AIQ Opening Bell
Newsletter

Our Money Flow System Is Complete! Adding Capitalization Rules and Sell Criteria Increases Returns

By David Vomund

Editors note: The study detailed in this article uses AIQ's Portfolio Simulator, a function found in TradingExpert Pro's Portfolio Manager application. For more information on how to use the Portfolio Simulator, see the November 2001 Opening Bell and read the TradingExpert Pro User Reference Manual (page 469).

In the last two issues of the *Opening Bell* newsletter, we created a model using the Money Flow indicator. Last month we built the screening rules and used AIQ's Expert Design Studio to run backtests. Our goal was to have the average stock selection outperform an equivalent trade in the S&P 500. That's what happened. A backtest over the last two years showed 1363 trades with an average gain per trade of 1.9%. That's much better than the negative 1.7% return per trade for the S&P 500 over the same period.

Let's review the model. The rules are:

- Price is greater than $10

- Volume is greater than 100,000 shares

- Persistence of Money Flow set at 90%

- The stock is below its 10-day high

- Two-day slope of Money Flow is greater than zero

- The stock has increased by at least 10% in the last six months

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> *"The Portfolio Simulator closely mimics actual trading conditions. The Simulation run on our Money Flow model yielded good results - the overall portfolio return using a time period of 12/29/99 to 05/09/02 was 26.9%. During this same time period, the S&P 500 fell about 26%."*

Of these rules, the Persistence of Money Flow rule is by far the most important.

The Expert Design Studio (EDS) backtest of this model showed good results but that doesn't mean that this model is ready to be used as a purely

mechanical trading system. The EDS model tells us which stocks to buy but this is only one element of a mechanical trading system. Should we continue using the fixed 30-day holding period or is there a better sell strategy? Capitalization rules such as how much money is placed in each trade are also needed.

EDS backtests are useful in determining whether a scanning model is effective but they don't tell you how much money would have actually been made using the system. A two-year EDS backtest of our model showed 1363 trades. Obviously, one can't act on all of those trades. In the real world, once you are fully invested you can't buy a stock without selling one that you hold. EDS backtests can be overstated if the vast majority of the trades come at a market low.

To determine how much money would have been made using a trading system, we can use AIQ's Portfolio Simulator. The Portfolio Simulator closely mimics actual trading conditions.

For example, in our first simulation we applied a discount brokerage commission rate, we limited the maximum number of trades per day
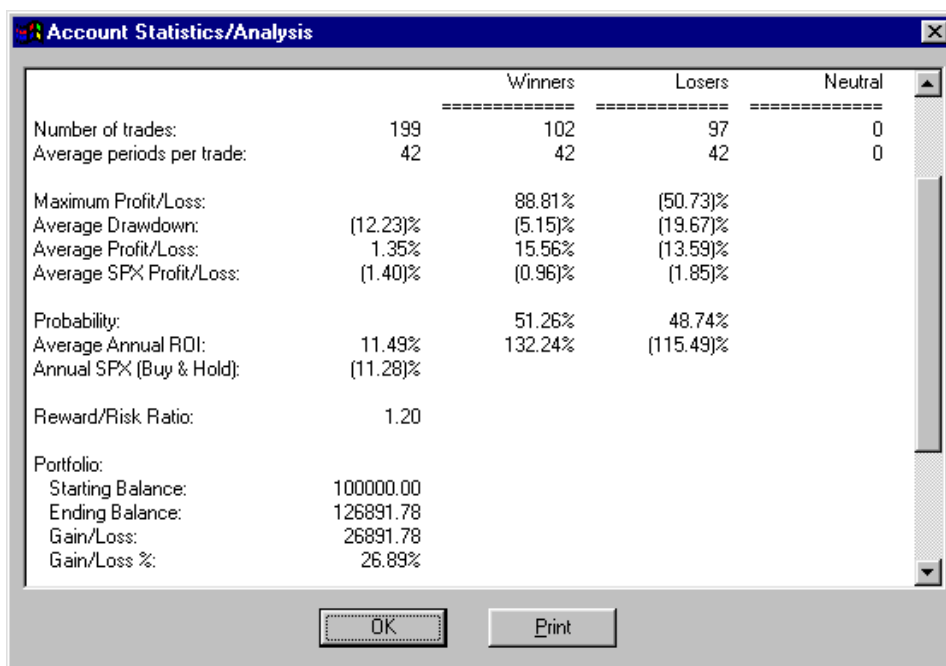

Figure 1. Simulation results: MF model with fixed 30-day holding period

to three, we stated that each new stock position represents 10% of our portfolio value, and we limited the number of open positions to ten.

