



Web-Based Technical Analysis Services

by Wayne A. Thorp

Over the last several years, *Computerized Investing* has highlighted how the Internet can assist investors both with retrieving financial information and in the security analysis process. Web-based tools continue to evolve beyond simple browsing and extend their abilities to the domain once reserved exclusively for stand-alone software programs. Many sites now boast powerful portfolio tracking and analysis along with mutual fund and stock screening. Charting and technical analysis is another aspect where the Web-based investment analysis is drawing nearer to its software-based counterparts. Only a few years ago, the landscape was dominated by a few sites such as BigCharts. Now, many respectable sites offer charting, technical indicators, trading systems, and technical screening.

As the number of sites offering technical analysis grows, individuals are confronted by more and more choices, and knowing what each site offers becomes increasingly difficult. To help educate readers on the various sites available and the services and features they provide, 17 Web-based technical analysis services are reviewed. They range from those that offer charting and technical analysis as part of their collection of investment analysis to those exclusively devoted to technical analysis and charting.

Web Versus Software

The first question to answer is whether you should go the software or on-line route for technical analysis tools. For Mac users, there is often the frustration of being limited in your choice of investment analysis software due to the smaller market. The Web alleviates most of this frustration because the Internet is largely platform-neutral. This means both Mac and Windows users alike can use the modules available via the Web. This holds

true with the Web-based services examined here, except one: WindowOnWallStreet.com is a Windows-only service. All of the rest run on both Windows and Mac systems.

When looking at the features and functionality found with Web sites and software, the most striking difference you will find is in the level of features each has to offer. While the functionality of Web-based services has grown significantly over the years, it is still dwarfed, for the most part, by that of technical analysis software. Most of the services covered in this comparison offer the most basic technical analysis features—mainly charting and the ability to overlay technical indicators. Even here, however, the libraries of technical indicators are typically less than what you would find with technical analysis software. Table 1 on pages 10 and 11 lists the technical indicators found with the services covered in this comparison. On average, these sites offer just over 16 technical indicators and studies. Compare this to programs found in the end-of-day technical analysis software comparison that ran in the May/June 2000 issue of *Computerized Investing*. These 16 programs averaged close to 63 indicators and studies. Software-based programs offer a much larger collection of technical indicators at this point in time.

Beyond offering more technical indicators, some of the advanced technical analysis programs on the market today allow users to create their own technical indicators. This level of flexibility is currently not found in any Web-based technical analysis service.

Technical analysis programs, at least the higher-end ones, are also ahead of Web-based services in terms of offering technical analysis trading systems. With this functionality, users are able to select a trading system based on a variety of technical indicators and the

program will generate buy and sell signals. They will also allow you backtest these systems for historical profitability. Furthermore, many programs typically allow you to create your own technical trading systems. Only a few of the Web-based services provide what could be called trading systems. These are generally buy and sell arrows on a chart based upon the behavior of technical indicators. None of them, however, allows users to create their own systems or perform significant historical backtesting.

While many of the differences between technical analysis software and Web-based offerings may lead you to believe that software is superior on all levels, Web-based services do hold some advantages over their software competitors. The most significant area where they excel is in the delivery and pricing of data.

When looking for a technical analysis program, there are typically two purchase decisions you must make—choosing a program itself and choosing a data vendor. With on-line services, the data is provided; therefore, you can begin your analysis without having to download historical data or subscribe to a real-time data service.

Whether you are dealing with software or Web-based technical analysis services, data is delivered in one of three ways—end-of-day, intraday delayed, or real-time. All of the services here offer end-of-day charting, while 14 of the 17 provide intraday delayed data. Only four of the 17 Web-based services provide real-time data delivery.

For end-of-day charting, all but one of the services here are free—WindowOnWallStreet.com is the exception. However, it is basically a Web-based software program and is by far the most robust system highlighted here. Three of the four services providing real-time data charge users for access, with MSN

Table 1.
Technical Analysis Indicators

	ASK Research	BigCharts	ClearStation	Data Broadcasting Corp.	FutureSource	MetaStock Online	MSN MoneyCentral	Prophet JavaCharts	Quote.com LiveCharts	Quintor Investor	SmartMoney.com	Stockpoint	Timefy.com	TradeSignals.com Java Charts	TradingCharts.com	Mall Street City	MinipointWallStreet.com
Moving Averages																	
Simple		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Exponential	✓	✓	✓	✓	✓			✓	✓				✓	✓	✓	✓	✓
Weighted				✓	✓											✓	✓
Chart Features																	
Andrew's Pitchfork																	✓
Bollinger Bands	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cycle Lines																	✓
Donchian Channels									✓								
Fibonacci Analysis															✓		✓
Gann Analysis															✓		✓
Linear Regression				✓	✓					✓	✓						
Moving Average Bands		✓		✓	✓	✓	✓	✓									✓
Open Interest						✓									✓		
Short Interest		✓															
Price Channels		✓					✓	✓									
Tick Volume						✓											
Volume	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Built-In Indicators																	
Accumulation/Distribution				✓		✓		✓							✓		✓
Advance/Decline		✓															
Arms Index (TRIN)		✓															✓
Average Directional Movement (ADX)														✓			✓
Average True Range				✓													✓
Chaikin Oscillator						✓											✓
Commodity Channel Index					✓	✓		✓		✓				✓	✓	✓	✓
Demand Index, Positive & Negative														✓			✓
Directional Movement Indicator		✓	✓					✓		✓							✓
Highest High/Lowest Low						✓											✓
MACD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓
MACD Histogram			✓					✓	✓					✓	✓		
Momentum		✓	✓	✓	✓	✓		✓	✓	✓				✓	✓	✓	✓
Money Flow	✓	✓		✓			✓				✓						✓
Negative Volume Index																	✓
On-Balance Volume (OBV)	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓		✓	✓
Parabolic SAR		✓	✓					✓							✓		✓
Positive Volume Index																✓	✓
Price Oscillator				✓		✓								✓			✓
Price Rate of Change	✓	✓		✓	✓	✓		✓	✓			✓		✓	✓		✓
Price/Volume Trend						✓		✓						✓	✓		✓
Relative Strength Index		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
Speed Resistance																	
Standard Deviation						✓											
Stochastics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TRIX																	

