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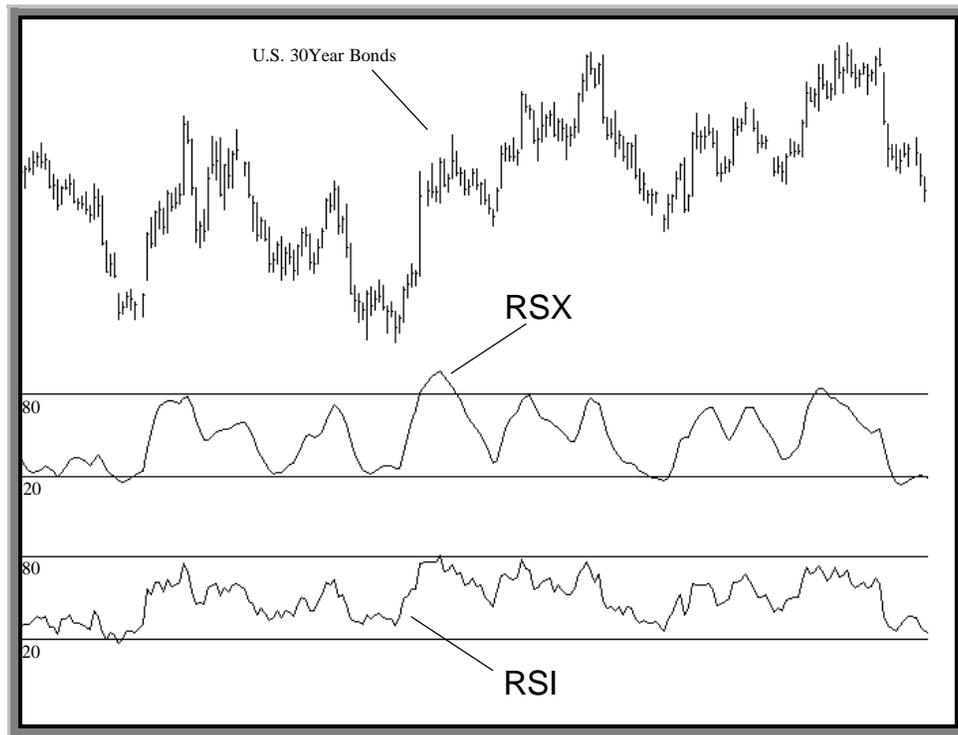
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RSX

Relative Trend Strength Index

Add-In Tool for TradeStation Technologies Software *



USER'S GUIDE

* TradeStation Technologies: TradeStation 4, SuperCharts 4, ProSuite 2000, TradeStation Pro

Installation Instructions

The software accompanying this manual is designed to be used inside TradeStation Technologies (formerly Omega Research) TradeStation 4, SuperCharts 4, TradeStation 2000, ProSuite 2000 or TradeStation Pro. If you do not have an up-to-date version, call TradeStation Technologies for the appropriate upgrade.

Getting Jurik's tools into a TradeStation software application is a 2-step process:

- **INSTALLATION:** to create .ELA or .ELS files containing the Jurik modules.
- **TRANSFER:** to move the modules into your TradeStation software product.

Step 1: INSTALLATION

1. The name of the installation software is JRSACT_2.EXE
2. If you **HAVE** received a password from Jurik Research (on a colored sheet of paper that came with this software), then **SKIP THIS STEP** and proceed to step #3. Otherwise, using Windows' Explorer (or File Manager), double-click or run the installer program JRSACT_2.EXE. If you have TradeStation 4 or SuperCharts 4, enter your security block number if you have one. (SuperCharts end-of-day users probably have no security block number so they should leave the field blank.) If you have TradeStation 2000 or ProSuite 2000, enter your TradeStation Customer ID number. Working through, select all the Jurik tools you currently have license to use. Eventually the program will give you an **identification code**. To receive your activation password from us, e-mail to: nfs@nfsmith.net, or call 323-258-4860 or fax 323-258-0598, and tell us your name, phone number, the platform you are installing to (TS4, SC4, TS2000, PS2000) and the identification code. After receiving your password, proceed to step #3.
3. Close your software application (SuperCharts, TradeStation or ProSuite). Leaving it open may interfere with the installation process. You do NOT need to shut down the data server.
4. Using Windows' Explorer (or File Manager), double-click or run JRSACT_2.EXE. Enter your security block number or Customer ID number, if applicable. (SuperCharts end-of-day users probably have no security block number.) Also enter your password. Click OK. Select all and only those tools you currently have license to use, otherwise the password will not be accepted. Click OK. Follow other instructions on screen.
5. At this point, all the Jurik tools (eg. JMA, VEL, CFB, WAV, DDR, RSX) you currently have license to use were placed as Easy Language files on your hard drive. The next page shows how to transfer (import) them into your TradeStation software product.

