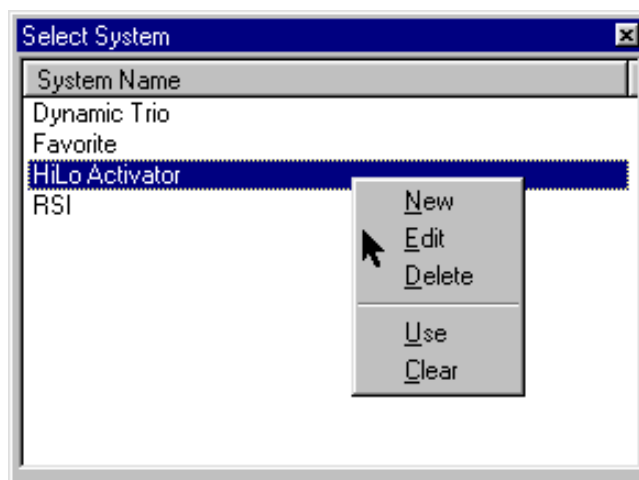# SYSTEMS & BACK TESTING

Along the main menu of the Fibonacci Trader you see a choice titled Systems. If you left click on Systems the window to the right opens. This is the Select Systems control window. Right click in this window and you can create new, edit, delete, use or clear systems from your plan.

There are two types of Systems available for the Fibonacci Trader. The first type is a simple collection of your favorite indicators that you would use on a regular basis. For example, you may want to use a moving average, the Dynamic Trio and the Dynamic Fibonacci Channel for trading your favorite stocks or commodity. You can create, name, and save a System that will have these indicators formatted to your taste. Any time that you want to use this collection of indicators, you can call it up to be used on any plan. This saves you time if you decide to follow a new stock or when a futures contract expires and a new contract becomes the active contract. You don't have to go to the Indicator menu and manually add each of the indicators to the plan. You simply create a System, name it, and it is available to be used at your command. All of the Fibonacci Trader indicators can be used in designing your System.
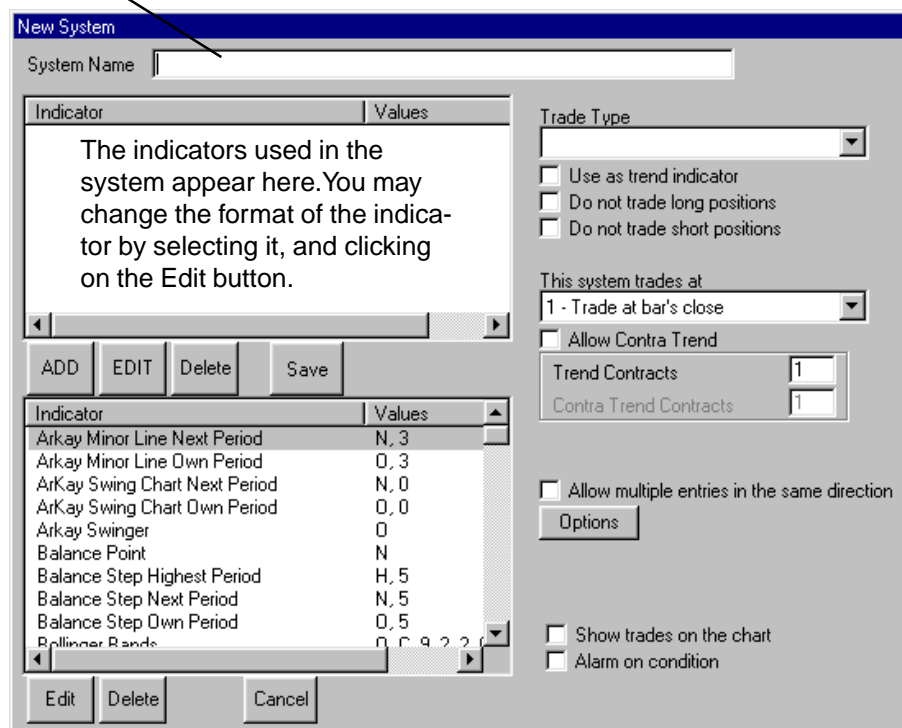
The second type of System uses the group of indicators that have alarms. The alarms accompanying the indicators can be used as rules for buying and selling. For example, a close past the HiLo Activator could be an entry rule. Once you have set up a System using these special indicators, you can back test the system. After you run the test, you can view the signals on your plan, analyze results of your rules, as well as monitor the system on an ongoing basis. We will go into the steps of setting up this system test shortly. But first, let's design a system for every day use of application of your favorite indicators.

Left click on Systems from the main menu. Next, right click in the Select Systems Window and select New. This window is used for both setting up a system as well as setting up a system test.

Name the system here.

The righ hand side of this window is used when we design a system test.

New System

System Name

Indicator | Values

The indicators used in the system appear here. You may change the format of the indicator by selecting it, and clicking on the Edit button.

ADD   EDIT   Delete   Save

Indicator	Values
Arkay Minor Line Next Period	N, 3
Arkay Minor Line Own Period	O, 3
ArKay Swing Chart Next Period	N, 0
ArKay Swing Chart Own Period	O, 0
Arkay Swinger	O
Balance Point	N
Balance Step Highest Period	H, 5
Balance Step Next Period	N, 5
Balance Step Own Period	O, 5
Bollinger Bands	O, C, 9, 2, 2, 0

Edit   Delete   Cancel

Select indicators to be used by the system by clicking on the indicator and then click on the Add button.

Trade Type

☐ Use as trend indicator
☐ Do not trade long positions
☐ Do not trade short positions

This system trades at
1 - Trade at bar's close
☐ Allow Contra Trend
Trend Contracts   1
Contra Trend Contracts   1

☐ Allow multiple entries in the same direction
Options

☐ Show trades on the chart
☐ Alarm on condition

Let's set up a new system that we will use on a regular basis with our Plan. This system will use two indicators: The Dynamic Trio (using *Own* time frame) and Fibonacci Zones High Period. The Dynamic Trio could be your signal for entry or exits, and the Fibonacci Zones can be used as support and resistance levels. Any time you set up a system you should spend time researching how well the system can aid you in your trades. So the first step is to left click on Systems on the main menu. Right click in the Select Systems window, and left click on New. Go into the New system window and select the Dynamic Trio and then click on Add. Select Fibonacci Zones High Period, and then

click on Add. Enter into the System Name your name for the system, such as "New System." The system should look like this one shown here. Now click on Save.

This system is now available to be brought up and used with any plan.

For example, here is a Daily/Weekly/Monthly plan for Microsoft. Open up the plan, then left click on System from the main menu. Your new system will be listed. Left click on the name of the new system "New System," right click, and then left click on "Use."

In our example, Microsoft moves up through resistance, trends higher, and hits resistance the next week. The Dynamic Trio followed the trend up, and

exited when the price traded back into the resistance zone. The next week the price hit support again. Let's set up a system test, using the available indicators.
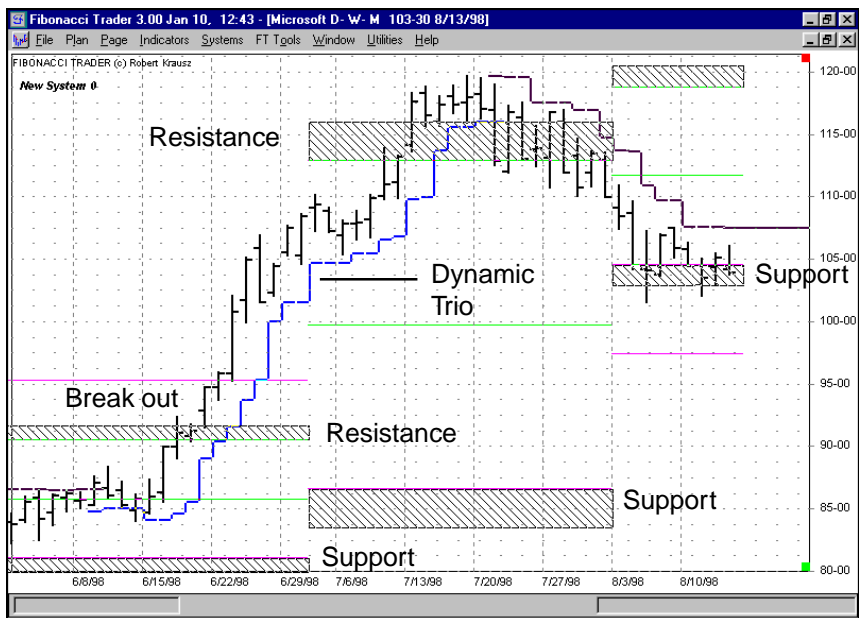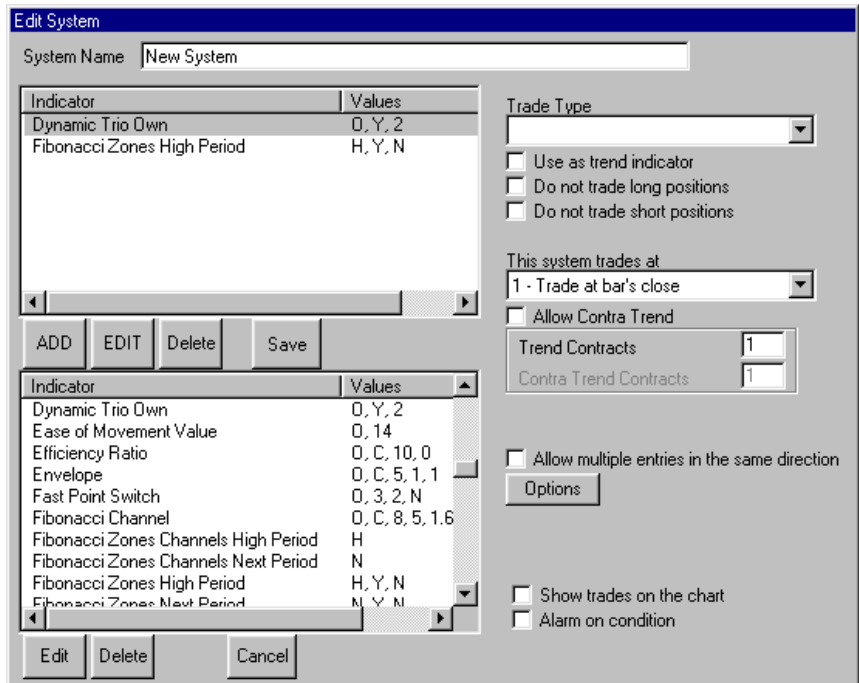
The list shown here on the right are the indicators that can be used in a system's backtest. All indicators can be used in any system for display purposes, but only the indicators listed here can be used with rules during a backtest.

