

# **THE BIG BLUE-2 TRADING SYSTEM**

**A Short Term Multi-Pattern Futures Trading System**



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Disclaimer-

In this document, you will find several tables detailing the trading performance of the Big Blue-2 trading system. These results were not generated by actually trading the system in live markets. They are theoretical results obtained by back-testing the system using historical trading data. For this reason, it is important that you carefully read the disclaimer below, which is required by National Futures Association.

**HYPOTHETICAL PERFORMANCE RESULTS HAVE MANY INHERENT LIMITATIONS, SOME OF WHICH ARE DESCRIBED BELOW. NO REPRESENTATION IS BEING MADE THAT ANY ACCOUNT WILL OR IS LIKELY TO ACHIEVE PROFITS OR LOSSES SIMILAR TO THOSE SHOWN. IN FACT, THERE ARE FREQUENTLY SHARP DIFFERENCES BETWEEN HYPOTHETICAL PERFORMANCE RESULTS AND THE ACTUAL RESULTS ACHIEVED BY ANY PARTICULAR TRADING PROGRAM.**

**ONE OF THE LIMITATIONS OF HYPOTHETICAL PERFORMANCE RESULTS IS THAT THEY ARE GENERALLY PREPARED WITH THE BENEFIT OF HINDSIGHT. IN ADDITION, HYPOTHETICAL TRADING DOES NOT INVOLVE FINANCIAL RISK, AND NO HYPOTHETICAL TRADING RECORD CAN COMPLETELY ACCOUNT FOR THE IMPACT OF FINANCIAL RISK IN ACTUAL TRADING. FOR EXAMPLE, THE ABILITY TO WITHSTAND LOSSES OR TO ADHERE TO A PARTICULAR TRADING PROGRAM IN SPITE OF TRADING LOSSES ARE MATERIAL POINTS WHICH CAN ALSO ADVERSELY AFFECT ACTUAL TRADING RESULTS. THERE ARE NUMEROUS OTHER FACTORS RELATED TO THE MARKETS IN GENERAL OR TO THE IMPLEMENTATION OF ANY SPECIFIC TRADING PROGRAM WHICH CANNOT BE FULLY ACCOUNTED FOR IN THE PREPARATION OF HYPOTHETICAL PERFORMANCE RESULTS AND ALL OF WHICH CAN ADVERSELY AFFECT ACTUAL TRADING RESULTS.**

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## I. ACKNOWLEDGEMENTS

Many people have encouraged, enlightened, entertained and educated me in my pursuit of mechanical trading systems over the years. Any attempt to list all these wonderful people in this business that I have had the privilege of working with would be incomplete, but here is at least a partial list:

- Laurie Barna, my wife of 27 years
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- Glenn Larson of Genesis Financial Data Service

Many other brokers, authors, analysts, hardware people, software and marketing individuals—to numerous to mention—educated, inspired and help me reach the point where I was able, with the help of Vilar Kelly, to complete and perfect the Big Blue-2 trading system. I extend my sincere thanks to all of them, named and unnamed.

### In Memoriam

There is one very special person that that will never be forgotten. It is Vilar Kelly, who was the co-developer of Big Blue-2. Vilar earned a Bachelor Degree in Mathematics and Physics from St. Peter's College in New Jersey and a Masters Degree in social work from Columbia University in New York. Vilar worked in sales with IBM for 25 years, eventually retiring in 1972 as a Vice President. He was also a retired Army captain, who served in World War II and the Korean War. During his army career he was in military intelligence as a cryptographer. Vilar created several trading systems, including DayCare, Trophy and Enigma. In May of 2000, Vilar died following a lengthy illness. His wife, Caroline, two daughters, a son, and six grandchildren survive him. Without his keen mind and programming expertise, Big Blue-2 would never be what it is today.

Portions of proceeds from sales of the original Big Blue and the Big Blue-2 trading system are forwarded to Caroline Kelly.

## II. ABOUT THE SOFTWARE DEVELOPER

Mike Barna has been registered with the National Futures Association as a Commodity Trading Advisor since 1977. Mr. Barna and his associates provide more "Futures Truth" top ranked trading systems than any other developer in the country ("Futures Truth" Rankings are based on annual percentage returns on 3 times margin required or one-half of three times margin requirements for day-trading systems). Money managers, institutions, brokerage houses and individual traders worldwide use his systems. His associations include MESA SOFTWARE, ALFARANDA SYSTEMS and WELLINVESTED. Mr. Barna has been programming for over 30 years, has been developing trading systems for over 14 years and has been managing money since 1998. One more notable international fund where several of his systems are being traded is the REFCO-CANADA FUND. He is the sole Managing Member of Aaron Asset Management, LLC, a firm employing his mechanical trading systems. Previously, he was Vice President for Trading and Systems with Regency Stocks and Commodities Fund, L.P. You may know of him as the author of the successful and popular R-MESA trading system. His original BIG BLUE trading system is listed as one of the Top Ten Trading Systems of All Time in the Hill/Pruitt/Hill book "The Ultimate Trading Guide". Articles, written with associates such as John Ehlers of MESA SOFTWARE and Murray Ruggiero of Ruggiero Associates, have appeared in "Futures Magazine" and "Technical Analysis of Stocks and Commodities". Paul Leo and Peter Temple interviewed Mr. Barna for the book "The Ultimate Technical Trading Software".

Mr. Barna is known for his tough on robustness approach to system development. Mr. Barna's research areas employ state of the art technology used in his prior career as an Astronautical Engineer. His current research includes an options back-testing engine using the Bjerksund-Stensland Options Model (among others) integrated with mechanical trading systems that are capable of producing "Options Trading Systems" backtest equity streams. Mike received a Master of Science in Astronautical and Aeronautical Engineering from Stanford University and a Bachelor of Science in Mathematics from Arizona State University. Mike holds or has held 2 commodity licenses, 10 FAA pilot ratings and licenses and a California State Realtors license. He is also a current Boeing 727 airline captain with a major US airline.

Mike is also the current 2003 USHA California State Golden Masters Singles Indoor 4-Wall Handball Champion.

### III. INTRODUCTION TO TRADING SYSTEMS

Before I get into a detailed discussion of trading systems, it is important to put them into perspective. There are more people involved in the markets today than ever before in the history of the markets. These individuals are generally categorized as investors or traders. Understanding what these terms really mean and who is truly an investor or trader is critical to understanding the value and usefulness of trading systems, particularly mechanical trading systems.

Investors are generally thought of as people who invest for the long haul. This could be for months, years or even decades. A typical investor may be putting aside money for retirement, using a qualified (IRA, 401(k), pension plan, etc.) or unqualified (mutual fund, annuity, trading account, etc.) plan. This type of person has been educated by the securities industry to think long-term. The general theory pounded into these investors is that over the long haul, the stock market always goes higher and can be expected to average something in the neighborhood of 10% to 12% per year on a long term basis.

This may be true for certain periods of time, say 1950 through 2000. Since this encompasses more than one generation, it has become an accepted truth by many currently in the market. It is also true that "averages lie and liars average," meaning that to defend this argument it is important to select the specific time frame when illustrating the amazing returns the stock market "guarantees" investors.

For those who have really studied the American stock markets performance over its lifetime understand that timing is everything. A mutual fund begun in 1930 would have taken a good deal of time to generate a 10% or 12% per year average return in its first decade of in business. Therefore, is successful trading a function of timing, luck or something else? This line of thought takes us to the question of exactly what is an investor and who should be truly called an investor.

In my opinion, the term "investor" is one of the most misused and abused terms in the English language. A stockbroker gets a hold of a car mechanic making \$30,000, \$40,000 or even \$50,000 a year with some overtime hours. The mechanic signs up to invest \$50 per month for 10 years in a mutual fund. Or what about the administrative assistance that signs up for a 401(k) at work and arbitrarily selects an investment vehicle from the five choices she is given. Are these investors? By Wall Street's standards they are, but not mine.

An investor does his homework. He or she spends time studying whatever is to be invested in. Warren Buffet is an investor, not Joe or Jane Average. Someone like Mr. Buffet starts with a detailed financial analysis. He dissects the company, the industry and the overall investment climate. Then he visits the company and sounds out the management team. Once assured the company, products, industry, people have long-term potential, he is comfortable moving ahead. Two of his hallmarks to successful investing are 1) never buy anything that you do not understand or 2) never buy anything that is over priced.

Compare that with a hotshot sales person or lawyer who jumps on a tech stock that is selling for 120 times earnings because of a news story about earnings that are expected to beat the Street's estimates. This is gambling in its purest form. To me, there is no difference between this and pulling the arm of a slot machine in Los Vegas, except in Vegas you would get a little exercise in the process and a few free drinks.

Also keep in mind, that the "investor"—or sucker, schmuck, patsy, whatever—that buys tips usually has no exit strategy. They buy something with the idea it is going higher, but no thought is given to determine how much higher and when is it time take profits. Equally, they do not protect themselves from the downside risk they have exposed themselves to by taking a long position. By this I mean they do not trade using protective stops. If this isn't gambling, I don't what is.

In the last year or so, this concept of gambling on the market has become even more apparent due to all the scandals from corporate fraud, to deceptive trading practices by mutual funds, like allowing big customers to make illegal timing trades. Not only does the average chump investing neglect to do the homework required to make solid decisions, he or she is cheated by both the company selected as an investment and the firm that sells it. It has come to the point that the investor cannot count on world-renown accounting firms to protect their meager interests. Gambling is risky enough, but having the deck stacked against you adds insult to injury.

Before I leave this subject, I just want to make it clear that there are successful investors, just as there are successful traders, which I will get to next. Some of these are like Mr. Buffet, who crosses all his "T's" before he opens his wallet. Others are lucky in their timing or sensible enough to employ honest, professional assistance. My point is simply, as an investor or trader you must do or be one or the other. The higher risk, of course, is assuming that you were born lucky and will remain so for all your days.

Now let's turn our attention to discussing the concept of being a trader. It sounds simple enough. To become a trader of securities, you buy and sell stocks, options or futures contracts—but so does the investor type individual. How are these two different? There are several ways of distinguishing the trader from the investor. One is the duration of the holding period of trades. An investor generally holds positions for much longer periods than a trader does. An investor has a long-term perspective, say holding positions for weeks, months, and even years. The trader plans to flip positions in minutes, hours, days and occasionally weeks.

Where the investor's objective is building wealth, the trader is thinking of ordinary income. One is after long-term capital gains, the other short-term.

The time frame of each defines the amount of risk each type of player is willing to accept and, this in turn influences the size of positions taken. Remember, there are certain parts of a trade or investment you can control and others that are completely out of your control. For example, you have absolute control of what entity you select to trade, be it a stock, option or futures contract. Or you can discriminate by type—some being more volatile than others, or offering more leverage or representing much larger commitment in margin money.

You also have absolute control over which side of the market you enter your position. Basically, you can be long or short. Most people consider being short as a higher risk position than being long. This is because the majority of people, particularly novices, do not fully understand shorting and its special rules, for example the uptick regulations. Also, downward moving markets seem more risky because they tend to fall faster than bull markets rise. People in the market lose faith in an entity that is plunging into oblivion, yet these same individuals will tend to continue to support an entity that is struggling to stay above water.

And, you have control of how long you hold a position. The only times this is not true is when a futures contract, for example, is caught in a limited move or expiring. Some futures contracts can fall a specified amount, called the limit move, at the open without executing any trades and then not trade for the rest of the day. Or a limit move, up or down, can occur within a trading session. Limit moves can go on for multiple trading sessions in a row, but it is very rare. Nevertheless, if you are long and you're in a futures position that is limit down against your position for even one session, it is a terrible feeling. I liken it to being in a car sliding out of control on ice. On the other hand, the limit move can be in your favor—that feels like hitting the jackpot on a \$10 slot. A stock trader can experience a similar sensation when a stock is sinking like the Titanic and you get your fill on a market order \$15 lower than when you entered it.

You also have no control over market direction and volatility once you initiated a position. You can do all the analysis in the world, but you have no assurance as to accuracy. Thus trading or investing is risky business.

Where the trader and investor often differ is as to the size, the duration of their positions, and the size of the anticipated profit. You, of course, have complete control of size. Do you buy or sell 1, 10 100, or 1000 lots?

The sizes of positions are often influenced by the amount of time you plan to hold them. Since investors choose to stay longer in a position, to compensate for being in the market indefinitely, he or she often decides to trade smaller size and would expect a much larger gain per share or futures contract. The day trader or short-term trader uses larger size trades (or higher leverage) seeking smaller profits, but more of them. Where an investor plans to make \$10, \$20 or a hundred dollars or more per share or thousands per contract, the day trader is looking at a few cents or points per trade but many more of them while avoiding the risk of "always" being in the market.

Size, by the way, is a very relative term. To Mr. Buffet, an investment of 100% of a company's stock may be reasonable. To Joe Average, 100 shares may be pushing the envelope.

Obviously, the investor and the trader are substantially different types of market players with different goals, time horizons, trade objectives and risk tolerances. But, to be successful, they must have at least one thing in common. And that is they must have a dependable approach to their activities. The investor, because of the long time horizon, must have a way of evaluating the future. What is the economy going to be like 3, 6, 12, 24, or 60 months ahead? Are the company and its products built for the long haul? Many of these types of questions are best answered by fundamental analysis.

The trader, on the other hand, cannot make decisions based on long-term trends developed by fundamental analysis because they do not provide specific timing signals. The focus must be on the here and now—the next ten minutes, hours or days. This is where technical analysis comes into play. It shines when it is used to tell the trader what is expected to happen in the short-term based on the immediate psychology and momentum of the market. Is the momentum bullish or bearish? Is volatility increasing or decreasing? Are there any important signals other technical traders are likely to see and react to? Technical signals often become self-fulfilling prophecies when enough players see the same thing.

The whole key is that technical analysis alerts you to what is expected, which is different than what is absolutely going to happen. Obviously, there is no known method of predicting exactly what will happen in the future. Therefore a trader must trade defensively, which means the use of stop loss orders that prevent major setbacks.

One other characteristic distinguishing an investor from a trader is how much they monitor the market. An investor, trading for the long-term, tends to put a position and let it cook for a substantial period of time. He or she checks on it perhaps daily, weekly or even on less frequency. A day or swing trader follows his or her positions in real time or at least using 15-minute delayed quotes. They are on top of the market like a buzzard over road kill.

Keep in mind, there are only five possible outcomes to any trade. You can have a big winner, a small winner, a break-even trade, small loser or a large loser. You can be a very successful trader if you do any of the five, except taking a large loss. Again, this is the argument for using stop loss orders. For example, the Big Blue-2 utilizes 5-point protective stops.