Table 1.
Technical Analysis Indicators (continued)

	ASK Research	BigCharts	ClearStation	Data Broadcasting Corp.	FutureSource	MetaStock Online	MSN MoneyCentral	ProphetTraderCharts	Quote.com LiveCharts	Silicon Investor	SmartMoney.com	StockPoint	timely.com	TradeSignals.com Java Charts	TradingCharts.com	Wall Street City	WindowOnWallStreet.com
Built-In Indicators (continued)																	
Ultimate Oscillator		✓								✓				✓			✓
Up/Down Ratio		✓															
Volatility (Chaikin)																	✓
Volume Accumulation		✓															
Volatility, Slow & Fast		✓															
Volume Oscillator						✓											
Wilder's RSI	✓					✓											✓
Williams' %R	✓	✓	✓	✓	✓	✓		✓		✓						✓	✓
Williams' Accumulation/Distribution						✓											
Total Number of Indicators/ Studies (Not All Listed)	10	25	12	17	27	21	10	18	12	13	6	8	5	24	17	12	42

MoneyCentral Investor providing this service at no cost. With technical analysis software, most charge for the software, which can cost up to \$350 for the most advanced end-of-day program and over \$2,000 for high-end real-time programs. However, there is the additional cost for data, which can range from \$30 a month for end-of-day to \$60 per month and higher for real-time data delivery. In spite of these charges, Web-based technical analysis services offer much in the way of cost savings when compared to software programs.

Which should you use?

If you are new to technical analysis or looking for simple charting and technical analysis on either an end-of-day, intraday, or real-time basis, a Web-based service should suffice. For technical analysis neophytes, a Web-based service will allow you to get your feet wet without having to make a financial commitment to software and data. If you have no desire to create your own indicators or have computer-generated trading signals, again a Web-based service should offer everything you are looking for.

On the other hand, if you need robust technical analysis capabilities,

including custom indicators and trading systems, your needs would be better-served by a software-based application.

Service Features

The comparison grid on pages 12–17 examines the features and functions that many of the Web-based technical analysis services have in common. Additionally, Table 1 outlines some of the more popular technical indicators and charting features that each site offers. This list is not intended to be all-inclusive. The information in these tables has been provided by the respective services.

Data—both price and volume—form the cornerstone of technical analysis. For this reason we lead off our discussion with some of the more important data elements you need to consider.

Securities

Most of the 17 services included in this comparison deal with stocks, mutual funds, and indexes. Two of these services, FutureSource and TradeSignals, deal exclusively with futures analysis, while ProphetCharts

and WindowOnWallStreet.com offer futures only with their premium subscriptions. ASK Research provides options coverage with its Pro subscription.

Data Intervals

Technical analysis is conducted on an end-of-day, intraday delayed, or intraday real-time basis. End-of-day charts are updated once the data has been collected from the completed trading day. All of the services listed here offer data on an end-of-day basis.

With intraday delayed data, charts can plot data during the trading day using time increments such as minutes or hours, but the most recent price information is delayed (usually 15 to 20 minutes) from the actual last trade. This delay allows the data to be offered for free, since exchanges sell real-time access to their data. Fourteen of the services here provide data on an intraday delayed basis.

Lastly, real-time data is the timeliest data available. This represents an attempt to capture the latest price at which a stock traded. Four of the services offer real-time stock or futures data. Note that even with real-time

PRODUCT COMPARISON: WEB-BASED TECHNICAL ANALYSIS SERVICES

Product name	ASK Research	BigCharts
Web address	www.askresearch.com	www.bigcharts.com
Price	free (\$25/mo. for real-time)	free
System Requirements	Windows or Mac, Internet Explorer/Netscape Navigator	Windows or Mac, Internet Explorer/Netscape Navigator 3.0+
Data elements	Securities covered	stocks, mutual funds, indexes, options (Pro)
	Data intervals	end-of-day, intraday delayed, real-time (Pro)
	Data provider(s)	World Wide Quote, North American Quotes, ChartWiz
	Historical data	48 months
	Export formats	
Charting elements	Chart types	bar, line, candlestick
	Save chart settings	✓
	Scaling (linear, semi-log)	✓
	User-adjusted trendlines	
	Multiple time frames	✓
	Custom time frames	✓
	Data frequency	tick (Pro); 1, 5, 10, 15, & 30 min.; day
	Security merge feature	
Indicators & Line Studies	Max. securities per chart	1
	Predefined	10
	Modify pre-existing	✓
Help	Max. indicators per chart	12
	On-line help	✓
E-Mail Alerts		✓
E-Mail Charts		✓
Screening		✓

data feeds, some delays will exist as trades are executed and flow from the exchange to your computer. With a real-time feed, no artificial delay is introduced into the feed.

