setting Highlighting color for instruments using a Scan

A new RTL token COLOR can be used to test or set the highlight color of instruments. Eight "constant" color tokens (e.g. COLOR_LTBLUE, COLOR_LTYELLOW) have also been added to facilitate setting highlight color. For example, the scan:

```
SET(COLOR, COLOR_LTBLUE);
```

This can will set the highlight color of all instruments in the source quote page to light blue. Setting the COLOR token to zero for an instrument turns off highlighting for the instrument. Setting the highlight color to a non-zero value not only sets the color but also turns on highlighting. Thus,

```
SET(COLOR, 0); turns off highlighting for all symbols
```

```
SET(COLOR, (CH > 5)*COLOR_PINK); highlights (in pink) all instruments with net change in price of $5 or higher, and turns off highlighting for all other instruments. NOTE: the express (CH > 5) evaluates as zero if the express is false and one if the expression is true.
```

```
SET(COLOR, (CH > 50)* COLOR_PINK + (CH <=50)*COLOR_LTBLUE); Highlights instruments priced above $50 in pink, those priced at $50 and below in light blue
```

COLOR can also be used as a scan criterion. For example,

```
CL > 50 AND COLOR = COLOR_PINK; Lists instruments priced above $50 that are also presently highlighted with color pink.
```

Setting COLOR to a value -1 through -256 will set the color to the corresponding color in the standard Investor/RT color pallet that pops up when you click on a color control. For example,

```
SET(COLOR, -81);
```

will SET the color of all instruments to color number 81 which happens to be a pastel green color on the Macintosh platform and a green-yellow color on Windows due to differing color palettes in use.

Investor/RT uses the RGB (red, green, blue) model internally to represent colors. All colors are represented by (usually large) numbers consisting of a R (red), G (green), and B (blue) component. R, G, and B are numbers between 0 and 255. The color number for any color is then calculated by the formula:

$$(R * 65536) + (G * 256) + B$$

Any color in the "24-bit spectrum" can be represented by some combination of R, G, and B in the above formula. For example, a light gray can be obtained by equal values of 200 for R, G and B, as in this example:

```
SET(COLOR, 200 * 65536 + 200 * 256 + 200); Set all instruments highlight color to light gray
```

The "Highlight Color" data column can be added to a quote page so you can see the actual RGB value assigned, if any, as the highlight color for each instrument. Highlight colors can be set using the color pallet by clicking on the highlight color control in the Setup: Instrument window.

New methods for cycling through open windows

Prior to version 4.7, the "Next Window" command in the Window menu had the effect of sending the front-most window behind all other windows, thereby revealing the window(s) behind the former front-most window. This menu item has been renamed "Send to Back" in the Windows menu in 4.7. The Next Window command now has the effect of simply bringing the "next" window in the Investor/RT window list to the front. After moving forward through the window list, you can move backward through the list in the reverse sequence using the new "Last Window" command. This improvement enables the user to move forward and backward through the window list in a logical sequence. On the windows platform, the keyboard shortcut ctrl-tab moves forward; to reverse use shift-ctrl-tab. On the Macintosh platform, command-N is used to move forward to the next window, while shift-command-N reverses the direction. Option-command-N issues the "Send to Back" command on the Macintosh as well.

Additionally, function key shortcuts can be setup for Next Window (by type), Last Window, and Send to Back using the Setup: Preferences: Keyboard Shortcuts command.

Paint Bars indicator enhanced

The paint bars indicator has been improved to paint line segments or candlesticks as well as bars, depending upon the style of the traditional chart. Formerly, only the color appearance of bar charts was affected by the paint bars indicator.

Setup: Alarms enhanced

The Setup: Alarms command now brings up the dialog box for specifying alarms levels for individual instruments. The shortcut is shift-alt-A (shift-command-A on Macintosh). The dialog box has been redesigned to enable complete operation of all alarm setting controls without having to use the mouse. Type in a ticker and press tab to adjust the alarm levels. Entering a zero into an alarm level will turn off the alarm; entering anything else will turn on the alarm checkbox. Press enter (return) to apply the new alarm settings and dismiss the dialog, or press shift-enter (shift-return) to "Apply" the changes. The "Apply" keeps the dialog box open and repositions the keyboard focus on the ticker symbol entry box so you may type in a new ticker and repeat the process on multiple symbols. The Esc key is equivalent to clicking on the "Cancel" button with mouse. The Setup: Alarms window now remembers that ticker symbol whose alarm settings were most recently updated. When you initially open the Setup: Alarms window using the main menu bar (or by shift-alt-A), this ticker will be entered for you. The alarm setting dialog can also be invoked by right clicking on any ticker and choosing "Alarms" from the popup menu. In this case, the ticker clicked on will appear.

Investor/RT for Quote.com Qfeed

Investor/RT for QFeed has been in a beta testing status for several months. Recent testing has surfaced a bug that had been causing instability in the product. While the 4.7 Rev 1 version brings a much improved level of stability and reliability to the QFeed version, we still do not consider our QFeed version comparable in stability to the other data services supported by Investor/RT. Thus, the QFeed version is still considered a Beta Test release.

New Keyboard Shortcuts

Setup: Preferences: Keyboard Shortcuts has been improved to add "Activate Schedule" and "Inactivate Schedule" shortcuts. This will be useful if you have a schedule of scans that you have specified to run periodically throughout the trading session, but you wish to "turn on" or "turn off" the schedule occasionally based on other market factors. You could define say F2 to activate that schedule and shift-F2 to deactivate it whenever you like.

Trendline/Ref Line alerts enhanced

Trendline and reference line break alerts will now initiate emails and/or chat room notices if those options are enabled in Setup: Preferences: Alarms.

New RTL token: TRIP, Triple Smoothing

The triple smoothing technical indicator can now be used in scans, signals, and custom indicators. The TRIP token now allows single, double, or triple smoothing using the specified moving average types and periods. The formula "MAa(MAb(MAc)))" can be used in RTL to perform a triple moving average smoothing using three MA tokens, each with its own settings. The TRIP token allows the same calculation to be performed and is much more efficient than the multiple MA token method.

Drawing Detrended Oscillator as a Histogram & Drawing Momentum Oscillator as a Histogram

Both of these technical indicators oscillate around the zero line. Either can now be displayed in a chart as a line or a histogram. The new histogram option makes it easy to see when the oscillator is rising, falling and changing slope. See Histograms are painted in two colors above for related information concerning histogram drawing.

Investor/RT 4.6, Rev 2 Release: September 19, 2000

New styles for main toolbar, contextual menu added

The main toolbar can be adjusted so that the status message area is placed to the right side of the main toolbar buttons. This "Slim" toolbar style takes up less space at the top of screen. The Slim toolbar style is only available when the toolbar is anchored at the top of the screen. To make main toolbar style adjustments easier, the status message area of the main toolbar now has a contextual popup menu, accessed in the usual way with a right-click on Windows or a ctrl-click on Macintosh. The popup menu allows you to anchor or un-anchor the toolbar, change from slim to normal, or turn button titles on or off. Double-clicking in the status message area of the main toolbar opens the Message Log so you can review the most recent status messages.

RTL Language: DV token enhanced

The DV (Date/Time Specific Value) token has been revised to enable it to be "date-relative" to the current date as an option. The settings for the DV token include a new checkbox titled "Use Date N days ago", where the value of N is user-specified. For example, if you setup a DV token with a time setting of 09:35 and the "Use Date 0 days ago" checkbox checked, Investor/RT will calculate DV as the 09:35 bar for the current day. Similarly "Use Date 1 days ago", if checked, would cause DV to be evaluated to the price at 9:35 in yesterday's session. This option makes the DV token more usable in intra-day analysis where price points at particular times for the current and preceding sessions are needed. When the "Use Date" checkbox is checked, the

Date of the DV function is relative to the current date and the time is fixed. When the "Use Date" checkbox is not checked, the actual date specified in the date/time box is used.

RTL Language: BARS token enhanced

Prior to version 4.6, the BARS token always evaluates to the number of bars of data on file. In 4.6, the BARS token is an "indicator" with a settings dialog. The settings dialog allows the specification of a starting and ending date and time. If a date/time range is specified, the BARS token will calculate the number of bars of data on file for the requested period. A side effect of this enhancement is that older scans that utilize the BARS token will have to be updated in order to function properly. To do this, open the scan, remove the BARS token from the list using the "<=" button and then click the Check button. The settings dialog for the new BARS token will appear. After setting the preferences, click the Save button.

Investor/RT now includes a full featured IRC Chat facility

Investor/RT allows you quick and easy access to the Investor/RT Chat Room, or any other IRC compatible chat room on any IRC server. You can connect to as many chat rooms as you like, create your own chat rooms, and send private messages to other individuals in the chat rooms. You can connect to or create as many simultaneous chat rooms as you like and have as many simultaneous private sessions as you like.

If you are just getting started, begin by clicking on the "Open Chat Room" button in the main toolbar. This will bring up the Chat Preferences window. If your version of the software is not registered, you will first get two dialog boxes asking you for a nickname and real name. All the default connection setting for connecting to the Investor/RT Chat Room will be filled in for you (#linsoft, irc.othernet.org, 6667, null, etc). You may want to change some of the preferences on the right, including font, colors etc. Once you have your preferences set, you are ready to connect. Make sure your Internet connection is active, and click on the "Connect" button.

Once you are successfully connected to the chat room, a chat window will open. To the right (provided you have the "Show Names List" checkbox checked), you should see the list of nicknames of the current participants in the chat room. The title of the window will display the name of the channel or chat room and how many participants are in the room. There are three "window panes" within the chat window: The Text Window, the Names List, and the Input Box.

Text Window

This is the large window that takes up the majority of the screen. All the chat room traffic is displayed in this window. You will see a variety of message types displayed in this window, including messages from other participants, notices that participants are coming or leaving, etc. You can double click or right-click inside this window to bring up

and change the chat room preferences. Macintosh users may use ctrl-click to access preferences.

Names List

This is the list on the right hand side of the window that shows the nicknames of all the participants in the room. If you do not see the names list, access the Preferences and click "Show Names List" and click OK. Double-click on any name in the list to bring up a private message window with that participant. Once the private message window is open, type your initial message in the Input Box and press the Enter key to initiate the conversation.

Input Box

The Input Box is the box where you type your message. Once you have finished typing (or pasting) a message into the Input Box, press the Enter key to send the message to the Chat Room. The message will appear in the Text Window prefixed with your nickname.

Below is a complete description of all the options in the Chat Preferences Window. Take a close look at these preferences to get a better understanding of how Chat Rooms work. Additional Information on IRC chat can be found at www.mirc.com.

Chat windows can participate in Investor/RT Layouts. When you open a layout that includes a Chat Room window, Investor/RT will automatically connect to the chat room when the window opens.

CHAT PREFERENCES

The Investor/RT Chat Room Preferences can be accessed in one of 2 ways:

1. by clicking on the "Open Chat" button in the main toolbar and selecting "New" from the list
2. by right-clicking or double-clicking inside an existing chat window.

Chat Locations

This group box contains all the information needed to connect to a chat room. Each chat room that has been created and saved in the database can be accessed from the drop down list box at the top.

New

Click this button to create a new chat room. After you click this button, you will be able to edit the Description, Channel, Server, etc., to correspond to the

settings necessary to connect to your desired chat room. When you are finished, click Save. Your new Chat Room Description will be added and selected in the drop down list at top. The newly defined chat room will also appear in the Open: Chat Room menu.

Edit

Click this button to Edit a Chat Room you have already created. After you click the button, you will be able to edit all the edit boxes except for the description. If you would like to actually Edit the description, follow this procedure: First click New, change the Description, and click Save. Then select the former description from the list and click Delete. Save - This button allows you to save a Chat Room based on the information filled in the text boxes below. If you have not supplied enough information, the program will alert you of this and the save will not succeed. Please fill in all boxes (with the exception of the password if not needed) before saving.

Delete

This button will delete the chat room that is selected in the drop down list box.

Title

This is the descriptive name by which you will remember the Chat Room in the future. This list button at the top of the Chat Preferences window displays the titles of all Chat Rooms defined to Investor/RT. This same list appears when you click the "Open Chat Room" button on the main toolbar. The list of chat room titles also appears in the Open menu, Chat sub-menu.

Channel

This is the IRC Channel name, sometimes called the chat room name. The Investor/RT chat room has the channel name "#linnsoft" on the "othernet" Investor/RT network. Channel names are usually preceded by a #.

IRC Server

This is the Internet address of the IRC server, or host. It specifies the location of the server to which you will be logging into when connecting to the chat room. In the case of the Investor/RT Chat Room (#linnsoft), the server address defaults to "irc.othernet.org". For a list of all "othernet" servers, see www.othernet.org/servers.

Port

This is the number of the port that the server uses for IRC traffic. This will generally be a four-digit number, such as 6667.

Password

Some servers require a password in order to connect. If the server you are connecting to requires a password, fill it in here. If it doesn't require a password, leave this field blank or enter "null".

Nickname

This is the name that will be seen by other members of the chat room. Try to limit your nickname to 9 characters or less, and use only letter, numbers, or '_'. You cannot use spaces in your nickname.

Real Name

The real name is accessible by other participants in the chat room via the "WHOIS" command. The real name can be your actual name or any text you like.

Show Names List

If you would like to create more room in your Chat Window for text, you may hide the Names List by un-checking this checkbox.

Ignore Administrative Messages (JOIN, QUIT)

In some very busy chat rooms, the JOIN and QUIT messages can be very distracting and fill your window with unnecessary lines. You can check this box and Investor/RT will not send such messages to the Text Window.

Sound Alert on Incoming Messages

Check this checkbox if you would like Investor/RT to sound an audible alert whenever the chat room receives an incoming message.

Show Time

When this checkbox is checked, each line will be prefixed with the time that the text arrived in the room. If you would like additional room for text and don't particularly care about the time, uncheck this box.

Military

This specifies whether or not to show the time in Military (16:24:34) or Standard (04:24:34 PM) format. This checkbox is only activated when the "Show Time" checkbox is checked.

Seconds

This specifies whether or not to show seconds in the time. This checkbox is only activated when the "Show Time" checkbox is checked.

Text Format

The Ircle and mIRC popular chat programs use two different text formats. Ircle right aligns the nicknames (most effective with monospaced fonts), while mIRC just left aligns the nickname and placed it in brackets. This groupbox allows you to specify which format you would like to use.

Font and Size

Click on the Font Button to specify the size and font you would like to use for the text in the Text Window.

Text Color

Color of the text in the Text Window.

Background Color

Color of the Text Background in the Text Window.

PRIVATE MESSAGE WINDOWS

Private Message Windows can be initiated by double clicking on a nickname in the Names List. Messages that you enter in this window will go only to the one nickname that is shown in the title of the private window. The window title will have a title such as "Private Chat with John". When someone sends you a private message in Investor/RT, a new window will open automatically with the message. Private message windows do not have Names Lists since there are only two participants in the chat.

Investor/RT now supports the QFeed service from Quote.Com, Inc.

QFeed is an Internet-based market data service of Quote.com, Inc. that supports real-time, delayed and end-of-day quotations for stocks, futures, options, mutual funds, and indices. Investor/RT for QFeed is available only for the Windows 95/98/NT/2000 platforms at this time.

Investor/RT supports all of the features of the Qfeed service. These include:

Streaming real-time or delayed quotes

There are no prescribed ticker symbol limits with QFeed, although Quote.com does incorporate "throttle" mechanisms on their servers to keep a single user from dominating the server.

Level II NASDAQ Displays (regional bid/ask display for NYSE/AMEX stocks).

Historical Data Downloading of all periodicities (daily, weekly, monthly, intra-day minute intervals, and tick data)

Click the Data Download button on the main toolbar or click the Download button in the lower right corner of any chart window to request data for a particular chart. See Setup: Preferences: Charts: General to activate "automatic downloading..." for charts as required.

Automatic quote page creation from QFeed-supplied industry group ticker symbol lists

From the QFeed Menu, choose Industry Groups.

Automatic quote page creation from QFeed-supplied option chain ticker symbol lists.

From the QFeed Menu, choose Option Display, or to view option chains on a particular issue, right-click on the ticker in a quote page and choose Option Display.

Automatic quote page creation from QFeed-supplied "hot lists" of ticker symbols ranked according to various market data criteria.

To view a list of all the available hot lists, choose "Hot Lists..." from the QFeed menu. Hot List may also be viewed as dynamically updating text windows (without actually defining the instruments to Investor/RT for real-time quoting).

Using QFeed

Investor/RT can monitor instruments in real-time via an Internet connection to the QFeed server. The instruments being monitored at any one time are determined by the Investor/RT windows that are open. The most common example is opening a quote page. Investor/RT notifies QFeed to watch each instrument in the quote. When you close an Investor/RT window, any instruments associated with the window are dropped from the "watch list" unless they are still active within some other open object window. When you open or close charts, quote pages, portfolios, and ticker tapes, Investor/RT adjust the QFeed watch list to include only those instruments that are "active" on screen. All Investor/RT objects update to reflect the latest market data as new data arrives. Instruments marked for intra-day data collection are automatically "watched" when you connect to QFeed, regardless of which quote pages, charts, and other objects may be opened.

The status of the QFeed connection may be monitored using QFeed: Status, or by glancing at the data feed heartbeat indicator in the main toolbar. The status window displays your QFeed account status and other useful information such as the current watch count. A special QFeed Status display is also available in the QFeed menu.

Access the ".Watched" quote page to see which instruments are currently on the watch list for live updates from QFeed.

To disconnect from the QFeed server, choose QFeed Stop Data. To later re-activate the QFeed feed, choose QFeed: Start Data or click the Start Feed button on the main toolbar.

To access historical data from the QFeed server, use the Control: Data Management: Download Data command to access the "Download Data" window. You may download daily/weekly/monthly or intra-day historical data for a single instrument or all instruments in the selected quote page. Specify "Historical Quotes" and set the periodicity. Then specify the time period you want. Either type in the ticker symbol you want or click the "One Instrument" checkbox and pick the instrument from the list provided, or leave the One Instrument box unchecked and pick a quote page containing the stocks and/or indices you wish to download. Finally, click "Download". When the message "Import Completed" appears in the main toolbar message area, the download has completed. Bring up a chart of any instrument to see the data graphically, or use the "V/E" (view/edit/export) button on the quote page toolbar to see the downloaded data listed numerically.

The download data function is also integrated with the chart window in Investor/RT. With a chart open, to download from QFeed simply click the data download button on the chart toolbar. The data download button is also conveniently placed in the lower right corner of the chart window. The periodicity of the requested download (daily, 1-minute, etc.) is obtained from the chart window periodicity. The chart will "fill in" automatically when the download is completed.

If you wish data downloading to be initiated automatically each time you open a chart window for which complete data is not available, go to Setup: Preferences: Charts: General and checkmark the "Automatic Download..." checkbox.

Miscellaneous QFeed Features

A Synchronize Clock command is provided in the QFeed menu

The effect is to set your computer clock to the precise time of day.

QFeed does not support news retrieval

Instead to access news on any ticker, right-click on the ticker in a quote page (or in any other symbol list) and choose a web server from the "Web Info" menu. This will direct your web browser to news and other available research materials for the particular ticker.

A "Next Server" command is provided in the QFeed menu

The effect is to disconnect from the current server and reconnect to the "best" server available. It is recommended that this command be issued only when the QFeed Stats window shows that a better server is available.

Color coding quote pages, portfolios

Each instrument defined to Investor/RT now has its own "highlight" color used as the background color when the instrument is highlighted in quote pages, portfolios, and instrument lists of various kinds (e.g. quick quote windows). To specify the highlight color for an instrument, right-click on the instrument and choose "Setup". The Setup: Instruments window now has a color control rectangle used to specify the instrument highlight color. To turn highlighting on or off for a particular instrument in a quote page or portfolio, right-click on the ticker and choose "Highlight" (Macintosh users ctrl-click).

Trading Notes: Save as Text now supported

To save all the trading notes for a particular instrument as a text file, open the Trading Notes window for the instrument and choose File: Save: Save as Text. A dialog box will appear prompting for the name and location to place the resulting text file.

Portfolio preferences window, portfolio auto-sort added

By default, portfolio windows open in "Position Number" sequence. This represents the sequence in which the entries were made into the portfolio. If it is preferable to have the portfolio positions listed in some other order, access the preferences for the portfolio by clicking the preferences button on the portfolio toolbar. A "Sort Portfolio" checkbox is provided. Check this box and choose ascending or descending and the data column to use to sort the positions. Click OK and the portfolio will be sorted into the specified sequence. Each time the portfolio window is opened in the future, it will be sorted initially in the specified sequence. Note that there is no "periodic sort" feature for portfolios at this time. You can re-sort the portfolio at any time using the portfolio toolbar or by shift or ctrl-clicking on the column title you wish to sort on.

Displaying "User Data" in Annotations

The "User Data" data column is a 24-character field that can contain any user desired numbers or text of any kind. The User Data column can be edited directly within a quote page, or it can be edited within the Setup: Instruments window for any instrument. The Annotation indicator has been enhanced to provide an option to show this user-specified text. This makes it possible to view the User Data text as an annotation in the chart when viewing slide shows. As the slide show advances from instrument to instrument, the annotation will change to show the custom

comment or notation the user has entered for each instrument. The User Data field may also be used in the RTL language to scan for character patterns within the data. For example, the RTL scan formula: USERDATA = "*sell*" would find any instruments with the word "sell" anywhere within the User Data column. Similarly, USERDATA = "??X*" would find any instruments with User Data beginning with any two characters followed by the letter X.

Adjusting portfolio, quote page column widths enhanced

Adjusting columns widths within portfolios and quote pages can be accomplished by either double-clicking on individual column titles or by clicking the "Resize Columns to Fit" button on the associated toolbar. The column width(s) are now adjusted to accommodate the display of the full column title as well as the data content of the column. Two modifier key options are available to provide a more compact column width. If the shift key is held down while adjusting column width(s), only the first word of the column width will be considered instead of the entire column title. If the ctrl key (option key on Macintosh) is held down, the column title is not considered at all and the column width is adjusted to the minimal width needed to show the actual data content of the column(s). Note that some or all of the column title text may be obscured if the modifier keys are used. In short, if the most compact display of a portfolio or quote page is desired then ctrl-click (option-click) on the "Resize..." button on the toolbar. If the most readable display showing full text of each column title is desired, simply click or double-click to resize.

Copy and pasting tickers into quote pages

A copy command has been added to the contextual menu within portfolios, quote pages, or other instrument lists. The effect is to copy the instrument along with a current quote to the "clipboard". The clipboard text may then be pasted into any text window as text or it may be pasted into another quote page to add the instrument to a different page. Note you can use the Show Clipboard command in the Edit menu to see what the quote looks like after using the new Copy command./a

Copying a current quote to the clipboard

The Copy command in the Edit menu works similarly to the Copy command in the popup menu if a particular instrument is selected in a quote page or portfolio. For example, you can click on a ticker to select the row, type Ctrl-C to copy (on Macintosh use command-C) and then paste the quote or the ticker as desired.

New quote page column for dealing with temporarily tracked tickers

A new data column named "Create Date" shows the date (and time) that the instrument was defined to Investor/RT. Instruments defined prior to using version 4.6 will have a create date/time of midnight on the day Investor/RT was upgraded to version 4.6. Correspondingly, a

new token named AGE has been added to the RTL language. AGE is defined as the number of minutes that the instrument has been defined to Investor/RT. This token will be useful in quickly identifying instruments recently added to Investor/RT. For example, say you import a list of ticker symbols, some of which were previously defined to Investor/RT and others that are new instruments. If you then decide to eliminate the recently imported symbols you can run a scan with the formula $AGE < 30$ and Investor/RT will present a quote page of tickers added to I/RT within the past 30 minutes. Thus you can quickly eliminate those tickers using the red trash can icon without affecting those that were defined more than 30 minutes ago.

File: Save as... added for trading systems

A trading system can be saved under a different name using the File: Save: Save as... command with the trading system window active. The effect is to make a copy of the trading system and its rules and save it under the new name. Instead of using the File menu, a shortcut for accomplishing a "Save as" is to shift-click on the Save System button in the Trading System window.

LRS token (Linear Regression Slope) added to RTL Language

The technical indicator Linear Regression Slope has been added to RTL. This indicator can be used directly within scans and trading signals and also as a function to perform the LRS calculation on some other indicator. For example, $LRS(RSI)$ would yield the linear regression line slope of the RSI line for a particular instrument.

Setup alarms for custom instruments

Using the contextual menu in a quote page or portfolio and selecting "Setup" usually takes you to the Setup: Instruments window. If the specified ticker is a custom instrument, the Setup menu choice takes you to the Custom Instrument Definition window instead. If you wish to set alarm levels on a custom instrument you can hold down the shift key while requesting "Setup" from the contextual menu. This takes you to the Setup: Instrument window regardless of the instrument type, where the alarm setup information can be specified. Prior to 4.6 it was necessary to open the Setup: Instruments window manually and type in the ticker for the custom instrument in order to set alarm levels. Note that alarm levels for any instrument can also be adjusted at any time by editing the HiAlarm, LoAlarm or VolAlarm data columns directly within a quote page.

Adjusting appearance settings for quote pages globally

If you want to set all quote pages to consistently use the same colors, fonts, and other appearance options use Setup: Preferences: Quote Page. When you press OK, a dialog box will ask if the settings should be applied to ALL quote pages, the OPEN quote pages, or NONE. Press

the "All" button to update the preferences for every system and user defined quote page. There is no "undo" command for this, so be careful using this feature. Click the "Open" button to apply the settings to only those quote pages that are presently open on screen. Press "None" to save the default settings for use with new quote pages. None of the existing pages are affected if you press "None". Note that the column format is NOT adjusted, only the "appearance" settings. Specifically, the appearance settings include:

1. Font and size
2. Background color
3. Up/Down/Unchanged colors
4. Show gridlines setting
5. Highlight symbol column setting
6. Color based on setting

Traditional Chart window contextual (popup) menu access revised

The popup contextual menu in traditional chart windows is accessed using a right mouse click on the Windows platform. The Macintosh equivalent is to depress the control key while clicking in the chart window. Prior to 4.6, the control key was optional on the Macintosh. It is now required. To enable Macintosh users to access this contextual menu without having to hold down the control key, the "red cross" toggle button in the lower right corner of traditional chart windows now pops up the contextual menu with a single click. Windows users can left-click or right-click on the "red-cross" to access the menu. The former function of the "red cross" button was to toggle the chart toolbar on or off. The contextual menu includes a menu choice called "toggle toolbar" for this purpose.

TRIX token added to RTL Language

The TRIX technical indicator scan now be referenced as a token in the RTL Language.

Portfolio option added to round off dollar amounts

The Preferences window for portfolios, accessed from the portfolio toolbar, now has a checkbox titled "Show whole dollar amounts". When checked, dollar denominated data columns (Net Gain/Loss, Cost Basis, Value, \$Change, etc.) will be shown as whole numbers (no decimal point and no cents).

Pivot Point added to RTL Language

The Pivot Point technical indicator is now available for use in the RTL language under the token PVPT. The pivot point indicator is usually used with daily data and generates two support and two resistance levels. PVPT can be setup as any of the four levels. Be sure to check mark only one "level" when configuring PVPT. If you need to access both a support and a resistance level

in the same scan or signal, add the PVPT token twice, assigning one to the support level and the other to the resistance level. Then rename the tokens PVPT_r and PVPT_s to distinguish the two price levels in your scan or signal. One interesting use of the Pivot Point indicator is to create reference lines in intra-day charts. This can be accomplished with the use of V#1 variables. For example, run a scan (on daily data) using the formula:

SET(V#1, PVPT_s) AND SET(V#2, PVPT_r)

This will set V#1 and V#2 to the primary support and resistance levels for each instrument. Then you can add a reference line to a chart that tracks the current value of V#1 and V#2. See item #23 below for more on the horizontal reference indicator. This, in effect, allows you to incorporate support/resistance calculations from the previous days daily bar into reference lines within intra-day interval charts. Each day, you rerun the scan to recalculate the pivot points for the day and your charts would automatically adjust to the new levels each day. Since each instrument has its own V#1 and V#2 levels, a slide show of some list of issues would draw the support and resistance lines for each issue uniquely as the slide show progresses.

Adjusting appearance settings for charts to default values

Setup: Preferences: Charts: Traditional Charts is the place where default preferences for new chart windows are specified. This dialog has been enhanced to allow you to apply the default settings to all traditional charts defined to Investor/RT. When you click the OK or Apply button in this window, you will be prompted whether to apply the settings to all or just the open chart windows (no to none at all). Press the ALL button and Investor/RT will adjust the saved settings of every traditional chart window to match the default settings. This includes such appearance settings as background color, scale text color, title bar background and text colors, gridline options, windowpane option, hollow candlestick options, and grid line color. This new feature makes it possible to easily adjust all saved charts into conform to the default settings. Note that other chart types (point and figure, market profile, etc.) are not affected by this operation; only traditional time-based charts are adjusted.

Horizontal reference lines can be based on RTL-calculated values

The horizontal reference line technical indicator has been enhanced to allow the reference line to be pegged to any of the twenty V# user variables in the RTL language. See the discussion of Pivot Point above. Another example would be to use a scan to set a V# variable to a moving average calculated using Daily data and then setting up a reference line in an intra-day chart to draw at the price level set into the V# variable. To setup a reference line this way, check the radio button titled "Use" and choose the V# variable from the list provided. Using an auto-scan, the value of a V# variable can be calculated periodically during the trading session, causing the reference line to move accordingly as the value of the V# variable changes.

Backtesting improvements made to "Rule Price"

Several new options are now available in the Backtesting section of Investor/RT. The "Rule Price" menu has been expanded to permit "Stop" as a menu choice. Thus you can now define a rule that exits a long or short position at the stop price when the stop is hit. To provide additional user flexibility menu choices for "user variables" V#1 through V#20 have also been added. What this means is that trading rules can set the value one or more V# variables and a particular V# variable can be used as the rule price to enter or exit a position. When a V# variable is used as an entry or exit price in a rule, Investor/RT will check to see if the value of the V#1 is between the high and low extremes for the particular bar when the rule is being tested. If so the V#1 variable will be used "as is". If the V# variable is higher than the high of the bar, then the high price of the bar will be used in space of the V# variable. Similarly if the V# variable is lower than the low of the bar, the low will be used to enter or exit the position.

Finally, a check box has been added to the right of the "Rule Price" to enable the user to specify that the price to be used should be taken from the "Next Bar" rather than the bar where the signal occurred. For example, when doing a backtest on daily data, the rule for entering a new position can now specify "Next Bar" and Open, so that the entry price will be the open price of the next day. This enables trading signals to be formulated from the perspective of the current bar and the rule price to be taken from the open, high, low, or close of the the next bar AFTER the signal triggers. Note that "Next Bar" can also be used with $(Hi+Lo)/2$ or other calculated prices in the menu. However, "Next Bar" cannot be used with Stop Price or for V# variables.

Backtesting improvements made to "Rule Quantity"

Prior to Version 4.6, the rule quantity could only represent the number of shares or contracts to be bought or sold when entering positions or adding to positions. Now, there is a menu to the right of the quantity to specify to whether the quantity entered represents the number of shares or contracts, or whether the number is expressed in dollars. When a trading rule has a quantity expressed in dollars, the number of shares or contracts purchased or sold will be calculated using the "rule price" divided into the dollar amount specified. For stocks, the number of shares purchased or sold will be rounded to the nearest multiple of 100 shares that does not exceed the specified dollar amount. If the dollar amount specified is insufficient to buy or sell 100 shares of the particular stock, no action will be taken.

BackTest Performance Chart added

Each time Investor/RT performs a backtest, the "performance" of the backtest is shown in a traditional line chart. The "instrument" charted has a ticker of \$xxxx where xxxx is the name of the trading system. Investor/RT creates this instrument automatically. The values shown in the line chart represent the bar-to-bar dollar gain/loss during the backtest. If the backtest is performed on a single instrument, the line will show the gain/loss trading that issue over time. If the backtest is performed on a quote page containing many instruments, the line will reflect to aggregate gain/loss amount for all issues. Note that when multiple instruments are tested,

the line chart will have data points only for those bars where all instruments were tested. For example, if you backtest with a test period of "last 2 years" and some instruments have the full two years of data on file while others have less data on file, the performance line will begin at the point in time where all instruments have data on file.

This new feature provides a quick graphical view of the performance in dollar terms of a trading system. Since the chart is like any other traditional chart, you can, for example, add graphs of the instruments tested (as well as technical indicators) so you can compare the price action and technical indicators visually with the performance line of the trading system. If you add a volume indicator for \$xxxx (where xxxx is the trading system name), the volume shown for each "bar" in the performance chart will be the number of positions that were open during the backtest at that time. When a single instrument is backtested, the volume will be one when the backtest was in a trade and zero otherwise.

New data column, "Settlement Price", added

Settlement prices for futures contracts prior to version 4.6 were posted to the "last" price. Now, settlement prices are posted to a new data column titled "Settlement" price. When a settlement price is received for a future, Investor/RT will set the "Bid Tick Indicator" column to "s" to indicate that the contract has settled.

Chart Wizard Slide Show feature

The Chart Wizard feature (see Setup Menu) has been improved to enable the array of charts to "auto advance" to the next group of charts at some user specified interval. This, in effect, provides another type of "slide show". The chart wizard is useful for looking at N symbols at a time in a similar chart. To use this feature, open the Chart Wizard window using the Setup menu, check the box titled "Advance to next group every N seconds", fill in the value for N (it must be 2 or more seconds) and press OK.

Keyboard shortcuts for accessing chat rooms, trading systems

Setup: Preferences: Keyboard Shortcuts has been enhanced to enable shortcuts to be defined for opening chat room windows and trading system setup windows. Choose "Open" as the action, and specify "Chat Room" or "Trading System" as the object to open. A list of chat rooms (or trading systems) will appear. Similarly, the Run action now includes the ability to define a shortcut for running a backtest of a particular trading system. In making this enhancement, the list of objects available under the "Open" action was alphabetized. A side-effect of this change is that existing keyboard shortcuts that use the "Open" action must be re-defined.

BackTest performance chart improved

Back test performance chart added, above describe the new performance chart produced by each backtest. The performance charting data is stored under an Investor/RT created instrument with a ticker of \$XXXX where XXXX is the name of the trading system. In addition, Investor/RT now stores "trading notes" for instrument \$XXXX indicating the actions taken each time a trading signal was taken during the back test. Investor/RT automatically add the technical indicator "Trading Note Markers" so you can see each bar where a signal was taken marked in the chart. Point the mouse at a marker and read the action taken from the message area of the main toolbar. Further, I/RT varies the marker drawn depending on the action taken. Dots are used for open of long positions, plus signs are used for adding to long positions. Boxes and triangles mark going short and adding to short positions, respectively. The X marker is used to denote exiting a long or short trade. Finally, I/RT adds a chart of the instrument backtested to another pane in the window so you can correlate the markers with the price action of the instrument. If a backtest is run on a quote page, Investor/RT adds just the first three instruments to the chart. This is the default behavior for creating the performance chart. If you want to customize your own performance chart simply create a "default chart" for \$XXXX (where XXXX is the name of the trading system. If a default chart exists for \$XXXX, it will be displayed instead upon completion of the backtest.

Automatic alarm setting, new Alarm Setup window

The Alarms capability has been revised and enhanced with several new features. The following changes and enhancements have been added:

- New Alarm Setup Window
- Automatic Stepping and Resetting of Alarms
- Email Alerts (see item Email and Chat Alerts)
- Chat Alerts (see item Email and Chat Alerts)

New Alarm Setup Window

A new window is use specifically for alarms setup. In previous versions, alarms were specified in the "Setup Instruments" window. Access the Alarm Setup by right clicking on a ticker symbol in a quote page (or any instrument list) and choosing "Alarms" from the popup menu. The Alarms Setup window can also be access by choosing Setup: Alarms, or by clicking the "Alarms" button in the Setup: Instruments window. Further, the Quick Quote window now has a convenient "Alarms" icon (it looks like a bell ringing) for accessing the alarm settings for the selected instrument.

Automatic Stepping and Resetting of Alarms

High, Low, and Volume alarms have been enhanced with a Step capability. If a value greater than zero is specified in the step field, that value will be used to move the alarm once it is triggered. For instance, if you have a high alarm set on the last price of MSFT at 70, with a step of 1, then when MSFT hits 70, the alarm will be triggered, and the alarm

will be reset to a value of $70 + 1$ or 71. If MSFT continues to climb, and hits 71, then the alarm will again be triggered, and reset at 72, and so forth. Volume alarms work the same way. For low alarms, the step value is subtracted to arrive at the new alarm level. Note that the step value is added to (or subtracted from) the realized price that caused the alarm. For example, if MSFT breaks through a 70 alarm with a last price of $70 \frac{1}{8}$, the new alarm would begin looking for $71 \frac{1}{8}$. If the alarm was set on the bid or ask price, the realized bid/ask price plus/minus the step value is used to set the next alarm level.

"Maintain Hi-Lo Alarm Spread when Stepping"

When checked for a particular instrument, I/RT will maintain a constant price spread between the high and low alarm as stepping occurs. For this feature to be applicable, initial alarm levels and step values must, of course, be specified for both the high and low levels. Suppose, for example, the high alarm for MSFT is set at 70 and the low alarm at 68, both with a step value of .50. If the high alarm triggers on a last price of 70.25 then high alarm will be reset for 70.75. The original 2 point spread in the alarm levels will be preserved by also moving the low alarm up to 68.75.

Email and Chat Alerts

In the Setup: Preferences Menu, choose "Alarms" to open a new window for specifying global settings concerning alarm handling. The Alarms Preferences window can also be opened by clicking the "Advanced" button in the Alarms Setup window discussed above. Checkboxes are provided for specifying special actions, if any, Investor/RT should take when an alarm triggers:

- Sound an Alarm
- Open an Alarm Notification Window
- Email Alert to <email address>
- Send Alert to Chat Room <chat room name>

The lower section of the window you can create, edit, and delete Email formats that specify what information will be present in the subject and body of the email message. Each format is a text message containing "tokens" indicating market data to be inserted into the text. The tokens must each begin with a percent sign followed by any primitive or historical data token in the Investor/RT RTL language. For example, the RTL tokens for open, high, low, close, and volume are OP, HI, LO, CL, and VO, respectively. In the email format you can use %OP, %HI, %LO, %CL, or %VO anywhere in the text where you want the associated price to be included in the email subject or email message body. There are also non-numeric tokens like %TICKER, %NAME, %ALERT, and %NOW that are used to insert the ticker symbol, the security name, the type of alert, and the time of day (respectively) into email messages.

When defining a new email message format you can test your definition at any time by pressing the "Test" button. This shows you how the subject and message body will look using live data from a few of the your instruments. If you make a typographical error and Investor/RT does not understand one of the tokens you have entered, it will set the value of the token to \$\$\$ in the test display.

A quote page selection list is provided. Email and chat room alerts will be sent only for those instruments that belong to the quote page specified . This enables you to have alarms specified for any or all symbols, but designate only selected instruments for email and/or chat alerts. You can specify, for example, ".All Symbols", or ".Stocks", or any user-defined quote page.

Specify an email address, or list of email addresses, in the "Email Address" field. If you specify multiple addresses, be sure to separate them with commas.

Chat Alerts

If you would like for your alerts to be sent into a chat room, check the "Send Alert to Chat Room" checkbox, and specify the chat room from the list provided. When sending alerts to a chat room, Investor/RT sends only the "Subject" line as specified in the alert format. The body portion is sent only when Emailing alerts. A word of caution on chat alerts: be careful when sending your alerts to a chat room, especially a crowded one. If one of your instrument starts moving, and the chat room starts getting flooded with your alerts, you could annoy other participants in the chat room.

Downloading intra-day data enhancement

Investor/RT supports four Internet-based data services: eSignal, InterQuote, myTrack, and QFeed (quote.com). Each of these services support downloading of intra-day bar data. Downloaded intra-day data replaces whatever data was already on file for the same time period in the Investor/RT database. Prior to Version 4.6, if intra-day charts of varying periodicities for the same instrument were open, it was important that the user request intra-day downloading of the correct lowest periodicity. For example, if you had opened one-minute, five-minute and ten-minute chart of the same stock, downloading one minute bars works fine since Investor/RT can update all three charts from the same one minute bar data, deriving the five and ten-minute bars from the one-minute bars. However, if you clicked the download button in the five minute chart, the five and ten minute chart would look find, but the one minute chart would lose detail since it then has only five minute data to work with. Furthermore, Investor/RT has a tick data compaction option in Setup: Preferences: Historical where the user can specify the minute interval for long-term retention of intra-day historical data. It is important that the long-term retention be taken into account when downloading intra-day data. For example, if the retention interval is 5-minute bars, then downloading ten minute bar data would dilute the data.

This problem was solved for myTrack users some time ago when myTrack began sending one-minute bar data for all intra-day download requests. Investor/RT then uses the one minute data to derive any other periodicity as needed. For the other Internet data services, however, downloading of two minute and higher interval bar data is possible and the requirement of all chart windows must be considered. In light of this, IRT has been enhanced to automatically determine the optimal minute interval when the user requests an intra-day chart download. Investor/RT considers the long term compaction minute interval as well as the periodicities of all chart windows that are open at the time when deciding what periodicity bar data to request from the server. In essence, Investor/RT determines the "greatest common divisor" of all periodicities. Some chart windows, like "Raw Tick" charts require tick data while traditional chart window, Point and Figure and Three Line break charts have a user specified periodicity. So, for example, if you have a Raw Tick Chart and a one-minute bar chart open and you click to download data for the one-minute chart, Investor/RT will figure out that it really needs "tick data" for the download period since the raw tick window requires it. The one-minute chart will be updated with one minute bars derived by Investor/RT from the downloaded tick data. If the long-term intra-day retention periodicity is five minutes and you have 5, 10, 15, and 60 minute charts open, Investor/RT will download five-minute bars regardless of which chart you click on since five minute data can be used to derive bars for all higher periodicities that are a multiple of five minutes. Similarly, if you have 3, 5, and 13 minute charts open, Investor/RT will always request one-minute bar data since one-minute is the only periodicity from which 3, 5, and 13 minute bars can be derived.

This enhancement is mentioned here to document that there has been a change in the decision process Investor/RT uses when requesting intra-day data downloads. Our goal in making this change is to "do the right" thing in all cases without the user having to worry about which windows/periodicities are in use.

Setting display format using a scan

A new RTL token, DISP has been added, for referencing the display format of an instrument. DISP is a number which represents the user-specified Display Format of an instrument. Powers of 10 indicate the number of decimal places displayed for the various decimal formats (1, 10, 100, 1000 mean 0, 1, 2, 3 decimal places, respectively). Powers of 2 are used to indicate the denominator of the various fractional formats (8, 16, 32 mean 8ths, 16ths, 32nds, respectively). DISP has a value of zero if the user has specified "fractional" format. Here are some scans for issues having a certain display formats:

```
DISP = 32; find instruments having display format in 32nds.  
DISP > 0 AND DISP%10 = 0; find instruments having ANY decimal format  
DISP = 0 OR DISP%10 != 0; find instruments having ANY fractional format
```

The DISP token can also be used in the SET command as follows:

```
SET(DISP, 100); set instruments to two-decimal (99.99) format
```

SET(DISP, 16); set instruments to 16ths format

Alarm setup button added to traditional chart toolbar

The alarm setup window can be accessed directly from a traditional chart by clicking the "alarm bell" icon on the chart toolbar. If there is only one instrument in the chart window, the alarm setup window will open, displaying the alarm settings for that instrument. If there are multiple instruments in the chart, the alarms dialog will open for the "selected" instrument. To select an instrument, just click on the instrument graph. If no instrument is selected, the alarm window will appear for the first instrument Investor/RT finds in the chart, usually the one in the top pane.

Alarm notifications as trading notes

Setup: Preferences: Alarms has a new option checkbox for specifying that alarm notifications should be added as trading notes to the alarmed instrument.

File: Open: Alarm Log command added

This command displays the file "Alarm Log" located in the admin folder. The time and text of each alarm is placed in this file.

Using RTL tokens in Chart Annotations

Chart annotation text can now include RTL tokens, each token preceded by a percent sign. When the annotation is displayed or updated in the chart, the tokens are replaced by the current market data for the associated instrument. For example, you could add an annotation with the text:

`%TICKER %CH at %CL on volume of %VO`

The annotation might then read "AAPL +3 at 51 on volume of 3,456,700". Note that any RTL primitive or historical token can be used, including any of the special V# tokens. Prior to this enhancement only the current price, change, bid and ask were displayable in annotations. This enhancement opens up all of the market data and even custom calculated formulas to dynamic display in chart annotations.

Version 4.6 Rev 2 maintenance release

This release contains a few minor improvements to existing features but mostly fixes for problems resolved in version 4.6 Rev 1. The Setup: Preferences: Formats window features a new tabbed interface to enable definition of either portfolio or quote page formats within the same setup window. Portfolios can be color-coded based on gain/loss in this update. Quote

pages and portfolios now print using the same font and size used to display them on screen. Efficiency improvements were made that will reduce computational overhead when scan markers and custom indicators are present in actively updating charts. A bug was fixed that prevented eSignal users from downloading data for tickers containing hyphens. The myTrack symbol lookup feature is operational again. Bugs were corrected in import and export. InterQuote mutual funds are now quoting last price and change properly instead of just "bid" and "ask" prices. The Elder Force Index calculation was corrected. This indicator is now drawn as an oscillator. Ticker tapes now retain their font and size in layouts. Trading notes windows in layouts now properly retain their screen position instead of always being centered in the screen. The daily value of all portfolios is once again recorded properly when "Posting History". A small memory leak was fixed in both the portfolio and quote page formats setup window. When the Last Session Layout or Startup Layout is loaded as Investor/RT starts up, prompting to start the data feed in order to download charting data has been eliminated (this applies only to Internet feeds). The Point and Figure and Three Line Break charting feature has been further refined. For details, press F1 while viewing a chart of this type.

Investor/RT 4.4 and 4.5

New RTL tokens for calculating quote page custom columns

There are now twelve quote page columns (named V#1, V#2, V#3, ..., V#12) designated as user-defined variables. V#7 through V#12 are new in version 4.3. These are columns whose value for each instrument can be calculated and set using a scan, a trading signal or a custom indicator. Tokens having the same names have been added to the RTL Language for referencing the current value of these variables. The first six variables have the property that the calculated values are retained in the Investor/RT database. The second group of six (V#7 through V#12) are temporary variables whose values are set to zero each time Investor/RT starts up. The SET command can be used to set the value of a variable to any user-specified formula. For example, the RTL scan request:

```
SET(V#1, HIALARM - CL)
```

Sets the value of V#1 for each scanned instrument to the amount each issue is currently trading from its high alarm value. Since the variables V#1 - V#12 are sort fields, the scan can also "rank" the quote page, showing you which issues are closest to their alarm levels. Unlike normal calculated values in scans, the values for V#1 thru V#6 are permanently maintained (on the database) for each instrument. The values are saved when you quit Investor/RT. These new columns are available for display in any quote page, not just the quote pages produced by scans. The displayed values for V#1 - V#12 will always reflect the results of the most recent RTL calculation that set the value. The RTL variables may be referenced by several scans (or trading signals) in succession. One scan sets the value of a variable for each instrument. Subsequent scans or trading signals base their results on the value of one or more variables calculated

earlier. Using the "auto scan" method, a particular calculation of interest to the user could be performed at some periodic interval and the most recently calculated values for each instrument can be displayed in any quote page.

Ticker symbol Popup Menu enhanced

A right-click (command-click on Macintosh) on a ticker symbol in a quote page, portfolio, quick quote, or any other displayed list of tickers brings up a pop-up menu. The "Chart" menu item in the pop-up menu has been expanded into a sub-menu containing all of the chart types available in Investor/RT. At the top of the Chart sub-menu is a menu item titled "Default Type". Choose "Default Type" to access the default chart type as setup in the system preferences. This new sub-menu makes it easier to quickly open charts of various kinds on a ticker, eliminating the need to use the File: New: Chart menu repeatedly.

Importing volume

A new data column named "Volume (Hundreds)" has been added. When displayed in a quote page, this data column simply shows the current trading volume of the issue expressed in hundreds rather than units. This new data column can be designated as a data item in the Import Format used when importing historical or intra-day data (see File: Import). When the data being imported is expressed in hundreds, use this column to instruct Investor/RT to multiply the imported volume by 100 to get the actual trading volume.

RTL SET command

The BID and ASK can be used in the RTL SET command to clear (zero) the value of each instrument's bid and/or ask. For example, run a scan on the ".All Symbols" quote page with the formula:

SET(BID, 0) and SET(ASK, 0)
This scan sets all bid/ask values to zero.

Color control appearance changed

The color control for "lines" is now displayed with the line thickness and line type options in black. The line color is displayed in a rectangle at the left of the control. Click on a line thickness to select it. A black dot will appear to the left of the selected thickness. Click on a line type (solid, dotted, dashed) to select it. A black dot will appear to the left of the selected line type. This kind of color control is typically found in the preferences for technical indicators.

Bar chart drawing refined

The drawing of bar charts was enhanced to make the open and closing price tick marks more prominent in the display.

Portfolio row and column highlighting

Portfolio row and column highlighting is now supported in the same way as with quote pages. When you highlight a particular ticker in a quote page or portfolio (using the popup menu), that instrument will also highlight in all other quote pages and portfolio. Access a popup menu in the portfolio with a right-click (command-click on Macintosh) on any column. The popup menu has choices for adding new columns, deleting the column, or highlighting the column. Highlighting every other column in a portfolio is also supported. The background and highlight colors used in portfolios are those specified as the default background and highlight color in Setup: Preferences: Quote Page.

Internet web site integration with Help button, F1 key

Over the past year the Linn Software web site has become an increasingly valuable source of customer support information, in many cases providing richer content illustrating the use of Investor/RT than the built-in help texts. In Investor/RT Version 4.3, the web site content has been integrated into the product to enable the user to quickly access context sensitive help via the Internet in most cases. A new option is available in Setup: Preferences: Mail and Internet. Check the box titled "Access Help Info via the Internet" to turn on this new feature. Whenever you press any Help button or press F1, Investor/RT will determine if there is an associated web page for the current window and display that web page in your designated web browser. If the "Help...via the Internet" check box is not checked then the built-in help topic will be displayed.

By holding down the Shift or Ctrl key (option key on Macintosh) while pressing F1 or any Help button Investor/RT will override the preference setting. Shift + Help will display Internet help if available. Ctrl + Help will always display the built-in help regardless of the preference setting.

Dial/Data Free Trial (as of December, 2002 this option does not work)

The automatic signup process for a Dial/Data free 30 day trial has been fixed. Investor/RT users who are interested in evaluating the Dial/Data service as a source of historical and/or fundamental data can do so by clicking the "Dial/Data Free Trial" button in the Setup: Preferences: Registration window. The assigned Dial/Data account is free for 30 days. If you use the account to download after that, a monthly fee is charged.

Collecting historical data for any RTL calculation

The SET command in the RTL language provides a means of setting any calculated value into a custom variable V#1 through V#12 (see item #1 discussion above). These values can be viewed by adding the appropriate V# columns to your quote pages.

Investor/RT Version 4.4 provides a new twist to the use of V# variables: a method for recording the results of any such calculation historically. This new capability is best explained by way of example. Suppose you want to track the tick velocity (ticks per minute) for some instrument or group of instruments. This can be done by running an auto scan to periodically calculate the TV (tick velocity) indicator. The scan formula would be simply:

TV > 0

Using one of the new custom variables you can revise the scan to read:

SET(V#1, TV)

Running this scan periodically with auto-scan (say once a minute) causes the V#1 data column in any open quote pages to update dynamically for each scanned instrument. The V#1 quote page column shows the tick velocity of each instrument.

To inform Investor/RT that you wish to record the values of tick velocity over time, you must define a special instrument to Investor/RT having a ticker symbol in a prescribed format. The purpose of the special instrument is to "hold" the collected data. The ticker symbol must have the format: "xxxx(V#n)" where xxxx is a valid ticker symbol and n is a number from 1 to 12. For example "INTC(V#1)" would be the ticker of a special instrument that tracks the values of V#1 for INTC over time. Each time Investor/RT executes a SET(V#1, ...) command for INTC, the computed value that is "set" into V#1 is used generate a "tick" for the ticker symbol INTC(V#1).

The ticker symbol "INTC(V#1)" is just like any other instrument in Investor/RT. You can chart it, view it in a quote page or quick quote window, or view each tick in a time and sales window if you like. All of the charting facilities of Investor/RT can be used to watch INTC(V#1) throughout the trading session. You can view technical indicators on INTC(V#1), e.g. add a moving average to the INTC(V#1) chart so see a smoothed tick velocity line.