For traders the trick is to have your stop trail your position as it moves up or down depending whether you are long or short. As soon as it retraces 5 points you are out. What you must be careful of is not overly reacting when you are whipsawed. That is when a long positions moves higher by say 10 points. They retrace 6 points, taking out your 5-point trailing stop loss order, only to immediately retrace higher 20 points. You were just whipsawed out of a 20-point profit. The danger is to let this type of incident weaken your discipline. Using stops is critical to long-term success. After being whipsawed, inexperienced traders often stop placing stop loss orders in the market. They say they will use mental stop loss orders and when a position reverse 5 points they will enter a sell order or look at the specific situation and decide to exit or not. This is very dangerous territory, often leading to serious drawdowns of capital.

When you commit to the mathematics of risk management, you will be on your way to becoming a successful trader. As you can see from the Loss-Recovery Table below, the deeper hole you put yourself in, the more difficult it is to recover. More importantly, there is a trading axiom that is worth remembering, "Scared money never wins." In this case, it simply means that if you lose too much money or more than you can afford to lose, you put so much pressure on yourself; you no longer make good, rational decisions.

Loss-Recovery Table

% Loss	% Needed to Break-even
5	5.26
20	25.00
30	42.85
40	55.57
50	100.00
70	233.33
90	900.00
100	You're busted!

Here is another way of thinking about the percentage of winning trades you need to break-even or make money. It is usually nowhere near 100%. It does not need to be even 50%. I have seen traders make money with only a third of their trades profitable. The trick is to keep losses small, which keeps you in the game when the market runs in your favor. If your average loss is kept to 5 points and your average win is 6 points and only half your trades are winners, you will make money in the long run.

Experience has proven that traders who have good money management systems are successful because they are in the market when the entity they trade makes a substantial run. The nature of trading is taking what the market gives you rather than trying to force your opinion on the market. That is the essence of Big Blue-2.

You will see later in this manual when you study the hypothetical performance records of Big Blue-2 that the winning trade percentage figure is usually just above 50%, yet the hypothetical returns average over 69% per year with a maximum drawdown (no slippage and commission) of approximately 26% (12,900), based on a \$50,000 account size. Successful trading is about discipline, which I discuss later in more detail. Discipline means faithfully following your trading plan, particularly with regards to cutting losses short. You cannot leave this up to chance or your emotional state when you are experiencing a loss.

Next, a little understanding of asset allocation is critical to our discussion on employing a mechanical trading system that trades the S&P Futures. Most investment portfolios are diversified, meaning composed of a blend of different classes of equities. The purpose is to smooth out returns and preserve net worth. The classic example is adding bonds to a portfolio of stocks. Historically, bonds do well when stocks are in trouble—thus one compliments the other. Bonds are said to be negatively correlated with stocks.

But negative correlation is not the only issue you should be looking at in your investment portfolio. Actually, you want a blend of various classes of securities that give you the maximum return regardless of the economy. For example, you want good performance in both bullish and bearish economies. This is what the Modern Portfolio Theory calls the Efficiency Frontier. There have been several studies that suggest that a portfolio composed of stocks, bonds and a small percentage, say in the 10% to 15%, of managed futures is an excellent mix.

This brings us to the question of exactly what is a mechanical futures trading system?

Mechanical trading systems are hard coded rule sets programmed in a computer language and applied to single or multiple time series data sets. Creators of trading system are called system developers. Specifically, system developers create programmed logic, in software, as opposed to hardware system developers whose attention is directed to the processor, network, storage units, etc., to be used in Information Technology (IT) and IT Management applications. Trading system developers are, in essence, "applied data miners" in that their goal is to determine efficient rule sets that produce a robust equity stream when applied to actual market data under actual market conditions. System developers use a variety of techniques to determine underlying inefficiencies in the data under study and then write code to exploit those new founded inefficiencies.

It often thought that markets are so random and non-predictive that creating a mechanical trading system that actually produces a profit is a futile exercise. System developers obviously do not prescribe to this "Pure Random Walk" hypothesis, and, it seems, neither do most brokers, money managers, institutions, banks and individual clients as evident by the large use of trading systems in almost every corner of the trading world. In the early 1990's, my associates and I had a difficult time in convincing brokers to offer mechanical trading system to their clients. Now, almost every major commodities brokerage firm and many stock brokerage firms offer a large "shopping list" of mechanical system to their clients and have spent equally large amounts of capital in developing complete trading system divisions.

As was briefly discussed above, trading systems can be less than 50% accurate. You might ask then: How can a trading system be any better than a coin toss? Well, we have spent a great deal of time analyzing the coin toss scenario just to understand the dynamics of "biased random walk" models. Let's just study a "Tossing a Coin Scenario" for a second, using a heads you win \$1 and tails you lose \$0.5 criteria. Tossing the balanced coin a sufficient number of times produces \$0.25 profit per toss, since the results are a 50-50 split between heads and tails. The governing equation for this coin toss equity curve is:

$$EV = PW*AW - PL*AL$$

Where:

EV = Expected Value  
PW = Probability of a win  
AW = Amount to win  
PL = Probability of a Loser  
AL = Amount to Loss

## HOW DO TRADING SYSTEMS WORK?

Consider a Coin Toss Game:

Toss heads you win \$1

Toss tails you lose \$0.5

$$EV = PW*AW - PL*AL$$

Average Trade = \$0.25

Trading Systems may have  $PW < 50\%$

You may have runs of losers

Over time you should see a positive outcome

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Figure 1. The Coin Toss

Of course you may have 10 losers in a row and thus lose \$10 right from the start. If you quit at that point, you will have lost money even though the overall long-term outcome is profitable based on the coin toss equity curve. If however, you were to continue to play this game, statistically you have the odds in your favor. This is basically how a trading system with less than 50% accuracy can make money by simply winning a lot more money on winning trades than losing trades. (Remember our Loss-Recovery Table.) Figure 1 summarizes the key principles of the coin toss scenario. The key point to this is to remember that an equity curve is produced by flipping coins with a defined payout, and that the equity curve will be slanted upwards if the Expected Value of the toss is positive.

At this point, I'd like to warn you regarding the "Gambler's Fallacy," which has been the ruin of thousands of traders. Some gamblers believe that their odds of winning improve each time they lose. You see it when a gambler doubles up, in say roulette, after each loss. It is their contention that each spin of the wheel is somehow related, meaning that if black comes up twice in a row—then red is more likely to come up next. Therefore, they increase their bets based on their wrong thinking that each event (the spinning of the roulette wheel) influences the next spinning. In fact, each event is totally unrelated. With each spin, there is an equal chance for red or black. Or, back in our coin flipping scenario, there is always an equal chance for a head or a tail.

Many gamblers get totally busted by increasing their bets each time they lose, believing their odds of winning are increasing. The same goes for traders, especially short-term traders who trade very frequently. Just because a trader has 10 losing trades in a row or 10 consecutive tails have been flipped, there is no greater probability of the eleventh trade being a winner than the next flip coming up heads. You may well run out of money before you hit the jackpot. When trading any system, such as Big Blue-2, you need to avoid the Gambler's Fallacy. System traders need to be focused on trading the system as it is and not "second-guessing" the systems' signals. System traders must be "systematic traders" and not discretionary traders". Of course we can evaluate the system equity curves and attempt to begin trading when the system is showing an equity curve drawdown of say, two standard deviations below its mean. My studies have shown that this type of trading system Improvement is not as efficient or as easily implemented as it may seem at first.

Before comparing discretionary traders with systematic traders, a brief explanation of each is in order. A discretionary trader is one who appears not to be following a strict set of rules that govern how he or she enters and exits positions. This type of trader appears, at a distance, to be trading from the seat of his pants. And, some actually are. For example, a trader who trades tips, jumps on momentum moves after they begin, or trades favorites regardless of the circumstances, is considered a discretionary trader.

There were some valiant attempts to create systematic, fundamental trading systems. They were known as econometric models, which attempted to project supply-demand numbers and thus price projections. All the known fundamental information about a commodity (carryover from previous years, planting intentions, acreage, expected yields, weather at planting and harvest, disappearance rates, etc., etc.) were plugged into a computer program and endless variations run. Similar attempts in the area of economic planning were also tried. All were virtually unreliable. There were just too many variables having to do with decisions made by humans that were unpredictable, not to mention all the little tricks (flood, draught, pestilence, etc.) that Mother Nature played on the computer models. About as close as you come to a

fundamentally based systematic trading program are commodity traders who automatically buy or sell a commodity when certain price levels is hit or penetrated. For example, buy copper when it hits 60-cents, which signals high demand and low supply. Or when prices of one commodity get so low and another commodity that is interchangeable with it is too high, the former will be bought driving up prices to replace the latter which will go down in price a demand wanes. In cases like these, traders do not need computerized systems; they just track the spreads.

On the completely opposite spectrum, there are traders who have developed very specific trading rule, which they follow religiously. These are usually technical in nature, since technical signals are easier to spot and usually more consistent compared to fundamental signals. This type of technical trading lends itself to computerization.

The evolution from discretionary trading to systematic trading usually moves through the methodological approach, as a trader becomes more acceptant of hard and fast rules to direct their trading. Figure 2 illustrates the evolution from discretionary to systematic trading. Eventually traders become more comfortable with using rules to manage their trading. It should be pointed out that diversification across time frames, trading systems and markets, offers considerably more variations of risk reduction.

**EVOLVING TO SYSTEM TRADING**

<b>TRADER STYLE</b>	<b>TRADER COMPLEXITY</b>
<b>DISCRETIONARY</b> No system testing	<b>HIGH</b> Multiple time frames, indicators, conditions, interpretations and setups
<b>METHODOLOGY</b> Minimum system testing	<b>MEDIUM</b> Uses computers to simplify observation of setups
<b>SYSTEMATIC</b> Extensive system testing	<b>LOW</b> Authorizes broker to trade system

Figure 2. Trading Style Evolution

Professional Money Managers have found that their trading performance can be enhanced using a systematic approach to trading the markets. Barclays, an admired financial services organization who tracks the performance of discretionary verses systematic Commodity Trading Advisors reported the trading

performance of discretionary and systematic advisors for the past 10 years. Those CTA's that identified themselves as systematic out performed those CTA's that identified themselves as discretionary by nearly a factor of 4. Figure 3 shows this large difference in performance between the two advisor types.

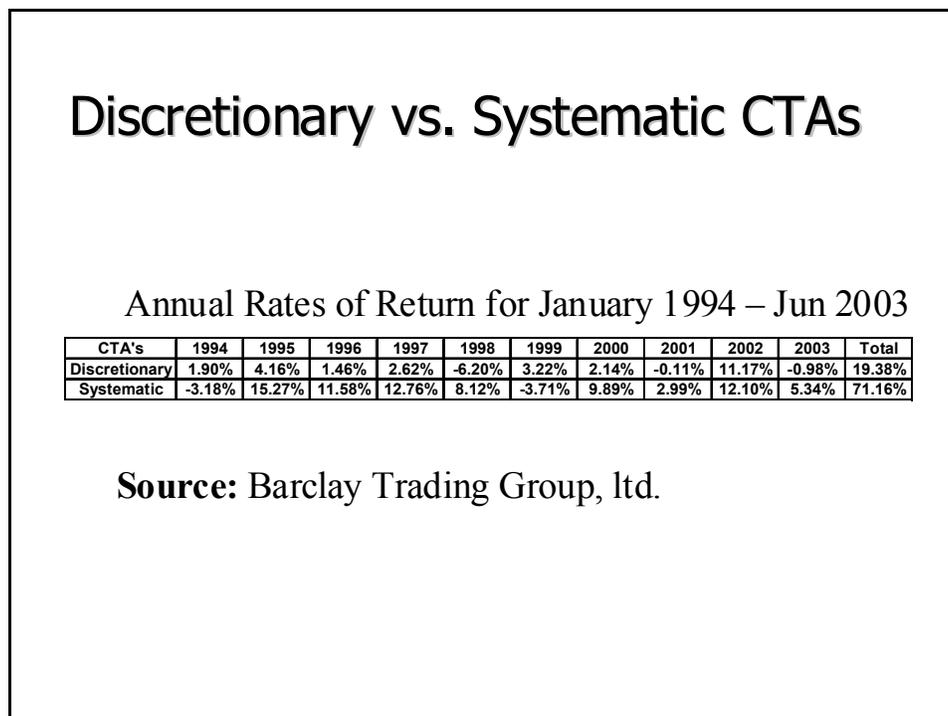


Figure 3. CTA Performance vs. Trading Approach

When I first started developing trading systems (over 14 years ago) it was very evident that there were many brilliant people involved in trading who understood the many aspects of the markets. It was also quite evident that there were many people who understood technology, mathematics, artificial intelligence, financial engineering and other disciplines. Unfortunately, there was also a lack of individuals who possess both sets of disciplines and skills. One element I worked very diligently at was to be able to simply talk to people about their trading approach then go and immediately write code embedding the essence of their "brain based" trading rules into mechanical rule structures. I would then test these rules and get a sense as to the efficiency of that trading approach. What continues to surprise me is that there remain individuals who can trade quite well looking only at a few indicators (all of which lose money when tested) and at a few prices. Any attempt at coding their trading style, even if they agree that the code is correct, fails miserably. Some good traders simply cannot communicate any rule sets in any form, but they continue to survive as traders. They just "have a feel" for the markets. Recently, these people have been using mechanical trading systems as an adjunct to their style, enhancing what they already had as a skill set in a sort of "hybrid" trading style. In the near future, man will make even more use of machines to assist them in trading

the markets. To be without algorithms in the future when trading the markets will be like riding a motorcycle without a helmet.

After creating, studying and testing thousands of trading systems many fundamental-technical aspects of markets have become evident to me. This understanding of the "blocking and tackling" of trading system is critical to the system developer. What works in the YEN will not work on the S&P and knowledge of these facts and relationships are central to developing the correct code. Many, many trading systems litter the alleys around Wall Street and the Chicago exchanges, written by well intentioned system developers who made several fatal errors along the way in their system's development. After many years of actually trading my own systems with my own hard earned money the main elements of trading system blocking and tackling have rung through loud and clear. There is no "magic black box" or "hidden underlying order" to the markets. No one should "guarantee" that any system, methodology, technique, program, or training school will produce riches beyond your wildest dreams, although some still do. What trading systems do for you that no other technique will do as well, is to control your emotion, focus your energy and allow you to be a "Master Monitor" of your "Soldiers of Trading" as you go about applying an already well tested, well developed mechanical trading system.