Historical Data Availability

One advantage Web-based technical analysis services hold over software is that there is no need to accumulate a historical database in order to plot stocks, funds, indexes, or futures. The amount of historical data these services provide, however, varies greatly. While some, such as ASK Research, offer two years of historical

data, others such as BigCharts, Wall Street City, and MSN MoneyCentral Investor provide over 20 years of data on their charts.

Export Formats

More and more people are looking for free sources of price and volume data that can be used in spreadsheets and other programs. One way in which to obtain this data is by exporting it from an on-line charting service. Four of these services allow users to export data in a variety of formats, including Excel spreadsheet and ASCII text format.

Chart Types

The services here offer a wide range of charting options. Most of the technical analysis you will perform will deal in some way with a chart. Whether it is only a price chart or a chart with indicators, the chart is the primary tool of the technical analyst.

The most common types of charts are line and bar charts, and all 17 services listed here provide both. Line charts normally plot the close over time, while bar charts show the open, high, low, and closing prices for a given period. Candlestick charts, another popular chart type, are avail-

ClearStation	Data Broadcasting Corp.	FutureSource	MetaStock Online
www.clearstation.com	www.dbc.com	www.futuresource.com	www.metastock.com
free	free	free	free
Windows or Mac, Internet Explorer/Netscape Navigator			
stocks, mutual funds, indexes	stocks, funds, indexes	futures	stocks, funds, indexes
end-of-day, intraday delayed	end-of-day	end-of-day, intraday delayed	end-of-day, intraday delayed
S&P ComStock	DBC	FutureSource/Bridge	Reuter's Datalink
10 years	5 years	1988 to present	5 years
bar, line	bar, line, candlestick	bar, line, candlestick	bar, line, candlestick
✓	✓	✓	✓
✓ (linear only)	✓ (linear only)	✓ (linear only)	✓ (linear only)
✓			✓
✓	✓	✓	✓
		✓	
1, 2, 3, 5, 10; & 20 min.; 1, 2, 3, 5, & 10 day	day; week; month	tick; minute; day; week; month	5-min; day; week; month
			✓
5	1		5
12	17	27	21
	✓	✓	✓
8	5	1	1
✓	✓	✓	✓
✓	✓	✓	✓
✓			

able with 13 of these services.

For a more in-depth discussion on basic chart types, refer to the Feature article in the March/April 1998 issue of *Computerized Investing*, called "An Intro to Technical Analysis: Basic Chart Types." It is available at our Web site at www.aaii.com in the *Computerized Investing* archives.

Chart Settings (Templates)

The user's ability to specify certain settings and save them for future use is an extremely useful feature found with more and more Web sites. Nine of the services compared here allow

users to specify such information as the time period, periodicity (daily or weekly), chart type, as well as any applied indicators; the service saves your choices so you can view charts with the same settings on subsequent visits. All you need to do is specify the security, and the "template" automatically displays it in the desired manner.

Linear and Log Scaling

When viewing price data, there are two general scales used—linear and log. Most of the charts you see are probably on a linear scale. In this form,

there is an equal distance between price points—the space between \$1 and \$2 is the same as the space between \$100 and \$101.

With log scaling, an equal amount of space is found between equal *percent changes* in price. In other words, the space between \$1 and \$2 is the same as the distance between \$100 and \$200, since in both cases the percentage change is 100%. Log scales are most useful when viewing data over a long historical period and among a number of securities. Ten of the 17 services offer log scaling for their charts.

PRODUCT COMPARISON: WEB-BASED TECHNICAL ANALYSIS SERVICES

Product name	MSN MoneyCentral	Prophet JavaCharts	Quo	
Web address	moneycentral.msn.com	www.prophetcharts.com	www	
Price	free	free (\$24.95/mo. for Pro)	free c real-t	
System Requirements	Windows 95/98/NT 4.0 Internet Explorer/Netscape Navigator 4.0+	Windows and Mac, Internet Explorer/Netscape Navigator	Wind Explo	
Data elements	Securities covered	stocks, mutual funds, indexes	stock	
	Data intervals	end-of-day, intraday delayed, real-time	end-o real-t	
	Data provider(s)	Media General, CSI		
	Historical data	to 1970	back	
	Export formats	Excel (Windows only)	ASCI (Live	
Charting elements	Chart types	bar, line	bar,	
	Save chart settings	✓	No	
	Scaling (linear, semi-log)	✓	✓	
	User-adjusted trendlines		✓	
	Multiple time frames	✓	✓	
	Custom time frames	✓		
	Data frequency	tick; day; week; month; year	day; week; month	1, 5, week
	Security merge feature			
Max. securities per chart	unlimited	2	1	
Indicators & Line Studies	Predefined	10 (moving avg. only for Mac)	12	
	Modify pre-existing	✓	✓	
	Max. indicators per chart	1	unlimited	1
Help	On-line help	✓	✓	
	Indicator interpretation help	✓		
E-Mail Alerts	✓		✓	
E-Mail Charts		✓		
Screening	✓			

Trendlines

One of the main functions of technical analysis is to identify trends in price and volume in the hopes of forecasting future price movement. Trendlines, which are lines used to connect two or more points on a chart, are a useful tool to this end.

Many of these sites go beyond static Web display pages to actually load programs within your browser that can manipulate data. Sun's Java and Microsoft's ActiveX are the two most popular Web-distributed programming languages. Java and ActiveX technology has allowed charts to be-

come more interactive. One way this is apparent is with the ability for users to draw their own trendlines on charts. Five of the services discussed in this comparison allows users to manually "draw" trendlines.