Obviously, indicators have unique uses. For example, a moving average rule may be a close past the moving average value or for momentum, the crossing of the zero line will be a rule. The system back test in the Fibonacci Trader has 9 choices for rules. These are referred to as the Trade Type in the Edit System window:

TRADE TYPE
1- Close past line
2- Bar crossing line
3- Change of slope direction
4- Stop and reverse
5- Overbought and Oversold
6- Slow average crossing
7- Change of trend
8- Crossing zero line
9- Step direction

Let's build a simple system, and back test the rules to see the results.

ARKAY SWING CHART NEXT
ARKAY SWING CHART OWN
BALANCE POINT
BALANCE STEP HIGH
BALANCE STEP NEXT
BALANCE STEP OWN
DANTON STOP
DIRECTIONAL MOVEMENT INDEX
DIRECTIONAL VOLATILITY NEXT 1.382
DIRECTIONAL VOLATILITY NEXT 1.618
DIRECTIONAL VOLATILITY NEXT 2.382
DYNAMIC BALANCE POINT OWN
DYNAMIC BP STEP NEXT:
DYNAMIC TRIO NEXT
DYNAMIC TRIO OWN
EXPONENTIAL MOVING AVERAGE
FAST POINT SWITCH
GANN SWING CHARTIST NEXT
GANN SWING CHARTIST OWN
HILO ACTIVATOR HIGH
HILO ACTIVATOR NEXT
HILO ACTIVATOR OWN
LEAST SQUARES
LEAST SQUARES SLOPE
MACD HISTOGRAM
MOMENTUM
MOVING AVERAGE CONVERGENCE-DIVERGENCE
ON BALANCE VOLUME
PARABOLIC
PARABOLIC FILTERS
PERRY KAUFMAN ADAPTIVE MA
RATIO OSCILLATOR
RELATIVE STRENGTH INDEX
SIMPLE MOVING AVERAGE
STOCHASTICS
STOCHASTICS RSI
TRIPLE SWITCH HIGH
TRIPLE SWITCH NEXT
TRIPLE SWITCH OWN
TRUE STRENGTH INDEX
VOLATILITY STOP
WEIGHTED MOVING AVERAGE
WILLIAMS %R
WILLIAMS A/D OSCILLATOR

Systems Control Window

Indicators that are drawn from the list on the previous page have rules associated for performing a back test. Once you run the backtest you can view tables of results in both summary and tabular form, plus the individual trades will be displayed on the charts and/or linked to an alarm. Let's get started reviewing the various features available. First, left click on Systems from the main menu. Next right click in the Select Systems window (above) and select New to set up a system. The Systems Control Window shown below will open. Now, we will walk through each of the features displayed on the right hand side of the window as we build a simple system.

Trade Type refers to one of the nine rules listed on the previous page. Each indicator has it's own rule or a set of rules.

New System

System Name [Name the system here.]

Indicator	Values
The indicators used in the system appear here. Select from the list below, click on Add. If you want to edit the indicator select it in this window and click on Edit.	

ADD   EDIT   Delete   Save

Indicator	Values
Arkay Minor Line Next Period	N, 3
Arkay Minor Line Own Period	O, 3
ArKay Swing Chart Next Period	N, 0
ArKay Swing Chart Own Period	O, 0
Arkay Swinger	O
Balance Point	N
Balance Step Highest Period	H, 5
Balance Step Next Period	N, 5
Balance Step Own Period	O, 5
Bollinger Bands	O, C, 9, 2, 2, 0

Edit   Delete   Cancel

Trade Type
[▼]

☐ Use as trend indicator
☐ Do not trade long positions
☐ Do not trade short positions

This system trades at
[1 - Trade at bar's close ▼]

☐ Allow Contra Trend

Trend Contracts   [0]
Contra Trend Contracts   [0]

☐ Allow multiple entries in the same direction
Options

☐ Show trades on the chart
☐ Alarm on condition

An indicator can be set to be used for only the confirmation of the direction of the trend, and not for entry and exit.

Specify long or short positions.

Set system rules, number of contracts, trend and contra trend trading.

Set stop loss rules and profit protection rules.

Show signals on the chart.

Alarms window will open.

SYSTEMS TUTORIAL

We'll start with very basic steps, and build from there while explaining each feature. As we evolve the system we will show a chart showing the effect of each modification. First, developing a system is detail work, and the purpose of this tutorial is to explain the features. For your own system please check carefully that the final logic of the system is the same as your goal. Developing a system with the use of a computer requires a careful study and analysis of your logic. One idea is to build the system in stages, checking how the system performs as you add each new rule.

So let's begin by building a simple trend following system. The system will be called the Trend Follower. Left click on Systems on the main menu, right mouse click in the Select System window and select New. Type in the name Trend Follower, and select the moving average indicator, and click on Add. Select the Moving average indicator in the upper Indicator window, and then in the Trade Type window select "Close past line." The next window, "This system trades at", refers to the choice of when the execution occurs, i.e., trade at the close , the next bar's open or the indicator value. For example, the indicator could issue a trade based on the close but if the system trades at the next bar's open, then the trade will be on the open. Click "Show trades on the chart:, and Save to save this system. See the next two charts of the September 1998 T-bond contract.

Set the number of ticks for a signal, here we'll use 1 tick.

Trade Type refers to one of the nine rules. The movingaverage can use this four of the available choices.

This widow controls when the Systen trades, as compared to the indicator signal.

Clck here to show the trades on the chart.

This simple moving average system is always long or short, and trades based on the close past the moving average. The system shows how many contracts are bought or sold for each signal in the arrow. Right click on the arrow and the current action and position is shown.
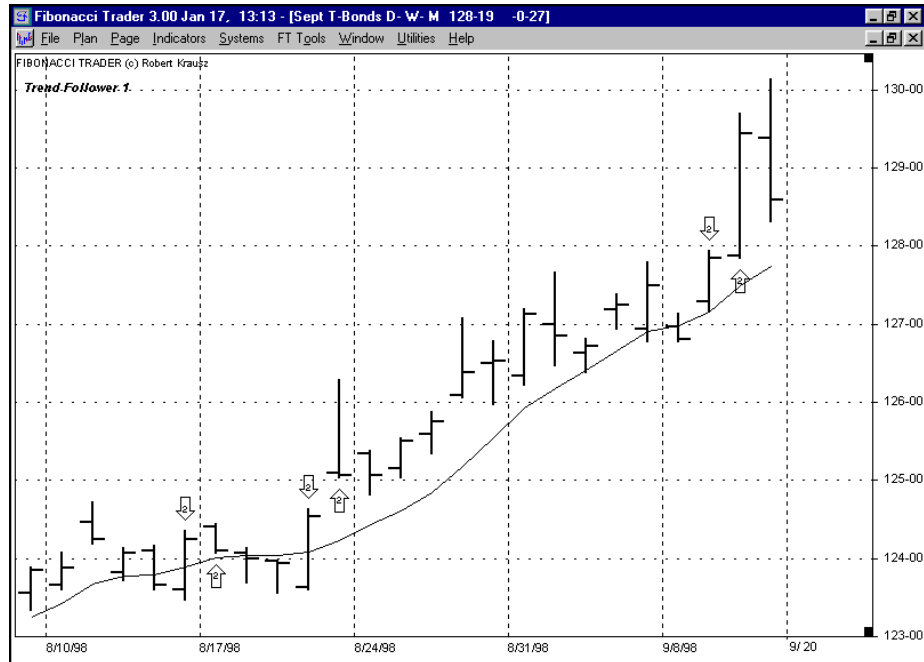

Here is the same simple moving average system except the system trades at the next bar's open. The simple moving average indicator will trade based on the close past the moving average but the system trades at the next bar's open.