The Portfolio Simulation run on our Money Flow model with these parameters yielded good results. **Figure 1** shows the portfolio return using a time period of 12/29/99 to 05/09/02. During this time period, the overall portfolio return was

26.9%. During this same time period, the S&P 500 fell about 26%. Our holding period was a fixed 30-day holding period.

Notice how the number of trades is dramatically lower in the Portfolio Simulation compared to the EDS backtest. A two-year EDS backtest had 1363 trades while a 28-month Portfolio Simulator backtest had only 199 trades. There were far fewer trades because the portfolio was almost always fully invested.

With only 199 trades over a three-year period it is easy to over-optimize the capitalization rules. Individual trades can have a big affect on overall returns. For example, if we change our backtesting parameters to allow for more than 10 positions in the portfolio, then the overall return jumps to 46%. If we allow more than three trades per day then the portfolio return turns negative. Making small changes to the capitalization rules can lead to greatly different returns.

To increase the number of trades in our Portfolio Simulation and thereby better validate the results, we changed the capitalization rule to limit each new stock purchase to
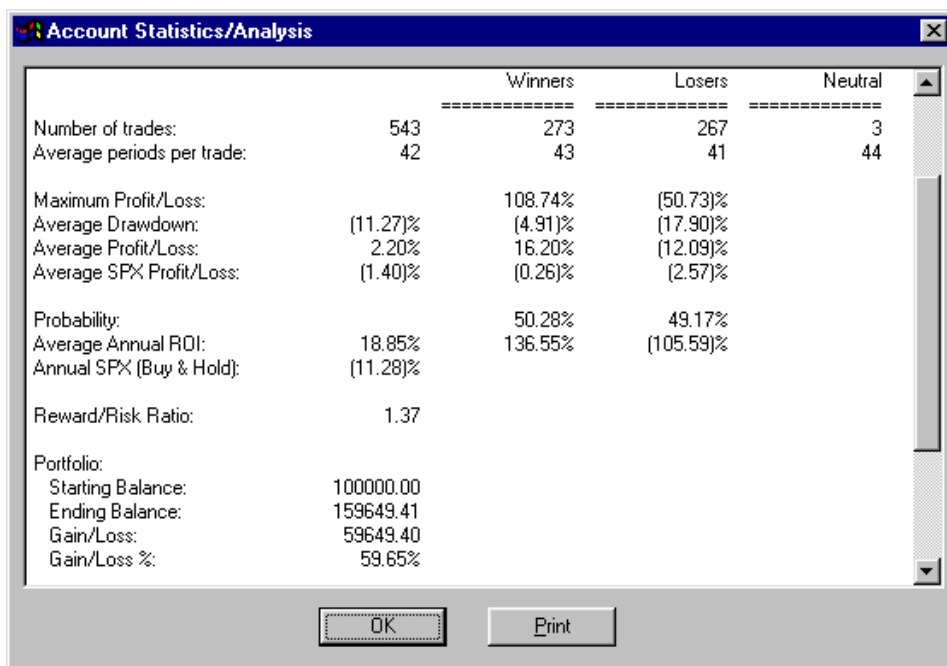

Figure 2. Simulation results: MF model with fixed 30-day holding period and capitalization rules
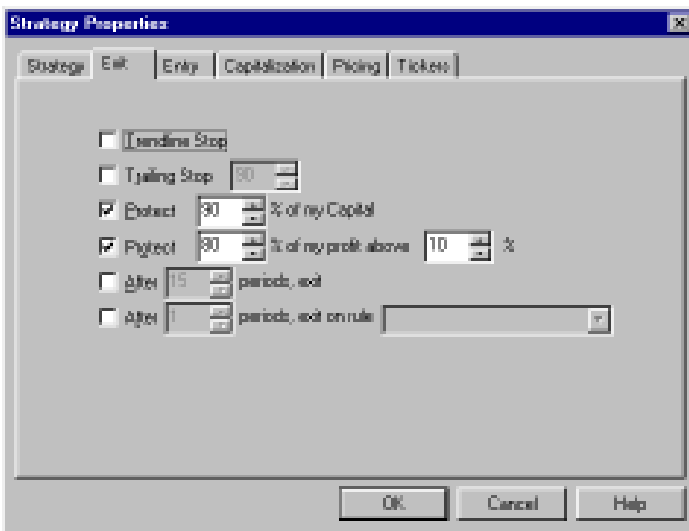
Figure 3. Strategy exit parameters