Security Merging

Data merging involves the bringing together of two or more securities to create a custom "index." For example, you could merge the prices of Gateway, Dell, Micron, and Apple to create your own custom computer index. Currently, MetaStock Online is the only service listed here that al-

lows users to combine securities into an index.

Indicators

A technical indicator is the mathematical manipulation of price or volume displayed in a graphical manner, such as stochastics and moving average convergence/divergence (MACD).

The number and type of indicators provided are important factors to consider when deciding upon a Web-based service. You should make sure that any service you are considering includes the indicators important to

BigCharts	Silicon Investor	SmartMoney	StockPoint
www.bigcharts.com	www.siliconinvestor.com	www.smartmoney.com	www.stockpoint.com
Delayed intraday charts, time from \$9.95	free	free	free
Windows and Mac, Internet Explorer/Netscape Navigator			
Stocks, funds, indexes	stocks, funds, indexes	stocks, funds, indexes	stocks, funds, indexes
End-of-day, intraday delayed, time	end-of-day, intraday delayed	end-of-day, intraday delayed	end-of-day, intraday delayed
	S&P ComStock	S&P ComStock, Media General Financial Services	S&P ComStock
From 1987	1991 to present	5 years	from 1995
Print and Excel (Charts only)	No	No	No
Line, candlestick	bar, line, candlestick	bar, line	bar, line, candlestick
	✓	No	
	✓	✓	✓ (linear only)
	✓	✓	✓
	✓	✓	✓
15 min.; hour; day; month; year	1, 5, 15, 30, & 60 min.; day; week; month	5 min.; day; week	1 & 10 min.; hour; day; week
	7	5	3
	13	6	8
	✓		
	5	1	9
	✓	✓	✓
	✓	✓	✓
			✓
	✓		
	✓		✓

your analysis. Taking a moment to consider your needs will be helpful in assessing the number of indicators you will require from the service.

Beyond a set of predefined indicators, the ability to modify indicators to fit your individual trading needs is a useful feature. Modifications allow you to adjust factors such as the number of time periods used in a calculation. For example, the Wilder's RSI (relative strength index) is usually constructed using 14 periods, but the period may need to be varied depending on the security or market condition.

Finally, many users of technical analysis follow more than one indicator. They track the behavior of multiple indicators in conjunction with one another to make buy and sell decisions. For this reason, it is convenient to have the ability to plot multiple indicators on the same screen. This may entail either plotting indicators on the same price chart, or having them plotted in their own "window" below the primary price chart.

Table 1 details the "mainstream" indicators each program offers as well as the overall number of indicators they provide.

Alerts

So you don't have to constantly monitor your positions or favorite securities, some services provide alerts and charts via E-mail.

MSN MoneyCentral Investor, for example, allows users to specify price targets and will send out an instant message alert through the MSN messenger service when the price target is reached.

Likewise, the BigCharts site can E-mail charts, complete with technical indicators, on an end-of-day basis. In all, six of the services offer E-mail alerts and three either deliver charts

PRODUCT COMPARISON: WEB-BASED TECHNICAL ANALYSIS SERVICES

Product name		timely.com	TradeSignals.com JavaCharts
Web address		www.timely.com	www.tradesignals.com
Price		free	free; \$20/mo., or \$120/yr. for premium charting
System Requirements		Windows and Mac, Internet Explorer/Netscape Navigator	Windows and Mac, Internet Explorer/Netscape Navigator 4.0+
Data elements	Securities covered	stocks, funds, indexes	futures
	Data intervals	end-of-day, intraday delayed	end-of-day, intraday delayed
	Data provider(s)	North American Quotations	S&P ComStock
	Historical data	from July 1993	10+ years
	Export formats	No	No
Charting elements	Chart types	bar, line, candlestick	bar, line, candlestick
	Save chart settings		
	Scaling (linear, semi-log)	✓ (linear only)	✓
	User-adjusted trendlines		✓
	Multiple time frames	✓	
	Custom time frames	✓	
	Data frequency	5, 15, & 60 min.; day	1, 5, 15, 30, & 60-minute; day
	Security merge feature		
Indicators & Line Studies	Max. securities per chart	1	1
	Predefined	5	24
	Modify pre-existing	✓	✓
Help	Max. indicators per chart	4	2
	On-line help	✓	✓
	Indicator interpretation help	✓	✓
E-Mail Alerts			✓
E-Mail Charts			
Screening			

via E-mail or allow users to E-mail charts.

Technical Screening

Finally, for those who seek out securities exhibiting specific technical behavior, five of these services allow users to screen for stocks based on technical criteria. The depth of technical screening ranges from screening for those securities breaking above or below 50- or 200-day moving averages to screening for particular values of technical indicators, such as stochastics or the MACD.

Technical Analysis Services

ASK Research

The ASK Research Web site is devoted to technical analysis and market data covering over 18,000 U.S. and Canadian stocks, mutual funds, and indexes. Three different types of charts are available: daily, intraday (live), and day trader. Access to end-of-day and delayed intraday charts is free. For a fee of \$25 per month, subscribers have access to real-time daily charts, intraday charts, streaming tick charts, and options chains.

The site offers open, high, low, and close charts with 50-day simple moving averages for over 25 major market indexes including the Dow Jones industrial, transportation, and utilities averages, Nasdaq Composite and 100 index, New York Stock Exchange Composite, and S&P 100, 500, and 400 MidCap indexes.

