

Tradecision

Version 1.7

NEO DIGITAL, INC.

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Product: Market analysis package with neural network capability and end-of-day data.

Requirements (minimum): Processor-800 MHz Pentium III or compatible, 256 MB RAM, hard drive: 40 MB free space, monitor: resolution 800x600 or higher, operating system: Windows 2000/XP, Internet Explorer 5.0

Price: Standard (\$698), Professional (\$1,198), Professional Real-Time (\$1,598)

by Dennis D. Peterson

It is easy to explore all the things you can do with Tradecision. It's a complete analysis package with a number of interesting features and a user interface that is extremely easy to use. It is a package that's offered at a highly competitive price with two key features: neural network capability and free end-of-day (EOD) data. It's definitely an interesting product, though it still has a few bugs.

There are three different packages available. For this review, I used the version with the most bells and whistles: Professional Real-Time. I tested Tradecision on two different machines, both using eSignal as the real-time feed. I focused on the features not usually seen in other packages to check out how they performed.

The three users I contacted each said he was happy with the product. They all liked getting a neural network capability at a reasonable price. They all chose the Professional version to get the neu-

ral network capability (this version comes with genetic algorithms, which helps enormously if you are trying to optimize parameters in conjunction with finding a neural network solution). They too had experienced a few bugs, but given that this product is so powerful, it makes you want to be patient and work through the glitches. Between phone calls and email, the issues I had were resolved (but I recommend email; my questions were answered in both a timely and a most thorough way, some of the best I have seen).

OVERVIEW

Three pieces make up each of the software packages: Tradecision, which does all of the analytical work; Data Manager, which deals with symbol lists and data sources; and NeatScan, which allows you to screen symbol lists looking for stocks that pass user-defined criteria. Normally \$99, NeatScan is free during some promotional periods. With few exceptions, all of the software is fast, although there were some delays. Overall, however, it was highly acceptable.

The interfaces were very easy to use. The Tradecision developers know some-

thing about designing user interfaces, because whereas you typically have to go through some additional steps and menu options with other software, you don't have to here. For example, you don't have to allocate a separate subchart for charting an indicator; you choose the indicator you want, click on "Insert," and if the indicator needs a separate subchart, it is automatically created. If not, the indicator is placed on the main chart (Figure 1).

DATA SOURCES

One big plus is that Tradecision provides the capability of getting free end-of-day (EOD) data from — as you might have guessed — Yahoo! Finance EOD. The historical data source is CSI, which is a highly reliable source of EOD price data. Therefore, I would say that data from Yahoo! Finance is an excellent choice.

The Tradecision Data Manager supports eight feeds: CSI, IQFeed, text file (CSV), Yahoo! Finance, MetaStock, Interactive Brokers, Worden Brothers, and eSignal. For this review, I used MetaStock and Yahoo! Finance EOD.

Like the design of other analysis packages, this software employs a Data Manager. The Data Manager manages a symbol list and identifies the data source for each symbol in your list. You either type in each symbol or use a few prebuilt symbol lists. You are restricted to one symbol list, and the prebuilt lists. If you are looking to import a text file with a