Figure 4. Strategy capitalization rules

only 5% of the portfolio value (originally we used 10%) and allowed no more than three trades per day.

Figure 2 shows that these changes not only increased the number of trades but they increased the overall return as well. The number of trades more than doubled to 543 and the overall return rose to 59.6%. Again, the time period of this test was 12/29/99 to 05/09/02.

It is interesting to note that limiting the number of trades to three per day has a big affect on results. If we take away this restriction the return is much lower. This is likely due to our sell rule of a fixed 30-day holding period. By limiting the number of trades per day, it forces us to enter a few trades each week rather than
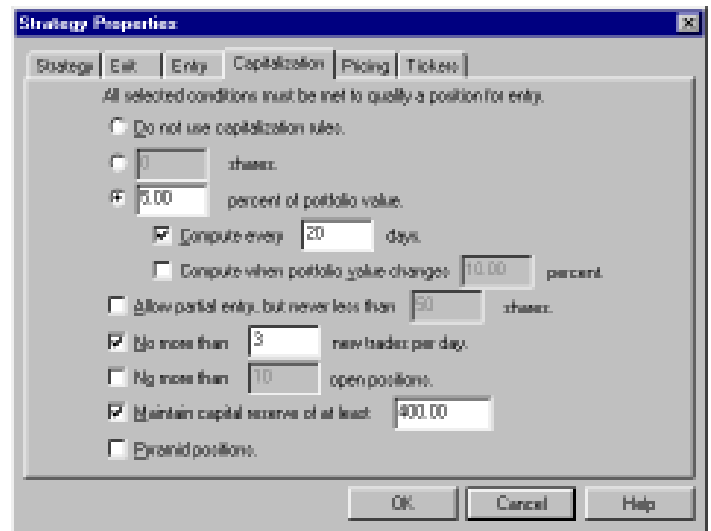
> *"We tested a variety of different stop criteria. Combining a fixed 15-day holding period along with capital and profit protects tested well. The highest return, however, used a 90% capital protect combined with 80% of profit protect above a 10% profit."*

turning over the entire portfolio every 30 business days.

The percentage return from this trading system is good but problems remain. Notice in Figure 2 that one trade had a loss of 50.73% and the average drawdown on losing trades was 17.9%. Changing the sell strategy to include some form of capital protect could lessen drawdowns. Our first step in testing different sell strategies was to look at different fixed holding periods. The objective was to see how the results changed with different time periods.

The 30-day fixed holding period that we tried first returned 59.65%. Further testing shows that a 90-day fixed holding period returns 60.88%. A 15-day holding period returns 77.76%, and a 5-day holding period returns 81.23%. It appears that

		Winners	Losers	Neutral
		==============	==============	==============
Number of trades:	538	308	229	1
Average periods per trade:	30	35	23	62
Maximum Profit/Loss:		74.39%	(32.76)%	
Average Drawdown:	(7.50)%	(2.52)%	(14.23)%	
Average Profit/Loss:	2.47%	13.47%	(12.32)%	
Average SPX Profit/Loss:	(0.96)%	(0.26)%	(1.90)%	
Probability:		57.25%	42.57%	
Average Annual ROI:	29.47%	136.75%	(193.66)%	
Annual SPX (Buy & Hold):	(11.28)%			
Reward/Risk Ratio:	1.47			
Portfolio:				
Starting Balance:	100000.00			
Ending Balance:	179743.91			
Gain/Loss:	79743.91			
Gain/Loss %:	79.74%			

Figure 5. Simulation results: final MF model with protection stops exit strategy and capitalization rules run on 2,000 stock database

shorter time periods work best.

