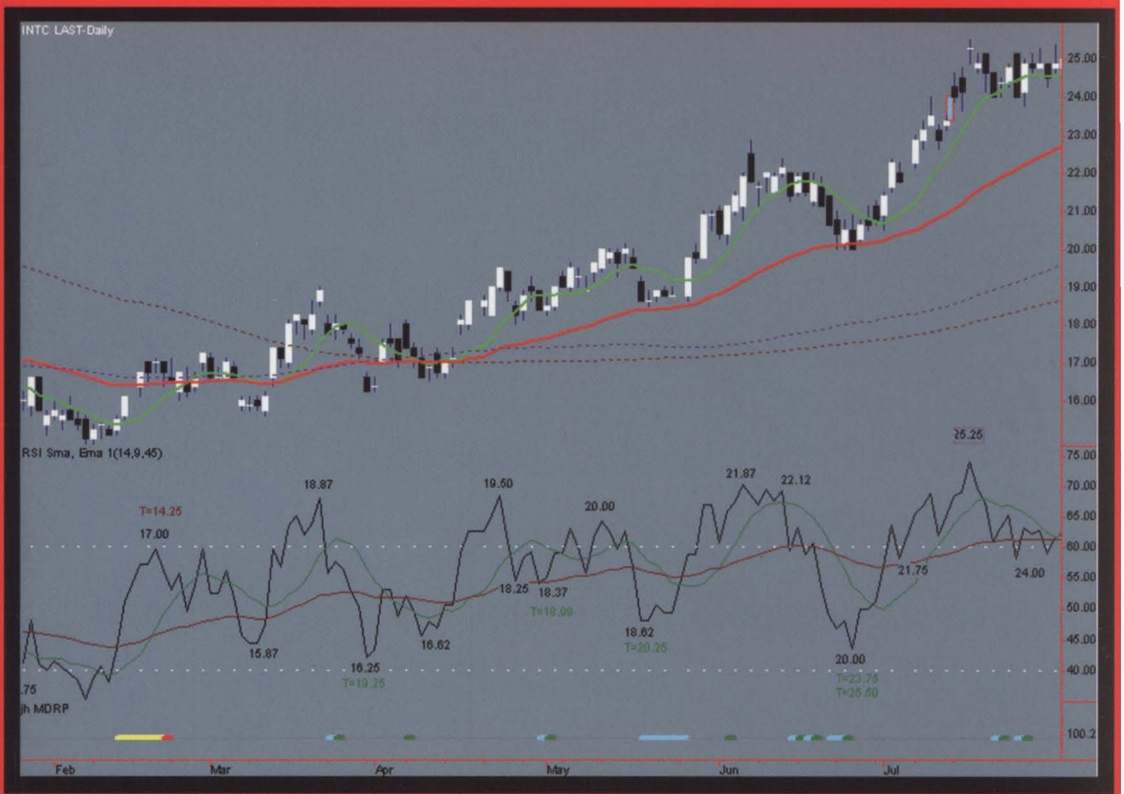
RSI:
The Complete Guide



John Hayden

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Mr. Hayden was born in 1955 in Anadarko, Oklahoma. While attending college in 1974 he began trading stocks with Merrill Lynch, and options with Hornblower Weeks-Hemphill in Poughkeepsie, NY after his classes. This is when Mr. Hayden began his studies of technical analysis using the programming language of APL on an IBM 360 mainframe computer. Since this inauspicious beginning, Mr. Hayden had been a trader of cash gold (1983-1993), 30 Year Treasury Bonds (1993-1997), and wrote his first book The 21 Irrefutable Truths of Trading (2000). In addition, Mr. Hayden has worked as an account manager for the Managed Funds Division of Lind-Waldock, the director of risk management for Directional Research and Trading. He presently resides in Samara, Russia and is the Managing Director for First Volga Investments.

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Dedication

I would like to dedicate this book to the one person who has inspired me the most to live my life to the best of my ability.
This is my wonderful wife,
Valeriya Hayden.