The daily charts allow you to plot stock and mutual fund data over one-, three-, and six-month periods, as well as one- to four-year periods. You can choose from bar, line, or candlestick charts and overlay either exponential

Tradingcharts.com	Wall Street City	WindowOnWallstreet.com
www.tradingcharts.com	www.wallstreetcity.com	www.windowonwallstreet.com
free	free charting and basic screening; \$9.95-\$49.95/mo. for premium screening	\$69.95-\$79.95/mo. plus exchange fees
Windows and Mac, Internet Explorer/Netscape Navigator	Windows or Mac, Internet Explorer or Netscape Navigator	Windows 95/98/NT only, Internet Explorer 4.0+
stocks, futures	stocks, funds, indexes	stocks, funds, indexes, options, bonds
end-of-day	end-of-day, intraday delayed	end-of-day, intraday delayed, real-time
North American Quotations	S&P ComStock	Financial Data Cast Network
from September 1999	from 1970	1978 to present
No	ASCII, HTML, DIF spreadsheet format	ASCII
bar, line, candlestick	bar, line, candlestick	bar, line, candlestick
	✓	✓
✓ (linear only)	✓	✓
		✓
✓	✓	✓
✓		✓
day; week; month		custom; 1, 5, 10, 15, 30, & 60 min.; day; week; month; year
1	2	1
17	12	42
✓	✓	✓
2	12	Unlimited
✓	✓	✓
	✓	✓
		✓
	✓ (free basic and fee-based premium screening)	

be saved for future use. Compared to some of the other sites in this comparison, however, you cannot fully customize the various indicators—you are simply offered a couple of different choices of how the indicator is calculated.

Other services at the site include the day trader section, side-by-side comparison of price, and indicator charts for numerous indexes, a portfolio tracker, and option chain data.

BigCharts

BigCharts, which is owned by CBS MarketWatch, has long been one of the top on-line charting services available. This free service offers users one of the largest databases of securities—over 50,000—along with interactive charts, market and company news, historical quotes, and industry analysis.

BigCharts offers two levels of charting: quick charts and interactive charts. With quick charts you enter a ticker symbol, specify the time frame, and are presented the chart. Quick charts do not support the plotting of multiple securities simultaneously and the indicators and studies that are automatically drawn with the chart are those saved in the chart settings.

The interactive charts provide additional features. You have the option of selecting a predefined time period or specifying a custom time period. Intraday data—one-, five-, 15-,

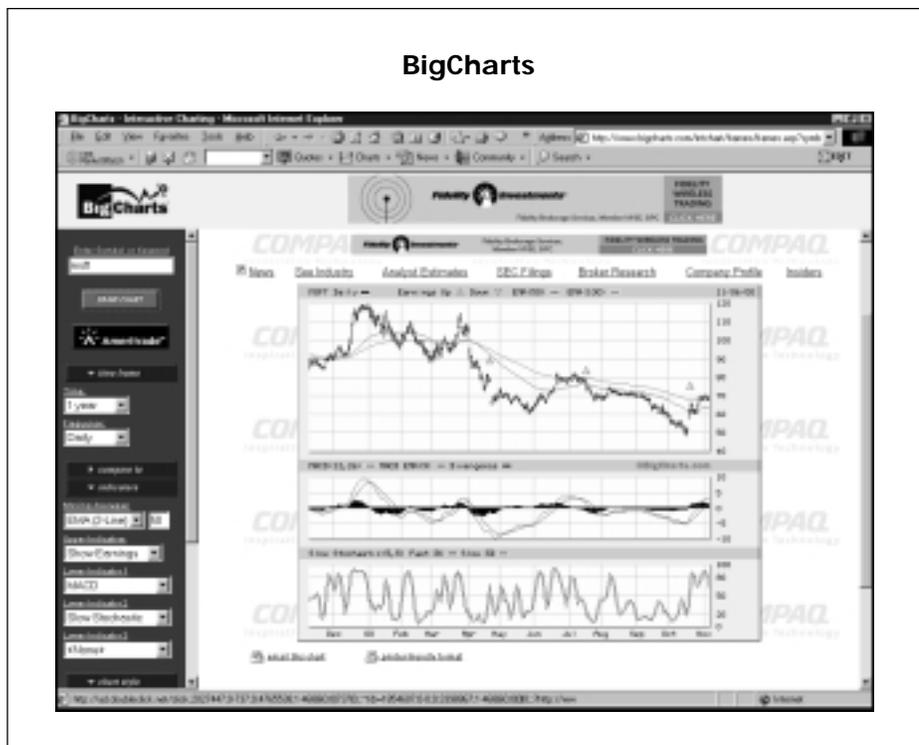
moving averages (up to three) or Bollinger bands. For technical indicators, you can plot one from a list of eight that includes volume, Williams' %R, price rate of change, and money flow index.

The live charts and day trader charts closely resemble each other. Both plot the movement of such market indexes as the S&P 100 and 500, Toronto and Vancouver Composite indexes, and the Philadelphia Stock Exchange Gold & Silver index. With the live charts, users are able to select from one-, five-, and 10-minute line, bar, or candle-

stick charts and can apply the same indicators available for the daily charts. The day trader charts are templates that display index movements using five-minute bars and update automatically every 90 seconds. Each chart displays a 50-minute exponential moving average, on-balance volume, stochastics, and money flow index.