There is no subjectivity when using a mechanical trading system. There are no variations of methodologies, no interpretation of signals, no fuzzy or gray areas to enter and exit a trade. While "Trading Methodologies" may have many interpretations making learning of the approach difficult and the implementation even more difficult, a mechanical trading system has a much lower learning curve and presents to the user only pure and clear signals. The purely mechanical trading system will tell you precisely what to buy or sell, when to buy or sell and when to exit the market. Of course, mechanical systems must be robust, that is, they must continue to perform outside of the development or "back-test" window.

This "forward-walk, acid test" is what further separates the mechanical system from the discretionary or non-mechanical methodology in that a mechanical system will have repeatable signals produced exactly the same way, whereas the discretionary methodology will sometimes enter the market this way and other times enter the market that way. Methodology advocates are quick to state that trading systems must take losses along the way. This is very true since no approach is 100% accurate. If the much-touted "methodology" was robust, then why not code rules around it and then create a mechanical system out of the methodological rules and test them to see if they really work.

**IF YOU THINK IT WORKS, THEN WHY NOT CODE IT AND TEST IT!**

There is no doubt in my mind that mechanical systems work best. Being an engineer, I even go as far as to say that the successful discretionary traders actually have mechanical systems. They just have not taken the time to program their "real" thought process. If you watch successful traders, they invariably trade using a much disciplined, methodical approach. No one consistently takes money out of the markets without doing his or her daily homework. This is one of the most obvious differences between winners and losers.

Doing one's homework every single day is part of a mechanical system. Every winning trader I have ever met has had a repeatable routine that he or she follows before each trading session. Some are so ritualistic you would compare them to a bullfighter preparing to enter the ring. Others will only trade a

certain times of the day or only respond to specific technical patterns, like trading breakouts or reversal chart patterns.

Much research has and is being done on how the brain functions. Researches are learning that much of what we do and how we act is based on neural pathways that are hard to reprogram once established and that is possible to rebuild them after a serious accident. Being an engineer, I think traders' minds work the same way. Trading patterns, which I think of as mechanical trading systems, are imprinted on the brain. My point is simply that consistency and repeated behavioral patterns are critical to successful trading in my opinion, no matter how it is achieved.

#### IV. THE HISTORY OF BIG BLUE

In early 1996, Vilar Kelly approached me regarding a re-programming consulting project of a day trading system called Trophy. My task was to convert the existing program into a DOS based non-real time trading system, which issued only signals and no back-testing capabilities. The effort seemed straightforward enough so I agreed and completed the project in short order. Shortly after that Vilar indicated to me that he had another system he needed help improving and updating since it was just not working as well as it did in the past. The name of that system was called DayCare and it was an S&P intraday system using simple 1 pattern, retracement logic and no adaptive rule sets. After testing and evaluating the system I concluded that although I could re-write the system and improve it considerably, it would not look at all like the original DayCare system. Vilar agreed to allow me to basically start over with a blank slate and gave me free reign to develop any system approach that had sense and kept the basic premise of the DayCare system intact. At the time I was deep into the development of my own day trading systems and had a large set of rules that looked interesting. This was an excellent chance to try out these new rules while building improvements on an existing system.

The original Big Blue system was partly based on the intraday pivot point calculation so my first goal was to keep this original equation set intact. Daycare used a fixed retracement level in its single pattern so finding an adaptive solution that would enhance the future robustness of the system was a goal. Additionally, a second pattern would have to be added to provide for a smoother equity curve and more diversified rule set. Further volatility filters would need to be added to allow the system to adapt to the ever-changing index markets.

The original Big Blue system was written to be a top 10 trading system. That is to say, I wrote it to compete with the top 10 S&P day trading systems currently tracked by "Futures Truth". Due to its simple 2-pattern approach, I would have been very happy to see it ranked #8 or #9 out of all the S&P day trading tracked by "Futures Truth" and in the top 50 or so out of all the systems tracked by "Futures Truth". Big Blue was originally released in August of 1996.

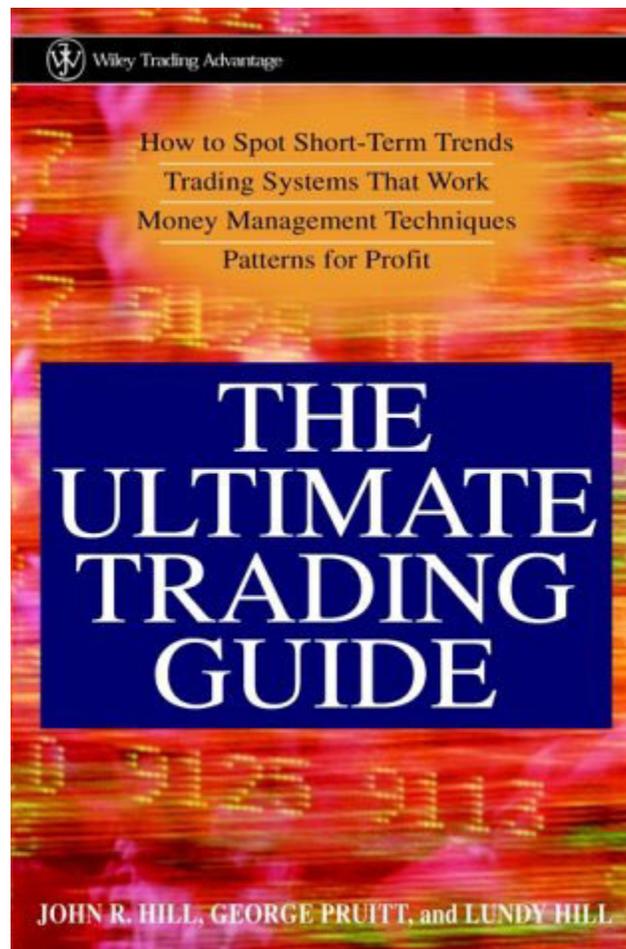
At its peak, the original Big Blue trading system was ranked as followed by "Futures Truth":

- The #3 day trading system (Feb/Mar 1998) since release date (release date more than 18 months prior) out of ALL the day trading systems tracked.
- The #4 trading system (Feb/Mar 1998) since release date out of ALL the systems tracked.
- The #10 in its prior year (Jan 1997-Jan 1998) performance out of ALL the Trading systems in ALL markets tracked.

John Hill, George Pruitt and Lundy Hill added the Big Blue to their Top Ten Systems of All Time in their book "The Ultimate Trading Guide" published by John Wiley and Sons in 2000. The robustness of adaptive systems was made very clear with this success in "out of sample" testing of this new system. Remember that "Futures Truth" does not report actual trading results, but out of sample results, or "forward walk" hypothetical testing over data that neither the developer nor the trading system have been exposed to. A poor system usually fails very soon after exposure to new "un-seen" data in forward walk testing and that point has become and still remains painfully obvious to numerous system developers. Armed with the success of the original Big Blue Trading System, it

was my intention to enhance an already good system with newer, yet still simple, analytics capable of being competitive in this difficult trading market.

Thus this effort towards the development of the Big Blue-2 trading system began. This manual is not intended to be for programmers. It is not intended for a user to be able to trade the Big Blue-2 trading system by performing manual calculations derived from this manual. The logic, rule sets and calculations are too complex to be able to be accomplished without the aid of a computer. The Big Blue-2 trading system has been programmed into the TradeStation™ platform and has been made available to an experienced brokerage firm operating a system assist department.



*Illustration of the cover of "The Ultimate Trading Guide"*

## V. INTRODUCTION TO INTRADAY TRADING

Since the Big Blue-2 trading system is a day trading system, you should have a sound understand of day trading, especially if you are not familiar with the concept. In the late 1990's day trading received a lot of notoriety due to its popularity just before the market for tech stocks disintegrated. For a while, day traders executed more daily volume than institutional investors. That made the headlines.

Nevertheless, day trading was not a new phenomenon by any stretch of the imagination. It actually dates back at least 200 years to the early days of exchange traded stocks.

The primmer stock exchange in the United States, and the world for that matter, is the New York Stock Exchange. Founded in 1792, it was the second exchange in the United States; the Philadelphia Exchange opened a year earlier. In the beginning all the exchanges were listed exchanges, meaning all the companies whose stock was to be traded on the exchange had to go through a listing process. That process was to establish the firm's financial soundness, so the members of the exchange and the general public investing in those businesses would a certain amount of protection. For example, to become listed a company has to have a market value of its publicly traded stock of over \$18 million, over a million shares in the hands of the public, over 2,000 shareholders with over 100 shares a piece, and income for income tax purposes must be over \$2.5 million.

Listed exchanges use a specialist system and this is where day trading first started. The stock of each firm had a specialist responsible for creating a fair and equitable market in that stock. To accomplish that goal, the specialists are granted substantial powers, which are:

- Determining the opening and closing prices
- Delay the opening if the market is disorderly
- Halt trading if major supply-demand imbalances occur
- Trade for his or her personal account
- Trade for special accounts of clients or relatives
- Trade the stock out of supply-demand imbalances
- Buy and sell from his or her personal inventory of stock

Basically, the specialist is the policeman on the floor of the exchange and is placed there to maintain an orderly market. Every trade goes through the specialist hands and every filled or unfilled order appears on the special's book of trades (now a computer). This gives the specialist great power to influence the market and profit from it. If you are trading the stock, it is like playing poker where one of the players has access to the cards in all the other players' hands.

Do you think you could make money in the stock market knowing the intentions of every one and every institution trading a specific stock? It must be a good business because it is almost impossible to become a specialist unless you inherit the position from a family member. Unfortunately, like other types of policeman, many of the specialists have abused their trust. It has long been one of the dirty little secrets of Wall Street that specialist traded ahead of customers to profit from run-ups or to dump their stock when negative news hits the floor. These abuses are finally coming to a head. Hopefully, some of the corruption will be corrected.

From just about the beginning of exchange trading, the specialists were day traders. Knowing the risk of overnight news that can substantially affect the price of their stock, the specialists prefer to be flat at the end of each day.

There have also been other types of day traders around for quite a while. There is what is known as the two-dollar broker. That is an independent floor trader. These brokers trade for many of the smaller brokerage firms that cannot afford a booth on the floor of the major exchanges. Since these traders have a good feel for the flow of the market, they often day trade for their own account. This type of trading is often referred to a scalping and is prevalent on both stock and futures exchanges. Scalpers look for short-term imbalances in prices and attempt to take advantage of them.

Another type of day trader that existed long before the general public type day trader became fashionable is the professional day trader. Let's make a distinction between the professional working for a brokerage firm and the retail day trader who is a client of a brokerage firm. Technically, the retail day trader could be making a living trading and therefore be considered by some to be a professional. But the day trader working for a brokerage firm still has some advantages over his or her retail counterpart. The advantages of the professional are usually better equipment, support, information, financing, more leverage and training.

The professionals work for broker-dealers that maintain their own trading floor or are market makers. I'll get to the market making in a second, when I discuss the OTC markets. The professional day traders have been with us just about as long as the exchanges. Once brokerage firms realized that they had a distinct advantage over all outsiders, they began trading for themselves. Outsiders became known as "dumb money". They, of course, were the "smart money". And that is how it always has been.

The listed exchanges, NYSE, the American Stock Exchange, Philadelphia, the other regional exchanges, and most of the futures exchanges, are open outcry markets. The means that floor traders gather in a "crowd" around the booth (a pit in the case of futures exchanges) on the floor of the exchanges and call out their orders, which are fill or entered into the book of the specialist running that booth. There is another type of exchange, which is more day trader friendly. It is the screen-based exchanges, like NASDAQ. Where the floor-based changes are open outcry, the screen-based exchanges have buying and selling done by negotiation. Negotiated transfer of stock actually predates the exchanges and was the original way stocks were bought and sold. It is known as the over-the-counter (OTC), since the customer went to the brokerage firm and bought or sold over the firm's counter.

As volume increased, brokerage firms looked for a clearinghouse for the most actively traded stocks, which expedite the creation of the listed exchanges. But there were still a great number of stocks that needed a market that did not qualify for listing on any of the existing exchanges. These stocks were bought and sold via the trading desk at brokerage firms via telephone. As the volume grew, a better method was needed to discover price and display the supply-demand situation.

That better method, of course, was National Association of Security Dealers Automated Quotation (NASDAQ) service. It began quoting prices for all those second tier stocks, many of which out paced the ones on the big board. Besides just quoting prices, NASDAQ also handled the execution of orders. Since it had

no floor, the specialist system was not feasible. In its place, NASDAQ established the market maker system. Brokerage firms became market makers for groups of specific stocks. By accepting the responsibility of becoming a market maker, the brokerage firms agreed to maintain a two-sided market in certain stocks. This means they always had both bids (buys) and asks (sells) prices in the market (posted on the NASDAQ quote screen). If they really wanted to buy, the bid price would be competitive. If they wanted to sell, the ask price would be attractive. If not, the bid or ask price would be out of the market. Stocks, that don't qualify for NASDAQ, are generally classified a pink sheet or penny stocks.

In the NASDAQ, the market makers replaced the specialist. But they did not have all the advantages of their counterpart. A market maker in a specific firm naturally knew all of the buy and sell orders in his firm, since he was the person who executed them. But he or she did not know what any of the other market makers had on their books and there are at least five market makers for each stock. The very active stocks, like Intel, Cisco, Lucent, etc., had dozens of firms ready, willing and able to act as market makers for them.

This creates a situation where many market makers are competing against one another to buy or sell stock for themselves and their customers. This is generally what gave the NASDAQ the reputation of being more volatile than the listed exchanges, which had an omniscient police force (the specialists).

The real excitement began when the retail day trader appeared on the scene, and it took some major changes in the security's industry and technology to make that possible. The industry, as you might have guessed, fought every move that even appeared to attempt to level the playing field for retail customers. They had access to a private feeding ground for two centuries and did not want to give it up.

One of the first holes in the dike occurred on May 1, 1975. This is called Mayday in the industry because for the first time customers could negotiate their commission. Prior to that, commissions were fixed, often as high as \$200 a round turn. No one could day trade at those prices. Institutional traders, specifically large portfolio managers, instigated this change. These guys were executing large block trades of 10,000 shares or more at a time. They had to get their transaction costs down and they did.

The next big event was the Crash of 1987. The DOW dropped 500 points in a single day. Thousands and thousands of retail customers tried to run for cover and exit the market. Phone lines to brokerage firms were jammed, calls were blocked. Some brokers took their phones off the hook and gave up in despair of being able to accommodate the stampede. Other just went home early. The outcry of customers who could not get serviced that day was monumental. In time the Security and Exchange Commission was forced to give retail customers a method of access the market directly.