Step 2: TRANSFER / IMPORT

Transferring to TradeStation 4.0 / SuperCharts 4.0

1. Run TOOLS / VERIFY_ALL to ensure all linkages are correct.
2. Using either QuickEditor or PowerEditor, use the FILE / OPEN command to bring up a dialog box, then press the TRANSFER button.
3. Select "**Transfer ... FROM Easy Language Archive File**" and press the OK button.
4. Transfer in RSX, whose default filepath is C:\JRSOMEGA\EASYLANG\JRC_RSX.ELA. (You may have elected to change this filepath during installation.) Enter the filepath and press OK.
5. Select "Transfer All" and press OK. All JMA related tools will be automatically transferred.
6. Do not assume all transferred modules were properly verified. Execute TOOLS \ VERIFY_ALL to ensure all linkages are correct.

Importing to TradeStation 2000 / ProSuite 2000

1. Using the PowerEditor, execute FILES \ VERIFY_ALL to ensure all linkages are correct.
2. Execute the FILE \ IMPORT_and_EXPORT command.
3. Select "**Import Easy Language Archive Files**" to import .ELS files. Press the OK button.
4. Import RSX, whose default filepath is C:\JRSOMEGA\EASYLANG\RSX.ELS. (You may have elected to change this filepath during installation.) Enter the filepath or use the browser to find it. Make sure you select to import all studies contained within the ELS file. Press OK.
5. During importation, it may want to load the same function several times, so you may repeatedly see a dialog box asking if you want to overwrite an already existing module. To speed up the import process, select "YES TO ALL".
6. Do not assume all the imported modules were properly verified. Execute the command FILES \ VERIFY ALL to ensure all linkages are correct.

IMPORTANT NOTICE

When upgrading
from
TradeStation 4 or SuperCharts 4
to
TradeStation 2000 or TradeStation Pro

INCOMPATIBILITY

TradeStation 2000 and TradeStation Pro (hereafter referred to as "TS2000") are 32-bit programs, which makes them completely different than TradeStation 4 and SuperCharts 4 (hereafter referred to as "TS4/SC4"), which are 16-bit programs. Consequently, the Jurik modules designed for TS4/SC4 are not compatible with TS2000. **To get Jurik modules for TS2000, you must run the installer and designate that platform.**

EXPANDED NAMES

Easy Language studies (functions, indicators and systems) will include during transfers (imports & exports) all functions required to make them work. Therefore, any studies that you import to TS2000 that were developed in TS4/SC4 will also transfer with them any Jurik functions that they utilize. Because these functions are not compatible with TS2000 (see incompatibility notice above), it is imperative that they not overwrite the Jurik modules already installed in TS2000.

To accomplish this, the names of all Jurik functions, indicators and systems for TS2000 have been expanded to include the suffix "2k". For example, if this user manual refers to a function named **JRC.RSX**, its expanded name for TS2000 is **JRC.RSX.2k**

You will need to modify any studies you transferred in from TS4/SC4 so that they will now include the ".2k" suffix on the names of all Jurik functions that they utilize.

Executive Summary

brief instructions for those who don't read user manuals

Use the **JRC.RSX** indicator just as if it were the classical RSI indicator. It uses a proprietary function, called **JRC.RSX**. You can code your own Easy Language modules to employ the user function as follows:

```
value1 = JRC.RSX ( SERIES , LENGTH ) ;
```

SERIES is the time series to be processed, such as the daily closing price. To use closing prices, replace “SERIES” in the above expression with “close”. This input series can also be any QuickEditor expression that produces a series. For example, “SERIES” could be replaced by “7+average (close, 14)”.

LENGTH is roughly the number of bars used in the calculation of RSX, and it determines the degree of smoothness. Small values make RSX respond rapidly to price change and larger values produce smoother, flatter curves. Typical values for LENGTH range from 5 to 30. You can even use decimal numbers, such as 28.3.

There may be times when you want to feed RSX your own calculated time series variable, instead of the standard open, low, low and close. For this purpose, we have a special version of RSX, called **JRC.RSX.flex**. In the following example, the time series variable is calculated just prior to feeding RSX:

```
series = close + 0.5 * stdev ( high , 10 ) ;  
result = JRC.RSX.flex ( series , 14 ) ;
```

NOTE: Although **JRC.RSX.flex** has this advantage over **JRC.RSX**, it also has two important disadvantages. Both are directly the result of the properties of type SIMPLE user functions in Easy Language. You need to decide which version of RSX is more appropriate in your coding. The two disadvantages of the flex version are:

- 1) **JRC.RSX.flex** does not produce a time series. Consequently, you cannot reference past values of it directly. However, you can do so indirectly by referring its output to a variable and then seeking past values of that variable. For example:

```
INVALID EXPRESSION:    result = JRC.RSX.flex (series,length)[7] ;
```

```
VALID EXPRESSION:     value1 = JRC.RSX.flex (series,length) ;  
                      result = value1[7] ;
```

Note: This method of referencing past values of variables is not permitted inside type-SIMPLE functions.