The charts offer some degree of flexibility—users can specify the size, type, and time frame of the chart as well as overlay up to nine different price and volume indicators. Chart settings can

BigCharts



and 60-minute—as well as daily, weekly, monthly, quarterly, and yearly frequencies are available. With each chart you can overlay up to five indicators from a library of over 20 popular indicators—including stochastics, relative strength index (RSI), Bollinger bands, and the MACD (moving average convergence/divergence). There are also nine display options: open, high, low, close; high, low, close; candlesticks; and bar charts. Depending on the security or index you choose, there is data available going back to 1970 and earlier. Once you have made your setting choices, you can save them for future use. You have the ability to create performance comparison charts where you can plot up to 10 stocks, mutual funds, and indexes as well.

For historical quotes, you specify a ticker and date, and BigCharts will provide you with the open, high, low, and closing price, as well as the volume for that date.

BigCharts has the ability to deliver custom charts to users via E-mail on a daily or weekly basis, or when viewing a chart through your browser. Both options require that the recipient of

the charts have HTML-enabled E-mail software.

Lastly, visitors to the Industry section of the site can view the best- and worst-performing industries as well as the best- and worst-performing stocks within each of those industries. Thumbnail charts are available for viewing stocks within a given industry, as are industry charts.

ClearStation

ClearStation, a wholly owned subsidiary of E*Trade Group, advocates what they call a three-point investment approach built upon fundamental analysis, technical analysis, and community. On the technical analysis end, ClearStation offers daily graphs and an interactive graphing tool. The daily graph is a template showing the one-year daily prices of a stock along with volume, MACD, MACD histogram, and stochastics. Those who elect to go for the free registration can also add support, resistance, and trendlines to the charts. At the daily graph page, you are also given key technical and fundamental information on the plotted stock, such as the percentage above or below the 13- and

50-day exponential moving average, date of next earnings announcement, and latest analyst rating.

The interactive graphing tool of the site provides users with greater flexibility. You can specify the time period of the graph—covering days, months, and years—overlay up to eight technical indicators and moving averages, as well as up to five different stocks or indexes on a single chart for easy comparison. Data is available going back 10 years; however, one drawback to the site is that you are not able to customize the technical indicators and overlays to your specifications.

A unique section of the ClearStation Web site is the “Tag & Bag” area. Here users will find lists of stocks, updated throughout the day, that are entering price action trends or experiencing fundamental events such as earnings surprises. A complement to this area is the “A-List,” which lists the top-performing Tag & Bag stocks.

In the Recommend area, users can monitor the portfolios and buying and selling activities of other members. An extensive collection of educational articles discussing technical analysis, trading strategies, and portfolio and risk management is also available.

Data Broadcasting Corp.

Data Broadcasting Corporation (DBC) is a leading provider of financial data. At their Web site, visitors can find free fundamental data, company reports from Market Guide, and charting. DBC offers two levels of charting—quick charts and technical charting. With a quick chart, a ticker is specified and a six-month daily chart with a 50-day simple moving average is displayed. This chart offers nothing in terms of user customization. With the technical charting module, however, users are able to control the duration (up to five years) and chart type (bar, line, or candlestick) and select up to five indicators from a collection of 17 that includes simple, weighted, and exponential moving averages, Bollinger bands, MACD, money flow, and Wil-

liams' %R. This site also allows you to save your chart settings.

FutureSource

FutureSource is one of the few Web sites catering to futures and commodities traders. Here you will find free futures commodity quotes, charts, and news.

When creating a chart at FutureSource, you either specify the contract explicitly or select the commodity symbol, month, and year from the menus. You dictate the chart type, period, and time increments in which the data is displayed. There are also 27 different technical studies and indicators from which to choose, all of which are fully customizable. However, you are only able to overlay one indicator per chart. The settings can be saved for future use.

The site also offers a trader's forum where visitors can interact with other futures traders.

MetaStock Online

For years, MetaStock has been recognized as one of the top technical analysis software programs on the market. It is no surprise that MetaStock Online—a scaled-down version of the software—is one of better Web-based charting and technical analysis services as well. MetaStock Online, formerly known as MetaStock for Java, allows users to create live, interactive charts for any U.S. and Canadian stock, mutual fund, or index.

You are able to plot up to five securities within one chart and plot the data using one of four charting styles: bars, bars with open, candlesticks, and lines. Data can be displayed on either a daily, weekly, monthly, or a five-minute intraday basis. Five years of historical data is available at the site.

For technical analysis, you can choose from 20 technical indicators, including accumulation/distribution, Bollinger bands, moving average crossovers, relative strength index (RSI), and stochastics. The only drawback is that you can plot just one indicator at a time.

One of the more unique features of the site is the ability to take a "basket" of up to five stocks and create your own custom index.

Beyond the MetaStock Online application, the Equis site is also a valuable source of educational material. If you are looking for a good introduction to technical analysis, Steven Achelis' book, "Technical Analysis from A to Z," is available at the site. It introduces the basic concepts of technical analysis and explains a multitude of technical analysis tools.

MSN MoneyCentral Investor

The MoneyCentral site is one of the most complete investment sites around offering portfolio tracking, market news and data, extensive stock and mutual fund research, investment education, and charting.

The charting module at MoneyCentral Investor is a Windows-based applet that is automatically downloaded into your Web browser the first time you try to access charts. Once downloaded, you are ready to begin plotting stocks, funds, and indexes. Mac users can create charts, but they are limited to plotting 50- and 200-day moving averages.