Now, we'll add another moving average as an additional signal and then as a trend confirmation. Open up the system Trend Follower from the Systems menu by right mouse clicking on the name and left click on Edit, or if the system is currently shown on your plan, then right click on the name and left click on edit. Let's add another moving average to the system. Select the Moving Average, and click on Add. Now select this new Moving Average, click on Edit and change the length to 21, and change the symbol to solid circles so we can see it on the chart. Change the "This system trades at" to Trade at bar's close. Your system should look like the above picture, then click on "Save as default."
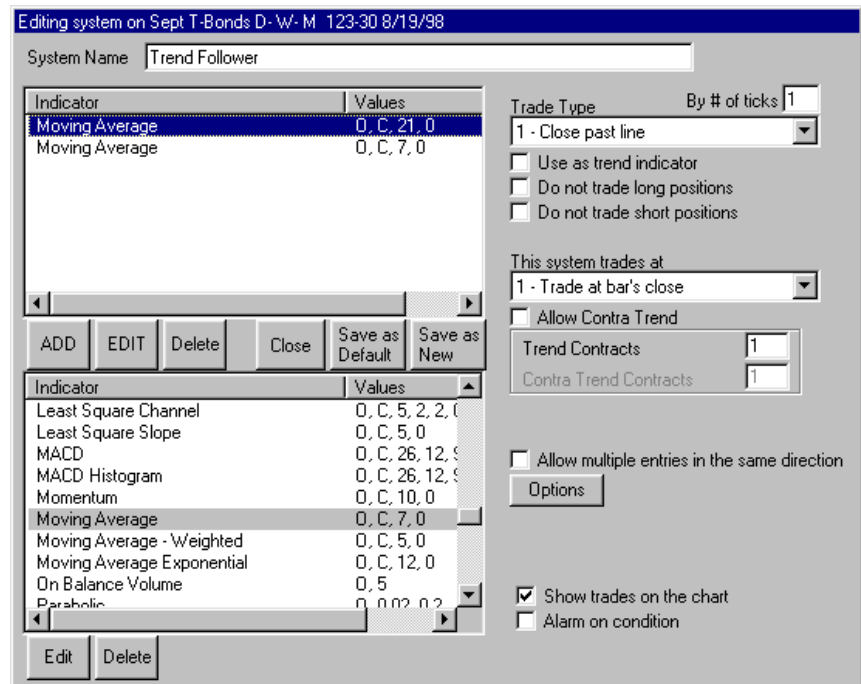

Here is the new system using the 7 and 21 period moving average. If the price closes above the 7 period moving average and the 21 period, moving average the system is long 1 contract, or if below both moving averages the system is short 1 contract. If the price closes between the two moving averages the system is flat. Why? Because one indicator
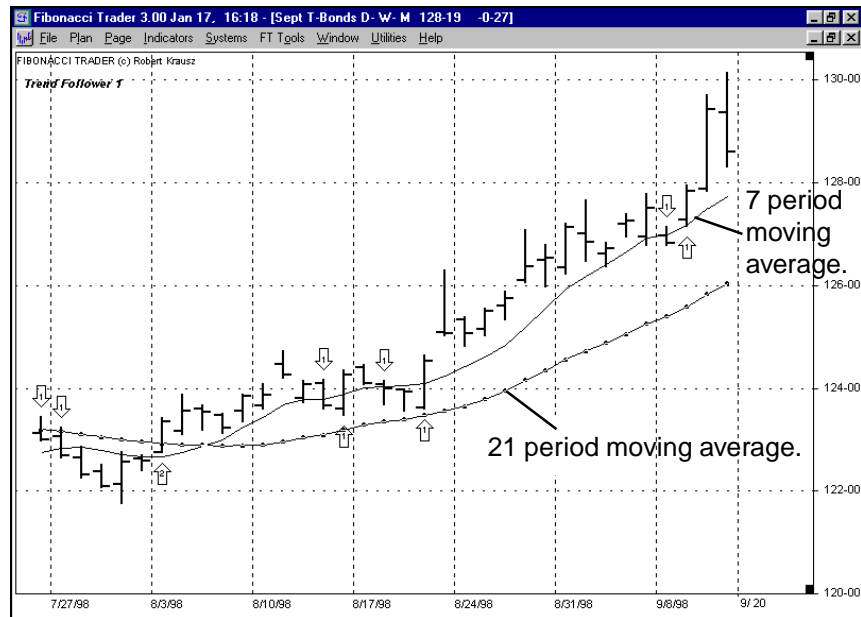
says to be long, and one says to be short, so they cancel each other. If we want both moving average

to contribute trades we can select the "Allow multiple entries in the same direction." Then, if the price closes above both the 7 period moving average and the 21 period moving average the system will go long 2 contracts because both indicators are long, or if the price closes below both moving averages the system is short 2 contracts. If the price closes between the two moving averages the system is flat because the 7 moving average would be short 1 contract and the 21 period moving average would be long 1 contract. Let's add an additional moving average and use it as a trend indicator and see some additional
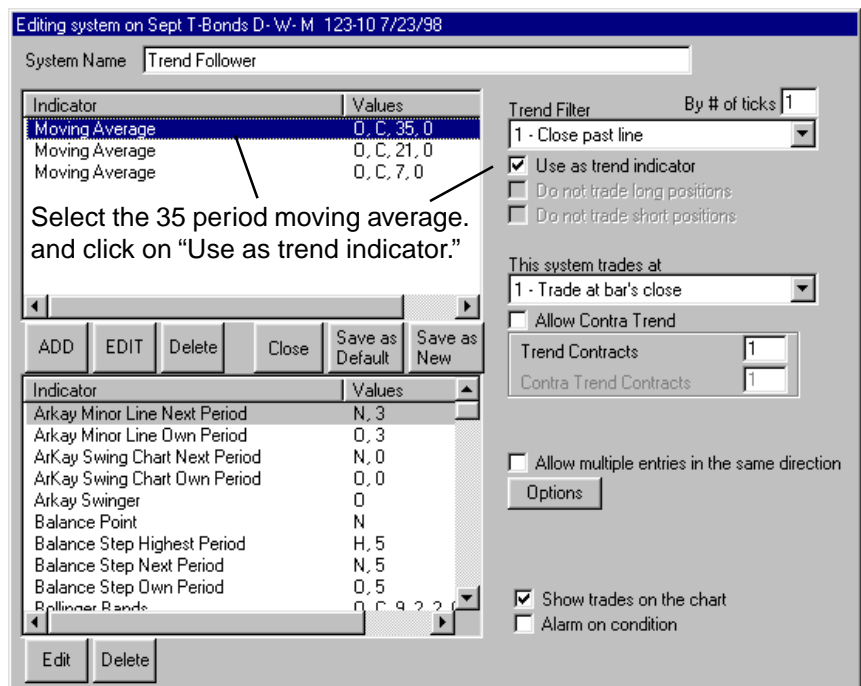
features of the system testing module. Add another moving average, then select it and change it to a length of 35, and change the symbol to a cross so you can see it on the chart. Select the new 35 period moving average and then click on "Use as trend indicator." Be that each indicator has the "By # of ticks" is set to 1, and that the Edit system window looks like the one above.

At this point we have created a crossover system that is using the 35 period moving average for identifying the trend, and the 7 and 21 period moving averages for trading signals. At first glance it would appear that there is redundancy in that all three of the indicators are trend following indicators, and using the 35 period moving average for trend identification does not offer any new information. This next section demonstrates a unique ability of the Fibonacci Trader. You can set a number of contracts to trade in the direction of the trend different from the set trading against or contra trend. We'll look into this feature by beginning with a the current system and make modifications to it, and see the results in a trading range.