Some enterprising software developers began modifying order entry programs being used by brokerage firms to be user friendly enough for the use by retail customers. They built into these systems the ability for the retail trader to see NASDAQ's Level 2 page. The NASDAQ system has three levels:

1. Level 1 shows the inside market or the best bid and ask price
2. Level 2 shows all the other bids and asks below the inside market with volume
3. Level 3 allows market makers of update their bid and ask prices

For the first time, retail customers could see the depth of the market. By learning to read the momentum of the Level 2 screen, retail traders could identify the "Ax" or lead market maker at any given time. The ax often drives the market up or down depending on its need to acquire or dispose of stock. Fledgling day trader could "follow the ax" by piggy-backing on its moves and make easy profits—or at least that is the way it was sold to them.

At the same time some the mountains, built by the security's industry on the playing field, were being leveled, at least a little. The personal computer industry was making incredible strides in developing machines powerful enough to accommodate retail day trading. It seemed like all of a sudden, online trading was a reality. To assist these new online stock jockeys, a wealth of online services providing information, trading advice and education also materialized.

When the term online is used in regards to stock or futures trading, a distinction between online brokerage services and direct access trading needs to be established. The classic online brokerage service is a glorified email service. Traders email their orders to a processing facility that either sells the order flow to a wholesale broker, or broker's broker who fills the order out of its inventory or the retail order is relayed to an ECN or exchange for execution.

The direct access trader (DAT) is a whole different animal. The DAT trader becomes his or her own financial advisor and order desk clerk. The DAT trader makes all his or her own trading decision (symbol, quantity, size, side), enters the order and tracks the progress. If adjustments need to be made, such as changing the type of order from limit to market or the quantity has to be raised or lower or the order canceled before execution, it is all his or her decision and responsibility. The brokerage firm backs up the retail trader by providing accounting and order clearing, but the primary trading responsibility belongs to the trader. This is a massive shift from the good old days.

An ECN, by the way, is an electronic communication network, which acts as an order matching system. Anyone wishing to buy or sell a stock can send his or her order to an ECN and, if the ECN has an offsetting order in its book, the order is filled. If not, it can add the new order to its book or go out and seek an offsetting match from another ECN or relay it to the appropriate exchange for execution. With many very actively traded stocks, like DELL, fills can take place in nanoseconds.

By the mid 1990's, everything was in place:

- Commissions were down to \$15-\$20 a side and even lower
- ECNs were ready for business
- Personal computers were cheap and powerful
- Telecommunications bandwidth was plentiful
- Software became competitive, even free with enough trades per month
- Too much information was within a few key strokes
- And the stock market, particularly the tech sector, was on fire

By the first quarter of 2000, online brokerage firms had 15,000,000 stock trading accounts holding over \$1 trillion in assets. Online trading outpaced institutional trading and accounted of over a third of combined volume of the NYSE and NASDAQ combined. What about futures day-trader? Let's talk about them now.

## VI. INTRODUCTION TO FUTURES DAY TRADING

Much of what has been covered so far regarding trading and day trading the stock market also applies to futures trading, but there are some very important differences you need to understand. The first is that futures contracts are called derivatives. The futures contracts derive their price and volatility from what is called the underlying entity. The Big Blue-2 trading system trades the S&P 500 Futures Contract. The S&P Futures Contract attempts to anticipate the price of the S&P 500 Index Cash Contract at some time in the future, specifically the expiration date of the contract. S&P futures contracts expire quarterly (March, June, September and December). Multiple forward futures contracts are continuously traded so whenever a contract expires, trading is "rolled over" to the next contract. The heaviest trading and the most liquidity are usually in the nearby contract, which is the one to expire next. Price discovery and volatility levels of the stock market normally occur first in the futures market, since it structured to project what the stock market will be priced at sometime in the future.

Fundamentally, futures contracts are hedging tools, having a history dating back hundreds of years. In the merry old England of the middle Ages, there was a flourishing futures market in wool and wheat. Physical commodities, like grains, cattle, coffee, sugar, cotton, etc., have an innate problem regarding their production. For example, harvest occurs once a year. At that time there is normally too much production, causing prices to collapse. Later in the year, there can be a shortage, sending prices into orbit. The producers cannot manage financially with this feast and famine seasonality. In addition, storage is often a problem which affects price. Wheat, corn and barley merchants came up with the idea of staggering the delivery of these commodities over the year and making partial payments to farmers in advance. Thus the payment and flow of the commodities stabilized somewhat. These agreements were known as forward contracts.

The merchants who owned these forward contracts began speculating among themselves by buying and selling the contracts. If the planting season was wet or the summer too dry, prices of the forward contract soared. When weather cooperated, down the tube went the prices. Next thing you know, there was a futures market and farmers learned to participate by selling a portion of their crop on this market when prices were high. Then they would deliver cash grain against that futures contract. When they had sold a futures contract to cover their cash entity, they were hedged. The risk of producing the crop was passed to the owner of the futures contract.

To make this work, it was very important to set standards for the product so that each contract represented a specific amount and quality of the underlying entity. For example, a contract of corn specifies the amount (5000 bushels), the quality (moisture content + kernel quality) and storage location (bonded facility approved by the exchange). Thus each contract is interchangeable or fungible. Obviously, this is a simple thing with the financial futures contracts, a T-bill is a T-bill. For the S&P Futures Index, it is possible to buy during regular trading hours on the floor of the exchange and offset the position after trading hours on the Globex electronic exchange. I'll explain Globex in more detail shortly.

The idea of passing the risk of ownership or price fluctuation to speculators became very popular. Commercial users of grains or metals can lock in prices a year in advance and eliminate one important variable of their business. Pension funds, brokerage firms, banks, etc. can protect stock portfolios from negative

movements of the stock market. The uses of futures as a hedging tool are endless.

The vortex of modern futures trading is Chicago, Illinois. It is in the center of hundreds of thousands of acres of excellent farmland, plus it has excellent transportation capabilities. The Chicago Board of Trade (the Board) was opened in 1848 and the forerunner of the Chicago Mercantile Exchange (The Merc) in 1874.

Next came some creativity on the part of the exchanges. If the risk of ownership of physical commodities can be hedged, why not hedge the risk of owning financial entities? The Merc began trading currencies in 1972. The Board followed in 1975 with interest rate futures. The Merc countered in the same year with T-bills. So the Board started trading T-bond futures two years later. This competition continues to today and you can trade or hedge just anything from disaster insurance to shrimp with futures contracts.

Let's look a little closer the futures contract to be traded by Big Blue-2, which is based on the Standard & Poor's 500 stock index. The index is comprised of approximately 400 industrials stocks, 20 transportation stocks, and 40 each of financial and utility stocks. These are not necessarily the largest 500 companies, but rather the most widely held. Plus consideration is also given to market size, liquidity and how well the company reflects its market sector. The purpose of this index is to provide a much broader coverage of the NYSE than the 30 stocks of the Dow Jones Industrial Averages. About 20 to 30 stocks change each year to keep the index reflective of the overall stock market.

The S&P 500 Index is the underlying entity of the S&P Futures Contract. The S&P 500 Index is a weighted index meaning that each stock's weight in the index is proportionate to that stocks market value. The futures contract value takes into account the risk free interest rate and the days to contract expiration to come up with a theoretical value for the futures. The contract value of the S&P futures contract is calculated by multiplying \$250 times the underlying index price. Futures contracts are highly leveraged. If you bought the index as shares of stock in a margin account, your leverage would be only 50% or 2:1, with the normal brokerage margin and would always subject to change. By buying futures contracts, the amount of leverage would be much higher and would vary by the price of the index. For example:

S&P Price	Contract Price	Margin Money	Leverage
\$1100	\$275,000	\$20,000	13.75:1

If the index goes up to 1200, the leverage increases to 15:1. Of course, if the index drops to 1000, then leverage becomes 12.5:1. The margin requirement can also fluctuate. It is set and reviewed daily by the Margin Committee of the exchange the futures contract is trading on, the Merc in this case, and adjusted depending on market conditions.

Some traders, particularly retail traders, cannot afford the initial margin requirement of the S&P 500 futures contract. For this reason, a smaller contract, named the E-mini S&P 500, was develop. Its initial margin is only \$4000 at the time of this writing. This contract is one-fifth the size of the full size contract or \$50 times the index trading price. Using the example above, the leverage of an E-mini would be the same ( $\$50 \times \$1100 / \$4000$ ) as the full size contract. The E-mini has become extremely popular with open interest of over 500,000 contracts, and its total liquidity (open interest times the

value of the contract) is only slightly less than that of the full size S&P contract. Open interest is the number of contracts being traded that have not been offset and is a good measure of liquidity. In other words, both contracts are very liquid.

The commodity exchanges, like The Merc and The Board, are floor based, meaning they have a physical trading floor divided into trading pits, one for each commodity or futures contract traded. Floor traders circulate in the pits buying and sell contracts. Orders from customers are signaled into the pits by staff on the sidelines, who have received the orders from brokers in the field via telephone or other electronic means.

The Merc also has an electronic exchange, call Globex. Generally speaking, the Globex exchange is open when the floor sessions are closed allowing virtually 24 hour a day trading. The flagship contracts on this system are Eurodollar, S&P 500 and the NASDAQ-100 indexes. The E-mini, introduced in 1997, trades only on Globex and is one of the fastest growing contracts of all-time. Globex gives the world's traders, no matter what time zone they are in, access to the futures markets.

Day trading is common in the most actively traded commodities and the most active months, which are the nearby. As a contract approaches expiration, trading activity increases. If someone is long a contract or contracts, that person must do one of three things before it expires, i.e., offset the contract, rollover the contract over into a deferred month or prepare to take delivery. Rollover simply means offset the contract owned and acquire another on the same side of the market (long or short). Very few contracts are taken to delivery. The only traders that take delivery are usually true hedgers, who have bought a long contract and will use the entity in their business. Baking companies buy wheat; jewelers buy gold and silver; refiners buy oil, etc., etc.

Since everyone has to get out of their positions at or before expiration, this is normally the time of the most liquidity and volatility. In other words, it is a day traders' paradise. The futures market is also very responsive to the various government reports, making the time before or after the release volatile or an active trading period. And, there are the floor price police, the scalpers, who day trade all session long in the active pits when ever prices get out of line, never taking a position home.

Which futures contract to day trade is a key question. As you know, the key ingredients are volatility and liquidity. You must trade a futures contract whose daily trading range is large enough to give you a decent profit after commissions, keeping in mind that it is rare that any trade will catch the entire move. Most systems, including Big Blue-2, trigger as a move begins and exit slightly after it stops, pauses or reverses--catching sometimes 60%, 70% or more of the move. It is also obvious that there must be enough trading activity allowing you to enter and exit trades quickly with good fills. The S&P 500 futures contract satisfies these two criteria.

Discretionary stock day-traders are very different from Systematic futures day-traders. The term "day trading" conjures up thoughts of traders attempting to scalp a few ticks out the market on each of many trades throughout the day. The sad truth is that most traders attempting to trade in this manner lose money and eventually blow out of trading. In an interview for a book entitled "Day Trading on the Edge", Don Bright, an experienced floor trader, day trader and founder of Bright Trading, stated the "99 percent of today's traders will not

make it." It is important to understand why and what it takes to be a successful daytrader.

Humans generally do not make very good traders and in day trading the situation becomes even more difficult due to the increased complexity involved in day trading. Ask a broker you trust at a direct access firm what the longevity of traders are at his or her firm for both the trading systems clients, including day trading system clients, compared to the discretionary clients who are trading without a trading system. Mechanical day trading systems trade at a frequency of usually less than one trade per day. Higher trading frequencies result in lower average trades, higher drawdown and reduced overall profits. It is easy to develop a day trading system that makes a lot of money in a hypothetical back-test over only a few years. This is known as curve fitting and the results of these systems moving forward are dismal.

The Big Blue-2 trading system averages about 2 trades per week, a nominal number for most day trading systems I have developed. As is the case with all day trading, there are no positions held overnight. All trades are exited at the end of the regular trading hours (RTH) session. There are also no entries made during pre-market hours or GLOBEX session hours. Note that trading twice per week means that you are normally exposed to the market for no more than about 15 hours per week.

For the Chicago Mercantile Exchange, the full size S&P market trades from 9:30am ET (8:30am CT) to 4:15 ET (3:15 CT). When trading the e-Mini S&P contract, all trades will also be accomplished during RTH as well. If Big Blue-2 is applied to the DOW or NASDAQ futures, all trading will be done also during RTH. Big Blue-2 uses several types of market orders including stops, limits, market-on-close (MOC) and MOC-OCO (one cancels the other) type orders. Your broker may allow you to use a portion of your account to purchase interest-bearing securities like T-Bills. All trading within this manual is assumed to be in the Full Size S&P futures contract unless otherwise stated.

In order to successfully day trade, the futures markets there has to be sufficient movement during the day to result in a profit after slippage and commission is factored into the trading. Mechanical systems usually capture only a fraction of the total intraday movement of a market. Therefore, the total intraday movement must be several times the expected average trade of the trading system, which must be more than sufficient to cover slippage and commission. Currencies, T-Bonds, Grains, Softs, Metals, etc. simply do not have the intraday movement necessary to produce a profit in the day trading environment.

The only markets that I have found suitable for day trading are the indices like the full size S&P 500 futures contract and the full size NASDAQ futures contract. The e-Mini futures contracts are a good choice as well; however, commissions must be kept low enough to justify trading more contracts to realize the same leverage as is available in the full size contracts. Additionally there is a trade off between slippage due to the sometimes lack of liquidity in the full size S&P contract verses the larger minimum tick size of the e-Mini S&P, its higher volume and potentially lowered slippage.

VII. INTRADAY PRICE PATTERNS

Financial markets are generally fractal in nature. That is to say that at various resolutions, one cannot tell a daily chart from an intraday chart if the horizontal axis (time scale) is not shown. There is, however, more information in intraday charts that is not present in longer-term charts. For example, intraday movement throughout the S&P futures trading day is dependent on the trading day of week. Figure 4 shows the movement off of the days opening price normalized to yesterday's range and given as a percent of yesterday's range. Clearly Mondays and Wednesdays have the greatest up movement as a percentage of yesterday's range. Fridays have the greatest down movement. Tuesdays and Thursdays are somewhere in between. On Fridays, note that most of the movement occurs in the mornings and afternoon with flat, directionless trading midday. For this study, approximately 17 years of intraday data was analyzed consisting of, for example, 886 Mondays. Other sample counts are shown in the graph legends.