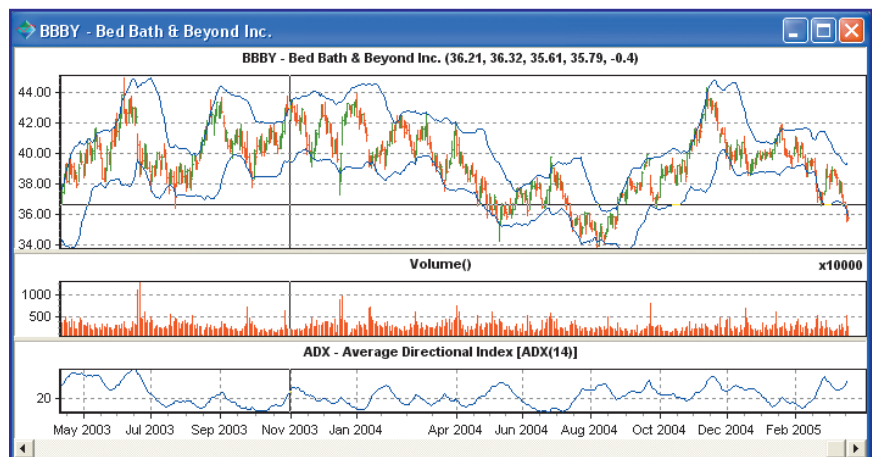
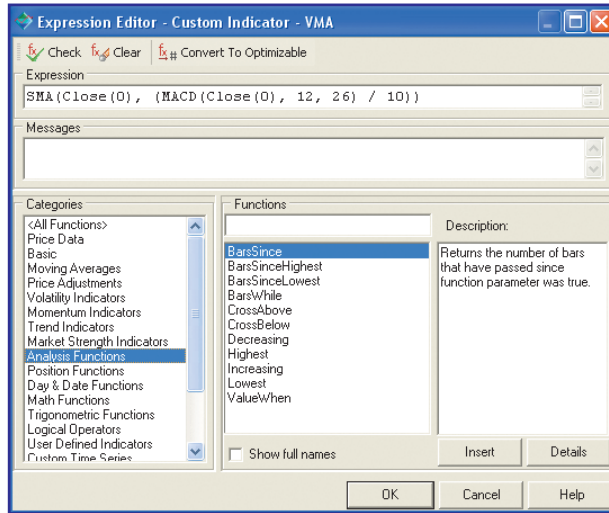


FIGURE 1: TRADECISION CHARTING FEATURES. Bollinger Bands envelop the daily price data using Yahoo! Finance as a free EOD datafeed. Adding indicators is easy and straightforward, and if an indicator needs its own subchart, such as ADX shown here as the bottom chart, it is created automatically. A single crosshair is used to provide vertical alignment. Price-bar spacing as well as height provides control over the price picture seen.

FIGURE 2: EXPRESSION EDITOR. Common to all Tradecision inputs requiring an expression is the use of the Expression Editor. As the categories on the left imply, the list is long and with more than 140 functions available. A click on the insert button transfers the expression to the expression field at the top (narrowed for this screen capture), where you can manually edit it.



sector or subsector symbol list, you'll have to wait for an upcoming release. On the plus side, one of the prebuilt lists is for the Standard & Poor's 500, which, as Martha Stewart is prone to say, is "a good thing" — and by the way, I am still a fan of Martha.

The other thing I ran into is that I had to create four custom time series. For my neural network, I wanted to predict the Nasdaq Composite based on Nasdaq advancers, decliners, new highs, and new lows. To do so, I imported my Reuters daily history and exported the data in CSV format to a folder. Then I accessed the data with the "Custom Time Series" option under the "Tools" menu, creating a new file for advancers, decliners, new highs, and new lows. Until I did that, the neural net kept telling me I had the error of no data.

The data source capability is robust. If you choose to import text, just about every imaginable combination of data delimiters and date formats is available. This could be handy if you want to convert some CBOE put/call ratio data from their spreadsheet format. I give Tradecision's Data Manager high marks for this.

CHARTING

The first thing you notice about the charting is the clean, crisp picture. Another feature that is a pleasant surprise is that you can control the height of your price bars. MetaStock is the only pack-

age I know of that automatically adjusts both the height and spacing of the price bars as you zoom in and out; Tradecision, in contrast, allows you to adjust the height as well as the spacing between the bars, so you can get the same quality picture, albeit manually. Indicators that require a separate subchart are charted with automatic creation of the subchart if needed. One of the things I use are vertical lines at points of interest that span both the main price chart and my subcharts. A later version may incorporate the vertical line that spans both price and subcharts, but for the time being, a single crosshair (see Figure 1) will have to do.

Four price bar choices are offered: candlestick, OHLC, HLC, and line on close. I was disappointed to find out that semilog charting is not offered. A handy set of drawing tools is available, such as Fibonacci retracements, time lines, and circles (and more). Fibonacci circles appear to be a unique offering by Tradecision.

Also available are Gann fans and grids. The input to the Gann fans allows you to adjust the ratio between the time and price. This lets you get the 1x1 to 45 degrees if you are so inclined. One feature not available is the ability to have two y-axes with different scales on the same chart. Having two y-axes on the same chart enables you to compare two price histories — a good thing if you are into pairs trading.