The charting module supports multiple time periods including intraday (both delayed and real-time), monthly, and yearly. If you take advantage of the site's free registration, you can access up to 50 free real-time charts per day. If you wish, you have the option of selecting a specific time frame as well. Beyond plotting daily, weekly, and monthly price history, you are also able to plot price performance and investment growth of a given security or index. You have a wide range of technical studies and overlays from which to choose—over 10 in all. You can also select to display corporate events such as dividends and splits. MoneyCentral allows you to save multiple chart styles that you can apply during future visits.

This site is also one of the few that allows you to export data into spreadsheet format. After specifying the security and the time period you wish

to have charted, you are able to export the high, low, and closing prices as well as volume. However, this feature is only available for Windows users.

Another feature not found at many charting sites is a stock screening function. Beyond being able to screen for stocks that meet various fundamental criteria, you can locate those exhibiting certain trading volume behavior—trading above or below 50-day and 200-day moving averages, for example.

Prophet Finance

The ProphetFinance.com Web site offers two charting options depending on your needs and browser—SnapCharts and JavaCharts. Both services offer free, end-of-day charting.

JavaCharts is Prophet's most flexible offering and, as implied by the name, requires a Java-enabled browser. The system charts stocks, mutual funds, and indexes on an end-of-day basis. You can add any of the close to 20 technical indicators to a chart. Users are able to draw custom trendlines by either clicking on two points on the chart or selecting the Add Trendline function from the Tools menu and clicking and dragging to draw the trendline. Other features include the ability to chart specific time periods and zoom function that is activated by dragging the cursor over a section of the chart.

SnapCharts offer many of the same features and functionality found with JavaCharts, but you are limited to plotting five indicators per chart and cannot draw trendlines as you can with the JavaCharts. You do have the added ability to plot futures contracts on an end-of-day basis. With both JavaCharts and SnapCharts, you can save your chart settings.

For those wishing to plot futures, futures options, and equities options in a Java format, you can subscribe to JavaCharts Pro for \$24.95 a month. Currently the site offers the first 30 days for free. Prophet ChartStream delivers live, streaming equities charts for \$19.95 per month.

Quote.com LiveCharts

Quote.com is an established leader in Web-based financial data and information that was acquired by Lycos in December of 1999. At the Quote.com Web site, registered users have access to the LiveCharts applet, which provides streaming, delayed quotes. Members of Quote.com—subscriptions begin at \$9.95 a month—receive LiveCharts Real-Time. The LiveCharts applet allows users to plot a single security and technical indicator per chart. Data can be displayed on a one-, five-, 10-, 15-, 30-, and 60-minute basis as well as daily, weekly, monthly, and quarterly. Users are also given time and sales data for the security being charted.

Other features of the site include quotes and news, portfolio tracking, company profiles, analyst projections, insider trading data, SEC filings, and options chains.

Silicon Investor

In recent years, Silicon Investor has grown beyond its original focus of investment-related message boards to provide one-stop shopping for investment news, information, and analysis. The free charting mechanism, which was once IQC.com, covers stocks, funds, and indexes and allows for a high level of user customization. Users can specify the number of periods the chart covers, choose the data frequency, select up to four technical indicators from a collection of 13, and

overlay additional securities for comparison. You can also create and save multiple chart templates as well as E-mail charts.

Some of the other useful features the site has to offer include the message boards, a stock screener, streaming portfolio tracker, and the SiliconInvestor University.

SmartMoney.com

The SmartMoney.com site offers its users free stock charting. Price data can be plotted over predefined or custom time periods going back five years, and up to five additional stocks can be overlaid on a single chart, along with an industry chart and one of six different technical indicators. Lacking some of the flexibility found in other services discussed here, users are not able to customize the indicators to meet their specific needs, nor can they save their chart settings.

One of the site's more unique features is its Map of the Market. This free service is designed to help users spot investment trends. The map tracks more than 500 stocks and updates the data every 15 minutes. Colored rectangles represent individual companies. The size of the rectangle reflects the market capitalization, while the color represents the stock's price movement for the day.

StockPoint

StockPoint offers visitors two charting options—quick chart and interactive chart. Using quick charts, you can plot stock, mutual fund, and index data for up to five years, overlay up to three comparison symbols and one comparison index, and plot up to eight indicators and studies. With the interactive charts, you have the same charting capabilities and indicators

to choose from. However, you have the added ability to click and drag a section of a chart in order to zoom in on the selected data.

The site also provides a variety of investing tools including a 401(k) allocation and distribution calculator, stock and fund screeners, and an asset allocation calculator, all of which are free.

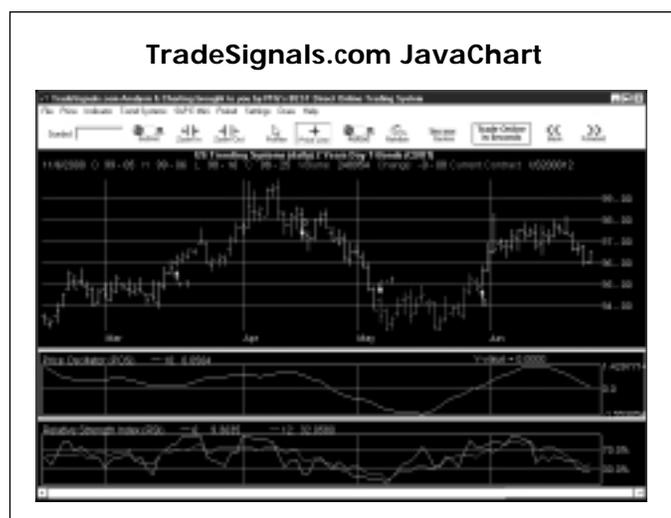
timely.com

This site offers visitors three free charting systems for the plotting of stock, mutual fund, and index price data. Level 1 charting provides closing price and volume data over a variety of different time frames. If you wish to plot technical indicators, Level 1+ charting allows you to plot up to four technical indicators as well as plot price data as a line (closing price) or open-high-low-close bar chart. Lastly, Level 2 charts are intraday delayed prices that can be displayed in five-, 15-, or 60-minute increments.