Look at the chart here. We'll walk through this example of the basic system, and then make changes to the rules and you will see the effect. First, at point A the system is long 1 contract because the price closed above both the 7 and 21 period moving averages (the multiple contracts is not checked, therefore only 1 contract is used), and the trend is up based on the price closing above the 35 period moving average. At point B the system is flat because the 7 period moving average is short 1 contract, and the 21 period moving average is long 1 contract, and they cancel each other.
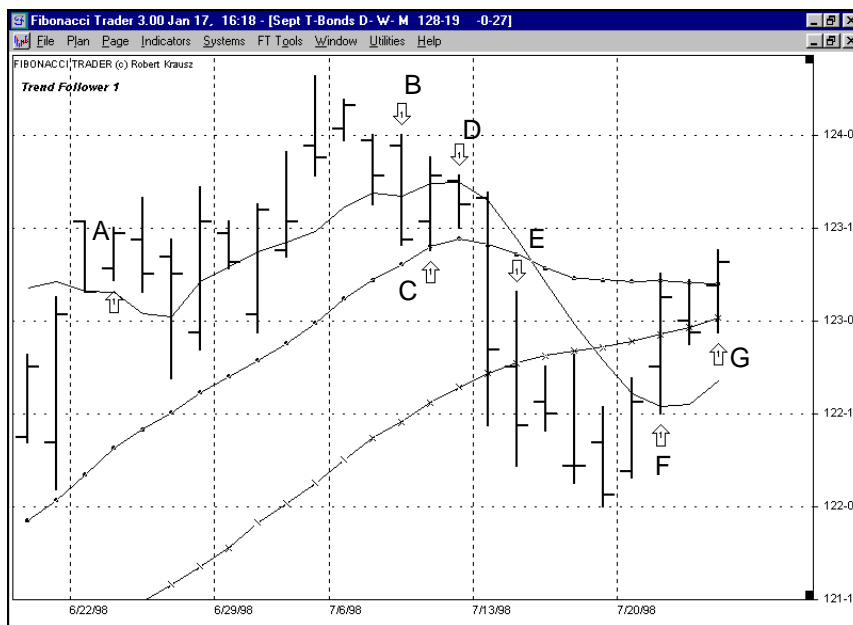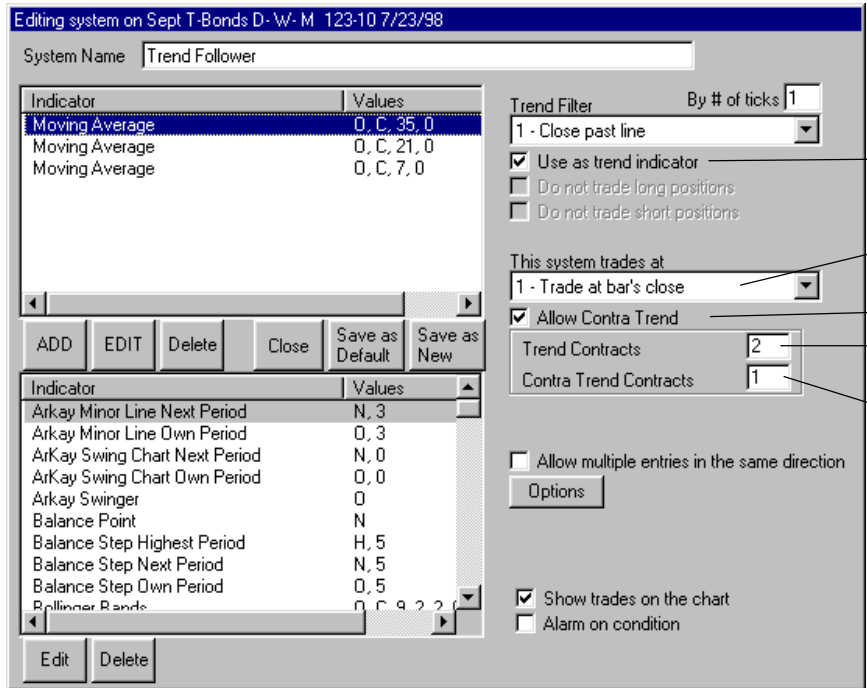
Notice that the 35 period moving average does not actually signal a trade, it is only for trend confirmation. Returning to the chart you can see that point C , the system is long 1 contract, and at point D the system is flat. At point E the system is now short 1 contract because the price closed below the 35 period moving average, which changes the trend to down, and therefore the short signals from the 7 and 21 period moving average is now accepted. At point F the system goes flat, and at point G the system goes long.

WHEN YOU CLICK THE "USE AS TREND INDICATOR" THE INDICATOR NO LONGER CONTRIBUTES A BUY OR SELL SIGNAL.

Return to the System Edit window and click on "Allow Contra trend, and change the "Trend Contracts" to 2, and the "Contra Trend Contracts" to 1, and click Save as Default. At this point we are changing the system to trade two contracts in the direction of the trend, and to trade 1 contract when the 7 and 21 period moving

averages are issuing short sell signals, but the price is still above the 35 period moving average. Your system should look like the one shown in this window.

The 35 period moving average is used for determining the trend.

The system trades at the close.

Contra trend trades are allowed.

Two contracts are traded with the trend.
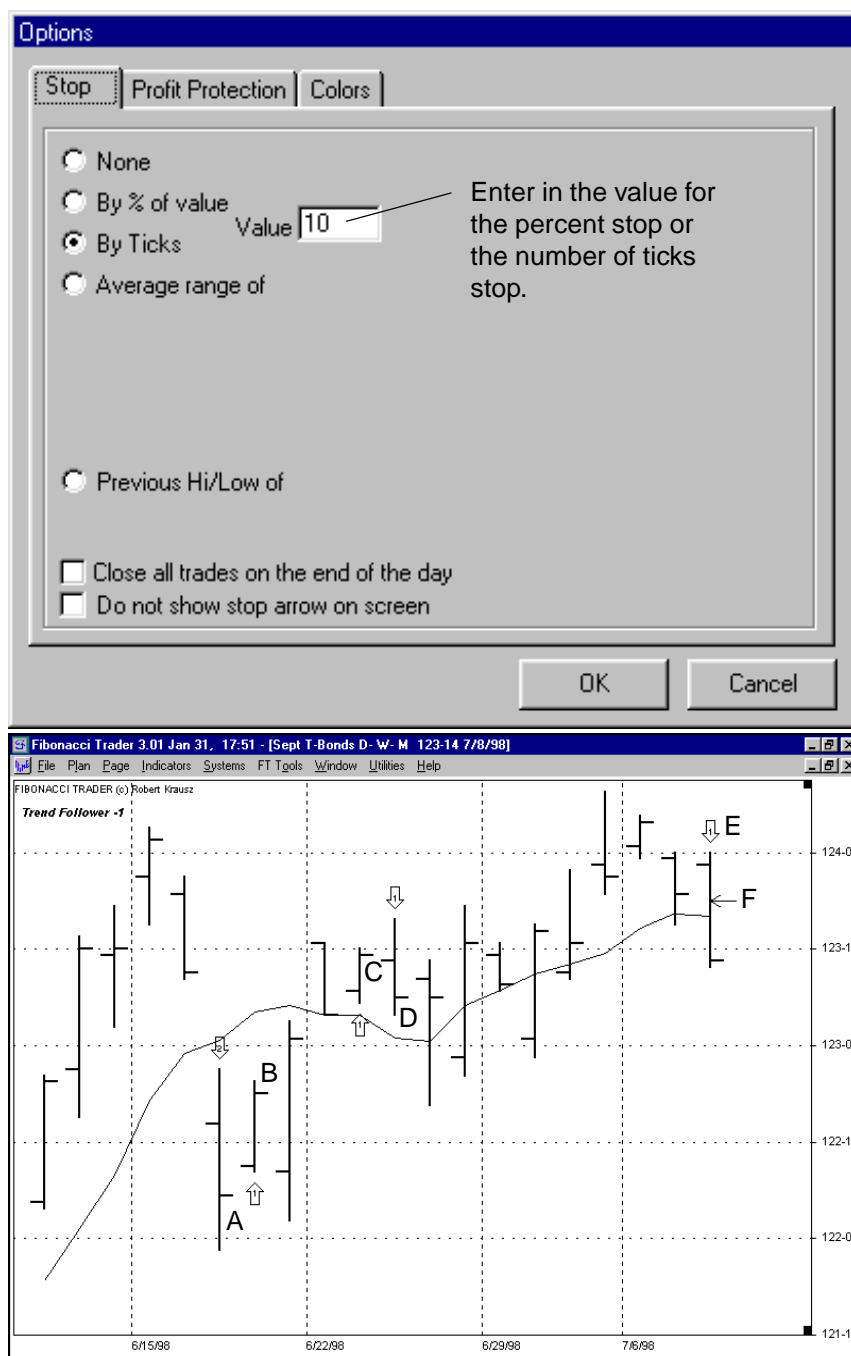
One contract is traded against the trend.