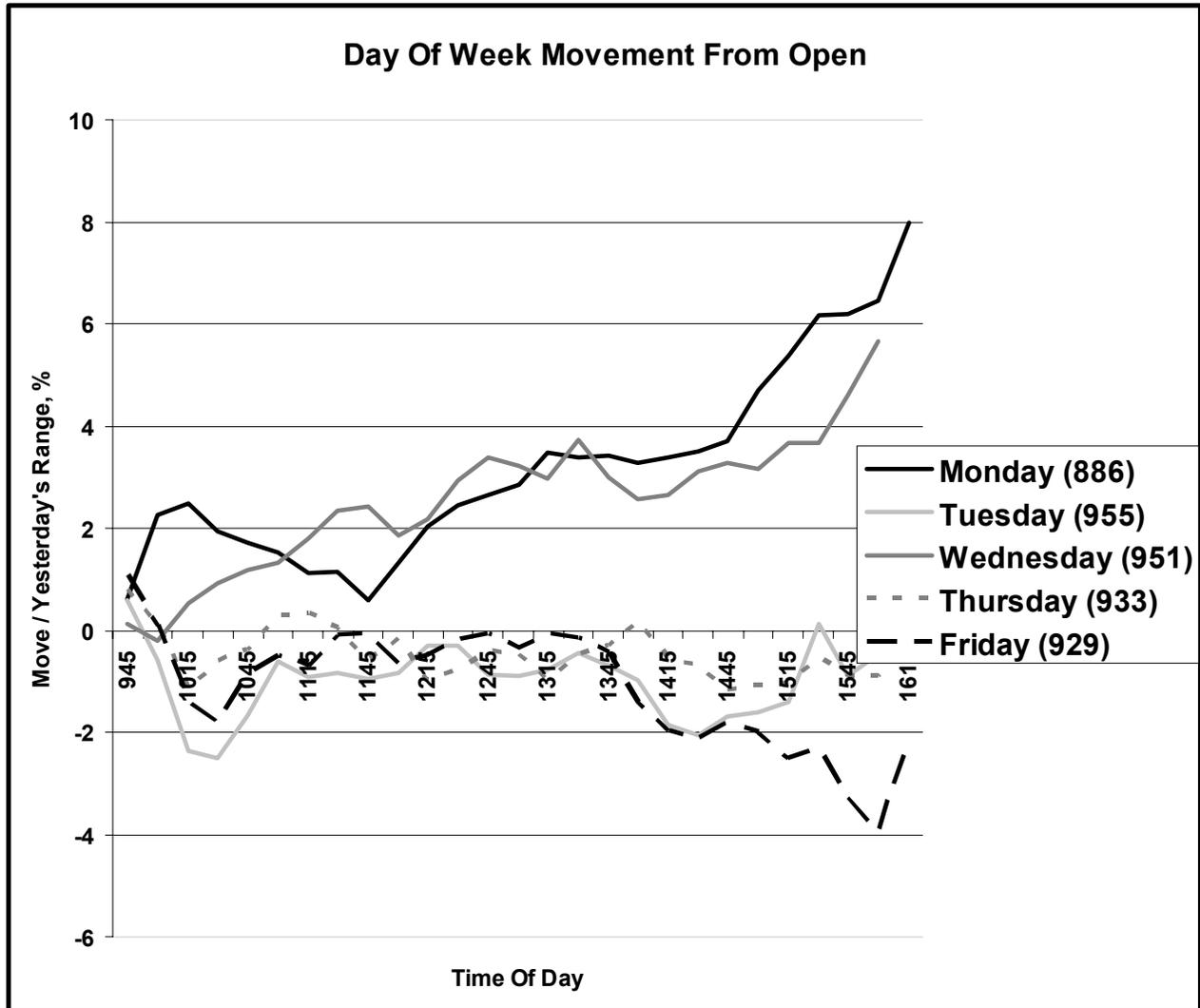


Figure 4. Day of Week Intraday Movements

Note what happens when a simple volatility filter is added to this study in Figure 5. That filter looks at the 4-day and the 8-day maximum high and low, takes the ratio and looks at only those days whose most recent volatility ratio is narrow, that is, less than 40%. New patterns emerge in this new data set. For example, Mondays have a clearly established low occurring at about 1145 ET, with Wednesdays turning out to be the dominant upward trending day of week. Tuesdays and Fridays turn in an early morning low as well with Thursdays remaining directionless. In this study, following the filter application, 216 Mondays remain with other day frequencies as shown in the graph label.

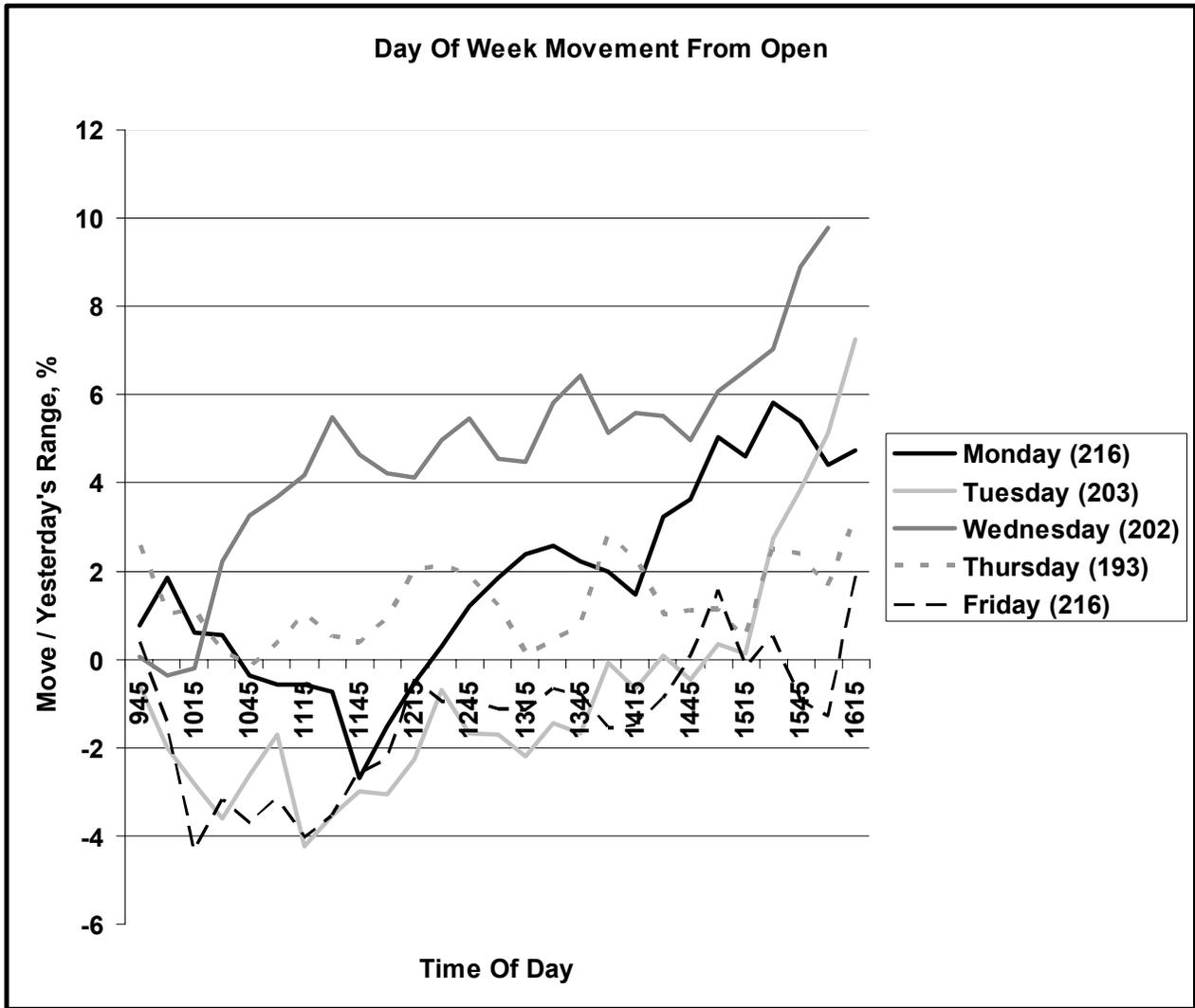


Figure 5. Day of Week Intraday Movements with Volatility Filter

Continuing in this manner we can apply various filters to the complete set of intraday data available with hundreds of example days that have clearly defined movement statistics. We need, however, to identify several key basic patterns to begin to write our trading system code. We will use 4 primary patterns in the

BigBlue-2 trading system. Note that the original Big Blue trading system made use of only 2 patterns: a counter-trend pattern and a breakout pattern. If a trading system has multiple patterns embedded in it a degree of diversification occurs similar to trading multiple systems in the same account. When one pattern (or system) is in a drawdown, other patterns (or systems), hopefully, will be in a profitable mode. Simply adding several systems or patterns together is not enough, however. You cannot make a good portfolio of systems or patterns out of bad systems or patterns. The combined portfolio of systems must consist of robust systems to begin with.

#### **THE 4 BASIC BIG BLUE-2 INTRADAY PATTERNS**

##### 1. The Pivot Counter-Trend Pattern

In the basic Pivot Counter-Trend Pattern, prices begin a move in one direction, then reverse and trend in the other direction. The trader watches for movements through the Support or Resistance Pivot Points, then sets a stop on the other side of the Pivot point which will either be filled sometime during the day or canceled Market-on-Close (MOC).

##### 2. The Cluster Counter-Trend Pattern:

This pattern is shaped like a check mark or an inverted check mark. In the buy scenario, the market is seen to move lower in the morning, reverse, and then rally into the close. In the sell scenario, an early morning market rally fizzles and the market moves lower into the close. Although there are many variations to this pattern, this basic scenario will be used as one of our primary patterns. This pattern will be based on an analysis of price clusters. This pattern will enter on a limit order.

##### 3. The Breakout Pattern:

In this scenario, the market moves strongly in either direction and finishes near its low or high of the day. This is the classical trend day with the market putting in a large move either up or down. This pattern will enter on a stop order.

##### 4. The Extreme Pivot Counter-Trend Pattern

Large moves in one direction sometimes follow large moves in the opposite direction, so the Extreme Pivot Counter-Trend Pattern looks for a large move through a second level Pivot Level, then places a stop order on the other side of this Pivot Level and this stop either will be filled, or will be canceled MOC.

These four patterns must work together in the full system and must not result in conflicting signals. Entering on both limit orders and stop orders can be complex since both a stop order above the market and a limit order below the market may exist at the same time. Of course all of these 4 entries filled during the day will be either stopped out at a loss or the position will be exited MOC. Big Blue-2 does not hold positions over night.

Before discussing these patterns in more detail, filters will be developed and used in the Big Blue-2 system. Filters are very important in the development of any trading system, however filters must be used judiciously, since we can "curve-fit" the data using filters as easily as we can curve fit the parameter set or logic of any trading system and purely curve fitting the data is not desirable.

## VIII. INTRADAY TRADING FILTERS

Filters turn on and off trading through the use of logic switches. Big Blue-2 use of the following types of filters:

1. Time of Day Filters
2. Day of Week Filters
3. Day of Week in Month Filters
4. Month Filters
5. Volatility Filters
6. Over bought/Over sold Filters

Although it is beyond the scope of this manual to go into complete detail regarding every filter, we can add the following information regarding these filters (Individual Patterns are discussed in more detail in the following sections):

1. Time of Day Filters. Intraday volatility is normally high in the morning and high in the evening with a midday lull. Some patterns seem to work well in the morning but not well in the afternoon, so although Time of Day filters may screen out a portion of the day, they will still let the predominant pattern emerge without over filtering the data.

2. Day of Week Filters. After significant testing it has been found that the Pivot Point Counter-Trend Short Pattern did not work well on Fridays, which was a surprise due to the downward bias on most Fridays. In addition, both Long and Short Price Cluster Patterns did not work well on Fridays.

3. Day of Week in Month Filters. Certain days in the month, like Triple-Witching and various report days need to be investigated for use as filters. Some patterns seem to be more sensitive to days of the month than do other patterns.

4. Month Filters. November is a difficult month for many day trading systems I have worked with over the years. This is probably due to holiday periods, end of year tax selling, end of year portfolio rotations, etc. This filter is incorporated as needed. It will reduce the number of trades during November. Other patterns will have month filters applied as needed. For example, during the summer month of July, some patterns do not perform well, perhaps due to lack of a particular type of intraday volatility not being present or being present in too large a quantity or possibly due to many traders being on summer vacation.

5. Volatility Filters. In Chapter VI, a simple intraday filter is applied to the analysis of intraday price movements and we observed a substantial shift in the intraday topology. Looking for current market conditions that facilitate a subsequently applied trading pattern we can create an enhancement to an existing pattern.

6. Over Bought/Over Sold Filters. The classical application of a long pattern to a market that has sold off, or a short pattern to a market that has rallied, is effective. Therefore, over bought/over sold filters will be applied to our patterns as applicable. This will again reduce the trading frequency, but increases the average trade and reduces the drawdown of our hypothetical tests.

## IX. THE PIVOT COUNTER TREND PATTERN

Traders watch a variety of price levels throughout the day. Yesterday's High, Low, Close, Fibonacci levels, Cycle Clusters, Price and Time Clusters and Pivot Points are typical price points often watched by traders. After testing many combinations of levels and price clusters for efficiency when applied to a trading system, pivot point calculations are among the highest profit yielding price levels to develop systems around. Big Blue-2 makes use of both Pivot Point levels and Price Clusters.

### The Pivot Point Calculations

The pivot point calculation results in an infinite series of progressively higher and lower price levels based on an average of yesterday's high, low and close. The calculation is as follows:

$$\begin{aligned}\text{Pivot} &= (\text{High} + \text{Low} + \text{Close})/3 \\ \text{Support} &= 2*\text{Pivot} - \text{Yesterday's High} \\ \text{Resistance} &= 2*\text{Pivot} - \text{Yesterday's Low}\end{aligned}$$

$$\begin{aligned}\text{Lowest Low} &= \text{Pivot} - \text{Resistance} + \text{Support} \\ \text{Highest High} &= \text{Pivot} - \text{Support} + \text{Resistance}\end{aligned}$$

$$\begin{aligned}\text{LL2} &= \text{Pivot} - \text{Highest High} + \text{Lowest Low} \\ \text{HH2} &= \text{Pivot} - \text{Lowest Low} + \text{Highest High}\end{aligned}$$

Note that:

$$\begin{aligned}\text{Resistance} - \text{Support} &= 2*\text{Pivot} - \text{Yesterday's Low} - (2*\text{Pivot} - \text{Yesterday's High}) \\ &= \text{Yesterday's High} - \text{Yesterday's Low} \\ &= \text{Yesterday's Range.}\end{aligned}$$

$$\text{Highest High} - \text{Lowest Low} = 2*\text{Yesterday's Range}$$

$$\text{HH2} - \text{LL2} = 4*\text{Yesterday's Range}$$

The important area is only the movements around the first 2 levels of support and resistance since movement rarely occurs that is greater than twice yesterday's range.