We tested a variety of different stop criteria. Combining a fixed 15-day holding period along with capital and profit protects tested well. The highest return, however, was obtained with a 90% capital protect combined with 80% of profit protect above a 10% profit (**Figure 3**).

This strategy produced a return of about 100% over our testing time period. While this sell strategy didn't produce the highest returns on the EDS backtests, Portfolio Simulations run with different stock lists and different time periods showed consistently good results.

The final capitalization rules are as follows: for each new stock position, buy stock equal to 5% of the portfolio value and limit the number of trades per day to a maximum of three (**Figure 4**). Using these parameters, a Portfolio Simulator backtest from 12/29/99 to 05/09/02 yielded an 81.8% return.

It is always a good idea to look at the largest winning and losing trades to see if these are legitimate trades or if they are a result of a problem with the data. We found

Figure 6. Simulation results: final MF model with protection stops exit strategy and capitalization rules and with databse limited to S&P500 and Nasdaq 100 stocks

our best trade was a 122% return on Acterna Corp (ACTR). When charting this stock it became obvious that this stock would not have been purchased. Possibly because of a large bid-to-ask spread, ACTR often closed on its daily high or its daily low so its Money Flow indicator wasn't accurate. After eliminating ACTR, the overall return fell to 79%.

The final step in creating a trading system is to implement a tie breaker rule. That is, if one stock can be purchased but 10 stocks pass the screening, which one should the system select? If you don't add a tie breaker rule, then the system picks stocks based on alphabetical order.

Amazingly, I found it hard to find a technical tie breaker rule that significantly improved the results. Picking stocks based on a 5-day slope of their Volume Accumulation Percent indicator seemed to add some value, but for our model we are not using a tie breaker rule.

Figure 5 shows the Portfolio Simulation results from our final model on a database of about 2,000 stocks. Notice that the largest loss on a trade is 33%. With our 90% capital protect, a loss that large indicates that the stock had a large downside gap before we could exit

> *"We ran the model on a database of the current S&P 500 and Nasdaq 100 stocks and found a 24% return. Not bad considering the S&P 500 fell 26% and the Nasdaq 100 fell 66% over the same time period!"*

the position.

This model works best on a large stock database, which usually means that the system will be buying stocks that are not well known. How does this system work on larger, more established stocks? We ran the model on a database of the current S&P 500 and Nasdaq 100 stocks and found a 24% return (**Figure 6**). Not bad considering the S&P 500 fell 26% and the Nasdaq 100 fell 66% over the same time period!

The backtests covered the bear market of the last two years. How would our model have performed during a bull market? Using the S&P 500 and Nasdaq 100 database, the model returned 47% in the two-year time period of 1998 to 1999. That's not as good as other aggressive high-growth models but it's still a very respectable return.

Users can download this model to their computers by visiting AIQ's web page at www.aiqsystems.com. Click on *Educational Products* and then *Opening Bell*. Download the file for the May *Opening Bell*.

If you want to run Portfolio Simulations on your database of stocks, then be sure to use the parameters highlighted in Figures 3 and 4. If this system has too many trades for your style, then change the capitalization rules by increasing from 5% to 10% the percentage of the portfolio value that each stock purchase represents. You can also test looser stop strategies.

With the testing phase completed, the daily process of analyzing the data to find trading candidates requires very little effort. Simply go to the Portfolio Simulator and run *Pick of the Day*. Confirm that the Simulation strategy and analysis date are correct, verify or enter the available cash, and then click the *Run* command. A list of tickers meeting your strategy criteria will appear on the screen.

David Vomund publishes VIS Alert, a weekly investment newsletter. For a sample copy of the newsletter, call 775-831-1544 or go to **www.visalert.com.**

STOCK DATA MAINTENANCE

The following table shows stock splits and other changes:

Stock	Ticker	Split	Approx. Date
Alltrista Corp.	ALC	2:1	06/04/02
First Data	FDC	2:1	06/05/02
AAON Inc.	AAON	3:2	06/05/02
Union Planters	UPC	3:2	06/07/02
Choice Point	CPS	4:3	06/07/02
Fossil Inc.	FOSL	3:2	06/10/02
Alliant Techsys	ATK	3:2	06/11/02
Applebee's Int'l	APPB	3:2	06/12/02
Waters Inst.	WTRS	3:2	06/17/02
PMI Group	PMI	2:1	06/18/02
Wilmington Trust	WL	2:1	06/18/02
Alfa Corp	ALFA	2:1	06/18/02
K-Swiss Inc.	KSWS	2:1	06/24/02
Nuveen (John) Co.	JNC	2:1	06/25/02
Tenet Healthcare	THC	3:2	07/01/02
Marsh & McLennon	MMC	2:1	07/01/02
St. Jude Medical	STJ	2:1	07/01/02