Here are trades from the same period show in the previous chart. Each of the trades are identical except now there are two contracts traded with the trend for each signal. The key difference is the new trade number E. Here the system goes short one contract because the price trades below the 7 and 21 period moving average, but

the price is still above the 35 period moving average so this is a contra trend signal, and the system goes short only 1 contract. At bar F the price closes below the 35 period moving average and so another contract is sold short because the trend is now down and the system should be short 2 contracts.
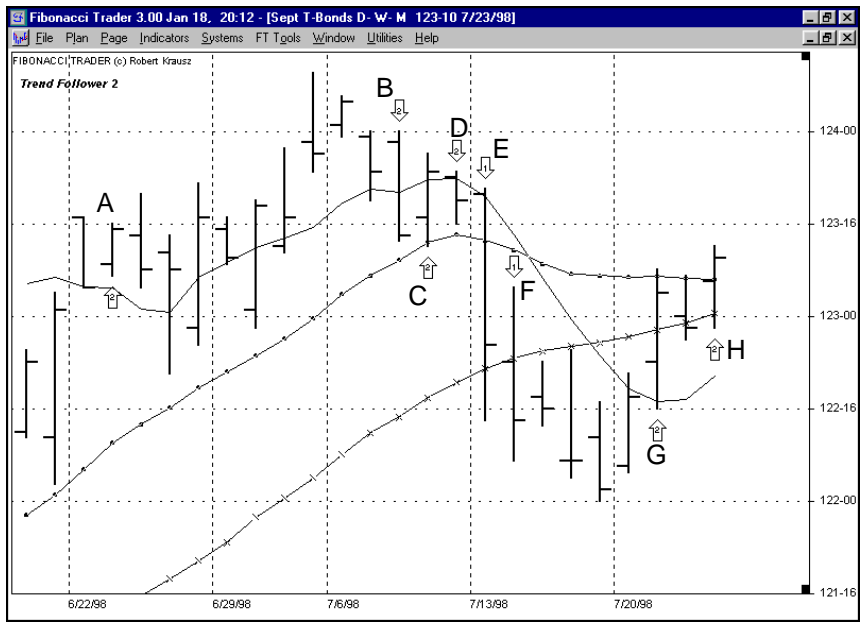
OPTIONS

The Options button takes you to the Stop Provisions, Profit Protection Rules and color choices for your system. The Stops window is the first selection available. If you choose "None" then your system will only exit a trade based on your indicators. If use a stop rule, and your system exits by the stop being hit, then your system will need a new signal to renter the market.

For example, the chart on the bottom of the page uses a 7 period simple moving average to signal entries, and a fixed stop of 10 ticks from the entry price. At point A the system sells short 2 contracts, reversing from long to short 1 contract. The next day, at point B, the position is stopped out for a 10 tick loss. At point C the system is long 1 contract on the close past the moving average. The next day, at point D, the trade is stopped out, and is now flat. Notice that the market rises with no new signal until point E when the price closes below the moving average. The arrow at point F is the fixed stop for this latest trade.

Options

Stop | Profit Protection | Colors

○ None
○ By % of value
◉ By Ticks   Value 10
○ Average range of

Enter in the value for the percent stop or the number of ticks stop.

○ Previous Hi/Low of

☐ Close all trades on the end of the day
☐ Do not show stop arrow on screen

OK   Cancel

Fibonacci Trader 3.01 Jan 31, 17:51 - [Sept T-Bonds D- W- M 123-14 7/8/98]
File Plan Page Indicators Systems FT Tools Window Utilities Help

FIBONACCI TRADER (c) Robert Krausz

Trend Follower -1

E, F, C, D, B, A

124-00
123-16
123-00
122-16
122-00
121-16

6/15/98   6/22/98   6/29/98   7/6/98

There are a number of choices for how you use stops in your system. Your first choice is None, the next is "By % of value" or "By Ticks." Either of these two choices require you to enter a value into the Value window. If you click on the "By % of value" and enter a whole number, such as 1, then 1% will be subtracted for a sell stop or added for a buy stop to the entry price. You can also use decimal, for example 0.5 will be 0.5%. Both the "By % of value" or "By Ticks" are a fixed stop based on the entry price, and will not adjust to market action after the initial entry.

The next stop loss option is the "Average range of" option. Here you can set the stop based on a lookback period and a percent of the average range over the lookback period. If you chose 5 periods then the program will calculate the last five period's average range, (H-L)/2, and the stop loss will be set at that price point difference from the entry point. For example, if you were trading T-bonds, and the average range was 28/32nds based on a five period lookback for the T-bonds and you set the stop to be 50%, then the program will place the stop 14/32nds from the entry point.

The next option is to set the average percentage range stop to be subtracted from the low or added to the high of the entry bar, depending if you are long or short. In addition, this stop can be set to be a trailing stop, following the overall trend of the market. As the daily ranges change the stop will adjust to the level of
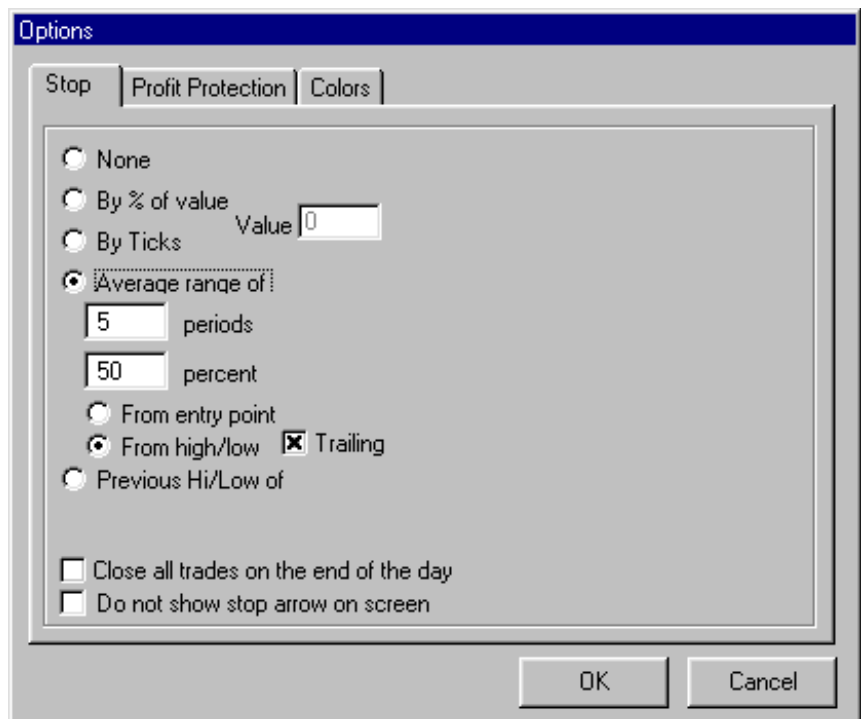
the daily range volatility. For example, if the daily ranges expand the stop will move away from the current price. If the daily ranges contracts, the difference between the stop and the market will tighten. The trailing stop will follow the trend of the market as in the chart.

You next choice is "Previous High/Low. This option enables you to set your stop based on the highest high or lowest low over the lookback period since the entry. If you click on the trailing option the stop will advance each bar based on the lookback period. Previous High or Low indicates that today's bar is no included in the lookback period.