In summary, the "Auto Scan" feature of Investor/RT in concert with the SET command causes updates to occur on any special instrument you have defined. This is a very powerful new capability. An auto scan can be used to calculate several V#n variables periodically while the instruments with ticker format "symbol(V#n)" are used to track the results intra-day. For example:

SET(V#1, TV) and SET(V#2, CL/CL(INDU)) and SET(V#3, CL/CL(SPX))

This scan calculates the tick velocity and the price of an issue relative to the Dow Jones Industrial Average and the S&P 500 Index. For any symbol scanned you can create the tickers symbol(V#1), symbol(V#2) and symbol(V#3) to track the intra-day values of the three V# variables.

Details of Version 4.5 Enhancements

Using Scans, Trading Signals and Custom Indicators within a scan or trading signal

The expressive power and ease of use of the RTL language has been improved substantially in Version 4.5 by the capability of referencing other scans, trading signals, and custom indicators when formulating an RTL expression for a scan or trading signal. New tokens have been introduced into RTL to enable the user to embed an existing scan (token SCAN), custom indicator (token CI), or trading signal (token TSIG) into the RTL expression. Multiple SCAN, CI, and TSIG tokens can be incorporated into a scan or trading signal just like multiple moving average (MA) tokens. When multiples are used, the user must rename the token(s) to distinguish them from one another.

Here is an example of using a custom indicator inside a scan. First create a custom indicator called "MA_Oscillator" with the RTL formula:

$$MA_ST - MA_LT$$

Where MA_ST is a simple short term moving average and MA_LT is a simple long term moving average. This custom indicator when added to a chart window oscillates around the zero line, crossing the zero line whenever the moving average lines cross over.

Now, we can use this custom indicator in a scan to look for moving average crossovers. Create a new scan. From the token list on the left choose CI:Custom Indicator and add it to the list on the right. When you do this Investor/RT will ask which custom indicator you want to use. Choose "MA_Oscillator" from the list of custom indicators. The token list on the right will now contain only one entry with a token of CI. Complete the scan definition using the RTL formula:

$$(CI.1 < 0 \text{ and } CI \geq 0) \text{ or } (CI.1 > 0 \text{ and } CI \leq 0)$$

This scan tests for moving average crossovers from either direction. CI.1 can also be written CI1 (without the period). We use the optional period to separate the token from the historical qualifier to improve readability. Save the scan and run it to find all issues displaying either a bullish or bearish moving average cross over in the current time frame. Add this scan as a "Scan Marker" indicator to a chart. Investor/RT will then mark each bar in the chart for which there is a moving average cross over. Note that the terms of the moving average involved in this analysis are part of the definition of the "MA_Oscillator" custom indicator, not the scan itself,

which only references this indicator using the token CI. You can call up the definition of "MA_Oscillator", edit the terms or moving average type preferences of the indicator and save the indicator and Investor/RT will redraw the scan markers accordingly.

In the same way, a scan or trading signal can include other scans and/or trading signals. For example, if you have already created scans called "MACD_Bullish" and "Stochastic_Bullish", you can easily create another scan testing for either of these conditions. Create a new scan, choosing the SCAN token from the list on the left, and choosing "MACD_Bullish" when the list of scans appears. The token in the right side list will initially be called "SCAN". Rename the token to read "MACD_BU". Then add the SCAN token a second time, choosing "Stochastic Bullish" and renaming its token "STOC_BU". Then complete the scan definition with the RTL formula:

MACD_BU or STOC_BU

The scan above will test for either of the referenced scans being true.

Similarly

MACD_BU and STOC_BU

Tests for both referenced scans being true.

Sometimes it is useful to see if both conditions have been true within the last few bars since you may miss signals if you look only for both conditions happening on exactly the same bar. The MAX function can be used to test any condition within some specified time in the past. For example:

$\text{MAX}(\text{MACD_BU}, 3) > 0$ and $\text{MAX}(\text{STOC_BU}, 5) > 0$

Tests for a MACD buy signal occurring within the last three bars accompanied by a stochastic buy signal any time within the preceding five bars. Scan, custom indicator and trading signal token can be qualified historical by appending a period and a number to the token. So another way to test to see if MACD_BU has been true during the preceding three bars is to use the formula:

MACD_BU OR MACD_BU.1 OR MACD_BU.2

Whenever a language includes "self-referencing" capabilities, the expressions of the language become eligible for endless loops. In natural languages these are called paradoxes; in computer programming languages they can become infinite loops. Now that RTL contains self-referencing tokens, Investor/RT must guard against such uses of the language to prevent infinite loops. For example, SCAN_A may reference SCAN_B, which in turn makes reference to SCAN_C. If SCAN_C happens to include a test for SCAN_A, the evaluation cycle would repeat forever if left unchecked. Before evaluating scans and trading signals, Investor/RT performs an "endless loop" test. If an illegal scan reference is detected, an error message is displayed and the scan or trading signal is not evaluated.

Charting Preferences consolidated/reorganized

Preferences windows for traditional (time-based) charts have been consolidated into a single window. Under Setup: Preferences, the new preference window is called "Traditional Chart". We now use the term "Traditional Chart" to refer to price-time charts having a precise time-based horizontal axis. Traditional charts can be viewed in various "styles": bar, candlestick, line (continuous or connected), or histogram. Notice that bar, candle, etc. are no longer listed as chart "types", but as chart styles within the traditional chart type.

"Setup: Preferences: Charting: General" opens a window for setting global charting preferences. This is where you specify your "default chart". The default chart can be a traditional chart or one of the specialized chart types: day bar, market profile, volume profile, point and figure, three-line break, or raw tick chart. There is also a new preference setting in this window for specifying what action Investor/RT should take when the user double-clicks on a ticker symbol in a quote page. The two choices are (1) open a new default chart or (2) substitute the ticker into the front chart. This preference also applies whenever the user requests a default chart from the popup menu in quote pages, portfolios, or instruction selection controls.

Related changes have been made in other windows or menus where "chart type" is an option. For example, in File: New: Chart (the Create New Chart window), the type menu shows Traditional along with five other chart types. When "Traditional" is chosen, another list box titled "Style" gives you the choice of bar, candle, etc.

Clicking the "Chart Preferences" button on the traditional chart toolbar immediately opens the consolidated chart preferences window instead of displaying a list of preference windows. Double-clicking in the time axis area or the chart name in the lower left corner of the chart is a shortcut for opening the chart preferences window.

Scan Statistics (STAT) token enhanced

When the STAT token is used to calculate the minimum or maximum price during some number of periods, the result of the calculation can now be either the actual minimum or maximum value encountered or the number of periods back that the minimum or maximum value occurred. For example, setup a scan, add the STAT token, defining it as the Max High in 50 periods. In the STAT setup box you will see a new set of radio buttons. Choose the radio button titled "the no. of periods since the maximum". Run the scan with the RTL formula:

STAT < 5; to find issues whose 50 period high has occurred within the last 5 periods.

User variables V#1 through V#20 now available

The number of user V# variables has been increased (again) to twenty. See item 1 above. Variables V#7 through V#20 are temporary variables. Their values are reset to zero each time

Investor/RT is started. Variables V#1 through V#6 are persistent. Their values are retained on the database just like open, high, low, close and other market data.

RTL token YRCL (Prior Year Closing Price) added

The token YRCL has been added to RTL to provide a means to scan on the year-to-date percentage change in price. Use the RTL expression:

$$((CL - YRCL)/YRCL)*100$$

To calculate the year-to-date percentage change. (10.5 means 10.5%). At present, the prior year's closing price is a data value transmitted only over the DTN data service. The close price of an issue on Dec. 31, 1999 is usually available in the historical record on the database. See item 16. below for a new technique for recording the prior year closing price using a scan.

RTL SET command enhanced to support setting of more tokens

The 52 week high, the 52 week low and the prior year closing price can now be set for a list of instruments using a scan. This may be desirable, for example, if the data service used with Investor/RT does not update these data columns directly but you have historical data on file to obtain the appropriate price. Run a daily periodicity scan on the .All Symbols quote page using the RTL formula:

SET(YRHI, MAX(CL,225)) and SET(YRLO, MIN(CL,225)) and SET(YRCL, CL.N)

N is a number representing the number of trading days thus far this year. You can combine all three SET commands above into one scan or run each SET command individually.

Line Color control improved

Various setup windows in Investor/RT contain "line color controls", a rectangle showing the selected line color in a small box at the left side. A popup menu has been added to this control for setting the line style (solid, dotted, dashed) and the line width (thickness). Prior to Version 4.5, only line widths of 1, 2, or 3 were permitted. The line width can now be set from 1 to 10 pixels. The popup menu also has selections for common colors and a "Color Picker..." menu choice. Choosing Color Picker opens the standard color selection window for the computer operating system you are using (Windows, Macintosh). Note that on the Windows platform, the dotted and dashed line styles only apply if the line width is one pixel. Lines thicker than one pixel always display as solid lines in the selected color on the Windows platform. On the Macintosh, dotted and dashed lines do have a visible effect at point sizes greater than one. Click the mouse in the color square at the left side of the control opens a pallet of 256 colors. Either click on a color to select it, or press the esc key to dismiss the pallet without changing the current color selection. A right + click on the color rectangle accesses the operating system

standard color selector for your platform just like the "Color Picker" menu choice. On Macintosh, ctrl + click or command + click instead of "right + click".

Rectangles can be moved and copied in charts

After a rectangle has been drawn into a window, it can be relocated at another position by dragging and dropping it at the starting location of the new position. The rectangle will retain the same horizontal size in bars at the new location. Its vertical size will encompass the trading range of prices during the revised periods. Holding down the ctrl key (option key if Macintosh) while dragging and dropping the rectangle causes a new rectangle of the same width (time) to be added at the new position.

Raw tick chart

Tick Bar option added. Raw Tick Charts can be setup to show "tick bars", i.e. open, high, low, close bars depicting the trading range of a fixed number of consecutive ticks. A "ticks per bar" setting has been added to the raw chart preferences. Set this value to one to see every tick individually. Tick bars can also be displayed in traditional charts, however the raw tick chart time access is better suited to displaying tick bars compactly than the traditional chart fixed time unit axis.

Chart printing improved

Refinements were made to printing of all non-traditional chart types: day bar, market profile, volume profile, raw tick, point and figure, three-line break, and custom profile charts. Printing of raw tick (or tick bar) charts is a new feature in version 4.5.

Creating quote pages from custom profiles

A "Create Quote Page" menu item has been added to the Custom Profile popup menu. This command creates a new quote page consisting of the instruments listed in the custom profile window. When the custom profile chart is used to rank and select the top issues from a larger list of instruments, this new command makes it easy to quickly create a quote page of the top ranked issues. The quote page created will have the same name as the custom profile.

New RTL Token for testing date/time specific values

A new token, DV, has been added to the RTL Language. DV allows you to refer to a price point at some time in the past using a specific date/time. For example, suppose you are running a scan and wish to compare the current closing price with the price of the issue at the close of last year. Simply add the token DV to your scan token list. A dialog box will appear in which you specify the date as 12/31/99 and the price point as "Close". Then use DV in your scan formula to refer to the 12/31/99 closing price. For example, try this scan:

CL/DV > 1.2; scan for issues up 20% of more this year.

The DV token can be added multiple times to the token list to reference variable date/time specific prices in the past. The DV token name must be changed to some other name to distinguish different DV price points. For example, you could set up DV_YEAR_END as the "close" on 12/31/99 and DV_QTR_END as the close March 31, 2000. Then use this follow scan to find issues up more than 30% year to date that were up less than 10% at the end of the last quarter.

CL/DV_YEAR_END > 1.3 AND DV_QTR_END/DV_YEAR_END < 1.1

The DV indicate can also be used in intra-day scans to test a time specific value. For example, you could setup DV to mean the "(Hi + Lo)/2" of the current days bar at 9:35, and use DV in an auto-scan running on five-minute bars throughout out the trading day. The DV value in this case refers to the high/low average for the first bar of the trading day. The DV can be used to refer to the open, high, low, close, volume, and various other calculated price points at any specific point in time.

Hollow volume bars and MACD histograms

New drawing options are available when charting volume, open interest histograms, MACD histograms, and histogram style traditional charts. To see the effect, check the "Hollow Bars" or "Hollow Histogram" checkboxes. Drawing volume histograms hollow make it possible to overlay volume histograms inside the same pane as the instrument bars (or candles).

Investor/RT 4.3, Release: April 27, 2000

Major New Feature. The Custom Profile Chart

This is the latest addition to the suite of available chart types in Investor/RT. A custom profile is a histogram showing a value for each of several instruments in a quote page. The value can be one of several built-in data items or calculations that are available as quote page columns (e.g. %change, high-low range, PE Ratio, etc.), or the value can be a user-specified custom indicator. The Custom Profile Chart can show a histogram value for every instrument in the quote page, or, for larger quote pages, the display can be limited to the highest or lowest N instruments ranked ascending or descending by the specified value. Like all other chart types in Investor/RT, the custom profile chart is "live". You may specify how frequently the profile is to be recalculated and displayed as market data flows in, similar to the "auto scan" feature.

To create a Custom Profile Chart, use File: New: Chart, choose "Custom Profile" from the Chart Type menu and press OK. Investor/RT will use the default preferences for the Custom Profile. Default preferences are specified using Setup: Preferences: Charting: Custom Profile. You can also access the preferences for the Custom Profile using Setup: Custom File. A custom profile window with your default preferences can also be opened using File: New: Custom Profile.

Modify the settings for a particular Custom Profile by right clicking in the histogram area (to the right of the ticker symbols) and choosing Preferences from the popup menu. Right-clicking (command+click on Macintosh) on a ticker symbol in the custom profile will popup a menu of actions for that ticker symbol (just like right-clicking on a ticker in a quote page). Double-click on any ticker symbol to open a default chart for the ticker.

Custom Profile windows can be saved using the toolbar or File: Save. Like other chart types, the names of saved Custom Profile charts appear in the Open: Chart menu for later recall.

As you move the mouse inside a Custom Profile window, Investor/RT shows the calculated value for each instrument at the top of the window. The source quote page or the data column or custom indicator used to display the profile can be changed at any time using the toolbar or the popup menu. For example, suppose you have a custom profile showing the top 10 issues ranked by %change from the open for a particular quote page. Right-click and choose "Set Quote Page" to open a selection list showing all quote pages. Pick any quote page in the selection list and click the "Apply" button to see the selected quote page profiled in the window.

Click the red-cross toggle button in lower right corner of the custom profile window to alternately show and hide the associated toolbar.

Chart grid line color setting

The grid line color in traditional time-based charts can now be specified by the user. Prior to Version 4.3 grid lines were always drawn in a light gray color. To set the default grid line color, go to Setup: Preferences: Charting: Color Preferences and click on the color control rectangle titled "Grid Line Color". Charts saved prior to version 4.3 will (unfortunately) have a blue color as the gridline color. To adjust an individual chart's grid line color, click the Preferences icon on the charting toolbar and choose "Colors". Then click on the "Grid Line Color" control rectangle to make your selection.

If you have several chart windows open and you wish to revise the gridline color on all of them, go to Setup: Preferences: Charting: Color Preferences. Make the gridline color selection and press the OK button. Investor/RT will ask if you want to apply the new settings to all open chart windows.

The new grid line color option can be used to completely eliminate the grid lines by setting the grid line color to the same color as the chart background. To "tone down" the gridlines, choose a grid line color very close to the background.

Parallel trend line drawing tool

A new tool has been added to the charting toolbar to facilitate the draw of parallel trend lines. The new tool is located adjacent to the regular trend line drawing tool on the toolbar. The new tool operates just like the regular trend line drawing tool if the windowpane in which you are drawing does NOT already have a trend line in it. However, if the pane does have a trend line in it, all you have to do is click at the price level you want and a new trend line will appear at that precise location having the same slope as the other trend line in the window. Any number of parallel trend lines can be drawn in this fashion. The tool is automatically "de-selected" after drawing the new trend line unless you hold down the shift key when releasing the mouse.

Function F1 for context sensitive help

The function key F1 is now equivalent to pressing the help button on the main toolbar. Function key F1 can be assigned to some other user specified action using Setup:> Preferences: Keyboard Shortcuts if you like. Formerly the F1 button would simply open the help window to the contents page. Now, for both Windows and Macintosh versions of Investor/RT, F1 opens the help window to the help topic related to the current (front) window.

Macintosh improvement

Using the Finder to view Investor/RT files. Investor/RT text files are now created with the Investor/RT "creator" signature. Formerly text files were created with the "Simple Text" creator signature. This means that Investor/RT text files can be opened and displayed by Investor/RT by double-clicking on them in the Finder. You can also open several Investor/RT text files at one time using the Finder to select them before issuing the Open command in the Finder.

Investor/RT creates most of its text file in the admin folder. Here are a few of the special files kept there that may be of interest:

File Name	Description
dialdata.dat	latest current quotes download from Dial/Data
dialdata.hist	latest historical download from Dial/Data
iqhist.txt	latest InterQuote daily historical download
iqbars.txt	latest InterQuote intra-day minute bar download
iqticks.txt	latest InterQuote tick data download
Message log	the Investor/RT message log file
Irtlog.txt	Investor/RT Internet log showing latest Dial/Data login transcript
Market Pulse.txt	latest market pulse report downloaded from myTrack

XXX_bars.txt	latest ticker XXX intra-day bars downloaded from myTrack or eSignal
XXX_hist.txt	latest ticker XXX daily bars downloaded from myTrack or eSignal
XXX_ticks.txt	latest ticker XXX tick data downloaded from eSignal

In a related improvement, the Macintosh applications I/RT Database Maintenance and I/RT Database Verify have been improved to produce their output files with the Investor/RT signature. These two file, called dbmaint.txt and dbverify.txt appear inside the Investor/RT Folder (not the admin folder). Double-clicking these files will show you the report of the most recent database maintenance or database verification.

Connection dialog box

When Investor/RT is connecting to an Internet remote host or resolving a domain name, if the connection attempt or domain name resolution takes more than a few seconds, Investor/RT will open a small modal dialog box to inform the user that a connection attempt is in progress. The modal dialog ensures that no menu commands or other user actions can be initiated until either the connection is made or the user presses the dialog's cancel button. This dialog box will not be seen at all when the Internet is responding quickly to Investor/RT requests. If there is a delay however, the dialog will appear and handle all user interface updates while the connection attempt is in progress. In the past, Investor/RT would appear to be locked up if there was a delayed response or no response from the Internet. The cancel button or dialog close box terminates the connection attempt.

Saving Quick Quotes

Quick quotes for particular instruments that you wish to appear in the list of quick quotes must be saved explicitly using the File: Save command. Formerly, Investor/RT would save quick quotes automatically when the quick quote window was closed. This often resulted in a build-up of unwanted items in the quick quote menu. To clear unwanted quick quotes from the menu, use the Delete command in the Control: Data Management menu. To add a new quick quote to the menu, open a quick quote window, set the window to the desired instrument and issue the File: Save command.

Investor/RT remembers the screen location of each saved quick quote window. When opening a quick quote window using the Open Menu or the list of quick quotes, Investor/RT will create the quick quote window at the screen location and window size it had when it was last saved. Quick quotes can be requested for any instrument using the right-click popup menu in quotes pages, portfolio, or instrument selection lists. In this case, a the quick quote window is centered in the Investor/RT task window.

Detrended oscillator added to RTL Language

The Detrended Oscillator technical indicator is available for use in scans, custom indicators, and trading signals. The RTL token is DTREND.

The Detrended Oscillator is calculated by first calculating the difference between "price" and a user specified moving average of "price" for the instrument. The price used may, of course, be the high, low, close, open, average of high and low, or average of high, low, and close. The resulting array of differences is then smoothed according to another user specified moving average. The resulting indicator oscillates around zero. This indicator makes it easy to spot situations when an instrument is trading at historical extremes relative to its average price.

Improved Date/Time Control

The "Date/Time Control" is widely used in various windows within Investor/RT. The control is a simple rectangle containing a date and time. The user can tab or click the mouse on any of the numbers in the date or time. The selected number is underlined and displayed in bold face type. Type in a new number or use the up/down arrow keyboard keys to adjust the date/time accordingly. When the control is active, up/down icons appear at the left side of the control. Click the up or down icon to increment or decrement the selected "number" in the control. The control accepts a right-click (command-click on Macintosh) anywhere inside the rectangle and responds by popping up a menu of useful dates for quickly setting the date of the control. The menu choices are listed below. The popup menu is useful in the Data Download window when specifying the beginning date for a historical data download. It may also be useful in setting the "Viewing Period" of charts or the "Backtesting Period" when testing trading systems. The "Normalized price" technical indicator preferences window is another example where the popup will be useful in setting the "base period" for this indicator in daily charts.

Menu Item	Description
Now	The current date and time
Today	The current date (no time)
Yesterday	The date of the prior trading day
Week Ago	The date five trading days ago
Month Ago	The date of the trading day one month ago
Three Months Ago	The date of the trading day three months ago
Six Months Ago	The date of the trading day six months ago
Year Ago	The date of the trading day one year ago
Beginning of this Week	The date of the preceding Monday
Beginning of the Month	The first trading day of the current month
Beginning of the Quarter	The first trading day of the current quarter
Beginning of the Year	The first trading day of the current year

Trend line break alerts

The preferences for the "Trend Line" technical indicator now include an "Alert" checkbox. When checked, Investor/RT will alert the user when the price breaks through the trend line. If you want trend line break alerts for an existing trend line, right + click on the trend line and check the alert box. If you want trend line alerts to be in effect for all newly drawn trend lines, use Setup: Preferences: Charting: Technical Indicators and checkmark the Alert box in the preferences for the Trend Line indicator.

Investor/RT will note which side of the trend line the current price is on when the trend line is first drawn and will watch for breaks to the other side of the trend line. The alert will consist of an alert sound and the display of an alert window describing the trend line break and showing the price of the issue. The alert sound will be the "High Alarm" sound when the break is above the trend line or the "Low Alarm" sound when the break is to the downside of the trend line. See Setup: Preferences: Sounds to configure the particular sounds.

Improvements to Import feature

Historical import of daily or intra-day data using the File: Import command has been improved to support the import of multiple files at one time. In cases where the imported file(s) do not contain the ticker symbol on each line, the files often are named with the ticker at the beginning of the file name. Investor/RT can now extract the ticker symbol from the file name and use that ticker to import the data. The new options are available as checkboxes in the File: Import window.

When importing multiple files at one time, the user is prompted to select the folder. Every file in the folder will be imported in turn using the specified import format. If the "Get Ticker from File name" checkbox is checked and the user specified format does not contain the ticker symbol field, then I/RT will attempt to extract the ticker from the beginning of the file name. The ticker may be the entire file name or the file name may begin with the ticker (usually all uppercase) followed by a delimiter character such as a space, comma, period, left parentheses, or underscore character. If the extracted ticker symbol is not yet defined to Investor/RT, the software will ask the user to supply a defined ticker or cancel.

Improvements to Point & Figure Charts

Point and Figure Chart have a new option called "Use Highs and Lows". Prior to version 4.3, Investor/RT would always use the closing price of each bar when computing the PNF chart. When the Highs and Lows option is checked, both the high price and low price of each bar are used when formulating the X's and O's. When the chart is in an up (X) column, the high is considered first to see if the up column should be extended. Then the low price is tested for reversals. Similarly, the low is considered first in a down (O) column.

The grid lines and scales have been improved to draw the X's and O's inside rectangles that represent the user specified box size. This provides a more traditional "graph paper" look and feel to the Investor/RT PNF charts. Each box is labeled with the price value of the X or O.


Changing chart types with popup menu

The behavior of the "Set Chart Type" menu within the chart popup menu has been changed in Version 4.3. When changing the chart to a new window type, the existing chart window will remain open and a new window of the requested type will open. For example, choosing "Set Chart Type: Market Profile" using the popup menu inside a point and figure chart results in a new window displaying the market profile of the same instrument. The point and figure chart remains open as well. Candlesticks, bars, lines and histogram charts all use the same window type, thus no new window will be created when switching among these chart types.

Investor/RT 4.1 and 4.2, Release: March 22, 2000

Details of Version 4.1 Enhancements

Improved method for adding textual annotations to charts

 The annotation tool allows the user to place text notes or markers directly on the chart. The chart toolbar has a button with letter "A" for annotation. Click the annotation tool button and the cursor changes to a pencil. Move the mouse to the spot in the chart where you wish to place a textual annotation. Click the mouse and a text entry box will appear. Type in the text and press return. The new Text tool creates an "Annotation" indicator. The annotation indicator has been a part of Investor/RT for a long time but adding annotations has never been this easy. Like the trend line drawing tool, the text tool is "turned off" when you complete the mouse click. Hold down the shift key when you click to add an annotation if you want the tool to remain selected for placing another annotation box.

Once you have placed an annotation in the chart window, if you want to revise the text then right + click (Mac users command + click) on the text. A dialog will appear showing the settings for the Annotation. Revise the text and/or any of the settings in the dialog. Note that the annotation indicator has been improved to allow the user to choose a marker to appear along with the textual commentary.

There are two types of chart annotations-those that are associated with a specific date/time and those that are time-independent. In the annotation settings there is a checkbox titled "Text is not date/time dependent". When this box is checked, the text is fixed in the window. You can drag and drop the annotation to another location, but the text does not move as you change periodicities or scroll the horizontal viewing period scrollbar. If you drag and drop an annotation that is date/time dependent, the annotation will become associated with the date/time where you dropped it in the chart window. After completing a drag and drop of an

annotation a message in the main toolbar message area will tell you the new date/time of the textual annotation. Use Setup: Preferences: Charting: Technical Indicators: Annotation to adjust the default settings for adding new annotations via the text tool. If you want your annotations to be fixed within the window rather than pinned to a particular date/time, be sure to mark the checkbox cited above.

To adjust an existing annotation in a chart, simply right-click on it to access its properties. Then check the box titled Last, Bid, Ask, or Change if you wish these quoted prices to be appended to the text (you can leave the text blank if you like). The quoted prices are updated as trades occur.

If the "Text is not date/time specific" checkbox is unchecked, the annotation will be pegged to the date specified, that is, the note will move as the horizontal scroll bar is used to scroll the chart. If this box is checked, the note behaves like a "sticky" note, that is, it does not move as the time axis changes.

Change the font and text color if desired using the color box and the font box.

Select a time to which your note pertains.

To enable more powerful diagnostic messaging during backtesting, the Annotation indicator is part of the RTL language. The token is NOTE. The NOTE token is simply a way to output instrument specific values to the backtesting detail report. Typically, the NOTE token (considered a "logical" token not an arithmetic one) could be added to an existing rule's signal, e.g.

```
NOTE and MACD.1 < 0 and MACD > 0
```

Or, the NOTE can be isolated into a NONE or TEST rule as simply:

```
NOTE = TRUE
```

The NOTE token always evaluated as TRUE. The NOTE token, like any other technical token can be qualified, e.g. a TEST rule may look like:

```
NOTE.1 and NOTE.2 and NOTE.0
```

The NOTE can be setup as a string of text plus instrument specific RTL tokens preceded by the % percent sign. For example, the NOTE text of:

```
%TICKER at %CL, HI=%HI LO=%LO
```

Displays messages like the following in the backtesting detail report:

```
IBM at 104.50, HI=105.75 LO=104.00
```

When you qualify a NOTE, e.g. NOTE.1, the values displayed will be for the preceding bar. This applies to historical tokens like %OP, %HI, %LO, %CL, %VO, %OI. It does not apply to V# variables. A NOTE text that contains "%V#1" for example will display the current value of V#1 for the instrument regardless of the qualifier.

Using SHOW and NOTE tokens inside signals that are used to form TEST or NONE action rules provides the user with a powerful diagnostic capability to see step-by-step for each bar why the trading system is performing the way it is.

Dial/Data Historical data downloading improved

If you make a historical download request for a quote page of instruments, Investor/RT will divide the instruments in the quote page into groups and perform multiple downloads so that each download request asks for no more than 15,000 days of data, the Dial/Data limit.

Backtesting: Consolidated summary report added

When running a backtest on a quote page of instruments, Investor/RT now produces a "one line summary" for each symbol tested. In addition, a consolidated summary report is produced showing the consolidated results of the backtest across all instruments tested.

Fibonacci Indicator improved

The three Fibonacci technical indicators in Investor/RT (Retracements, projections and arcs) have been enhanced to add a user-specified retracement level.

Show/Hide Chart windows pane titles

A new button has been added to the chart toolbar for showing or hiding the window pane titles with the chart window. Click the "Show/Hide Pane Title(s)" button to toggle all pane titles on or off. If you want to toggle the title for only a particular window pane, first select any graph element within the pane by clicking on it. The graph element will become highlighted to indicate visually that it is selected. Then click the "Show/Hide Pane Title" button to toggle the title on or off as desired. If you click the "Show/Hide Pane Title" button while holding down the shift key, Investor/RT will toggle ALL panes regardless of whether an element is selected or not. Another way to toggle a particular pane title is to use the popup menu. Right-click (Mac users just click) in the particular pane you want to adjust and choose "Chart Preferences: Show/Hide Pane Title" from the popup menu. Chart windows that were saved prior to version 4.1 will have no pane titles displayed when the saved chart is opened in Version 4.1. If you want such charts to show their pane titles, click on the "Show/Hide Pane Title(s)" button or adjust each pane individually, then save the chart. Once a chart is saved under release 4.1 or higher, the chart's pane title display settings will be remembered.

InterQuote Ticker Symbol Limit

InterQuote now offers an optional service level of 600 real-time ticker symbols, double the standard allotment of 300 symbols. Investor/RT 4.1 and higher now recognizes the user's service level when the system connects to InterQuote and allows the expanded number of symbols. For more information or to sign up for the extended symbol limit, visit www.interquote.com.

Internet data feed temporary file deletion

Each of the Internet data services supported by Investor/RT (eSignal, InterQuote, and myTrack) provide data downloading services for daily and intra-day data. Investor/RT creates temporary text files in the admin folder directory when downloading. These files are not deleted after the downloading is completed. The files are useful as an "after the fact" record in diagnosing downloading problems. A new command has been added to the Control menu (Control: Data Management: Delete: Temporary Files) for the purpose of purging all temporary text files from the admin directory. This command may be useful to those running Investor/RT from a RAM disk because it can reduce the size of the Investor/RT folder/directory considerably.

Version 4.1 fixes a memory leak in the candlestick pattern recognition chart indicator.

Intra-day candlestick pattern recognition is now effective without memory resource problems. In the process of correcting this bug, we discovered a flaw having to do with the pattern recognition logic used by this indicator. The calculation of "average candle body size" for an instrument was yielding a lower than actual true average in some cases. This impacts the overall candle pattern recognition since average body size is an important factor in searching for patterns. This bug has been fixed and the pattern recognition is much more precise than in earlier versions.

Chart drawing tools improved

The charting toolbar has been rearranged to better organize the drawing tools. A (horizontal) reference line tool has been added. Both horizontal reference lines and vertical reference lines can be dragged to adjust their placement within the pane. Select a horizontal reference line for dragging by clicking anywhere on the line. Select a vertical reference line for dragging by clicking on either end of the line. The rectangle tool is used to draw rectangles enclosing some period of price activity. To select a rectangle for editing or deletion, click on any corner of the rectangle. Then press the Delete key (forward del key on Macintosh keyboards) to delete the rectangle, or press enter (or return) to edit the selected rectangle. Trend lines, Fibonacci base trend lines, and regression lines are now more easily selected by clicking anywhere on the line.

Note that to select a Fibonacci indicator in a chart you must click on the base trend line, not on one of the Fibonacci retracement or projection lines.

Dial/Data automatic downloading

Users of the Dial/Data Edition of Investor/RT and users of broadcast data services (Signal, BMI, DTN) who also use Dial/Data for historical data will see an improvement in the way chart data downloading operates. If the Automatic Downloading option is turned on in Setup: Preferences: Charting: Other Preferences or if the user clicks the download button in the chart window or in the chart toolbar, Investor/RT will connect directly to Dial/Data and download daily/weekly/monthly data as needed for the chart. There is no longer any need to view or work with the Data Download window to get historical data into a chart. This is essentially, the same way Investor/RT operates with Internet based data feeds (eSignal, InterQuote, myTrack).

Web Resource Access by ticker symbol

Investor/RT 4.1 Rev 1 features improved Internet integration for easy access to a variety of popular Internet sites. Right-click on a ticker symbol in a quote page, portfolio, or instrument selection list and choose Web Info from the popup menu to access web based information on that ticker symbol. Macintosh users hold down the command (apple) key while clicking on the ticker to access the popup menu.

Database (data_f) directory placement option

Investor/RT expects to find the database files in a directory (folder) named data_f. The data_f folder is usually located in the same directory (folder) as the Investor/RT application. Many users, especially on the Macintosh platform, run Investor/RT on a RAM DISK for increased performance. In this past this has required placing the entire Investor/RT directory folder on the RAM DISK. In Version 4.1 it is now possible to relocate the data_f folder to any location you want. It is no longer a requirement that the data_f folder reside in the same directory folder as the Investor/RT application. To accomplish this, create a text file named "datapath.txt" and place this file in the admin directory folder where the Investor/RT application resides. The datapath.txt file, if present, must contain a valid "path" specification, telling Investor/RT where to find the data_f (database) folder. The "database definition file" named irtdb40.dbd at present, must also be copied to the same location as the data_f folder. The dbd file must exist outside the data_f directory folder at the same level as the data_f. For example, a Macintosh user with a ram disk volume named RAMDISK can now copy the data_f folder and the irtdb40.dbd file to the RAMDISK volume. Create the datapath.txt file containing a single line of text with the path: RAMDISK: At startup, Investor/RT would note the presence of the datapath.txt file in the admin directory and use the "dbd file" and data_f folder located on the RAMDISK volume instead of the data_f folder on the hard drive. If no datapath.txt file is found in the admin folder, Investor/RT will expect to find the data_f folder directly in the same folder where the Investor/RT application resides. The Backup Database, Verify Database, and

Database Maintenance commands within the Control: Database Utilities menu will also use the datapath.txt file if present to perform their functions on both Windows and Macintosh platforms. On the Macintosh platform, the I/RT Database Maintenance and I/RT Database Verify applications, if launched manually from the Investor/RT Folder will also honor the datapath.txt file if present. On the Windows platform, the Database Maintenance and Verify Database commands in the Windows Start Menu, are configured to expect the data_f directory in its usually location in the investrt directory. Windows users who wish to relocate their data_f folders in this way, should modify the dbmaint.bat and dbverify.bat files in the investrt directory so that the various commands contain the correct path to the database. For example, if a Windows users created a ram disk drive and assigned the ram disk to drive letter F:, then the datapath.txt file should contain the single line: F: The dbmaint.bat file should be edited using notepad, changing the lines: dbclrlb irtdb40 keybuild irtdb40 dchain irtdb40 dbcheck -a -c irtdb40 > dbmaint.txt notepad dbmaint.txt to dbclrlb F:irtdb40 keybuild F:irtdb40 dchain F:irtdb40 dbcheck -a -c F:irtdb40 > dbmaint.txt notepad dbmaint.txt This new feature may also be useful to those who may wish to maintain multiple Investor/RT databases. For example, a user may have one data_f database containing end-of-day historical data for thousands of instruments, and a leaner database of a few hundred symbols for intra-day usage with an Internet data service. To switch from one database to another, quit Investor/RT and revise the datapath.txt file to "point" to the alternate directory containing the other database. The "User Profile" in Investor/RT has been revised to show the current "path" Investor/RT is using to access its database. To view your user profile, choose "Copy User Profile" from the Edit menu and click "Show" in the ensuing dialog box.

Volume/Market Profile improvements

The volume profile chart can now be configured to show the volume profile of daily data over some user specified long term period. Formerly, the volume profile window could only show the profile of intra-day (tick by tick) data. When a long term volume profile is requested, the user can specify the price point (open, high, low, close, High + Lo/2, or High + Low + Close/3) to use for each day's volume. The Market Profile chart has been enhanced to show the current trading price of the instrument more clearly.

Momentum CD ROM Stock History update

In January 2000, Momentum began publishing their historical stock CD in a revised format. The Momentum CD contains up to 13 years of daily historical data on US Stocks. Investor/RT 4.1 Rev 1 has been updated to recognize the new CD format. For more information on the Momentum CD, visit www.momentumcd.com. Investor/RT users (both Windows and Macintosh) should order the February 2000 or later CD ROM in Metastock format. (do not order the ASCII format CD ROM).

Miscellaneous portfolio enhancements

The data column "Tick Volume" is now available for display in portfolios. For stocks, this column shows the number of shares bought or sold for the most recent trade. The %Change Today data column can now be used to sort the portfolio.

RTL (Investor/RT Real-Time Language) additions

Two news tokens, TIME and NOW have been added to make it possible to include time-of-day tests within scans and trading signals. Nine new trigonometric functions have been added for use in custom indicators, scans, and trading signals. TIME evaluates to the time of day expressed as a whole number (hhmm). TIME can be used in trading signals that are included in trading systems. During backtesting on intra-day data, TIME will be the time of day of the bar (or tick) being evaluated. For example, the RTL expression:

TIME > 1530 AND <any RTL expression>

Would be true when the back test time of day is 3:30 pm or later and the rest of the expression is true. The NOW token serves the same purpose in scans that are run during the trading session (apart from backtesting). For example, the RTL expression:

(NOW < 1030 AND <RTL expression 1>) OR (NOW > 1500 AND <RTL expression 2>) OR <RTL expression 3>

would scan for <expression1> during the first hour of trading and <expression2> during the last hour of trading or <expression3> otherwise.

The nine trigonometric functions are:

SIN	sine function
ASIN	arc sine function
HSIN	hyperbolic sine function
COS	cosine function
ACOS	arc cosine function
HCOS	hyperbolic cosine function
TAN	tangent function
ATAN	arc tangent function
HTAN	hyperbolic tangent function

Each of the functions takes a single value or expression as an argument, e.g. SIN(CL - CL5). The function tokens may be entered in all upper or all lower case.

Details of Version 4.2 Enhancements

Major Enhancement: InterQuote Data Feed

Investor/RT has been enhanced to operate with the new "compressed" data feed from InterQuote. This new feed format uses less bandwidth to transmit real-time streaming quotes than its predecessor and also supports several new data items including several items of fundamental data for equities. The new data items are listed below with their Investor/RT quote page column heading:

Assets Balance sheet assets in millions
Liabilities Balance sheet liabilities in millions.
Debt Balance sheet long term debt in millions
Growth 5 year growth rate
Shares Common shares outstanding
Pshares Preferred shares outstanding
EPS Earning per share
EPS Estimate Earnings estimate current FY
Interim EPS Latest interim EPS (quarterly EPS)
Interim EPS LY Interim EPS year ago same period
PE Ratio PE Ratio
Avg Volume Daily Average Volume
52WeekHigh 52 Week High price
52WeekLow 52 Week Low price
YearHigh High price current calendar year
YearLow Low price current calendar year
Yield Dividend yield
Dividend Latest dividend amount
Div xDate x-dividend date
Div Pay Date Dividend payment date
Annual Div Rate Annual Dividend Rate
Name Security Name
Option Prefix Option Prefix symbol
Leaps Leap option symbols(s)
Wraps Wrap symbol(s)
CUSIP CUSIP Number
%Held %Held by Institutions
Beta Beta
Split Factor Latest split factor, 2 means 2 for 1
Split Date Date of latest split

In addition, the new feed transmits 52 week high/low alerts, abnormal volume and market performance high/low alerts when tracked issues reach significant prices or trading volume reaches high levels. These appear as messages in the I/RT main toolbar. Each tick is identified by the exchange (market center) on which it occurred. Add the data column "Exchange of Trade" to your quote page to observe this. If you want to track trades on only a specific

exchange you can now do so with the InterQuote feed by adjusting the "requested exchange" for the instrument in Setup: Instruments. A requested exchange of COMP (composite) will cause the instrument to update when a trade occurs on any exchange. If a specific exchange is specified, only trades on that exchange will update the instrument. 18. Scan tokens added for InterQuote fundamental data items Scan tokens have been added to the RTL language to enable scans and signals to access the fundamental items now broadcast over the InterQuote data feed. The new tokens are listed below:

ASSETS	Balance sheet assets in millions.
LIAB	Balance sheet liabilities in millions.
DEBT	Balance sheet long term debt in millions
PSHARES	Preferred shares outstanding
IEPS	Latest interim EPS (quarterly EPS)
IEPSLY	Interim EPS year ago same period
CYRHI	High price current calendar year
CYRLO	Low price current calendar year

Investor/RT Version: 4.0 Rev 1, Release: Feb. 9, 2000

Trading Systems and BackTesting

Create trading systems and evaluate the performance of your trading rules using historical data.

Investor/RT now makes it possible to define a trading system. A trading system is composed of one or more trading rules. Each trading rule is in turn composed of a trading signal and an associated action such as buy, sell, sell short, etc. Trading signals are logical expressions (true or false statements) written in the Investor/RT Language (RTL). RTL is the language used to compose scans, custom indicators, and trading signals in Investor/RT.

Once a trading system has been defined in Investor/RT and given a name, the user can BackTest the trading system using historical data for one or more instruments. BackTesting refers to the actual execution of the trading system on a security, or set of securities over a given period of time. It simulates decision-making based on past data, and is effective in refining systems in order to optimize future performance. Upon completion of the BackTest, Investor/RT displays a summary and a detailed report of the performance of the trading system over the specified period. The user can make revisions to the trading rules, add or remove rules, or adjust the trading signals used in the rules, then BackTest again to see if the revisions improved the performance of the trading system. Here is a sample summary report for a simple trading system (maximize or resize the Help window wider to make the report easier to read).

IRT_TRADING_SYSTEM COMPUTER ASSOC INTL-Daily 08/03/98 - 12/30/99

Performance Summary: All Trades

Gross profit	\$15,905.00	Maximum Drawdown	2,312.50
Commissions	\$176.00	Average Drawdown	\$1,721.59
Net Profit	\$15,729.00	Ratio avg win/avg loss	1.97
Total # of trades	11	Percent profitable	81%
Number winning trades	9	Number losing trades	2
Largest winning trade	\$3,765.25	Largest losing trade	\$1,828.50
Average winning trade	\$1,969.97	Average losing trade	\$1,000.38
Largest winning long	\$3,765.25	Largest losing long	\$1,828.50
Largest winning short	\$0.00	Largest losing short	\$0.00
Number periods long	79	Percent periods long	22%
Number periods short	0	Percent periods short	0%
Max consec. winners	5	Max consec. losers	1
Avg # bars in winners	8	Avg # bars in losers	3

 BackTesting by Investor/RT, (c) 1996-2000 Linn Software, Inc. <www.linnsoft.com>

Investor/RT produces a detailed report showing the date (and time) each trade occurred, the signal that triggered the action, and account balance information at each entry and exit during BackTesting. Here is some sample detailed output:

```
IRT_TRADING_SYSTEM  COMPUTER ASSOC INTL-Daily 08/03/98 - 12/30/99

09/16/98 MACD_BUY: BUY 500 at 33 5/8.
09/29/98 STOPSIGNAL: SELLSTOP 500 at 37 1/4 to exit long with a gain of $1,796.50.
10/16/98 MACD_BUY: BUY 500 at 35 1/2.
10/22/98 STOPSIGNAL: SELLSTOP 500 at 39 1/8 to exit long with a gain of $1,796.50.
12/31/98 MACD_BUY: BUY 500 at 42 5/8.
01/08/99 STOPSIGNAL: SELLSTOP 500 at 48 5/8 to exit long with a gain of $2,984.00.
03/30/99 MACD_BUY: BUY 500 at 35 7/8.
04/23/99 STOPSIGNAL: SELLSTOP 500 at 39 13/16 to exit long with a gain of $1,952.75.
05/21/99 MACD_BUY: BUY 500 at 44 15/16.
06/04/99 STOPSIGNAL: SELLSTOP 500 at 49 15/16 to exit long with a gain of $2,484.00.
06/22/99 MACD_BUY: BUY 500 at 51 13/16.
06/25/99 MACD_SELL: SELL 500 at 51 1/2 to exit long with a loss of $172.25.
06/30/99 MACD_BUY: BUY 500 at 54 3/4.
```

07/14/99 MACD_SELL: SELL 500 at 55 3/4 to exit long with a gain of \$484.00.
08/16/99 MACD_BUY: BUY 500 at 48 3/16.
08/25/99 STOPSIGNAL: SELLSTOP 500 at 53 1/8 to exit long with a gain of \$2,452.75.
10/06/99 MACD_BUY: BUY 500 at 62 5/8.
10/11/99 MACD_SELL: SELL 500 at 59 to exit long with a loss of \$1,828.50.
11/04/99 MACD_BUY: BUY 500 at 59 3/16.
11/19/99 STOPSIGNAL: SELLSTOP 500 at 66 3/4 to exit long with a gain of \$3,765.25.
12/28/99 MACD_BUY: BUY 500 at 66 3/16.
12/29/99 END TEST: SELLSTOP 500 at 66 1/4 to exit long with a gain of \$14.00.

Creating a new trading system

To create a trading system, choose Setup: Trading System. The Trading System Definition window will appear. A menu of existing trading systems, if any, appears at the top of the window. Choose a system from the menu or click the "New" button to add a new system. Investor/RT will ask for a name for the new trading system. Enter a name up to 31 characters in length.

Defining Trading Rules

The next step is to define the trading rules for the system. As mentioned earlier, a trading rule is composed of a trading signal and a corresponding action. The middle section of the Trading System Definition window is used for this purpose. A list of available trading signals appears at the left. Moving right, several actions are listed that can be associated with a particular signal to form a rule. To the right of the actions are window controls for specifying the quantity (applicable to buy, sell short, and certain other actions), the price at which to perform the desired action (last, open, high, low, etc.) and the periodicity (daily, weekly, 1-minute, etc.) to use when BackTesting. At present Investor/RT requires that all rules in a trading system have the same periodicity. There is also a control for picking a "chart marker" to be used when viewing a trading system in a chart. This will be discussed in more detail below.

If no trading signals appear in the list, you must define the signals you wish to use in the trading system. Click the "New" button inside the "Define Trading Rule" area of the window to add a new trading signal. A signal setup window will appear for building the signal using RTL. For example, you may define the signal:

MACD1 < 0 AND MACD > 0

When prompted, setup the MACD as an oscillator with the desired periods. Save the signal under the name "MACD_BUY". This is a simple signal that triggers whenever the MACD oscillator crosses from below zero to above zero.

Similarly, you could add a "MACD_SELL" signal using the RTL formula:

MACD1 > 0 AND MACD < 0

When you close the signal setup window, the two new trading signals will appear in the signals list in the Trading System Definition window. Create rules by picking a signal and an action, specifying a quantity and a price if appropriate and clicking the "Add Rule" button. The newly added rule will appear in the list at the bottom of the setup window. For example, choose MACD_BUY as the signal, "BUY" as the action and enter a quantity of 500 at the "last" price. For now, set the periodicity for Daily data. After clicking "Add Rule" the new rule will read:

Daily: If MACD_BUY then BUY 500 at Last price

Similarly, add a rule to SELL when the MACD_SELL signal is triggered. Since "SELL" means sell the entire position to exit a long position there is no need to specify a quantity. For price we can use the average price for the day $(High + Low)/2$. This yields a new rule:

Daily: if MACD_SELL then SELL at $Hi + Lo/2$ price

These two rules actually make up a complete (but simplified) trading system. There is a rule for going long and another rule for exiting the long position. Both rules depend upon the MACD indicator. We can now test the system on past data (BackTest).

BackTesting Setup

First we must setup various BackTesting options. This is done in a separate window called the BackTest Setup window. Click the "Setup BackTest" button to access this window.

At the top of the window, specify a ticker symbol or a quote page to use for the BackTest. The "Maximum Position Size" settings are used when going long or short or adding to long or short positions to assure that no more than the maximum shares or contracts are purchased or shorted during any particular trade. Enter the commission and fees to access on entry and exit of trades during the BackTest. Use the "BackTesting Period" controls to specify the time period over which to run the BackTest. Investor/RT will attempt to load data for the specified period from the database but may use less data if historical data is unavailable for a portion of the requested period. A space is provided for user comments. Comments are stored with the trading system for future reference. Click OK to return to the Trading System Definition window or click the BackTest button to run the BackTest. For convenience, there is a BackTest button on the Trading System Definition window as well.

Trading Rule Actions

So far we have illustrated the use of BUY and SELL actions in trading rules. There are eleven actions available for forming trading rules. Each action is listed below with a description:

BUY

Buy to open a long position, specify quantity and price type

SELLSTOP

Sell to exit a long position, specify the selling price type

BUYMORE

Buy to add to a long position, specify a quantity and price type

REVERSE

Exit long position (SELL) and open a short position (SELLSHORT), specify a quantity to short and a price type.

SELL

Sell to exit a long position, specify quantity and price type

SELLSHORT

Sell to open a short position, specify quantity and price type

BUYSTOP

Buy to exit (cover) a short position, specify the price type

SELLMORE

Sell more to add to a short position, specify a quantity and price type

REVERSE

Exit short position (COVERSHORT) and open a long position (BUY), specify a quantity to buy and a price type.

COVERSHORT

Buy to exit (cover) a short position, specify the price type

CONFIRM

A special action that causes I/RT to confirm the signal by testing the next rule in sequence. The rule following a CONFIRM rule will only be tested if the CONFIRM rule signals "true". Any number of CONFIRM rules can be stacked in succession. Once any

CONFIRM rule tests "false", rule testing continues with the next "non-CONFIRM" rule in sequence. The CONFIRM action is essentially a way of combining signals that must all be true for some other ultimate action to be taken. This makes it possible to write simpler signals and then combine them in various ways in a trading system.

Notice that SELL and SELLSTOP do essentially the same thing, as do COVERSHORT and BUYSTOP. The actions are provided to clearly distinguish between rules for exiting a position pre-maturely (i.e. a stop loss rule) and rules for exiting normally when the trading system issues an exit signal.

Modifying Rules - Visual Markers

Each trading rule has an associated visual marker. To specify a rule's marker, click on the marker control box in the Trading System Definition window. First click on a rule to select it for modification. Then change the marker and click "Modify Rule" to record the change. You can also change the action, quantity, and periodicity of a rule in the same way. Notice that when you click on any rule, all of its current settings including the action and signal, quantity, marker, and price type if applicable, are shown in the window.

To view the signals historically for the selected rule click the "Chart Rule" button. A chart window will appear with markers showing each bar where the rule's trading signal tested "true". Similarly, clicking the Chart System button shows a chart of the entire list of trading rules. It is important that you specify distinct markers and/or marker colors for each trading rule so each rule's signals will be distinguishable in the chart window.

Creating Signals

Several new tokens have been added to the Investor/RT Language (RTL) for use in composing trading signals. The new tokens are listed below with a brief description.

POS_STATE

A numeric code indicating whether the backtest is long (1), short (2), or out of the market (0).

ENTRY

The price at which the current position was entered.

BARSOPEN

The number of bars (periods) that the current position has been open.

MINOPEN

The number of minutes that the current position has been open. This token would be used only in intra-day trading system backtesting.

DAYSOPEN

The number of days that current position has been open. This token would be used in daily/weekly/monthly trading systems, and may be useful at times in intra-day systems.

STOP Stop price. A variable the user may calculate and set using the SET command and use in a stop loss rule. Note that when a position is long, the STOP price can only be set higher by the SET command. Conversely, when short, the STOP price can only be set lower by the SET command.

PCTGL

The percent gain/loss in the position. Negative numbers mean "loss percentage". The PCTGL value does not take commission costs into account just the price movement from the entry price to the current last price.

GL

The gain/loss in dollars for the position.

POS_SIZE

The size of the current position, i.e. the number of shares or contracts long or short. The number is negative if the position is short. Use ABS(POS_SIZE) as appropriate in your trading signals.

POS_COST

The dollar cost of the current position.

Using these tokens in the trading signals within a trading system allows the user to compose decision criteria that take into account: the entry price, the current stop price, the number of bars or minutes or days the position has been open, the position size and/or cost and the profitability of the position at any stage.

Major New Feature: Custom Indicators

Investor/RT 4.0 introduces Custom Indicators, a powerful new feature that enables to Investor/RT user to add customized technical indicator formulas and graph them in chart windows. A custom indicator is an arithmetic expression (formula) that can be graphed in an Investor/RT chart. The language used to specify the formula for a custom indicator is essentially the same language used to specify Scans, with a few powerful extensions. The Scan Language has been extended in Investor/RT 4.0 to enable any built-in technical indicator to operate on any arithmetic expression, including other technical indicators. A quick example will illustrate the power of this major extension of Investor/RT:

Suppose you want to use a triple smoothed RSI indicator in your analysis. Investor/RT has a built-in RSI indicator, but the built-in RSI has only one smoothing option, not three. This calls for

a Custom Indicator. Choose "Custom Indicator" from the Setup Menu. The Custom Indicator Setup window is similar to the Scan Setup window. It has the same list of primitives on the left and an entry box for writing the expression (formula) for the Custom Indicator. Type in:

$$\text{MA}(\text{MA}(\text{MA}(\text{RSI})))$$

and click the "Check" button to check the expression for correctness. Investor/RT will prompt you for the RSI and MA parameters and add the MA and RSI tokens to the list on the right automatically. This is a new convenience feature in 4.0 for writing both scans and custom indicators. It not necessary to first list all the elements you wish to use in a scan or custom indicator. Simply write the formula using the tokens as listed in the left side list and Investor/RT will add them to the list of indicators on the right automatically.