STUDIES & INDICATORS

Determining the difference between a study and an indicator took some examination. Both use expressions; a study puts markers on price bars based on an expression being true or false, while an indicator plots an expression. User tip: if you want to have several studies on a chart, don't forget to uncheck the "Remove previous study for chart" box and paint your studies with different colors for better visualization. Pivot calculations are prebuilt in two ways, as proprietary analytical study and easily editable expressions in the study builder. Unfortunately, you cannot see two different indicators on the same subchart. You can't, for example, have positive volume index (PVI) on a subchart and compare it to the 120-day moving average of PVI and see the two curves.

You can write expressions using math notation of the Tradecision formula language. The expression below is for the stochastic relative strength index (RSI) and is obviously an indicator.

$$\frac{(RSI(Close(0), 14) - \text{Lowest}(RSI(Close(0), 14), 14))}{(\text{Highest}(RSI(Close(0), 14), 14) - \text{Lowest}(RSI(Close(0), 14), 14))}$$

While there are roughly 60 prebuilt indicators, there are 140 functions, including some items you don't see frequently, such as maximum adverse excursion (MAE) and maximum favorable excursion (MFE), both of which are useful to see what type of stop would give your system more profit. Functions are used in expressions, and expressions are created using the expression editor. Expressions are used in studies, simulations, neural network modeling, and so on. The same interface is used everywhere, which is very helpful in utilizing this product.

Like so many interfaces for this product, it is simple and easy to use. Currently, you are limited to one line of code, but development is in progress to give a full formula language. However, there are many who are uncomfortable with programming, and therefore, this might just be the right thing. At any rate, it works easily and you can check your



FIGURE 3: PATTERN FINDING. Here you see the results of inserting the reversal pattern analysis technique. Only double tops and bottoms were requested and the ones framed in fuchsia seem to be a reasonable choice for the category called minor. Two other categories offered are intermediate and major. Zooming in on the patterns reveals dashed lines that delineate the beginning and end of the pattern. Pattern-finding is just one of six different analytical studies that can be inserted.

expression (Figure 2: upper left-hand corner) before trying to click on “OK” and exit the expression editor — because if the expression isn’t legal, in some circumstances you won’t get a record of it.

I wanted to try two things with Tradecision: use a variable calculation for periods in a moving average, and write the formula for PVI. The first item resulted in Tradecision getting stuck in a loop that took ctrl-alt-delete to exit and the second stumped me, but the Tradecision staff speedily provided the following for PVI:

```
CumSum(If((V(0) > V(1)), ((C(0) - C(1)) / C(1)), 0), BarNumber())
```

Note: BarNumber is needed to start CumSum at the first bar of the chart.

SPECIAL ANALYSIS

One of the “heavy hitters” categories that Tradecision offers are analytical techniques that can be inserted. Six are available: Autotrends, pivots, single-day patterns, Elliott waves, reversal patterns, and Fibonacci clusters. At least three of the analyses (pivots, Elliott waves, Fibonacci clusters) relied on how pivots are defined. What immediately got my attention was the reversal patterns capability. Patterns are difficult because, for example, triangle patterns require you to draw trendlines correctly, which might

have an occasional missing line or two, even for those of us who make a living at it. As it turns out, reversal patterns do not use trendlines, and as a result, they search for double bottoms and tops, and head & shoulders patterns.

Pivots can be calculated in several ways. You can construct a study building your own expression from just price data, create a study using the pivot high and pivot low functions, use a prebuilt study, or use an analysis called “Pivots,” one of the six analyses offered. Since the analysis can be inserted independent of the study, you can compare at least those two methods. The study I

chose shows where on the price chart a pivot high occurs using the rule that the three previous and following highs all have to be lower. The analysis technique, on the other hand, uses a neural network solution that is proprietary. The analysis technique attempts to identify noise so that pivots have a better chance of being meaningful. The two techniques can be seen in Figure 4.

I had conversations with the folks at Tradecision about their analysis technique to calculate pivots. It appeared to me that price spikes caused them to adjust their noise filter too high and consequently miss some pivots that immediately followed the spike. Conversely, low-volatility data sometimes identified events I would argue were not pivots. I suggested a prefilter based on standard deviations to catch the spikes. If you examine Figure 4, you will see an example of the event; in the first week of June, the wide range day kept them from seeing what I would argue is a pivot marked by the red down arrow in mid-June. The reason I belabor the point is that Elliott waves are based on this same pivot analysis, as are Fibonacci clusters.