The Long Pivot Counter-Trend pattern occurs when prices fall down below the pivot by a certain threshold, and then begin to rally higher. A stop is set a certain amount above the Support Pivot Price and will either be filled during certain times of the day or canceled at the end of the trading day. The Short Pivot Counter Trend Pattern occurs when prices rally above the Resistance Pivot Price by a certain amount, and then sell off. A sell stop is placed below the Resistance Pivot Price and is either filled during the day or canceled.

Figure 6 shows a typical trade made on 4/22/2003 for a Pivot Counter Trend Pattern. The pattern entered long in the morning and exited MOC at the end of the day. You may notice that the price scale is not what the S&P 5-00 futures contract was trading at on 4/22/2003. This is because the data I used in this test was carefully created out of back and forward adjusted continuous contract data. The intraday ranges are correct, however and since % price movement is not used in the Big Blue-2 trading System, this is acceptable. The movement during the day is important, not the absolute number of the price at that moment.

On the chart the 5 pivot point levels are displayed. The center line is the pivot point line. The first line above the pivot and the first line below the pivot is the Resistance and Support line respectively. The next levels are the Highest High and the Lowest Low lines.

Figure 7 shows the hypothetical test of the Pivot Counter Trend Pattern from 9/30/1985 to 3/10/2004 with all volatility, time of day and days to avoid filters engaged. This test and all the tests in this guide assume trading using 1 large S&P contract and the point value was set constant at \$250/point throughout the test. There are 989 trades in this single pattern back test. Remember, this is just one of 4 patterns we are developing. Note that there is no slippage or commission applied to this test and the fixed stop loss is set at 5 points.

This pattern trades throughout most of the trading day but avoids some mid-day time periods, avoids all trading in November, and does not go short on Fridays. This pattern must signal the first trade during the day and there must not have been any trades during the day up to the time this trade is activated. This signal exits on a 5 point protective stop or at MOC.

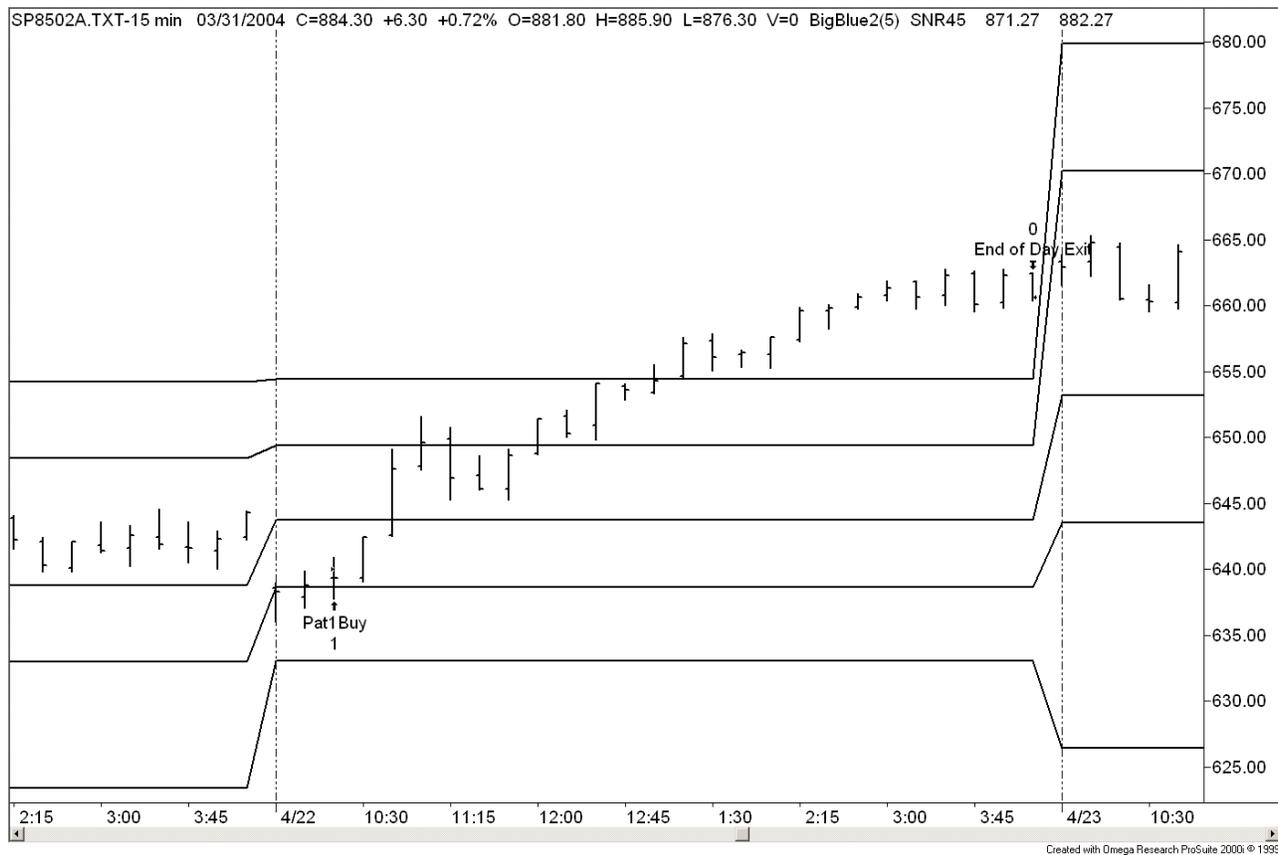


Figure 6. The Pivot Counter Trend Pattern

<b>Performance Summary: All Trades</b>			
Total Net Profit	\$391,450.00	Open position P/L	\$0.00
Gross Profit	\$694,750.00	Gross Loss	(\$303,300.00)
Total # of trades	989	Percent profitable	58.54%
Number winning trades	579	Number losing trades	410
Largest winning trade	\$13,625.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,199.91	Average losing trade	(\$739.76)
Ratio avg win/avg loss	1.62	Avg trade (win & loss)	\$395.80
Max consec. Winners	17	Max consec. losers	7
Avg # bars in winners	15	Avg # bars in losers	11
Max intraday drawdown	(\$9,000.00)		
Profit Factor	2.29	Max # contracts held	1
Account size required	\$9,000.00	Return on account	4349.44%
<b>Performance Summary: Long Trades</b>			
Total Net Profit	\$194,012.50	Open position P/L	\$0.00
Gross Profit	\$353,025.00	Gross Loss	(\$159,012.50)
Total # of trades	503	Percent profitable	61.43%
Number winning trades	309	Number losing trades	194
Largest winning trade	\$13,625.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,142.48	Average losing trade	(\$819.65)
Ratio avg win/avg loss	1.39	Avg trade (win & loss)	\$385.71
Max consec. Winners	9	Max consec. losers	7
Avg # bars in winners	15	Avg # bars in losers	10
Max intraday drawdown	(\$9,225.00)		
Profit Factor	2.22	Max # contracts held	1
Account size required	\$9,225.00	Return on account	2103.12%
<b>Performance Summary: Short Trades</b>			
Total Net Profit	\$197,437.50	Open position P/L	\$0.00
Gross Profit	\$341,725.00	Gross Loss	(\$144,287.50)
Total # of trades	486	Percent profitable	55.56%
Number winning trades	270	Number losing trades	216
Largest winning trade	\$12,100.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,265.65	Average losing trade	(\$668.00)
Ratio avg win/avg loss	1.89	Avg trade (win & loss)	\$406.25
Max consec. Winners	12	Max consec. losers	6
Avg # bars in winners	15	Avg # bars in losers	11
Max intraday drawdown	(\$7,375.00)		
Profit Factor	2.37	Max # contracts held	1
Account size required	\$7,375.00	Return on account	2677.12%

Figure 7. Pivot Counter Trend Pattern Backtest

Please note also that we are showing trades that were profitable. Not all of your trades will be profitable as we have discussed.

The following defines key terms used in all the reports presented in this guide.

Net Profit	Net monies made in this test
Gross Profit	Total monies made on all winning trades
Gross Loss	Total monies made on all losing trades
Total # of Trades	Total number of round turns (entry and exit)
Avg trade (win & loss)	Expected value of the system per trade
Profit Factor	Gross Profit/Gross Loss
Max Intraday Drawdown	The largest equity dip in the test
Account Size Required	Equals the Max Intraday Drawdown
Return on Account	Calculated from Net Profit and Account Size

Note: The Account size required and Return on account is not computed correctly so ignore these numbers. In our trading Big Blue will require a minimum account size of approximately \$35 000 for the large S&P or \$7,000 for the e-Mini S&P, Therefore, the Percent Return on Account would be approximately 1100% over a 19 year period or approximately 58% per year, however the percent per year over the past 5 years has averaged 158% per year, not including slippage and commission for this hypothetical test. Note that the smaller the initial account size, the greater the theoretical drawdown as a percentage of the initial account size. The reason why recent years have resulted in larger returns is due to the fact that in the 80's and early 90's the total daily range of the S&P was just a fraction of what it is today. It is for this reason that short term S&P systems, including day trading systems have become so popular over the past decade. Again, please note that these tests are hypothetical tests and do not include slippage and commission.

## X. THE CLUSTER COUNTER TREND PATTERN

In intraday trading, prices often rally from clusters or prices that occur during the formation of an intermediate term low. Prices are also often seen falling after forming a cluster of prices at an intermediate term high. If the underlying market is becoming weak, often times a rapid move higher will be followed with massive selling which will push prices down as traders sell into strength or buy into weakness.

In order to capitalize on this pattern, the first step is to identify the basic price cluster to be used.

LL = The Lowest Low of the past N bars  
HH = The Highest High of the past N bars.

This trade will be set up by moving a limit entry to go long a certain amount below the LL point and by setting a limit to go short a certain amount above HH. Should the market spike upwards leaving this price cluster, you would be filled on the limit order to go short. Of course, this pattern must distinguish itself from the breakout pattern. A limit-based pattern will lose money in the cases where, for example, a short entry is made in a roaring bull breakout pattern. To avoid this scenario, we will apply this pattern during particular periods of intraday patterns and end of day patterns and with key filtering components engaged.

Figure 8 shows a typical chart for a day that the Cluster Counter Trend Pattern traded.

Figure 9 shows the hypothetical test of the Cluster Counter Trend Pattern from 1985 to 2004 with all volatility, time of day and days to avoid filters engaged. There are 716 trades in this single pattern back-test. Note that there is no slippage or commission applied to this test and the fixed stop loss is set at 5 points. This is the second of 4 patterns we will be including in the overall BigBlue-2 trading system.

The Cluster Counter Trend Pattern will be applied to go long during periods of intraday weakness, avoiding certain times of the day, avoiding recent strong intermediate moves, when intraday volatility is less than daily volatility and will not trade at all on Fridays. Additionally, this pattern will have reduced trading during several months of the year.

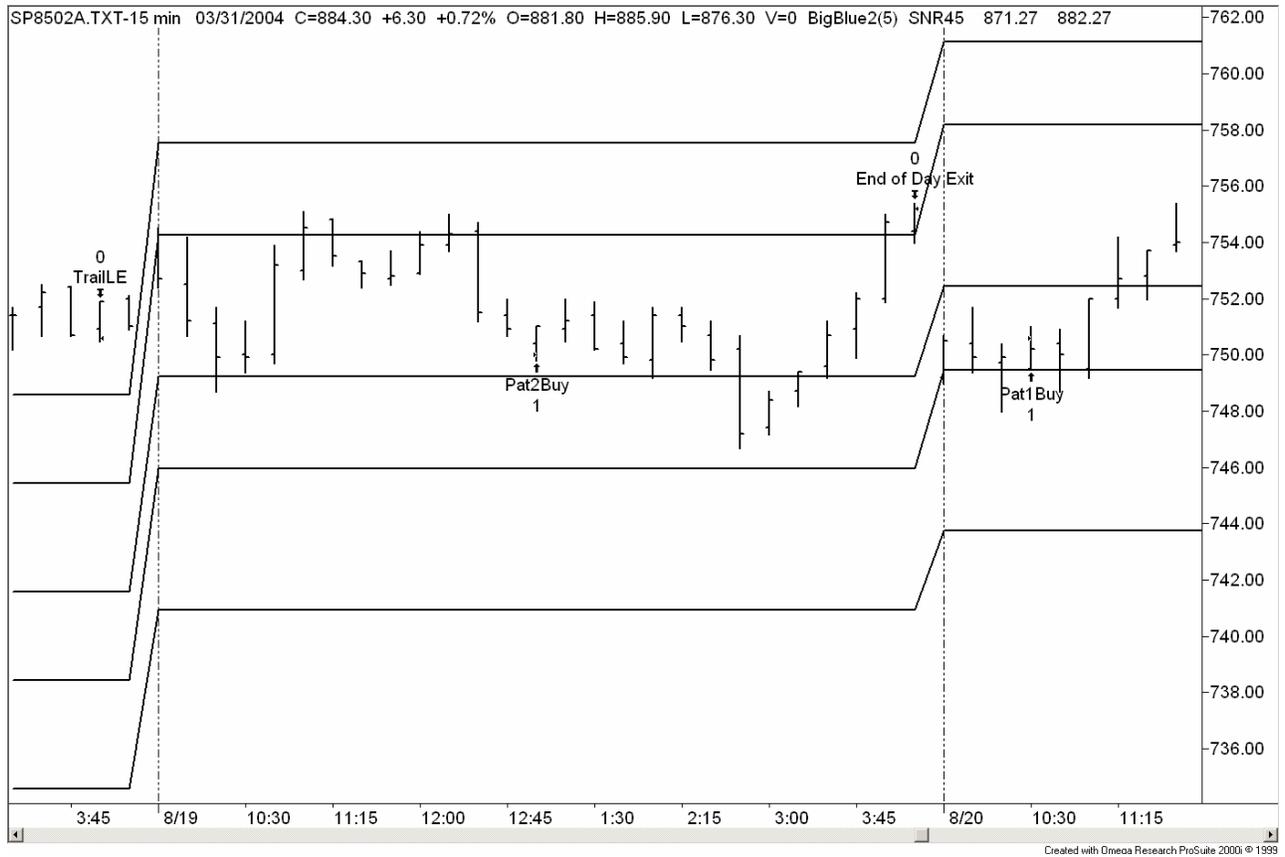


Figure 8. The Cluster Counter Trend Pattern

<b>Performance Summary: All Trades</b>			
Total Net Profit	\$217,262.50	Open position P/L	\$0.00
Gross Profit	\$427,787.50	Gross Loss	(\$210,525.00)
Total # of trades	716	Percent profitable	56.70%
Number winning trades	406	Number losing trades	310
Largest winning trade	\$10,350.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,053.66	Average losing trade	(\$679.11)
Ratio avg win/avg loss	1.55	Avg trade (win & loss)	\$303.44
Max consec. Winners	13	Max consec. losers	7
Avg # bars in winners	12	Avg # bars in losers	10
Max intraday drawdown	(\$9,600.00)		
Profit Factor	2.03	Max # contracts held	1
Account size required	\$9,600.00	Return on account	2263.15%
<b>Performance Summary: Long Trades</b>			
Total Net Profit	\$112,725.00	Open position P/L	\$0.00
Gross Profit	\$205,887.50	Gross Loss	(\$93,162.50)
Total # of trades	332	Percent profitable	61.75%
Number winning trades	205	Number losing trades	127
Largest winning trade	\$5,400.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,004.33	Average losing trade	(\$733.56)
Ratio avg win/avg loss	1.37	Avg trade (win & loss)	\$339.53
Max consec. Winners	10	Max consec. losers	7
Avg # bars in winners	12	Avg # bars in losers	10
Max intraday drawdown	(\$9,000.00)		
Profit Factor	2.21	Max # contracts held	1
Account size required	\$9,000.00	Return on account	1252.50%
<b>Performance Summary: Short Trades</b>			
Total Net Profit	\$104,537.50	Open position P/L	\$0.00
Gross Profit	\$221,900.00	Gross Loss	(\$117,362.50)
Total # of trades	384	Percent profitable	52.34%
Number winning trades	201	Number losing trades	183
Largest winning trade	\$10,350.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,103.98	Average losing trade	(\$641.33)
Ratio avg win/avg loss	1.72	Avg trade (win & loss)	\$272.23
Max consec. Winners	12	Max consec. losers	7
Avg # bars in winners	12	Avg # bars in losers	11
Max intraday drawdown	(\$12,225.00)		
Profit Factor	1.89	Max # contracts held	1
Account size required	\$12,225.00	Return on account	855.11%