Now click "Save" and give the custom indicator a name, say "TRIPLE_MA_RSI".

Finally, click "Chart" to add the TRIPLE_MA_RSI custom indicator to the current chart window. Custom indicators, like built-in technical indicators are saved with the chart when you save it.

In order to calculate and graph the TRIPLE_MA_RSI indicator, the expression MA(MA(MA(RSI))) is evaluated by Investor/RT as follows:

- Calculate the RSI using the instrument data under study in the chart window.
- Perform the MA function on the RSI line produced by step 1.
- Perform the MA function again on the smoothed RSI line produced by step 2.
- Perform the MA function again on the double-smoothed line produced by step 3 to produce the triple smoothed RSI line.
- Draw the triple smoothed line produced in step 4.

Notice that the smoothing is performed three times in succession using the same moving average specifications, i.e. if the token MA is setup as a simple-9-period moving average, then the RSI will be smoothed three times using a simple-9-period average. If different smoothing specifications are desired for each moving average, add the MA token three times to the list of tokens, giving each MA it's own specification. Then re-name the MA tokens MAa, Mab, and MAc. Finally, edit the formula to read:

$$\text{MAc}(\text{MAb}(\text{MAa}(\text{RSI})))$$

Click the "Save" button to save the revised definition of TRIPLE_MA_RSI, Investor/RT will automatically update the chart with the revised custom indicators, evaluate for formula, and redraw the chart using the new definition.

Built-in indicators can be used either as tokens in expressions, as in:

$$(\text{MA} + \text{CL})/\text{HI}$$

or they may be used (invoked) to operate on any arbitrary expression as in:

$$\text{MA}(\text{HI} + \text{LO})/2$$

In the first case $((\text{MA} + \text{CL})/\text{HI})$, the MA is calculated using the instrument data in the chart. In the second case, MA is followed immediately by a left parenthesis. This indicates that the MA technical indicator is to operate on the expression that follows (not on the instrument data itself). So Investor/RT first calculates an array of data using the formula $(\text{HI} + \text{LO}/2)$ and then it calculates the moving average of that array using the specification for MA, and draws the result.

The statistical functions (MIN, MAX, AVG, SUM, and STD) have been revised in Investor/RT 4.0 to behave much like built-in technical indicators. (The SUM function is new in 4.0). These functions take two parameters, an expression and a number representing the number of periods. For example $\text{MAX}(\text{HI}, 5)$ graphs as a line where each point on the line is the maximum HI in the preceding five periods. The formula $\text{SUM}((\text{RSI} > 70), 9)$ draws a line that tells how many times the RSI has been over 70 during the preceding 9 periods. The statistical functions can also be used to operate on any expression, for example:

$$\text{MAX}(\text{RSI}(\text{MA}(\text{HI})), 5)$$

In this example, Investor/RT first calculates the moving average of the HI prices and then calculates an RSI on that moving average. Finally the MAX function is evaluated to draw a line showing the maximum RSI value calculated in the preceding five periods.

The scan language has been extended to recognize the same extensions when composing scans. In other words, custom indicator calculations can also be used in scan requests to test for trading signals. For example the scan:

$$\text{MAX}(\text{RSI}(\text{MA}(\text{HI})), 5) > 70$$

finds all instruments having a MAX RSI of 70 or higher in the last 5 periods. If you add that scan to chart using the Scan technical indicator, Investor/RT will display markers on the chart wherever the expression is true. Similarly, $\text{SUM}((\text{RSI} > 70), 21) > 10$ finds all instruments whose RSI has exceeded 70 in at least 10 of the preceding 21 periods.

A word about efficiency: Where possible always use built-in technical indicators because they calculate much faster than custom indicators. For example, the custom indicator $\text{RSI}((\text{HI} + \text{LO} + \text{CL})/3)$ will draw the exact same line as the built-in RSI indicator, assuming the built-in indicator is setup to operate on the HLC/3 price. In the triple smoothed RSI example above, the custom indicator:

$$\text{MA}(\text{MA}(\text{MA}(\text{RSI})))$$

can be made more efficient by writing it as:

MA(MA(RSI))

assuming you setup RSI to calculate and perform the first smoothing using the same smoothing parameters as MA uses.

Using Relational Expressions in Custom Technical Indicators. As indicated in a few of the examples above, relational expressions (those involving comparison operators like less than or greater than) can be used in custom indicators. The formula $SUM((RSI > 70) , 9)$ for example, first evaluates $RSI > 70$ for each point in the chart. Conceptually, this produces a series of data points where 0 indicates the condition is false and 1 indicates true. The $SUM(x, y)$ function then sums these zero and one values for the preceding 9 periods for each point in the graph. The result will be a line whose value ranges between 0 and 9 where each point on the line tells you how many times in the preceding 9 period that RSI has been above 70.

Window tiling

The Tile command in the Windows menu was enhanced to make it easier to quickly arrange (tile) an array of open chart windows for slide show use. The Tile menu item is now a submenu. You can choose to tile:

- All traditional chart windows (i.e. line, bar candlestick types)
- All Chart Windows (i.e. all charts including the "special" chart window types)
- Quote Page
- Level II Windows
- All Windows

The keyboard shortcut Alt-T (Command-T on Macintosh) issues the Tile: Charts command, tiling only the traditional chart windows. Holding down the shift key while typing Alt-T or Command-T invokes the Tile: All Windows command. The new submenu gives the user more control over which subset of the open windows are tiled. For now, the Tile Vertical and Cascade command still operate on all open windows.

Linear Regression indicator enhanced

The regression indicators has been enhanced to provide a "Use Last ___ Periods" options. When selected, the regression line is dynamically calculated on the last number of periods specified. In other words, the linear regression is always performed on the most recent bars. During intra-day trading the regression line remains anchored to the right end of the intra-day chart.

Live Three-Line Break Charts

If you choose for the Three-Line Break Chart to be "Live", Investor/RT will first compute the standard chart based on the viewing period and periodicity selected. Then, a vertical line is drawn just to the right of the last column that resulted from processing historical data. As ticks start coming in, they will be processed and appended to the chart. For example, if you have a 10 minute chart, everything to the left of the line will be based on processing the last price of the historical 10 minute bars. Everything to the right will be the result of live tick data from that point forward. The chart is labeled based on the periodicities just to the left and right of this line. To recalculate (compress) the chart, ctrl-click anywhere in the chart. If the "live chart" checkbox is unchecked, the chart will simply process a tick at the end of every period. For example, if you have a 1-minute period specified, the chart will only receive and process the closing price of each minute.

The Three-Line Break Chart is similar in concept to the Point and Figure Chart. The decision criteria for determining "reversals" are somewhat different. The three-line break chart looks like a series of hollow and filled blocks of varying heights. Each new block, like the X's and O's of a Point and Figure Chart, occupies a new column. Each block is also called a "line". Using closing prices, a new rising (white) block is drawn if the previous high is exceeded. A new falling (black) block is drawn if the price hits a new low. If a rally is strong enough to create three consecutive rising (white) blocks, then price must fall below the lowest point of the previous three rising (white) blocks lines before a new falling (black) block is formed. Conversely, if a sell-off is strong enough to create three consecutive falling (black) blocks, then price must rise above the highest point of the previous three falling (black) blocks lines before a new rising (white) block is formed. The term "three line break" comes from the criterion that the price has to break the high or low of the previous three blocks in order to reverse and create a block of the opposite color. Three-line break charts are described in detail in chapter 6 of Steve Nison's book *Beyond Candlesticks*.

The left to right spacing of the columns may also be adjusted using the up and down arrow keys on the keyboard. The last trade is shown in message area at the top of the chart.

Popup Menu and Toolbar

The popup menu can be accessed by right clicking anywhere in the chart window, and along with the toolbar, gives you quick access to tasks such as changing the periodicity or downloading data.

To save a Three-Line Break Chart object use File: Save from the menu bar. To switch the Three-Line Break Chart to a different instrument, simply begin typing the first few letters of the desired instrument's ticker symbol. An instrument selector window will appear automatically.

When the desired instrument is identified, press enter or return to switch the Three-Line Break Chart to the selected instrument.

Three-Line Break Charts use many of the same charting preferences as traditional time-based charts. Under Setup: Preferences, a new section called "Charting, Three Line" has been added for specifying global preferences when creating new Three-Line Break Charts. In the preferences window, you can specify the width of each column in pixels. You may also choose to draw horizontal "gridlines".

Viewing Period

Here is where you specify the period of data that you would like Investor/RT to use when developing your Three-Line Break Chart. For instance, if you are creating a 1-minute intra-day chart, you may specify that you want the last 3 days of data to be considered.

Live Three-Line Break Charts

If you choose for your Three-Line Break Chart to be "Live", then Investor/RT will first compute your standard chart based on the viewing period and periodicity you've selected. Then, a vertical line is drawn just to the right of the last column that resulted from processing historical data. Now, as live ticks start coming in, they will be processed and appended to the chart. So essentially, if you have a 10 minute chart.... everything to the left of the line will be based on processing the last price of the historical 10 minute bars, and everything to the right will be the result of live tick data from that point forward. The chart is labeled based on the periodicities just to the left and right of this line. You could then force the chart to re-compute itself (and likely compress itself) from historical data by Ctrl-clicking anywhere in the chart. If the "live chart" checkbox is unchecked, the chart will simply process a tick at the end of every period. So if you have a 1-minute period specified, the chart will only receive the closing price of each minute, instead of every tick.

The Tab Key Hitting the tab key will toggle "Live Message" on and off in the chart window. This can be helpful if you are trying to move your cursor over certain columns to get details and the message bar is being constantly updated with information about the live data that is coming in.

To create a new Three-Line Break Chart, choose File: New: Chart or click the chart icon on the main toolbar and pick "New". When the "Create New Chart" window appears, choose graph type " Three-Line Break ", set the desired time frame, select the instrument by double-clicking or select the instrument and click the OK button.

If you have a traditional chart window open, e.g. a bar chart with volume, and you wish to switch to a Three-Line Break Chart, just right click in the chart window and choose "Set Graph Type - Three-Line Break".

The names of saved Three-Line Break Charts will appear along with the name of traditional charts in the Objects: Charts menu and in the list selection window for chart objects. Like traditional charts, any saved Three-Line Break Chart may be saved as a part of a layout. Similarly, Three-Line Break Charts left open when quitting Investor/RT will automatically be opened the next time Investor/RT starts.

Three-Line Break Charts may be printed. Use the File: Print command in the menu bar or click the Print icon in main toolbar when the Three-Line Break Chart is the active window.

At present, Three-Line Break Charts may NOT be used in conjunction with the slide show feature of Investor/RT. This is an area for future development.

Chart cross hairs improvement

Hold down the control key (option key on Macintosh) while moving the mouse pointer inside a chart window to temporarily turn on cross hairs. When the control key is released, the cross hairs disappear. This new feature provides for cross hairs when you need them without the necessity of turning on the cross hair tool in the charting toolbar.

DDE (Dynamic Data Exchange) Improvement

On the Windows platform, improvements were made to the Dynamic Data Exchange support in Investor/RT. DDE linkage of Investor/RT market data to Microsoft Excel and other DDE client applications is now working properly. In Microsoft Excel, use the cell formula:

=RT | ticker ! column

- Ticker is a valid instrument ticker and column is the (abbreviated) name of any quote page column. Each time Investor/RT receives an update for the ticker, the resultant value of the specified column will be updated in the Excel spreadsheet.
- The column-designator can be the first few letters of a column, e.g. "la" for "last" or "quotedate" for "quotedatetime". Column-designators are not case sensitive so they may be typed in all lower case for convenience. The Feed Status window shows the number of DDE Links that are currently active and the number of times that DDE links have been updated by Investor/RT.

Chart popup menu access changed

Windows platform users must use the right-mouse-button to access the popup menu in chart windows. This behavior is more consistent with Windows conventions. Use the left-mouse-button to select an element in the chart window for editing or to "drag and drop" an element elsewhere, or simply to activate a chart window.

Window -> Close Menu has new menu items

The Close menu item in the Windows menu now has a sub-menu. Menu items are provided to close all windows or to close windows of a certain type. The choices are similar to the new Tile command sub-menu mentioned above.

Multi-session market profile Charts

The Market Profile displays a horizontally positioned histogram that graphs a time-price relationship for trade in a security. A letter designates each half-hour of the day. If a certain price is traded during a given half-hour, the corresponding letter is marked next to the price. The first half hour (or portion thereof) of trade will be noted with the letter A, the second half-hour will be noted with the letter B, and so on. The open price for the day is marked with the letter O. As price moves up and down each letter is marked only once at each price level. Pointing the cursor at a point on the chart causes the message box to reflect the price range for the selected column as well as the date if the chart happens to be a multi-session chart. Both Market Profile and Volume Profile charts may be printed.

Changing the Market Profile Instrument

With a Market Profile chart window open, to switch the window to a different instrument, begin typing the ticker symbol of the new instrument. An instrument selector window will appear to assist you. Keep typing the letters of the desired ticker symbol until the new instrument is identified in the selection window. Then press enter or return.

Adjusting Market Profile Preferences

To adjust the default settings for new Market Profile charts use Setup:Preferences: Market Profile

To adjust the settings of an open Market Profile Chart window, right click or double-click in the Market Profile window. (Macintosh users command-click). The preferences window will appear.

Popup Menu and Toolbar

The popup menu can be accessed by right clicking in the chart window, and along with the toolbar, gives you quick access to performing certain tasks, such as switching to a different chart type, downloading data, or displaying the View/Edit window.

Market Profile Preferences

"Show bar with N range"

This allows you to set a price range, N, for each bar. For instance, if you specified a range of 1/2, then all the ticks between 25 1/2 and 26 would be considered in creating one market profile bar.

"Show all realized prices"

This option will create a bar for each individual price that was realized during the session. You may want to start the session with this option checked, and later in the session, change the bars to a range when your chart gets too crowded vertically.

"Use last session and previous N sessions"

This option allows you to create a multiple session Market Profile Chart. You just specify here how many additional sessions (N) you would like to display on the chart window. You may have to resize the window vertically or horizontally to get a proper picture once the multi-session chart is created. Tick data must be available for each session in order to create the Market Profile Chart for that session.

"Put each letter in a separate column"

You may want to spread the chart out and view each letter in it's own column. This will give the chart more of a Point and Figure look, and give you an easier indication of the direction of the price movement during each time interval.

"Condense Histogram"

This option allows you to condense your chart by eliminating any price ranges with no ticks associated. If all bars contain ticks, the chart will not be condensed.

"Color Tint"

You may choose from 7 different color tints for the letters in the profile. You should choose a tint that contrasts with your background color.

"Shading"

If you have this option checked, as the session progresses, you will notice the letters becoming a darker shade of the color you selected. This gives you an added visual representation of the different time ranges.

"Superimpose Volume Histogram"

The Market Profile chart optionally shows (superimposes) a volume histogram in the background of the window. This essentially provides for a Volume Profile/Market Profile chart in a single window.

"Highlight tick volume at or above..."

When the volume histogram is displayed, the volume bar is shown in two shades depicting the total volume due to block trades vs. small trade. The user can specify the tick volume limit at which the trade is considered a block trade.

"Time per letter"

This user option specifies the time in minutes depicted by each letter in the Market Profile. Prior to Investor/RT 4.0, each letter always represented 30 minutes.

"Show Gridlines"

Check this box if you want gridlines in the market profile window.

Showing and Hiding Toolbars

Prior to version 4.0, when a new window of some type was opened, the toolbar for that window type would always become visible. In version 4.0, toolbars that have been explicitly hidden will remain hidden when opening new windows (or layouts). Some window types such as charts, quote pages, and portfolios, have a toggle button (a plus sign) for recalling the associated toolbar. Toolbars can also be opened or closed using the Windows: Toolbar menu. Once the user hides (closes) a particular toolbar type (e.g. the quote page toolbar), that toolbar will remain hidden until the user specifically activates it again.

Improved window maximization

When maximizing windows, Investor/RT assures that the maximized windows does not obscure the main toolbar when the main toolbar is "anchored" at the top of the screen. If the main toolbar is hidden or "floating", maximized windows fill the entire screen.

Improved trading note entry

Clicking the "New Note" button (or pressing the return key) in the Trading Notes window now presents a dialog box for entering the text of a new trading note. Enter the text and press return to add the new note. Prior to version 4.0, Investor/RT required an extra editing step to add the note text. The new dialog box makes it possible to quickly add a trading note to an instrument with minimal use of the mouse. For example, suppose you are viewing a chart of MSFT and decide to add a trading note for this stock.

1. Click the "Trading Notes" icon on the chart toolbar. This opens the trading notes window and selects MSFT automatically.
2. Press the return key to add a new trading note. A dialog box appears prompting for the text of the note.
3. Enter the text and press the return key to add the note.

4. Press the esc key to dismiss the trading note window and return to the chart.

Alarm data columns in quote pages improved

The quote page columns HiAlarm, LoAlarm, and VolAlarm are now displayed with exclamation points if the alarm has been triggered. If the high or low alarm level is on the bid or ask, the quote page display will show a B or A following the price to so indicate. Here are some samples for the HiAlarm value and the associated meaning:

33 1/8 B	-- alarm is set for bid price of 33 1/8 or higher
33 1/8 A	-- alarm is set for ask price of 33 1/8 or higher
33 1/8	-- alarm is set for last trade of 33 1/8 or higher
33 1/8 B !!	-- alarm was triggered. The bid reached 33 1/8 or higher

Portfolio Reporting Improved

With a portfolio window open, click the "Portfolio Reports" button on the portfolio toolbar. The Portfolio Reports window will appear. Select one or more reports and click the "Report" button to view the report(s). At present, there are four reports available: (1) Audit Trail (2) Closed Position Detail, (3) Closed Position Summary, and (4) Asset Allocation Report. The number keys 1 through 4 are shortcuts for selecting or deselecting the associated report. These are the same reports that have been available for some time in Investor/RT. The Close Position Detail report has been improved to show the entry and exit price per share for each closed position. Further, reports 1-3 can now be viewed for a variety of times spans. This limits the reports to all activity that has occurred within the current year, the current quarter, the current month, week, or day. Selections are also available for "Last Year" and "All Years". In future releases we will be adding additional report types for selection from this window.

The order desk window now "remembers" that last order type that was entered by the user and will always open up with that order type selected. Prior versions always opened up the order desk with "Market Order". Users who typically use journal entries to update their portfolios will no longer have the extra step of switch the order type from market order to journal entry.

A bug was fixed in the portfolio manager that was causing Investor/RT to deduct commission expenses from the portfolio cash balance even when the user performed a "journal entry".

Scan/Custom Indicator Improvements

When entering the formula for a custom indicator or a scan request, Investor/RT does NOT require that you first identify the tokens you wish to use. When you click the "Check" button to check the formula for correctness, Investor/RT will automatically identify the tokens you have used in the scan or custom indicator and list them in the box on the upper right side of the

window. Further, tokens and functions may now be entered in lower or upper case. Data tokens such as (OP, HI, LO, CL, MA, etc.) will be converted to uppercase if typed in lower case. The arithmetic functions (ABS, MIN, MAX, SUM, LOG, etc.) may now be entered in all upper or all lower case, e.g. min and max mean the same as MIN and MAX, but note that Min or Max are both invalid.

The Tokens menu now inserts function templates into the scans request. For example, choose MAX and the template:

MAX (exp, n)

appears in text entry area. You can then double-click on "exp" to highlight the placeholder and begin typing the expression to be used as input to the MAX function. Next double-click on "n" and replace it with a number of periods to use in the MAX function.

Trend lines in Point & Figure Charts

Investor/RT provides classic Point and Figure Charting. Daily, weekly, monthly, and intra-day Point and Figure Charts are supported. All charts may be appended with live tick-by-tick activity if desired.

A Point and Figure Chart window shows price movement and reversals as columns of X's and O's. The X columns represent periods of rising price movement, the O columns falling prices. New columns are added whenever the price trend changes according to user specified reversal criteria. Each X or O represents a realized price change of a certain user specified amount, called the box size. The reversal criterion is then expressed in terms of the number of box sizes the price must move in the opposite direction to warrant starting a new column.

Point and Figure Chart windows show the X's and O's for one instrument. Pointing the mouse pointer at a particular column causes the message area at the top of the window to display the price and time that the trend began and ended. Since a column's start and end time is determined strictly from price movement, there is no horizontal axis per se. The vertical scale is drawn on the left. Double-clicking (or right-clicking/command-clicking) inside a point and figure window opens a familiar chart preferences window in which you may adjust the view period, change the box size or reversal criterion, adjust color settings, and change the name of the chart object.

Trendlines

You can create trendlines on a Point and Figure Charts by clicking in the chart and dragging while holding down the Ctrl and Shift keys together. The trendline will anchor itself between the column and price position where you first clicked, and the column and price position where you last released the mouse. The price will round off to the

nearest multiple of 1/2 the box size. The trendline will extend itself in both directions to the edge of the chart. You may add up to ten trendlines to your chart. Remove all trendlines by double-clicking in the chart while holding down both the Ctrl and Shift keys.

Horizontal reference lines

Create horizontal reference lines on a Point and Figure Charts by clicking in the window while holding down just the Shift key. The line will position either in the middle of a box, or at the top of a box, whichever it is closest to. You can add up to 10 horizontal reference lines. To remove a reference line, shift-click on the reference line again. To remove all reference lines, shift-double-click anywhere in the chart.

The column spacing may also be adjusted using the up and down arrow keys on the keyboard. The reversal criterion may be adjusted as well using the left and right arrow keys on the keyboard. The rightmost (most current) column will show a horizontal dash drawn through the X's or O's to indicate the current trading price. The last trade is also shown in message area at the top of the chart. A vertical line next to the last column indicates the current bid and ask range.

Popup Menu and Toolbar

The popup menu can be accessed by right-clicking anywhere in the chart window, and along with the toolbar, gives you quick access to tasks such as changing the periodicity, the box size, or downloading data.

To save a Point and Figure Chart object use File:Save from the menu bar. To switch the Point and Figure Chart to a different instrument, simply begin typing the first few letters of the desired instrument's ticker symbol. An instrument selector window will appear automatically. When the desired instrument is identified, press enter or return to switch the Point and Figure Chart to the selected instrument.

Point and Figure Charts use many of the same charting preferences as traditional time-based charts. Under Setup:Preferences, a new section called "Charting, Pt. & Fig." has been added for specifying global preferences when creating new Point and Figure Charts. In the preferences window, you can specify the box size, reversal criteria, and width of each column in pixels. You may also choose to draw horizontal "gridlines".

Viewing Period

Here is where you specify the period of data that you would like Investor/RT to use when developing your Point and Figure Chart. For instance, if you are creating a 1-

minute intraday chart, you may specify that you want the last 3 days of data to be considered.

Live Point and Figure Charts

If you choose for your Point and Figure Chart to be "Live", then Investor/RT will first compute your standard chart based on the viewing period and periodicity you've selected. Then, a vertical line is drawn just to the right of the last column that resulted from processing historical data. Now, as live ticks start coming in, they will be processed and appended to the chart. So essentially, if you have a 10 minute chart.... everything to the left of the line will be based on processing the last price of the historical 10 minute bars, and everything to the right will be the result of live tick data from that point forward. The chart is labeled based on the periodicities just to the left and right of this line. You could then force the chart to recompute itself (and likely compress itself) from historical data by Ctrl-clicking anywhere in the chart. If the "live chart" checkbox is unchecked, the chart will simply process a tick at the end of every period. So if you have a 1-minute period specified, the chart will only receive the closing price of each minute, instead of every tick.

The Tab Key

Hitting the tab key will toggle "Live Message" on and off in the chart window. This can be helpful if you are trying to move your cursor over certain columns to get details and the message bar is being constantly updated with information about the live data that is coming in.

To create a new Point and Figure Chart, choose File:New:Chart or click the chart icon on the main toolbar and pick "New". When the "Create New Chart" window appears, choose graph type "Point & Figure", set the desired time frame, choose the instrument by double-clicking or select the instrument and press the OK button.

If you have a traditional chart window open, e.g. a bar chart with volume, and you wish to switch to a Point and Figure Chart, just right click in the chart window and choose "Set Graph Type - Point and Figure".

The names of saved Point and Figure Charts will appear along with the name of traditional charts in the Objects:Charts menu and in the list selection window for chart objects. Like traditional charts, any saved Point and Figure Chart may be saved as a part of a layout. Similarly, Point and Figure Charts left open when quitting Investor/RT will automatically be opened the next time Investor/RT starts.

Point and Figure Charts may be printed. Use the File:Print command in the menu bar or click the Print icon in main toolbar when the Point and Figure Chart is the active window.

At present, Point and Figure Charts may NOT be used in conjunction with the slide show feature of Investor/RT. This is an area for future development.

Portfolio formats added

A new button has been added to the portfolio toolbar to enable changing the column format of the portfolio, similar to the "Change Format" feature of the quote page window. First, the user must create one or more portfolio formats using Setup: Preferences: Formats, Portfolio. Note there are now two format definition windows, one for quote page formats, the other for portfolio formats. Like quote pages, a portfolio format may have up to 30 columns. Choose the desired columns in left to right sequence.

When you click the "Change Format" button a list of format names appears. You can select a format and click "Apply" to see the effect while leaving the format selector window open.

If you hold down the shift key while clicking the "Change Format" button Investor/RT will take the format of the current portfolio window and insert it into the "Setup: Preferences: Formats, Portfolio" setup window.

Quote page format setup improved

The "Change Format" button on the quote page toolbar has been similarly improved (see item Portfolio formats Added above) to make it easier to setup a user defined quote page format. Open a quote page and add columns and/or adjust the positioning of columns using the mouse. Then shift + click on the "Change Format" button on the quote page toolbar. The "Setup Quote Page Format" window will appear with the current list of data columns listed on the right. Adjust the column order or make other changes as desired, then click "Save" to give the format a name. This saved format can then be applied to other quote pages using the "Change Format" button (without shift).

N-Line Break Charts now supported

The "three-line break" chart type in Investor/RT has been generalized to support N-line break charts where N is a user specified number. The preferences for "three-line break" now contains an entry box titled "Reversal (#lines)" where the N value is specified. This generalization of the three-line break chart is discussed in Steve Nisson's book, Beyond Candlesticks.

Scan language improvement

The scan language has been improved to allow testing of historical values or properties of fixed instruments during the scan. For example, suppose you wanted to see a list of stocks that were performing better than the Dow Industrials over the last 5 day period. The scan request:

$CL/CL5 > CL(INDU)/CL5(INDU)$

would identify all issues whose 5-day performance is better than INDU (INDU is assumed to be the ticker for the Dow Jones Industrials in this example-some data services use \$INDU). Similarly the scan request:

$PE < PE(IBM)$

Identifies stocks whose PE Ratio is lower than IBM's. Any Historical or Primitive Data Element in the scan language may now be qualified by specifying a ticker symbol after the token enclosed in parentheses. During the scan run, all such tokens will be evaluated based on the properties or historical values of the specified instrument, while unqualified tokens will be evaluated using data for the instruments in the subject quote page.

Note that scans containing specific references like this can also be added to charts using the Scan Markers technical indicator.

Automatic downloading for Pt. & Figure Chart

Point and Figure and Three Line Break charts now have an automatic downloading option similar to time-based charts. The default setting is specified in Setup: Preferences: Charting, Pt. & Figure. The setting can also be adjusted for a particular Point and Figure or Three Line Break window using the Preferences window for the particular chart window.

Two new line chart types introduced

Connect line and continuous line charts can now be graphed using two new "Price Types". The first is called "OHLC/2". This type of line draws a price line that is the average of the open, high, low, and close prices for each period. Investor/RT also supports line charts of "(Hi + Low + Close) / 3" and "(Hi + Lo)/2". The second new line price type is "% change". This type of line chart draws a line that represents the percent change in price since the first period for the instrument. For example, if you chart a %change line in a daily chart of the INDU, and the chart contains data for the past year, each point on the line indicates the percentage change in INDU over the preceding year. If you adjust the charts "Viewing Period" to begin January 1, 1999, then the %change line starts at zero on January 1 and shows the %change since the price on January 1 for each succeeding day.

The %change line chart is a very convenient way to compare the relative performance of any number of instruments graphically. For example, add IBM, AAPL, MSFT, and INDU instruments to the same chart, charting each instrument as a %change line and giving each line a different color. Set the View Period of the chart to Daily with a begin date of January 1, 1999. The chart will show the relative performance of all issues since the beginning date of the chart. Adjust the begin date of the chart to observe relative performance over literally any period you like.

Scan Language debugging

A new feature has been added to the Scan Setup window and Custom Indicator Setup window to enable the user to see how Investor/RT analyzes (parses) the scan request or custom indicator formula. This tool can help pin point errors in the formulation of more complicated scan requests and custom indicators. If the control key (option key on Macintosh) is held down while clicking the "Check" button in the Scan Setup or Custom Indicator Setup window, Investor/RT will check the syntax of the request or formula and copy a report to the clipboard and show the clipboard. For example, the custom indicator formula:

```
MAX(CL-3.6*TR,10)
```

will display the following results:

Parsing: MAX(CL-3.6*TR,10)

#1. Evaluate: T1=3.60 * TR

#2. Evaluate: T2=CL - T1

#3. Result is: T3=MAX(T2, 10)

Custom Indicator "maxcl36tr" is okay.

- *The numbered lines in the display show the steps Investor/RT will follow to evaluate the formula when drawing the custom indicator or running the scan. If the formula has some kind of syntax error, the list of steps may be incomplete. This will give you a clue as to where the syntax error lies in the scan request since the display will stop at the point where the error in the syntax was found.*

Sharing Custom Indicators with other users

Custom Indicators, like scans, can be saved as text using the Save as Text command in the File menu. The resulting text file can be emailed to Linn Software for support related matters or the definition file can be used to exchange custom indicators with other Investor/RT users. The recipient of a scan or custom indicator definition file can use the Open: File command in the File menu, to import the scan or custom indicator into their IRT system. When a definition file is opened in this fashion, Investor/RT will prompt the user for any required technical indicator preferences associated with the scan or custom indicator.

New Scan SET function for settings alarms

The scan language now includes a SET function that can be used to set alarm levels and monitoring options for all instruments in a quote page. This is a very powerful extension since literally any user-define formula can be used to calculate and set alarm levels for any list of instruments. The resulting alarms levels are then monitored tick-by-tick. Prior to the

introduction of this feature, technical alarm level conditions either had to be tested in an auto-scan or the calculated alarm levels had to be entered manually after running a scan request to calculate them.

The SET function has the following format:

SET(property, expression)

Where property can be HIALARM, LOALARM, VOLALARM, PREV, MON, or FLAG. Expression is a numeric constant or formula whose resulting value is used to set the value of the property. Here are some examples:

SET(HIALARM, (HI1 + HI)/2) Sets the HIALARM of every instrument in the source quote page to the average of the current and previous high.

SET(LOALARM, CL - 1.3 * TR)

Sets the LOALARM of each instrument to current price minus 1.3 times the current value of the TR (true range) indicator.

SET(PREV, CL1)

Set the Previous Close value of each instrument to the closing price as recorded in the Investor/RT database.

SET(MON, value) and SET(FLAG, value)

Are used to set alarm flags and monitoring options for the instruments in a quote page. To facilitate using SET(MON,...) and SET(FLAG,...), the scan language now includes a list of pre-define numeric constants that can be used within the SET command as the value parameter. The list of available numeric constants can be viewed within the Scan setup window by choosing Numeric Constants and Flags from the "Show" menu in the upper left of the window. The list includes LARM_GE, a flag used to turn on hi alarm monitoring, e.g. SET(FLAG, ALARM_GE). ALARM_LE is a flag used to turn on lo alarm monitoring, e.g. SET(FLAG, ALARM_LE). ALARM_ASK_GE and ALARM_ASK_LE similarly turn on hi and lo alarm monitoring using the ask price while ALARM_BID_GE and ALARM_BID_LE do the same for the bid. ALARM_RESET is a flag used to clear any alarms that have triggered.

Four constants are pre-defined with names beginning with "MON" for use in setting monitoring options: MON_DAILY, the flag used to turn on monitoring of daily historical data, e.g. SET(MON, MON_DAILY). MON_WEEKLY, MON_MONTHLY, and MON_INTRA flags turn on weekly, monthly, and intra-day monitoring, respectively.

To turn off a flag use a minus sign before the constant, e.g.

```
SET(MON, -MON_INTRA)
```

turns off intra-day monitoring for all instruments in the subject quote page.

Each SET statement in a scan request is considered a "true" statement, thus two or more SET statements connected with "and" perform a series of set operations. For example, the scan request:

```
SET(HIALARM, (HI1 + HI)/2) AND SET(MON, MON_INTRA) AND SET(FLAG, ALARM_RESET) and SET(FLAG, ALARM_GE)
```

Sets the high alarm values, resets all alarms and turns on high alarm monitoring and intra-day monitoring for each instrument in the subject quote page.

Other miscellaneous numeric constants, Pi, e, G

Pi = 3.1415927, the ratio of the circumference of any circle to its diameter

e = 2.7182818, the base of natural logarithms

G = 1.6180339, the "Golden Ratio"

Periodic display of DOW, NASD Composite, and S&P

Once a minute, Investor/RT displays the current quote of the Dow Jones Industrial Average, NASD Combined Composite Index, and the S&P500 Index on the main toolbar. Prior to 4.0, only the Dow was displayed. This feature is activated only when the appropriate ticker symbols are defined to Investor/RT. If, for example, you only follow the S&P, then only the S&P 500 Index will be shown every minute.

New scan token, CNUM

The quote page data column "User Data" can now be used to pass a user defined number for each instrument to the Investor/RT Language using the CNUM token. For example, you could use the user data column to record the number of shares owned of each issue and then incorporate the number of shares into a scan request or custom indicator. The custom indicator CL*CNUM would then show a line of the dollar value of a stock position, for example. Another usage would be some kind of "weighting factor" unique to each instrument that is used as a multiplier in the scan request or custom instrument calculation. Yet another example would be a "reference price", for example, the price at which you bought a stock. You could then use CNUM - CL in the formula for a of gain/loss calculation. See item #34 below for a related capability for a scan to set a value for display in a quote page.

File: Save as Excel menu item

This new command saves the current quote page in a special format for creating a dynamically linked excel spreadsheet from an Investor/RT quote page. The resultant text file can be opened by Microsoft Excel to view the Investor/RT quote page in Excel with dynamic updating of Investor/RT data columns. This is accomplished by DDE (Dynamic Data Exchange) on the Windows platform or by Linn Software's Spreadsheet Link on the Macintosh platform. For Investor/RT users familiar with using the =RT cell formula for linking Excel cells to Investor/RT data, the Save as Excel command essentially produces all of the =RT formulas for you. When opening the text in Excel follow the Excel prompts to process the file as "tab delimited text". Reply "Yes" if you are asked whether to "update all linked information".

View/Edit of intra-day minute bar data

The view/edit window (Control: Data Management: View/Edit) now supports editing of minute bar data. Formerly only daily, weekly, monthly, and tick data could be editing. When the user has elected to compact longer term intra-day data into bars for retention on the database (see Setup : Preferences: Historical Preferences), the view/edit window will allow editing of minute bar data that has the same periodicity in minutes as the compaction interval specified in the historical preferences.

InterQuote News Feed

Investor/RT 4.0 now supports InterQuote news feed. News alerts for tracked symbols are supported. News Ticker and News Browser windows are now operational. Double-clicking on a headline will request the full text of the news item from the InterQuote news server. InterQuote users be sure to specify your news retention settings in Setup: Preferences: News Preferences.

Multi-chart slide shows now supported

Version 4.0 supports multi-window slide shows. Slide shows are initiated in the usual way by clicking the slide show icon on the chart toolbar. As the slide show proceeds from instrument to instrument, the instrument is inserted into all chart windows. In prior releases, only the active chart window was updated. Chart windows can include traditional chart windows (line, bar, candlesticks), or any of the special chart window types: point & figure, three-line break, raw tick, day bar, market profile, and volume profile chart windows. Each chart window can have any periodicity, thus for example, you can do a slide show studying each issue in several time frames. The new multi-chart slide show feature can be turned on or off using the Charting, "Other Preferences" window. When the multi-chart slide show is off, only the front chart is updated as the slide show progresses.

New RTL (RT Language) token naming convention

When composing scans, custom indicators, and trading signals the user can assign a token name to a technical indicator, or a user-defined variable (see below). In Investor/RT 4.0 and later, token names can be composed of alphabetic characters, the underscore, the percent character, or the pound sign (#). If the token name contains a pound sign, one or more digits can follow the pound sign as part of the token name. For example, the token MA5 is taken to be the "MA" token followed by a qualifier of 5, meaning the moving average indicator five bars in the past. A user-specified token of MA#25 even though it ends with a number, is interpreted as a single token named "MA#25", i.e. the 25 is not considered to be a historical qualifier. If a period is found at the end of a token, the period is considered to be a separator and a historical qualifier is expected to follow the period. Thus CL5 and CL.5 are now equivalent; they both refer to the value of CL, the closing price five periods ago. If MA#20 is the name of a 20 period moving average, the MA#20.5 is the 20 period moving average five bars ago.

New RTL tokens for calculating quote page custom column, V#1 – V#6

Six new quote page columns (named V#1, V#2, V#3, V#4, V#5, and V#6) have been added to Investor/RT. These are "variable" columns for each instrument whose value can be calculated and set using a scan, a trading signal or a custom indicator. Tokens having the same names have been added to the RTL Language for referencing the current value of these variables. The SET command can be used to set the value of a variable. For example, the RTL scan request:

```
SET(V#1, HIALARM - CL)
```

Sets the value of V#1 for each scanned instrument to the amount each issue is currently trading from it's high level alarm value. Since the variables V#1 - V#6 are sort fields, the scan can also "rank" the quote page, showing you which issues are closest to their alarm levels. Unlike normal calculated values in scans, the values for V#1 thru V#6 are permanently maintained for each instrument. The values are saved when you quit Investor/RT. These new columns are available for display in any quote page, not just the quote pages produced by scans. The displayed values for V#1 - V#6 will always reflect the results of the most recent scan calculation that set the value. Since the values are maintained in this way, they may be referenced by several scans (or trading signals) in succession. One scan sets the value of a variable for each instrument, while subsequent scans or trading signals base their results on the value of one or more variables calculated earlier. Using the "auto scan" method, a particular calculation of interest to the user could be performed at some periodic interval and the most recently calculated values for each instrument can be displayed in any quote page.

Excluding charts from multi-chart slide shows and multi-linking

When multi-chart slide shows are in effect, it is often desirable to exclude certain charts from the slide show. It is now possible to accomplish this by designating some charts as "locked". A

locked chart is "locked in" on its current instrument(s) and will not participate in slide shows or in the "multi-link" command.

To lock a chart, check mark the "Locked" checkbox in the Period Preferences window for the chart. The period preferences window is accessed by right clicking in the horizontal time axis area of the chart. Mac users command+click. When a chart is locked, the chart's name which appears in the lower left corner of the window to the left of the horizontal scrollbar, will be shown in italics.

To permanently lock a chart, check mark the "Locked" checkbox and save the chart. To unlock a chart simply uncheck the box and save the chart.

Creating multiple chart windows for a quote page of instruments

The "Chart" icon on the quote page toolbar is normally used to request a chart for the selected instrument (row) in the quote page. If you click the chart button with no instrument selected in the quote page, Investor/RT will now ask if you wish to view charts for every instrument in the page. To avoid opening too many windows, Investor/RT will only ask if there are fewer than 65 instruments in the page.

If the user responds by clicking the "Chart All" button, Investor/RT will ask whether to tile or cascade the resulting windows. "Tile" is the recommended response. A "default" response is also available. Clicking the "default" button means that the charts will be opened in their normal default position, usually centered in the screen. Investor/RT will then open chart windows for each instrument in the quote page. The chart that is opened depends on the instrument. Some instruments may have their own default charts, others may not in which case the default chart is used if one is specified. Otherwise a price chart, optionally with volume, is shown according to the chart preferences specified in Setup: Preferences.

Thumbnail chart windows

The percentage of the chart window devoted to the y-axis price labels is now dynamic. At very small chart window sizes, the price axis no longer dominates the window. In some cases the price values may be clipped off when the chart window is very small. This enhancement makes it possible to view a screen full of chart thumbnails and see the most recent few trading bars in each window.

Chart Wizard

The Chart Wizard is a chart setup assistant that can create multiple chart displays from the list of instruments present in a quote page. The Chart Wizard can be opened from the Setup Menu or by clicking the Chart icon in the Quote Page toolbar when no row in the quote page is

selected. After running a scan, for example, you can click the chart icon on the scan results quote page toolbar to quickly view an array of charts on the issues identified by the scan.

The Chart Wizard has a menu of all available quote pages. The "current" quote page if there is one, is selected from this list automatically.

Select a quote page to use. The quote page you select need not be open.

Indicate how many charts to create by filling in the two boxes "instrument N through M". Enter the numbers N and M representing the row numbers containing the instruments to chart. For example to chart the top ten instruments in the quote page, specify 1 through 10.

Specify whether you wish the selected quote page to be sorted before choosing the range of instruments specified in step 2. If you specify a sort, Investor/RT will open the quote page if it is not already open and sort it by the designed criteria before picking the instruments to chart. This is a very handy way to quickly examine the top ranked issues by some criterion in chart form.

Specify whether you wish the new charts to replace any existing chart windows that may be opened. If you check this box, Investor/RT will close all "chart type" windows before producing the new array of charts.

Specify whether you want the new array of charts "tiled". This is recommended. The charts will be arranged in a grid each chart sized the same size producing a tiled effect.

Specify a default chart object to use as a template for each of the new charts. If this box is checked, every new chart will have the same makeup as the designed default chart object. If this box is unchecked, the type of chart opened depends on the settings in Setup: Preferences: Charting... Note that the charts created by the Chart Wizard can be any type: bar, line, candlestick, daybar, rawtick, market profile, volume profile or point and figure/three line break charts.

Cancel: Click the Cancel button or press the esc key to dismiss the window without taking any action.

Apply: Click the Apply button to produce the array of charts and leave the chart wizard window open for additional actions.

OK: Click the OK button or press the return key to produce the array of charts and close the chart wizard window.

Using the Chart Wizard toolbar

At the top of the chart wizard is an array of toggle buttons that can be used to control the operation of the chart wizard to cycle through groups of charts in a quote page. The button at the far right (or) is a window-size toggle that alternately expands and contracts the size of the chart wizard window. When the wizard window is in its thin-

strip form only the toggle buttons and the instrument numbers are visible. If you set the main toolbar into "condensed" format (see Setup: Preferences: General Preferences) then the chart wizard window fits nicely to the right of the main toolbar, out of the way of the tiled charts. Then you can produce an array of charts and the chart wizard window remains visible so you can easily click to advance the display to the next group of charts.

Clicking the "right" , or "left" button advances the display of charts to the next or previous group of charts, respectively. For example, if the chart wizard was set to display instruments 1 through 10, clicking "next" would advance to instruments 11 through 20. The "Go" button is equivalent to clicking the "Apply" button. For example, if you have just charted instruments 11 through 20 and want to make an adjustment, say, to the chart type, make the adjustment and click the "Go" button to re-generate charts of the same instruments (11-20) using the adjusted chart type. The "first" and "last" buttons, reset the instrument numbers to the first or last group of instruments in the selected quote page. Click the "cancel" button to dismiss the chart wizard window or click the help button to access this help topic.

Market Profile/Volume Profile enhancements

In addition to the multiple session enhancements described in 'Multi-session market profile charts' above, the Market Profile chart has been enhanced to optionally show (superimpose) a volume histogram in the background of the window. This essentially provides for a Volume Profile/Market Profile chart in a single window. When the volume histogram is displayed, the volume bar is shown in two shades depicting the total volume due to block trades vs. small trade. The user can specify the tick volume limit at which the trade is considered a block trade. Other enhancements include a user option to specify the time in minutes depicted by each letter in the Market Profile. Prior to Investor/RT 4.0, each letter always represented 30 minutes. Gridlines are now optional. Both Market Profile and Volume Profile charts may now be printed.

Data Feed Heartbeat improved

Legend:



Data Feed Active



Data Feed Inactive



No Data Condition



The button at the right end of the Investor/RT Main Toolbar is called the Data Feed Heartbeat Indicator . This button changes appearance every second when Investor/RT is connected to the data feed. The purpose of the animation is to give the user a visual indication

that market data is flowing into the program. If the button is changing, data is flowing properly. The Data Feed Heartbeat indicator is not applicable to the end-of-day Dial/Data Edition of Investor/RT.



When the data feed is inactive, the button image is a red X. To activate the data feed, click the Start Feed button in the Main toolbar or issue the "Start Data" command in the data feed menu.



The button image is solid red with a question mark when no data has been received from the data feed source during the past 60 seconds. Investor/RT can be setup to automatically reconnect to the data feed in such cases. See Setup: Preferences: Data Feed or choose Setup from the data feed menu.

Feed Status



For a more detailed view of data feed activity click the Feed Status button on the Investor/RT Main toolbar.

To access the Data Feed Status window, click the Data Feed Status icon on the main toolbar or choose "Status" from the main menu for your data service.

The Data Feed Status window updates continuously (every 5 seconds) and indicates whether the feed is active or inactive. When data is being received, the Packets Received value increases.

- "Last data packet" tells when the most recent packet of information was received from the feed.
- "Reads Issued" is an indicator of requests made by Investor/RT to the feed.
- "Packets Received" is a count of how much data has been received from the feed during the current Investor/RT session. This count should be constantly increasing.
- "Last Raw Symbol" displays the most recently received symbol quote, regardless of whether the symbol is defined in Investor/RT.

For Signal users, the primary and report service codes are contained in this window. For DTN users, the authorized exchanges are listed at the bottom of the window. For InterQuote users, the status of the user's InterQuote account is shown.

The Main toolbar has a data feed active indicator at the right end of the tool bar. When the data feed is inactive, the indicator (a rectangle) is solid black. When the data feed is

active, the rectangle changes appearance every few seconds to let you know that valid data packets are being received from the data feed. If data stops arriving for some reason, the rectangle will remain static until a minute has gone by when it will turn solid red to indicate a NO DATA condition.

User specified trend line slopes

The trend line indicator has a new preference that allows the user to specify or adjust the slope of the trend line once it is drawn. In the trend line preferences, check the box titled "User specified slope". The current slope value will be shown and may be edited. When this checkbox is turned off, the slope of the trend line is calculated based on the start and ending price points of the trend line. When the checkbox is checked, the trend line is drawn from the starting point forward based on the user specified slope value. The slope value is expressed in price per bar.

Viewing indicator values in chart windows

When many technical indicators are inserted into the same window pane it is often difficult to view the values of all of the indicators because there is insufficient room in the chart window pane title bar to display every indicator's value. Shift+clicking the mouse to the right of the vertical axis in a chart window tells Investor/RT to cycle through each indicator in turn (one per shift+click) bringing that indicator's values into the leftmost position in the title bar for viewing.

Saving layouts improved

The File: Save as Layout command displays a dialog box showing the names of all existing layouts. The current window layout can be saved under an existing layout name by selecting that layout name and pressing the Save button. To create a brand new layout, simply type in the name and press Save. A button is provided for saving the current window layout as the "Startup Layout". The startup layout, if any, will be opened automatically when Investor/RT starts, regardless of what windows arrangement was open the last time Investor/RT quit. If no Startup Layout is set up, then Investor/RT always opens "Last Session Layout" when it starts. Last Session Layout, by definition, is the collection of windows that were open the last time Investor/RT was terminated.

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Automatic Toolbar Positioning

The Setup: Preferences: General Preferences window has been enhanced to provide several new options for floating toolbar positioning. There are now six choices for Toolbar positioning:

1. Floating Toolbars - each toolbar floats independently and stays in the same position unless moved explicitly by the user. This has been, prior to 3.9, the method used by Investor/RT.
2. Fixed Position - all toolbars snap to the same position on the screen when their associated window becomes active. Moving any toolbar causes the new toolbar position to become the fixed position for all other toolbars.
3. Pin to Left - each toolbar automatically appears aligned with the upper left corner its associated window. This options works well when the toolbar style is set to vertical.
4. Pen to Right - each toolbar automatically appears aligned with the upper right corner of its associated window. Toolbar style vertical works best with this option also.
5. Pin to Top - each toolbar automatically appears aligned with the upper left corner its associated window. This option works well when the toolbar style is set to horizontal.
6. Pin to Bottom - each toolbar automatically appears aligned with the lower left corner its associated window. This option works well when the toolbar style is set to Horizontal.

Scanning for Candlestick Patterns

The candlestick pattern recognition technical indicator can now be used in the scan language to search for candle patterns. The scan token is CPR and it can be setup to match one or more patterns of interest. CPR will have a value of 0 if the current bar does not have any of the requested candle patterns and a positive number if one or more patterns are found. A value of 2 for CPR, for example, would indicate that the current bar matches two of the patterns specified in the CPR setup. You can qualify CPR historically, for example, CPR1 will be > 0 if the previous bar matched one or more of the specified patterns. You can also use the MAX function to test a span of bars for a candle pattern. For example MAX(CPR5) will be > 0 if any of the preceding five bars matched the specified patterns. You can also add the CPR token multiple times to the scan token list and give more meaningful names to each one. For example, setup one CPR and name it HAMMER to recognize the hammer candle pattern. Add another CPR and name it EDOJI to match the evening doji star. Then the scan request:

MAX(EDOJI5) > 0 AND HAMMER > 0

Finds all instruments having an evening doji start sometime during the preceding five bars and having a hammer in the current bar.

Testing Quote Page membership in Scans

A new token, QP, has been added to the scan language to enable scans to test for an instruments membership in particular quote pages. The QP token is a "primitive" property of an

instrument and is tested with the = or != (equal or not equal) operators. For example, the scan request:

QP = "Focus List" AND CL > 50

Identifies instruments that belong to the Focus List quote page and are priced above \$50. The quote page name specification can be an explicit name as illustrated above, or it can be a pattern matching specification using ? to match any single letter or * to represent any span of letters. Thus, the formula:

QP = "F*"

would find instruments that belong to any quote page that begins with the letter F. Some, but not all, of the system defined quote pages can be tested, as in:

QP = ".Intraday"

to find instruments marked for intra-day monitoring. Here is the list of system defined quote pages that can be used with the QP token in scan requests:

.Alarms-All
.Alarms-Price
.Alarms-Price/Volume
.Alarms-News
.Unupdated
.Monitored
.Intraday
.Watched

New Pop up Menus Added

Convenient pop up menus have been added to the point and figure chart, market profile, volume profile, raw tick, and day bar windows. Click the mouse inside any of these windows to access the menu. The new menu now allows the user to switch a traditional chart to any of the more specialized chart window types and then switch it back to a traditional chart again.

Portfolio Window positioning

Portfolio window sizes and positions are now saved automatically when the portfolio window is closed so they will open at the same size and position the next time they are requested from the menu. Prior to 3.9 portfolios were always opened to a common size and position in the center of the screen unless the portfolio was a part of a layout.

Options Display Feature

The Option Display command accessed from the pop up menu in quote pages, portfolios, or symbol selectors has been improved. At present this feature is available only with the myTrack data service. The Option Display command now creates a live quote page showing the options chain for the underlying instrument. The quote page is arranged in a two repeating group format with Call options arrayed on the left and Put options at the same strike price arrayed on the right in each row. In the center is a new quote page column called "month strike" which displays the expiration month and strike price for the calls and puts. The user can exert control over the particular data fields displayed by creating a custom format and naming it "Options Format". If defined, this format will be used to display the option chain. The "month strike" data column must be the last column in the format for best results since this column serves a separator between the calls and puts in the quote page.

Users of other data feeds can achieve this same effect (albeit manually) by setting up a quote page of options with 2 repeating groups of columns. The trick is to make sure that the list of options in the quote page is in Call-Put sequence with each pair of options at the same strike listed together. Then when the quote page is displayed in 2 repeating format, the calls will all appear on the left and the corresponding puts at the same strike will appear on the right. The last column in the format should again be the month-strike column. This column can be highlighted if you wish by right clicking on the column heading.

For myTrack users, note that the option display command now adds each option contract to the list of instruments being tracked by Investor/RT. These symbols do not "go away" when you close the quote page-they remain defined. If you want to view option chains only temporarily, remember to click the red trash can icon to delete all of the options instruments before closing the options quote page, otherwise you may build up too many instruments and exceed the 300 symbol limit imposed by myTrack for real-time tracking.

New scan tokens for futures

Two new scan tokens have been added to the scan language to make it possible to evaluate a variety of different kinds of futures contracts in a single scan. Typically this has not been possible since the price moves are often very different for differing types of futures contracts. The TICKUNIT scan token is a "primitive" property of a futures instrument that represents a "one tick move" in price, i.e. the basic increment of price in which the commodity trades. Thus the scan formula:

$$(HI-LO)/TICKUNIT > 5$$

identifies futures contracts with a current trading range of more than 5 "ticks". For example, a Treasury Bond contact would qualify if it had a range of more than 5/32 since a one tick move is 1/32nd in this case.