Trading Suspended:
Austria Fund (OST), Compaq Computer (CPQ), Federal-Mogul Corp. (FMO), Freeport-McMoran Copper & Gold(FCXA), IKOS Systems (IKOS), Storage USA (SUS), Wackenhut Corp. (WAK)

Name Changes:
Benton Oil & Gas (BNO) to Harvest Natural Resources Inc. (HNR)
Kansas City Southern Ind. (KSU) to Kansas City Southern (KSU)
NetSol Int'l (NTWK) to NetSol Technologies Inc. (NTWK)
Noble Drilling (NE) to Noble Corp (NE)
Transocean Sedco Forex (RIG) to Transocean Inc. (RIG)
USA Networks (USAI) to USA Interactive (USAI)

S&P 500 Changes

Changes to the S&P 500 Index and Industry Groups:

Apollo Group (APOL) replaces WorldCom Inc. (WCOM). APOL is added to the Diversified Commercial Services (SERVICED) group.

BJ Services (BJS) replaces US Airways Group (U). BJS is added to the Oil & Gas Equipment & Services (OILGASEQ) group.

American Standard (ASD) replaces Sapient Corp (SAPE). ASD is added to the Building Products (BUILDPRD) group.

S&P 500, AIQ All, or the new AIQ Pyramid?

What is the best group structure to use? Here Are Advantages and Disadvantages

By David Vomund

TradingExpert Pro comes with two industry group structures: the Standard & Poor's structure and the AIQALL structure. AIQ has now created an all-new industry group structure called the AIQ Pyramid. In this article, we'll examine the strength and weakness of each of these structures.

Before examining these three

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group structures, it is important to understand how the AIQ software handles industry groups. TradingExpert Pro calculates group indexes based on the stocks that are in each group. The advantage of this over simply downloading group index data is that AIQ calculates volume data as well. Therefore, volume-based indicators can be plotted for groups. AIQ groups are also calculated on an unweighted basis. That is, each stock in a group plays an equally important role.

The Standard & Poor's and the AIQALL group structures come with TradingExpert Pro. Updated versions can be downloaded at **www.pewd.com**. Click on *AIQ FAQ Pages* and view the *AIQ Database Updates* page.

Since TradingExpert Pro calcu-

lates the group indexes, it is important that users have a database that is large enough to meet the needs of the group structure. For example, the Standard & Poor's industry group structure uses the S&P 500 stocks. Therefore, it is important to have all the S&P 500 stocks in your database. Similarly, if you use the Pyramid structure, then make sure all the stocks in that structure are in your database.

To add the stocks that you are missing, insert the AIQ Historical Data CD and go to TradingExpert Pro's Data Manager. Click on *Manager* and *Ticker Import Utility.* Check *Advanced* and click *Next.* On the next screen accept the second choice and highlight *SP500* for the Standard & Poor's structure. Keep clicking *Next* until there is a *Finish* icon. After clicking *Finish,* a list of the missing stocks will appear. Highlight the stocks and click *OK.* This process is covered in the *User Reference Manual* on page 39.

An alternative method uses the *Find and Create* function within the Data Manager. This feature is found on page 116 of the *User Reference Manual.*

Since AIQ calculates the groups based on the stocks in your database, it is important to have clean data on the stocks. If there is a spike in a stock's price as a result of bad data,

then there will be a spike in that stock's industry group as well.

If you see an industry group with a spike or a large price gap, then scroll through its stocks until you find the one with possible bad price data. Reload history on that stock and recalculate its group and sector.

What is the best structure to use? There is no simple answer. The best structure for one person might not be the best for another. Here are the advantages and disadvantages of each structure.