Figure 9. The Cluster Counter Trend Pattern Backtest

XI. THE BREAKOUT PATTERN

Occasionally, the market simply takes off running in one direction or another without much in the way of retracements. When this type day occurs, you want to participate in it but you need to add some filtering logic to ensure that you do not trade it too frequently and that you do not trade on days that are really just a "head fake".

Again, you will begin with the second level Pivot Points and set stops a predetermined amount above the Highest High Pivot Point and below the Lowest Low Pivot Point. The market may get filled in one or the other direction, however if it is not filled by the end of the day, the order will be canceled. Add the following filters to enhance the performance of this pattern: Time of Day, Day of Month, Month, and Volatility filters. Figure 10 shows a day that the BreakOut Pattern was traded.

Figure 11 shows the hypothetical test of the Breakout Pattern from 1985 to 2004 with all volatility, time of day and days to avoid filters engaged. There are 867 trades in this single pattern back-test. Again, there is no slippage or commission applied to this test and the fixed stop loss is set at 5 points. This is the third of 4 patterns that we will be including in the overall Big Blue-2 trading system.

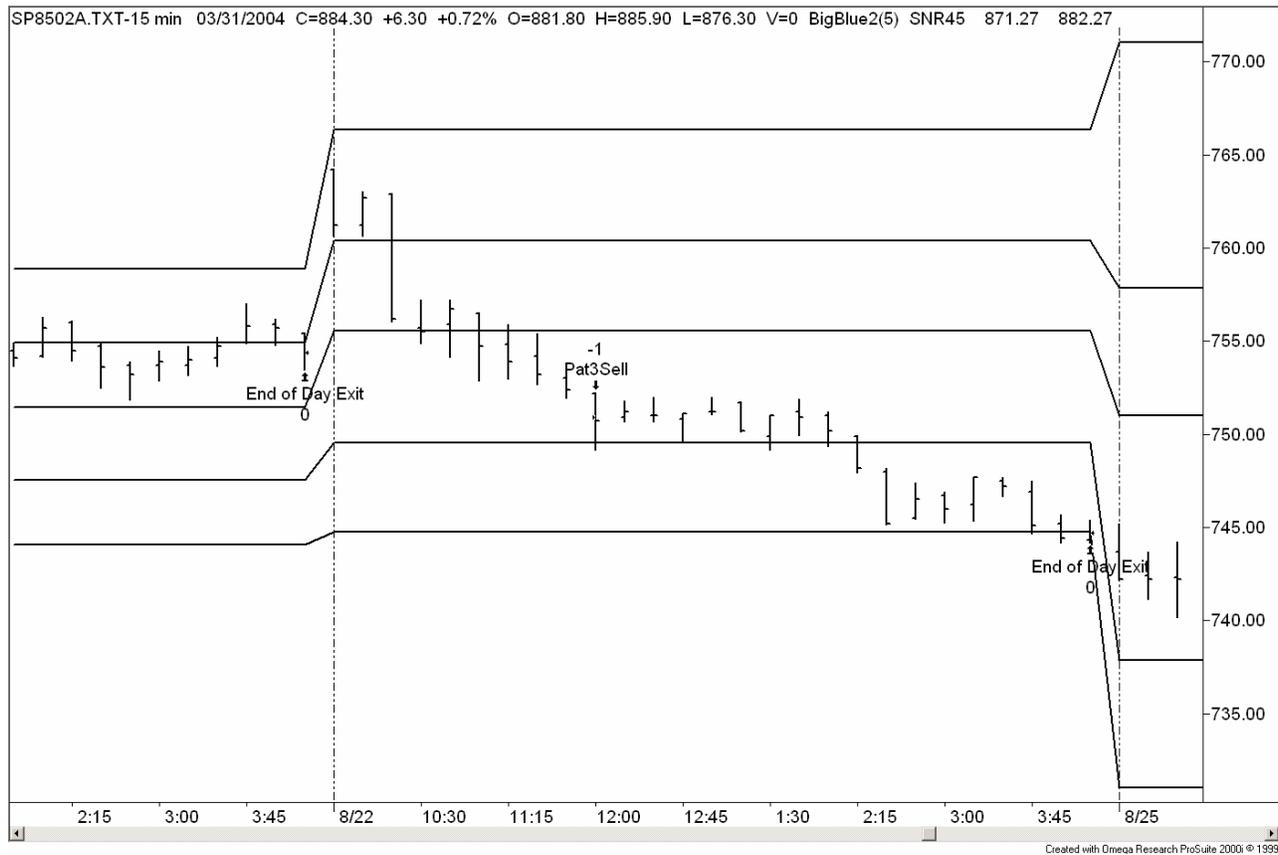


Figure 10. The BreakOut Pattern

<b>Performance Summary: All Trades</b>			
Total Net Profit	\$258,737.50	Open position P/L	\$0.00
Gross Profit	\$584,362.50	Gross Loss	(\$325,625.00)
Total # of trades	867	Percent profitable	53.17%
Number winning trades	461	Number losing trades	406
Largest winning trade	\$11,775.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,267.60	Average losing trade	(\$802.03)
Ratio avg win/avg loss	1.58	Avg trade (win & loss)	\$298.43
Max consec. Winners	10	Max consec. losers	10
Avg # bars in winners	19	Avg # bars in losers	14
Max intraday drawdown	(\$16,425.00)		
Profit Factor	1.79	Max # contracts held	1
Account size required	\$16,425.00	Return on account	1575.27%
<b>Performance Summary: Long Trades</b>			
Total Net Profit	\$129,600.00	Open position P/L	\$0.00
Gross Profit	\$295,487.50	Gross Loss	(\$165,887.50)
Total # of trades	446	Percent profitable	54.93%
Number winning trades	245	Number losing trades	201
Largest winning trade	\$9,925.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,206.07	Average losing trade	(\$825.31)
Ratio avg win/avg loss	1.46	Avg trade (win & loss)	\$290.58
Max consec. Winners	10	Max consec. losers	7
Avg # bars in winners	19	Avg # bars in losers	14
Max intraday drawdown	(\$13,175.00)		
Profit Factor	1.78	Max # contracts held	1
Account size required	\$13,175.00	Return on account	983.68%
<b>Performance Summary: Short Trades</b>			
Total Net Profit	\$129,137.50	Open position P/L	\$0.00
Gross Profit	\$288,875.00	Gross Loss	(\$159,737.50)
Total # of trades	421	Percent profitable	51.31%
Number winning trades	216	Number losing trades	205
Largest winning trade	\$11,775.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,337.38	Average losing trade	(\$779.21)
Ratio avg win/avg loss	1.72	Avg trade (win & loss)	\$306.74
Max consec. Winners	9	Max consec. losers	8
Avg # bars in winners	19	Avg # bars in losers	14
Max intraday drawdown	(\$14,100.00)		
Profit Factor	1.81	Max # contracts held	1
Account size required	\$14,100.00	Return on account	915.87%

Figure 11. The BreakOut Pattern Backtest

XII. THE EXTREME COUNTER-TREND PATTERN

This pattern is the final pattern to be adding to the Big Blue-2 trading system. Moves well below the Lowest Low or well above the Highest High Pivot Point will often retrace substantially back in the opposite direction. This is the classic "head fake" pattern which catches many traders off guard wondering why the market is not continuing to move in the same direction. It should be pointed out that unlike other markets, the indices "counter trend" substantially and "momentum" based trading simply does not work well. Statistically, the indices do not hold a trend very well.

To use this pattern you will look at those days that have moved below or above the second level Pivot Price levels then set stops to capture the retracements. This pattern may trade after another pattern has already been traded within the day. However, the available window for this pattern is early in the morning. Delaying more than a few hours after the market has opened to begin trading this pattern has been shown to be ineffective. Additionally, we will avoid the months of July and April and avoid Fridays and Mondays to go short. Figure 12 shows a day that the Extreme Counter Trend Pattern traded.

The performance of this pattern is shown in Figure 13. Again, there is no slippage or commission applied to this test and the fixed stop loss is set at 5 points. This is the final pattern we will be adding to the Big Blue-2 trading system.

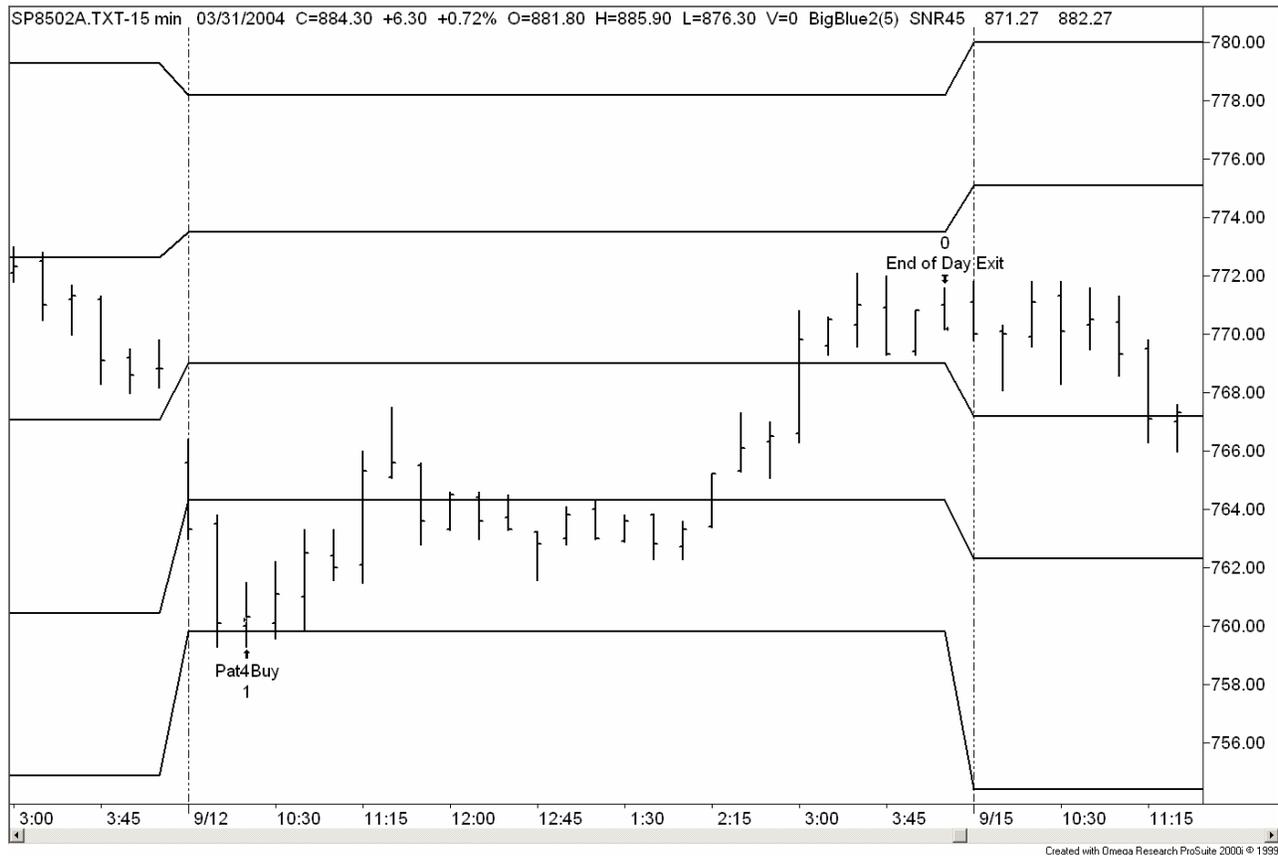


Figure 12. The Extreme Counter Trend Pattern

<b>Performance Summary: All Trades</b>			
Total Net Profit	\$90,650.00	Open position P/L	\$0.00
Gross Profit	\$186,562.50	Gross Loss	(\$95,912.50)
Total # of trades	252	Percent profitable	51.59%
Number winning trades	130	Number losing trades	122
Largest winning trade	\$7,200.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,435.10	Average losing trade	(\$786.17)
Ratio avg win/avg loss	1.83	Avg trade (win & loss)	\$359.72
Max consec. Winners	7	Max consec. losers	7
Avg # bars in winners	23	Avg # bars in losers	16
Max intraday drawdown	(\$8,825.00)		
Profit Factor	1.95	Max # contracts held	1
Account size required	\$8,825.00	Return on account	1027.20%
<b>Performance Summary: Long Trades</b>			
Total Net Profit	\$65,712.50	Open position P/L	\$0.00
Gross Profit	\$140,600.00	Gross Loss	(\$74,887.50)
Total # of trades	192	Percent profitable	52.60%
Number winning trades	101	Number losing trades	91
Largest winning trade	\$5,750.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,392.08	Average losing trade	(\$822.94)
Ratio avg win/avg loss	1.69	Avg trade (win & loss)	\$342.25
Max consec. Winners	7	Max consec. losers	8
Avg # bars in winners	23	Avg # bars in losers	15
Max intraday drawdown	(\$8,662.50)		
Profit Factor	1.88	Max # contracts held	1
Account size required	\$8,662.50	Return on account	758.59%
<b>Performance Summary: Short Trades</b>			
Total Net Profit	\$24,937.50	Open position P/L	\$0.00
Gross Profit	\$45,962.50	Gross Loss	(\$21,025.00)
Total # of trades	60	Percent profitable	48.33%
Number winning trades	29	Number losing trades	31
Largest winning trade	\$7,200.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,584.91	Average losing trade	(\$678.23)
Ratio avg win/avg loss	2.34	Avg trade (win & loss)	\$415.63
Max consec. Winners	4	Max consec. losers	4
Avg # bars in winners	23	Avg # bars in losers	18
Max intraday drawdown	(\$5,200.00)		
Profit Factor	2.19	Max # contracts held	1
Account size required	\$5,200.00	Return on account	479.57%

Figure 13. The Extreme Counter Trend Pattern Backtest

### XIII. POST DEVELOPMENT ANALYSIS

This fundamental development approach used here was to back test over a large span of data (18+ years) producing a high quantity of trades, as a validation that the pattern developed was robust. Filters were then added carefully and retested to increase the odds that the system remained robust. Several older patterns present in the original Big Blue system released in 1996 were enhanced and used in this newer version, Big Blue-2. There are several other critical issues that we were concerned with along the way during this effort.