Similarly, the new scan token VALTICK is the dollar-value of a one-tick movement in the associated futures contract. Thus, the scan formula:

$$((HI-LO)/TICKUNIT)*VALTICK > 5000$$

would identify futures contracts whose dollar value has had a swing of at least \$5000 in current trading.

The new tokens may also be listed in quote pages with the column titles "TickUnit" and "\$Val Tick". The tick move and dollar value of the tick move for each futures contract is stored in the Investor/RT database. To adjust these numbers, go to Setup : Futures and choose Setup from the menu of futures types. Enter the future type code and adjust the "Point Move" and "Point Value" for that future type.

Odd intra-day minute intervals Prior to Version 3.9

Any intra-day minute interval that did not evenly divide into 60 would occasionally exhibit incorrectly aligned bars. For example, 13 minute bars, often used because the NYSE trading session can be divided precisely into an a fixed number of 13 minute bars, would occasionally do this. This flaw has been fixed in 3.9. By the way, if you want to display a chart with a minute interval other than those listed explicitly in the chart pop up menu, go to Setup: Preferences: Charting Period and set the default intra-day interval to the desired number of minutes. Then use the "intra-day" choice in the pop up menu to switch the chart to the specified periodicity.

myTrack Market Pulse improvement

The Market Pulse window, accessed via the myTrack menu has been enhanced with a new checkbox titled "Add instruments and create quote page". This new option is available with accessing market pulse reports from the NYSE, AMEX, or NASD. When this options is unchecked, clicking the "view" button displays a static text display showing the tickers and prices of the particular report chosen. If checked, Investor/RT creates new instruments for each ticker if necessary and creates a quote page of the list of issues in the chosen market pulse report. When the market pulse feature is used to add new stock symbols to Investor/RT in this way, the instruments will NOT "go away" when the quote page is closed. An option has also been added to request the market pulse report for "yesterday" if desired. This option is necessary on the weekends to see the market pulse reports for the preceding Friday.

Three-Line Break Chart

The three line break chart is similar in concept to point and figure charts. The decision criteria for determining "reversals" are somewhat different. The three-line break chart looks like a series of hollow and filled blocks of varying heights. Each new block, like the X's and O's of a point and figure chart, occupies a new column. Each block is called a "line". Using closing prices,

a new hollow (white) block is drawn if the previous high is exceeded. A new filled (black) block is drawn if the price hits a new low. The term "three line break" comes from the criterion that the price has to break the high or low of the previous three lines in order to reverse and create a line of the opposite color. Three-line break charts are described in detail in chapter 6 of Steve Nison's book *Beyond Candlesticks*. Three-line break charts are initially provided for daily, weekly, and monthly data. Investor/RT 4.0 will add intra-day intervals.

The "Periodicity" menu in Investor/RT has been updated to include "Tick Bar"

Unlike minute bars where ticks are collected for a fixed period of time and represented as open-high-low-close-volume bars, a tick bar is a bar formed by a fixed number of ticks. The default value for tick bar is 10 ticks per bar. In chart windows the number of ticks in each bar, the tick bar interval, can be adjusted using the "Period settings" window. Access the period settings window by right-clicking in the time axis area of the chart or using the charting toolbar.

The Periodicity menu used in various places throughout Investor/RT has been updated to include 12 and 13-minute bar intervals. The "Intra-day" periodicity has been more properly titled "Intra-day default" to indicate that making this selection means "use whatever intra-day periodicity is specified as the intra-day default". The intra-day default periodicity can be "tick", any "minute interval", or any "tick bar interval". To specify the intra-day default periodicity, go to Setup: Preferences: Charting Period, choose one of the intra-day periodicities, specify the minutes, seconds or tick bar count as applicable and click OK.

Note that Tick Bar can be used in chart windows, as a scan periodicity, as an export periodicity, or as a view/edit periodicity.

eSignal Ticker Symbol Limits

eSignal ticker symbol limits are now properly recognized by Investor/RT to control the number of tickers that can be monitored in real-time. DBC currently offers market data plans with 50, 500, and 1000 ticker symbol limits. Prior to this revision, Investor/RT would limit the tickers to 50 or 500, but would not allow more than 500 tickers to be monitored at one time.

Minute bar date/time stamp revised

Minute bars (and tick bars) are now time stamped with the ending time of the bar. For example, in a 13-minute bar chart with a session opening time of 9:30, the first (dynamic) bar appears titled "09:43". The time stamp indicates that this is the bar for the first 13-minute interval ending 09:43. The first tick that arrives after 09:43 will cause a new bar to appear titled 09:56, and so on. Tick bars are handled slightly differently. When a new tick bar is started, it is initially stamped with the date time of the first tick in the tick bar. When the tick bar is eventually filled with the user specified number of ticks, the completed tick bar is updated with

the date time of the ending tick and a new tick bar is started. When viewing minute bars or tick bars in the View/Edit window, all rows will show the ending time of the bars.

myTrack intra-day data downloading bug fixed

Version 3.9 Rev 1 fixes an obscure and long outstanding bug having to do with handling multiple intra-day download requests from myTrack. If a second intra-day download request was initiated before the first one completed, in some circumstances the historical data for a previous trading day for the first download request could be mis-interpreted as intra-day bars for the current trading day. This would cause current day intra-day charts to plot a mixture of current day and previous day bars at the same time location on the chart. This bug could happen, for example, if a user clicked the data download button twice by accident when requesting a download for a chart. It could also happen if automatic data downloading was enabled and the user opened two intra-day charts in rapid succession.

Instrument specific default charts

Investor/RT now supports the capability of designating a unique default chart for any instrument. If a default chart does not exist for an instrument then a request for a chart on the instrument will use the "default chart" specified in Setup: Instruments: Charting Advanced. If no global default chart is specified, Investor/RT will substitute the ticker symbol requested into the front most chart window already open. If no chart window is already open, Investor/RT will create a plain price chart (with optional volume) as specified in Setup: Preferences: Charting General, and Chart Advanced.

To create a default chart specific to a particular instrument, create a chart containing the instrument and any technical indicators (or additional instruments) you like. Then access the chart pop up menu and choose "Save as default chart". Investor/RT will respond by asking if you wish to make the chart the global default chart for all instruments or make the chart the default for the specific instrument. If you choose the specific instrument, the chart will be saved in the database under the name "<XXXX Chart> where XXXX represents the ticker symbol of the default chart. For this point on, whenever you request a chart for that ticker, the default chart will be opened. To delete a default chart, the chart pop up menu now has a "Delete Chart" command. Another way to delete charts from Investor/RT is to use the Control: Data Management: Delete: Chart menu command from the main menu bar. If you have an existing chart that you would like to make into the default chart for a particular symbol, simply open the existing chart, make sure the symbol is present in the chart, then choose "Save as default chart" from the chart pop up menu. Alternatively, open the chart and use File: Save As to save the chart, When Investor/RT prompt you for a name for the chart, enter the name as <XXXXX Chart> where XXXX is the ticker for the default chart. If you name default charts manually like this, please note that the name must begin with the angle bracket character < followed immediately by the ticker in upper case, followed by one space, followed by the word Chart, followed by the right angle bracket >.

Note that default chart names are stored in the database just like any other user-defined charts. Their names appear at the top of the list of available charts when you click the "Chart" button on the main toolbar.

Optional titles in horizontal reference lines

The "Reference Line" technical indicator now has an optional 40 character title that can be used to place a text label at the left side of the reference line in chart windows.

New technical indicators in scan language

Up/Down Volume Ratio and Up/Down Volume Ratio Slope technical indicators have been added to the scan language. Their tokens are named UDVR and UDVRS respectively.

Improvement made to list selection windows

List selection windows appear in various places in Investor/RT to present the user with a list of choices. For example, clicking the QP button on the main toolbar presents a list of quote pages, or choosing Setup: Preferences lists the choices for preference topics. Many list selection windows can be opened using shortcut keys. For example, Alt-1 (command-1 on Macintosh) is used to open one of the chart windows displayed in a list selection window. The list selection window has been improved to enable the user to pick from the list using the keyboard more effectively. Type the first few letters will move the selection to the first choice in the list matching those letters. Then press return to choose the highlighted choice. Press the esc key to dismiss the list selection window without making a selection. Press the same key repetitively to advance one-by-one through all selections that begin with a particular letter. For example if you use Alt-1 to open a chart and strike the letter M Investor/RT will pick the first chart name beginning with M, strike M again to select the second chart name beginning with M and so on.

Over night session charting bug fixed

Investor/RT Version 3.9 Rev 1 introduced a bug that affected the drawing of multi-day intra-day charts for instruments whose trading session spans midnight. The bug caused the chart drawing to stop prematurely, showing intra-day bars only for the previous session(s) and not the current trading session. The bug is fixed in 3.9 Rev 2.

New Periodicity selection control added

There are many windows throughout Investor/RT that provide a menu or a list box in which the user specifies a periodicity (daily, weekly, monthly, tick, 1-minute, etc.). Investor/RT now uses a special "Periodicity Selection" control to provide a consistent user interface for choosing a periodicity. The periodicity selection control appears as a rectangle with a periodicity name

displayed inside the rectangle. At the left side of the rectangle is a downward pointing rectangle to indicate visually that you can click on the control to change the periodicity. If the user employs the "tab" key to tab through the controls in a window, the periodicity control appears highlighted (black background/white text) when it is the focus control. When the periodicity control has focus, the user can type keyboard shortcuts to select various periodicities eliminating the need to use the mouse to click on the control. The letters D, W, M, or I change the periodicity to Daily, Weekly, Monthly, and Intra-day Default, respectively. The intra-day default periodicity is user-specified in Setup: Preferences: Charting Period. Pressing the "return" or "enter" key has the same effect as clicking inside the control, namely: a windows pops up for selecting a new periodicity. Buttons are provided for many popular intra-day periodicities. Keyboard shortcuts are provided for daily (D), weekly (W), monthly (M), tick (T), intra-day minute bars (M), intra-day tick bars (B). If the user types M for minute bars, an entry box can be used to type in the number of minutes in the periodicity or the up and down arrow keys access several predefined minute intervals. Pressing the "esc" key dismisses the pop up window without changing the periodicity.

The new periodicity control appears in every Investor/RT window in which a periodicity option is present:

1. File : Export -- for specifying the periodicity of exported data.
2. Control: Data Management: View/Edit -- for specifying the periodicity of the bars or ticks displayed in a view/edit (or time and sales) window.
3. Scan setup window - for specifying the periodicity of the bars or ticks used in a scan.
4. File: New: Chart - for specifying a new chart's periodicity.
5. Chart Period Settings - for adjusting a chart's periodicity or setting the default charting periodicity.

In addition, the chart pop up menu has a "Set Periodicity..." command now instead of a pre-defined (and limited) sub-menu. Selecting "Set Periodicity..." from the chart pop up menu causes the period selection pop up window to appear at the current mouse pointer. This provides a quicker, easier, and more flexible way to change the periodicity of a chart than the former menu based method.

Chart "Last Trade" tick mark added

Daily and all intra-day bar, line, and candlestick charts show a last trade marker on the vertical price axis. If bid/ask prices are available for the charted instrument, markers for bid and ask prices are also shown. The color coding of the bid, ask, and last trade markers are the down color, up color, and unchanged color respectively, as specified by the user in Setup: Preferences: Quote Page Preferences.

New technical indicator: Time Series Forecast (TSF)

This technical indicator is based on linear regression analysis. The value of TSF for each bar is based on a regression analysis of the preceding N bars. N is called the regression period in the setup window for TSF. The user specifies a forecast period F. F is used to derive a predicted (forecasted) price value F periods in the future based on the slope of the regression line for the preceding N periods. This indicator is often used in trading systems in conjunction with a moving average to generate trading signals when a moving average line crosses a time series forecast line.

Improvement for multiple-monitor users

On the Windows/98 platform Investor/RT can be run on multiple display monitors by expanding the Investor/RT "task window" to cover two (or more) screens. One of the problems associated with using multiple monitors is that Investor/RT often centers windows or message prompts. When two monitors are used, for example, centered windows appear half on the left screen and half on the right. To remedy this, the General Preferences window now has a centering percentage option (1 thru 99) that can be used to force centering on either monitor. By default, windows are centered 50% from the left side of the Investor/RT task window. If two monitors are in use, change this preference setting to 25% to cause centering to occur on the left monitor. Use 75% to cause centering on the right monitor. Users with a single monitor can also employ this new setting to skew the centering of messages, alerts, and new windows.

Historical data retention problem fixed

The "Historical Data" preferences window has a "Compact ticks older than N days.." option that was introduced in Version 3.5 (March 1999). Users who elected this feature may have noticed that intra-day bar data is being retained in the database beyond the intra-day retention limit specified in the Historical Data preferences window. Version 3.9 Rev 4 corrects that. All intra-day bar data older than the intra-day retention period will be purged from the database the first time Investor/RT records closing prices (Posts History) under 3.9 Rev 4. Due to this problem some users may have a large amount of disk space allotted to intra-day data in the database. This space can be recovered using the "Compress Tick Database" command located in the Control: Data Management menu.

In a related change, the Historical Data preferences for daily and intra-day data are now interpreted in trading days, not calendar days as before. There are roughly 250 trading days per year so a daily retention of 500 days is sufficient to maintain a two-year history. Prior to version 3.9 Rev 4, calendar days were used so the default setting of 730 (365 times 2) is common for most Investor/RT users. Trading days are also used in the interpretation of the "Compact ticks older than N days into X minute bars" options.

Auto Save/Discard option for charts and quote pages

Several new preference settings have been added to the "General Preferences" window. The new settings have to do with the action to be taken by Investor/RT when a user closes a user defined quote page or a chart window that has been modified in some way. Three choices are available: (1) save, (2) discard, or (3) ask me. Choice #3 (ask me) is the way Investor/RT Version 3.9.3 and earlier operated. The other two choices instruct Investor/RT to perform the desired action instead of requiring a user response.

If the "Discard" option is used, it will be the user's responsibility to save quote pages or charts before closing them or any revisions will be discarded. To save a chart or quote page, click the "Save" icon on the associated toolbar, or choose Save from the File menu. Note also that the "Quick Exit" command in the File menu instructs Investor/RT to save all open windows and exit.

An additional box titled "Discard untitled charts and quote pages when closing them" is used to control the action taken when untitled charts and quote pages are closed. An untitled chart or quote page is any quote page or chart whose name begins with the word "Untitled". If the box is checked, Investor/RT will close such windows without saving. If the option box is NOT checked, Investor/RT prompts the user to name the chart or quote page when the window is closed.

These new options are designed to enable experienced users to eliminate the need to respond to dialog boxes so often as charts and quote pages are closed.

Using Volatility in scans

The VOLAT token in the scan language has been improved. Formerly, this token was a static property of each instrument calculated only periodically by the Investor/RT option analysis feature. VOLAT is now associated with the Volatility technical indicator. This means the volatility is calculated dynamically when the scan runs according to the technical indicator setup in the scan setup window. Further, VOLAT can now be qualified to test the volatility values in prior period (e.g. VOLAT5 is the volatility 5 periods ago). Like any other technical indicator token VOLAT can be added to the token list multiple times each time with a different volatility calculation period. This enables scanning for ratios or differences in short and long term volatility.

Adding/removing instruments to/from quote page(s) improved

The QP icon in the quick quote window and the QP icon in the quote page toolbar now perform the same function. Investor/RT shows a list of the quote pages that contain the selected symbol. When the list of one or more quote pages appears, the user can open one of them by double-clicking on the quote page name or by selecting one and clicking OK. The user can open all of the quotes listed by clicking the "All" button, or open selected ones individually by

selecting them in turn and clicking the "Apply" button. When no row is selected in a quote page, clicking QP will open a new empty quote page.

The same QP button may be used to add or remove the selected instrument to or from one or more quote pages.

To add an instrument to one or more quote pages, shift click on the QP icon. A list of all user defined quote pages will appear in a window with the title "Add XXXX to..." where XXXX is the ticker of the selected instrument. Add the instrument to a quote page by double-clicking on a quote page in the list, or select a quote page and click OK. The "All" and "Apply" buttons can be used to add the instrument to all or selected quote pages, respectively.

To remove an instrument from one or more quote pages, control click on the QP icon (on Macintosh use option click). A list of all user defined quote pages that contain the instrument will appear in a window with the title "Remove XXXX from..." where XXXX is the ticker of the selected instrument. Remove the instrument from a quote page by double-clicking on a quote page in the list, or select a quote page and click OK. The "All" and "Apply" buttons can be used to remove the instrument from all or selected quote pages, respectively.

When adding or removing an instrument from a quote page, the quote page need not be open. If the quote page in question is open, the instrument is added or removed from the open quote page. The user must save the quote page explicitly or do so when prompted (upon closing the quote page) to make the addition or removal permanent. Additions or removals to/from quote pages that are not open are implicitly "saved".

After adding or removing the instrument from one or more quote pages, simply click the QP icon again (without shift or control key) to see the adjusted list of quote pages that now contain the instrument.

Saving intra-day Point & Figure periodicity fixed

Investor/RT Version 3.9 Rev 4 did not properly save the periodicity of Point & Figure chart windows other than Daily, Weekly, Monthly, or Tick. When such windows of other periodicities were re-opened, the periodicity would always revert to "tick". This has been corrected.

New scan technical indicators: TSF and OBV

The Time Series Forecast (token: TSF) and On Balance Volume (token: OBV) technical indicators have been added to the scan language.

"Run Scan" keyboard shortcut fixed

Investor/RT Version 3.9 Rev 4 would not process user-defined keyboard shortcuts for running particular scans. This has been corrected in Rev 5.

New keyboard shortcuts for setting chart periodicity

The Setup: Preferences: Keyboard Shortcuts window has been enhanced to allow the definition of keyboard shortcuts for changing the periodicity of a chart window. For example, F4 could be defined as "Periodicity 1-minute" and F5 as "Periodicity 5-minute". When the user presses a periodicity function key, the assigned periodicity is set for the current chart window if there is one. This feature applies to bar, line, and candlestick chart windows only.

Prior to Version 3.9 Rev 5, function key F5 was "hard wired" into Investor/RT to change the current chart periodicity to Daily. This hard wired definition of F5 has been eliminated. For F5 to have its former meaning, define F5 in Setup: Preferences: Keyboard Shortcuts as "Periodicity Daily".

Reference Line labels added for Fibonacci, Pivot Point indicators

Horizontal reference line labels were added in 3.9. The horizontal reference lines generated by the Fibonacci Retracements indicator and the Pivot Point Support and Resistance lines make use of this feature by adding descriptive titles for each line.

Memory usage improvements

Version 3.9 Rev 5 has been improved in the area of memory management. Memory requirements have been reduced in some areas and fixes to memory leaks were made that in prior versions could have contributed to excessive memory usage. Overall, users of Rev 5 should experience substantially reduced memory requirements. These improvements apply to both Windows and Macintosh versions. The improvements will be especially welcomed on the Macintosh platform where a fixed memory size is assigned to the application and/or the application is run from a RAM disk.

Periodicity selection control improvement

The periodicity control popup window has been enhanced to add two more common periodicities to the array of buttons in the upper left of the window. A small button titled with the letter T can be clicked to select "Tick" periodicity with a single click. Before, two clicks were necessary to click the "Tick" radio button and then click OK. Another small button was added for 13-minute periodicity.

Chart mouse feedback for trend lines, regression lines

When a chart window contains trend lines or regression lines Investor/RT shows the current value of the trend/regression line as the mouse is moved from bar to bar in the chart. The display format of the line's price value is derived from the instrument charted, e.g. if you have a MSFT trend line and MSFT has a display setting of 16ths, then the trend lines values will be rounded to the nearest 16th. If you wish to see more precise values, change the display format of the associated instrument to 99.999 or 99.9999.

Investor/RT 3.8, Release Date: July 30, 1999

Tick Velocity Indicator

The tick velocity indicator is a technical indicator available for use in the scan language (the scan token is TV). This indicator calculates the current velocity of trading for an instrument in ticks per minute. The setup dialog for the TV indicator allows the user to specify a short-term period and/or a long term period in minutes. Periods less than a minute can be expressed with fractions or decimal numbers, e.g. enter 1 / 4 or .25 to specify a period of 15 seconds. Investor/RT calculates the number of trades that have occurred in either the short term or long term period and returns the value in ticks per second. For equities, the user can request that the result be returned in tick volume per minute. The setup dialog has three choices for the returned value: (1) short term velocity, (2) long term velocity, or (3) short/long term ratio. A ratio above 1.0 indicates the tick velocity is higher recently vs. longer term. For example, if short term period is 15 seconds and long term is 5 minutes, and the ratio calculation is selected, then the scan request $TV > 2$ would identify instruments whose trading velocity during the last 15 seconds was more than twice the rate it has been over the preceding 5 minutes.

Chart Pop up Menu Improved

The chart pop up menu has been improved to show the current periodicity and chart type with check marks when making a selection in the menu. In addition, a new choice "Intraday" has been added to the list of periodicities. The Intraday choice changes the chart periodicity to the default intra-day periodicity which could be tick or any user specified minute interval. To set the default intra-day periodicity, go to Setup: Preferences: Period Settings, choose Intraday from the menu there and specify the minute interval or zero for tick by tick. Once set, use the chart pop up menu to switch to that periodicity anytime you want. The default intra-day periodicity could be any number of minutes you like. This is the way Investor/RT provides for minute intervals that do not appear specifically in the Periodicity menu.

Default Chart as Raw Tick Chart

Prior to Version 3.8, a raw tick chart could not be made the default chart in Setup: Preferences: Charting Advanced. This restriction has been removed. When a raw tick chart is the default chart, double-clicking on a symbol in the quote page will open a raw tick chart.

Order Confirmation Window Improve

Prior to Version 3.8, placing unconfirmed trades (e.g. market orders) and then deleting the underlying instruments before either confirming or canceling those trades would cause Investor/RT to fail when opening the Confirmation window. This problem has been eliminated.

New moving average types

The moving average technical indicator in Investor/RT supports nine distinct moving average types. The four new moving average types are described in detail in the June 1999 issue of Stocks and Commodities Magazine, p. 18. The new types are:

Adaptive Moving Average

This moving average moves slowly when prices are moving sideways and moves swiftly when prices move swiftly.

Triangular Moving Average

The triangular moving average derives its name from the way the weighting factors are applied to the un smoothed data. For example, for a 7 period moving average, the weighting factors are 1, 2, 3, 4, 3, 2, 1.

Endpoint Moving Average

The endpoint moving average uses a least squares (linear regression) fit to derive each point on the moving average line based on the preceding period.

Sine-Weighted Average

The sine-weighted moving average is similar in concept to the triangle moving average, but the weighting factors are based on a sine calculation instead.

These new moving averages may be used as overlay indicators showing the moving average of some price type for an instrument, or they may be used as smoothing options in conjunction with other technical indicators. For example, the Adaptive moving average could be used to smooth the CCI, RSI, or MACD indicator.

True Range Smoothing

The True Range technical indicator has been enhanced to add an optional smoothing moving average to the resulting True Range line. Specify a period of 0 or 1 if you want to see the raw unsmoothed true range line. If you want to see both the smoothed and unsmoothed line, add the indicator twice, once with and once without smoothing.

True Range added to scans

The scan language now supports TR, the True Range indicator. As noted above, either the smoothed or unsmoothed True Range can be tested in a scan.

Multiple Scales Option

Version 3.7 Revision 2 introduced the "multiple scales" feature. See the help topic *New in Investor/RT 3.7* for more information about this major new feature. In version 3.8, the multiple scales feature has been made an option. When the option is on, Investor/RT will create up to 10 distinct scales for instruments and their associated overlay indicators, or standalone indicators. When the option is off for a particular chart window pane, all instruments and indicators in the pane will be scaled to a common scale that spans the range of values of the component elements in the pane. The ability to turn off multiple scales is important when charting multiple futures contracts of the same type (different months) in the same pane. Some combinations of indicators, e.g. ADX, ADX, D+/D- are typically used together in the same pane and must be drawn to the same scale to see trading signals.

The multiple scales options is ON by default when creating a new chart. To turn off multiple scaling, right click in the vertical scale area (command click on Macintosh) and uncheck the Multiple scales checkbox. When chart objects are saved, the scaling preference is saved with the chart.

Volatility Indicator

The volatility indicator is based on the same calculation used by Investor/RT in the options analysis feature of the program. The volatility is calculated historically for each bar. At present, the volatility can be graphed daily, weekly, or monthly. The volatility is a measure of the expected percentage change in price over a one-year period for the underlying instrument. The expectation is based on one standard deviation (68% probability). Prior to version 3.8, the volatility could only be calculated and displayed as a quote page column where the value represents the present volatility. Now the volatility may be viewed graphically to see how it has changed over time for an instrument.

RSI Indicator Improved

The RSI technical indicator has been enhanced to provide the option of calculating the RSI according to the Morris Modified RSI algorithm as described in the 1998 bonus issue of Stocks and Commodities Magazine (p. 56). The Morris calculation differs slightly from the classic Welles Wilder calculation and typically generates more buy/sell signals as the RSI crosses the 70 and 30 threshold values.

Tom DeMark Range Expansion Index (TD REI)

The DeMark Range Expansion Index is a market-timing oscillator described in DeMark on Day Trading Options, by T.R. DeMark and T.R. Demark, Jr., McGraw Hill, 1999. The oscillator is arithmetically calculated and is designed to overcome problems with exponentially calculated oscillators, like MACD. The TD REI oscillator typically produces values of -100 to +100 with 45 or higher indicating overbought conditions and -45 or lower indicating oversold. DeMark advises against trading in extreme overbought or oversold conditions indicated by six or more bars above or below the 45 thresholds. For more information on using TD REI the user is referred to the DeMark text.

Chart Toolbar Improvement

Now that Investor/RT supports multiple scales, it will be more common that chart windows contain multiple instruments. When more than one instrument is present in the chart window, Investor/RT will operate on the selected instrument when certain instrument specific functions are requested using the chart toolbar. For example, clicking the green trash will remove the selected instrument from the chart window. Similar, clicking the V/E button (view/edit) will bring up the historical data (or time and sales) for the selected instrument. The trading notes button acts similarly. To select an instrument in the chart window, simply click the mouse while pointing at the line, bar, or any candle stick for the desired instrument. Then click the desired function on the charting toolbar.

New toolbars

Five new toolbars have been added to Investor/RT. Toolbars are now available when working with Point and Figure Charts, Market Profiles, Volume Profiles, Day Bar and Raw Tick Charts. Like other object specific toolbars, the new ones show and hide automatically when a window of the appropriate type opens or is activated by clicking on it. The new toolbars provide access to common features like accessing preferences, downloading data, instrument setup, trading notes, and saving the window.

Investor/RT 3.7 Rev 2, Release Date: July 12, 1999

New Scan Functions

Several new statistical and arithmetic functions have been added to the scan request language. The statistic functions MIN, MAX, AVG, and STD calculate the minimum, maximum, average, and standard deviation for some period. These functions take a single parameter which can be any historical data value (CL, HI, LO, etc.) or any technical indicator (RSI, CCI, MACD, etc.) qualified by a number to indicate the number of periods to examine in computing the result. For example:

MIN(CL30) yields the minimum closing price in 30 periods

MAX(RSI5) yields the maximum RSI value in 5 periods

STD(VO20) yields the standard deviation of trading volume in the last 20 periods .

Notice that the statistical functions, unlike arithmetic functions, must have only a single token and numeric qualifier as a parameter. Expressions like MIN(HI5 -LO5) are improper since HI5 - LO5 is not a single token.

A new arithmetic operator, LOG, has been added to calculate the natural logarithm of any numeric expression. For example:

LOG(HI5-LO5) will calculate the log of the high/low range 5 periods ago.

Arithmetic functions now include:

LOG natural logarithm ABS absolute value SQRT square root

News markers in chart window

A new technical indicator called "News Marker" can be added to chart windows. This indicator examines the news items on file for the charted instrument and displays a visual marker in the chart window for each bar that has an associated news story. The selection of marker and marker color is similar to the scan technical indicator for marking scan signals. When a news marker appears in the chart, point the mouse pointer at the marker and the headline of the news items appears in the message area of the main toolbar. Right click on the marker to access the settings for the news markers. The settings dialog has a button to access a news browser for the charted instrument.

Trading Notes markers

Similar to news markers, the new trading notes marker indicator places markers on the chart for each bar that has an associated trading note. When you enter trading notes for an instrument you can specify the exact date and time of the note. Whether you are viewing a

daily or intra-day chart the marker will be placed on the bar with the closest date time of each trading note.

New markers

Several new marker images have been added. These markers can be used in the scan technical indicator, or the new indicators for news and trading notes discussed above. The new marker images are: triangle, letter N, letter T, flag, and exclamation point. The letter N and T markers were added for use with the news and trading note indicators.

Historical Data Compression

New commands have been added to the Control: Data Management menu for compressing the tick data and daily/weekly/monthly historical data files to their minimal size. The database management system used by Investor/RT does not reduce the size of database files when data records are deleted. Deleted record slots remain in the database available for re-use. The Compress Tick Database command exports all tick and intra-day bar data to a single text file and then creates a new tick database files and imports the exported data back into the database. This results in a smaller tick database with no deleted record slots. The Compress History Database works similarly on daily/weekly/monthly data. The exported text files are placed in the admin directory. They are not deleted after the process has completed. These file may be deleted by the user or retained for backup purposes if desired.

Scan setup window enhancement

In the scan setup window, a list button of scan tokens has been added in space of the token button. The new list button contains all user specified tokens listed first, followed by all built-in function tokens (ABS, LOG, MIN, MAX, etc.). To insert a token into the scan request text area select the token you want from the list. An "undo" choice is also available to undo the most recent action. When adding functions from the token list, Investor/RT inserts the token followed by left and right parentheses and places the text entry cursor between the parentheses. You may then type in the parameter or use the token list to insert the parameter to the function.

NASD Level II support for DTN

Level II screen are now available with the DTN data feed. A high speed serial connection is required for receiving level 2 data from the D8000 receiver. A DTN connection of at least 230400 is recommends, 460800 BPS is preferred. If your serial port is unable to communicate at these higher speeds an add-in high speed serial card is recommended.

Order desk (place trade) enhancements

In anticipation of connecting Investor/RT to electronic trade execution systems, the order desk dialog has been enhanced in a variety of ways.

First, accessing the order desk for a particular instrument has been made easier by adding "Place Trade" as a menu choice in the pop up menu in charts, quote pages, portfolios, and quick quote windows. The pop up menu appears when you click in a chart window, or right click on a ticker in a quote page, portfolio, or in any "instrument selection" dialog. When accessed in this way, the order desk window opens with the desired symbol selected in the order desk's instrument selector.

Second, the order desk is now live. The window title updates dynamically showing the last, bid, and ask price as trades occur on the selected instrument. The last price and tick volume also appears inside the window and updates as trades occur, e.g. "IBM Last 114 5/8 x 1000."

The order desk now defaults to "market order" and opens with some of the non-required entry fields out of view. When the user wishes to make a journal entry or trade entry into the portfolio, the window automatically expands to show the other data entry fields, e.g. trade date/time, commission amount, etc.

As controls are operated in the window. Investor/RT shows an abbreviated description of the trade, e.g. Buy 1000 IBM (New Position) or Sell 500 MSFT (Short Sale), or Sell 500 AAPL (Exit Short). The trade description appears just beneath the "Place the Order" button to make it clear what action is about to be performed.

The Quantity entry field is now an "Edit List Box". This means that trade quantity numbers can be entered manually by the user or selected from a menu of frequently used quantities. For equities, the menu list has 100, 500 and 1000 choices, For other instrument types, choices of 1, 5, 10, and 100 are listed.

Finally, all instrument selectors, including the one in the order desk dialog, now have a pop up menu that allows the user to switch the instrument selector to an alternate list of instruments. The first choice in this pop up menu is "Trading List". By creating a user defined quote page with the name "Trading List", the instrument selector in the order desk window will always open with those instruments displayed. If there is no Trading List quote page, Investor/RT will show all instruments. Thus the "Trading List" quote page can be setup with a short list of candidate issues to facilitate trade entry. You can drag and drop symbols from other quote pages into the trading list quote page and save the revised trading list at any time. Then choose trading list from the pop up menu to see the revised list in the order desk. Another advantage to the "Trading List" feature is that the order desk will list the instruments in the sequence they are listed in the actual "Trading List" quote page. Thus, you can position the instruments most frequently traded at the top of the trading list. While the order desk window is active, you can right click on the instrument selector title row to access the pop up menu of other available

instrument lists. On Macintosh, a right click is accomplished by holding down the command key while clicking.

Version 3.7 Rev 1 Fixes

The 3.7 Revision 1 release fixes two bugs discovered in the original 3.7 release. The posting of daily/weekly/monthly historical data at the end of each trading session was not taking place automatically. Also, intra-day charts of instruments whose trading session spans midnight were not including all of the intra-day data for the current session. Both bugs have been corrected in the revision 1 update to 3.7.

Scan markers enhancement

Scan markers are small video images that are used to mark up charts showing when user specified trading signals are triggered. Investor/RT has approximately a dozen such markers stored within the markers folder directory on the hard drive. Examples include diamond, ball, dot, box, up arrow, down arrow, etc. The user can add new marker images or edit the existing ones using an appropriate application. The image files are 16 by 16 bitmaps stored in Windows/OS2 BMP format. These files can be created or edited by Paint Show Pro software or equivalent on the Win32 platform, or by Adobe Photoshop on the Macintosh.. After adding new images to the markers folder, Investor/RT must be restarted to recognize the new markers. The list of markers appears in the Setup: Charting Indicators window for the Scan indicator. Markers are also used in the News and Trading note indicators.

myTrack enhancement

Several new features have been added to the myTrack edition of Investor/RT in the 3.7 Rev 1 release. The instrument pop up menu now includes commands for requesting Zacks Earnings Reports and Market Guide report on stocks. For OTC Bulletin Board issues, a View OTC BB command has been added to call up a static report of current bid/ask levels and their sources.

The Investor/RT myTrack menu has a few new commands. The "News Roundup" commands displays a report of current news headlines on all issues currently being monitored by Investor/RT. The News Entitlements command produces a report of news services for which the user is entitled. The myTrack Account Info command shows current name/address/email information on file at myTrack for the user.

Color coding enhancement

Quote pages, portfolios, and ticker tapes may now be color coded in one of three ways. The user specifies the "up color", "down color" and "changed color". Each row in the quote page or portfolio or each tick shown in the ticker tape is colored as up, down, or unchanged. The meaning of up/down/unchanged can now be relative to:

- a. the previous day's closing price
- b. the current day's opening price
- c. the previous tick price

Option "c" is new for portfolios and quote pages. With this setting, the rows in the pages change colors as the instrument's prices move up and down during the day. The up color shows issues whose last change in price was in the up direction.

To set the color coding option for portfolios and ticker tapes, use Setup: Preferences: Quote Page Preferences. This same dialog is used to set the default preferences for new quote pages. Existing quote pages have their own preferences. Adjust the color coding preference for an existing quote page using the Preferences icon on the quote page toolbar.

Multiple chart scales per pane

Prior to 3.7 Rev 2, Investor/RT maintained a single vertical scale for each pane in a chart window. Even though Investor/RT allows multiple instruments and indicators to be placed in any pane, the single scale rule limited the ability to mix instruments or indicators with widely differing "price" ranges. For example, if you add IBM and AAPL to the same chart window pane a vertical scale range is setup to accommodate prices of AAPL trading in the 40's and IBM trading in the 120's. Thus the graph of IBM would hug the upper end of the scale while AAPL's chart would hug the lower end of the scale. Similar difficulties are encountered if you added a technical indicator, like RSI, with values in the 1 to 100 range, to a pane containing an instrument, like AAPL with prices ranging in the 40's.

Version 3.7 Rev 2 adds a significant new feature-the ability to maintain distinct scales as appropriate for different instruments and indicators that are mixed within the same pane. This new feature now makes it possible to mix as many instruments and indicators as you like within a single chart window pane.

How does it work?

Never two or more instruments are present in the same pane, each instrument now has it's own scale. Thus the graph of each instrument spans the entire pane. When instruments share a pane, it is usually advisable to display the price data as a line rather than a bar or candlestick. If bars or candlesticks are desired, we recommend changing the color coding of the instrument's bars or candles to make it easier to differentiate between the instruments.

What about technical indicators?

There are two types of technical indicators: (1) overlay and (2) standalone. Moving averages, trend lines and Bollinger Bands are examples of overlay indicators-their values are in the same

price vicinity as the underlying instrument's prices. All overlay indicators are assigned to the same scale as their associated instrument.

Standalone indicators include Volume, RSI, MACD, Stochastics, and others whose values are quite different than the instrument's price values. Therefore, all standalone indicators are assigned to their own scale.

How can I switch the scale?

Here is an example. Suppose we have a single pane chart containing AAPL, a MA on APPL, IBM, and the RSI of IBM. In this case there are three distinct scales calculated internally by Investor/RT:

1. the AAPL scale (shared by AAPL and MA) /a
2. the IBM scale /a
3. the RSI scale (a standalone indicator) /a

The vertical scale drawn on the vertical axis will be the scale associated with the first instrument or standalone indicator listed in the pane's title bar. To adjust the scale, right click (command click on Mac) in the vertical scale area or use the chart popup menu to access the Vertical Scale Settings window. The settings window will show the name of the current scale in the window title. The current high and low value range of the scale are shown in the edit boxes within the window. To switch to a different scale, click the "Alternate Scale" button. This button will be available only when there are two or more scales present for the pane. When you click this button, the name of the new scale appears in the window title and the chart window itself is updated to show the newly selected scale. Click repeatedly to cycle through all of the scales for the chart pane until the one you want appears.

How can I create panes with multiple instruments and indicators?

When you click on the "Add new instrument" button on the chart toolbar, the "Select New Instrument" window appears. Pick the instrument you wish to add. Notice the "Pane" menu at the upper right side of the window. The Pane menu defaults to "Create New Pane". Use the menu to direct the new instrument to an existing pane. Similarly, when using the "Add New Indicator" window, use the "Pane" menu to direct the indicator to an existing pane.

"Drag and Drop" may also be used to move instruments or indicators from their former panes into a common pane to experiment with this new capability. To drag, point the mouse pointer at the instrument or indicator and push down the mouse button. Continue to hold the mouse button down as you drag the mouse pointer. The name of the element being dragged will appear next to the mouse pointer as you drag. Drag the element into the destination pane and release the mouse button. To drag an instrument out of a mixed pane into its own private pane, drag the instrument (or indicator) out of the pane and drop it on any pane title bar.

Normalized Price technical indicator

The Normalized Price indicator graphs the price movement of an instrument using 100 as the base value for a user specified base date/time. The normalized value for each bar after the base date/time is the percent of the base price expressed as a whole number. (i.e. 100 times actual price divided by actual base price)

This indicator shows the percentage move in price relative to some fixed starting point. For example, if you add this indicator to a daily chart using 12/31/99 as the based date, the indicator line will show you how the issue has performed since the beginning of year 2000. Values above 100 indicate the percentage increase in price since the beginning of 2000. For example, a value of 115 means the price has increased 15% since the base date, while a value of 82 would indicate a decline of 18% since the base date.

The "price" graphed can be any of the standard Investor/RT price values: close, high, low, high + low average, or high + low + close average. An optional smoothing can be applied to the resultant graph. For example, if the actual closing prices beginning at the base date/time were:

Another purpose of the Normalized Price indicator is to provide a means of easily comparing the price action of two or more instruments since some fixed starting point. When a chart window contains two or more instruments, you may create normalized lines for each of the instruments and add them all to the same pane. Be sure to use the same base date/time in all normalized price indicators.

Other Miscellaneous Enhancements

The Order Confirmation window has been renamed "Order Status". This window is still used to manually confirm filled orders as before. When trade execution capabilities are added to Investor/RT this window will show all submitted orders and their status until they are confirmed electronically.

The Setup: Preferences: Charting Advanced window was improved to add "% Change" as an optional display value in chart window panes. When %Change is checked, chart window pane titles will show the percentage change in price from the bar pointed at to the present price.

Investor/RT 3.6, Final Release Date: May 13, 1999

NASDAQ Level II Screens

To view NASD Level II for a particular NASD stock, right click on the ticker symbol in any quote page, portfolio, or instrument selector list and choose "NASDAQ Level II" from the popup menu. On Macintosh, use command-click to access the menu.

NASDAQ Level windows in Investor/RT show the current bid/ask and bid/ask sizes for each market maker for a particular NASD stock. The window updates tick by tick as trades occur and as level II data arrives on the data feed. Current market data including the bid tick indicator are displayed at the top of the window. The market makers on the bid side are listed on the left side of the window ordered from best bid (highest bid) descending. The market makers on the ask size are listed on the right side of the window ordered from best ask (lowest ask) ascending. The first five levels of bid/ask prices are color coded with all market makers bidding or asking the same price have the same color code.

In addition, Investor/RT shows a histogram that provides a graphical perspective on the proportion of volume (bid/ask sizes) at each of the top four prices levels. The bid sizes are shown on the left and the ask sizes are shown on the right. The bid/ask boundary point of the histogram shifts left and right as trading occurs to provide an overall picture of the ratio of bid size to ask size for the first four price levels as a whole.

NASDAQ Level II data is available with five data services supported by Investor/RT: eSignal, myTrack, InterQuote, DTN, and QFeed. eSignal and QFeed are supported only the Windows platform. InterQuote, myTrack, and DTN Level II data is available for both Windows and Macintosh.

Improved ticker tape object



Click on the Ticker Tape icon on the main toolbar to open a Ticker Tape window. There is a ticker tape for each defined quote page. A list of quote page names appears; select the one you want and a ticker tape window will open showing trades on any instrument in the selected quote page. Any number of Ticker Tapes can run simultaneously. If you want to create a ticker tape of just few or even one instrument, just make a quote page containing the instrument(s) and save the quote page. Then open the ticker tape for that quote page to view just the trades for those instruments.

NEW IN VERSION 3.6 AND HIGHER: After market hours, the prices are shown in the up and down colors based on the user color preferences in Setup: Preferences: Quote Page Preferences. The color can be based on whether the issue is up or down relative to either the open price of the session or the closing price of the previous session. During market hours the trades appearing in the ticker tape are color coded according to the bid tick indicator (the direction of the last trade up or down). The bid tick indicator (plus or minus sign) is also shown after the tick volume for equities. The ticker tape has been improved to scroll more smoothly from right to left as trades occur. The tape automatically adjusts its scrolling speed to the pace of the trades that are occurring. For ticker tapes monitoring a list of very actively traded equities, it is recommended that the tick volume limit be used. Otherwise the tape may scroll too quickly to be useful. See below for instructions on setting the tick volume level.

Modifying the ticker symbols:

Once a ticker tape window is open, it may be switched to any list of instruments, i.e. to any existing quote page by clicking on and making a selection.

The Tick Volume Limit, if specified, limits the display to those trades that have a tick volume at or above the amount entered. This can serve to restrict the tape scrolling speed which can be useful if the ticker is tied to quote page with a large number of active issues. This feature is quite useful for tracking large block trades in the equities market. Specify the ".Stocks" quote page and set tick volume to 5000, for example, to watch all trades of any stock of 5000 shares or more.

Clicking on the color button toggles between the user-defined color dynamics and a black on white display.

Checking the recap feature causes the ticker to loop sequentially through its defined symbols and display the most recent price for each. With this feature unchecked, the ticker displays trades only when they arrive on the data feed.

A Ticker Tape can be positioned anywhere on the screen. It can be widened or narrowed using standard window manipulation or by using the horizontal and vertical arrow buttons. Ticker tapes windows may, of course, be part of a layout so that they appear automatically when the layout is opened.

Improved instrument selection object

The instrument selector used throughout Investor/RT has been improved to enable the user to select subsets of the universe of tracked instruments. The instrument selector appears in quick quote windows, order desk windows, export and view/edit dialogs, etc. Normally, the instrument selector lists all tracked instruments. A pop up menu has been added to the instrument selection window. To access the menu, right click on a column title (ticker or name). On Macintosh, use command + click. There are menu choices for stocks, futures, options, indexes, all instruments with alarms, intra-day instruments, etc.

New "Multi-Link" feature

The multi-link feature enables you to quickly insert a particular instrument into all open chart windows, quick quotes, and NASD Level II window. The multi-link command is available in the pop up menu when you right click on a ticker symbol in a quote page, portfolio, or any instrument selection list. Mac users must command-click. The selected instrument is inserted into all open chart windows. These include bar, line, candle, day bar, point and figure, market profile, and volume profile charts. In addition, the selected symbol is selected in any open quick quote window and Level II window. This feature is designed to enable you to have a variety of chart types in view and quickly update all windows to study a particular instrument.

Custom Instrument Improvement

When defining custom instruments, the user may now specify which price component to use (last, bid, ask, high, low, etc.). This enables the user to define custom instruments that track, for example, the spread between the bid of one instrument and the ask of another, a useful indicator in options trading. Price component may also include advances, declines, unchanged. These are properties of statistical instruments sent by some data services, notably DTN. Thus it is possible to track the NYSE advance decline line in real-time, even with data services that send the advances and declines in a single ticker like DTN does.

New data columns for options contracts

Two new data columns have been added to Investor/RT for options instruments (stock options, index options, and future options). Underlying ticker is the ticker symbol of the stock, index, or futures contract that underlies the option. Option Type (put or call) shows, for option instrument whether the option is a put or call. These two data columns must be setup properly when defining new options contracts to Investor/RT if you wish to have the software properly calculate the various option analysis values (implied volatility, theoretical value, beta, gamma, and other "greeks"). The underlying ticker and option type columns are setup for you automatically if you use the Setup menu to define the options. If you define an options contract directly by typing a new ticker into a quote page it will be necessary for you to setup these values manually. This can be done by adding the Option Type and Underlying Ticker data columns to the ".Options" quote page and entering the values directly into the quote page cells. When entering the option type you may type just a p or c for put or call. If you use the Setup: Instruments window to define a new option contract you may begin the name of the option with the ticker of the underlying and include the word "Put" or "Call" elsewhere in the name and Investor/RT will setup the underlying ticker and option type automatically by inferring these from the supplied name. User that wish to display or scan using options analysis data values should add the Underlying Ticker and Option Type data columns to the ".Options" quote page and review the entire quote page to assure that the correct values are set for each option. Prior to version 3.6, Investor/RT relied on the security name field of options contracts to supply the ticker symbol of the underlying instrument and to specify whether an option was a put or call. This improvement make option analysis possible even when the name of an option is not in the Investor/RT prescribed format such as is the case with some data services that transmit security names for options instruments.

Revised Control Menu

The Investor/RT Control Menu has been revised and one new function has been added. The "Run Scan" menu item has been moved to the File Menu. It can still be accessed by the keyboard shortcut Alt + R (or command + R on Macintosh). The Control Menu now has two sub menus, "Data Management" and "Database Utilities". The Database Utilities menu was

formerly called "Database Functions" and contains the same menu items. The Data Management menu contains the following menu items:

Verify

This new function scans all the historical data on the database for consistency and makes minor repairs if necessary. Daily, weekly, monthly, tick data, and intra-day bar data are verified.

Delete

Shows a sub-menu for deleting information from the database, e.g. quote pages, scans, historical data, etc.

View/Edit

Open the View/Edit Setup window

Download

Opens the Download Data window

Adjust for splits

Opens the split adjustment window.

Save current prices Formerly named "Save Quotes"

This menu item causes all current market data to be written to the database. This function is performed automatically when Investor/RT quits or when historical data is posted to the database at the session posting time.

Record Closing Prices Formerly named "Post History"

This menu item causes the current market data to be recorded in the daily, weekly, and monthly historical record for each instrument. This function is performed automatically at the user specified session "post time". If closing prices are downloaded after the automatic posting time, this command should be issued to update the historical data for each instrument after downloading closing prices.

New system defined quote page

A new system defined quote page, ".Custom Instruments" has been added. This quote page lists all of the user-defined custom instruments for quick references. When you right click on a custom instrument in this or any other quote page and choose Setup, Investor/RT will now take you to the Setup: Custom Instruments window and show you the definition of that custom instrument.

DBC Data Manager improvements

Investor/RT now supports the very latest DBC supplied access software for connecting to the DBC Data Manager. For Signal Online users, this new access software enables Investor/RT to also connect to the DBC historical server, tick data server, NASD Level II server and historical news server. For example, to request historical news for a particular instrument simply right click on the ticker in a quote page or portfolio and choose "Download News" from the menu that appears. Similarly to access Level II information for a NASD stock, right click on it and choose "Level II" from the menu.

The DBC Data Manager setup window (under Setup: Preferences) has been improved. There are now options for connecting to Signal Online through a proxy server and for starting the Data Manager automatically when Investor/RT Starts up.

Object menu renamed "Open"

The "Object" menu has been renamed "Open" to better reflect its purpose, i.e. to Open windows of a certain type that have been previously saved in the database. The "Delete" command, formerly in the Objects menu, has been moved to the Control Menu under "Data Manager". All data management functions are now listed together in one menu (the Data Management menu) and all access to saved definitions in the database is handled via the Open menu.

New Raw Tick Chart Type

Investor/RT has always supported tick charts as one of the available periodicities within an Investor/RT chart window. This kind of tick chart uses a fixed time interval on the horizontal axis, just like intra-day bar charts where the "distance" in time between ticks can be perceived by the relative distance between the ticks in the chart. The "Raw Tick Chart" is a new kind of Investor/RT chart window that takes a different approach to the display of tick-by-tick data. The ticks are equally spaced across the window as opposed to being spaced in a time dependent manner. During trading hours the raw tick charts update tick-by-tick.

Popup Menu and Toolbar

The popup menu can be accessed by right clicking in the chart window, and along with the toolbar, gives you quick access to performing certain tasks, such as switching to a different chart type, downloading data, or displaying the View/Edit window. The user may adjust various parameters:

"Space between ticks"

You may specify here how many pixels you would like to see separating each tick.

"Tick size"

You may specify here the diameter in pixels of each tick on the chart.

"Draw Gridlines"

If this choice is checked, horizontal and vertical gridlines will be drawn on your chart.

"Connect Ticks"

Check this box for lines to be drawn between each consecutive tick.

"Don't show ticks with unchanged price"

Check this box if you would like to compress your chart by eliminating the display of two ticks side by side with the same price. It will only show the next tick if it has changed in price from the previous tick. This option can be toggled on and off by hitting the Tab key with the chart in focus.

"Volume Histogram"

Check this box to show a volume histogram in the background of your chart. The color of the Histogram will automatically be generated as one that is only slightly different from your background color. The volume bars will all be relative to the largest volume tick in the window. You can view the volume for each tick in the message box by moving your cursor across the chart. Raw tick charts like all other chart window types can participate in user defined layouts. They may be saved under a user specified name, and recalled from the Open: Chart menu.

Scan fixes and improvements

There is now improved error checking when opening charts that have been saved with scan indicators to assure that the scan is still defined to Investor/RT. If you delete a scan from Investor/RT then this will no longer cause problems if the deleted scan was used in various charts. An error was fixed in the HLR (high-low range) and OCR (open-close range) scan tokens. These tokens were not computed properly when the tokens were used to test current HLR or OCR. Investor/RT now handles scans used in chart windows more efficiently and uses less memory. Scans used in chart window no longer causes the create of hidden windows. The Windows menu is no longer cluttered with hidden windows when scans are active within chart windows.

Finally, when a scan definition is edited and saved, Investor/RT checks to see if the scan is currently active in any open chart windows. If so, the scans running in chart windows are updated to reflect the revised made in the scan setup window. This feature makes it possible to make revisions to a scan and immediately view the effects of the chart in a chart window running side by side with the scan setup window.

Enhanced Copy/Paste

When copying text to the clipboard you can now view the contents of the clipboard using the Show Clipboard command in the Edit Menu. For example, to view your user profile choose Copy User Profile and then Show Clipboard from the Edit Menu. Text may be copied to the clipboard from any text window, news text window, for example, or from within cells in quote pages, portfolios, time and sales spreadsheets. Use the Edit menu or keyboard shortcuts (ctrl-C for windows, command-C for Macintosh). Text may be pasted in to cells in quote pages, portfolios or view/edit spreadsheets.

A special case of "paste" has been added to Investor/RT 3.6 to make it easy to quickly create quote pages of ticker symbols from news text windows or text files. For example DTN news items showing most actives or leading gainers and losers for the day, or myTrack "market pulse" displays. These text displays often have ticker symbols listed at the left edge of each line in the display. If so, you can copy these lines on to the clipboard and "paste" them into any open quote page. Investor/RT will define new instruments for each symbol it finds at the beginning of each line in the clipboard text.

If you find some ticker symbols you wish to add to Investor/RT that are not exactly in the required format, just copy them to the clipboard then show the clipboard using the new Show Clipboard command in the edit menu. You can then edit the text in the clipboard window so that the desired tickers are each at the beginning of a line then select the lines you want and copy the revised text to the clipboard for pasting into a quote page.