Fibonacci clusters are an interesting idea I haven’t seen elsewhere. First, the price range for the entire chart is divided into equal ranges of prices. Let’s say the total range is 100 points, then 20 subcluster ranges of five points each



FIGURE 4: PIVOT POINTS. The small blue m’s are the result of inserting an analytical study and choosing minor pivots. The red down arrows are the result of inserting a prebuilt study called pivot high. The difference between the two is due to very different calculations. The analytical study uses neural network technology, while the study uses a formula to identify the highest high of three previous and following price bars.

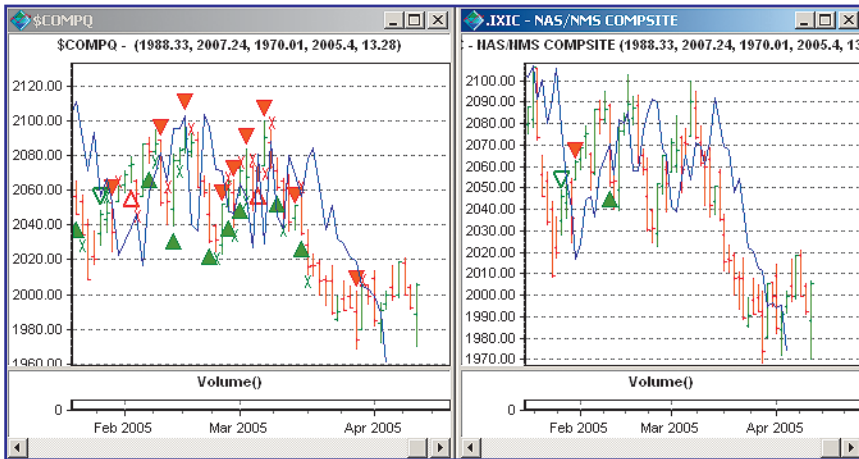


FIGURE 5A: NEURAL NETWORK RESULTS. The Nasdaq Composite is shown overlaid with entry and exit signals depicted by red and green arrows and the predicted five-day price of the Nasdaq Composite. Solid green up arrows are entry, solid red down arrows are short entry, with open green and red arrows for the appropriate exits. The left-hand chart uses eSignal daily Nasdaq Composite data while the right-hand chart uses Reuters daily Nasdaq Composite data. The blue lines are the forecasted price that ends up in the bar data instead of to the right.

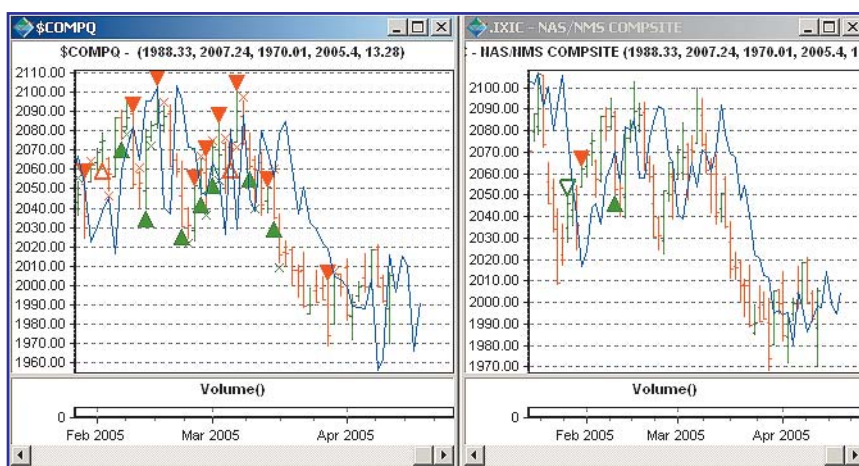


FIGURE 5B: NEURAL NETWORK RESULTS. The results shown are the same as in Figure 5A, except that Tradecision was exited and reentered. The blue forecasted lines now appear to be correct, showing where the Nasdaq Composite price is expected to be in five days. Note also that the same input resulted in very different neural network solutions when using eSignal data (left-hand chart) versus Reuters data (right-hand chart).