Standard & Poor's Industry Group Structure

The Standard & Poor's industry group structure is free with TradingExpert Pro. This structure classifies the 500 stocks in the S&P 500 index into about 100 industry groups. The advantage of using the S&P 500 structure is that it requires fewer stocks in your database than the other two group structures. It

> *"Standard & Poor's industry groups will work for you if you are only interested in large company stocks and if you want to identify general sector rotation instead of performing specific group analysis."*

also is effective if you want to spot sector rotation and you are only willing to buy well-known stocks.

The downside of the S&P structure is that many of the groups contain only two or three stocks. In these groups, a large move in one stock has too great an influence on

the group. There are even groups such as Internet Software & Services, Agricultural Products, and Air Freight & Couriers, that have only one stock.

> *"Investors who like the smaller-cap Nasdaq issues prefer the AIQALL structure…This structure also works well for investors who use a bottom-up approach toward stock selection."*

Overall, Standard & Poor's industry groups will work for you if you are only interested in large company stocks and if you want to identify general sector rotation instead of performing specific group analysis. If industry group analysis plays a major role in your stock selection process, then you will want another structure.

AIQALL Industry Group Structure

The AIQALL structure is also free with TradingExpert Pro. This is a large industry group structure that has about 8,000 stocks classified into 200 industry groups. Many people think that they need all these stocks in their database. This is not true. Generally, a database of at least 2,000 stocks will work just fine.

Investors who like the smaller-cap Nasdaq issues prefer the AIQALL structure since these stocks appear in the industry groups of this structure. This structure also works well for investors who use a bottom-up approach toward stock selection. That is, they initially select stocks based on AIQ Reports, Expert Design Studio, or some other method and then look at the stock's industry group. Nearly every stock is classified into a group so the analysis of industry groups is available. In a sense, the industry group analysis works as a confirmation of the stock that you are inter-

ested in.

The disadvantage of the AIQALL group structure is that it needs a large database of stocks, requiring more time with data maintenance. Also, since there are so many groups it is hard to see the group rotation.

Overall, the AIQALL structure works best if you want every stock in your database, including small-cap stocks, to be classified into industry groups.

The New AIQ Pyramid Industry Group Structure

AIQ has created a new Pyramid industry group structure, one that is very different from past structures. Most industry group structures are classified only on a fundamental basis. That is, stocks with competing

products are placed into an industry group. AIQ's Pyramid industry group structure, however, is classified on a technical as well as a fundamental basis.

To create the new Pyramid structure, AIQ began with the AIQALL structure and then used AIQ's MatchMaker, a program which tests the correlations of securities, to see which stocks within each industry move together and which stocks don't.

For example, if a Technology group contains four technology stocks that move together and one technology stock that moves independently of the others, then that one stock is deleted from that industry group. That way, the industry group index is a better representation of the underlying stocks.

Remember that AIQALL is a very large structure that contains about 8,000 stocks. After running MatchMaker and removing the uncorrelated stocks (a correlation below 500), the structure is a more

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Table 1

Group BLDRESMM
Building (Residential/Commercial)

AIQ MatchMaker Weekly Analysis
05/24/01 to 05/24/02

Coef.	Ticker	Stock
907	TOL	Toll Brothers Inc.
885	CTX	Centex Corp.
881	KBH	KB Home
869	RYL	Ryland Group Inc.
856	DHI	Horton D R Inc.
849	PHM	Pulte Homes Inc.
841	BZH	Beazer Homes USA
836	LEN	Lennar Corp.
829	SPF	Standard Pacific Corp.
798	MDC	Goldcorp Inc.
739	HOV	Hovnanian Enterprises
688	NVR	NVR, Inc.

reasonable size. The Pyramid structure encompasses about 1,700 stocks that are classified into 160 groups (an average of about 10 stocks per group). The 160 groups are placed into 23 sectors.

When the structure was created, AIQ required the stock price to be at least $1 and the average daily volume to be greater than 800,000 shares.

To look at an example, the AIQALL Building (Residential/ Commercial) group has 38 stocks but MatchMaker showed that many of the stocks were uncorrelated to the group index. After running MatchMaker and recomputing the group with only the stocks that have correlations greater than 500, AIQ found only 12 homebuilding stocks with good correlations.