Saving scan definitions as text

Investor/RT users can share scan definitions with one another by saving them as text files using the "Save as text" command in the File menu. Investor/RT now includes a description of the parameters of each technical indicator used in the scan. When the recipient user loads the scan definition into their system (using File: Open: File), a setup dialog will appear for each technical indicator. The description of the technical indicator parameters will appear in the main toolbar as an aid to the setup process.

New menu items in File menu

The new menu item "Save All" performs a save on each quote page and chart window (all types) if the window is been modified or if the window is still "Untitled". The new menu item "Quick Exit" performs a "Save All" followed by a Quit command. The quick exit is quicker since there is no prompting for saving modified quote pages and charts before quitting. The "Save Layout" command saves the current arrangement of windows as a named layout. This command is equivalent to "File : New: Layout".

Drag and drop Fibonacci indicators

Each of the three Fibonacci studies (arcs, projections, and retracements) can be drawn, dragged, and dropped within a chart window. To draw a Fibonacci study on the chart, click one of the Fibonacci drawing tools on the chart toolbar and draw a line on the chart connecting any significant high with any significant low or vice versa. The Fibonacci lines or arcs will then appear. Note that Setup: Preferences Charting Indicators should be used to pre-define the preferences for each of the three Fibonacci studies.

The base line of the study is the line connecting the significant high and low. You can adjust an existing Fibonacci study by dragging the base line from either end to a new position in the chart and dropping the endpoint. Be sure to turn off the Fibonacci drawing tool using the toolbar before trying to move a base line. If the cursor appears as a pencil this indicates that the drawing tool is still on. To drag and drop Fibonacci studies the cursor must appear as an arrow.

Manually drawn trend lines can also be moved the same way. When you mouse down on either end of the base line it is NOT necessary to click exactly on the end of the line. In fact, it is recommended that you mouse down somewhere near the end of the line where your mouse click will not be misinterpreted as clicking on the instrument graph itself instead of the Fibonacci base line.

Momentum technical indicator

A momentum technical indicator with optional smoothing has been added. Momentum and/or smoothed momentum indicators can be added to chart windows with user selectable momentum period and smoothing period. Momentum has also been added to the scan language under the token MOM. Momentum oscillates around zero with higher positive values indicating strong upward price momentum and lower negative values indicating stronger downward price momentum. For example to find the issues with the greatest upward price momentum use the scan:

$$\text{MOM} > 5$$

and rank (sort) the resulting quote page descending by MOM value. To find issues whose momentum is positive and has been increasing for 3 days in a row use the scan:

$$\text{MOM} > 0 \text{ and } \text{MOM1} > \text{MOM2} \text{ and } \text{MOM2} > \text{MOM3} \text{ and } \text{MOM3} > \text{MOM4}$$

When configuring the MOM token in the scan setup, check the box for "Smoothed Momentum" if you want the MOM token to be the smoothed value, otherwise the raw (not smoothed) momentum will be used. The Rate of Change indicator was also revised to behave the same way in the scan language. The rate of change and momentum indicators are essentially equivalent measures of price change velocity. We provide them both for completeness.

Drag and Drop improvement

Quote page setup can be performed very easily by dragging and dropping the instruments you want from one quote page into the new quote page you are constructing. For the benefit of those for whom the order of the instruments in the page is important, we have improved the drag and drop feature so that the newly added instrument is inserted in a new row above the row on which it is dropped. You can also remove instruments from quote pages by dragging them off the quote page and dropping them on the desktop.

myTrack Enhancements

NASDAQ Level II support has been added. Option Display command for stocks, indexes and futures has been added. Right click on a ticker in a quote page and choose "Option Display" to see all options related to that ticker. Use copy/paste to insert the listed options into a quote page. New Download is also available from the pop up menu. This command requests current news headlines for the selected ticker symbol. Choose "News" from the pop up menu to open a news browser showing all news items on file for the ticker.

Point and Figure Enhancements

Up to 5 horizontal reference lines may be added to any point and figure chart. To add a reference line shift+click anywhere in the chart window. To remove a reference line shift+click on the line. Pressing the tab key when a point and figure chart is active causes Investor/RT to toggle on/off the dynamic updating of price information at the top of the chart. During periods of active trading, turning off the dynamic display enables the user to position the mouse at any X or O on the chart and view pricing information for that mouse position without having the display updated with live market data arriving on the feed. Strike the tab key again to resume dynamic updating of incoming market data.

Investor/RT 3.5, Release Date: March 12, 1999

Rectangle and vertical line drawing tools for chart annotation

These two new charting "indicators" allow the user to mark up charts with verticals lines placed at a specific date/time or rectangles enclosing a user specified trading date/time range. Both indicators support a user comment that will display in the chart to annotate the line or rectangle. For vertical lines, the user comment appears only when the line is "selected". Both indicators have drawing tools on the charting toolbar. For example to draw a rectangle, click the rectangle drawing tools, the mouse pointer will change to a pencil. Move the mouse pointer to the place in the chart to start the rectangle, mouse down and drag the mouse to the ending time and release.

Row and column highlighting in quote pages

Rows and columns in quote pages may be highlighted using the highlight color specified in preferences. To highlight an instrument, right click on the ticker cell in a quote page (or portfolio), and choose "Highlight" from the popup menu. To highlight a column, right click on the column title and choose highlight from the popup menu. Options are also provided to highlighting every other column to improve the readability of the spreadsheet.

Tick Data Compression into Bars

In Versions prior to 3.5, Investor/RT maintained all intra-day historical data as ticks. The user specifies the number of days of tick data to retain in the database. To view longer term intra-day charts going back more than a week or so it was necessary for Investor/RT to store and retrieve huge amounts of tick data from the database. For many users, tick by tick data is only required for the last few hours or days of trading, while 1-minute or 5-minute bar data is sufficient for scanning or viewing charts going back several weeks or months. Saving longer term intra-day ticks as n-minute bars uses considerably less disk storage space than tick data, especially for actively traded stocks and futures contracts.

To facilitate longer term intra-day charting in Investor/RT, Version 3.5 incorporate a new user option for controlling the compression of tick data into a minute bars of some user specified duration. The option is part of the Setup: Preferences: Historical Data window. The checkbox is titled:

Compact tick data older than [n] days into [m] minute bars.

where the user checks the box and fills in numeric values for n and m. If the checkbox is not checked, then all intra-day data will be kept as ticks just as it was in Version 3.4 and earlier. The user specifies the tick data retention period in this window. The number n above must be less than the default tick data retention period. The recommended value for m is one. One-minute bars can be translated into minute bars of any other user desired duration for charting. If the user specifies a value greater than one, this will restrict intra-day charts to multiples of m. For example, if you retain long-term intra-day data as 5 minute bars, intra-day charts of 5, 10, 15, or any other multiple of 5 will be possible. The trade off is between flexibility and disk space. 5-minute bars take less disk space than 1-minute bars. If you only want a week or two or intra-day data then use 1-minute bars. If you wish to retain intra-day data for several months, consider 5-minute or a higher bar duration.

For discussion purposes, consider this example:

Default Retention Settings

Tick Data: 60 days

Compact tick data older than 3 days into 1 minute bars

Intra-day data will be collected tick by tick for each intra-day instrument for three days. At the end of each trading day when historical data is posted to the database, Investor/RT will convert all ticks older than 3 days into 1-minute bars and store the bars in the database. The ticks used to derive these bars are removed from the database. Each day the process repeats and more bars are added. Eventually, there will be bars older than 60 days on the database and these will be removed at that time.

When drawing intra-day charts, Investor/RT will merge the bar data with the tick data on file to derive the chart. In this example, if you call up a 5 minute bar chart, Investor/RT will first convert the 1-minute bars to 5-minute bars. Then it will add 5-minute bars derived from the tick data currently on file and draw the chart.

When you request a tick chart, ONLY the tick data on file is referenced. There is no reference to the older bar data in the case. In this case tick charts can only be viewed for the last 3 days, while intra-day minute bars charts can go back as much as 60 days.

The view/edit and historical export features of Investor/RT combine the bar data and tick data. If you call up a view/edit window of 1-minute bars you will see a continuous list of bars derived first from the bar data followed by the more recent bars derived from the tick data on file.

Scanning using an intra-day periodicity works similarly to charts, the data scanned is derived from both the bars and ticks as necessary.

Importing tick data or minute bar data from text files or from Internet data services (InterQuote, Signal Online, or myTrack) works as follows. The imported tick data or bar data is first loaded into the database as ticks. The imported data will be available for tick charts and/or intra-day minute charts for the remainder of the trading session. After the end of session when Post History occurs, the tick data that is older than 3 days (in this example) will be merged with the bar data on file. During this merging process, any bars already on file will be replaced by the newly imported bars having the same minute interval.

Keyboard shortcuts (function keys)

A wide array of common Investor/RT actions may now be initiated by a function key.

Scan improvements

Three new scan tokens have been added: HLR (the high-low range for any bar) , OCR (Open-Close Range for any bar), and BAS (the current bid/ask spread)The OCR token always returns a positive range value measuring the distance in price between the open and close. Since HLR and OCR are historical tokens, they can be qualified with a number to refer back in time. BAS is a primitive property of an instrument representing the current bid ask spread. It cannot be referenced historically. For example, the scan:

HLR > HLR1 and HLR1 > HLR2 and HLR2 > HLR3

will identify bars showing three consecutive periods of increasing high-low range.

In concert with this, the STAT technical indicator in the scan language has been enhanced to allow statistics to be calculated on the historical values of the high-low range. For example, you can define STAT to be the maximum hi-lo range during 30 periods. Then the scan request:

HLR >= STAT

will identify bars where the current period's trading range is the maximum range during 30 periods.

The scan $BAS \geq 1 / 4$ will find all issues having a bid ask spread of .25 or greater.

Each of these new data columns may, be displayed in quote pages and may be used to rank (sort) the quote page.

Day Bar Charts

A day bar chart is a special chart window showing the current daily bar for an instrument. This is a convenient way to keep your eye on a graphical representation of the day's session. The day bar shows the open, high, low, and current price numerically and graphically. The bar is color coded as up or down based on either the open or previous session close. Optionally, the time of the high and low are shown. The day bar updates tick by tick. Think of it as a magnification of the last bar in a daily bar chart.

Market Profile Charts

The Market Profile displays a horizontally positioned histogram that graphs a time-price relationship for trade in a security. Each half-hour of the day is designated by a letter. If a certain price is traded during a given half-hour, the corresponding letter is marked next to the price. The first half hour (or portion thereof) of trade will be noted with the letter A, the second half-hour will be noted with the letter B, and so on. The open price for the day is marked with the letter O. As price moves up and down each letter is marked only once at each price level.

This method of graphing time spent at each price will often form a bell curve. The most dense portion of the bell curve is called the value area. In general, look for price to gravitate toward the value area and away from the extremes.

Volume Profile Charts

The volume profile study creates a histogram that displays the volume for a security at each price it traded throughout the day. Most notable is the price at which the most volume has traded--this is called the "volume weighted average price" (VWAP).

Market makers and institutional traders are under pressure to offer executions to their customers which are better than the VWAP. This pressure is in the form of revenues generated by commissions. One of the best times to watch the VWAP is at the end of the day, when market makers may bid up a stock or sell it off to better position their executions. In general, look for trade to gravitate toward the VWAP.

myTrack Chat facility

myTrack users may now communicate live with other myTrack users and with Track Data personnel using the built-in "chat" facility in Investor/RT. This feature of Investor/RT is designed to operate similarly to the chat feature in myTrack software for windows. Macintosh users can now participate in myTrack chat sessions using Investor/RT.

The myTrack edition of Investor/RT supports myTrack live chat. This feature enables Investor/RT users to interact with each other and with Track Data and Linn Software personnel. To invoke this feature, make sure the myTrack connection is active and choose Chat from the myTrack menu.

A special Chat toolbar will appear at the bottom of the screen. The toolbar is used to enter text and commands to the chat system. A public and private chat window will appear. The toolbar has three push buttons for controlling the "chat channel" on which you wish to communicate. For example, to chat on the public channel, click the "Pub" button. The public window will come into view and the chat command will change to "Say". In the text box enter some text and press return. For example:

Say This is a test message

Whatever text you "Say" appears in the public window. All other connected users will see your message in their public window. Replies from other users will then appear beneath your text. In this way you can ask questions and interact with other myTrack users. Each chat window holds the most recent 2000 lines of chat.

You can direct messages to a particular user if that user is connected. To send a private message, push the Pri button and the command will change to "Tell". Then type in the user id followed by the message. For example:

Tell wlinn I'm using Investor/RT version 5.8.

The private window is used to show private messages sent to you by other users and responses to other commands you enter. For example, use the command menu to pick the help command. Press return and view help instructions in your private chat window. To get help on a particular topic, leave the help command in place and type in a topic, e.g. help exchange. Your private window will then show help on using the "exchange" command to activate exchanges for real-time.

To enter the exchange command, choose it from the command menu and press return.

In addition to the public and private chat channels there are twenty private chat channels. Some private channels are pre-assigned for certain purposes. For example, channel 1 is for "day trader chat", channel 2 is assigned for "position trader chat", and channel 10 is for Investor/RT chat. Using a private message or a public chat message you can invite other users to join you on a private channel so you can have a more one on one conversation.

To move to a private channel, click the "Chan" button and pick the channel number you want from the menu. The channel window will open and the command will change to "Tell 10" (where 10 is the channel number). Type in some text and it will be routed to the window for channel 10. Those users viewing channel 10 will see your message.

Chat windows in Investor/RT are remembered in Layouts so you can configure your startup layout if you like to include one or more chat channels. The chat toolbar, like other toolbars, floats over all other windows. You can save the text in a chat window to a text file for future reference if you like. Use the File menu Save or Save As command.

To turn off the chat feature, close the chat toolbar. You will be asked if you wish to close all chat windows. To re-join chat, choose Chat from the myTrack menu.

Using the chat feature, you can also control all aspects of your myTrack account.

You can upgrade or downgrade your myTrack "plan" (gold, silver, platinum). You can update your credit card information. You can enter information about yourself using the whois command. You can enable/disable news services, etc. The Help command documents all of the chat commands you can issue to accomplish these things. If you have questions, just ask one of the hosts in the public channel. Here are some examples that may be useful:

To see a list of your "feature" setting for your myTrack account type:

```
/feature
```

and press the enter key

To see a list of all of your exchange settings type:

/exchange

and press the enter key

To enable a particular feature, e.g. the NASDAQ dynamic level II feature (code dlevel2) enter the command:

Feature dlevel2 enable

And press the enter key. Responses to your commands will be shown in the private chat window.

To view your plan type "/plan" and press the enter key.

To set your plan to silver type "/plan silver" and press the enter key

To view your credit card setup, type "/cc"

To view help on setting up a new credit card, type "/help cc" and press the enter key.

Investor/RT 3.4, Release Date: Dec 21, 1998

Scan Technical Indicator improved

The scan technical indicator setup now has a "marker size" option for specifying the size of the markers drawn in the chart window. The default is 16 pixels, the standard size used in version 3.3. Values from 4 to 64 are permitted.

New pop up menu for quote pages, portfolios, instrument selectors

Use the right-click (click with either command or ctrl key down on Macintosh) to click on a row in a quote page or portfolio to access a convenient pop up menu of functions to operate on the selected instrument in that row. The pop up menu also available throughout Investor/RT in every window that contains an "instrument selection". Examples include the Import and Export windows, the Quick Quote window, the Order Desk, etc. The pop up menu contains the following choices:

Setup
Chart
News
Positions
Quick Quote
Trading Notes
Time and Sales
NASDAQ Level II

Setup

Opens the Setup Instruments window for the instrument. This is useful for adjusting alarm settings, for example.

Chart

Opens a new chart window for the instrument. A new chart window will always be opened even if there is a chart window already open. To chart an instrument in the already opened chart window, double-click on the ticker symbol in a quote page or portfolio. The chart opened depends on the preference settings for default chart in the Charting Advanced or Charting General Preference windows.

News

Opens a news browser showing all news items on file for the instrument. The general error sound is played and a message is displayed on the main toolbar if there is no news available for the instrument.

Positions

Displays a list selector showing all open portfolio positions for the instrument. If there is only one position, the associated portfolio is opened immediately, otherwise the list is displayed. Close the selector or double-click on a listed position to open the associated portfolio window.

Quick Quote

Opens a quick quote window showing a detailed quote for the selected instrument.

Trading Notes

Opens a trading notes window showing all trading notes for the selected instrument.

Time and Sales

Opens a Time and Sales (view/edit) window showing all trades in the instrument for the current trading session.

NASDAQ Level II (when available)

Will open a Level II window for the selected instrument showing bids, asks and bid/ask sizes for all market makers in a NASD issue. At present Level II screens are not available in Investor/RT.

Instrument selection window

The Objects menu now contains an Instruments menu item to open a simple "instrument selector" window. This window, in conjunction with the right click feature described above can be used to provide quick access to commonly requested windows for any instrument. The

instrument selection window is similar to the "Add to Quote Page" window used to add issues to quote pages, and in fact, may also be used for this purpose.

With version 3.4, Linn Software introduces support for myTrack, an Internet based data feed service of Track Data Corporation.

The myTrack service is available for either real time or delayed intra-day quotes and includes full access to all Dial/Data historical downloading services. The myTrack service includes real-time news headlines, tick data and intra-day bar data downloading. Optional services include full-text news and NASDAQ Level II. Level II screens are supported by myTrack supplied software (Windows only) that runs in parallel with Investor/RT. Level II screens will be available in Investor/RT soon for both Windows and Macintosh Investor/RT versions. For more information on the myTrack service, visit www.mytrack.com.

Absolute Value and Square Root functions added to scan language

The ABS and SQRT functions may be used in scan requests. Either function must be followed by a parenthesized numeric expression. For example, the scan request:

$ABS(CL1 - OP) > 4$

would identify all issues with an opening gap (up or down) of more than 4 points from the previous day's close. To accomplish the same thing WITHOUT the ABS function, you would have to compose a scan request something like:

$CL1 - OP > 4$ OR $CL1 - OP < -4$

The SQRT function calculates the square root of the parenthesized expression that follows it. For example,

$SQRT((HI-LO)**2 + (HI1-LO1)**2 + (HI2 - LO2)**2) > 1.5$

identifies issues for which the square root of the sum of the squares of the daily ranges for three days is greater than 1.5.

Investor/RT 3.3, Release Date: Ver 3.3.3 Dec 2, 1998

IMPORTANT NOTICE:

This version of Investor/RT has a new "Automatic Data Downloading" feature when opening chart windows. If Investor/RT determines there is insufficient historical data on file, it will

attempt to access the Internet based historical server specific to your product registration. This feature applies to all Internet based services supported by Investor/RT and to all other data services if a Dial/Data account is registered. If you want more control over the download process you can turn off automatic downloading in the Setup: Preferences: Charting Advanced window. A new "download data" button in the charting toolbar initiates data downloading for the current chart window.

A new document "Introduction to Investor/RT" is now available for downloading from the Linn Software web site www.linnsoft.com/docs.. This 60-page document provides a step-by-step guide for registering Investor/RT, configuring the data feed, and setting up windows of each type. Data Feed Trouble-shooting tips for each data service are also provided. The document is designed primarily for new Investor/RT users and is provided in printed form to all new customers. The Startup Guide is available in Adobe Acrobat Reader (PDF) format on the web site (approx. size 3.6 megabytes).

Browse button fixed for Windows users in Backup Preferences

This fix makes it possible for Windows users to use the Browse button to set the Investor/RT backup location to any directory. For example, to set up Investor/RT to backup to a zip disk, create a folder called "Backup_f" on a zip disk. Place a file of any kind into the folder (using Notepad, for example). Choose Setup: Preferences: Backup Preferences and click the Browse button. When the file selection dialog appears, navigate to the zip drive, open the backup_f folder and open any file in that folder. Investor/RT will then set the backup location to the same directory as the selected file. Use the Browse button is less error prone than typing in a path name manually.

Delete Historical Data now has a "Single Instrument" option

Prior to 3.3 the Delete Historical Data window required a quote page to be selected to indicate which instruments to process when deleting historical data. Now, to delete data for one instrument, check the "One Instrument" box. A dialog box will appear for selecting the instrument. Alternatively, fill in the ticker in space provided and the "One Instrument" checkbox will be checked.

Run Scan command added to Control menu

Prior to 3.3, running a scan required the user to open the scan definition window and click the scan button. Pre-defined scans may now be run directly by using the Run Scan command in the File menu (keyboard shortcut is alt-R or command-R for Macintosh). A list of scan names will appear. Double click one to run it or type the first few letters of the one you want and press return to run the identified scan.

Another method of running scans is to select the scan name directly from the Object: Scan menu while holding down the shift key. Without the shift key the scan setup window will open to that scan. When the shift key is down, Investor/RT runs the scan directly without opening the scan setup window.

Automatic periodic sorting added for quote pages

New options have been added to the quote page object to enable the quote page to be automatically sorted in a user-specified sequence when the quote page is opened. Optionally, the quote page can be sorted periodically while the quote page remains open. To set the global default quote page sorting option use the Setup: Preferences: Quote Page Preferences window. Check the box "Sort quote page" and choose the data column to sort on and the desired sequence, ascending or descending.

If desired, check the "Repeat sort" box and specify the frequency of the sorting in seconds. To adjust the sorting option of existing quote pages, open the quote page and click the Preferences icon on the quote page toolbar. When a quote page is sorted upon opening and/or repeat sorted, the window title of the quote page window displays the sorting options, for example ".Stocks (6687 issues) Sorted every 60 seconds by Percent Change".

Continuous slide show option added

Choose Setup: Preferences: General Preferences and check the box "Slide Show Continuous Loop" to request that slide shows run continuously. Instead of stopping at the end of the list of instruments in a quote page, the slide show will loop around to the beginning and repeat until the user stops it. This feature can be used to cycle through charts for any lists of instruments continuously.

If there are several chart windows open, the continuous slide show will use the active chart window. While a continuous slide show is in progress, clicking on another chart window will dynamically switch the continuous slide show to that chart window. Then same applies to the quote page used in the continuous slide show. If several quote pages are open, Investor/RT uses the active quote page as the source for the list of instruments to be charted. If you activate a different quote page while a continuous slide show is in progress, the slide show will continue with the same chart but will begin charting the instruments one-by-one in the newly active quote page.

Setup: Preferences windows enhanced

Most Setup: Preferences windows now have Cancel, Apply, and OK buttons at the bottom right. The Apply button is dimmed until some change has been made to an element in the preference window. Click Apply or OK to put those changes into effect. OK applies the changes and closes the window while the Apply button applies the changes, dims the Apply button, and leaves the

preferences window open for further modifications. The Cancel button or close button (or esc key) dismisses the window without applying any changes since the last Apply.

Slide Show keyboard shortcuts added

When a slide show is in progress the right and left arrow keys on the keyboard may be used to control the progress of the slide show.

Y2K Compliance Revisions were made in version 3.2 and 3.3 to ensure proper operation of Investor/RT under Year 2000 conditions.

Charting, importing and export have all been verified to operate properly with Y2K dates and market data in version 3.3. Various displays have been updated to show a four digit year where appropriate. The data/time data entry control used throughout Investor/RT works properly with dates past 1999. The year displays as a 2 digit number in this control with 00 representing 2000.

Technical Indicator selection enhanced

When selecting a technical indicator to add to a chart or when selecting an indicator to set up defaults (Setup: Preferences: Charting Indicators) typing the first few letters of the indicator advances to the appropriate indicator in the list. This has always been the behavior on the Macintosh platform. The improvement extends this to the Windows platform as well.

Wildcard scanning on ticker

When running a scan with the TICKER or NAME scan element, wildcard matching is now supported. Use ? to represent any single character and use * to represent any span of 0 or more characters. Thus the scan request TICKER = "????X" will identify all 5 letter tickers ending in X. The scan NAME = "*Put*" will match any instrument that has the word "Put" in the security name.

Dynamic reference lines for bid/ask, others

The horizontal reference line indicator has been improved. The line can be pegged to various new price values: previous close, current bid, current ask, high alarm level, low alarm level, 52 week high, 52 week low. When such reference lines are present in intra-day charts the reference lines update dynamically as the price values change. This will be most evident when bid or ask reference lines are used.

Auto sorting of scan results

The scan object has been improved to allow the quote page resulting from the scan to be sorted automatically on any field or calculated value used in the scan request. In the scan request window, after entering a new scan request, click the Check button to check the syntax of the scan request for errors. Once you have checked for errors, Investor/RT shows a list of potential sort columns in a list button. Choose ascending or descending, then choose the sort data column. When the scan is run the resultant quote page will be ranked (sorted) by the requested column.

Scan result window positioning improved

Prior to 3.3, running a scan repeatedly during the session, either manually or as an "auto run", would always reposition the resulting quote page at the center of the screen. In version 3.3, this has been corrected. If you move the quote page result window to some other location on the screen and run the scan again, the new scan results will appear in the new location.

Scan syntax editor improved

The scan language editor has been improved. When you click one of the token or operator buttons above the scan request language entry area or if you type letters on the keyboard, the new characters replace any selected text in the entry box. If there is no selected text, the characters are inserted at the cursor. The Undo button reverses the last editing operation. The () operator button is used to parenthesize the selected text. Select some text and click the () button to enclose the selected expression in parentheses.

Scans on % change and % change from open

The % change (from previous close) and % change from open data columns have been added to the scan request language.

View/Edit Chart Data now shows bars not ticks

When viewing an intra-day chart of n-minute data, clicking the View/Edit button (V/E) on the charting toolbar brings up the n-minute bar data. Prior to 3.3, tick data was displayed. The minute bar data is derived from the underlying tick data and may not be edited. To edit ticks in a tick by tick display, you must request the View/Edit from a tick chart. The T/S (time and sales) button on the quote page toolbar can be used to open a view/edit window showing tick data for any instrument. When requested from a chart window, the view/edit window will only show the tick data (or bar data) that is visible in the chart window. To correct a bad tick in a chart, use the zoom tool to zoom in on the period in which the bad tick occurred, then click the V/E button to see just those ticks in the zoomed in period. After corrected the tick, choose Edit:Undo to zoom back out again.

Chart auto scaling improvements

The vertical scaling method used by Investor/RT has been improved to provide more reasonable scale intervals for futures that trade at prices under 1.0, e.g heating oil futures.

Investor/RT email feature

The Help menu has been improved to provide quick access to several useful help topics. In addition a "New Message" command has been added to the Help menu to enable Investor/RT users to send email messages to Linn Software without leaving the program. Choose New Message from the Help menu. A message window will appear. Type in your message and click send. Investor/RT will use your established Internet connection to route the message to support@linnsoft.com.

Before sending mail using Investor/RT, set up your email reply address and the mail server address you use. This is accomplished in Setup: Preferences: Mail Preferences. The mail server address should be something like "mail.mindspring.com". The mail feature does not operate over America Online connections. AOL users should send mail the normal way using AOL software..

We recommend that all email messages to support be sent using this method because Investor/RT automatically includes your user profile information along with your question. The user profile tells Linn Software which version of the software you are running, which data feed, which platform, how your sessions are set up, etc. The Send Message window may also be used to subscribe to the Investor/RT discussion list, submit messages to the Investor/RT Discussion List, submit enhancement requests to the development team, and make inquiries of the Linn Software Sales Department. The user profile information is sent only in messages to support.

Each message is saved as a text file in the mail directory folder within the Investor/RT directory folder. You may inspect the text of past messages using the File: Open: File command.

Replies to your messages will be received though your normal email application.

Copy User Profile to clipboard

If you prefer to use another email application to send messages to support, it will be necessary for you to include the user profile information in every message. To make this easy a "Copy User Profile" command has been added to the Investor/RT Edit menu. Issue this command, switch to your email program and paste the profile text into a new message to support@linnsoft.com. This improvement makes it unnecessary to open the System Status window in order to copy the user profile to the clipboard.

Keltner Channels Study Added

A The Keltner channel study consists of a moving average and two channel lines above and below it. The channel lines are offset from the moving average line by a value equal to a user-specified constant times the average "true range" of each bar. The true range of a bar is calculated by inspecting the prices for the bar and the previous bar to get the maximum absolute range of current high - low, current high - previous close, and current low - previous close. Buy signals occur when the closing price of a bar breaks above the upper band. Sell signals occur when the close breaks below the lower band. The original Keltner study calls for an exponential moving average of $(\text{high} + \text{low} + \text{close})/3$ and a single constant multiplier for both channel calculations. Investor/RT allows more flexibility by enabling the moving average to be of any type and price indicator. The constant multiplier for the upper band distance can be different from the lower band constant if desired.

Incremental (tick) volume for indexes

Some data feeds transmit a cumulative volume associated with an index. For example Signal (and DBC Data Manager) sends the cumulative volume of trading on the NYSE as the volume figure for the ticker symbol \$INDU, the Dow Jones Industrial Average. Incremental tick volume is not provided by the data feed. Investor/RT now simulates tick volume for indices by calculating the incremental tick volume as the current volume minus the previous volume for each tick. The result is that \$INDU intra-day charts now show trading volume underlying each minute bar (or tick) if requested.

Alarm Reset Improvement

When a high, low, or volume alarm triggers on an instrument, the instrument stays in the alarm state until the alarm is reset. No further alarms can trigger until the instrument is no longer in an alarm state. Prior to 3.3, the alarm could be reset by clicking the Reset Alarms button in the Setup: Instruments window. In 3.3, the act of editing the high, low, or volume level in the Setup: Instruments window also resets the alarm state for the instrument so that monitoring for the new alarm level goes into effect immediately.

Reviewing total position in an instrument

When an instrument is held in several portfolios or there are multiple positions in an instrument in the same portfolio it is often desirable to quickly determine the total number of shares or contracts for that instrument. Clicking the "portfolio" (money bag) icon in the quote page toolbar or in a quick quote window will show a summary of each position in each portfolio for the selected instrument. Double-clicking on the position in the displayed list opens the associated portfolio for viewing. In version 3.3, the total exposure in the selected instrument (across all portfolios) is also displayed in the message area of the main toolbar. The message appears when the portfolio icon is clicked. The message may be replaced by another message, a

news headline for example. To display the total position in a separate window, hold down the shift key while clicking on the portfolio icon in the quote page toolbar or quick quote window.

New scan request technical indicator tokens

The scan request language now includes 5 new technical indicator tokens. KELTU and KELTD are used to scan for penetrations of price (CL) of the upper or lower Keltner Channels. Similarly BOLU and BOLD are used to scan for Bollinger bands penetrations. The UDVRS (Up/Down Volume Ratio Slope) indicator has been added. See the discussion of UDVRS in the Help for details of the buy sell signals given by this indicator.

Stock Option Analysis

Investor/RT supports the calculation and/or display of the following stock option related data items:

- a. Historical volatility (of the underlying stock)
- b. Implied Volatility (of each option)
- c. Theoretical Value of each option
- d. Greek Analytical Calculations-delta, gamma, lambda, rho, theta, and vega.
- e. Intrinsic value and time value of each option
- f. days until expiration, strike price

When "greek" data columns are present in a quote page, all greeks are recalculated when the quote page is opened. As trades occur in the option the greeks are recalculated. Historical volatility of underlying issues is calculated no more than once per hour. All other values are recalculated each time there is a price change in the option instrument.

For best results, we recommend that option traders create option instruments using the Setup: Equity and Index Options window. This ensure that Investor/RT establishes the strike price and expiration date of each option so these values may be used in calculating option analytical values. The Setup window also creates a properly formed name for each option. Investor/RT requires that the name of each stock option begin with the ticker of the underlying stock, e.g. "IBM May 90 Calls". Further, all put options must contain the word "Put" in the instrument name.

Stocks options must have a correctly set expiration date and strike price in order for the option analysis calculations to function correctly. These data items are setup for you if you use the Setup:Equity and Index Options window to create options instruments. If you enter option symbols manually, you must also enter the expiration date and strike manually. This can be accomplished by viewing all options in a quotepage with the expiration date and strike data columns. These data fields may be entered manually into the quote page spreadsheet by typing the values into the appropriate cells for each option instrument. Expiration date must be entered in mm/dd/yy format.

NOTE: All of the new option analysis data columns have been added to the scan language. You will find them under the "Primitive Data Elements" list. As scans are performed on greeks the greeks are calculated once per stock option instrument. Volatility is calculated once per underlying instrument.

Automatic Trend Lines

A new charting indicator, Automatic Trend Lines, has been added. Add this indicator to any chart window, specifying the "look back period" (e.g. 100 days in a daily chart) and Investor/RT will examine the historical data for the last 100 periods and draw up trend and down trend lines automatically. The up trend line will be anchored at the lowest low price of the period and will intersect the most recent non penetrated low that occurred before the highest high since the lowest low. The down trend line will be anchored at the highest high price of the period and will intersect the most recent non penetrated high point that occurred before the lowest low since the highest high.

The up and down trend lines each have a color specification. This indicator facilitates trend line analysis in a slide show. The auto trend line indicator can be used in daily, weekly, monthly, intra-day and tick charts. When calculating the trend lines, Investor/RT does not include the last bar or tick. Thus you can easily see the current trading bar relative to the up and down trends established by the previous n bars (or ticks) and look for penetrations of the trend lines.

Keyboard navigation and control improvements

Version 3.3 has been extensively modified to provide a consistent set of keyboard controls for navigating through the data entry fields within all windows. Specifically, the tab and shift-tab keys may be used in all windows to move to the next or prior entry box or "control" within the window. On the Windows platform these include text entry boxes, list buttons, and list edit boxes, as well as special controls like the standard Investor/RT date/time entry control and the instrument selection control. On the Macintosh platform, these include text edit boxes, list edit boxes, and special controls (but not list buttons).

The esc (escape) key may be used to effect the "cancel" button, i.e. close the window. The return or enter key is used to effect the default button in the window, usually OK. To see a good example of these improvements, go to Setup: Preferences: Historical Preferences and tab through the controls. Notice that the instrument selection control used in this preference window and elsewhere throughout Investor/RT lights up when it has the "focus". When you tab or click the mouse to focus on some other control, the instrument selector now "dims" and leaves the selected instrument highlighted. The colors used for the instrument selector background and highlighting color are the preferences specified in Setup: Preferences: Quote Page Preferences. When a new window is opened, if you don't see which control has the "focus" just press the tab key to select the first control in the window.

New scan element, data column

A new quote page data column, DAY% has been added. For each instrument this data column shows the percentage of the instrument's trading session that has elapsed so far. If the instrument's session is closed the displayed value will be 100. This data value is most useful when incorporated into scan requests. The associated scan token is named DAYPCT. The scan element DAYPCT returns a value between 0 and 1 representing the percentage of the instrument's trading session that has elapsed. The DAYPCT token has a value of one (1.0) if the instrument's session is closed. The scan request:

$$\text{VOL}/(\text{DAYPCT}*\text{AVGVOL}) > 2$$

when run during an active session would select issues whose current trading volume is more than two times the amount expected for the elapsed time of the trading session.

Relative Strength Indicator improved

The relative strength indicator has been improved to allow the specification of a smoothing type and smoothing period to the raw relative strength line, if desired. In addition, a bug was corrected so that the indicator works properly so long as there is sufficient data on file for both the instrument and the comparison instrument.

Text windows improved

Text windows opened via File: Open: File or by double-clicking in news ticker or news browser windows now respond appropriately to several keyboard characters. The Page Up/Down keys scroll a page at a time. The up/down arrow keys scroll the text a line at a time. The Home/End keys take you to the top or bottom of the text respectively. The esc key may be used to dismiss the text window.

Text windows may now be viewed using any user specified font and font size. Specify the font and size in the Setup: Preferences: General Preferences window. This is a global setting for text windows, news stories, and any news ticker windows you have open. Prior to 3.3, text windows and news tickers were shown in a fixed font and size.

File: Import: Current Quotes

Current Quotes has been enhanced to permit importing of the following data fields: security name, ticker alias (for Dial/Data downloading), User Custom (an arbitrary user defined field), expiration date (mm/yy/dd) , and strike price. These fields may be set up in a user defined format to import data for existing issues from ascii text files. Strike price and expiration date importing may be useful to user following many leap option contracts as these fields are not setup for leaps as they are for normal option contracts.

Setup Instruments improvement

The Setup:Instruments window has been improved to enable the user to modify the session or the request exchange for an instrument. Formerly, this could only be done by editing the session or exchange field in a quote page. When an instrument has been identified in the Setup:Instruments window, operating the session menu or the exchange menu will cause a dialog to appear offering 3 options: 1. Modify the session or exchange of the identified instrument 2. Add a brand new instrument (leaving the identified instrument alone) 3. Cancel

Hitting cancel causes the menu choice to revert to the original setting for the identified instrument. If you wish to modify the ticker symbol for an instrument, this can only be accomplished only by editing the ticker in a quote page where the new ticker is not yet defined to Investor/RT.

Chart data download automation

The chart popup menu now has a "Download Data" menu item. The charting toolbar now has a button titled "Download Data for Chart". The icon for this button is the same icon used in the main toolbar for accessing the Download Data window. Clicking this button or choosing "Download Data" from the popup menu has the same effect. The effect is to download historical data for the particular chart. The effect depends on which data service you use, whether you have a Dial/Data account, and whether you own a Momentum CD ROM.

If your data service is InterQuote, myTrack, or Signal Online (via Data Manager) (all Internet services) the download request uses the historical data downloading services provided by those services.

If your data service is BMI, DTN, or Signal (all serial port data receivers), the download is performed using your Dial/Data account, if you have one. Dial/Data supports daily, weekly, and monthly downloads only. If there is no Dial/Data account, Investor/RT will attempt to download from the Momentum CD ROM. The Momentum CD ROM supplies daily historical data for stocks only via this method.

The download request executed is based on the periodicity of the chart and the viewing period that is visible on the screen at the moment.

If you want Investor/RT to automatically initiate data downloading whenever you open a chart window with insufficient data to fill the window, then checkmark the "Automatic Downloading" checkbox in Setup: Preferences: Charting Advanced window. Otherwise downloading will only be done when you specifically requested it by clicking the download button on the toolbar or using the chart popup menu.

The behavior of the Download Data button on the Main toolbar has been enhanced as well. If you open a chart window and click the Download Data button on the Main toolbar (not the

chart toolbar), Investor/RT will open the Download Data window and setup the window to download data for that particular instrument for the time period represented by the chart window. You can then adjust any parameters (e.g. the date range or "server") if you like , and then press the Download button to initiate the download.

Investor/RT will soon support myTrack, a data service of Track Data Corporation, the parent company of Dial/Data. The myTrack edition of Investor/RT is still in development and internal beta testing. We expect to release this edition within the next 30 days. MyTrack is an Internet based service that provides streaming realtime or delayed quotes, historical data downloading, and real-time news headlines and full text news service options. For more information see www.tdc.com.

The scan feature of Investor/RT has been integrated with the charting system of Investor/RT. This is accomplished by the "Scan Marker" technical indicator. See Scan/Signal Marker Indicator for details.

Investor/RT 3.2, Final Release Date: July 31, 1998

Audible news alerts and news alert boxes

Each instrument tracked by Investor/RT now has a "News Alert" property that can be turned on in the Setup:Instruments window for individual instruments, or can be set on or off for an entire quote page using the Setup:Preferences:Instruments... window.

When the News Alert property is on (checkmarked), the associated instrument will trigger a news alert action whenever a news item arrives for that particular instrument. The news alert action depends on user settings in the Setup:Preferences:News Preferences window. One such action is to sound the "News Alert" sound. The user can select this sound using "Setup:Peferences:Sounds. Once you have the instruments setup for audible news alerts, you can temporarily turn of the sound by setting the News Alert sound to "No Sound" in the Sounds Preference window.

Whenever a news alert fires for any tracked instrument, the instrument will be added to the ".Alarms - All" and the ".Alarms - News" quote pages regardless of the News Alert property of the instrument. The News Preferences windows allows the user to specify if the news alert action will include an audible alert sound, an alert dialog box, or both.

News Preferences window

All news related preferences are now grouped together in the News Preferences window, accessible through Setup:Preferences. Several news preference items were formerly shown in the General Preferences window prior to Version 3.2. A new checkbox titled "News Capture

Off" may be checked by those users who do not wish to receive or collect news item from the data feed. As mentioned in item #1 above, checkboxes are available to specify the news alert action to be take whenever a news item arrives for an instrument that is marked for News Alerts. Finally, the News Preferences window has buttons for purging out-dated news items and deleting all news items and compacting the database. Clicking the Delete button causes all news items on file to be deleted including those associated with particular instruments. The database files used to hold news items are initialized to their minimum size on disk. Prior to version 3.2, the disk space formerly occupied by the deleted news items would stay allocated for reuse for new news items. The only way to recover the disk space is to Delete all news items. The Purge button simply deletes all news items that are older than the thresholds specified for news item retention. Note that news items are purged automatically each day at midnight, and also when Investor/RT starts and ends.

A by-product of the purge operation is to reset all news alarm flags to coincide with the news items still on file. The N alarm flag for all instruments is removed if there are no longer any news items on file for the instrument after the purge.

Three new scan request elements

Scan requests may now be made on the "Exchange Requested" and the "Exchange of Trade" data items. A third scan request element, LEN, can be used to scan for instruments having a certain ticker symbol length. For example, the scan expression LEN <= 3 applied to the ".Stocks" quote page would identify all issues that trade on either the NYSE or AMEX, while LEN > 3 would select NASDAQ stocks.

Signal Data Manager Support (beta release)

Investor/RT 3.2 for Windows 95/98/NT supports the Signal Data Manager. The Data Manager is a Windows based software product of Data Broadcasting Corporation. The Data Manager software can access DBC market data from:

1. any Signal receiver (cable, FM, satellite)
2. any BMI receiver (cable, satellite)
3. DBC Internet services (Signal Online)

Investor/RT communicates with the Data Manager to receive real time or delayed quotes and news. Our implementation also supports access to the Internet based "DBC Tick Data Server" to fetch tick data on demand for any list of instruments. In the near future, Investor/RT will also provide access to the "DBC News Server" to provide on-demand new headlines and news stories for a user specified list of stocks, or keywords.

Another benefit of this technology is that the Data Manager can support multiple "clients". That is, Investor/RT can operate simultaneously with other Data Manager compatible applications, such as DBC's Signal 4.5 software, and other 3rd party applications.

Signal Tick Server Support (beta release)

Investor/RT supports Internet based access to the DBC Tick Data Server via the "Download Data" window. Choose "DBC Tick Server" as the "Server"; choose Download Type of "Historical Data"; specify the Historical Period as "Tick". Finally, specify the beginning date/time for the download. All ticks from that time to present will be downloaded. You may download data for one issue at a time, or specify a quote page and Investor/RT will download the requested ticks for all instruments in the quote page. The DBC tick server maintains tick data for the current and previous trading session.

Instrument Selector Improvement

A minor improvement was made to the instrument selector to make it easier to tell which letters have been keyed in when identifying a particular symbol or security name. As letters are keyed in, the letter typed so far will display in a box at the far right of the Main Toolbar status message area. In addition, the Quick Quote window (which contains an instrument selector) always displays the letters typed thus far at the beginning of the Quick Quote window title. As always, you can tell which letters have been typed by noticing the caret marker ^ that appears to the right of the letters typed in the selected row of the instrument selector.

Tick Data database initialization

When the "Delete Historical Data" window is used to delete all tick data from the ".All Symbols" quote page (i.e. ALL tick data), Investor/RT will initialize the tick data portion of the database to its minimal size (2K) on disk. Prior to version 3.2, the tick data files remained at the same size, ready for reuse. Users with large tick data database files (the tick.d01 file in the data_f folder) may be able to recover a lot of disk space and reduce verify and backup times by following this procedure: (1) use File:Export:Tick Data to export all the tick data for the instruments you wish to preserve, (2) use the Delete Historical Data window to delete all tick data for ".All Symbols", and (3) Use File:Import:Tick Data to bring the saved ticks back into the database. We recommend you backup the database prior to doing this so you can restore if you have any difficulty.

Quick Quote Window improvements

The Quick Quote window has been improved in several ways: (1) the title bar of the window updates as you type showing the characters you have typed thus far and the instrument that has been identified. If the identified instrument has current day news items, a notation appears in the window title as well.

The Quick Quote window now has its own embedded "toolbar" of buttons you can click to act on the currently selected instrument (see news, portfolios positions, setup, trading notes, etc.). A new button has been added, the QP button. Clicking this button shows you a list of the user defined quote pages that contain the selected instrument. The list of quote pages operates like any list selector window, you can open all quote pages containing the selected instrument by clicking the "All" button or double-click or use the apply and ok buttons to open one or more of the listed quote pages for the selected instrument. Note that if the selected instrument is listed in one and only one user defined quote page, clicking the QP button will open that quote page immediately rather than showing you a list of only one item to choose from.. Press the esc key to close the quote page if you like. When the list of quote pages appears (when there are 2 or more), pressing the esc key will dismiss the quote page selection list without opening any quote page. This feature will be particularly useful for those users who track their stocks by industry group. Clicking the QP button in the Quick Quote window will quickly identify the associated industry group quote page.

New technical indicator: Linear Regression Slope

The Linear Regression Slope indicator plots the slope of the n-period regression line of the price data selected (high, low, close, etc.). The raw price data can be optionally smoothed by a moving average of the user's choice prior to calculating the slopes. The LRS line oscillates around the zero line. When the LRS line is trending upwards, the issue is in an accelerating uptrade. When the LRS line is trending downward the downtrend is accelerating. Buy and sell signals are indicated when the LRS line peaks and begins to turn downward, or bottoms and begins to turn upgrade. Investor/RT points out the trend and the exact buy/sell signals as you move the mouse across the LRS line.

Tick Volume Limit in Export and View/Edit (time & sales) windows

The File:Export window and the View/Edit Historical Data window now support a tick volume limit preference. This means you can export a file of all ticks of any instrument (or list of instruments) where all the ticks represent block trades of some size or larger. Similarly, if you specify a tick volume limit when opening a View/Edit window of tick data, the View/Edit will filter out all ticks below the level you specify PLUS as new trades occur during the trading session, the window (time & sales) will only report trades at or exceeding the tick volume limit you specify.

InterQuote Tick Server Support

The tick data server access has been in beta test status in release 3.1 of Investor/RT. The 3.2 version is now "final" release. Support is provided for downloading tick data or n-minute bar data for stocks, futures, and indexes for the preceding 5 days. To access the feature choose "Download Data" from the Control menu. Pick "Tick" or "Intra-day" for the Historical download

period. If "Intra-day" specify the duration of the n-minute bars. Specify the start date and time for the download. If you specify more than 5 trading days back, the download will be for the preceding 5 trading days. To initiate the download, click the "Connect" button. Status messages appear in the Main Toolbar window as the download proceeds. If a chart window is open when the download completes, it is updated to reflect the downloaded data. A typical scenario would be to open a 1 minute chart of an instrument, discover that you need data for the last few days, initiate the download and upon completion the chart will update automatically showing the downloaded data.

Scan output quote page format control

The Scan Setup window now has an optional format button for setting the output format for the quote page that will display the results of the scan request. You can elect whether to also show the calculated columns and other scan elements "after" the user defined format or not. By default, the format is "automatic" which means that the output quote page will contain the ticker, the security name, any calculated data columns from the scan request, and any scan elements listed in the scan request. To change the format, click the "Format" button.

Main toolbar styles.

Investor/RT 3.2 supports three main toolbar styles: (1) condensed (2) expanded, and (3) expanded with titles. Prior to version 3.2, the condensed style was used. The setting may be changed using the Setup:Preferences:General Preferences window. The "expanded" style shows each main toolbar button a bit wider in order to spread the toolbar across the entire width of the screen. On Windows, the size is dependent upon the "task window" width, not the screen width. The status message area of the main toolbar is usually considerably wider than before thus allowing longer news headlines to be viewed in full as they arrive. The "expanded with titles" style adds subtitles for each icon beneath the button. This style uses more screen real estate but is especially useful for new users as they are becoming accustomed to the icon interface of Investor/RT. The alt-H command (command-H on Macintosh) can be used to hide and show the main toolbar. Thus you can keep charts and quote pages at full screen and alt-H anytime you want to use the main toolbar. The toolbar style in effect when you quit Investor/RT will become the startup main toolbar style. The main toolbar may also be anchored beneath the menu bar at the top of the screen or it may "float" above other Investor/RT application windows.

For Windows users, Investor/RT now remembers the dimensions of the "task window" when you quit Investor/RT. At startup, the Investor/RT task window will appear maximized at first, then after initialization is completed, the task window will be returned to its last known position on the screen. This feature will be most appreciated by users with multiple monitors under Windows, who may have only one monitor showing Investor/RT's task window and the other monitor(s) showing other applications. This issue is not applicable to the Macintosh platform. Investor/RT supports multiple monitors on Macintosh.

Miscellaneous Fixes

The Save As command in the File menu can now be used to save a Scan under a different name. The View/Edit (time and sales) window now scrolls better during intra-day trading. The automatic association of perpetual futures, e.g. SP* with the highest open interest contract has been corrected. Signal users tracking the tick (\$TICK) index will no longer see occasional bad values when \$TICK goes into negative territory. Windows/95 users will now be able to collect tick data for perpetual futures instruments, e.g. BP*, SP*, etc.

Investor/RT 3.1, Release Date: June 8, 1998

Delete History Command

The Delete History command in the Control menu may be used to delete daily, weekly, monthly, or tick data for any user specified date or range of dates.

The news alert feature in Investor/RT has been improved

The Alarms quote page column will show a capital N if the instrument has 1 or more news items dated with the current date, or a lowercase n if the instrument has news items only prior earlier dates. The "Alarms News" quote page shows only those issues that have current news.

In a quote page, double-click on the N or n in the Alarms column to open a news browser to view an instruments news items.

In a quote page, double-click in the Alarms cell showing a H (high), L (low), or V(volume) alarm code to open the Setup window for adjusting or resetting the alarm.

The quote sifter has been improved to allow for wildcard searching

In the symbol pattern box you must use the question mark to indicate any single character and the asterisk to indicate any span of zero or more characters. If the pattern you enter does not end with a ? or *, there is an implied * at the end of the pattern. Here are some examples:

FD??X	mutual funds that begin with FD
IBM -??	stock options on IBM (Signal feed)
IBM	all tickers beginning with IBM
??8M	all September futures (BMI feed)

The same wildcard method may also be used in the DTN Symbol Lookup window accessed via the DTN menu.

Scan Request Language Improved

The scan request language has been improved to allow wildcard search on ticker symbol, security name, and the "user data" of any instrument. Scan request elements TICKER, NAME, and CUSTOM have been added. The equal and not equal operators support string matching using ? and * as described above. The search pattern must be enclosed in double quotes. Here are some sample scan requests.

TICKER =	"A?"; two letter tickers beginning with A
TICKER =	"SP??"; S&P futures
TICKER =	"????X"; any mutual fund
NAME =	"*Put*"; any instrument containing the word "Put" in its name

Scan Statistic Indicator Improved

The Scan Statistic indicator has been improved to all scanning on maximum, minimum, average, standard deviation of volume or open interest for any period. Formerly the statistical functions were only available for price data.

Metastock Directories, Import Function

Metastock directories containing more than 255 files (instruments) may now be imported by Investor/RT. When Investor/RT's Import functions requests the Metastock Master File, locate the file named XMASTER instead of MASTER. The XMASTER is the "Extended Metastock" directory file used when there are more than 255 data files in the directory.

Chart Name Added

Investor/RT chart windows now displays the "name" of the chart object in the lower left corner of the chart window. The name of the chart object is the name by which the chart object appears in menus. This name can and usually differs from the "title" of the chart which appears in the title bar. The chart's name may be edited by right clicking on the name (Mac users command+click). The name is shown underlined when the chart object has been modified in some way.

Saved Chart Cycle

With a chart object active, pressing the space bar repeatedly cycles the current chart window frame through each of the "saved charts" in the database. This list of charts is the same list that appears in the Objects:Chart menu. Holding down the shift key and pressing either the left or

right arrow keys on the keyboard does the same thing, except you can go backward and forward through the list. The spacebar only moves "forward" through the list of chart objects.

Keyboard Commands

The left and right arrow keys in combination with the ctrl key may be used to cycle through a variety of periodicities. On Macintosh, use the option key. The periodicities are daily, weekly, monthly, tick, 1 minute, 5 minute, 10 minute 15 minute, 30 minutes and 60 minute. The left and right arrows are use for horizontal scrolling when pressed alone. The home, end, page up and page down keys are also operative for horizontal scrolling.

Find Command Improved

The Find.. command (ctrl-F on Win95, command-F on Macintosh) opens the dialog box for searching for news items containing some word or phrase. If a news browser is open when the Find command is issued, the search will be done on the items in that browser. If no browser is opened, Investor/RT will automatically open a browser containing all news items presently on file. Enter the word or phrase and press enter or return. The search is not case sensitive. Note that the search function only scans the first 256 characters of the news item.