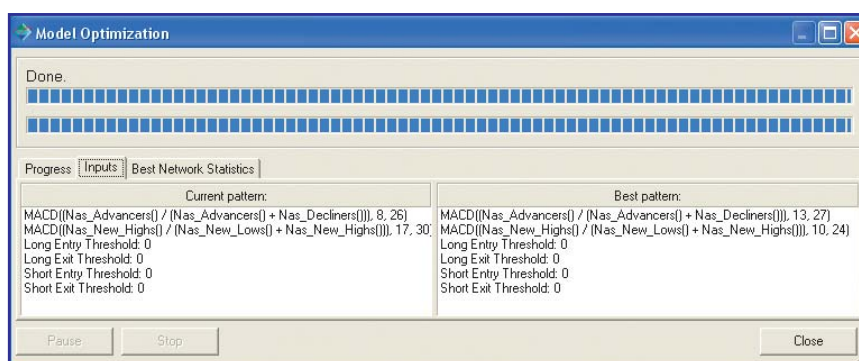


FIGURE 6: RESULTS OF NEURAL NETWORK OPTIMIZATION. The results of optimizing on both periods of both MACDs of Nasdaq advancers/(advancers+decliners) and Nasdaq 52-week new highs/(new highs+new lows). The best patterns use periods of 13 and 27 for MACD of advancers and decliners, while the MACD periods for new highs and lows is 10 and 24.

will be created. Add one, or a weighted value determined by input, to each subcluster depending on whether a Fibonacci retracement such as 23.6% or 32.8% falls within the boundaries of a subcluster. Finally, for each minor pivot pair, attach the zero and 100% retracement points to determine the price at which retracements fall. Two additional values of Fibonacci retracement of 161.8%, as well as 261.8%, are also considered. Check it out. You might find it useful.

NEURAL NETWORKS

You can create the Model Builder by using neural networks. Decide how many days ahead you are going to predict, the test versus training period ranges, and a host of other parameters. I decided I wanted to try predicting the Nasdaq Composite five days ahead (yes, I am a market timer when it comes to the Nasdaq). I wanted to use the ratio of Nasdaq 52-week new highs divided by the sum of 52-week new highs and lows, as well as the ratio of Nasdaq daily advancers divided by the sum of advancers and decliners.

To do so, I first had to import the data from my Reuters folder, although my CSI account would have worked well. I decided a better test would be to try MetaStock formatted data. So, using the Data Manager, I created four symbol names in the symbol table for data import. After importing, I exported each of the data series in CSV format to a folder, and used the custom time series procedure to create four custom time series for expression building (if you want to update the data, you first use the Data Manager to update the symbol table by either a batch update or individually and then exit and reenter Tradecision to update the custom time series).

The resulting expressions I chose for neural network inputs are shown here and are the MACD of the two ratios:

$$\text{MACD}((\text{Nas_New_Highs}() / (\text{Nas_New_Lows}() + \text{Nas_New_Highs}()))), 7, 24) \text{ and}$$

$$\text{MACD}(\text{Nas_Advancers}() / (\text{Nas_Advancers}() + \text{Nas_Decliners}())), 12, 26).$$

If you look closely at the two expressions, you may note that first of all, using new highs and lows does not use the standard periods for MACD. That is because I tried some optimization. Like so much of Tradecision, the means to optimization is simple because all you have to do is click on “convert to optimization” and it is done automatically.

For my first test case, I used Nasdaq Composite data from Yahoo! Finance. I also had the software automatically convert the two MACD moving average periods to optimization parameters. Then I used genetic algorithms on both input expressions and, surprisingly, had to stop the calculation initially, because of the time needed — several hours. I was expecting that a solution should come about in a matter of minutes. I finally let the software run to completion, optimizing on both periods of both MACDs. After six hours, 45 minutes, I got the summary results that are displayed in Figure 6.

Before looking at the summary results, however, let’s examine Figures 5A and 5B. Instead of using Yahoo! Finance data, I used eSignal and Reuters data for the daily Nasdaq Composite data. Figure 5A is the “before” picture and Figure 5B the “after” picture. The blue forecast lines in Figure 5A, the left-hand chart being the eSignal data and the right-hand chart the Reuters data, end in the bar chart prices.