- 2) **JRC.RSX.flex** is not automatically evaluated on every bar. You must control when it gets evaluated. This can be advantageous. For instance, you can take a moving average of only Tuesday's closing prices when using a *daily* chart, by writing code so that RSX is called only on Tuesdays. For example:

```
if (DateOfWeek(Date) = 2) then result = JRC.RSX.flex (close,length) ;
```

Max number of bars RSX will reference equals the lookback of the input time series plus the lookback of RSX itself.

<u>INPUT to RSX</u>	<u>FULL EXPRESSION</u>	<u>MaxBarsBack</u>
close	JRC.RSX (close, 21)	21
close[5]	JRC.RSX (close[5], 21)	21 + 5
average(close[5],14)	JRC.RSX (average(close[5], 14), 21)	21 + 14 + 5

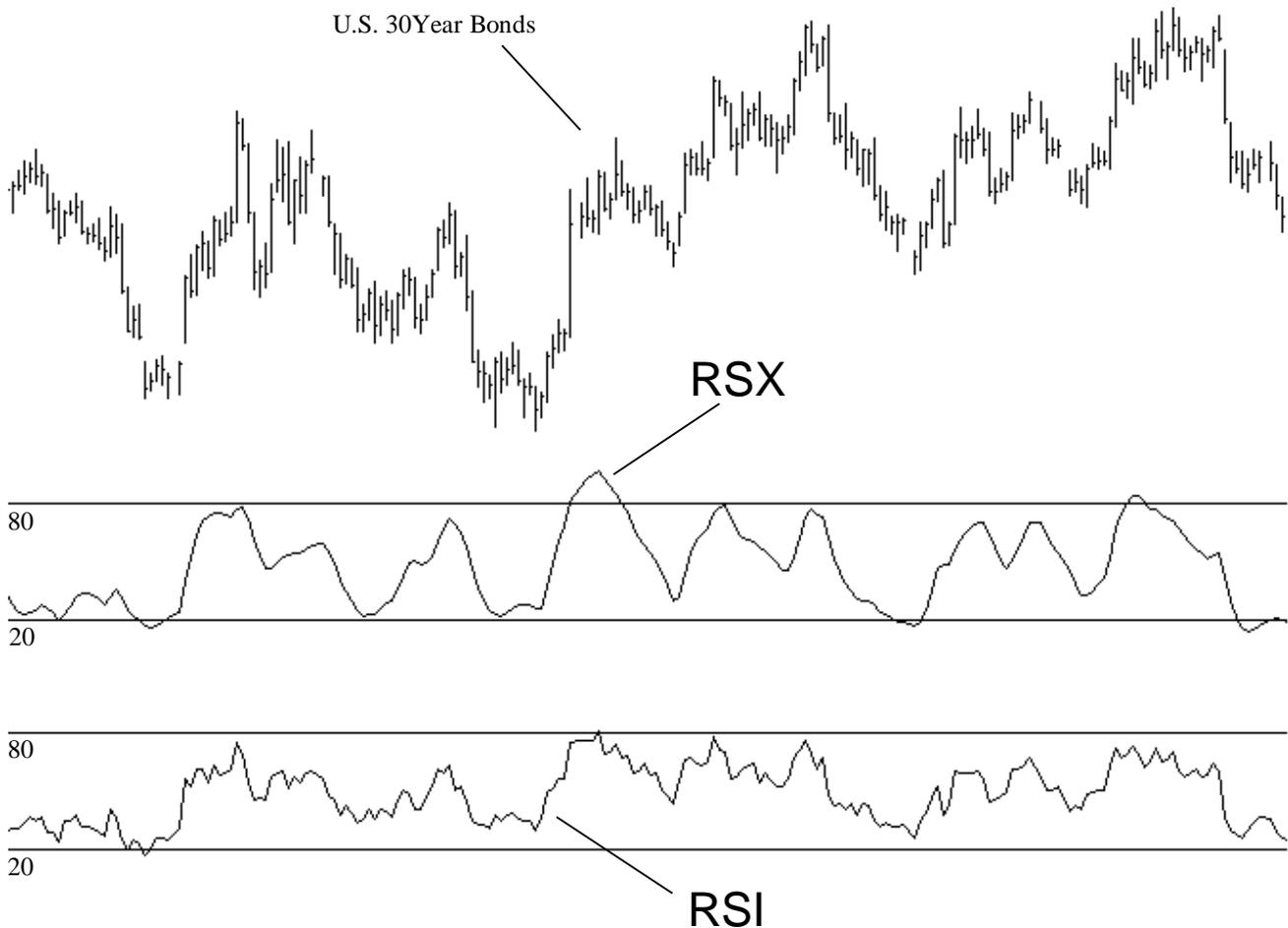
Why use **RSX** ?

The popular RSI indicator is very noisy. RSX eliminates noise completely !!