The next option is to close all trades at the end of the day. Day traders, may want a system that does not carry positions over night, so check this box and all trades based on an intraday system will be exited at the close of the tr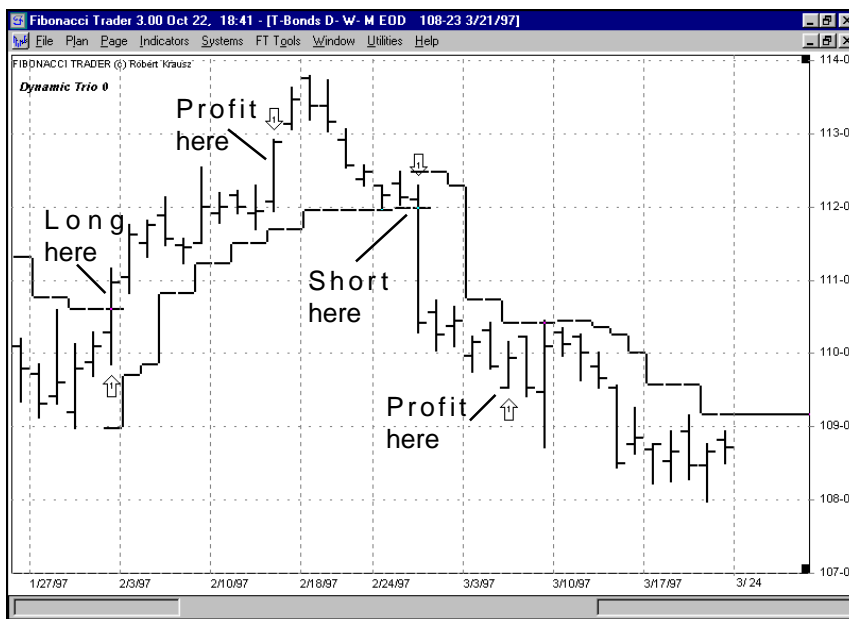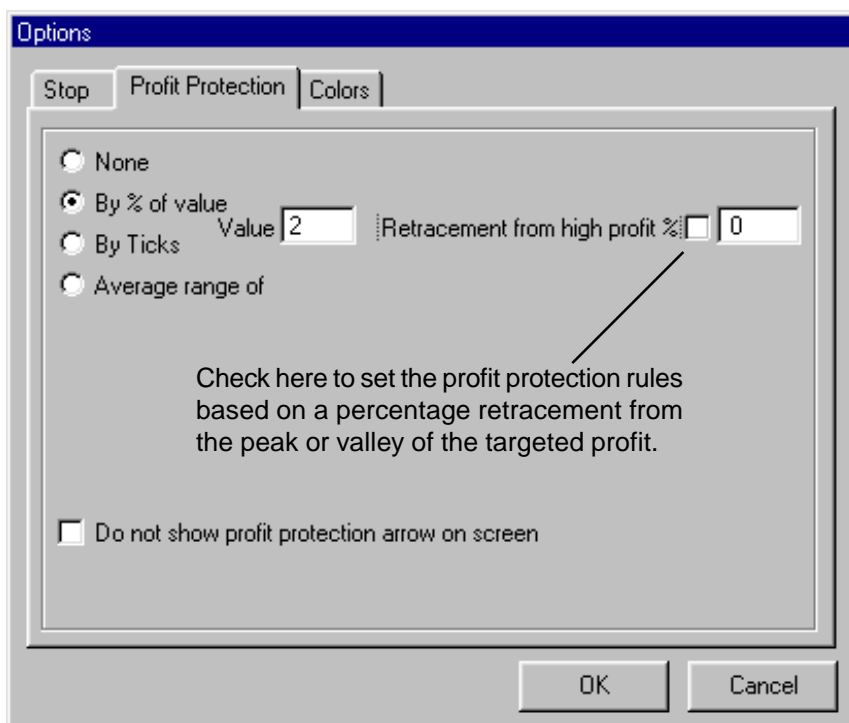ading day. Otherwise the intraday system will keep the position open overnight. No slippage is considered for fills, but if the opening price exceeds your stop loss level, then the opening price will be used.
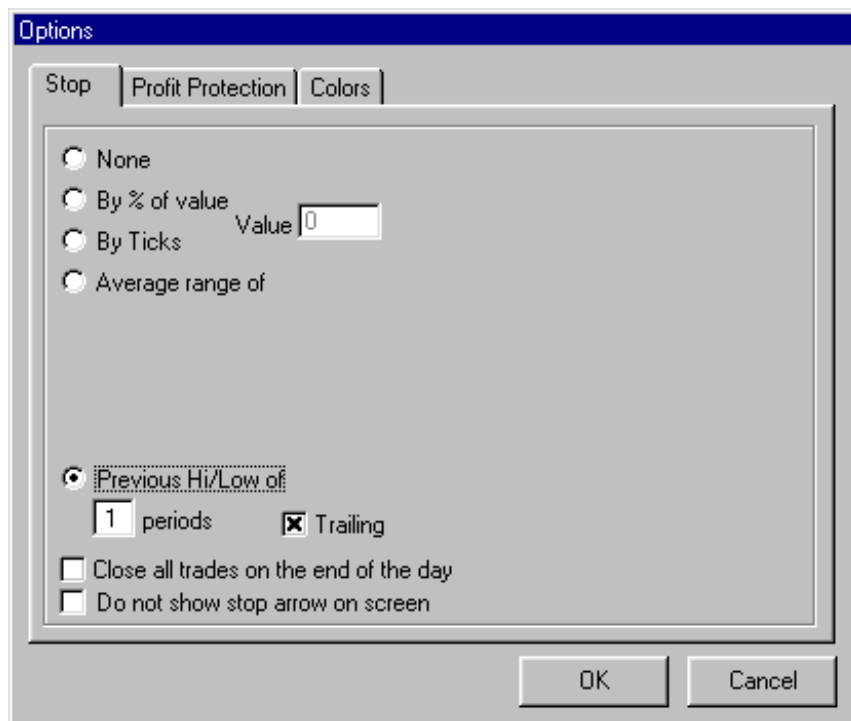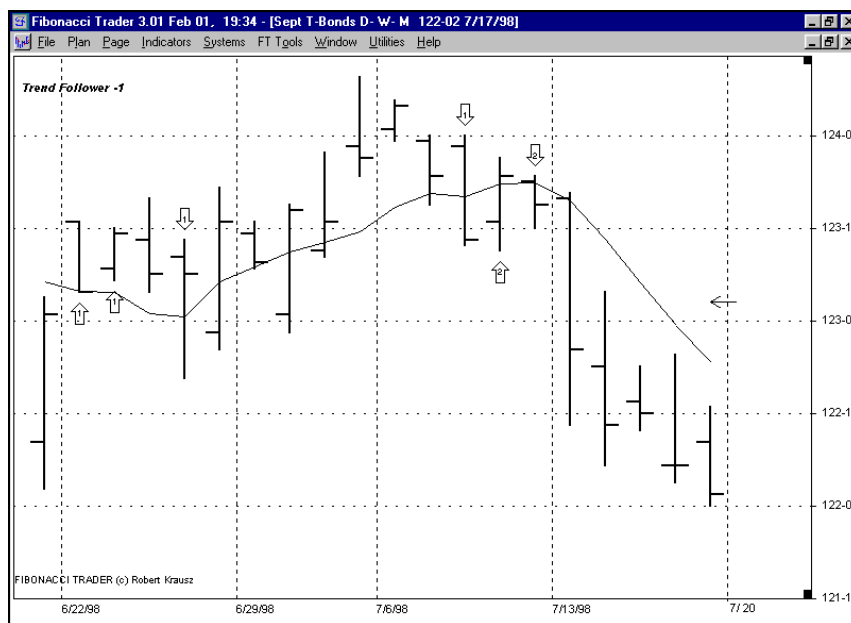
PROFIT PROTECTION

Click on the Profit Protection tab. Here, you set parameters to take profits either by a set objective of ticks or a percentage gain based on your entry price. You can also set also set the objective as a percentage gain based on the average bar range of a lookback period. In addition, you can set the profit objective to be based on a percentage retracement from the peak or trough of a trend. The first option is "None." This would be clicked to remove any previous profit protection instructions.

The next option is "By % of value. Once you click on this option you will need to place a value in the box. For example, in the chart on the right the entry system is enter a position if the market penetrates the Dynamic Trio Own line and the profit object is 2% of the entry price. If the price moves 2% of the entry price in your favor the system goes flat, and waits for the next signal. If the market opens past your profit point the program will use the opening price for your exit price. The next option is "By ticks." Enter in an amount of ticks for a profit objective. For example, you may set up your system


Check here to set the profit protection rules based on a percentage retracement from the peak or valley of the targeted profit.

to automatically take profit 20 ticks from the entry price. Another feature is to set your profit target and then set a percentage retracement of the peak profit if the minimum profit is hit. The window to the right shows a profit protection minimum of 1% and if hit, then exit at a 33% retracement of the peak profit.

The chart below shows this action. The simple moving average system went short at the close at 123-20 (point A). The minimum target was 1%, which calculates to be 122-12, (123.625*.01 = 1.23625, 123.625 - 1.2365 = 122.3888 which approximates 122-12). Two days later the price exceeds this price (point B) and reaches 122-07 (point C). A 33% retracement of this peak profit (123-20 minus 122-07) is 122-21 (point D), and the system exits and goes flat.