When I exited and reentered Tradecision and did nothing else, the blue forecasting lines corrected themselves, as seen in Figure 5B. This phenomenon of the software either correcting or letting you do something by exiting and reentering occurred three times while I was using Tradecision. But the most surprising result is the difference, as seen by the left-hand versus right-hand charts in Figures 5A or 5B, in solutions produced by using eSignal versus Reuters data.

For the period shown in one case, we see three versus 17 trades. In their defense, Tradecision states that it is because the solution is unstable. I believe, however, that there is a correlation between the momentum of Nasdaq daily advancers and decliners and Nasdaq

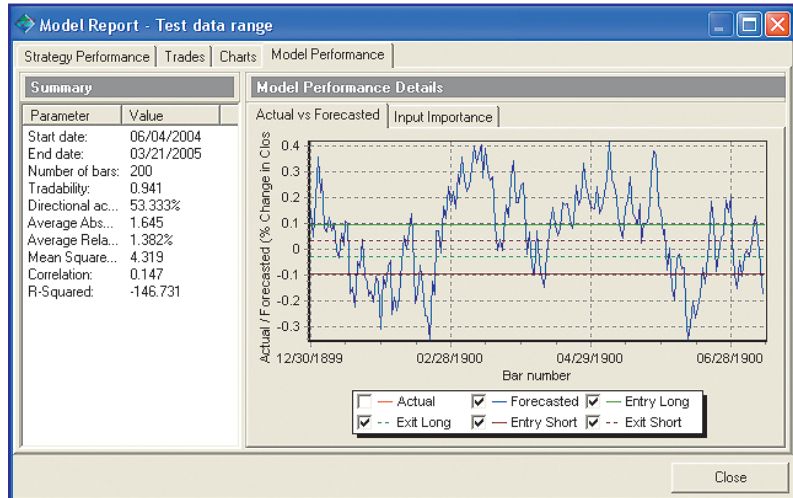


FIGURE 7: NEURAL NETWORK PERFORMANCE. Four tabs let you see how well your trading scheme worked. The Model Performance tab shown here has six different items relating to either actual or forecasted percentage change. The blue graph is the five-day forecasted percentage change in price. Vertical lines mark where the percentage change in price will result in entry and exits for longs and shorts. You can adjust these triggers when setting up the model.

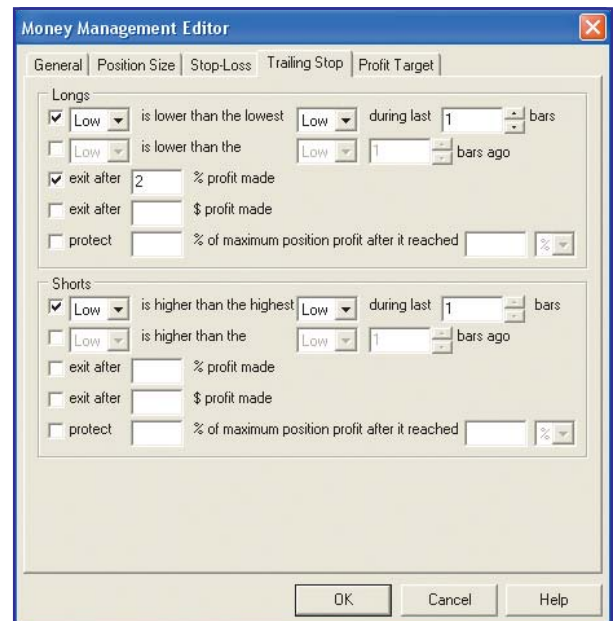
daily 52-week new highs and lows, and the price movement of the daily Nasdaq.

The entry and exit triggers for neural network trading are based on the forecasted percentage (Figure 7). You can see this actual versus predicted percentage price change for either the training or testing phases. Figure 7 depicts performance for the testing phase. You are allowed to adjust the triggers. An equity chart allows you to see drawdowns, as

well as two “underwater” curves, which give you a measure of monthly drawdowns relative to a VAMI curve. A VAMI curve is a monthly plot of the progress of a hypothetical \$1,000 initial investment. You can examine the individual trades as well as a summary report of performance, which gives the usual information such as the number of winning/losing long or short trades and the average winning/losing profit, among others.