There is only one convincing way to illustrate the power of RSX. In the chart below, we see daily bars of U.S. Bonds analyzed by RSX and the classical RSI.

RSX is very smooth. Typically any indicator can be smoothed by a moving average, but the penalty is added lag to the resulting signal. Not only is RSX smoother than RSI, but its smoothness comes **without added lag**.

RSX permits more accurate analysis, helping you avoid many trades that would have been prematurely triggered by the jagged RSI. Once you begin using RSX, you may never apply the classical RSI again!



User Guide

for use in
Power Editor

After installing RSX, the indicator **JRC RSX** is ready for use. You may use it within TradeStation and SuperCharts the same way as you would use the classical RSI indicator. The indicator **JRC RSX** consists of the following Easy Language code:

```
INPUTS: PRICE(CLOSE), LENGTH(8) ;
VARS: RSXplot(0);
RSXplot = JRC.RSX(PRICE, LENGTH);
PLOT1(RSXplot, "JRC RSX");
```

The first line of code says the indicator requires 2 input parameters. The first one is PRICE, which defines the time series to be processed. It defaults to the closing price of each bar. PRICE can be any simple calculation that produces a series, such as (High+Low+Close)/3, or any function that produces a series as its output, such as "average(close, 14)". In the later case, a line of code may look like this:

```
RSXplot = JRC.RSX(average(close,14), LENGTH);
```

Although any type-series function can be used to generate input to **JRC.RSX**, we do not recommend using any time series other than simple combinations of Open, High, Low and Close, for example, (H+L+C) / 3. This gives results with the least lag.

The next parameter is LENGTH, and it determines the function's time scale. Larger values produce a smoother result. The default value for LENGTH is 8.

The third line of code above calls the user function **JRC.RSX**. This user function contains a proprietary algorithm. It is encrypted and cannot be viewed. The last line tells the indicator to draw a plot of RSX's results.

Set the indicator's PROPERTIES so that its maximum number of bars referenced (**MaxBarsBack**) is as specified in the Executive Summary section of this manual.

You may want to design your own indicators that use the underlying user function directly. To see how to do this, read the "Executive Summary" earlier in this manual.

SuperCharts users can easily build their own RSX indicator by specifying it as follows:

Indicator Name:	my_RSX						
Plot1 Formula:	JRC.RSX (price, length)						
MaxBarsBack:	1 {see Executive summary for more info}						
Inputs:	<table><thead><tr><th>Name</th><th>Default Value</th></tr></thead><tbody><tr><td>Series</td><td>close</td></tr><tr><td>Length</td><td>8</td></tr></tbody></table>	Name	Default Value	Series	close	Length	8
Name	Default Value						
Series	close						
Length	8						

for use in
Quick Editor

The formula for plot1 may use complex expressions for PRICE. PRICE can be any calculation that produces a series, such as (High+Low+Close)/3, or any function that produces a series as its output, such as "average(close, 14)". In the later case, the formula for Plot1 might look like this....

```
JRC.RSX(average(close,14), LENGTH);
```

Demonstrations

The remaining portion of this user manual contains demonstrations that show the power of RSX. The demonstrations include systems for the S&P and for US 30-Yr Bonds. The installer created two data files in the JRSOMEGA \ DATA directory: USBONDS.TXT and SP500.TXT. You are invited to perform the same experiments as we did. Just follow the instructions in the manual, and you should get similar results.

To load the sample data for any demonstration, following these steps:

LOADING SAMPLE U.S. T-BOND DATA (or SP500 DATA) in TradeStation 4 / SuperCharts 4

1. Select menu command FILE / NEW WINDOW / CHART
2. In the INSERT PRICE DATA box select DIRECTORY radio button
3. Press NEW DIR and enter C:\JRSOMEGA\DATA\ in the DIRECTORY field and select ASCII
4. Press OK. Select USBONDS.TXT or SP500.TXT Select "Prompt for Format". Press PLOT
5. Select FIRST LINE OF DATA FILE and press OK.
6. In SETTINGS box
 - Select FUTURE as data type
 - enter "US" {for Bonds} or "SP" {for SP500} in the SEARCH FOR field
 - Deselect EXACT MATCH
 - Press FIND
 - Select "TREASURY BONDS 30 Yr" or "S&P500 Index" in the DATA NAME field
 - For the S&P, specify these price settings: Min Move = 5, Value = 500
 - Press OK
7. In FORMAT PRICE DATA box, select SETTINGS tab
8. For Bonds, enter 'First Date' as 1/03/84 and 'Last Date' as 1/03/90. For S&P, Enter 'First Date' as 1/01/83 and 'Last Date' as 1/10/96. Press OK

LOADING SAMPLE U.S. T-BOND DATA (or SP500 DATA) in ProSuite 2000 / TradeStation 2000