You can also set the profit protection to be based on a minimum of ticks. The next example sets a minimum target of 52 ticks and a percentage retracement of 33%. The
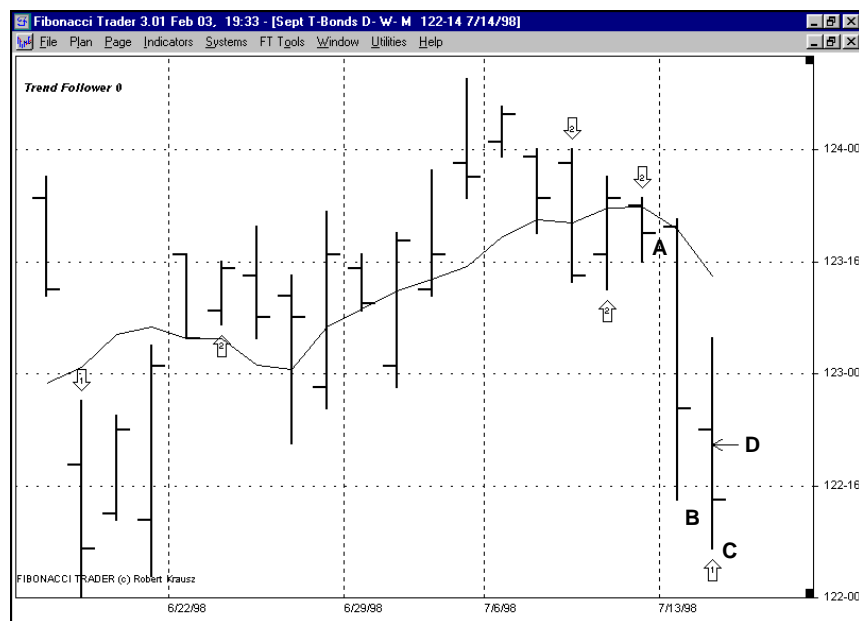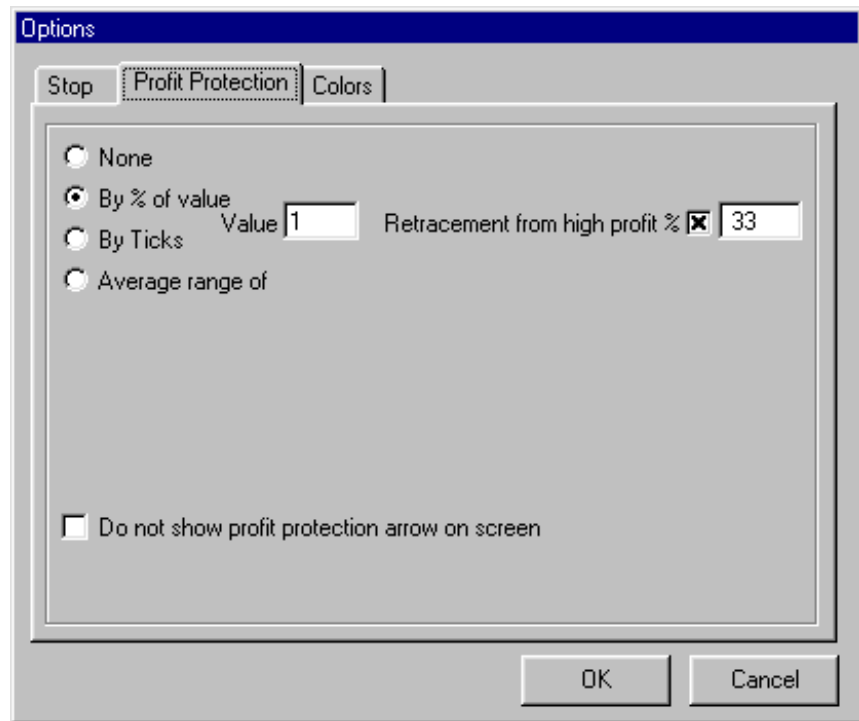
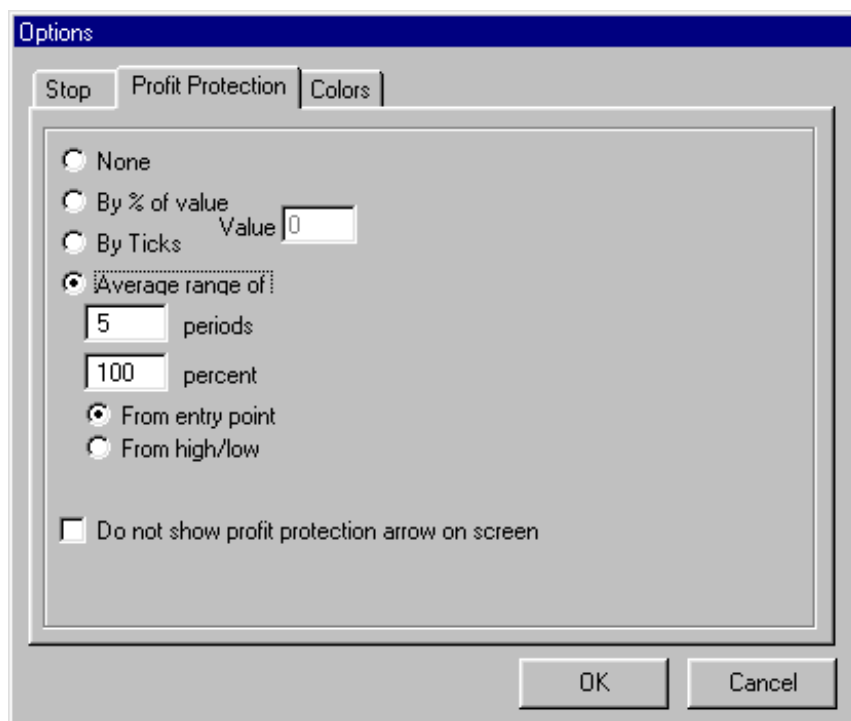menu shown is this set up. Click on "By Ticks," enter 52 into the Value box, then click on retracement and enter 33. The chart below shows the trade.
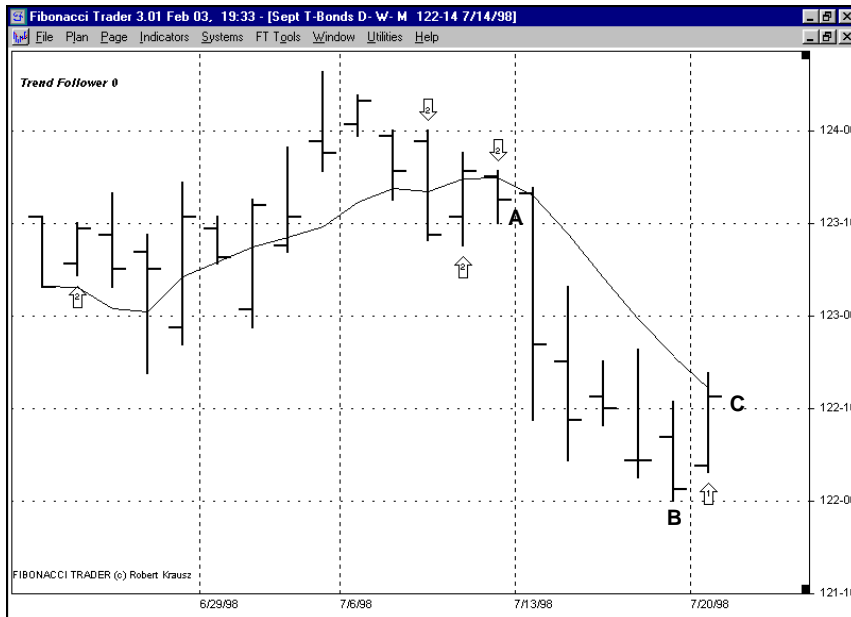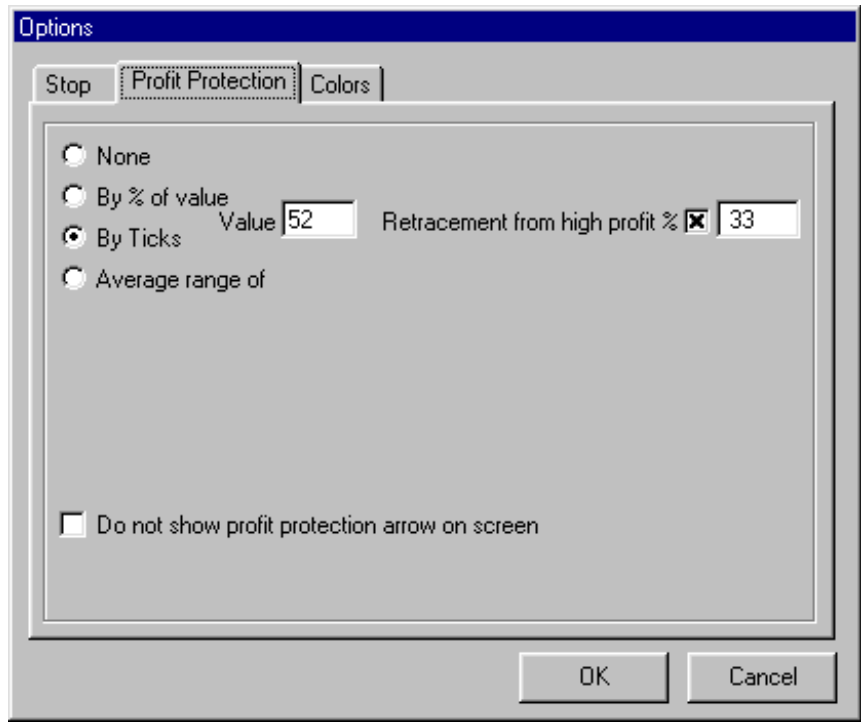

The system went short at 123-20 (point A). The minimum objective was 52 ticks, which was hit at point B. A 33% of 52 ticks is 17 ticks, which was hit at point C. When the profit protection rule is enacted, the system goes flat and wauts for the next entry signal.

Another feature is to calculate the average bar range over a lookback period as a profit objective. For example, set the Average range to 5 periods, and the percent to 100. The program will track the 5 bar range and add that to the entry point if you are long, or subtract from the entry point if you are short. If the price hits your objective the system will go flat and wait for the next entry signal.