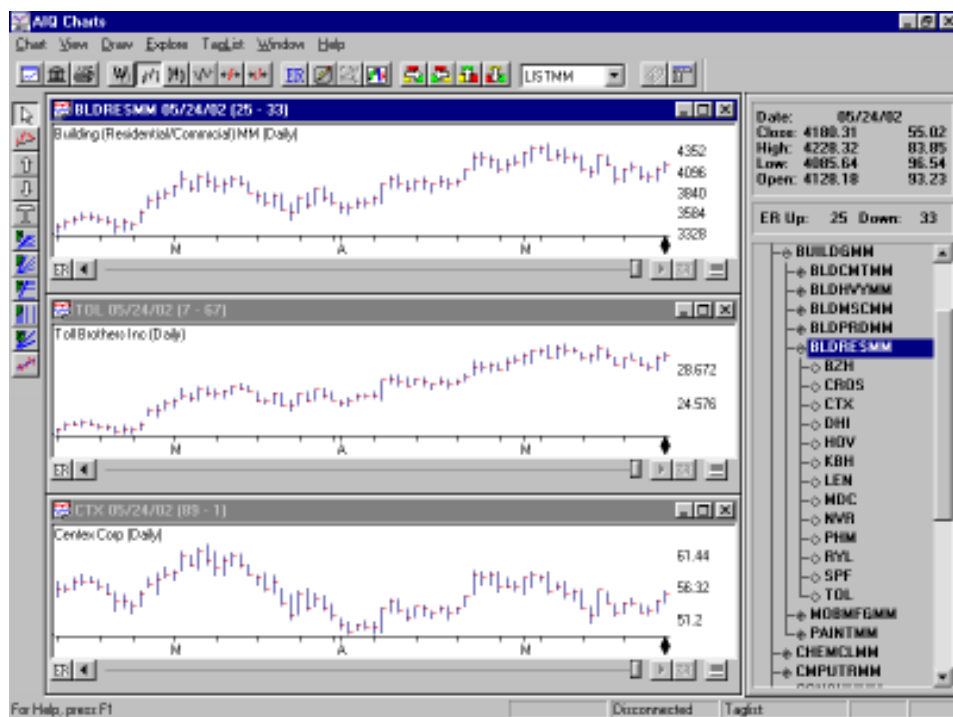**Table 1** shows the MatchMaker results of the Building (Residential/

Figure 1. Chart of Building (Residential/Commercial) group with charts of Toll Bros. & Centex, the two stocks in this group with highest correlations.

"The AIQ Pyramid structure is the best choice for those who perform a top-down analysis...It is also a good structure for those who like both large-cap and small-cap stocks."

Commercial) group. A coefficient of 1000 represents perfect correlation and a score greater than 500 demonstrates a high correlation. A chart of the Building (Residential/Commercial) group along with the two highest correlated stocks is found in **Figure 1**. Notice that the patterns of the two stocks are similar.

The Pyramid structure is the best choice for those who perform a top-down analysis. That's because the sectors and groups represent their stocks well. It is also a good structure for those who like a large variety of stocks, including both large-cap and small-cap stocks.

Since the Pyramid structure has 1,700 stocks, most but not all of the stocks that people are interested in will be classified. If you are interested in a stock that is not in this structure then you will have to switch to the AIQALL structure.

The AIQ Pyramid is $188 plus shipping. Updates to the structure are sold for $44. For more information, call 800-332-2999.

Market Review

In May, the S&P 500 index fell 1.1% and the Nasdaq fell 3.3%. Even the small-cap stocks, which have increased in value in the previous months, succumbed to the selling pressure. The Russell 2000, the best measure of small-cap stocks, fell 4.5%.

The AIQ market timing model began the month by registering a 99 buy signal on May 1. A 97 buy then came on May 8. The model turned bearish on May 21 when a 100 sell was registered.

The easiest way to make money in May would have been to buy gold stocks. The AIQ Pyramid's Metal Ores (Gold/Silver) group contains 17 stocks including some South African mining shares. This group rose 40% during May!

Other advancing groups had more reasonable returns. Containers (Paper/Plastic) rose 12%, Steel Producers rose 11%, and Retail-Mail Order rose 10%.

The losing groups were the usual suspects. Electrical-Control Instruments, Internet Networking, Computer-Local Networks, and Internet-Software all lost more than 15%. All of these groups have fallen at least 80% from their high prices of just over two years ago.