1. Select menu command FILE / NEW... / TradeStation Chart
2. Select menu command INSERT / SYMBOL ... , then press NEW DIR...
3. Select DATA TYPE as ASCII and press the BROWSE button and find the C:\JRSOMEGA \ DATA folder
4. Press OK to exit the Browse box. Press OK to exit the NEW DIRECTORY box.
5. Select either USBONDS.TXT or SP500.TXT and press PLOT. Select "First Line of Data File"
6. Select date format MONTH/DAY/YEAR for SP500, or select YEAR/MONTH/DAY for USBONDS. Press OK
7. In the Settings box, set DATA TYPE: future
8. For S&P: set SEARCH FOR = SP.
For BONDS, set SEARCH FOR = US
9. Deselect "EXACT MATCH", press FIND
10. FOR S&P: Select "S&P500 Index" in the DATA NAME field, set MIN MOVE= 5, VALUE = 500. Press OK
FOR BONDS: Select "TREASURY BONDS 30 Yr", set MIN MOVE= 1, VALUE = 1000. Press OK
11. In Format Symbol box, For Bonds, enter 'First Date' as 1/03/84 and 'Last Date' as 1/03/90.
For S&P, Enter 'First Date' as 1/01/83 and 'Last Date' as 1/10/96. Press OK

DEMO #1

Comparing RSX to RSI

Load any price data onto a chart.

Insert onto your chart the indicator "*Custom 2 line*". Before pressing the PLOT button, make sure the "Format" box is selected.

For the field "Input 1", enter the formula ... **RSI (close , 10)**

For the field "Input 2",

in TradeStation/SuperCharts 4, enter the formula ... **JRC.RSX (close , 10)**

or in TradeStation 2000, enter the formula **JRC.RSX.2k (close , 10)**

Set it to plot on any subgraph other than subgraph 1. Press OK button.

For the chart below, we used daily US Bonds data. Your chart may look different. The heavy line is RSX and the thin, lighter line is RSI. Note RSX smoothness.



Smoothness can be adjusted by varying the LENGTH parameter. Small values make RSX respond rapidly to price change and larger values produce smoother, flatter curves. Typical values for LENGTH range from 5 to 80.

NOTE

ALL DEMONSTRATION SYSTEMS

Historical back-testing does not prove a system will be profitable in the future, but it can demonstrate whether or not a system would be worthless in the future.

The example trading systems described in this manual are for illustration purposes only. Do not trade real money using these demonstration systems.

A real trading system should be tested extensively for various kinds of flaws, including over sensitivity to parameter settings.

A real trading system requires not one but several mutually concurring indicators as well as good money management rules useful for assessing how much to invest and for placing exit stops.

DEMO #2

RSX Zones
Trading System

RSX measures two aspects of market trend simultaneously: momentum and purity. Trend momentum is the speed with which price is moving, and trend purity is concerned with the relative proportion of bars that are actually moving in the direction of trend. A fast moving upward trend with 90% of the last 20 bars moving in the same direction will produce a strong RSX value (a value close to either 0 or 100). Congested price movement will have about half of the price bars moving up and half moving down. In that case, RSX will produce a neutral value of 50 out of 100 (just as the classical RSI would).

Trend momentum and purity are important aspects to consider when timing trade entries and exits. The following demonstration trading system is based on the following key rules: Buy when RSX is rising, sell when RSX is falling. However, if RSX is in either extreme long/short range, let the current position continue until RSX falls out of the extreme range. There's no point in ending a trade when the trend is going strong.

The installed trading system is called "JRC RSX ZONES" and has the following code:

```
Inputs: rlen(12), LongZone(74), ShrtZone(34);
vars: RSX(0) ;

RSX = JRC.RSX.2k(h+1,rlen) ;

If          RSX < RSX[1] AND RSX < LongZone then sell
else if     RSX > RSX[1] and RSX > ShrtZone then buy ;
```

System parameter definitions:

- RLEN specifies the length of RSX.
- LONGZONE specifies the RSX level above which no "sell-short" commands may be executed.
- SHRTZONE specifies the RSX level below which no "buy-long" commands may be executed.

In TradeStation 4 and SuperCharts 4, it uses the function JRC.RSX, whereas in TradeStation 2000 it uses the function JRC.RSX.2k.

To run this demonstration, load in the U.S. Bond data we supplied (loading instructions are provided earlier in this manual). Next, insert the system "JRC RSX ZONES", and set the following parameters values:

Cost parameters:

Commission	\$30
Slippage	\$50
Margin	\$2700

System parameters:

Rlen	12
LongZone	74
ShrtZone	34

Max number of bars referenced (MaxBarsBack) = 50.
Default Trade Number = 1 contract.

This very simple system was profitable during the 6 years of trading, yielding a \$44,000 profit when trading with only \$2,700 margin, and a worst case drawdown of less than \$10,000.