1. Trade to Parameter Ratio. This ratio takes the number of trades in the test and divides it by the number of parameters used to produce the test results. We would like to see this ratio as high as possible, preferably around 100:1 or higher. The Trade to Parameter Ratio ranges from 100:1 to 200:1 for Pattern 1, 2 and 3, and as low as 50:1 for the Extreme Counter Trend Pattern. Since this pattern tests fairly well without any filters and quite well by only avoiding Thursdays, it is believed that the base pattern can operate with a lower Trade to Parameter Ratio than is desired.
2. Long Back-test. The data for our test begins on 10/1/1985 and ends on 3/10/2004, or 4,654 days. This is considered a lengthy back-test.
3. Numerous Trades. The full back-test with minimal filters has 2,562 trades or an average of 2.75 trades per week. Figure 10 shows the full back test with minimal filters. Note that the Average Trade (\$216) is excellent considering that the daily range back in the 80's was only 2-3 points (\$500 scaled in today's dollars per point).

The Hypothetical performance of the full system with no day filters engaged is shown in Figure 14. This minimum filter test adds credibility to the base patterns used in the Big Blue-2 trading system.

Of course, markets may change causing this and any other trading system to be ineffective and lose money. You should evaluate your own tolerance to risk when trading any trading system.

<b>Performance Summary: All Trades</b>			
Total Net Profit	\$555,200.00	Open position P/L	\$0.00
Gross Profit	\$1,478,950.00	Gross Loss	(\$923,750.00)
Total # of trades	2,562	Percent profitable	52.07%
Number winning trades	1,334	Number losing trades	1,228
Largest winning trade	\$13,625.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,108.66	Average losing trade	(\$752.24)
Ratio avg win/avg loss	1.47	Avg trade (win & loss)	\$216.71
Max consec. Winners	12	Max consec. losers	11
Avg # bars in winners	16	Avg # bars in losers	12
Max intraday drawdown	(\$20,550.00)		
Profit Factor	1.60	Max # contracts held	1
Account size required	\$20,550.00	Return on account	2701.70%
<b>Performance Summary: Long Trades</b>			
Total Net Profit	\$283,850.00	Open position P/L	\$0.00
Gross Profit	\$744,362.50	Gross Loss	(\$460,512.50)
Total # of trades	1,259	Percent profitable	54.65%
Number winning trades	688	Number losing trades	571
Largest winning trade	\$13,625.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,081.92	Average losing trade	(\$806.50)
Ratio avg win/avg loss	1.34	Avg trade (win & loss)	\$225.46
Max consec. Winners	10	Max consec. losers	11
Avg # bars in winners	16	Avg # bars in losers	12
Max intraday drawdown	(\$20,750.00)		
Profit Factor	1.62	Max # contracts held	1
Account size required	\$20,750.00	Return on account	1367.95%
<b>Performance Summary: Short Trades</b>			
Total Net Profit	\$271,350.00	Open position P/L	\$0.00
Gross Profit	\$734,587.50	Gross Loss	(\$463,237.50)
Total # of trades	1,303	Percent profitable	49.58%
Number winning trades	646	Number losing trades	657
Largest winning trade	\$12,100.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,137.13	Average losing trade	(\$705.08)
Ratio avg win/avg loss	1.61	Avg trade (win & loss)	\$208.25
Max consec. Winners	8	Max consec. losers	11
Avg # bars in winners	16	Avg # bars in losers	13
Max intraday drawdown	(\$12,087.50)		
Profit Factor	1.59	Max # contracts held	1
Account size required	\$12,087.50	Return on account	2244.88%

Figure 14. Minimum Filter Backtest of BigBlue-2

#### XIV. SUMMARY

The completed Big Blue-2 trading system has:

- Approximately 2 trades per week
- A 56% accuracy rate
- An approximate average trade of \$363
- Has a \$12,900 maximum intraday drawdown
- A 2.13 Profit Factor (no slippage and commission)

The system is very tradable, however, some signals may show up suddenly as a market order since the filters will turn on and off throughout the day, however this will be the exception rather than the norm. The system may trade twice per day; however this will be rare as well. With a 5-point stop, the maximum loss per day will be \$2500 plus slippage and commission; however, 4 times in the history of the back-test (18+ years) there were 3 trades in one day.

Figure 15 shows the Big Blue-2 equity curve. Note the flat period around 1993 and 1994. Many systems suffered during this flat period. In fact, many systems ONLY show profitable trading from 1996 forward, however the hypothetical performance of the Big Blue-2 trading system from 1985 forward showed only a few years with negative performance.

Figure 16 and Figure 17 shows the hypothetical Total Profit and the Annual Profit of the full Big Blue-2 trading system from 9/30/1985-3/10/2004 based on the trading of 1 full size S&P futures contract with no slippage and commission.

As with any trading system, minor changes may be made to this system in the near future to enhance its performance and reliability. At the time of this writing a 5<sup>th</sup> pattern is being evaluated for inclusion as well as simplified trailing stops and variable exit stops.

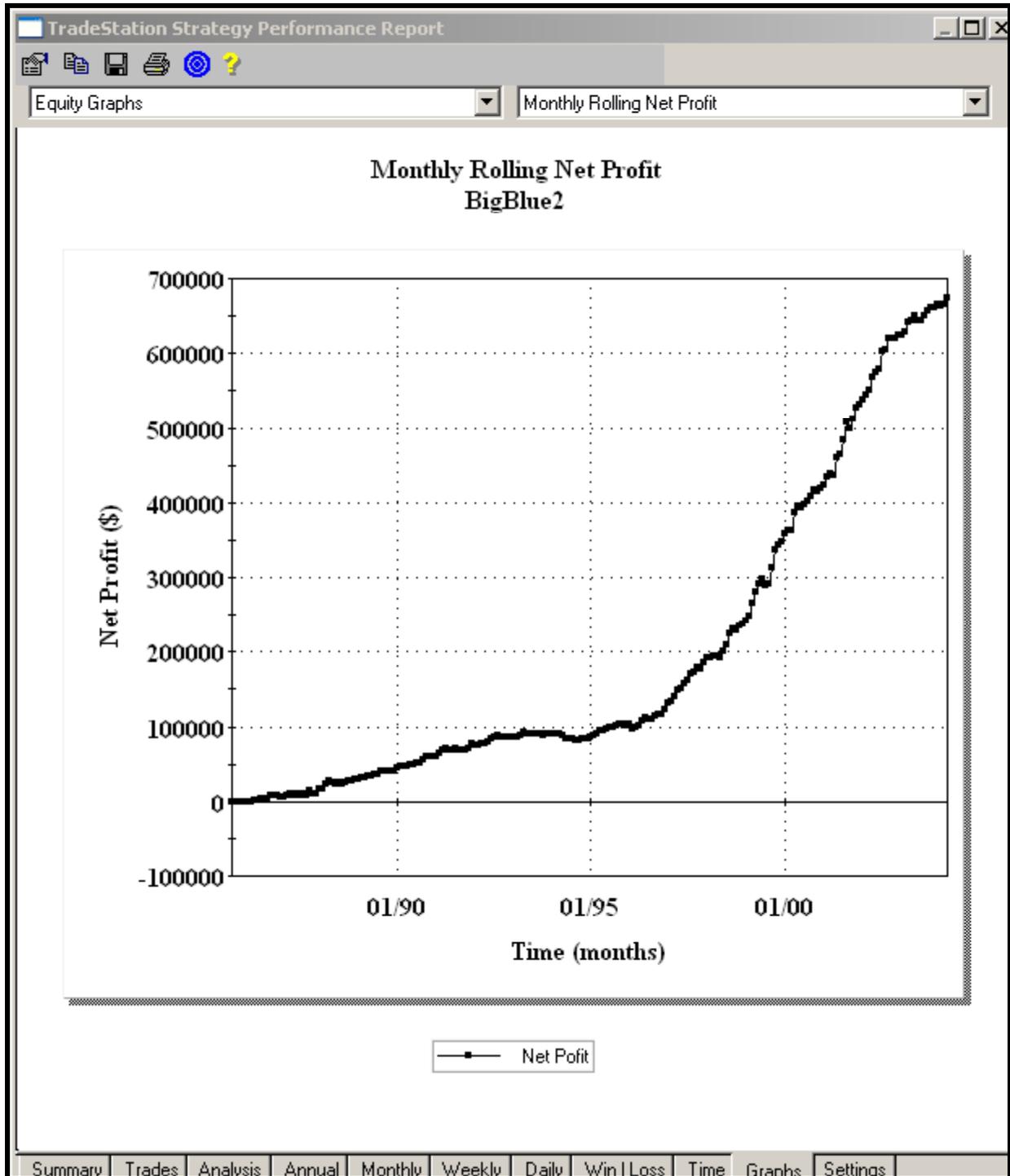


Figure 15. Big Blue-2 Equity Curve 9/30/1985-3/31/2004

<b>Performance Summary: All Trades</b>			
Total Net Profit	\$663,850.00	Open position P/L	\$0.00
Gross Profit	\$1,251,350.00	Gross Loss	(\$587,500.00)
Total # of trades	1,826	Percent profitable	56.68%
Number winning trades	1,035	Number losing trades	791
Largest winning trade	\$13,625.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,209.03	Average losing trade	(\$742.73)
Ratio avg win/avg loss	1.63	Avg trade (win & loss)	\$363.55
Max consec. Winners	13	Max consec. losers	7
Avg # bars in winners	17	Avg # bars in losers	12
Max intraday drawdown	(\$12,900.00)		
Profit Factor	2.13	Max # contracts held	1
Account size required	\$12,900.00	Return on account	5146.12%
<b>Performance Summary: Long Trades</b>			
Total Net Profit	\$338,462.50	Open position P/L	\$0.00
Gross Profit	\$658,962.50	Gross Loss	(\$320,500.00)
Total # of trades	967	Percent profitable	58.84%
Number winning trades	569	Number losing trades	398
Largest winning trade	\$13,625.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,158.11	Average losing trade	(\$805.28)
Ratio avg win/avg loss	1.44	Avg trade (win & loss)	\$350.01
Max consec. Winners	15	Max consec. losers	6
Avg # bars in winners	17	Avg # bars in losers	12
Max intraday drawdown	(\$10,575.00)		
Profit Factor	2.06	Max # contracts held	1
Account size required	\$10,575.00	Return on account	3200.59%
<b>Performance Summary: Short Trades</b>			
Total Net Profit	\$325,387.50	Open position P/L	\$0.00
Gross Profit	\$592,387.50	Gross Loss	(\$267,000.00)
Total # of trades	859	Percent profitable	54.25%
Number winning trades	466	Number losing trades	393
Largest winning trade	\$12,100.00	Largest losing trade	(\$1,250.00)
Average winning trade	\$1,271.22	Average losing trade	(\$679.39)
Ratio avg win/avg loss	1.87	Avg trade (win & loss)	\$378.80
Max consec. Winners	11	Max consec. losers	8
Avg # bars in winners	16	Avg # bars in losers	13
Max intraday drawdown	(\$9,650.00)		
Profit Factor	2.22	Max # contracts held	1
Account size required	\$9,650.00	Return on account	3371.89%

Figure 16. The Big Blue-2 Trading System Backtest

<b>Annual Analysis (Mark-To-Market):</b>					
<u>Period</u>	<u>Net Profit</u>	<u>% Gain</u>	<u>Profit Factor</u>	<u># Trades</u>	<u>% Profitable</u>
YTD	\$5,225.00	0.69%	1.76	22	50.00%
12 month	\$29,375.00	4.00%	1.76	91	52.75%
03	\$37,800.00	5.24%	1.87	94	52.13%
02	\$93,475.00	14.90%	2.37	127	48.82%
01	\$112,950.00	21.96%	2.81	121	54.55%
00	\$77,200.00	17.66%	2.14	100	44.00%
99	\$104,750.00	31.51%	2.84	109	55.05%
98	\$52,650.00	18.82%	1.94	110	53.64%
97	\$63,162.50	29.16%	2.54	99	56.57%
96	\$21,337.50	10.93%	1.65	102	62.75%
95	\$19,062.50	10.82%	2.40	104	65.38%
94	(\$6,425.00)	(3.52%)	0.70	92	40.22%
93	\$3,687.50	2.06%	1.28	83	59.04%
92	\$7,212.50	4.20%	1.59	90	61.11%
91	\$16,500.00	10.63%	1.93	102	61.76%
90	\$18,687.50	13.68%	2.34	101	63.37%
89	\$9,475.00	7.45%	1.94	91	58.24%
88	\$18,100.00	16.61%	2.37	95	68.42%
87	\$1,287.50	1.20%	1.05	95	51.58%
86	\$9,287.50	9.44%	2.05	75	60.00%
85	(\$1,575.00)	(1.58%)	0.22	14	28.57%

Figure 17. Big Blue-2 Annual Profit (Hypothetical)