Acknowledgements

In the preparation and the writing of this book there were many people who contributed, inspired, and encouraged my efforts in placing these thoughts onto paper. Additionally there are many people that have guided me in my efforts in becoming a better trader. I would particularly like to express my gratitude to my wife Valeriya Hayden for patience and encouragement, Christopher Castroviejo whose mentoring was crucial in my understanding of time analysis and the "big picture", and Andrew Cardwell who taught in his seminars of the early 1990's some of the concepts mentioned in this book.

Special Thanks

Creating this manuscript was made possible with the help of three individuals. I would like to take this opportunity to thank my wife, Valeriya Hayden, who has supported me in countless ways. I would also like to thank Joe Schedlbauer, who was invaluable in critiquing the ideas that this manuscript encompasses. And finally, I would like to thank Edward Dobson. His unfailing encouragement helped me complete the writing of this comprehensive book about the RSI. Without this encouragement, this manuscript would never have been born. Thank you.

A book only comes "alive" when the reader becomes involved with the subject matter. I would like to take this opportunity to say "Thank you" to the readers of this book for taking their valuable time to learn more about truly understanding price behavior.

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"In trading, as in life, what often appears obvious is not important and what is not obvious is important." – John Hayden

SECTION I

PREPARATION AND UNDERSTANDING – THE KEY TO SUCCESS!

CHAPTER 1

OVERVIEW

In the "old" pre-personal computer days, bar charts and indicator values had to be calculated and plotted by hand on honest-to-goodness paper charts. It was during this 'early' time that the Relative Strength Index or RSI first made its appearance.

In June 1978, Welles Wilder introduced the Relative Strength Index to the trading community in an article for *Commodities Magazine*. In his classic book, *"New Concepts in Technical Trading Systems,"* Mr. Wilder provided step-by-step instructions on calculating and interpreting the Relative Strength Index. As time has passed, other indicators with similar sounding names have been developed. The majority of traders refer to this index as the "RSI" instead of the "Relative Strength Index." This helps to avoid confusion with other indicators with similar names. For example, *Investor's Business Daily* publishes its "Relative Strength Rankings" and John Murphy promotes his "Relative Strength Charts." Neither of these 'relative strength tools' is related to Welles Wilder's Relative Strength Index or RSI, as we shall call it.

The Relative Strength Index (RSI) is one of the most popular momentum oscillators used by traders. It is so popular that every charting software package and professional trading system anywhere in the world has it as one of its primary indicators. Not only is this indicator included in every charting package, but it is not out of the realm of possibility that every system has identical original default settings.

There are many reasons that the Relative Strength Index quickly became so popular with traders. When hand plotted in conjunction with a daily bar chart, it provided interpretative information on market tops and bottoms, chart formations, market reversals, areas of support/resistance, and price/indicator divergence. All of this information was rolled into one easy to calculate formula, so what was not to like? At this time, enter the personal computer bringing with it the ability to manipulate numbers in the blink of an eye. The personal computer has made the process of decision-making so easy with instant real-time charts and indicator overlays that most traders simply do not know where to begin.

It is so simple to jump into trading using the preset system default values that novice traders often begin trading without testing different parameters or educating themselves on the proper interpretation of an indicator because of the desire to make money quickly! As a result, the RSI is also one of the most widely misused technical indicators!

Once understood and correctly applied, the Relative Strength Index has the ability to indicate whether prices are trending, when a market is overbought or oversold, and the best price to enter or exit a trade. It can also indicate what trading timeframe is most active and provides information in determining key price levels of support and resistance. However, in order to fully understand the Relative Strength Index, we must first understand how price behavior affects it.

The calculated value for Wilder's RSI oscillates between 0 and 100. This value represents a ratio of the average recent time period price 'gains' to the average recent time period price 'losses' calculated over a number of time periods. In other words, it compares the internal strength of a security or market. A trip into any professional trading office in the world will reveal at least one or two charts with this indicator being plotted on at least one monitor. It is the opinion of many professional traders that this one indicator, of all the widely known indicators - is the most versatile and powerful indicator that is available.