JRC RSX Zones	USBONDS.TXT-Daily		01/02/84 - 01/03/90	
Performance Summary: All Trades				
Total net profit	\$ 44,315	Open position P/L	\$ 1,718	
Gross profit	\$140,888	Gross loss	\$ -96,573	
Total # of trades	182	Percent profitable	41.76%	
Ratio avg win/avg loss	2.03	Avg trade(win & loss)	\$ 243	
Max intraday drawdown	\$ -9,860			
Profit factor	1.46	Max # contracts held	1	
Account size required	\$ 12,560	Return on account	352%	

This system is only for demonstration purposes. Do not trade real money using this system, it does not have all the necessary safety features for limiting exposure to risk. In addition, the maximum drawdown of this "paper traded" system may be too large for your trading account.

NOTE: Before running any trading system, make sure ...

- *Cost parameters are appropriate for the market being traded.*
- *System parameters are appropriate for the market being traded.*

DEMO #3

RSX Zones 2

Trading System

The previous demonstration had a profit factor of only 1.46. This means that only \$1.46 was gained for each \$1 lost. We'd like to improve this performance, while keeping maximum drawdown (MDD) low, and the Return on Account (ROA) high.

Examination of the actual trades reveals many were entered prematurely, despite the fact that the RSX zones were designed to prevent this. The question then becomes "How do I get additional confirmation before entering a trade?"

In this demonstration, additional confirmation of a trend reversal is attained by requiring the bar of entry to move sufficiently in the direction of the anticipated new trend direction. This is accomplished by requiring the bar low to be below a moving average before entering a SHORT trade, and requiring the high to be above the moving average before entering a LONG trade.

The installed trading system is called "**RSX Zones 2**" and is coded as follows:

```
Inputs: Rlen(10), Wlen(24), LongZone(77), ShrtZone(38);
vars: RSX(0), Wavg(0) ;

RSX = JRC.RSX.2k(h+1,rlen) ;
Wavg = waverage( waverage( (h+1)/2, Wlen), Wlen ) ;

If RSX < RSX[1] and RSX < LongZone and L < Wavg then sell;
If RSX > RSX[1] and RSX > ShrtZone and H > Wavg then buy;
```

Although not as good as Jurik's JMA moving average, the double weighted moving average employed in this system does a fair job of smoothing with low lag.

System parameter definitions:

- RLEN = length of RSX.
- WLEN = length of the double weighted moving average.
- LONGZONE = RSX level above which no "sell-short" commands may be executed.
- SHRTZONE = RSX level below which no "buy-long" commands may be executed.

To run this demonstration, load in the U.S. Bond data we supplied (loading instructions are provided earlier in this manual). Next, insert the system "**JRC RSX ZONES 2**", and set the following parameters values:

Cost parameters:

Commission	\$30
Slippage	\$50
Margin	\$2700

System parameters:

Rlen	10
Wlen	24
LongZone	77
ShrtZone	38

Max number of bars referenced (MaxBarsBack) = 50.
Default Trade Number = 1 contract.

This simple system was profitable during the 6 years of trading, yielding a \$45,000 profit when trading with only \$2,700 margin, and a worst case drawdown of less than \$12,000.

The detailed performance statistics show a profit factor of 1.80, a nice increase over 1.46 from the previous system. Consequently, significantly fewer trades were needed to maintain the same overall net profit, as profit per trade almost doubled in value. The downside is that maximum drawdown increased, thereby lowering ROA from 352% to 317%.

When designing any system, there are multiple factors to consider, and as is typically the case, a tradeoff exists between them.

JRC RSX Zones 2	USBONDS.TXT-Daily		01/02/84 - 01/03/90	
Performance Summary: All Trades				
Total net profit	\$ 45,183	Open position P/L	\$	375
Gross profit	\$101,452	Gross loss	\$	-56,268
Total # of trades	102	Percent profitable		41%
Ratio avg win/avg loss	2.58	Avg trade(win & loss)	\$	442
Max intraday drawdown	\$-11,533			
Profit factor	1.80	Max # contracts held		1
Account size required	\$ 14,233	Return on account		317%

This system is only for demonstration purposes. Do not trade real money using this system, it does not have all the necessary safety features for limiting exposure to risk. In addition, the maximum drawdown of this "paper traded" system may be too large for your trading account.

NOTE: Before running any trading system, make sure ...