Esc Key Information

Pressing the esc (escape) key will close the front most chart, quote page or portfolio window. If the chart or quote page has been modified, the normal confirmation box will appear. The esc key may also be use to dismiss any text window or OK box, scan window, and import window. Pressing esc means "cancel" if their is a button by that name in a dialog box.

Backup Log

Use File:Open:Backup Log to view the report of the last backup. The report includes a confirmation of the last verification prior to the backup. You may close the window with the esc key.

Investor/RT 3.0, Release Date: May 8, 1998

Chart Window Improvement

The chart window is composed of at least one instrument and zero or more technical indicators, arrayed in one or more panes. Investor/RT now supports "selection" of one or more of these chart elements using the mouse. To select a chart element, click the mouse on the element. If the element is in a pane by itself you can click anywhere in the pane to select the

element. If there are multiple elements in a pane, you must click "near" the element. For example, click on a line to select that element, or click on a candlestick to select the instrument whose candles are displayed.

To select several elements, hold down the shift key as you click. Chart elements that are selected appear with hollow rectangles periodically displayed along the line. Bars and candles appear with a hollow rectangle above every few bars or candles. Volume histograms appear with each volume bar drawn hollow to indicate the volume histogram is selected.

To de-select a particular element in the chart, hold down the shift key while clicking on it. Clicking the mouse in any window pane title bar de-selects all elements.

The tab key may be used to cycle through each element within a chart window selecting each one in turn. Each time you press tab for former element is de-selected and the next element in the chart appears selected. The name of the item selected appears in the status message area of the main toolbar along with a count of how many items are selected in cases where the shift key is used for multiple selections.

When one or more elements are selected there are three things you can do:

- Delete: Click the trash can icon in the chart toolbar or press the delete key (forward del key on Macintosh) to delete the selected element(s). Please note that if you delete an instrument, all of the technical indicators associated with the instrument will be deleted, even if they are not selected. Deleting the sole instrument in a chart window causes the window to close.
- Edit: Click the "Edit Chart Element" button on the toolbar or press "enter" to edit the properties of each selected element. If more than one element is selected, an edit window will open for each element in turn.
- Drag and Drop: You can drag and drop the selected elements into the same or into a different chart window. As you drag the selected element(s), the name of the last selected element appears with the cursor as you drag the selection with the mouse button held down. The action taken when you release the mouse depends on where you drop the element(s) and what kind of elements were selected. You can also modify the effect by holding down the cntl key (option key on Macintosh) while you drag and drop.

Here are the drag and drop rules:

- a. When dragging within a single window, the cntl (option) key means "duplicate" the selection in the new location, otherwise the selected elements are "moved" from the former to the new location.

- b. When dragging from one chart window to another, the selected elements are always duplicated into the destination window. The selected elements will also remain in the source chart window. Technical indicators that are dragged to a different window will automatically be associated with the first instrument in the destination window, unless the instrument with which it is associated is present in the destination window. For example, if you drag a 10 period moving average on IBM into a chart window containing the instrument INTC, the 10 period moving average will become associated with INTC. If you drag a 20 period INTC moving average into a window containing IBM and INTC, the moving average will remain associated with INTC. Similarly if the selection you are dragging contains both an instrument and an indicator associated with that instrument, the indicator remains associated with the same instrument. When the window you are dragging to contains more than one instrument the first instrument in the pane in which you drop a technical indicator gets the association with the new indicator. If you drop an indicator to create a new pane, the association is with the 1st instrument in the chart (starting from the top pane downward). Similarly, if you drop an indicator into a pane that does not contain an instrument the first instrument in the chart gets the association.
- c. At present the "Reference Line" indicator and the "Trend Line" indicator are the only indicators you can drag and drop within the same pane. This is done to adjust the reference line's position within the pane or to relocate the trend line. Trend Lines are anchored at one end or the other as you move the other end of the trend line. You can duplicate a reference line or trend line by dragging with the cntl (option) key down. The original line remains the same as before the drag.
- d. If you drop the selection onto a pane's title bar, a new pane will be created "above" that pane and the selection will be placed into the newly created pane.
- e. If you drop the selection "inside" a pane, the selected elements will be added to the elements already charted in that pane.
- f. If you drop the selection into the view period area at the bottom on the chart window, the dropped elements will be added to a new pane at the bottom of the chart window.
- g. If you drop the selection "off" the chart (not into another window), the selected chart elements will be deleted. Note that deleting an instrument in this way causes all associated technical indicators to be deleted as well. If no other instrument remains in the window, the window will be closed.

- h. When you click to select an item for dragging, Investor/RT plays the "Object Selected" sound to give you audio feedback that an item has been properly selected. You may adjust the sound or specify no sound for this event in the Sounds Preferences panel of Setup:Preferences.

The new select/drag/drop feature is extremely powerful and makes chart setup and modification a snap. Most of the work can now be done with the mouse. Dialog boxes are needed only to set indicator parameters when they differ from the default values you have set.

Helpful Hint: Suppose you typically use 10 or so of Investor/RT's indicators. You can create a special chart object, call it "Favorite Indicators" or something similar and add each of the indicators you like to use in its own pane. The instrument shown in the chart doesn't matter, just pick any one at all. Now, resize "Favorite Indicators" very tall and narrow so you can see just enough of the title of each indicator in the window. Save the chart object. You now have a "pallet" of your favorite indicators already setup just the way you like them. Whenever you wish to add one or more of them to any other chart, just select, drag, and drop them onto other chart windows for quick and easy chart setup.

Floating Toolbars

Floating toolbars no longer float above other applications under Windows 95/NT. This improvement actually made the revised 2.9 release.

Memory usage was improved for certain technical indicators

Certain technical indicators in 2.9 and earlier were not freeing temporary memory used in their calculations when the calculations were completed. During active trading with intra-day charts updating frequently the amount of memory unnecessarily left allocated could have been substantial enough to cause Investor/RT to run out of memory. All technical indicators have now been certified free of "memory leaks".

Dragging Trend/Reference Lines

See discussion above of dragging trend lines and reference lines. When dragging a reference line within a pane to adjust its reference value, Investor/RT will calculate the price point where you release the reference line and set the reference value automatically. The settings for the reference line indicator now has a new option for specifying when dragging how to "round" the reference value. For example, you could set the option to round to the nearest eighth and Investor/RT would "snap" the line to the nearest multiple of 1/8 in the chart pane. Rounding to "99" means "snap to the nearest whole number", while rounding to 99.9 means "snap to the nearest exact tenth". For reference lines in stock charts, sixteenths is usually a good choice. For Treasury bond charts, round to 32nds, etc. When dragging reference lines the messages area of

the main toolbar keeps you informed of the price value as you move the mouse vertically in any chart window pane. The value shown is the "snap to" value the reference line will assume if you release the mouse.

Improved Split Finder

The Split Finder is a "technical indicator" you can add to a chart window or use in a scan to easily locate stocks with abrupt price changes indicative of stock splits. The Split Finder has been improved in several ways:

1. You may now specify a percentage price change from one day to the next that the Split Finder will use to locate possible splits. Formerly this was a fixed value of 10%.
2. When the Split Finder is added to a chart window, the title bar of the chart pane indicates if a split has been detected. When the mouse points to the effective date of the split the title bar will indicate the date and the split ratio found. The split ratio is the ratio of the previous day's close to the opening price on the effective date. Rarely will this give an exact number. Typically you may see something like 2.007 to 1 indicating a 2 for 1 split, or 1.504 indicating a 1.5 to 1 (3 for 2) split.
3. If you right click (command-click on Mac) in the pane to edit the properties of the Split Finder and the Split Finder has detected a possible split, the Split Finder preferences window will appear with a push button to effect the split adjustment. Clicking this "Adjust Now" button will open the Split Adjustment window with the issue in question selected, the effective date entered for you, and the calculated split ratio shown in the edit boxes. All you have to do is adjust the split ratio, e.g. change 2.007 for 1, to 2 for 1, and click the Split button. Note that 1.5 to 1 works exactly the same as 3 for 2 (or 6 for 4 for that matter).

The Split Finder is especially useful when employed in a chart that is the subject of a chart slide show. You can easily go through lots of issues and stop the slide show when the Split Finder indicates a possible split for an issue.

Data Validation Technical Indicator

The Data Validation "technical indicator" is another charting or scan indicator that inspects the data for some instrument and looks for exceptional conditions. The data validation indicator when used in a chart window now has an option to remove any data bars or ticks having a price that is outside some user specified acceptable range. The Data Validation indicator resides in the chart window and "recalculates" each time a tick arrives. If the tick is out of the user

specified range, it is removed automatically from the chart. The bad tick has no effect on the chart or any other technical indicators in the chart window.

Note that the data validation indicator does not delete the "bad ticks" from the database, it only removes them from the chart window. If you open another chart of the same instrument that does not have a data validation indicator in it, the "bad ticks" will be present.

The Data Validation indicator also has a new checkbox titled "Auto-correct invalid bar data". When checked, the indicator will "fix" any bars where the relationship between open, high, low, and close is invalid (e.g. close less than low). The "fix" is to adjust the bar so that open, high, and low are all set to whatever the last value is. Note that these "auto" fixes will impact the calculation of any technical indicators based on the instrument. It is recommended that you first add the Data Validation indicator to the chart window with the "Auto-Correct" box unchecked to see if any invalid bar data is present in the chart, if so you may elect to fix it by turning on the "Auto-Correct" checkbox.

Users tracking issues intra-day who have experienced bad data points occasionally will now be able to view "trouble free" charts for the entire trading session. By using the data validation indicator in all of your charts there should be no need to edit tick data manually any longer.

DTN now offers the S&P Stock Guide service to DTN D8000 and D7000 subscribers

Support for this service is still under development by Linn Software. When this feature is available, Investor/RT will be able to display a detailed S&P report for any stock guide issue and new fundamental data fields will be available for use in scans. S&P reports are accessed via the "S&P Stock Guide" menu item in the DTN menu. This capability is expected in the 3.1 release scheduled for early June 1998.

Improved tick data editing during active trading periods

Prior to version 3.0, editing an occasional bad tick from the intra-day data could be very frustrating when attempting this feat on a very active issue. The view/edit (time and sales) window would update so quickly that it was difficult to insert the cursor in a row long enough to press the delete key. In version 3.0, the view/edit (time and sales) window captures new ticks ONLY when there is no cell editing in progress. Once you click in a cell to edit the cell or in preparation of deleting the tick, dynamic updating of the window ceases until your editing is completed. The editing of a cell is completed when you press enter or return or when you press the delete key to eliminate the tick.

The Setup:Preferences:Instrument

Preferences window has been improved to enable you to apply the specified monitoring options to all of the instruments within a particular quote page. For example to turn off intra-

day monitoring for an entire quote page, uncheck the intra-day checkbox in the Instrument Preferences window and press the "Apply to QuotePage..." button. The ellipses ... means you will be asked to pick which quote page from a list that appears. When the list appears pick the quote page you want and press OK. Another button in the window titled "Apply to Active QuotePage" will immediately apply the current default monitoring options to all of the instruments in the currently active quote page.

Signal Feed Software Improved

The Signal feed software in Investor/RT was improved to correct a failure condition (on Macintosh only) having to do with capturing text files. The symptom was a "once a day" failure at approximately the same time of day. Also a bug was fixed to correct a problem using the Quote Sifter to look for indices.

Signal users may now use the "+/-" data column in quote pages to watch the up tick/down tick indications sent over the Signal feed. After market close, this column will read "c" for closed, or "s" for settlement.

Holding down Shift Key Features – not starting data feed

Starting Investor/RT while holding down the shift key will start the application without opening the last sessions window layout and will not activate the data feed regardless of the user preference settings. This may be useful in situations where you wish to start up I/RT and reconfigure the data feed settings before starting the feed.

Dialog Window Prompts

Investor/RT uses two types of prompting dialog windows to request user input. One is a "multiple choice" type message box that presents a message prompt and provides one, two, or three buttons for alternative responses. The other is a "user input" dialog. The dialog prompts the user to enter some information into an edit box. Usually two or three buttons are provided for alternative responses.

In both of these types of dialogs holding down the Alt key (command key on Mac) causes the button titles to show their keyboard shortcuts. Also, the return or enter key may be used in either case to "press" the default button. The esc key may be used to "press" the "Cancel" button, if there is a button with this title in the window. The esc key may be used to "press" the OK button in cases where there is only one choice.

In prompting dialogs of the first kind (buttons only, no edit box). The Alt (command) key is not required to respond to the dialog, e.g. pressing "c" or Alt-c", or esc will press the "Cancel" button.

Drag and Drop to Quote Pages

Drag and drop may now be used in quote pages to select an instrument and drag it into another quote page. To initiate a drag operation, mouse down in any cell in a quote page. As you drag the mouse outside of the cell, the ticker symbol of the instrument you are dragging will appear next to the mouse pointer as you drag. Drag the mouse anywhere over some other quote page and release the mouse button to add the instrument to the destination quote page. Dragging and dropping an instrument within one quote page has no effect. The new instrument is added to the end of the destination quote page. If the instrument dragged is already present in the destination quote page, the drag/drop has no effect. When an instrument drag is in effect the cursor changes to a plus sign.

Instruments may also be dragged from a quote page into a chart window

As you drag the instrument over a chart window, the ticker and chart type will appear next to the plus sign cursor as the mouse is moved. Dropping an instrument onto a chart window from a quote page has the effect of "replacing" the chart's first instrument with the one dropped onto the chart. If you wish the dropped instrument to be added as a new instrument to those already in the chart window, hold down the ctrl key (option key on Macintosh) while you drop the instrument. When the ctrl (option) key is used., the new instrument is added depending on where you dropped it. Drop onto a title bar to create a new pane or drop into a pane to add the instrument to that pane.

Saving Text Windows as text files

Text windows in Investor/RT may be saved as a text file using either the Save, Save as, or Save as Text command in the File menu. Examples of text windows are (1) any news text window, (2) data feed status, (3) system status, (4) message log, (5) internet log.or (6) any other text file opened by Investor/RT in response to a File:Open:File command. Note that you may add your own comments, notes or do any editing you wish on the text prior to saving the text for future reference.

Dynamic Reference Lines

The reference line indicator has been enhanced to allow the reference line to adjust itself dynamically to the current trading high, low, last, etc. When adding the reference line to a chart, check the radio button "Use Current" and select the particular price value you wish the reference line to track: open, high, low, close (last), midpoint of high low range, average of high low last. Dynamic reference lines are most useful in intra-day charts.

Drag and drop portfolio instruments

Mouse down on any position row in a portfolio and drag the associated instrument into a quote page or a chart window. Dropping the position on a quote page adds the position's instrument

to that quote page if it is not in the quote page already. Dropping the position onto a chart window is equivalent to dragging a quote page instrument to the chart.

Positions may also be dragged from one portfolio and dropped into another portfolio. This has the effect of making a journal entry to add the position to the destination portfolio. The position will still exist in the source portfolio as well.

Dragging an instrument from a quote page and dropping it onto a portfolio indicates your desire to add a position in that instrument into the destination portfolio. Investor/RT responds by opening the "Order Desk" window. The instrument dragged is selected automatically and the order desk is setup to "buy 100 to open" as a "journal entry" for the destination portfolio. Make adjustments as desired and place the trade.

Deleting from drag and drop method

The drag and drop method may now be used to delete from portfolios, charts, and quote pages. In a portfolio, dragging a position out of the portfolio window and dropping it in "open space", that is, not on any other window, causes the position to be deleted. Confirmation is requested. The similar action in a quote page "removes" the dropped instrument from the quote page. The instrument is not deleted from the system, just removed from the quote page. Note that dropping an instrument out of the ".All Symbols" quote page denotes a request to actually delete the instrument from the system. Dropping an instrument out of the ".Intraday" quote page unmarks it for intra-day data collection. Finally, chart element(s) may be dragged and dropped in open space to remove them from the chart window. No confirmation is requested in either the quote page or chart cases, except when an instrument is being deleted.

Here is a quick summary of all of the drag and drop possibilities:

Source	Destination	Action
QuotePage	QuotePage	instrument added to destination quote page
QuotePage	Portfolio	Order Desk open for adding position to portfolio in that instrument
QuotePage	Chart	Instrument replaces the instrument formerly charted
QuotePage	Chart	Ctrl/Option Key: Instrument added to chart
QuotePage	drop off	Remove the instrument from that page.
.All Symbols	drop off	Delete the instrument after confirmation.
.Intraday	drop off	Unmark intra-day collection and remove instrument.
Portfolio	Portfolio	Position replicated in destination portfolio
Portfolio	QuotePage	Position's instrument added to quote page
Portfolio	Chart	Same as Quote Page to chart
Portfolio	drop off	Remove the position after confirmation.
Chart A	Chart A	Graph Element(s) moved to a new pane in chart A
Chart A	Chart A	Ctrl/Option Key: Graph Element(s) replicated in a new

Source	Destination	Action
		pane
Chart A	Chart A	Trendlines/References lines moved within same pane
Chart A	Chart B	Graph Element(s) replicated into Chart B
Chart	drop off	delete the element from the chart.

**drop off means drop the selected item outside the window, not on any other window.*

The Chart annotation indicator has been improved in several ways

A background color has been added so that chart annotation can be in any combination of text color and background, regardless of the background of the chart window itself. This makes annotations stand out more. The "Append Last Price" option, when checked, causes the last price plus the bid and ask price, if applicable, to be displayed in the annotation. The annotation is now dynamic, it updates on every tick to show the most recent trade price, bid and ask. This applies to tick chart, intra-day minute charts of any periodicity, and daily charts. The annotation is selectable (it appears with a rectangle around it when selected), and you may drag and drop annotations to the same or different chart windows as desired.

Scan Request Language – Primitive Scan Element MON

The scan request language now has a new primitive scan element called MON (Monitoring Options) and a new operator, modulo, represented by the percent sign %. These additions make it possible to construct scan requests that pick instruments with any combination of monitoring options. The monitoring option data item for an instrument is a whole number that represents the sum of the number shown below:

Monitor Option	Value
Intraday	1
Daily	2
Weekly	4
Monthly	8
Monitor Price >=	16
Monitor Price <=	32
Monitor Volume >=	64
>= Price Level Reached	128
<= Price Level Reached	256
>= Volume Reached	512
Scan TRUE	1024 (not used by Investor/RT at present)
News available	2048
Quote received	4096
Instrument modified	8192
Gap Alarm	16384

Monitor Option	Value
Big Move Alarm	32768
unused	65536
Use Bid Price >=	131072
Use Bid Price <=	262144
Use Ask Price >=	524288
Use Ask Price <=	1048576

For example, if an instrument is marked for daily, weekly, and intra-day data collection (and nothing else), the MON value would be (1 + 2 + 4) or 7 for that instrument. The modulo operator % is used to operate on the MON value so you can test for specific values regardless of the other conditions that may be true for the instrument. The scan request a % b computes the remainder when expression a is divided by expression b. Thus the expression MON%16 yields a number between 0 and 15 that represents the sum of the daily, weekly, monthly, and intra-day value.

Here are some sample scan requests:

MON%16 == 15; all instrument marked for all 4 monitoring options

MON%16 == 2; all instruments marked for ONLY daily data collection and not any other periods.

In general, to test for a specific option setting use the scan request

(MON / value)%2 == 1 ;where value is one of the values in the table above

Some Examples

MON%2 == 1 ; all instrument marked for intra-day collection

MON%2 == 0 ; all instrument NOT marked for intra-day

(MON/8)%2 == 1 ; all instruments marked for Monthly data collection

(MON%2) + (MON/2048)%2 == 2; all intraday instruments with news available

Investor/RT 2.9, Release Date: April 1, 1998

New feature for DTN users

Symbol Lookup command in the DTN menu. This new feature give the DTN user a handy tool for looking up any ticker symbol by exchange or security type. A pattern matching feature is provided for looking up lists of tickers that begin with the same few letters. The user can easily

add individual issues, all issues, for all selected issues to Investor/RT. This feature was first introduced in 2.8.2.

Split Adjustments for Instruments

Split adjustments for instruments are now recorded as trading notes for the instrument automatically. The date of the note is the user specified split effective date. The split adjust function now also adjusts all open positions in all portfolios for the specified instrument. For example, if you own 100 shares of IBM, purchased at 90 and IBM splits 2 for 1, the position will be adjusted automatically in the portfolio to show a new quantity on hand of 200 and a new "opening price" of 45. The cost basis of the position will, of course, remain unchanged. These changes will be noticed the next time you open the portfolio. If a portfolio window is open at the time of a split adjustment, it will be necessary to close and reopen the portfolio to see the revised numbers for the position.

Open/Closing positions recorded as trading notes

Open and closing of portfolio positions for each instrument are now recorded as trading notes for that instrument automatically. The note is assigned the date specified by the user as the trade date.

Quote Pages and Portfolios may now be displayed in any font, size, and style

Formerly, only font and size could be specified. Now, bold, italics, bold italics, and other styles are available. Quote page may have their font style set individually using the preference button on the quote page toolbar. When the preference window appears, click on the button containing the name of a font and a standard font selection window will appear. Portfolio windows may NOT be individually specified. All portfolios are displayed in the default quote page font. The default quote page font/size/style may be modified using Setup:Preferences:QuotePage Preferences.

User profile

To provide timely technical support by email it is usually necessary for LinnsSoft to know which platform you are using (WIN or MAC), which data feed, which version of Investor/RT, registration status and other key items of information. To enable our users to conveniently supply the required information, a "user profile" has been added to the System Status window. Choose System Status from the Control menu or click the System Status icon on the main toolbar. Copy the user profile text and paste it into each email message you send to support. In general, you will receive a more timely response if you include this information. Thank you for helping us serve you better.

Quote Sifter

The quote sifter can be used to sift the raw feed for certain types of ticker symbols and add them to Investor/RT. When the instruments are added to Investor/RT, the assigned security type, session, and requested exchange for the instrument are taken from the default Instrument specification (Setup:Preferences:Instruments). When you open the quote sifter, a dialog box will appear to remind you of the current settings, giving you an opportunity to adjust them depending on your intended usage of the quote sifter.

The Scan setup windows may now be resized

Under Windows 95/NT the minimize button is also available. Thus while running the scan in "auto run" mode the scan window can be sized very small or minimized. When the Scan setup window is sized taller than normal, the scan element list boxes are resized to show more elements. This makes it more convenient to locate the scan elements you wish to use without scrolling.

Fourteen new primitive scan elements have been added to the scan request language.

A primitive scan element is a property or calculated value of an instrument. A primitive cannot be referred to at any time in the past, only the present value. The new scan elements are:

SESSION: the session number SECTYPE: the security type TICK: the number of ticks TICKU: the number of up ticks TICKD: the number of down ticks STRIKE: the strike price ULPRICE: the price of the option's underlying instrument IV: the intrinsic value of the option TV: the time value of the option DAYS: the number of days until option expiration GAP: the gap between yesterday's close and today's open PCHY: the percent change since yesterday's close PCHO: the percent change since today's open XAVGVOL: today's volume divided by 20-day average volume

SESSION

the session number of the instrument.

SECTYPE: the security type.

This property is a number which indicates the type of instrument. For example the scan request "SECTYPE = 1 AND SESSION = 0" would list all instruments of type stock (1) that are assigned to trading session 0. Here is table of code numbers for all Investor/RT security types:

Stock	1
Stock Option	2
Future	3

Spread	4
Future Option	5
Spot	6
Corp Bond	7
Govt Bond	8
Muni Bond	9
Fund	10
Statistics	11
Index	12
Forex	13
Cash	14
GarvinBond	15
UserDefined	16

TICKS, TICKU, and TICKD: the number of trades (ticks)

the number of up ticks, and the number of down ticks for the instrument since the beginning of the trading session. For example, the scan request "TICKS > 100 and TICKU/TICKD > 1.5" would find the instruments that have traded more than 100 times during the current trading session and whose ratio of up ticks to down ticks is greater than 1.5.

**STRIKE for option instruments (stock options, index options, futures options)
this primitive is the strike price.**

This value is transmitted by the DTN data feed. For other feeds, the strike price can be entered manually in a quote page. The scan request "SECTYPE = 2 and (CL + STRIKE) > 0" would show a list of all stock options along with the sum of the option's price and the strike price.

ULPRICE: for option instruments

This property is the current trading price of the underlying instrument for the option. For example for an Apple Computer option instrument (ticker: AAQ??), ULPRICE would be the current price of Apple Computer (ticker: AAPL). In order for Investor/RT to make the association between an option and it's corresponding underlying stock, index or future, the option's name must begin with the ticker symbol of the underlying instrument, otherwise, ULPRICE will return zero. Please note that if an option instrument is improperly named, Investor/RT may even return the underlying price for some unrelated instrument if the name of the option begins with a valid (but inappropriate) ticker symbol. The ULPRICE is a useful scan element, as in "SECTYPE = 2 and ULPRICE >

STRIKE" which lists all stock or index options for which the underlying stock or index is trading higher than the strike.

IV: for option instruments

This property is the "intrinsic" value of the option. A call option has intrinsic value when the underlying issue is trading above the option's strike price. A put option has intrinsic value when the underlying issue is trading below the put option's strike price. The IV property is useful in scan requests as a way of identifying "in the money" options, i.e. those options with an intrinsic value. The scan request "SECTYPE = 2 and IV > 0" would identify all in-the-money equity and index options.

TV: for option instruments

TV is the "time value" component of the option's price that exceeds its intrinsic value. Of course, if the option is "out of the money", there is no intrinsic value, thus the entire price of the option (the premium) is "time value".. The scan request "SECTYPE = 2 and (TV > 2" would list all equity and index options with a premium exceeding \$2. Sorting the resulting quote page by the TV column effective ranks all options by premium. Similarly, a scan request that included the calculation "TV/ULPRICE" would result in a quote page that could be sorted to reveal those options with the highest or lowest premiums when expressed as a percentage of the underlying instrument's price.

NOTE: in order to calculate the intrinsic value of an option instrument

Investor/RT must determine whether the instrument is a put or a call option. It does this by examining the name of the option for the word "Put". The word Put or Call is automatically placed in the name field of each option by the Setup:Equity and Index Options feature of Investor/RT. If you create your option instruments manually, you must be sure to properly title the option as a "Put", otherwise the instrument will be treated as a call. DAYS: for options and futures instruments, DAYS is the number of days until the instrument expires. The number of days is calculated based on the value of "Expiration Date" for each instrument. The Expiration Date data column may be displayed in a quote page. The Expiration Date is transmitted by the DTN data feed for futures and options. IRT's Equity and Index Option setup window (see Setup menu) also calculates the expiration date of stock and index options and sets the expiration date for each generated option instrument.

GAP

The "gap" is defined as the difference between the open price and the previous close. The scan request "GAP > 2" would list all instruments that opened 2 points higher than the previous day's close.

PCHO and PCHY

These are percent change values. PCHO is the %change in price since the open, and PCHY being the % change in price since yesterday's close.

XAVGVOL: for stocks and options

This is the ratio of current trading volume to the 20-day average trading volume. Investor/RT calculates and maintains 20-day average volume for all stocks and options. The scan request "AVGVOL >= 100k and XAVGVOL > 2.5" would identify all issues with a 20-day average volume of 100,000 or more with current volume more than two and a half times the average.

Four new data columns are now available for display in quote pages

Intrinsic Value, Underlying Price, Days to Expiration, and Time Value. These data columns only pertain to stock options, index options, or futures options; they will be blank for other security types. See the discussion above of the IV, ULPRICE, DAYS, and TV scan elements for additional information on these new data columns.

The Setup Formats window (under Setup:Preferences) may now be resized

Making the window taller enables more data column names to be seen without scrolling.

Intra-day Charts update more smoothly

Intra-day charts, ticks charts especially, now update more smoothly as trades occur. Very active issues would sometimes draw hashed lines instead of smooth continuous lines prior to version 2.9.

InterQuote now has a new checkbox in the Data Feed Setup window

Check the box titled "Automatically restart data feed when no data" to request that Investor/RT automatically reconnect to InterQuote whenever it detects a "no data" condition. NOTE to users with dialup connections to the internet under Windows 95/NT: Investor/RT will reconnect automatically only if your Internet connection is still active. If the connection to InterQuote is dropped because the dialup connection terminated, Investor/RT will be unable to reconnect (although it will try). In this case, you must reestablish the dialup connection before I/RT will be able to reconnect to InterQuote.

Quote Pages may now be sorted by Session, Strike Price, Intrinsic Value, Time Value

Note that the Intrinsic value of all "non-options" instruments is simply the last price of the instrument and the Time Value of all "non-options" instruments is always zero. Sorting by Intrinsic Value will be most useful when sorting a quote page containing only option instruments (equity options, index options, or futures options).

DTN Bug Fix

A bug was corrected in the DTN version that was causing spurious "bad ticks" to occur once or twice a day on some instrument.

List Selection for Elements Improved

The standard "list selection" popup window for choosing or applying one or more elements from a list is now displayed in the user specified text background and text color as set in Setup:Preferences:General Preferences. A bug was fixed which caused the list to be partially displayed when selecting preferences windows in particular.

Session Improvements

Investor/RT has been enhanced to allow sessions that begin one day and end the next day. Such sessions are defined by setting the start time later than the stop time in Setup:Preferences (Sessions).

Technical indicator additions

The moving average indicator has been enhanced to enable the specified moving average line to be shifted left or right by a user specified number of periods. Formerly only left shifting was available. A new indicator called Detrended Oscillator was added. This indicator calculates and smoothes the spread between price and some user specified moving average of price. The resulting oscillator indicates when the issue is at extremes with regard to the historical spread between price and the moving average of price. A triple smoothing indicator was added. The indicator allows either a double or triple smoothing of some price (open, high, low close, etc.). Each smoothing moving average may have the same or a different period and type (simple, exponential, etc.).

IRT Maintenance Fix

A problem was corrected having to do with IRT's maintenance of the association between perpetual futures instruments (e.g. S*) and the related contract with the greatest open interest. For example, if soybean futures were listed in the ".All Symbols" quote page immediately

followed by S&P futures (SP), Investor/RT, prior to 2.9, was improperly linking an unrelated S&P contract to the soybean perpetual due to the fact that S&P futures happen to begin with "S" just like soybean futures. The software now correctly distinguishes single and double letter futures in this regard.

EPS and PERation Redundancy Eliminated

The fundamental data items EPS (Earnings per Share) and PERatio (Price/Earnings Ratio) were defined twice in the list of available data columns depending on the source of the data (Dial/Data fundamental download, or continuous data feed). This was confusing, so the redundancy has been eliminated. There are now unique data columns for EPS and P/E Ratio. The EPS and P/E Ratio data items are considered "fundamental" data and are now listed in the Scan Elements as fundamental elements (formerly they were listed as both fundamental and primitive elements). A by product of this change is that any quote page formats setup prior to version 2.9 which include the P/E Ratio or EPS data columns will have to be revised using Setup:Preferences (Format Definition). The old (redundant) columns will be listed as "Unused" and should be eliminated from all formats where they appear. Then add the "P/E Ratio" or "EPS" data column to the format(s) as you like. In a related improvement, the data columns P/E Ratio, EPS, EPS estimate, Shrs Outstanding, and Beta now appear in the "Sort By..." list when you use the quote page toolbar to sort the quote page. All five of these data items are available either via the DTN data feed or via Dial/Data fundamental download. The InterQuote feed transmits P/E Ratio, and the BMI feed transmits P/E and EPS.

These 5 key fundamental indicators plus 65 others are available for downloading via Dial/Data. The Dial/Data fundamental download feature has been simplified in version 2.9 as well. Simply use the Format Definition window (under Setup:Preferences) to modify the definition of the special format named "Fundamentals Format" to include up to 30 fundamental items you wish to download. Investor/RT has been improved to arrange the columns automatically in the order required by Dial/Data (formerly the items had to be arranged manually into a prescribed order). Then use the Download Data window to request a fundamental download of the ".Stocks" quote page. This will update the selected fundamental data items so you may rank or scan for stocks meeting any combination of fundamental criteria. All 70 fundamental data items may be used in scan requests.

Chart Windows Saved as Text

Chart windows may now be saved as text, similar to scan objects. The resultant text file contains all of the specifications of the chart object. Should you need assistance with a particular chart you can e-mail the text file describing the chart to support@linnsoft.com along with your question.

Chart Setup Improved

Investor/RT 2.9 chart setup has been considerably improved. Prior to 2.9 some technical indicators could be added to a chart only as "overlays" (e.g. moving average, Bollinger Bands). While others (RSI, Stochastics, MACD) could only be added as new sub windows (new panes) as "stand alone" indicators.

The "Add New Technical Indicator" and "Add Instrument" dialogs have now been improved to allow any technical indicator and any instrument to be added either as a new pane, or overlaid on some existing window pane. This generalization opens up several useful new possibilities that were not allowed prior to 2.9. For example:

The chart annotation indicator may now be added to any chart window pane, not just those containing instrument graphs.

The Reference Line indicator may now be added to panes containing technical indicators.

Any indicator may be added multiple times to any pane. You can create a pane containing three "Volume Analysis" indicators, one to show the day to day volume histogram, the other two to display short and long term moving averages of volume. The histogram will be drawn with the volume moving averages overlaid.

A pane containing several moving average indicators could be drawn with or without the price graph of the instrument.

You can create a pane containing indicators of more than one instrument. To do this, first add two or more instruments to the chart. Then create, for example, an MACD of each instrument and direct each MACD to the pane. Each MACD oscillator could be drawn in a different color.

Similarly, you could create a new pane containing the (raw) CCI for some instrument, then add a smoothed CCI to the same pane.

A Note about Scaling

When Investor/RT draws the scale of each chart window pane, it determines the maximum and minimum values for the scale based on ALL of the graphs to be displayed in the pane. For example, if a pane contained two instruments, one trading in the range 20 to 30 and the other trading between 40 and 60, Investor/RT would scale the pane from 20 to 60 to include all possible values. Thus the graph of one instrument would appear "above" the graph of the other. When mixing instruments and technical indicators in the same pane, you must consider how the scale of the pane might be affected. For example, if a pane were created with a MACD oscillator and an RSI on the same instrument, the resulting scale will probably now show the MACD very well since RSI values typically range between 30 and 70 and the MACD oscillator may range from -2 to + 2. The resulting scale of -2 to 70 may allow the RSI to be drawn fairly

well but the MACD will appear flat and hard to read. Bottom line, adding multiple indicators to a pane is best done in cases where you are adding multiple instances of the same indicator or multiple indicators with similar range of values.

In a future version of Investor/RT. We will provide more flexibility in scaling within a pane to alleviate this difficulty.

Chart Window Panes

When viewing a chart window with multiple panes, you can double-click in a pane's title bar to maximize the pane to fill the entire chart window. If you hold down the ctrl=key (option key on Macintosh) while double-clicking a pane's title bar, the chart window will be redrawn with all panes tiled to equal size.

Ticker Tape Object Preferences

The ticker tape object may now be set to any font/size/style you like. The window resizes based on the font selected. When you open ticker tape, the tape first appears in the font specified as the default font for quote pages. You can then adjust the font if you like by clicking the Font & Size pushbutton in the ticker tape controls section of the window. After choosing a new font, click the toggle button in the upper right corner of the ticker tape window to collapse the window into a narrow strip showing just the tape portion of the window.

Option Down When Closing

Macintosh users may hold the option down when closing any Investor/RT window to close ALL windows. This is a shortcut alternative to using the Close All command in the Windows menu. Windows 95/NT users can hold the Ctrl key down while choosing "Close" from the File menu to close all windows.

Periodicity Popup Menu

Prior to 2.9 clicking at the left edge of a chart window was a shortcut for switching the periodicity of the chart window from daily to intra-day. Clicking elsewhere in the chart window would bring up the popup menu. This shortcut was causing confusion so we have revised Investor/RT to switch the periodicity from daily to intra-day only when clicking at the left edge of a chart window with the ctrl key down (option key for Macintosh). This change means that (left) clicking anywhere in the chart window will always display the chart popup menu and there will be no "unexpected" change in the periodicity of the chart.

Investor/RT 2.8, Release Date: February 1, 1998

InterQuote users: Ticker symbol format for all futures contracts has been revised in this release. If you track futures contracts, please see the details below in item 29.

Version 2.8 uses a new method for adjusting user default preferences. The Setup:Preferences menu command or clicking the Preferences button on the main toolbar now display a standard selection box listing the available preference windows. Just like lists of quote pages or charts, there is an Apply button and an OK button at the bottom of the list.

Selecting a Preference topic and pressing OK is equivalent to double-clicking on the topic-the list disappears and the chosen Preference window opens.

Note that alt+Y (apple+Y) is the keyboard shortcut to display the list. Then type the first letter of the desired preference topic to select it. The up and down arrows may also be used. The escape key closes the list box and the return or enter key is equivalent to clicking OK (or double-clicking).

If you wish the preference topic list to remain open (so you can make adjustments to several preference sections, then use the Apply button. Clicking this button leaves the list open and also opens the chosen preference topic. You may have as many different preference windows open at one time as you like.

Setup:Preferences Updated

Setup:Preferences now has an "Instrument Preferences" windows in which you may specify default values to be used when adding new instruments. The instrument preferences window allows the user to specify default values to be used when adding new instruments to Investor/RT. Instruments may be added to Investor/RT in four ways:

1. Using the Setup Instruments window
2. Typing ticker symbols directly into a quote page
3. Importing ticker symbol lists using File Import
4. Importing ticker symbols using Setup Quote Sifter

In each of these cases, Investor/RT uses the default values specified here when adding the new instrument(s). The instrument preferences window allows you to specify:

- the default security type (stock, future, etc.)
- the default requested exchange code (COMP, NYSE, etc.)
- the default session to assign to new instruments
- the default display format (eighths, sixteenths, 99.999, etc.)
- the default data monitoring options (daily, weekly, monthly, intra-day).

Specifying these defaults in advance streamlines the setup process for new instruments. For example, if you are principally using Investor/RT to trade equities you could set your defaults to: stock, COMP, Session 0 NYSE Session, 99.99, daily and intra-day data collection. Then when you define a new instrument by typing its ticker symbol into a quote page, Investor/RT will automatically define the new instrument for you with these settings.

When you bring up the Setup Instruments window, the defaults specified here are the initial settings whenever you are adding a new instrument.

If you import a list of ticker symbols from an ASCII text file, each ticker will take on the default values specified here (unless you include slash commands in the file to override these settings-see Import help for details).

A new data column named "Monitor" is available for display in quote pages.

The Monitor data cell for each instrument shows the data collection (monitoring) options in effect for the instrument. The cell can contain any of the four letters DWMI representing daily, weekly, monthly, and intra-day respectively. The cell maybe edited to adjust the monitoring options for the instrument. For example, typing DI into the cell sets the data collection options for the associated instrument to daily and intra-day, while clearing the cell's contents turns off all data collection for the instruments (other than current quotes).

The Quick Quote window now has a new "Get Info" toggle button

Clicking this button opens a window showing detailed information about the instrument selected in the quick quote window. The values of all data items are displayed along with all news items, portfolio positions, and trading notes for the instrument.

Annotation Indicator Changed

The "Annotation" indicator, now has an option to allow you to annotate any chart subwindow with the current price of the charted instrument. Use the Add Technical Indicator button to add the Annotation. Configure the annotation by checking the box titled "Append Last Price to Note". If you specify annotation text, the price is appended to it. If you leave the text box blank, Investor/RT displays "XXX = YYY" where XXX is the ticker and yyy is the price. The last price annotation is useful when viewing slide shows. As each chart is displayed, the current price of each instrument can be prominently displayed centered near the top of each sub window containing an instrument.

Chart improvement

A thin vertical line marks the beginning of the each new trading session in minute bar charts even if the "grid" option is off for the chart. The vertical line is drawn in the same color as the vertical scale.

Chart Improvement: In version 2.7 the F5 key was introduced for toggling the current chart window between daily and intraday periodicity. The periodicity of the intraday chart (tick, 1 minute, 5 minute, etc.) is controlled by the current setting in Setup:Preferences:Charting Period. The same toggle effect may now be achieved by clicking the mouse at the left edge of the chart window. The "left edge" is defined as a strip one inch wide or one quarter of the window width whichever is smaller. Clicking the mouse to the right of the "left edge strip" brings up the popup menu as usual.

This change provides convenient single click toggling between the daily and intra-day chart modes for any chart window while maintaining the convenience of the popup menu for adjusting chart options. If you attempt to click in the leftedge to toggle the daily/intraday setting and the popup menu appears, just click again a bit farther to the left.

News Improvement

Clicking the "News Browser" button on either the quote page or portfolio toolbar with no row selected will gather all news items for all instruments in the quote page or portfolio and present them in a browser window for viewing. If an instrument is selected, only news items for that instrument are shown.

Charting Bug Fix

A bug was fixed in the charting system that would sometimes incorrectly report "no data for the period" for daily charts when in fact data was on file.

Setup:Preference Additions

In Setup Preferences there are now sections for "Charting, General" and "Charting, Advanced". The new "Charting Advanced" section provides access to some chart preference settings that formerly were shown in the "Charting, General" section. In addition, the advanced settings include the new capability to specify whether grid lines are desired based on the periodicity of the chart. For example, you may elect to see grid lines on daily/weekly/monthly charts, but not on tick charts or intra-day minute charts.

Charting Advanced

The Charting Advanced section includes a powerful new setting that allows the user to specify the name of a chart object to be used as the default whenever a new chart

window is created for an instrument. Prior to 2.8, newly created charts always contained the instrument's price chart and (optionally) the volume. Now you may create a default chart of any complexity (any number of technical indicators, etc.), save that chart object and specify that chart name as your default chart. Then, double clicking on an instrument in a quote page or using the chart button on the quote page toolbar will use that chart object when it opens a new chart window. Keep in mind that double clicking on an instrument in a quote page only creates a new chart if there is no chart already opened. The instrument is inserted into the current open chart if there is one. You can request that a new chart be created, even if one is already open, by holding down the option key (Macintosh) or the ctrl key (windows) while double-clicking in a quote page.

The Charting Advanced preference section also includes a new feature that enables the user to specify how quote pages are to be sorted (ranked) when opening them. (Note: this is actually a feature of the quote page, not charts. We anticipate moving this setting to a new section in a later release.) For example, you may request that all quote pages be ranked by change or %change, either ascending or descending. Note that the sort, if requested, occurs only when the quote page is first opened. As prices fluctuate the rankings may change, but the quote page will not be sorted again unless the user requests it explicitly. If you close the quote page and reopen it later, it will appear sorted based on the current price values. If the quote page auto sorting is not requested, then all system defined quote pages are opened in ticker symbol alphabetic sequence. User defined quote pages are opened in the order in which the user define quote page was last saved.

TRIX and Oscillator and Summation

Two new technical indicators have been added in Version 2.8, TRIX and "Oscillator and Summation".

Update quote windows

At the open of each trading session, Investor/RT sets the open, high, low, bid, ask, and volume for each instrument to zero. If quote pages, portfolios, or quick quote windows are open at this time, Investor/RT 2.8 will now properly update any currently displayed market data.

Scan Element "BARS"

The Scan Element "BARS" (Bar Count) may now be used in a scan request. A bug was fixed in 2.8 that would cause Investor/RT to fail (under Windows 95) if a scan request was run containing the BARS scan element. The BARS scan element is used to show the number of bars of historical data on file in the Investor/RT database for each instrument. Setup a scan request with the language "BARS > 0" and scan the ".All Symbols" quote page. Run the scan with a periodicity of

1 minute and a quote page of ".Intraday" to see how many one minute bars are on file for each instrument being tracking intra-day.

List Selection Improvements

The standard Investor/RT "List Selection" window has been improved. A list selection window is a gray window with a list of names to choose from. There are now three buttons at the bottom of the window: Apply, OK, and a new button titled All. The improvements are:

1. Pressing enter or return on the keyboard with the shift key down is the same as using the mouse to click the Apply button. The list selector "applies" the current selection (taking some action such as opening a window), and leaves the list selection window open to enable another selection. Without the shift key, the enter/return key (or double-clicking) applies the selection and closes the list selection window.
2. The All button "applies" every listed item taking some prescribed action for each one. For example. If you click the "Chart" button on the main toolbar, a list of chart objects will appear in a list selection window. Click the All button to open every one of the charts listed. Similarly you could click the Preferences button (or choose Setup:Preferences) to get the list selector of preference topic and open all of them.
3. Investor/RT determine if three or more windows were opened as a result of click the "All" button. If so, the user is prompted with the message "Would you like to tile or cascade all windows?" Press "T" or click "Tile" to tile or "C" to Cascade. The default action is to do nothing, press return or "N" or click the "No" button to leave all windows as is. Tile and Cascade are commands in the Windows menu as well.

X Dividend Date for BMI

The data column X-Dividend Date is now available for users of the BMI data feed.

Help Topic for Setup: Preferences

All of the Setup:Preferences windows have their own help topic. Open the Preference window and click the red question mark button on the main toolbar to review information specific to that preference window.

Scan Feature for Historical Data – All Periods

The Scan feature is now fully functional for scanning historical data for ALL periods (daily, weekly, monthly, tick, and intra-day minute periodicity). Prior to 2.8, scans operated correctly only on daily bar data. Run scans for other periodicity settings would erroneously report insufficient data.

Scan Window Save Feature

Any scan window may now be saved as text using the Save as text command in the File menu. The resultant scan definition text files may then be emailed to other Investor/RT users. The recipient may then import the scan definition using the File:Open (File) command. When Investor/RT opens any text file, it inspects the file to determine if it is a scan definition file and if so, the file is used to create the scan setup window. The user may then adjust or revise the scan definition and save it. All Investor/RT users are invited to submit their favorite scans via email to info@linnsoft.com. The scans will be tested and published with attribution (with your permission) on our web site. The saved scan definition file may include arbitrary comment lines describing the scan and how to use it. A special line in the text file, beginning with COMMENT= may be used to display any comment you like whenever that file is opened in Investor/RT. The comment could include your name and brief instructions for using the scan. When another Investor/RT user opens your scan text file, this comment will be displayed in a dialog box prior to setting up the scan in the recipient's Investor/RT system. For documentation purposes, the saved scan text file includes the name of the user (from Setup:Preferences:Registration), the date the scan was saved, the version of Investor/RT and data feed in use by the creator of the scan. When you save a scan definition, Investor/RT displays the contents of the saved text. Scan text files are platform independent, this is, Windows 95 users can exchange scan files with Macintosh users and vice versa.

Scan Definition Files

Linn Software has included a dozen or so scan definition files in version 2.8. You will find these in the scans directory within the investrt/program directory under Windows 95. The scan folder for Macintosh users is directly inside the Investor/RT Folder. Any scan definition file may be opened and edited using a word processor or text editing program. Opening a scan definition text file with Investor/RT results in the creation of that saved scan in your Investor/RT system.

When you open a scan definition text file for a scan definition that contains one or more technical indicators, Investor/RT will prompt you one-by-one for your preferred settings for each technical indicator. After responding to each technical indicator setup prompt, the newly opened scan window will appear. Click the Scan button to launch the scan or the Auto Scan to launch the scan to run repetitively at some prescribed interval of time. The scan definition is not saved in your Investor/RT database until you issue the File:Save command or click the Save button. If you open a scan text file and after reviewing (or even running the scan) decide not to

keep the scan, just close the scan setup window and click "Discard" when asked if you wish to save the scan.

Charting Bug Fix

A bug was fixed in the charting area that prevented intra-day technical indicators from drawing properly unless the chart window was the current front window. Intra-charts' technical indicators now update and redraw properly as new bars are added to the intra-day chart regardless of how many chart windows are open at one time.

Historical Retention Preferences

The historical retention preferences window now has some new options to enable intra-day monitoring on groups of instruments. As in earlier releases, all instruments explicitly marked for intra-day monitoring will have tick data captured and maintained for the retention period specified in the historical retention preferences window. All instruments that are not explicitly marked for intra-day monitoring can be enabled for current session tick data collection using the check boxes at the bottom of the historical preferences window. For example, if you check "All Symbols", this means that every symbol tracked by Investor/RT will have current session tick data collection enabled, however, only those explicitly marked for intra-day will have their tick data maintained for longer than the current session. Tick data for those instruments not explicitly marked for intra-day will be available for the previous day until the session opens again at which time the tick data for the previous day's session will be discarded. If you want tick data maintained for longer than the current trading session then mark the instrument for intra-day.

QuoteTime been renamed to QuoteDateTime

The quote page data column formerly known as "QuoteTime" has been renamed "QuoteDateTime". This column shows both the date and the time of the most recent quote update for each instrument. A new column has been added and named "QuoteTime". It shows just the time component in HH:MM:SS notation of the last update.

Import Bar Data

Investor/RT can now import "bar data" as ASCII text from other sources for charting and analysis. For example, the data below is 15 minute bar data for the March US Futures contract.

```
"Date","Time","Open","High","Low","Close","Volume"  
971229,0915,120.781250,120.812500,120.718750,120.718750,22  
971229,0930,120.750000,120.750000,120.656250,120.656250,44  
971229,0945,120.687500,120.687500,120.531250,120.593750,55
```

971229,1000,120.562500,120.656250,120.562500,120.625000,45
971229,1015,120.593750,120.656250,120.593750,120.656250,29

Notice that the date and the time components in the input file are distinct fields with the date time expressed as whole numbers in the format yymmdd and hhmm. Six digit time numbers are taken to be hhmmss. Investor/RT also support date time formats like 12/29/97, 09:15 or 12/29/97, 10:43:33.

Bar data and tick can be import using the "Tick Data" import type in the Import window. The way Investor/RT knows the difference between tick data and bar data is by the Import format definition. If the import format used contains open, high, low, then Investor/RT treats each imported row of data as a bar. If the import format contains just last, bid or ask prices, then the row is treated as a single tick.

Note that Investor/RT does not store "bar data" as such in its database. Tick data is stored and minute bars of any duration are derived as needed for charting and analysis. When importing bar data, Investor/RT translates each incoming bar into 4 "ticks" each having the same time stamp: one each for the open, high, low, and last price of the bar. Thus Investor/RT retains all of the information for each bar. Note also that if you import say 15 minute bar data, a 15 minute bar chart (or candle) should be used to view the data. There would not be sufficient data to view a shorter term bar or candle chart. If you import 1 minute bar data, then any minute bar chart can be drawn.

Sounds

The sounds associated with the opening and closing of trading sessions are now made only when the trading session actually has instruments assigned to it.

InterQuote users Connection

InterQuote users may now specify that Investor/RT automatically initiate a connection to InterQuote a few minutes before a user specified session opens for trading. See Setup:Preferences:Data Feed Preferences. On the Macintosh platform, the dialup networking connection (PPP) will be made automatically if it is not already active. On the Windows 95/NT platform, Investor/RT requires that an Internet connection be active at the specified time.

Chart Object SubWindows

Chart objects containing more than one subwindow now open with each subwindow at the same size as they were when the chart was last saved. Formerly, the subwindows were adjusted to a "default" size each time a saved chart object was opened.

InterQuote Tracking Futures

Attention InterQuote users tracking futures: Effective with the release of Investor/RT 2.8, InterQuote futures contract symbol format has been revised. The year digit now precedes the month code. For example, the March 1998 SP contract is now quoted as SP8H, not SPH8. Investor/RT's Setup Futures window will generate the new format for newly defined futures. Instruments that were defined using the former format may be easily modified in the ".futures" quote page by editing the ticker symbol cell to reverse the codes. Press return and Investor/RT will ask if you wish to modify the existing instrument's ticker symbol. Click "Modify" or press the letter m to modify. This technique assures that any intra-day or historical data on file for the instrument is retained. If you do not care to retain any historical data, then simply delete the former instruments and define them again using the Setup:Futures window.

Note: Changing the ticker symbol of an instrument during trading hours will result in the loss of any tick data collected prior to the symbol change. It is advised that ticker symbol revisions be made prior to the open of the trading session.

Investor/RT 2.7, Release Date: December 19, 1997

Intra-day Tick Charts

Intra-day tick charts now have viewing period time settings expressed in hours instead of days. Intra-day minute charts of any number of minutes still have their viewing period expressed in days.

The reason for this change is to enable users to open tick charts that display only the last hour or so of trading activity. Such charts do not consume nearly as much memory as before, when viewing periods were expressed in days.

Four new buttons have been added to the portfolio toolbar.

Delete Position

The first is the "Delete Position" button. The button has the red trash can icon and is used to remove (journal out) a position from the portfolio. First select the row you wish to remove by clicking in a cell in that row, then click the Delete Position button. The F2 key (Cut) or the Del key (forward delete on Macintosh) is equivalent to clicking in the toolbar with the mouse. Confirmation of the deletion is request.

Prior to version 2.7 removing a position required the user to place a closing trade using the order desk window. The new button, in effect, does this automatically. The position is closed with the Journal Entry, that is, there is no effect on the portfolio's cash balance.

Cash Balance Adjustment

The second new button, the "Cash Balance Adjustment" button, opens a window used to make deposit or withdrawal transactions. The cash adjustment window may also be used to set the cash balance in the portfolio to a specific amount. This may be useful, for example, to synchronize the cash balance with a brokerage statement.

Portfolio Reports

The third new button is the "Portfolio Reports" button. Clicking this button presents a list of available portfolio reports. Choose the one you want and click OK or Apply to produce the report. At present there are three portfolio reports:

1. Audit Trail
2. Closed Position Summary
3. Closed Position Detail

The Audit Trail report shows a dated list of changes to the cash balance in the portfolio. These include buy and sell transactions, commissions paid, and any manual adjustments to the portfolio's cash position.

The Closed Position Summary and Close Position Detail reports show information about each closing transaction, i.e. each closed position or partially closed position. Data items include the dates the position was opened and closed, the opening and closing values of the position and the profit or loss realized upon closing the position.

Investor/RT Version 2.7 is the first release of the software that maintains a historical record in the database for each closed position. Portfolio positions that were closed using prior versions of Investor/RT were not retained in the database and therefore will not appear in the reports. It is recommended that all Investor/RT users update to version 2.7 prior to January 1, 1998 so that at year end 1998 a full report of trading profits and losses will be on file.

Chart Portfolio Value

The final new button on the portfolio toolbar is the "Chart Portfolio Value" button. Clicking this button produces a daily line chart of the current portfolio's net equity value. The day to day portfolio value of each portfolio is tracked by an Investor/RT generated instrument whose ticker symbol is a \$ followed by the name of the portfolio. Clicking the "Chart Portfolio Value" button will determine if this instrument is still defined and if so a chart will be produced. If the portfolio value instrument is not defined (for example, it may have been deleted by the user), then it will be defined again and daily portfolio tracking will begin anew with the current day.

Dialog Box removed for InterQuote Users

For InterQuote users, the dialog box requiring a response when connecting to the InterQuote server has been removed. This makes it possible to have Investor/RT start and begin collecting data automatically without the user present. On the Macintosh platform, Investor/RT establishes the Internet connection automatically as well. On Windows/95, the user must take steps to assure that the Internet connection is established prior to starting Investor/RT. This can be accomplished, for example, by adding a shortcut to the dial-up connection file to the Windows/95 startup directory.

Signal Users – “Signal Market Leaders”

For Signal users, a new command "Signal Market Leaders" is now present in the Signal menu in the menu bar. This command opens a window for displaying the leading percentage gainers and losers, or most active issues for the NYSE, American, NASDAQ, and stock options markets. The user selects which market to show and three lists of ticker symbols appear (gainers, losers, most actives). Any list of tickers may be viewed as quote page by clicking the Quote Page button. Constructing the quote page includes defining the instruments to Investor/RT if necessary. You can also add (define) individual instruments by double-clicking on any ticker symbol. Clicking once on any listed symbol causes the current quote (if available) to appear in the message area of the main toolbar.

Data Broadcasting refreshes the market leader ticker symbol lists frequently during trading hours. Clicking the refresh button requests that Investor/RT re-display the lists using the most recently received data. This is recommended if the market leaders window has been left open for more than a few minutes. Each time the user switches markets (NYSE, AMEX, NASDAQ, OPTIONS), Investor/RT displays the most recently received market leader tickers.

Backup Preferences Additions

Several new preference setting checkboxes have been added to the Backup Preferences section of the Preferences window. Check marking "Always verify database before making a backup" insures that no backup operation will be performed until the database has been verified as okay. It is recommended that all users mark this checkbox. While it does take extra time to verify the database, this option protects against accidental backup of a damaged database.

For Macintosh users, new versions of the I/RT Database Maintenance utility and I/RT Verify Database utility are provided with version 2.7. The new utilities now run "unattended" and quit automatically when processing is completed without requiring any response(s) from the user. This enables backups (with verification first) to be made at times when Investor/RT is running unattended. The output of the most recent run of either utility is placed in a text file named dbmaint.txt or dbverify.txt. The maintenance and verify utilities for Windows/95 users have always operated in this fashion.

The next backup related checkbox is titled "Verify at Startup if Database was not closed properly". Checking this box bypasses the dialog box normally displayed at startup if it is determined that the database was not closed properly. Instead of asking if the user wishes to restore, verify, or quit., Investor/RT will proceed unconditionally to verify the database. The intent of this checkbox is to allow Investor/RT to startup unattended, perform a verify, if necessary, and proceed with startup as long as the database verifies as okay.

The final new checkbox is titled "Restore database at startup if verify finds errors". This checkbox works in tandem with the previously mentioned checkbox. If the verify step at startup is required and the verify step determines that the database is damaged, then a database restore will be performed automatically when this box is checked, otherwise Investor/RT will stop and wait for the user to make a decision to restore, quit, or continue. Again, the intent of these options is to allow Investor/RT to start up without user interaction, even in cases when the database may have errors.

Investor/RT Updating 20 day Trading Volume

At the close of each session, Investor/RT updates the 20-day average trading volume of each stock or stock options assigned to that session. This process can take several minutes in cases where thousands of instruments are being tracked. Investor/RT 2.7 has been improved to continue processing incoming data from the data feed during this process.

Session Time Changes

When switching an intra-day chart from one instrument to another, Investor/RT now properly recognizes whether the session times for the new instrument are different than those of the former instrument and adjusts the horizontal time scale accordingly. Prior to version 2.7 the horizontal time scale was not adjusted properly in such situations, resulting in less than perfect charts.

Intra-day Charts

Intra-day charts now show a bold vertical line to mark the beginning of each day's trading session. The vertical line is drawn in the chart's "Scale Color".

Setup Instruments

Setup Instruments now permits the specification of alarm levels using either the bid, ask, or last price of the instrument. Formerly, only the last price could be used in specifying an alarm position.

New Technical Indicator – Up/Down Volume Ration Slope

A new technical indicator, Up/Down Volume Ratio Slope shows the moving slope of the Up/Down Volume Ratio. The indicator oscillates around zero. Values above zero indicate a bullish condition, values below zero indicate a bearish condition. Transitions from bearish to bullish or vice versa signal a change in trend.

CCI smoothing option

The Commodity Channel Index (CCI) now has a smoothing option. The smoothed CCI can be drawn alone or in addition to the raw CCI value.

MACD Indicator Updated

The MACD indicator now gives the user the option to specify which type of moving average to use in the MACD calculations.

All Months option in Setup Futures

The Setup Futures feature now operates correctly when the "All Months" option is selected. Checking the "All Months" checkbox in the Windows/95 version of Investor/RT caused an "illegal operation" failure. This feature has always worked properly in the Macintosh version.

Keyboard Shortcuts

Several new keyboard shortcuts were added. F5, Insert, and Delete are operative for chart windows, and F6 and F7 are defined for quote pages and portfolios as described below:

When a chart is the active window, pressing F5 toggles the chart between Daily and Intraday. The user may control the type of intraday chart (tick, or n-minute) by choosing the desired intraday period in Setup:Preferences:Chart Period. The Insert key pops up the window for adding a new technical indicator to the chart. The Delete key (forward del key on Macintosh) pops up a list of graph elements for deletion. If the chart has only 1 element, the delete key closes the chart window.

The F6 key operates on either the active portfolio or quote page window and provides a shortcut for sorting the quote page or portfolio in descending "change" sequence, i.e. the portfolio or quote page is ranked with the largest gainers at the top and the largest losers at the bottom. The F7 key is a shortcut for requesting a chart on the instrument currently selected in a quote page or a portfolio. The Insert and Delete keys add or remove rows from a quote page.

Here is a summary:

F2 (cut) or Del

- Quote Page: Remove row from quote page.
- Portfolio: Remove position from portfolio
- Chart: Remove an element from the chart

Insert

- Quote Page: Insert a blank row into the quote page
- Portfolio: Insert a new position, i.e. open the order desk window
- Chart: Add a technical indicator to the chart

F6:

- Quote Page: Sort quote page by "change"
- Portfolio: Sort positions by "change"

F7:

- Quote Page: Chart the currently selected row's instrument.
- Portfolio: Chart the instrument of the currently selected position.

Bid/Ask Markers

The bid and ask markers that appear on the vertical axis for intra-day charts have been made slightly larger to improve readability.

Candlestick Charts

When drawing candlestick charts Investor/RT inspects each bar to be drawn to determine if the data is "reasonable", i.e. the high must be greater than or equal to the low, and the open and last price must fall within the high low trading range. If these checks reveal faulty data, the candle is drawn as a simple dash at the last price. Prior to version 2.7, nothing was drawn at all.

Net Equity Value Ticks

When a portfolio is open, the net equity value of the portfolio is calculated each time any open position in the portfolio changes price. Each recalculation of portfolio value now generates a "tick" for the portfolio's instrument (each portfolio has an associated instrument defined to track the portfolio's value day-to-day, the ticker symbol of this instrument is \$ followed by the portfolio name).

The portfolio value tick data makes it possible to view intra-day charts of portfolio value. The portfolio instrument must be marked for intra-day data collection. The portfolio value can be charted tick by tick, or at any minute interval, just like any other instrument. The only requirement is that the portfolio window remains open during the trading session. When a

portfolio window is closed, no "ticks" will be generated until the portfolio window is opened again.

A side benefit of this enhancement is that Investor/RT can maintain an open, high, low, and closing value for the portfolio each day. This makes bar charts and candlestick charts possible, not only for intra-day portfolio value charts, but the daily portfolio value charts as well. To get an accurate open, high, and low for the portfolio, the portfolio window must be open for the entire trading session. Portfolios that are not open at all during the trading session will have a daily posting with open, high, low, and last set to the portfolio value at the end of the session. If a portfolio window is open for only a part of the trading session. The open will be the portfolio value at the beginning of the session, the high and low will be the high and low portfolio values during the time that the portfolio window was open, and the last will be the portfolio value when the session closed.

Investor/RT 2.6, Release Date: November 12, 1997

Cascade Command

The Cascade command in the Windows menu now operates properly. This command re-arranges all open windows in a layered cascade where you can see the title of every window. Window sizes are not adjusted, just their position on the main monitor. The command is not recommended for users of multiple monitors, as it will bring all windows back to the main monitor.

The Save As

The Save As command for chart objects now saves a NEW chart object under the specified name. Prior to 2.6, it renamed the former object. The change was made to make it easier to "clone" multiple copies of the same chart object (perhaps with different instruments) when making multi-chart layouts. Starting with a saved chart object you may insert a different instrument into the chart and use Save As to make a clone, then change instruments again and Save As to make another. Finally, open each clone using the Objects menu . Size and position the windows in the desired arrangement and issue the File:New:Layout command.

Tile Command

The "Tile" command in the Windows menu now does a better job of partitioning the main screen. Try it with 4 or more charts open to see the effect.

Windows Close All Command

The Windows:Close All command in version 2.5 for Macintosh was mistakenly given the shortcut key of command-A. This has been removed, thus command-A opens the Setup Instrument window once again.

Bug fix for Chart Windows

A bug was fixed that mistakenly activated chart windows simply by passing the mouse pointer over them.

Activate Feed at Startup

The "Activate feed at Startup" feature now works properly in the Windows/95 InterQuote edition of Investor/RT.

InterQuote Crash with quote pages

A bug was fixed in the InterQuote version that could cause a crash when opening and closing quote pages. Also, for Windows/95, the time it takes to open or switch to a different quote page has been dramatically reduced.

Quote page / Ticker Tape Alphabetized

The Quote Page and Ticker Tape submenus of the Objects menu are now alphabetized.

Periodicity Tick Changes

Switching a tick chart to another periodicity and then back again would reset the tick resolution to 1 second, regardless of the user's setting. This has been corrected to preserve the tick seconds resolution setting.

Mac mouse rejection bug fixed

On the Macintosh, a long standing nuisance bug was corrected that rejected the use of the mouse when responding to messages regarding the closing/saving of certain windows.

Name added to Ticker Symbol

The ticker symbol is now shown in the window title of chart windows followed by the security name and periodicity .e.g. "AAPL: Apple Computer: Daily".

Alarms available for Scan Requests

The data elements High Alarm Level, Low Alarm Level and Volume Alarm Level are now available for use in scan requests. This enables scan requests to be formulated in terms of the current alarm levels of instruments. Adjustment of alarm levels by the user is then reflected automatically the next time the scan is run. If a scan is being run in "Auto Run" mode, the user may modify the alarm levels on the fly and the new values take effect immediately in the auto running scan.

Signal data Feed – fixing General Error

The Signal data feed software was modified to eliminate the General Error sound that was programmed to occur when receiving a data file too large to be handled by Investor/RT.

Preferences Window repaired

When opening the Preferences window for the first time after starting Investor/RT, the preferences section last accessed will appear. Formerly, the Registration section would always appear first regardless of the section last referenced.

DTN Setup Preferences Modified

DTN Setup Preferences have been modified to include a "Maintenance" function and to specify how often and at what time of day to perform maintenance. Performing maintenance every 15 days is recommended. The time of day should be a 24-hour time during which the markets you follow are closed. The maintenance consists of removing certain DTN related files from the hard drive and loading fresh copies of these files from the DTN receiver unit. The maintenance takes place in the background while you work with Investor/RT. Do not perform maintenance or schedule maintenance during active market hours since Investor/RT's capacity to receive quotes is limited until the maintenance activity is completed. Normally this takes 15-30 minutes.

DTN to capture EPS estimate

Corrections to the DTN version were made to capture EPS estimate, shares outstanding, and beta for stock instruments.

Quick Quote Window Enlarged

The quick quote window was enlarged slightly to permit display of beta, shares outstanding, EPS estimate, X-Dividend date, and 52 week high and low dates.

Up Tick and Down Tick Revised

The up tick and down tick counts for each instrument are now reset to zero at the opening of each trading session. Formerly, these were set to zero only when Investor/RT started.

Daily and Intra-day Charts Revised

Daily and intra-day charts now show current bid and ask markers on the vertical scale of sub windows containing instruments. The bid marker is drawn in the default "down" color (usually red), and the ask marker is drawn in the default "up" color (usually green). If more than one instrument is present in a sub window, there will be a of bid/ask markers for each instrument. You may not be able to distinguish which is which if more than one instrument is bidding/asking at nearly the same price as another. If this occurs, setup each instrument in it's own sub window. The bid/ask markers are updated each time a trade occurs. At present, bid ask changes in the absence of a trade event do not trigger chart updates.

Signal Data Feed with large files repaired

A bug was corrected in the Signal data feed library that caused failures when very large files were sent out over the Signal data feed.

20 Day Average Volume on Stocks Options

Investor/RT now calculates and maintains 20-day average volume on stocks options as well as stocks.

New Data Feed Menu added to Menu Bar

A new Data Feed menu has been added to the menu bar. The name of the menu is the name of the data service in use (BMI, DTN, InterQuote, Signal, or Dial/Data). Menu items for starting and stopping the data feed, viewing data feed status, and setting up data feed preferences are provided. These menu items are no longer present in the Control menu. In future editions of Investor/RT any data feed specific features unique to a particular feed will be made accessible through this menu.

DTN – Database Mode checkbox added

For DTN Setup, a "Database Mode" checkbox is now provided for users with the model D8000 DTN receiver. When checked, Investor/RT constructs a watch list of all issues tracked by the user and requests that the DTN D8000 transmit quotes and trades only on those instruments. This mode of operation reduces the data traffic on the serial port considerably. Certain Investor/RT features such as the Quote Sifter lose their ability to watch the unfiltered raw data

feed when database mode is in effect. This mode of operation is not recommended when more than 500 instruments are tracked.

Two new data columns are available for DTN users who utilize the database mode: DTN Database and DTN rec #. These data columns indicate which DTN database and record number Investor/RT has identified for each instrument. These data columns may be useful in diagnostic situations. If the DTN database number is shown as "0x00000000", it means that the ticker symbol could not be identified as a legitimate DTN supported ticker.

+DI & -DI Technical Indicators repaired

A bug was fixed to enable proper drawing of the +DI/-DI technical indicator as a standalone technical indicator.

%Change Value Updated

In chart windows, the data shown in the window as you move the mouse pointer in the window now includes a %Change value. This value is calculated as the percent change in price realized from the date/time the mouse is pointing at to present. For example, if you are looking at a daily chart of a stock trading currently at \$120 and you point to a date in the chart when the closing price was \$100, the %Change would be shown as 20%, i.e. $(120 - 100) / 100$. This is a useful tool for examining how much an instrument has gained percentage wise since the previous significant low, or how much an instrument has retraced from its most recent high.

Investor/RT 2.5, Release Date: October 27, 1997

Attention DTN Users:

Investor/RT 2.5 is a mandatory update for users of the DTN data feed. Revisions in the data transmission format for the DTN Spectrum and DTN Real-Time data feeds make it necessary to update to version 2.5 in order to maintain compatibility. The DTN edition of Investor/RT 2.5 now uses a DTN definition file retrieved from the DTN receiver unit to process the incoming data. This enhancement means that Investor/RT can adjust to future revisions to the feed definition "on the fly" by accessing a new definition file from the DTN receiver unit. The definition file is named "F09010001" and is stored in the Admin folder. The user may delete this file at any time to force Investor/RT to fetch an updated version of the file from the DTN unit the next time a Start Feed is issued.

Prior to version 2.5, Investor/RT maintained certain DTN related definition files in the News folder. These files all have names of the form "F0901xxxx" where xxxx are any characters. These files in the News folder are no longer needed for use with version 2.5 so they may be removed

to the trash/recycle bin. Files with similar names will be maintained in the Admin folder by Investor/RT Version 2.5 and subsequent versions.

New Startup application:

Investor/RT 2.5 now has a companion application named "Investor/RT Startup" (irtstart.exe on Windows/95). The new startup application is designed to manage the start up and registration process. Many of our clients have multiple data feeds and the process of configuring Investor/RT when changing from one data source to another needed to be made more convenient.

The Startup application is located in the same folder as the Investor/RT application. Instead of launching Investor/RT directly, it is recommended that the Startup application be launched instead. On Windows/95, the Start menu short will automatically launch the irtstart.exe application. If you have created other shortcuts to the investrt.exe application, it is recommended that you remove them and create new shortcuts to the irtstart.exe application instead. Macintosh users should similarly delete any aliases for the Investor/RT application and create new aliases for the Investor/RT Startup application.

The startup application will verify that the correct data feed library and registration are in place and start Investor/RT within a few seconds. You may interrupt the start up process and re-configure Investor/RT for use with a different data service by clicking the mouse or pressing any key. When the logo for your data service appears you can launch immediately by pressing Alt-L (command-L on Macintosh) or by clicking the mouse on the "Launch" button.

Macintosh users should trash the file IRT_PPC_FEEDLIB from the Extensions folder. In version 2.5, this shared library file will be kept in the Investor/RT folder instead. The Investor/RT Startup application automatically places the correct data feed shared library into the Investor/RT folder at startup.

Warning: Starting Investor/RT (investrt.exe) directly instead of launching the startup application may result in Investor/RT using an incorrect or out-of-date data feed library. If you get a message at startup that the library is the wrong version, just launch the startup application to configure Investor/RT.

Four new data columns are now available for display in quote pages

YTD%Change and PrevYearClose are transmitted by DTN for mutual funds. The PrevYearClose field may be manually entered by typing a value into a quote page. When an instrument has a PrevYearClose value, Investor/RT calculates and updates the YTD%Change field as the last price changes.

The other two new fields 52WkHighDate and 52WkLowDate are transmitted by DTN for most security types. At present, these two data columns are of use only to DTN users.

Setup:Equity Bug Corrected

A bug was corrected in the Setup:Equity and Index Options feature that caused Dial/Data alias ticker symbols to be incorrectly generated for stocks with tickers less than 3 characters in length.

Setup:Preference Updated

The Setup:Preferences:Format window now displays the available list of data columns in alphabetized order.

Data Download Updated from Dial/Data

A bug was corrected in the Data Download feature concerning downloading full text news stories from Dial/Data.

File: Export Window Improved

The File:Export window has been improved to allow the user to specify a starting and ending date/time for the export. Formerly, all data on file was exported. A Export Quote Page button was also added. This permits the user to export to a single file all historical data or data from some range of date/time. Exporting historical data formerly was invoked using the "View/Edit" button on the quote page toolbar with no instrument selected. The new feature replaces that (non obvious) feature and also adds the flexibility of specifying a starting and end date/time for the export.

View/Edit Button on Quote Page Toolbar Revised

The "View/Edit" button on the quote page toolbar now requires an instrument to be selected. When clicked, the View/Edit window appears. This window is similar to the Export window. The user may specify a time frame (daily, weekly, etc.) and optionally a starting and ending date/time for the view/edit. An instrument selector in the View/Edit window automatically shows the instrument that was selected in the quote page. Press return or the View/Edit button and a spreadsheet of historical data will be displayed for viewing and/or editing.

This enhancement will be especially useful when viewing tick data. Formerly, Investor/RT loaded ALL ticks on file when a view/edit operation was requested. This could cause out of memory conditions due to the memory requires for viewing tens of thousands of ticks. When a starting and ending date/time is specified considerably less memory is need to view and edit tick data.

Note that the "View/Edit" window may be opened directly from the Control menu by choosing "Edit Historical Data". When invoked from a quote page, the quote pages' selected instrument is passed to the "View/Edit" window. When invoked from the menu the instrument to view is selected manually.

Time/Sales Button Enhanced

The "Time/Sales" button on the quote page toolbar automatically opens a "View/Edit" spreadsheet of tick data for the current trading session. If you want to view time and sales for an earlier period, use the "View/Edit" button as described above and specify the time period you want.

Scan Setup Window Modified

The Scan setup window has been modified to make it easier to locate the scan elements you wish to use in formulating a scan request. A new list button has been added for specifying the type of scan elements to be displayed in the element list on the left.

The new list button has 4 choices:

Show All Scan Elements

Lists all available scan elements in alphabetically order.

Historical Data Elements

Lists the scan elements that accept a historical qualifier, i.e. open, high, low, close, volume, etc.

Primitive Data Elements

Lists the scan elements that represent properties of an instrument that do not take a historical qualifier, e.g. YRHI, YRLO, CH)

Fundamental Data Elements lists 70 fundamental data items.

These instrument properties are available to users with a Dial/Data account.

Chart Window Updates

Two minor bugs were fixed in the chart window. The close box at the left side of each chart sub window's title bar now continues to be visible when moving the mouse in the chart window. Also, when viewing intra-day charts, the date and time of each tick is now properly displayed in the title bar as the mouse is moved in the chart window.

Portfolio Manager Updated

A bug was fixed in the portfolio manager. If a portfolio was deleted (using Object:Delete) and the portfolio had pending market orders that had not yet been confirmed, then attempting to open the Confirm Trades window would crash Investor/RT.

New Preference added to Quote Page Preferences

A new preference setting has been added to Quote Page preferences. Checkmark "Abbreviate Volume" if you wish volume number to be displayed with "k" or "m" suffixes to indicate thousands and millions respectively. If you want to see the exact volume number, e.g. 1375800 instead of 1.3m, then uncheck the checkbox. This is a global setting that takes effect immediately for all open quote pages. Quote pages that are open at the time the setting is changed will begin to display volume in the new format with the next trade. To see the change for all rows immediately, press the Home or End key on the keyboard or scroll the quote page window up or down.

Investor/RT 2.4, Release Date: September 30, 1997

Attention Macintosh Users: Investor/RT is still not "officially" certified to be Mac OS 8 compatible because our cross platform software development tools and libraries have not been certified for OS 8 by our software vendor. However, we have found a work around that enables Investor/RT 2.4 to operate successfully under Mac OS 8. Open the "Appearance" Control Panel, press the "Options" button, and uncheck the check box titled "System-wide platinum appearance". With this box unchecked, Investor/RT works properly under OS 8. At present, there is one known situation that can cause Investor/RT to crash under OS 8 due to an incompatibility in our development software.

The situation is this: if you click the mouse in any Investor/RT window in which there is a pushbutton control, e.g. an "OK" button, and you "miss" the button, Investor/RT will crash. In other words any mouse click in a window having one or more pushbuttons where the mouse pointer is pointing at "white space" outside of any of the controls causes a crash. As long as you are careful when clicking on push buttons Investor/RT works fine. Note that this bug does not affect windows such as charts or quote pages in which there are no push buttons. We expect this bug to be fixed when we release an OS 8 certified version of Investor/RT in the near future.

At present we cannot rule out the possibility that there may be other, as yet undiscovered, incompatibilities, however, our testing has been successful running several days continuously with real-time data feed under OS 8 and a number of our customers have been operating without incident under Mac OS 8 for several weeks.

Auto Registration Added

Auto registration facility enables Linn Software to email a user registration file containing registration information for the customer or prospective customer. The registration file is attached to an email message and is named "<user name>.reg" Where <user name> is the name of the customer. Upon receipt of the email message, the user places the ".reg" file into the Investor/RT folder on the hard drive. The next time Investor/RT starts up or the next time the user activates the "Registration" section of Preferences, the file will be noted by Investor/RT and the software will automatically be registered for the user.

Update Instrument – in Chart Subwindow

The "update instrument" dialog that appears when you double click in a chart sub window containing an instrument has been improved in several ways. First, this dialog now shows an instrument selector box you can use to quickly switch the chart to a different instrument. Second, the time frame (daily, weekly, etc.) menu is now activated so you can easily change the periodicity of the chart window. Third, an Apply button is now available. The apply button enables you to apply the changes immediately to the chart window while keeping the "update instrument" dialog open for further changes. Using the Apply button, for example, you could view daily, then weekly, then monthly charts on the same (or different) instruments with just a few clicks.

Finally, when a chart window is active, just typing alphabetic characters on the keyboard causes this improved update instrument dialog to appear. The keystrokes you type are used to identify a new instrument in the instrument selector. Pressing return then updates the existing instrument with the newly selected one. In other words, if a chart is active and you wish to substitute a different instrument into the chart, simply type the first few letters of its ticker symbol and press enter or return.

Portfolio Window Updates

- The portfolio window now shows certain data columns in the up/down/unchanged colors (like quote pages) as trades occur.
- The portfolio window now has the %change today field available as well as a new computed field called "Cost Basis/Share". The cost basis per share is simply the cost basis divided by the shares held. Cost basis is defined as the number of shares times the position entry price plus commissions and miscellaneous fees and margin expense.

Cross Platform Development – Win/Mac

Version 2.4 includes an updated version of the cross platform development tools library Linn Software uses to attain portability of Investor/RT between Windows/95 and Power Macintosh platforms. The updated software fixes several bugs which appear to be related to problems

reported by our customers. Without detailing these, suffice it to say Investor/RT 2.4 should run more reliably as a result of these improvements by our tools vendor.

Selection List Windows Alphabetical

All selection list windows are now sorted alphabetically, e.g. lists of portfolios, quote pages, quick quotes, news browser/ticker categories, etc.

*File:Import supports importing of Metastock Files * Momentum CD ROM*

The Import window (File:Import) now supports importing of Metastock files, including the Momentum CD ROM.

The Investor/RT ASCII text file import feature has been improved to enable import of historical files that do not contain a ticker symbol. To accomplish this, set up a format using Setup:Preferences:Formats that describes the sequence of data items in the ASCII file. When using the ASCII text file import, specify the new format name instead of "Import Format". When Investor/RT notices that the import format to be used does not contain "symbol", it will ask the user to enter the ticker symbol for the ASCII file being imported. The symbol you type in (use upper case) must have been created already in Investor/RT. The historical data will then be merged with the data, if any, already on file for the specified symbol. This import enhancement applies to import of daily, weekly, or monthly data for single instruments where the symbol does not appear in each line of the ASCII text file.

I/RT Database Startup Improvements

Investor/RT database startup has been improved. When Investor/RT starts up, it first determines if the database was closed properly the last time Investor/RT was run. If so, Investor/RT starts up immediately. If the database was not closed down properly, as would be the case in a power failure, system, or application failure, Investor/RT now gives the user the option of either (1) verifying the database, (2) immediately restoring the database from the previous backup, or (3) quitting.

Formerly, the database verification step was automatic. The verification step is still the recommended action. Nevertheless, some users with extremely large databases (e.g. tracking more than 5,000 instruments) have reported unacceptable run times to verify the database. Restoring the database to the most recent backup is much faster and Investor/RT can get back to receiving data more quickly. The advantage of running the verification step is that the database may, in fact, turn out to be okay in which case no data is lost. Performing a restore has the advantage of speed but the downside is that a restore may not actually be necessary. Depending on how often backups are made, restoring to the most recent backup will undo all database changes since the last backup. On the other hand, if the verification step is chosen

and the database turns out to be damaged, a restore will be necessary anyway to guarantee database integrity.

Users tracking less than 500 symbols or so should always choose to verify the database at startup if the choice presents itself. In such cases, the verification step takes only a few seconds. Those with larger databases now have the option. If a crash occurs during trading hours and the priority is to get back on-line as quickly as possible, doing a restore minimizes the time it takes to get Investor/RT active again with the data feed. If there is no need for urgency to get Investor/RT active quickly, the Verify choice is the preferred one. The Quit option is there for those who may have special procedures for restoring the database apart from those in Investor/RT.

Point & Figure Charting

Investor/RT now provides classic point and figure charting. Daily, weekly, monthly, and intra-day point and figure charts are supported. Intra-day point and figure charts update dynamically as trades occur.

Quote page addition - % Change from Open

A new data column, "% change from open" is now available for display in quote pages. This column shows the calculated percent change in price from the open to the last price. For some users, the percent change from the open is more useful than the % change from the previous close. Quote pages may be sorted by % Change (from prev close) or % Change from Open.

BMI Improved Maintenance with previous days closing price

BMI users will notice improved maintenance of the previous days closing price for each issue. Each time a session closes, Investor/RT sets aside the "last price" of each instrument assigned to that session. When the session opens again the next day, this set aside price (the closing price) is set as the "Previous Day's Close". This assures an accurate reading for "change" and "% change" values for data feeds, such as BMI, which do not transmit Previous Close quotes very often. This enhancement makes it imperative that Investor/RT for BMI be running at the designed session closing time AND at the designated session opening time so that the proper maintenance of Previous Close is performed. If Investor/RT for BMI is not started until AFTER a session opens, the previous close, change and % change fields for instruments in that session will be incorrect until some random time during the session when BMI transmits data for previous close. These issues do not affect users of Signal, DTN, or InterQuote data feeds since these services transmit previous close data frequently.

Post History Process Corrected

A bug was corrected in the post history process which would sometimes cause repetitive history posting to occur for a session. Another minor bug was corrected so that the "Session is now open message" and associated session opening housekeeping will no longer occur on days for which there is no trading, e.g. Saturday and Sunday for the NYSE session.

View/Edit Historical Data Spreadsheet Improved

The View/Edit Historical Data spreadsheet has been improved so that the spreadsheet updates dynamically when tick by tick data is being viewed. If the spreadsheet is scrolled to the bottom, the arrival of a new tick causes the new tick to be inserted at the bottom of the sheet. The existing tick rows scroll up one position automatically. If the user scrolls the view/edit spreadsheet back in time, new ticks will still be added but will not become visible until the spreadsheet is scrolled back to the bottom. The View/Edit spreadsheet, in effect, is a dynamic "time and sales" display when viewing tick by tick data for an instrument.

View/Edit windows may now be included in layouts.

Layouts may now contain: traditional charts, point and figure charts, quote pages, quick quotes, news tickers, news browsers, text windows, scan objects, portfolios, and view/edit widows.

Scans may now be performed on tick data, intra-day bars, weekly, and monthly data.

This feature was supposedly introduced in version 2.3, but an error message disallowing anything but Daily for the scan time frame was erroneously left in version 2.3 thus blocking the new functionality.

Change & %Change Column Revised

- The change and %change columns now sort from biggest positive change to biggest negative change or vice versa. Thus, the big movers up are not mixed with the big movers down as before.
- The change column no longer displays a leading zero for changes under \$1 and plus signs have been removed to improve readability. Negative changes are prefixed with a minus sign.

The "View/Edit Historical Data" button on the Quote Page and Chart Toolbar has been revised

Formerly, the button had the letters "Ex" inscribed on it since the original purpose of this button was to invoke the export function. The main purpose now is to bring up a tick by tick time and sales display or daily, weekly, monthly data for viewing and editing. The face of the button is now inscribed with "V/E" to indicate its view/edit function. When this button is clicked on the quote page toolbar with no particular instrument selected, the effect is to perform a historical data export to a text file of all historical data of the selected time frame (daily, weekly, etc.) for ALL instruments in a quote page.

News Purge Bug Fix

A bug was corrected in the news purge process that takes place each time Investor/RT quits. News items older than the user specified retention period were not being deleted as they should have been.

Improved method of collection Tick Data during the Trading Session

Investor/RT 2.4 uses an improved method of collecting tick data during the trading session. Instead of updating the Investor/RT database continuously throughout the trading session, Investor/RT 2.4 collects tick data in a temporary file inside the TickData directory folder. Each instrument marked for intra-day data collection will have a temporary file containing all of the ticks for the day. At the end of the trading session, the tick data is processed into the database for longer term retention and the temporary file is deleted. This revised technique has two important advantages. First, if a system or application failure occurs during the trading session, most if not all of the ticks collected thus far will be preserved, regardless of the status of the database after the failure. Second, since the database is no longer being continuously updated during the trading session, it is very unlikely that a system or application failure would require a database restore. Note that the method used to save the tick data is otherwise transparent to the user. Intra-day charts, time and sales displays (view/edit tick data) fetch the tick data from both the database as well as the temporary file as needed.

Illegal Operation Bug Fixed

A bug was corrected in the Window/95 version of Investor/RT that caused an "illegal operation" failure when exiting Investor/RT when "Backup Database upon Quit" was selected.

Quote Page Toolbar Revised

The quote page toolbar now has a button for turning on intra-day data collection for the instrument selected in the quote page. If no instrument is selected in the quote page, clicking the "Mark Intra-Day" button will turn on intra-day data collection for all instruments in the

quote page. Confirmation will be requested. The number of instruments that can be tracked intra-day by Investor/RT is subject to the speed of the processor and available disk space to store the tick data. Tracking several hundred instruments intra-day generally presents no problem. If you wish to track more than 500 issues intra-day, a 200+ MZ processor and ample hard drive space is recommended. Intra-day data collection for an average stock takes about 100K bytes of disk storage per day of tick data.

Chart Windows Pop Up Menu Enhanced

Chart windows now have a pop up menu for adjusting the time frame (daily, weekly, monthly, tick ,etc.) for the window. Click the mouse anywhere in the chart window and the pop up menu appears. Choices are provided for switching the chart to daily, weekly, monthly, tick, 1, 3, 5, 10, 15, 30, and 60 minute intra-day time periods. At the bottom on the menu, there are choices for opening the various chart preference setting windows: Period Settings, Color Settings, and Vertical Scale Settings. Choices are also provided for adding technical indicators, viewing/editing the chart data, editing a chart element, and deleting a chart element. Each of these functions has a button on the charting toolbar as well, however, the popup menu is sometimes more accessible, especially on the Macintosh when multiple monitors are used and the charting toolbar is not necessarily on the same monitor as the active chart window.

Double-clicking in chart windows is no longer needed. A single click pops up the menu. A right button click (command-click on Macintosh) is used to adjust properties of the chart, depending on where the mouse is pointing. Right click in the vertical scale to bring up the vertical scale setting window. Right click in the horizontal scale to bring up the period settings window. Right clicking (command-clicking) inside a chart sub window brings up the settings window for the particular instrument or technical indicator you are pointing at when you click. If there is only one instrument or technical indicator in the sub window, the settings window for that instrument or technical indicator will appear. If there are multiple instruments and/or technical indicators in the sub window, Investor/RT determines if the tip of the mouse pointer is pointing at a particular instrument or indicator line. If so, the settings window for the particular instrument will appear. If the tip of the mouse is not pointing at anything in particular, Investor/RT will pop up a menu from which you may choose the instrument or indicator you wish to edit.

In version 2.4, we have substantially improved the method of identifying the instrument or technical indicator from the mouse position. To use the facility to best advantage, position the mouse pointer directly on a bar, candlestick, or a line and right click. Investor/RT can identify all of the technical indicators that can overlay an instrument: moving averages, Bollinger bands, trend lines, regression lines, reference lines, etc. In situations where you wish to edit the properties of a technical indicator, right click on the technical line in a location that is distinctive. For example, if you have an bar chart with two moving averages and you wish to edit one the of moving averages, right click on the moving average line where the line is not close to the other moving average or a bar.

Heartbeat Indicator Added

For users of continuous data feeds, a data feed "heartbeat" indicator at the right end of the main toolbar provides an instant visual indication of whether the data feed is active and whether new data packets are being received. The indicator is a rectangle that updates every 3 seconds when the feed is activate and new data is being received. When the data feed is stopped, the rectangle is solid black (i.e. you are in the dark). When the feed is active but no new data is being received, the rectangle will not change. Eventually, the rectangle will be changed to solid red to indicate that no data has been received during the past n minutes and a message to that effect will appear in the main toolbar message area. This new indicator allows you to determine at a glance that market data is incoming without having to open the Data Feed Status window.

Show Volume on New Charts Enhanced

When "Show Volume on New Charts" is checked in Setup:Preferences:Charting-General, Investor/RT will add the volume histogram automatically when you open new chart windows for stocks, indexes, futures, and options. The volume histogram is not added for other security types, e.g. mutual funds or money market funds.

Portfolio Updated

The portfolio now shows total cost basis at the bottom of the window (in the Equity row of the Cost Basis column). A new data column, \$Change, is now available for display (and sorting) in Portfolios. This data column shows the dollar change in value of each position from the previous day, taking into account whether the position is long or short, e.g. a position long 200 shares of a stock with a \$1 change would show a \$Change of 200, a position short 500 shares of a stock up \$2 would show a \$Change of -1000.

Time and Sales Button added to Quote Page

The quote page now has a "time and sales" (T/S) button. Select an instrument in the quote and press the T/S button to see the tick data (time and sales) for the instrument. The button is a shortcut equivalent to using the V/E (view/edit) button and choosing a time period of "tick". The slideshow button has been moved to a new location on the quote page toolbar so that the V/E and T/S button are adjacent to one another. The Save as Text (T) button on the quote page toolbar has been removed. To save a quote page as text, activate the quote page window and choose File:Save as text...

Sound Effects Revised

Investor/RT now has "sound effects" capabilities which allow the user to customize the alert sounds associated with particular events. To setup alert sound preferences, choose Setup>Preferences>Sounds or use the main toolbar to access Preferences and choose Sounds.

A list of Investor/RT "events" appears on the left of the window and a list of available sounds on the right. At present, the following events are supported:

Startup	Investor/RT is starting up.
Session Open	A session is now open for trading.
Session Close	A session is now closed.
Session Posting	Recording historical data for the session has begun
Shutdown	Investor/RT is quitting.
General Error	Any error condition
Feed Active	Continuous data feed is active
Feed Inactive	Continuous data feed has been inactive for at least a minute.
Feed Error	An error occurred reading data from the data receiver
Object Added	A new object (an instrument, quote page, portfolio, etc.) was successfully added to the database.
Object Deleted	An object was successfully deleted from the database.
Object Modified	A modification of some kind was successful.
Object Saved	An object was saved on the database
High Alarm	An instrument triggered a price alarm by reaching or exceeding the high price specified.
Low Alarm	An instrument triggered a price alarm by falling to or below the low price specified.
Volume Alarm	An instrument triggered a volume alarm by reaching or exceeding the specified volume
. Big Move Alarm	A stock exceeded the "Big Move" criteria specified in Setup:Preferences:Stock Alarms.
Gap Alarm	A stock exceeded the "Gap" criteria specified in Setup:Preferences:Stock Alarms.
Scan Alarm	A scan completed (manual or auto-run) and detected one or more instruments satisfying the criteria specified in the scan request.
News Alarm	For future use. Not yet supported.

To associate a particular sound with an event, first select the event and then select the sound to be associated with the selected event. When you select an event, Investor/RT immediately highlights the sound currently associated with the event. You may listen to the selected sound by pressing the Preview button, or by double-clicking any sound or any event. Keep in mind, clicking or double-clicking a sound causes that sound to be associated with the selected event.

To turn off the sound associated with an event, select the event and choose <No Sound> at the top of the sound list. To reset all sound settings to the "System Default" settings click the "Use Defaults". button. The defaults settings are to use the system default sound for most events or no sound at all.

Platform Specific Information

Windows/95 users: The sounds listed on the right are ".WAV" files stored in the investrt/program/sounds directory. A few sample .WAV sound files are provided with Investor/RT. To add more sounds, copy additional .WAV files into the sounds directory. Then choose Setup:Preferences:Sounds and the new sounds will appear for assignment to Investor/RT events.

Macintosh users: The sounds listed on the right are the sounds currently installed in your Mac OS System plus a few samples provided with the Investor/RT application. To add sounds, drag and drop sound files onto your System Folder icon. Using a microphone equipped Macintosh you may record alert sounds using the Monitors and Sound Control panel (choose Alert, then Add). The recorded sounds then become available for use by Investor/RT

Price/Volume Alarms Revised

Investor/RT now automatically resets all price and volume alarms for instruments when the instrument's session opens.

Investor/RT 2.3, Release Date: August 22, 1997

I/RT Concepts & Facilities Guide Updated

The Investor/RT Concepts and Facilities Guide has been updated to version 2.3. Page numbers, table of contents, and a detailed index have also been added to make this document more useful, especially in printed form. The new version may be downloaded from the Documentation section of the Linn Software web site at :

<www.linnsoft.com>

Save As Command Updated

The "Save as..." command in the File menu may now be used to save quote page, portfolios, and chart objects under a new name. Open a quote page, portfolio, or chart object, make revisions to it as appropriate, then issue the Save as... command. You will be prompted for a new name for the object with the former name shown as the suggested name. Change the name and press OK to save the renamed object. This feature works like a rename for the portfolio and chart objects, i.e. the same object is saved under the new name and the former object name no longer exists. For quote pages, both the former and new quote pages exist after the "Save as...".

Portfolio Object Enhanced

The portfolio object has been enhanced in several ways. First, the credit balance, debit balance, and totals at the bottom of the portfolio have been simplified. The three summary lines at the bottom now read: Equity, Cash(Debt), and Net Equity. The equity line shows the total value of the positions in the portfolio, i.e. the total of the Value column. The Cash(Debt) line shows either the positive cash balance in the portfolios or the margin debt (negative) balance. When the cash amount is negative, it represents the amount of margin debt and the amount is shown in red with parentheses around it. The cash balance or margin debt balance must be maintained by the user. Adjustments may be made at any time by simply editing the number in the portfolio window and pressing enter or return.

In addition, several new fields are now available for display in portfolio windows: open, high, low, bid, ask, bid size, ask size, alarm, change, volume, user data, and the +/- indicator may now be added to the portfolio window. Unwanted fields may be removed from a portfolio by dragging the column title into the body of the window and releasing the mouse button. When a portfolio window is closed, Investor/RT now makes note of the columns displayed in the window and their widths so that the window may be restored to the same format when the portfolio is opened again. The user data and the manager id fields in the portfolio may now be updated by the user. Each position may be assigned a manager id, an arbitrary number assigned by the user to indicate a particular manager or brokerage where the position is held.

Several new buttons have been added to the portfolio toolbar. The "Add New Column" button presents a list of columns that may be included in the portfolio window, similar to the way columns may be added to quote page windows. The "ReSize columns to fit" button auto sizes each column to fit the currently displayed content of the column.

A portfolio privacy feature has been added. You may protect your sensitive financial data by adding a password to each portfolio. Click the "Set Portfolio Password" button to add, modify, or remove password protection from the portfolio. Please use this feature carefully. When you assign a password to a portfolio, you will be asked to enter it twice for verification before Investor/RT "locks" the portfolio. Make a note of all passwords assigned. Once you have added a password to a portfolio, that portfolio may only be opened again if you know the password.

Finally, the "Save as text" command now operates on portfolio windows. The current data columns displayed in the portfolio window are written to a tab delimited text file. The first line in the text file will contain the column titles. The resultant text file may then be used by other applications such as a spreadsheet application.

Equity and Index Options Enhanced

The Equity and Index options generator (Setup menu) now generates the proper options symbols for the "half strikes", e.g. 7.5, 12.5, 17.5, 22.5, etc. When entering the list of desired strike prices use decimal notation, e.g. 20,22.5,25,27.5. Do not enter fractions like 7 1/2. 4.

The hourly news purge has been eliminated. News is now purged at midnight and each time Investor/RT quits.

Post History Process changed

The Post History process may now be cancelled by pressing a period or the esc key when the post history in progress window is in view. If you interrupt history posting for some reason, be sure to manually post history using the Control menu before quitting.

InterQuote – Dial/Data Download Changes

InterQuote users with Dial/Data accounts may now choose to use either the Dial/Data or the InterQuote server when requesting downloads of daily historical data.

Macintosh Print Function Enhanced

The Macintosh version now prints individual topics in the on-line Help.

Toolbar Button – HELP improved

The toolbar "button help" delay may now be controlled by the user by adjusting the "Show toolbar button help" seconds number in Setup:Preferences:General. The mouse pointer must remain on top of a button for the user-specified number of seconds before the popup help window appears showing the button's description. Specify zero if you want the help box to appear instantly when you point at a button. Specify 1, 2, or 3, for a short delay. Most users will find a short delay desirable. If you do not want to be bothered by the popup boxes, just specify a large number, like 999.

DTN Setup:Preferences updated

DTN users may check a box in Setup:Preferences:DTN Setup to "Request Quotes at Startup". This option instructs Investor/RT to request the current quotations for each tracked instrument when starting the data feed. This option may be useful if you start Investor/RT after the market is closed and want all issues to be updated immediately instead of waiting for a trade or recap quote to arrive.

Adding & Removing Instruments IntraDay

Adding and removing instruments from the "Intraday" quote page now has the added effect of marking or unmarking the instrument for intra-day data collection. For example, if you want to mark several instruments for intraday data collection, open the ".Intraday" quote page and press the "Add instruments to quote page" button on the quote page toolbar. When the instrument selector appears, double click as many as you want. As each instrument is added to

the quote page, it is automatically marked for intraday data collection. Similarly, removing instruments from this quote page (using the green trash icon), stops intraday data collection for the instrument.

If you add an instrument to an intra-day chart and the instrument is not yet marked for intra-day data collection, you will be asked if you wish to start intra-day data collection for the instrument. If you reply yes, the instrument is so marked. If you reply no, the instrument is still added to the chart window and intra-day charting of the instrument will begin, however, all of the tick data collected for the instrument will be discarded when the chart window is closed. This list of instruments currently marked for intra-day data collection may be reviewed at any time by opening the ".Intraday" quote page.

Zoom In Tool Improved

The zoom in (cropping) tool on the chart toolbar has been improved. After zooming in on some period in the chart, the data before and after the zoom-in period may be seen by operating the horizontal scroll bar. The most important improvement is that all technical indicators are now correctly calculated on the overall charting period, not just on the data point in the zoom-in period. After zooming in you may zoom back out using Edit:Undo. (command or alt-Z).

Cross Platform bug fixes

The 2.3 Version incorporates a substantial number of bug fixes in the cross platform software development system used to build Investor/RT, thereby improving Investor/RT reliability and stability in several areas.

The Setup:Equity and Index Options window has been improved.

An "Add months" checkbox has been added which allows the user to check mark just those contract months desired. When the "Add months" checkbox is checked, the "cycle" (Jan., Feb., Mar.) selection is ignored and option instruments are built only for the months whose boxes are check marked. If the "Add months" checkbox is left unchecked, the cycle selection is used to build option instruments for all months in the selected trading cycle. An "All months" checkbox was added. When you click to check the "All months" checkbox, all of the individual month checkboxes are check marked for you. Similarly, all of the individual month checkboxes are unmarked when you uncheck the "All Months" checkbox.

If the "Add to Quote Page" checkbox is marked when you Add the options (i.e. when you press the Add button), then each generated options will be added to the front quote page window. If no quote page is open, then one will be created with the name "XXX Options" where XXX is the ticker symbol of the underlying instrument.

Tick charts in "Bar" Format

Tick charts may now be viewed in a special "bar" format where the trading bars represent the bid/ask spread at the time of the tick and the trade price is indicated by a mark through the bar. To obtain this format when opening or updating the properties of a tick chart, select "bar" instead of "line" or "connected line". All bars are drawn in the "up color". This new tick chart format makes it easy to see the relationship of the bid/ask and the trading price for users of real-time data feeds.

InterQuote users tracking Futures - Improvements

InterQuote users tracking the treasury futures (e.g. USU7) will now see the quotes expressed properly in 32nds. The InterQuote data feed sends US futures quotes as compound whole numbers. For example 11423 is sent to represent 114 and 23 thirty-seconds. Investor/RT now converts these compound numbers into the proper values. This improvement corrects intraday charting and display of US futures contracts.

Portfolio Sorts Updated

Portfolios may now be sorted by any column by clicking on the column title with a modifier key held down. Macintosh users press the shift key and option key for ascending and descending. Windows/95 users press the shift key and control key. Sort buttons have also been added to the portfolio toolbar. Click on the ascending or descending sort button and a list of data columns will appear. Select the column you wish to sort on and press OK. To perform multi-level sorts, select a column, press Apply, then select the next column and press Apply and so on.

New Data Item "Asset Class" – available in Portfolio Window

A new data item, "Asset Class" is now available in the portfolio window. You may assign a number between 1 and 99 as the asset class of each position. For example, you could use 1 as the asset class for high tech stocks, 2 for gold stocks, 3 for bonds, etc. You can sort the portfolio by asset class to see all related positions in adjacent rows. A new "Asset Allocation" button has been added to the portfolio toolbar. Click this button to see a break down of the portfolio first by security type and then by asset class. The breakdown by security type shows the dollar amount and percentage of the total portfolio allocated to: stock, bonds, mutual funds, other, and cash. The breakdown by asset class is user defined. For each class the total dollar amount and percentage for the class is shown.

In a future version of Investor/RT, a facility for assigning names to asset classes 1 through 99 will be provided. Class 0 (zero) will be reserved to indicate that a position has not yet been assigned to any user defined asset class.

Scan Canceling Updated

Scans may be cancelled by the user by pressing the esc (escape) key or the period key on the keyboard while the scan-in-progress box is visible.

Order Confirmation Process Enhanced

A bug was fixed in the order confirmation process. The commission amount entered when confirming a pending trade is now properly posted to the portfolio.

Automatically run Scans for Intraday traders

A significant new feature of intra-day traders is the capability to run scans automatically, repeating the scan at a fixed time interval during the trading hours of a session. To initiate an "auto scan", click the "Start Auto Scan" button at the bottom on the scan object window. A dialog box will appear in which you may specify a trading session and a time interval in minutes, e.g. "run the scan every 3 minutes during session 0". The minute interval may be expressed as a whole number, a decimal number or in fractional notation (1.5 or 1 1/2). Thus it is possible to automatically run a scan every 10 seconds by specifying an interval of 1/6 of a minute. Press the dialog's OK button to start the auto scan.

If the session specified is open for trading, the scan will run immediately and will run repeatedly at the specified time interval. If the specified session is not yet open, the scan will not begin running automatically until the trading session opens. For example, you can start an auto scan in the evening and Investor/RT will automatically begin scanning when the session opens the next morning, without any further user input. While an "auto scan" is in progress, the "Start Auto Scan" button will read "Stop Auto Scan" instead. Clicking this button or closing the scan object window will stop the auto scan.

While an auto scan is in progress, you may make revisions to the scan request (or even switch to a different scan object) by operating any of the controls in the scan window. Each time the scan is run, the syntax of the scan request is rechecked in case changes were made to it. You may also change the target quote page for the scan run. The next time the scan is initiated, the new target quote page will be used. To change the frequency of an auto scan run you must stop the auto scan first and then press "Start Auto Scan" to specify a new frequency and/or trading session.

Please exercise care when activating auto scans. If the scan you wish to run repeatedly takes only a few seconds or less, then the auto scan interval may be as low as every 5 seconds. However, if the scan run typically takes a minute or two to run, then specify a time interval greater than that.

This enhancement adds considerable power to continuous feed editions of Investor/RT. It is now possible to perform real-time technical monitoring of one or several instrument's market

behavior by auto scanning frequently with a source quote page containing just those instruments. When the trading condition is met, the scan will trigger the creation of a quote page reporting which symbol(s) satisfied the condition. In effect, this feature provides real-time alerts on any combination of technical indicators and user-specified conditions stated in the scan request.

Multiple "auto scans" may be in progress at one time. To accomplish this, open multiple scan setup windows using the main toolbar. Each scan window may be set in "auto scan" mode as described above, with all scans running concurrently, each with its own interval, source quote page and scan criteria.

While an auto scan is in progress it is permissible to update the quote page upon which the scan is operating. You may add or remove instruments from the source quote page. When you save the quote page, the next timed execution of any related auto scans will then use the revised list of instruments.

When initiating an auto scan, checkboxes are also provided to specify how you are to be notified when the scan detects one or more instruments that satisfy the scan request. The default behavior is to simply open a quote page showing the results. Optionally, you may elect to have an audible alarm sounded and/or a user-specified message displayed in an "OK box". The user-specified message text is displayed along with the time of day that the event occurred and the number of instruments detected at that time.