Options

Stop | Profit Protection | Colors

○ None
○ By % of value
○ By Ticks   Value 0
◉ Average range of
   5   periods
   100   percent
   ◉ From entry point
   ○ From high/low

☐ Do not show profit protection arrow on screen

OK   Cancel

For example, in the chart the system went short at 122-22 (point A). On that day the 5 bar average range was 16 ticks, which was subtracted from 122-22 and set an objective of 122-06. Each new bar added adjusts the 5 bar average range and the target will adjust to this new average. In this case the target was hit at point B. You also have the choice of using the high or the low of the entry bar for the calculation of the target instead of the entry price.
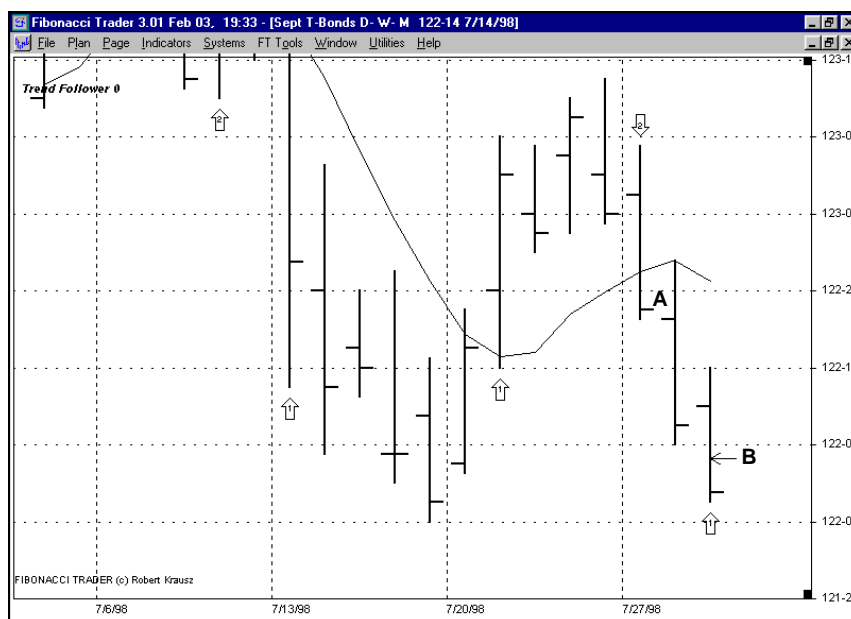
Finally, you have the option of the Profit Protection Arrow appearing on the plan or not.

The Colors Tab provides you with the choice of colors for the arrows for Going Long, Going Short, Going Flat, Stop Arrow and Profit Protection Arrow.
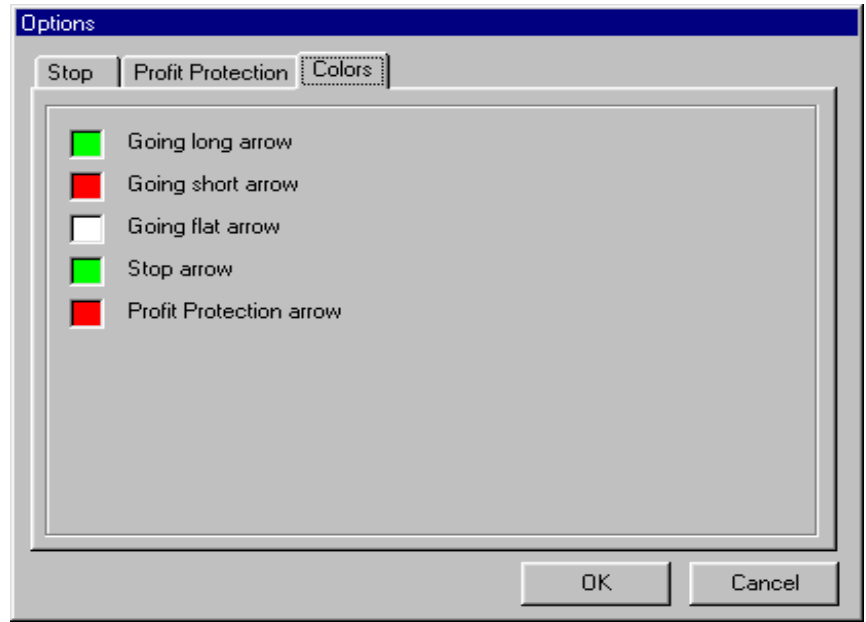
SYSTEMS REPORTS

The Fibonacci Trader program produces three reports for a system. The reports are available by right mouse clicking over the name of the system in the top left hand corner of the chart and selecting Results. The first report is a trade by trade listing giving you the date, time if intraday, quantity, price, stop & reverse quantity, and the cumulative total number of ticks the system produced. You can copy any and all of the information by dragging your mouse over the data and pressing the key "Ctrl" and the letter "C," then paste to the application you want to use.

From this window you can select to view the parameters of the system, see the next two reports by clicking on Summary, or print the report. If you click on Summary your choices are the Performance report and the Risk report. The table on the right is the Performance Report. The Open Interest figures at the bottom refer to the number of contracts the system carried.

The Risk report, shown here on the right, is a much more detailed

488	10/29/96	05:20	3	111-24	4	96-17	
489	12/5/96	05:20	-1	113-20	-4	102-05	
490	12/19/96	05:20	3	112-22	4	103-03	
491	12/31/96	05:20	-1	112-05	-4	101-16	
492	1/3/97	05:20	-3	111-03	-2	102-18	
493	1/14/97	05:20	1	110-30	4	103-01	
494	1/24/97	05:20	-3	109-25	-4	101-28	
495	1/31/97	05:20	1	110-31	4	98-10	
496	2/7/97	05:20	3	112-00	2	99-11	
497	2/20/97	05:20	-1	112-18	-4	101-01	
498	2/28/97	05:20	-3	110-14	-2	103-05	
499	3/24/97	05:20	1	108-31	4	107-18	
500	3/27/97	05:20	-3	107-12	-4	105-31	
501		Last Pos Value		106-20		108-07	

T-Bonds D- W- M EOD   106-20   -0-23

Results

Performance Results for T-Bonds D- W- M System
HiLo Activator
From 1/2/85 05:35 to 4/11/97 06:46

Gross Profit	585.41
Gross Loss	-479.44
Net	105.97
Total Trades	425.00
Total Winning	145.00
Total Losing	280.00
Percent Profitable	34.12
Largest Winning Trade	25.31
Largest Losing Trade	-6.66
Average Winning Trade	4.04
Average Losing Trade	-1.71
Ratio Average Win/Average Loss	2.36
Average Trade	2.51
Max Consecutive Winners	5.00
Max Consecutive Profit	31.78
Max Consecutive Losers	11.00
Max Consecutive Draw Down	-17.75
Maximum Open Interest	3.00
Maximum Open Interest Average	2.18

report. This report breaks down the trading statistics to include day trades as well as overnight (normal) trades.

In addition, the reports lists the total number of contracts traded, including the number of contracts for winning and losing trades. With this information you can calculate the impact commissions would have on your systems' performance.

The average buy price and average sell price are included, as well as the average buy instrument value and sell instrument value. Other contracts have an instrument value because of the size of the contracts, such as wheat is 5,000 bushels multiplied by the price equals the instrument value.

Any results that you save are viewed by going to the Contracts Lists and right mouse clicking on the contract.

Results ☒

Print | Copy | Close

Performance Results for T-Bonds D- W- M System
HiLo Activator
From 1/2/85 05:35 to 4/11/97 06:46

Gross Profit	585.41
Gross Loss	-479.44
Net	105.97
Gross Profit Points	585.41
Gross Loss Points	-479.44
Net Points	105.97
Total Winning DayTrades	0.00
Total Losing DayTrades	0.00
Total DayTrades	0.00
Total Winning Normal	145.00
Total Losing Normal	280.00
Total Normal Trades	425.00
Total Trades	425.00
Total Winning DayTrades Contracts	0.00
Total Losing DayTrades Contracts	0.00
Total DayTrades Contracts	0.00
Total Winning Normal Contracts	381.00
Total Losing Normal Contracts	545.00
Total Normal Trades Contracts	926.00
Total Trades Contracts	926.00
Average Contracts per Trade	2.18
Max Trade Contracts	6.00
Min Trade Contracts	2.00
Largest Winning Trade	25.31
Average Winning Trade	4.04
Max Consecutive Winners	5.00
Max Consecutive Profit	31.78
Largest Losing Trade	-6.66
Average Losing Trade	-1.71
Max Consecutive Losers	11.00
Max Consecutive Draw Down	-17.75
Maximum Open Interest Average	2.18
Average Buy Price	80.64
Average Sell Price	80.84
Average Trade Price	80.74
Average Buy Instrument Value	80.64
Average Sell Instrument Value	80.84
Average Instrument Value	80.74