FIGURE 8: TRAILING STOP.

The interface for trailing stops has some features rarely seen. You can choose to get stopped out based on the lowest low and the number of bars for long positions, or conversely to get stopped out for shorts based on the highest high. Your choices are neatly organized using tabs, a common interface approach used by Tradecision that is an effective way to organize the choices.



STRATEGY BUILDER

You can build your trading system using the same expression editor that you use in building studies, indicators, and so forth. Screens with tabs for long entry, exit, and shorting let you enter the true condition for entry and exit. The best part, however, is the money management editor embedded in the Strategy Builder.

The money management editor allows you to control the amount of risk that your trading system can accept. For example, you can control position size, stop-loss, and profit target before entering the market. The editor has predefined position size, stop, and trailing-stop rules. For example, position size can be automatically calculated using optimal f , Kelly, fixed fractional trades, and Williams formulas. Trailing stops are typical of the flexibility offered by letting the exit be based on lowest bar and other combinations (Figure 8).

NEATSCAN

To complete the picture, Tradecision offers a scanning capability. The interface is a single screen (Figure 9) that allows you to scan the symbol list you have created via the Data Manager. The number of scan types is large, and includes the reversal patterns from the analytical studies, such as head & shoulders and double top/bottom. Each of the output columns can be used as the basis for ordering the results. You can build your own scan using the expression

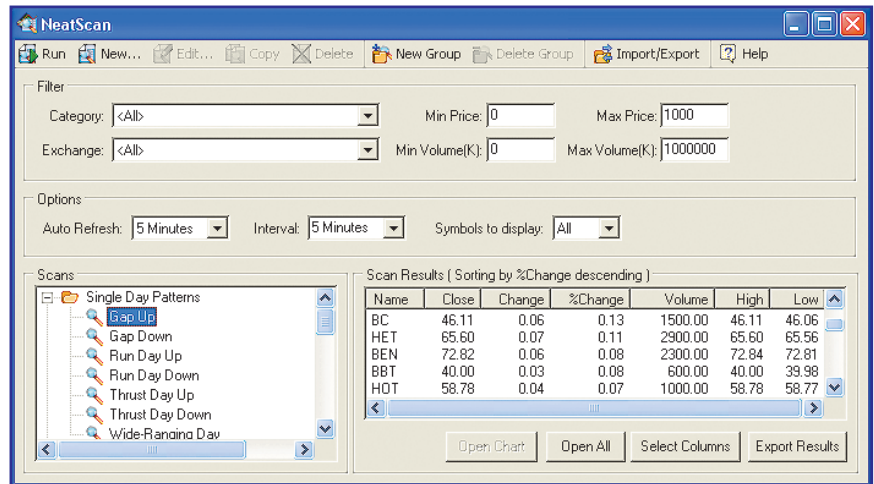


FIGURE 9: NEATSCAN INTERFACE. You scan all of the stocks in your symbol list as identified by the Data Manager. A large number of choices are available, including the reversal patterns that are part of the analytical studies. Auto refresh is available to keep your scan current. The Gap Up scan took about 30 seconds on a 1 GHz+ processor for an S&P 500 symbol list.

editor. Obviously, when Tradecision offers an editor that allows a complete language, the sophistication that you can apply here could be very useful.

SUMMARY

There is a lot to like about this product, though it's not perfect. Some enhancements, such as vertical lines that span the main price chart and including subcharts, may be simple conceptually but not easy to implement. Despite that, this is definitely a user-friendly product, and updates are planned. It would be useful if Tradecision were to follow a similar path for including a complete formula language — namely, choose an existing framework that is popular and reliable.

There were three times when I couldn't get something to work and all I had to do to make it work was to exit and reenter Tradecision. There were a few times when I had to use ctrl-alt-delete to exit.

Give Tradecision a try — it is definitely fun to use because it is so easy.

SUGGESTED READING

Sweeney, John [1987]. "Using Maximum Adverse Excursions For Stops," *Technical Analysis of STOCKS & COMMODITIES*, Volume 5: April.
____ [1997]. *Maximum Adverse Excursion: Analyzing Price Fluctuations For Trading Management*, John Wiley & Sons.