When a scan is run repeatedly and instrument(s) are found satisfying the request, the quote page listing the instruments replaces any previous quote page with the same name.

InterQuote users – instruments increased to 300

For InterQuote users, the number of instruments that may be monitored at any given time has been increased from 200 to 300. Prior to 2.3, when the connection to the InterQuote server was active for 2 hours without any keyboard or mouse activity, the connection would be "idled due to inactivity". The "idle time-out" has been eliminated in version 2.3.

Instrument Deletion Improved

Instruments may now be deleted by calling up the instrument in the Setup Instruments window and pressing the Delete button. Confirmation will be requested. This is sometimes more convenient than opening a quote page and using the red trashcan icon to delete a symbol.

Scan Windows Enhanced

Scan object windows (one or more) may now be included in layouts.

Right-mouse Clicks are now recognized in selected locations

Investor/RT now recognizes right mouse button clicks in selected locations, typically to set properties of objects as is customary in Windows/95. On the Macintosh platform, clicking with the Apple command key held down is equivalent. Here is a summary of currently supported right mouse clicks:

Object Type	Location within Object	Action
Quote Page	on a row's symbol	Setup Instrument
Quote Page	elsewhere on a row	Quick Quote instrument
Quote Page	on column title row	Add a new column
Portfolio	on column title row	Add a new column
Portfolio	on any position's row	Setup Instrument
Chart	right of vertical scale	adjust vertical scale
Chart	in horizontal scale	Chart Period Settings
Chart	in body of chart	Change time frame

On the Macintosh platform, shift-click and option-click are now used for sorting quote pages and portfolios by clicking on a column title. Command-clicking on any column, as noted above, brings up the add new column selection list.

Investor/RT 2.2, Release Date: July 15, 1997

Release 2.2 is a maintenance release with a few new features. Improvements were made to correct a time-of-day problem for Windows/95 users and to provide more stability in low memory conditions for both Windows and Macintosh users. This release also fixes several problems, which would cause InterQuote feed to be dropped at random times.

New Concepts and Facilities Guide Available

This 96 page Adobe Acrobat document (pdf file) provides a conceptual overview of the Investor/RT System followed by a detailed description of each of the key functional areas of the software (charting, quote pages, ticker tapes, portfolios, etc.). Download the document from our web site at www.linnsoft.com. On our home page, click the Documentation link. The Guide requires Adobe Acrobat 3.0 or high. The Adobe software may also be downloaded from our web site. Please send comments and suggestions regarding this document to support@linnsoft.com

Toolbar help has been improved

Once the mouse pointer is positioned inside any toolbar for seconds or more, any mouse movement will show a small help window describing the button on which the mouse pointer is positioned. The button's name is no longer shown in the main toolbar message area.

User response dialogs have been improved.

All "OK" boxes and other dialog boxes that require a user response of some kind now recognize keyboard shortcuts. Pressing enter or return takes the highlighted default action as before. Pressing the alphabetic key for the first letter of any response button has the same effect as pressing that button with the mouse. For example, a dialog box with choices of Cancel, Discard, or Save would accept the letters "c", "d" or "s" respectively. On Windows/95, the user may also "tab" through the choices and press return when the desired choice is highlighted.

Save As Added to File Menu

A "Save As..." command was added to the file menu. At present, this command is used only on quote pages to save an existing quote page under a different name.

View/Editing Data Improved

View/Editing tick data for instruments with large tick data collections now requires considerably less memory. When you view/edit tick data on any instrument with more than 10,000 ticks on file, Investor/RT will inform you in the main toolbar message area of the number of ticks on file and the memory used.

InterQuote Updates

InterQuote users with Dial/Data accounts may now choose between using either Dial/Data or InterQuote servers when downloading daily historical data.

DTN Updates

The quote page column "+-" (the up down indicator) is now supported on the DTN data feed. This column shows the direction of the last change in price, "U" for up and "D" for down. Add this column to your favorite formats in Setup:Preferences:Quote Page Formats or add this column to specific quote page using the "Add New Column" button on the quote page toolbar. This column is also available with the InterQuote feed.

Investor/RT 2.1, Release Date: July 1, 1997

IMPORTANT NOTICE: Users of the Windows/95 editions of Investor/RT located outside the Eastern U.S. time zone may have observed a problem concerning the time-of-day displayed within Investor/RT. The problem has been corrected in Version 2.1. If you have adjusted your clock or your time zone setting in Windows/95 to compensate for this error, you must now use the date/time control panel to reset the time zone to your true time zone and/or set the clock to the true local time. Also make sure that all session start and stop times (Setup:Preferences:Sessions) are specified in local time.

Scan Feature Enhanced

The Scan feature introduced in version 2.0 for daily data scanning now supports scanning of daily, weekly, monthly, tick-by-tick, and intra-day bars.

Downloading of Comprehensive Data now available

Investor/RT now supports downloading of comprehensive fundamental data for stocks from Dial/Data. Seventy (70) new data columns are available for downloading and display in Investor/RT quote pages. A complete list of available fundamental data can be viewed by opening a quote page and clicking on the "Add Column" button on the quote page toolbar.

The Dial/Data Internet download feature has been enhanced to allow downloading of security names and cusip numbers for any quote page of stocks.

Armed with these new features, IRT is a powerful analytical tool capable of sophisticated stock selection based on a wide array of fundamental and technical indicators of stock performance. In a matter of minutes using Dial/Data the Investor/RT user can:

- Download industry group(s) (symbols and quote page defined automatically)
- Download official security name and cusip number for each issue.
- Download 6 months or more of history on each issue.
- Download up to 70 fundamental indicators on each issue.
- Display the industry group quote page(s) in various fundamental formats.
- Sort (rank) the quote page(s) by any fundamental data column.
- Perform scans on the quote page(s) for those issues that exhibit ANY combination of (1) fundamental criteria, (2) price related criteria, and (3) technical indicator related criteria

Dial/Data Downloading

The Dial/Data function in Investor/RT gives the user the capability to download current data, historical data, or news headlines and text for any symbol. To use the Dial/Data

function in Investor/RT, you must have an Internet Service Provider (ISP) and a Dial/Data account. If you do not have a Dial/Data account, you may sign up for a free trial.

To start a download with Dial/Data:

Click the Download button on the main toolbar.

-or-

Click Control>Download Data

-or-

Press {Alt,Apple}+D.

The Download window will appear.

Select the type of download desired, Bulk Download, Current Quotes, Historical Quotes, News Headlines, News Headlines and Stories, or Company Profiles.

Current Quotes

The Current Quotes download will obtain today's data for any defined quote page or for a single symbol.

****NOTE**** Dial/Data charges a per quote fee for current quotes obtained during trading hours, i.e. weekdays between 9 am and 4:30 pm EST. Quotes obtained during this time are 15 minute delayed. Use of this feature outside of market hours does not result in additional fees.

- To activate this feature:
- Select Current Quotes from the Download Type menu.
- Select the quote page for download from the list on the left side of the window.or Click "One Instrument" and select the desired instrument using the Instrument Selector.
- Verify the date; the default is the current day.
- Verify Password.
- Click Connect. Activate your internet connection if you have not already done so.


Historical Quotes

The Historical Quotes download will obtain historical data for any defined quote page or for a single symbol. Regarding the depth of history desired, Dial/Data supports a variety of plans including one that allows downloading quotes dating back indefinitely. Investor/RT can support historical information dating back indefinitely.

This feature offers a choice of Daily, Weekly or Monthly downloads. A Weekly quote consolidates a week's worth of daily quotes into a single quote. A Monthly quote consolidates a month's worth of daily quotes into a single quote. The Weekly or

Monthly selections may be the best choice for reviewing several years worth of history. They download faster, use disk space more efficiently, and allow the user to view wider stretches of chart history at a glance.

To activate this feature:

- Select **Historical Quotes** from the **Download Type** menu.
- Select **Daily**, **Weekly** or **Monthly** from the **Historical Period** menu.
- Specify start date and stop date; the stop date defaults to the current day.
- Select the quote page for download from the list on the left side of the window.
OR
- Click **"One Instrument"**. A **Symbol Selection** box will appear. Double click a selection from the list of symbols, or click the  in the lower right corner to switch to a list of names from which to choose. The chosen symbol will appear in the text box to the right. It is also permitted to type in this text box and manually enter the symbol of your choice.
- **Verify Password.**
- **Click Connect.** Activate your internet connection if you have not already done so.
- **Bulk Download, Stocks**

Bulk Download

The **"Bulk Download, Stocks"** feature provides end-of-day stock quotes for approximately 8000 stocks, sent in a compressed format. This is the most efficient way to update quotes for a large number of stocks.

The current day's trading becomes available as a **Bulk Download** file from **Dial/Data** after 7 pm and can be accessed for up to twenty days. For example, the quotes for **May 10, 1996** would be available for **Bulk Download** after 7 pm EST, **May 10, 1996** and could be downloaded as late as **May 30**. It may be faster for some users to use **Bulk Download** to collect a few days of data than to use the **Historical Quotes** feature.

To activate this feature:

- Select **Bulk Download, Stocks** from the **Download Type** menu.
- Check the date. The default date is the current day which would be the proper choice if downloading between 7 pm EST and 12 midnight on a market day.
- **Verify Password.**
- **Click Connect.** Activate your internet connection if you have not already done so.
- **Bulk Download, Mutual Funds**

"Current News Headlines" and "News Headlines and Stories"

"Current News Headlines" and "News Headlines and Stories" provides a selection of daily news.

To activate:

- Select the **Current News Headlines** or **News Headlines and Stories** from the **Download Type** menu.
- **Verify Password.**
- **Click Connect.** Activate your internet connection if you have not already done so.

"Historical News Headlines"

To activate:

Select the **Historical News Headlines** from the **Download Type** menu.

Specify **Download ending date.**

Verify Password.

Click Connect. Activate your internet connection if you have not already done so.

Company Profiles

Dial/Data provides **Company Profiles** as one of its premium services.

To activate **Company Profiles**:

Select **Company Profiles** from the **Download Type** menu.

To specify the desired company, click **"One Instrument"**. A **Symbol Selection** box will appear. Double click a selection from the list of symbols, or click the **in the lower right corner** to switch to a list of names from which to choose. The chosen symbol will appear in the text box to the right. It is also permitted to type in this text box and manually enter the symbol of your choice.

Downloading Fundamental Data

Investor/RT supports downloading of comprehensive fundamental data for stocks from **Dial/Data**. Seventy (70) data columns are available for downloading and display in **Investor/RT** quote pages. A complete list of available fundamental data can be viewed by opening a quote page and clicking on the **"Add Column"** button on the quote page toolbar.

To download fundamental data, the first step is to define a special format that contains the fundamental data items you wish to download. Up to 30 fundamental data items may be included in the format. The format name must be **"Fundamentals Format"**. The next step is to open the **Download** window by clicking the **Download** icon on the main toolbar. Choose **"Fundamental Data"** as the download type and choose the quote page on the left that contains the symbols for which you want fundamental data (e.g. **".Stocks"**). Do not request fundamental data for instruments of other types. Press

Connect and the fundamental data items will be downloaded. Then open a quote page and place the quote page in "Fundamentals Format" format to view the downloaded data.

Any of the 70 fundamental data items can be used to sort a quote page. This is accomplished by clicking on any fundamental column title while holding down a modifier key on the keyboard. On the Macintosh, hold down the option key to sort the quote page in ascending order and the shift key to sort in descending order. Windows/95 users hold down the control key or the shift key.

All 70 of the fundamental data items are scan elements in the Investor/RT scan definition language. This means that Investor/RT is capable of selecting and displaying lists of stocks which satisfy any user-specified fundamental and technical criteria.

Here is the list of available fundamental items.

Beta	BetaDown
Beta Up	Book Val/Shr
Current Ratio	EPS %Chng Yr ago
EPS %Chng YTD	Free Cash Flow/shr
EPS Growth %	EPS Growth #yrs
Net Income Growth %	Net Income Growth #yrs
%Held by Institutions	Net Profit Margin
EPS excl extraord	Quick Ratio
Return on Equity	Revenue/shr
Total Debt/Assets	Annual Dividend Rate
Unused Data Item	Last Split Factor
Asset Turnover	Total Debt-Equity
Interest Coverage	Inventory Turnover
Receiveable Turnover	Return on Assets
Payout Ratio	Revenue/employee
Tang Book Val/shr	Cash/shr
Debt Service to EPS	Gross Margin
Return on Sales	Cap Spending /shr
Revenue %chng	Return on Investmt
EPS %chng	Shrs Outstanding
Inst Ownership	Float
EPS Growth Rate 3 yr	Book Val Growth Rate 5 yrs
Cap Spend Gro Rate 5 yrs	Cash Flow Gro Rate 5 yrs
Div Growth Rate 5 yrs	EPS Growth Rate 5 yrs
Net Profit Mar Gro Rate 5 yrs	Gross Mar Gro Rate 5 yrs
Revenue Gro Rate 5 yrs	Net Income Gro Rate 5 yrs
Histor Rel PE Ratio	Div yield avg 60 mos

Short Int % of float	Short Int % of outstanding
Short Int Avg Daily Vol	Short Int 1 mo % chng
%Held by Insiders	Price to Cash Flow
P/E Ratio	Price to Sales
Yield	Price to Tangible Book Val
Cash to price	Price to cap spending
Market Cap	EPS Estimate cur FY
EPS Estimate next FY	%EPS growth cur FY
%EPS growth nxt FY	

Downloading Security Name, Cusip Numbers, and Industry Groups

The Dial/Data Internet download feature has been enhanced to allow downloading of security names and cusip numbers for any quote page of stocks and to allow downloading of ticker symbols for industry groups. The download feature automatically creates a quote page for the industry groups requested. Each Dial/Data industry group is represented by a ticker symbol that begins with ##. For example,

##ACROPS	Crops
##ADVERT	Advertising
##AGRLIV	Fish/Livestock
##AIRCOU	Air Courier
##AIRDEF	Aerospace & Defense
##AIRLIN	Airline ##ALARMS, Security Systems & Services
##APLNCE	Appliance & Tool
##APPARL	Apparel/Accessories
##AUDVID	Audio & Video Equipment

To create industry group quote pages you must first define the industry groups you want by creating a quote page of industry group tickers. A complete list of all of the available industry groups and their tickers is available by opening the file "IGROUP.DOC" located in the Symbols folder. The entire list of industry group tickers may be imported using File:Import:Ticker Symbols:Ascii Text File. Once each industry group ticker is defined to Investor/RT, click on the "Download" icon on the main toolbar (or choose Download Data... from the Control menu. When the Download window appears, choose "Industry Groups" as the download type. You may then download a list of industry groups by choosing a quote page name on the left that contains a list of industry group tickers. The list of stock tickers that make up the industry group will then be downloaded and each stock ticker will be setup as an Investor/RT instrument (if it isn't already) and a quote page will be created automatically to house the list of instruments. You can also download individual industry group using the "One Instrument" checkbox in the Download window.

Normally, when you double click on a symbol in a quote page, Investor/RT charts the symbol. However, when you double-click in a quote page on an industry group ticker (a ticker that begins with ##), Investor/RT instead opens the associated industry group quote page containing the actual stock instruments for the group. The name of the industry group quote page to open is obtained from the "security name" of the industry group ticker. If Investor/RT determines that the associated industry group quote page does not yet exist, Investor/RT users with Dial/Data accounts will be asked if you wish to download the group. If you reply OK, Investor/RT will log in to Dial/Data, download the ticker symbols for the industry group and create the industry group quote page for you automatically.

This feature can also be used to "link" quote pages together. For example, suppose you have a quote page named "Focus Stocks" and another quote page named "IBM Stock Options". You could add a group ticker (just make up a ticker symbol) such as "##IBMOPTS" and give it the name "IBM Stock Options", and place the ##IBMOPTS instrument in the "Focus Stocks" quote page, along with IBM and several other stocks. Then, whenever you wish to see the quote page of options for IBM you simply double click the ##IBMOPTS symbol and Investor/RT opens the quote page whose name is "IBM Stock Options". Note that you can change the association between a group ticker and its associated quote page simply by editing the security name for the group ticker in a quote page or in the Setup:Instruments window.

You may then download the official security name for each instrument in the resultant quote page by using the Internet Download window and choosing "Company Names & Cusips" as the download type. Choose the newly created industry group quote page name from the list on the left and press Connect. Once the industry groups have been downloaded, the special industry group tickers (e.g. ##ADVERT) may be deleted using the "red trash can" delete button on the quote page toolbar, or you may retain the instrument and use it as a link to the quote page as described above.

Additional Data Columns Added

Two additional data columns have been added to Investor/RT in addition to the 70 new fundamental data columns. Cusip is the cusip number for stock instruments. This data column is updated when you use the "Company Name and Cusip" download type for Dial/Data. SIC code is available for stock instruments for users of the DTN data feed. This is the numeric industry code for the stock.

Charting Feature Enhanced to eliminate screen flickers

The charting feature of Investor/RT has been enhanced to eliminate screen flicker during active chart updating. User who watch intra-day minute bars or tick charts will notice a significant

improvement. As new bars or ticks are displayed, the charts now shift smoothly to the left as the new bar or tick appears on the right. Note that the Intra day chart will be completely re drawn only when the arrival of a new tick or bar causes the vertical scale to be adjusted. These re draws can be eliminated by specifying a fixed vertical scale range.

Mouse Enhancements with a chart

- When a chart window is open, you can now use the mouse to quickly and easily adjust the vertical scale of any sub window and expand or contract the horizontal spacing of the chart.
- To adjust the vertical scale of any chart sub window, point the mouse to the right of the vertical scale line (where the scale numbers are listed). Click and hold down the mouse. The cursor will change to indicate a vertical scaling re sizing is in progress. Keeping the mouse button down, dragging the mouse pointer upward narrows the vertical scale in small increments. Drag the mouse downward to expand the vertical scale thus flattening out the chart a bit. As you drag the mouse, the new vertical scale range values are shown in the message area of the main toolbar and the chart re dresses using the new range. Release the mouse to end the re-scaling operation. If you make a mistake and wish to return to the automatically computer scale values or adjust the range manually, double click in the vertical scale area.

Horizontal Spacing Updated

The horizontal spacing of Investor/RT charts is controlled by the "pixels per bar" preference setting. The value may be between 1 and 16 pixels. The pixels per bar for the current chart may be adjusted in the period settings preference window or it may be increased or decreased using the up and down arrow keys on the keyboard. In version 2.1, the bar spacing value may now be adjusted by dragging the mouse (with button down) in the horizontal scale area of the chart. Dragging the mouse to the left increases the pixels per bar setting thus it spreads the data out more with the result that fewer bars of data are viewable in the window. Conversely, dragging the mouse to the right decreases the pixels per bar, packing more data into the window. Release the mouse when the desired bar spacing is seen. The horizontal scroll bar may also be used to scroll back to earlier time periods. Double-clicking in the horizontal scale area now brings up the period settings window immediately. This is more convenient than clicking once on the preferences button in charting toolbar and double-clicking again on "Period Settings".

DTN Updates

Users of the DTN data feed now have 4 additional fundamental data items that updated daily as required by the DTN feed. These are: (1) shares outstanding, (2) beta, (3) estimated earnings, and (4) SIC code. Items 1-3 are also available via Dial/Data download.

New Technical Indicators added – Directional Indicator, Money Flow Index, Split Finder, & Data Validation

Four new technical indicators have been added. The Directional Indicator calculates and graphs the +DI and -DI lines and will be of special interest to users of the ADX indicator. The Money Flow Index, is a momentum indicator similar to RSI. Money Flow incorporates trading volume where RSI is based solely on price movement. The Split Finder technical study locates possible stock splits and annotates the chart. The Data Validation study performs checks for valid open, high, low and close and annotates the chart when an invalid bar is detected.

The Split Finder and Data Validation indicators are especially useful when used in a scan request. It is now possible to scan any list of issues to obtain a list of those for which a possible stock split was detected. Similar, the data validation study when used in a scan identifies issues that have one or more invalid bars.

Button added to Charting & Quote Page toolbars – “Ex”

The "Ex" button on the charting and quote page toolbars exports data of any time frame into a spreadsheet format for viewing and editing. This feature, when used with intra-day data is, in effect, a "time and sales" display. In version 2.1, the time and sales spreadsheet displays all ticks as of the time the "Ex" button as pressed. Prior to 2.1, a limited number of ticks that had been captured but had not yet been written to the database, were not displayed. The "View/Edit" feature was also improved to reduce memory requirements when editing large tick data collections.

Quote Page updates

When viewing a quote page, the Insert key is now a shortcut for inserting blank rows into the quote page. If a cell is selected, the blank row is inserted beneath the selected cell, otherwise, the blank row is inserted at the bottom of the quote page. The Insert key is clearly labeled on most PC-compatible keyboards. For Macintosh users with extended keyboards, the Insert key is shift+Help.

When double-clicking in a quote page to obtain a chart, the instrument clicked upon is inserted into the open chart window. If instead, you want a NEW chart window opened then hold down the option key (mac) or the ctrl key (windows) while double-clicking.

InterQuote Updates

Users of the InterQuote edition of Investor/RT may now download historical data for stocks and indices using the Internet Dowload window (Control:Internet...). Daily historical data for the up to 5 years is supported for stocks and indices. Download is supported for individual instruments or for all instruments in a user selected quote page.

Investor/RT 2.0, Release Date: June 3, 1997

Scans are now available

It is with pleasure that we announce the arrival of this major new feature in Investor/RT. The Scan feature provides a market data exploration tool of considerable power and usefulness to users of Investor/RT. We are pleased to bring this new level of functionality to our existing customer base as a no-cost upgrade.

Scan Object

Investor/RT 2.0 introduces the Scan Object. A Scan is a specification for searching all of the instruments in a quote page to identify those that exhibit certain characteristics. User specified scan criteria can include current data values of the instrument, historic values of open, high, low, close, volume, and open interest, and a number of technical indicators including moving averages, RSI, stochastics, and MACD. The result of performing a scan is a quote page that lists the instruments that were selected. The data columns in the resultant quote page show the ticker and instrument name, the scanned data values and the calculated values used in the scan operation.

The Investor/RT Scan Object features a general purpose Scan Definition Language for defining the scan request. The language supports any arithmetic and/or relational expression that can be evaluated as true or false. For example, the expression:

$$CL > 10 \text{ and } CL < 50 \text{ and } (YRHI - CL)/CL < .15$$

is a scan request for instruments whose closing price (CL) is between \$10 and \$50 per share that are within 15% of their 52-week high (YRHI).

The scan definition language supports the logical operations of AND, OR, and NOT, the relational operators less than, less than or equal, equal, not equal, greater than, greater than or equal to, and the arithmetic operators of addition, subtract, multiplication, and division.

Elements in the scan request can be qualified with a number to request the value of the scan element a certain number of days ago. For example, if MA represents the current value of the 50-day moving average and CL represents the current close, you may write CL5 to refer to the closing price 5 days ago, or MA3 to refer to the value of the 50-day moving average 3 days ago. Thus the scan request:

$$CL1 < MA1 \text{ and } CL > MA$$

would identify those instruments for which yesterday's close was below the 50-day moving average and today's close was above the 50-day average.

Scan elements for technical indicator calculations with different preference settings may be easily defined. For example, you may wish to search for moving average crossovers by using the names MA_st to refer to a short term moving average and MA_lt to refer to a long term moving average. Then the expression:

$$\text{MA_st1} < \text{MA_lt1} \text{ and } \text{MA_st} > \text{MA_lt}$$

would identify those instruments where the short term moving average moved from below to above the long term moving average in today's trading.

The first release of this powerful new facility supports scanning using daily historical values and technical indicator calculations on daily historical data. In future updates to be released in the coming months, the scan facility will be enhanced to operate on intra-day, weekly and monthly data. The number of technical indicators supported in this first release is substantial. More indicators will be added in subsequent updates.

About Investor/RT

The "About Investor/RT" command in the Investor/RT Macintosh version, displayed an incorrect window. The About dialog now shows the current Investor/RT version number.

Vertical Scale Update

Drawing the vertical scale for charts when very few data points were available or where the instrument had a narrow trading range would sometimes cause a noticeable delay in updating the screen. This delay has been eliminated in version 2.0.

Quote Page Addition

Two new data columns "Previous Bid" and "Bid Change" may now be viewed in quote pages. These items are designed to show the change in price of an instrument as measured by the difference between the current bid price and the closing bid price of the previous session. These data item are not "transmitted" by the data feed, they are set by Investor/RT for any data feed that transmits bid and ask prices for instruments.

Here is the method Investor/RT uses to set these items. At end-of-session, the current bid price of each instrument is set aside as the "closing bid" (this data item is not view able in quote pages). When you quit Investor/RT all "closing bid" prices are saved on the database into the "Previous Bid" data item. If you do not quit Investor/RT, i.e. you leave Investor/RT active until the session opens again, the set aside "closing bid" is posted into the "Previous Bid" at session-

open time. During the session, the "Bid Change" is updated anytime a bid is received. The Bid Change is the difference between the bid and the Previous Bid.

The change in bid is sometimes a better indicator of the "change" of non-listed stocks than is the change in closing prices session to session. Quote pages may be sorted by the Bid Change field as well.

Please note that Investor/RT will not show a bid change on any instrument until it has monitored the instrument for one session in order to establish the "previous closing bid price". Thus, when you add new instrument, they will not begin showing a bid change value until the next day of trading.

Windows/95 Chart Next, Chart Prior

A bug was corrected in the Windows/95 version having to do with the use of the "chart next" and "chart prior" buttons on the charting toolbar. Use of these buttons to sequence through stored chart objects would cause the chart window to become smaller and smaller each time a button was pressed. An illegal operation failure would result if this was done repeatedly until the chart window was very small. This has been corrected in 2.0.

Instrument Selector Enhanced

The instrument selector used throughout Investor/RT now recognizes when new instruments have been added and incorporates the new instruments into the selection list. Prior to 2.0, it was necessary to close and re-open the window to see the newly added instruments.

Quote Page Object Updated

The Quote Page object now permits direct data entry or editing of open, high, low, last, previous close, volume, open interest, bid and ask. This feature is useful for entering daily information manually for instruments not quoted by the data service or to correct an erroneous data value.

Help System Improved

The built-in Help system is now "context sensitive", that is, when you press the Help toggle button on the main toolbar (or F1 on Win/95, or Help key on Mac), the Help system displays the topic associated with the front window. For the Preferences or Add Technical Indicator windows, the topic will be that associated with the particular preferences area or technical indicator selected in the window. If there is no particular topic for the front window, the "Table of Contents" topic will be displayed.

New Technical Indicators Added

Three new technical indicators have been added in version 2.0. Accumulation Distribution Index. Williams AD Index, and True Strength Index.

Chart Object Improved

The chart object has been improved to enable user-control of the vertical scale range for any chart sub window. By default, newly created charts have "automatic" scaling based on the actual data values visible in the chart window. Investor/RT 2.0 allows the scale range to be set to a user-specified range. Double-click anywhere in the vertical scale area of a chart sub window and a dialog box will appear in which you may specify automatic scaling or set the scale range to any desired values.

Some reasons you may want to use this feature follow:

When viewing intra-day tick charts, setting the vertical scale to a specific range has 2 advantages. The window does not revise the scale while scrolling (smoother scrolling) and the window excludes any data outside of the specified range. If the chart gets a "bad tick", for example, (a rare event thankfully) the erroneous value will not distort the vertical scale as it would if automatic scaling were in effect.

Volume histogram sub windows may also benefit from this enhancement. Sometimes a stock will have an extraordinarily high trading volume that dwarfs the normal trading volume of other days in the histogram. By adjusting the chart range to a lower maximum value, this effect can be eliminated. Each day with volume above the specified maximum will be drawn at maximum height.

DTN Addition

The Setup:Equity and Index Options feature has now been implemented for the DTN data feed. This feature was disabled in the DTN edition prior to version 2.0.

Database Maintenance Utility Repaired

A bug was corrected in the Database Maintenance Utility. The clear record lock phase was not properly reporting the number of records whose lock had to be cleared. The utility has also been improved to provide more periodic feedback of its progress when operating on extremely large databases.

Post History Process

A bug was corrected in the Post History process. Under certain (rare) circumstances, posting a daily bar at end of session would leave a history record "locked" which would prevent further

posting or importing of historical data for the associated symbol. This bug was confined to version 1.7. Running the database maintenance utility will remove any these locks and permit posting again. For this reason, all users who operated under version 1.7 are advised to run the database maintenance utility prior to updating to version 2.0.

DTN & Real Time News Enhancements

DTN Spectrum and Real-Time users now have automatic linkage of news items to associated stock instruments for those news items for which DTN transmits a cross reference to the ticker symbol(s) mentioned in the story.

InterQuote – Setup: Futures

A bug was corrected in the InterQuote edition so that Setup:Futures would generate the proper InterQuote symbols for futures contracts. A similar bug was fixed in the Setup:Equity and Index Options feature for InterQuote users.

InterQuote – Historical Data

A bug was corrected in the InterQuote edition that would occasionally cause a daily historical data access to fail.

Cross Hairs Bug Corrected

Closing a chart window while cross hairs were active could sometimes cause a fatal error. This bug has been corrected.

Feed Status Updated

Opening the Feed Status window repeatedly could sometimes result in "invalid text object" messages and ultimately a fatal error. This has been corrected.

Message Log Enhanced - XVT

All XVT related warning messages are now quietly routed to the Investor/RT Message Log instead of interrupting the user with the message displaying in a dialog box. These obscure (some might say bizarre) warning messages sometimes caused unrelated problems as noted in item 17 above. The result is a big improvement in product stability in version 2.0. Users who happen to notice an XVT related message in the message log are asked to e-mail the message text to support@linnsoft.com to assist us in problem resolution.

Data Columns Added

Two new quote page data columns have been added. They are titled " $(H+L)/2$ " and " $(H+L+C)/3$ ". These data columns show the calculated value of the average of high and low, and the average of high, low, and close.

Quote Page Enhancements

Several Quote Page enhancements were made to facilitate the user of quote pages to display the results of scan operations. When a quote page is used to display the results of a scan, certain "dynamic data columns" will be shown depending on the scan request. Dynamic columns represent arithmetic calculations or technical indicator values calculated during the scan process for each instrument. For example, if you used the expression $YRHI - CL$ (the 52-week high minus the current price), then the resultant quote page will show a column labeled $YRHI-CL$ to show this calculated value for each instrument. All so called dynamic columns may be used to sorting the quote page. Sorting is accomplished by clicking on the column title with a modifier key depressed. Macintosh users hold down the command-key or option-key while clicking; Windows/95 users hold down the Alt. key or the Shift key while clicking to sort either ascending or descending on any dynamic column.

Investor/RT 1.7, Release Date: May 1, 1997

Chart Window Titles

Chart window titles. Prior to 1.7 the window title for chart windows showed the chart object name followed by the time frame (daily, weekly, etc.). Version 1.7 has been revised to show the name of the instrument charted and the time frame, e.g. Apple Computer:Daily. If more than one instrument resides within the chart window, the title will be the list of ticker symbols followed by the time frame, e.g. IBM, MSFT, AAPL: Weekly.

Chart objects are still saved using a user-specified name and recalled using the objects menu or list selector by name, but when the actual chart window is opened it will be titled according to it's contents, rather than its name. This change eliminates any confusion about what is charted in the window, especially when reviewing a chart slide show--as each instrument is charted in the slide show, it's name or ticker will appear in the window title.

If you have a chart window open and wish to inspect the chart object name, click the Preferences icon on the chart toolbar. The chart name appears at the bottom of the charting period preferences window. You may revise the name and use the Save button on the charting toolbar to save the object under a different name.

Historical Data Feature

The import historical data feature now provides better information when the historical data being imported is not in ascending date sequence. You are also given the option of skipping the out-of-sequence data and continuing with the import.

Change Ticker Symbol

It is now possible to change the ticker symbol, the requested exchange, or the session for an Investor/RT instrument by simply editing the Symbol, rExch, or Session data within a quote page. All of the historical data, news, and other data relationships for the instrument remain intact. This feature enables you to easily make corrections to instruments entered incorrectly, or to change the ticker when a stock moves to a different exchange and is assigned a new trading symbol.

To change a ticker, open a quote page containing the instrument you wish to revise. Click the mouse in the symbol field, revise the symbol, and press return, enter, or tab, or click elsewhere in the quote page. If the new symbol typed is already defined as an instrument to Investor/RT, the software assume you are simply changing the row of the quote page to the new instrument--no revision is performed. If the newly typed symbol is unknown to Investor/RT, a dialog box will appear asking if you wish to add new a new instrument or change the ticker of the former instrument. If you press the "Change" button, the instrument originally listed in the row is given the new symbol. Similarly, when you change the session or requested exchange of an existing instrument in a quote page, you will be asked if you want a new instrument to be created or if the existing instrument's requested exchange or session should be changed. The feature makes it possible to reassign an instrument to a different trading sessions and/or exchanges while retaining its historical data.

Slide Show Improved

The slide show feature was improved in various ways. Requesting a slide show when there is no chart window open or no quote page open now correctly prompts for the chart object or quote page you want and opens it so the slide show may begin. While a slide show is in progress you may close either the chart or the quote page and the slide show will stop and ask for a new chart or quote page as appropriate. Slide shows are now more intuitive since the chart window title is revised as each new instrument from the quote page is charted. The slide show control now has a close box and the close toggle button has been eliminated. The start slide show button is now more easily distinguished from the manual advance button.

Quick Quotes

Investor/RT now deletes quick quotes at startup for instruments that are no longer being tracked. Prior to version 1.7, quick quotes remained in the quick quotes menu even though the associated instrument had been deleted.

Bug Fixes

A bug was fixed in the charting area that could cause a fatal error in the function "xvt_sbar_set_pos".

A bug was fixed in the portfolio manager to correctly value positions in bonds. The 1.6 version over stated the value by a factor of 100.

When opening new chart windows, the scroll bar is now drawn properly. Prior to 1.7 the scroll bar was not drawn until you clicked on it.

The View/Edit historical data spreadsheet invoked from a quote page or a chart now opens with the sheet scrolled to the very last posted date. Prior to 1.7 the last posted bar was sometimes hidden.

Inserting a replacement instrument into an intra-day minute chart now works correctly. Prior to 1.7, the new instrument's intra-day data was erroneously loaded in tick-by-tick format instead of the specified minute bar format thus producing an invalid chart.

Invalid rectangle warning messages when charting have been eliminated.

Tick count is now reset to zero for each instrument when the instrument's session opens.

Mouse Fix

When moving the mouse in a chart window with the mouse button down, the data for the mouse position appears in the sub window title bars. When you move the mouse past the last visible bar, the title bars now revert automatically to the standard sub window titles showing the names of the instruments and technical indicators. Version 1.6 sometimes left the title bars blank or displayed a few arbitrary characters as the title if you moved the mouse past the last bar.

Setup: Custom Instrument

The Setup: Custom Instrument feature was revised to permit multipliers of zero. This makes it possible to easily define a custom instrument as some instrument times a scaling factor. Use the Sum definition option and set the multiplier of one of the two instruments to zero. For example, to create a custom instrument that represents the Dow Industrials times a scaling factor of say .115, create a sum composed of $INDU * 0$ plus $INDU * .115$. This yields a custom instrument that trades tick by tick with INDU but has a value in the 750 range. This makes it possible to chart the S&P500 index and the scaled Dow Jones Average in the same chart sub window intra-day. You may, of course, chart the S&P and INDU in separate sub windows each

with its own vertical scale, but some users have requested the capability of charting two or more instruments with much different price scales in the same chart sub window. This scaling method provides a means of watch intra-day price movement of a variety of indexes or futures in the same sub window.

News Browser Improved

The news browser has been improved to allow the user to easily link a news item to one or more instruments for future reference. Some news items from Signal and BMI are automatically linked to the instruments to which they pertain. DTN news items are not automatically linked. The news browser toolbar now has a "Link" button. First select a news item in the list and press the Link button. An instrument selector box will appear. Double-click or select and enter to associate the selected news items with one or more instruments. News items that are linked to instruments typically have a longer retention period than those that are not linked. Use Setup:Preference:General Preferences to specify retention periods for news items.

News Alarms Up To Date

News alarm indications for all instruments are now kept up-to-date automatically as news items are purged hourly. The ".Alarms-News" quote page now accurately lists all instruments for which there are one or more news items on file.

Preference Icon Improved

The "Preferences" icon on the chart toolbar, formerly used for adjusting the "Period Settings" for a chart, may now be used to adjust either the Period Settings or the Color Settings for the chart window. The Color Settings include background color, scale color, title background and title text colors. News charts are created using the default color settings in Setup:Preferences:Charting, General. Existing chart windows may then have their colors adjusted individually using the chart toolbar. When a chart object is saved, its color settings are saved with it. Thus different chart objects may now be "color coded" individually if you like.

Title Background

Please note that the title background and title text colors control the color scheme of the thin sub window title bars at the top of each sub window. If both of these settings are set to the same color, the sub window title bars will display as a solid bar of color--the text of the sub window title will not display. The sub window title bars convey useful information. They indicate the content of the sub window and/or the actual data values when you point the mouse at a bar with mouse button down.

BMI Update

BMI users are now able to properly track equity and index option contracts. A bug in the version 1.6 data feed software for BMI caused incoming option contracts to have their month code and strike price code reversed. Thus, the ticker symbols for these instruments would seldom match or in some case would match an instrument with a different month and strike price. The corrected feed library software (IRT_PPC_FEEDLIB for Macintosh and IRTCOMM.DLL for Windows/95) has been available as an interim 1.6.2 update and is now incorporated into version 1.7.

Technical Indicator Additions

Williams Accumulation Distribution indicator, Trend lines may now be drawn with parallel lines above and below the trendline. The parallel lines may be offset at a user specified percentage.

Daily Chart Update

When a daily chart is opened for an instrument whose session is open and a quote has been received for the instrument, the intra-day (unposted) daily bar now appears immediately. In version 1.6, the intra-day bar was not displayed until the next trade. This makes daily chart slide shows much more useful during an open session. Please note that if the instrument has not yet been quoted in the current session, the daily chart will appear with only the posted (previous day's) historical data. Then the next trade that occurs will trigger the addition of an intra-day bar for the current day.

Dynamic Data Exchange

Support for Dynamic Data Exchange has been added for Windows/95 users. Any Windows application supporting DDE, such as Microsoft Excel, can request market data for any Investor/RT instrument. For example the following formula could be placed into an Excel spreadsheet cell: =RT|IBM!last. The last price of IBM will be posted to the cell automatically each time the last price changes within Investor/RT. In general, the DDE formula is RT|instrument!item, where instrument identifies the Investor/RT instrument and item specifies the desired data item. All Investor/RT quote page data items are supported (open, high, low, last, etc.) The item name is the same as the column title when the item appears in a quote page. The instrument may be a ticker or a ticker qualified by exchange and session if necessary (e.g. IBM:NYSE, or AAPL:COMP:1). Note the special separator characters: a vertical bar follows RT and an exclamation point separates the instrument identifier from the data item identifier.

Dial/Data Updates

The Dial/Data Internet Connection window has been renamed "Internet Download"

The Dial/Data command in the Control menu has been renamed "Internet...".

Investor/RT 1.6, Release Date: March 14, 1997

On-line Help Feature

The On-line Help feature of Investor/RT has been improved. Help may be requested in four ways:

- Press the "Help" button on the keyboard.

- Click the "Help" icon in the Investor/RT main toolbar

- Choose "Help" from the Investor/RT Window menu.

- Mac users choose an Investor/RT help topic from the Apple Help menu located at the far right of the menu bar.

When the On-line Help window appears, the Investor/RT menu bar now changes to File-Edit-Navigate-Help. These menus permit the user to operate the On-line Help system. The File menu's Print command, for example, prints the current help page.

The Help window is now modal, that is, you may not operate on or activate other windows of Investor/RT until you close the Help window. If you attempt to do so, the message "Please close the Help window first" will appear in the main toolbar (if it is visible).

Charting Object

Several improvements have been made to the charting object of Investor/RT.

Setup:Preferences:General now provides a user setting for the foreground and background colors to be used in chart sub window titles. The colors chosen should complement the charting scale color and background. Prior to 1.6, the chart sub window titles were fixed at a gray color that sometimes did not mix well with the user choice of background color.

Chart Enhancements

Chart sub window titles are now shown in the title foreground color chosen in preferences.

Prior to 1.6 the titles were color coded and often difficult to read. The names of each instrument or technical indicator included in the sub window are shown, prefixed with a smaller colored rectangle, like a legend.

Suggested defaults for chart colors: background color light beige or white, scale color blue, title background light gray, title text color black. The light beige color is the brightest color located on the bottom row of the color picker. For those that prefer a dark background chart use black or near black as background, light blue or light green for the scale color, gray title background with blue title text.

Moving the mouse within the chart window with the mouse button down causes the data in each sub window to be displayed in the sub window title bar. The data displayed in the title bar includes the data for ALL instruments and ALL technical indicators in the sub window, a big improvement over version 1.5 which showed only the first instrument or indicator's value. Each value is labeled with a colored rectangle which relates to a color preference for the instrument or indicator. Data is displayed ONLY when the mouse button is depressed. When the mouse button is released the data display is left at the last data point displayed. Thus you can mouse down, point to a bar or candle in the chart and release the mouse to freeze the data display at that bar. To restore the original titles, click on the border between any two sub windows or re size any sub window.

Some users will prefer to wave the mouse around the chart window and see the data change without having to hold the mouse button down as the software worked prior to 1.6. Activating the cross hairs feature on the chart toolbar has this effect.

The chart toolbar now has 6 tools which determine the drawing behavior of the mouse when you mouse down and drag. Tools are provided for cropping, trend line drawing, Fibonacci projections, Retracements, and arcs, and regression lines (a new 1.6 feature). The chart toolbar has been improved to show visually which of the drawing modes, if any, is currently selected. The selected drawing tool appears to be pressed down. When a different drawing tool is chosen, the former tool's button is re drawn in the up position so that at most only one drawing tool button appears to be pressed down. To turn off the currently selected (down) tool, click on it. The cross hairs on/off state is similar but independent of the drawing tools. Thus you may have cross hairs on while drawing a trend line or a regression line, for example.

Horizontal View Period

Improvements were made to the labeling of the horizontal view period at the bottom of the chart window. Vertical lines are now displayed for each major interval. In daily and weekly charts, for example, the beginning of each month is marked by a vertical line in each sub window. On monthly charts, each year in a major interval. For intra-day charts, an interval is chosen appropriate to the period of the intra-day chart.

Preferences of Instruments & Technical Indicators

Changing preferences of instruments and technical indicators within a chart window can now be accomplished by double-clicking on the graphic itself. Place the tip of the mouse pointer exactly on the line drawn by a technical indicator and double-click to get a dialog box for adjusting its preferences. It is not necessary to aim the mouse pointer precisely if there is only a single indicator within the sub window. If you double-click with the mouse pointer pointing to no particular instrument or technical indicator, the preferences for the first instrument in the chart sub window will appear. Pressing the "Edit Chart Element" on the charting toolbar presents a list of all instruments and indicator in the chart window. Pick the one you wish to edit and press OK.

Technical Indicators

Six new technical indicators have been added to Investor/RT in version 1.6. These include the Arms Ease of Movement Index, Pivot Point (support/resistance) Calculations, Moving Average Channels, Linear Regression Lines (with channels), the Rate of Change indicator, and Candlestick Pattern Recognition. The pattern recognition indicator supports more than 40 common patterns of interest to candle chartists. The linear regression indicator has its own drawing tool on the chart toolbar. The icon is a line with the letter R on it.

IMPORTANT: Before using any of the new technical indicators, it is important that you set the default preferences for the indicators using Setup:Preferences:Charting Studies. Select each indicator in turn and set the preferences for each study.

Quote Sifter

The quote sifter has been improved to provide a "window" into the raw data feed for continuous feed users. While the quote sifter is sifting the raw data feed, the symbols that match the user-specified criteria are listed in a window that appears automatically. The window may be closed, re sized or repositioned as desired. Clicking in the window "freezes" the window so you can more easily read the data displayed. Click again to resume the updating. The window closes automatically when the sifter has completed the maximum symbols requested.

Signal Users – Quotes at Startup

For Signal Users, the "Request Quotes at Startup" option in Data Feed Preferences now works properly and quickly to obtain a fresh quote on each symbol when starting the Signal data feed. This option is not recommended if you are tracking more than 1000 or so symbols. The "Data Base Mode" now works properly as well. Database mode may be of interest to Investor/RT Signal users who are tracking fewer than 500 symbols. At feed start, Investor/RT loads the list of symbols being tracked into the Signal receiver. The Signal receiver then broadcasts quotes only for the symbols being tracked, thereby eliminating much of the processing overhead that otherwise would be required to filter out symbols of no interest to the user. Users tracking relatively small lists of symbols (under 500) may wish to experiment with this feature to determine if it improves the performance of the software. Database mode is not recommended for those tracking large numbers of symbols or those who are making frequent changes to the mix of symbols tracked by Investor/RT.

Post History Improvements

The Post History process was improved for the benefit of users of the Dial/Data Edition of Investor/RT to enable manual Post History after downloading current closing quotes for a prior day. The date of the downloaded quote, if earlier than the current date, is now used to post

the data to the database. Prior to 1.6 the current date was always used without regard to the date of the quotation. For example, on Tuesday a Dial/Data user may download Monday's quotes for all symbols and Post History. The quotes will be recorded under Monday's date, the date of the quotes, not Tuesday.

Daily Charts for Continuous Feed Users

For continuous feed users, when calling for a daily chart of an instrument, the chart will initially contain only the daily bars posted on the data base as of the most recent close-of-session. If the instrument's session is open for trading, the next trade that occurs for the instrument will trigger the creation of an additional daily bar to reflect the trading for the session-in-progress. The daily chart will continue to update the session-in-progress bar as further trades occur. After the instrument's session is closed, no further updates will occur.

Portfolio Manager Improved

The portfolio manager has been improved to calculate the gain/loss and portfolio value of bonds and equity and index option positions. The portfolio manager now supports: stocks, bonds, mutual funds, equity and index options, and futures contracts. Support for futures options positions will be added in a later release.

Custom Instruments – Spreads & Straddles

Spreads ,straddles, custom indexes may now be easily defined using the new Custom Instruments feature. Use Setup:Custom Instruments... to define your own instruments as sums, differences, or ratios of other instruments. Custom instruments may be tracked and charted in any timeframe since they are recalculated each time there is a price change on any component of the custom instrument.

Deleting Portfolios

Portfolios may now be deleted. Choose Delete from the Objects menu. Pick "Portfolios" from the list of objects. Highlight the portfolio name you wish to delete and press "Delete". Confirmation will be requested.

Printing Feature

The View/Edit Historical Data window may now be printed.

News Browser

The News Browser was improved to show the instruments associated with each news item. The instruments to which the news item is related are listed showing ticker, security name, change and current price.

Mac Improvements

Macintosh versions were revised to utilize Open Transport for Internet access to Dial/Data. To utilize Investor/RT 1.6 with Dial/Data, Open Transport must be installed. Some benefits are improved reliability in establishing Internet connection via PPP. It is no longer necessary to have your Internet connection active when connecting to Dial/Data. Investor/RT, using Open Transport, will open the Internet connection for you if necessary. Your PPP preferences must be set to allow this. For best results with the Internet it is recommended that you run Mac OS 7.6 with Open Transport 1.1.1.

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Printing Improvements

Printing of charts, portfolios, quote pages, news items, trader notes, and text windows are now supported. Use the print command in the File menu or click the Print icon on the main tool bar to print the front window.

Dial/Data Downloading

Improvements were made to enable Dial/Data downloading of futures quotes for single character futures symbols such as soybeans (S) and (C) corn. The Dial/Data aliases for these symbols are now generated properly, e.g. S^1297 where ^ represents a single space.

Charting: General, Draw Solid Up Candles

A new preference setting has been added to "Charting, General". Check the check box "Draw solid up candles", if you prefer up candles to be drawn solid in the "up color". If unchecked, up candles are drawn hollow with the frame of the candle body drawn in the "up color". This is a global preference that governs candle drawing in all chart windows. When printing candle charts in black and white or gray scale, uncheck this box so that up and down candles are more easily distinguished.

Dial Data Connection Window

Dial/Data Connection window now has a checkbox titled "Monitor Window". When connecting to Dial/Data with this box checked, Investor/RT will display the progress of the connection in

this window. This feature is useful for diagnostic purposes. It is recommended that you leave this box unchecked unless you are experiencing difficulty connecting to Dial/Data.

Chart Annotation Preferences

The Chart Annotation preferences (Chart Study Preferences) now sets the default date/time of the chart annotation to the present date/time. The annotation is now drawn centered above the date/time specified. If the "Draw Arrow" checkbox is checked, a vertical marker is drawn beneath the annotation. When viewing a chart with annotation(s), you may quickly determine the date/time of the annotation by pointing the mouse at the annotation marker (arrow).

Continuous Feed Users – Ticker Symbol for Dial/Data

For continuous feed users (Signal, BMI, DTN), each instrument has a dial data alias symbol that can be used to specify the Dial/Data ticker in cases where it is different than the ticker symbol used with your continuous feed service. The alias is a selectable data column for quote pages. When present in a quote page, you may edit the alias directly within the quote page (this did not work properly in 1.4). Also, if you specify an alias that begins with a hyphen (a lone hyphen will do), this is interpreted to mean that the associated instrument does not have a dial/data ticker. When downloading current quotes or historical data for a quote page of instruments, Investor/RT will ignore instruments that have a alias beginning with the hyphen character. In particular, users with Dial/Data accounts should set the alias' of all "portfolio" symbols to hyphen so that Investor/RT will not request data for these special symbols when downloading.

Color Coding – Bar Charts

The color coding scheme for bar charts has been revised as follows: The color of daily, weekly, and monthly bars is always based on the close of the prior bar. This is consistent with the color coding of volume. For intra-day bars, the color coding is now based on your preference of either prior bar close, or open price of the bar. The preference setting may be found in Setup:Preferences:Quote Page General, the same preference setting used to determine the color coding of text in quote pages.

Dial/Data Communication Error

If a communication error disrupts a Dial/Data download, you now have the option to cancel or retry the download. If your Internet connection is still active, press Retry and Investor/RT will attempt to reconnect with Dial/Data and perform the requested download.

Dial/Data Trial Feature (does not exist anymore, 12/30/02)

A problem associated with the Dial/Data Free Trial feature (Setup:Preferences:Registration) was corrected. If you do not yet have a dial/data account and want to experiment with this

capability of Investor/RT at little or no cost for 30 days, press "Free Trial" in the Registration preferences and follow the instructions on screen. You must be registered with a Dial/Data user id of "NA" to obtain a 30 day Dial/Data trial account.

Trading Notes

Trading Notes windows may now be included in layouts.

The "Up/Down Volume Ratio" technical indicator was revised and now graphs properly.

Dialog Boxes

Many windows and dialog boxes in Investor/RT have a default button outlined with a bold border (on Macintosh). The default button is pressed when the "return" key or the "enter" key is pressed.

New Ticker Tape Default

The "recap" options for new ticker tape windows now defaults to "off" for continuous feed users (BMI, DTN, Signal), and "on" for Dial/Data edition users.

Last Session Layout

When Investor/RT quits, a layout called "Last Session Layout" is saved to preserve the layout of windows that were open at the time. When Investor/RT starts up again, it restores "Last Session Layout" automatically. If you quit Investor/RT with no windows open, I/RT now deletes "Last Session Layout" so that upon subsequent restart no windows will open automatically. The "Tip of the Day" window will always open at startup unless you have explicitly turned off the "Show Tips at Startup" option.

Chart Window Modified

When closing a chart window, if the chart has been modified in some way, you will be prompted with a message to that effect and having three possible responses: Save, Discard, or Cancel. Press "Discard" to close the window without saving the changes. Press "Cancel" (or hit the escape key) to leave the window open without saving the changes. Press "Save" (or hit the return or enter key) to save the changes.

If you press "Save" and the window is still untitled, a dialog box will appear in which you may give the chart a name. If you cancel this second dialog box, the chart window will remain open and untitled, and will not be saved.

The same chart naming dialog box may appear when you press the "Save" icon on the chart toolbar. That is, if the chart has a name, the chart will be saved under that name; if the chart is untitled you will be asked to name it. Note that you may name a chart object "Untitled" if you like, however, this is not recommended since you will be asked to supply name for the chart each time you save it.

To save an existing chart under a different name, press the Preferences icon in the chart toolbar, enter the new name for the chart and press "OK". When you save and/or close the chart window, it will be saved under the revised name.

To delete chart objects that are no longer needed, choose "Delete" from the objects menu, select "Charts" from the object type list, then select and press "Delete" for any charts you wish to eliminate.

Signal Feed Preferences – Passwords are New

Signal feed preferences window now has a new check box titled "Passwords are New". Checking this box causes Investor/RT to insert the new Signal passwords into the Signal Receiver when you start the feed, even if the Signal Receiver is already authorized by some other set of passwords. This feature is useful when adding new Signal services to your subscription.