This book will attempt to convey the information that a trader would want or need to know about the Relative Strength Index. There is a considerable body of information that has been gathered concerning the RSI since 1978 when Mr. Wilder promoted this indicator in his groundbreaking book. While it is impossible to discuss all of the knowledge that is available on the subject of the RSI, when you have finished studying this short book you will know how to use it to determine:

1. The current trend.
2. The best entry/exit prices for a trade.
3. Price levels where contra-trend market retracement will likely end.
4. Basic Price Retracement Theory and Momentum Discrepancy Reversal Points.
5. What is meant by the term "timeframe".
6. How to determine the dominant market "timeframe".
7. When a different "timeframe" is negating or overpowering the present timeframe.
8. How to determine upside or downside price objectives that have high probability of being reached.

Every profitable trader has learned that he or she must possess their own "edge" that enables them to regularly extract money from the market place. For a trader to have an "edge," he or she must have an accurate perception of the market that is also *unique*. The applied definition of a trader with an "edge" is a trader with an accurate perception of the market place that differs from other trader's perceptions. The converse of this argument is that if all of the other traders have or get the same perception of the market, the trading "edge" will quickly disappear. Including this thought makes it natural to expect that any advantages found in using the RSI would have long since disappeared since Mr. Wilder published his original information about the indicator in 1978.

While this expectation might be true in a perfect trading world, it is not the case in the chaotic world that we live in. The advanced and largely unknown concepts mentioned in this book are as effective today in 2004, as they were in 1978 when *"New Concepts"* first hit the bookstands. *In fact, these advanced concepts with some modifications can also be beneficially applied to other momentum-based indicators.*

If asked, many seasoned traders will tell a novice trader that it is important to focus on truly mastering one indicator. It is essential to know when and why an indicator is about to behave in a certain way. Once an indicator is truly mastered, the trader is able to apply his own unique perceptions and rules to it. Many inexperienced traders want to believe that they have mastered an indicator simply because they know its particular trading "rules" governing entries, exits and stops. The reality is that they "know" no more than any other trading novice. Consequently, they have no "edge" versus other traders when using a particular indicator, which is one of the primary reasons that 99% of all new traders lose their money.

It is my hope that you as the reader will take some time to realize how the RSI functions and see the dramatic benefits that can be obtained by using it in a more proficient manner. Once mastered, the Relative Strength Index provides key information telling when the market is trending and when it is overbought or oversold. The RSI can also provide strategic price levels to enter or exit market positions and give insight into when it is best to stand aside. In my mind, there is no other widely known indicator that is as effective and/or profitable!

This book is divided into two sections. In Section I, the focus is on developing the basic knowledge of the Relative Strength Index that is necessary to use with the advanced concepts. Without a thorough understanding of the basic concepts that are involved, the trader will have neither the <u>courage</u> nor <u>confidence</u> to consistently take action when the price action conveys a valuable clue.

Section II focuses on integrating the basic knowledge of price behavior, retracement theory and various timeframes with RSI theory. Also in Section II, we will learn how to enter and exit trades more profitably.

Chapter 2

RSI Math

It is an accepted fact that the simple geometric formula resolutely declaring, "pi (3.1416) times 'd,' the diameter of a circle" yields its circumference. This simple formula has dramatically changed the world that we live in. The formula for calculating the Relative Strength Index is also relatively simple. In some ways, this formula for calculating the Relative Strength Index has just as profoundly changed the trading world in the few short years since its introduction.

In this section, we will discuss the math and perhaps more importantly, the logic of the math that is used in computing the Relative Strength Index. The single ending RSI value is the ratio calculation between the average increase in price versus the average decrease in price over a pre-defined period of time. It is a front-weighted momentum indicator, which gives it the ability to respond quickly to price changes. Because of its mathematical construction, it is also less affected by the sharp price swings that occur from time to time in markets.

There are two equations that are involved in solving the formula. The first component equation obtains the initial Relative Strength (RS) value, which is the ratio of the average UP closes to the average DOWN closes over 'N' periods represented in the following formula:

RS = Average of 'N' day's closes UP/Average of 'N' day's closes DOWN

The actual RSI value is calculated by indexing the indicator to 100 through the use of the following formula:

$$RSI = 100 - (100 / 1 + RS)$$

This second component equation yields the final RSI value. To calculate the first value of the RSI, the previous 'N' days' price data is required. From then on, all that is needed is the data from the previous day.