TradeSignals.com JavaCharts

TradeSignals.com is devoted exclusively to futures trading. Visitors to the site have free access to intraday and end-of-day Java charting. You can chart futures contracts on a one-, five-, 15-, and 30-minute basis, as well as daily going back over 10 years. There are 24 fully customizable technical indicators and studies available—three of which can be plotted on a chart at one time. You can also manually draw in your own trendlines. Other free services include line quotes, options strips data, and a listing of all current open positions generated by TradeSignals.com trading systems.

If you wish to view the buy and sell signals on a chart, you must subscribe to TradeSignals. For a limited time, subscriptions cost \$20 a month, or \$120 per year. (The site offers a free 30-day trial.) You have the same charting capabilities you find with the free charting; however, you are also able to select from 30 trend systems covering currencies, energies, interest rates, softs, grains, metals, and livestock. When you select any of these systems,



the charts are color-coded to indicate whether the system is long, short, or neutral. Other subscription-based services include daily commentary on over 30 U.S. futures markets, free real-time futures quotes, daily analysis and trading recommendations, E-mail trade alerts, and real-time access to trading experts providing advice on your trades.

TradingCharts.com

TradingCharts.com is a no-frills site devoted to providing free quotes and charts for over 30,000 stocks and futures contracts. Charts cover prices going back to September of 1999 on a daily, weekly, or monthly basis. From the chart pull-down menu, you can select from 17 different technical studies and indicators, which can be customized by the user.

TradingCharts.com provides sell signals based on the various indicators. These signals appear as red down arrows (sell or sell short) or green up arrows (buy or go long). These signals can be toggled on and off by selecting the Signals button on the chart page. In addition, long and short stops are provided for buy and sell signals. These are drawn by selecting the Target button on the chart window.

Wall Street City

Telescan's Wall Street City site offers a broad range of news, data, analysis, and investing tools, along with charting and technical analysis. The charting mechanism at WallStreetCity.com, which is free, al-

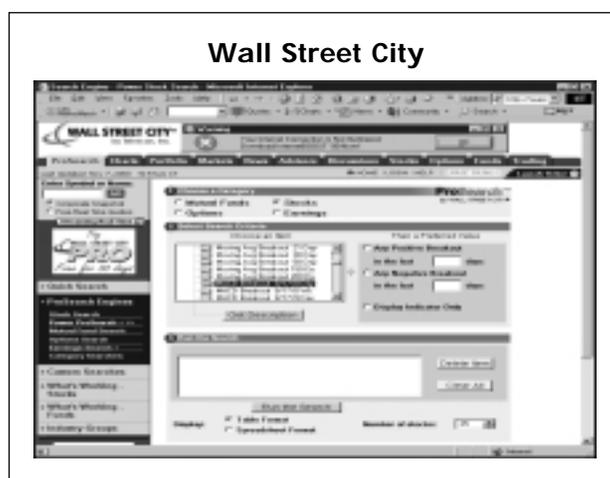
lows users to plot U.S. stocks, mutual funds, and indexes going back to 1970. There are 11 technical indicators available, as well as insider trading statistics, all of which can be displayed at once if you desire. Many of the technical indicators provide buy and sell arrows on a chart. In addition, you are given the return the signals generated for each of the indicators.

Wall Street City also offers some of the most extensive screening capabilities on the Internet. The site offers varying levels of screening, some of which require a subscription to WallStreetCity.com. The free Stock Search module allows users to screen for stocks experiencing daily range gaps, as well as 50- and 200-moving average breakouts. For \$9.95 a month, subscribers can access Power ProSearch, which provides screening on a number of technical indicators including Bollinger bands, MACD, and stochastics.

WindowOnWallStreet.com

WindowOnWallStreet.com represents what could be the future of investment software. This Web-based application is the reincarnation of the Window On Wall Street line of software, which was purchased by Omega Research in 1999. By far the most comprehensive browser-based technical analysis program available, it contains many of the features found in some of the more advanced software-based technical analysis programs available today.

Subscribers to the service can access streaming real-time quotes, charts, and news, a dynamically updated portfolio manager, technical indicators,



line studies and drawing tools, Nasdaq Level II data (for an additional \$10 per month), and customizable Internet research.

Several chart types are offered, including bar and candlestick, as well as real-time daily charts, intraday tick charts, user-defined minute bar charts, and tick bar charts. There are over 40 technical indicators, trendline studies, and drawing tools. Charts are also updated in real time, tick by tick.

With the Level II screens, you are able to watch the buying and selling activity of individual market makers and electronic communications networks (ECNs). Dynamic time and sales data is also available.

Using the Internet research feature, you are given links to research sites, brokers, and corporate Web sites. The research area is customizable.

Other features include the Market Leaders window, where you see which stocks are making the big moves, streaming on-line news with search capabilities and real-time alerts, and a live quote ticker. A dynamically updated portfolio manager tracks realized and unrealized gains, hypothetical portfolios, and multiple accounts. Discussion forums allow you to interact with other traders and discuss the latest trading news, plus read and give buy and sell recommendations on the symbols of your choice.

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