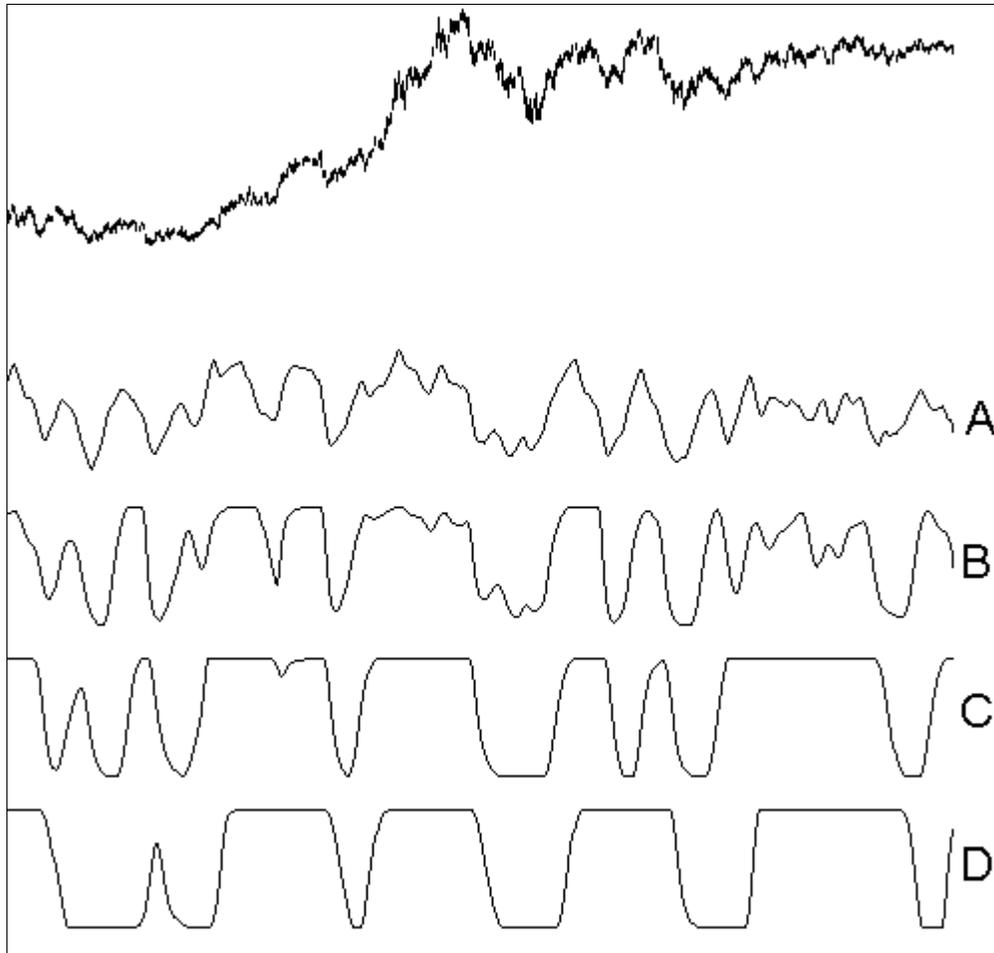
- *Cost parameters are appropriate for the market being traded.*
- *System parameters are appropriate for the market being traded.*

The following examples require Jurik tools RSX and JMA

This section illustrates the power of combining **RSX** with another tool of ours, the **JMA** (Jurik Moving Average). To run the demonstrations described herein, you will need to have installed both JMA and RSX onto your TradeStation application software. Details about JMA and how to acquire it are available on our web page at http://www.jurikres.com/catalog/ms_ama.htm .

Most technical indicators can be smoothed by applying JMA to the indicator's output. In addition, you can also apply JMA to data **before** it is fed to an indicator. This form of pre-processing may transform the nature of a technical indicator into a completely new function.

For example, plot **A** in the chart below shows the RSX indicator with no pre-smoothing by JMA. In plots **B**, **C** and **D**, JMA's smoothness parameter is 10, 30 and 60 respectively. As pre-smoothness increases, note how RSX tends to yield more extreme values. In plot **D**, RSX yields only two values, its maximum and minimum, indicating "trend-up" and "trend-down".



The formula for plot

- A: JRC.RSX (JRC.JMA (close, 0 , 0) , 14)
- B: JRC.RSX (JRC.JMA (close, 10 , 0) , 14)
- C: JRC.RSX (JRC.JMA (close, 30 , 0) , 14)
- D: JRC.RSX (JRC.JMA (close, 60 , 0) , 14)

The next two demonstrations show how pre-smoothing with JMA yields trading systems better than those shown in demonstrations 2 and 3.

DEMO #4

Threshold RSX Trading System

In this demonstration, we take the RSX signal, whose input was pre-smoothed by JMA, and compare it to two threshold values for triggering buy/sell signals. If the signal crosses above BUYLINE, then buy long. If the signal crosses below the SELLINE, then sell short.

The installed trading system is called "**JRC thresh RSX**", and its code is as follows:

```
Input: series(close), L1(2), P1(49), L2(9), Buyline(39), Sellline(54) ;
IF JRC.RSX( JRC.JMA( series, L1, P1 ), L2 ) crosses above BuyLine
    Then Buy on Close ;
IF JRC.RSX( JRC.JMA( series, L1, P1 ), L2 ) crosses below SellLine
    Then Sell on Close ;
```

System parameter definitions:

- SERIES = the price time series to be analyzed.
- L1 = length of JMA.
- P1 = phase of JMA.
- L2 = length of RSX.
- BUYLINE = RSX level that triggers a buy command.
- SELLINE = RSX level that triggers a sell command.

To run this demonstration, load in the U.S. Bond data we supplied (loading instructions are provided earlier in this manual). Next, insert the **JRC thresh RSX** ", and set the following parameters values:

Cost parameters:

Commission	\$30
Slippage	\$50
Margin	\$2700

System parameters:

series:	close	{ price series to be analyzed }
L1:	2	{ length of JMA }
P1:	49	{ phase of JMA }
L2:	9	{ length of XMA }
Buyline	39	{ threshold to enter long }
Sellline	54	{ threshold to enter short }
Money Management	\$2550	

Max number of bars referenced (MaxBarsBack) = 50.
Default Trade Number = 1 contract.

This simple system was more profitable than demonstrations #2 and #3. Overall net profit was \$60,000, profit factor was 2.06, average trade was \$609 and ROA was almost 500%.

Note: This demonstration system has more input variables than the prior demonstrations, naturally lending it to be more finely tuned to the market's behavior. However, there is always the danger of developing systems that are too complex, enabling it to memorize specific trades, rather than learn the general behavior of a market. This is why it is crucial to keep your system as simple as possible. With regards to this system, its complexity consists of a money management stop and the three lines of code as shown on the previous page.

JRC thresh RSX	USBONDS.TXT-Daily	01/02/84 - 01/03/90
Performance Summary: All Trades		
Total net profit	\$ 60361	Open position P/L \$ 1093
Gross profit	\$ 119705	Gross loss \$ -59343
Total # of trades	99	Percent profitable 49%
Ratio avg win/avg loss	2.06	Avg trade(win & loss) \$ 609
Max intraday drawdown	\$ -9400	
Profit factor	2.02	Max # contracts held 1
Account size required	\$ 12100	Return on account 499%

This system is only for demonstration purposes. Do not trade real money using this system, it does not have all the necessary safety features for limiting exposure to risk. In addition, the maximum drawdown of this "paper traded" system may be too large for your trading account.

NOTE: Before running any trading system, make sure ...

- *Cost parameters are appropriate for the market being traded.*
- *System parameters are appropriate for the market being traded.*

DEMO #5

Reverse RSX
Trading System

This demonstration illustrates a strategy for trading reversal markets. In addition to RSX, it uses the function JMA (Jurik Moving Average). Its design philosophy is based on the notion that reversal markets flip direction too fast for trend following systems to track. For example, by the time a trend following indicator registers an uptrend, the market may have already reversed into a downtrend. When this occurs, we say the indicator is "out of phase" with the market's swings.

Because the market's reversals are fairly regular, "phase error" can be fairly constant. We exploited this property by adding lag to the indicator, making it so late as to put it back in phase again, but with the market's next reversal. This idea is implemented in the following demonstration system.

The installed trading system "**JRC reverse RSX**" contains the following three lines of code ...

```
Input: series(H+L), L1(5), P1(9), L2(22), lag(8) ;
IF JRC.RSX( JRC.JMA( series[lag], L1, P1 ), L2 ) crosses below 50
    Then Buy at market ;
IF JRC.RSX( JRC.JMA( series[lag], L1, P1 ), L2 ) crosses above 50
    Then Sell at market ;
```

To run this demonstration, load in the daily S&P500 futures price data we supplied. (Loading instructions are provided earlier in this manual. Note that for the time period used, the point value of the S&P was \$500.) Next, insert the system "**JRC reverse RSX**", and set the following parameters values:

Cost parameters:

Commission	\$30
Slippage	\$150
Margin	\$15,000

System parameters:

series:	H+L	{ price series to be analyzed }
L1:	5	{ length of JMA }
P1:	9	{ phase of JMA }
L2:	22	{ length of RSX }
lag:	8	{ added lag to the price time series }
Money Management	\$3850	

Max number of bars referenced (MaxBarsBack) = 40.
Default Trade Number = 1 contract.

Note that because this is a reversal-market system, it is blind to long price trends. For example, although all of 1995 was one huge uptrend for the S&P, this system did not capitalize on it, and for most of the year, was out of the market. Nonetheless, this system's profit factor is almost 2.0, ROA is 510% and the average trade nets a \$1330 profit.

JRC reverse RSX	SP500.TXT-Daily	01/03/83 - 01/10/96	
Performance Summary: All Trades			
Total net profit	\$ 166250	Open position P/L	\$ 0
Gross profit	\$ 345485	Gross loss	\$-179235
Total # of trades	125	Percent profitable	58%
Ratio avg win/avg loss	1.37	Avg trade(win & loss)	\$ 1330
Max intraday drawdown	\$ -17580		
Profit factor	1.93	Max # contracts held	1
Account size required	\$ 32580	Return on account	510%

This system is only for demonstration purposes. Do not trade real money using this system, it does not have all the necessary safety features for limiting exposure to risk. In addition, the maximum drawdown of this "paper traded" system may be too large for your trading account.

NOTE: Before running any trading system, make sure ...

- *Cost parameters are appropriate for the market being traded.*
- *System parameters are appropriate for the market being traded.*

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