In calculating for the value for RSI on succeeding days, the 'sum of gain' in price in 'N' time and the 'sum of loss' in price in 'N' time is multiplied by one less than the fixed period of time 'N'. The gain or loss for the next subsequent bar is added and the resulting number is divided by the fixed period of time 'N'. We can see this in the following formula.

RSI = 100 – (100/1+[((Sum of gain in price in 'N-1' past intervals* 'N-1')+Gain this bar) / 'N' / ((Sum of loss in price in 'N-1' past intervals* 'N-1') + Loss this bar) / 'N']

Where:

RSI_i = Initial RSI value
'N' is the length of time intervals that is referenced in the past. For example, 14 of the prior bars.

In other words, 'N' is an interval of time. If the price action that is plotted is where each day is represented by 1 bar, and if N = 5, the RSI value is looking back at the last 5 days.

Table #1 (on the following page) shows the values in calculating the RSI where N = 14 in a hypothetical market.

Table # 1 – RSI Calculation

	Close	Chg	Gain	Loss	AvgGain	AvgLoss	RS	RSI
	1161.32							
1	1161.28	0.0400	0	0.0400				
2	1161.39	0.1100	0.1100	0				
3	1160.75	-0.6400	0	0.6400				
4	1160.71	-0.0400	0	0.0400				
5	1160.79	0.0800	0.0800	0				
6	1160.16	0.6300	0	0.6300				
7	1159.67	-0.4900	0	0.4900				
8	1159.74	0.0700	0.0700	0				
9	1159.18	-0.5600	0	0.5600				
10	1158.99	-0.1900	0	0.1900				
11	1159.24	0.2500	0.2500	0				
12	1158.93	-0.3100	0	0.3100				
13	1158.94	0.0100	0.0100	0				
14	**1158.77**	**-0.1700**	**0**	**0.1700**	**0.0371**	**0.2136**	**0.1739**	**14.815**
15	1158.78	0.0100	0.0100	0	0.0352	0.1983	0.1775	15.075
16	1157.7	1.0800	0	1.0800	0.0327	0.2613	0.1251	11.120
17	1157.09	0.6100	0	0.6100	0.0304	0.2862	0.1061	9.589
18	1156.88	0.2100	0	0.2100	0.0282	0.2808	0.1004	9.123
19	1156.56	0.3200	0	0.3200	0.0262	0.2836	0.0923	8.450
20	1156.57	0.0100	0.0100	0	0.0250	0.2633	0.0950	8.677
21	1156.61	0.0400	0.0400	0	0.0261	0.2445	0.1067	9.641
22	1156.75	0.1400	0.1400	0	0.0342	0.2270	0.1507	13.100
23	1156.71	0.0400	0	0.0400	0.0318	0.2137	0.1487	12.947
24	1157.06	0.3500	0.3500	0	0.0545	0.1984	0.2747	21.552

It should be noted that it takes many more days of data to smooth the RSI value. This table is an example only. See point Number 2 in the list below.

If you would like to see the Excel spreadsheet formulas on constructing this spreadsheet, please see Appendix A.

There are a few main points to remember about the RSI calculation:

1. The second formula changes the structure of the RSI from a simple moving average of the gains and/or losses to an exponential moving average.
2. The second formula requires at least 10 times 'N' time intervals to stabilize the RSI value and it is better to have to have 20 times 'N'. In other words, if N = 14 days, then we need 140 days of prior data for the RSI value to be of use. This is assuming daily data is used.
3. The second formula, because it is an exponential moving average, incorporates all prior price behavior into the RSI value. This adds more weight to the preceding bar price behavior.
4. As 'N' or time periods used becomes larger, the RSI value oscillates less vigorously. As 'N' becomes smaller, the oscillations of the indicator become more pronounced.

On the following page is an example of how changing 'N' changes the RSI amplitude: