velocity
FROM SCHWAB
SIGNATURE SERVICES

Charting

INTERACTION DESIGN SPECIFICATIONS

CRS Interactive
Version 5
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Contents

Charting

1 Project Overview

1.1 Introduction

This document outlines the interaction design specifications for charting in Velocity. Charting is not currently available in Velocity. The charting initiative would allow Velocity users to view dynamically generated charts, drawing upon an array of features from which to create a graphical display of stock data. Historical stock data will be provided by the charting vendor Big Charts, but the technical indicators will be interpreted within the GUI of the existing Velocity desktop trading program.

1.2 Scope of interaction design specification

Velocity's charting interaction design should allow the user to select and display charts from within multiple windows. The user should also be able to configure the way a chart (or any set of charts) appear by setting preferences from a range of display options.

The designs presented in this document will allow us to develop and evaluate the usability of various charting features (see "Charting features overview" on p. 5).

1.3 Deliverables

The release date for the charting function is TBD. The following cross-functional team is organized to support charting in Velocity.

Business Requirements – Sid Tsubota
Interaction Design Specification – Jim Coughenour
Interaction Design – Terri Wolf, Connie Amador
Usability Testing – Richard Mander
Functional Specification – Leticia Redwood
UI and Component Development – Brad McCarty
Quality Testing – Jeff Michael
EB Service Integration– Lisa Bernard

Version and Push Date – Robert Marshall, Karen Tam
Project Sign-off – Karen Tam

2 Interaction Design

2.1 Charting features overview

The interaction design for Velocity's charting function should provide the user with a set of charting features that are easy to use, customize and view. The business specifications for charting define the optimal user experience as follows:

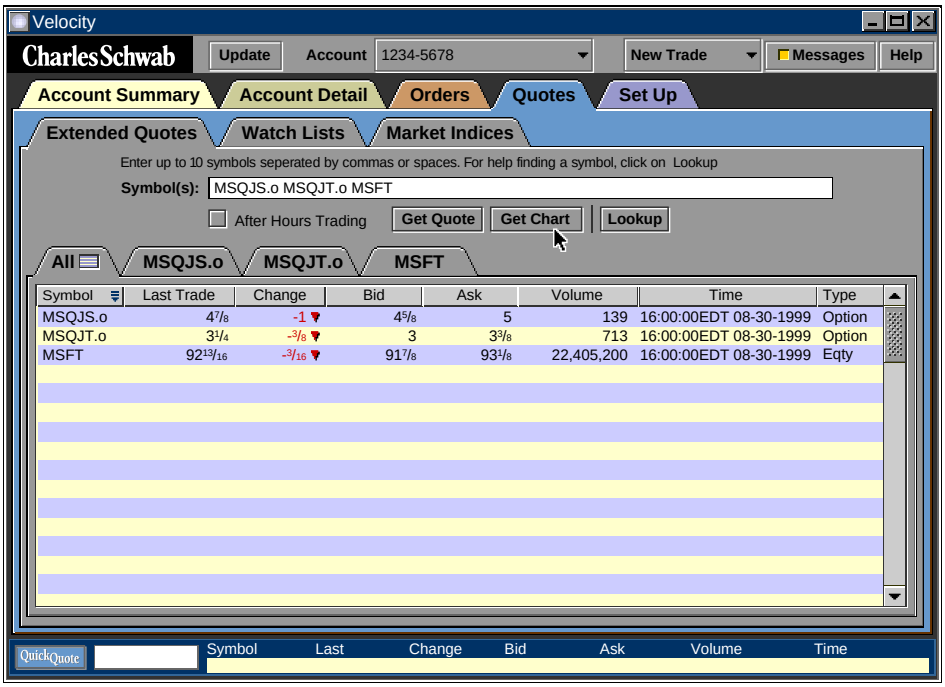
- The user could chart stocks, mutual funds, and market indices, if the appropriate symbols are input.
- The user interface should be consistent with the current Velocity UI.
- The user could launch the charting tool from the Extended Quotes window.
- Charts would be displayed in a pop-up window or a non-modal charting screen.
- The Chart container features a pulldown menu with several preset charting styles.
- The pulldown menu would also contain an "Advanced Settings" selection, which would allow the user to save a combination of selected settings.
- Scroll bars would display if the user resizes the window to dimensions smaller than the default size, or if user selects larger chart sizes or multiple lower indicators in Chart Settings.
- The charting container would have a symbol entry field where the user could enter a symbol.
- The chart display would include some quote data within summary and/or detailed quotes (also provided by Big Charts).
- The user could use the symbol lookup from the Chart Settings window.
- The user could print charts.

2.2 Interface design features not shown in this version

- Chart gifs *without* the quote feature (see note to "The Chart container" on p. 7).
- Placement of spinner to left of time stamp.
- Center alignment of quote.
- Change of "Daily" to "Day" in quote field.

2.3 Generating a chart: the GET CHART button

A new GET QUOTE button has been added to the Extended Quotes container. The user enters stock symbols in the text field to the left (as usual), then clicks the GET CHART button to launch the Chart container.

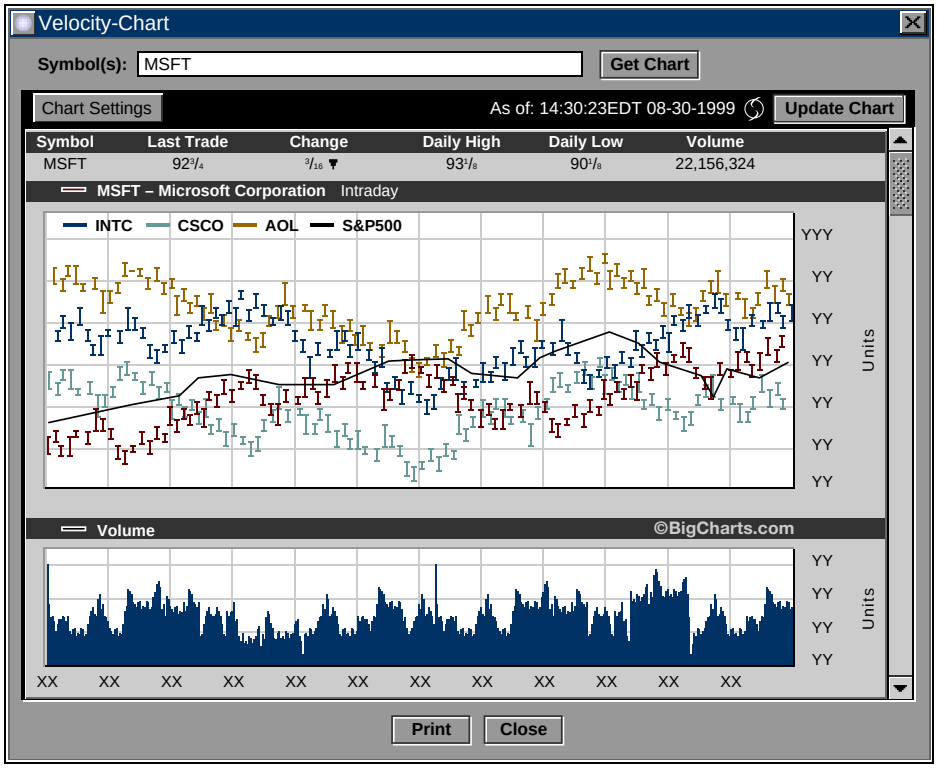


THE SYMBOL FIELD. Typing a symbol in the symbol field is optional. If the user enters one symbol in the symbol field, then clicks the GET CHART button, the chart for that symbol will appear in the Chart container. If the user enters more than one symbol in the symbol field, the chart will display the first symbol in the main graph and the remaining symbols as comparison graphs.

2.4 The Chart container

When the user clicks the get QUOTE button, Velocity opens the chart container.

The chart container has two main levels: (1) the base container, which allows the user to enter another symbol, then click the GET CHART button to see a new chart; and (2) the display level, which shows the gif generated by Big Charts and includes a reiteration of basic information (symbol, company name, quote data) for the entered symbol(s).



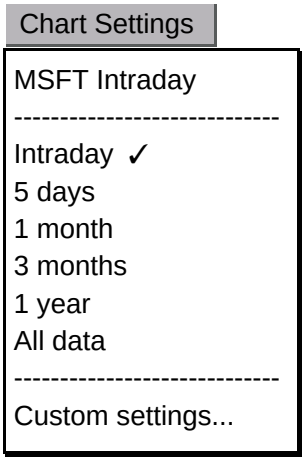
CONSISTENT DISPLAY. Both the graph(s) and the abbreviated quote data displayed at the bottom of the base container are provided by Big Charts—which guarantees that the data presented pictorially and that data presented numerically are consistent.

SCROLL FEATURE. The chart container also includes a scroll feature, to ensure that the user can see multiple lower indicators.

Please note: SHOW QUOTE FEATURE. A business decision has not yet been made whether or not to show quote data within the chart gif. In this version, chart gifs are shown *with the quote included.*

2.5 Chart container pulldown menu

The Chart container introduces a new control element: the Chart Settings command button. When the user clicks the Chart Settings, a pulldown menu appears.



The Chart Settings pulldown menu displays a list of preset settings. In the illustration above, "Present Intraday" is designated as the default.

TIME FRAME SETTINGS. Each time setting shown above has a corresponding frequency:

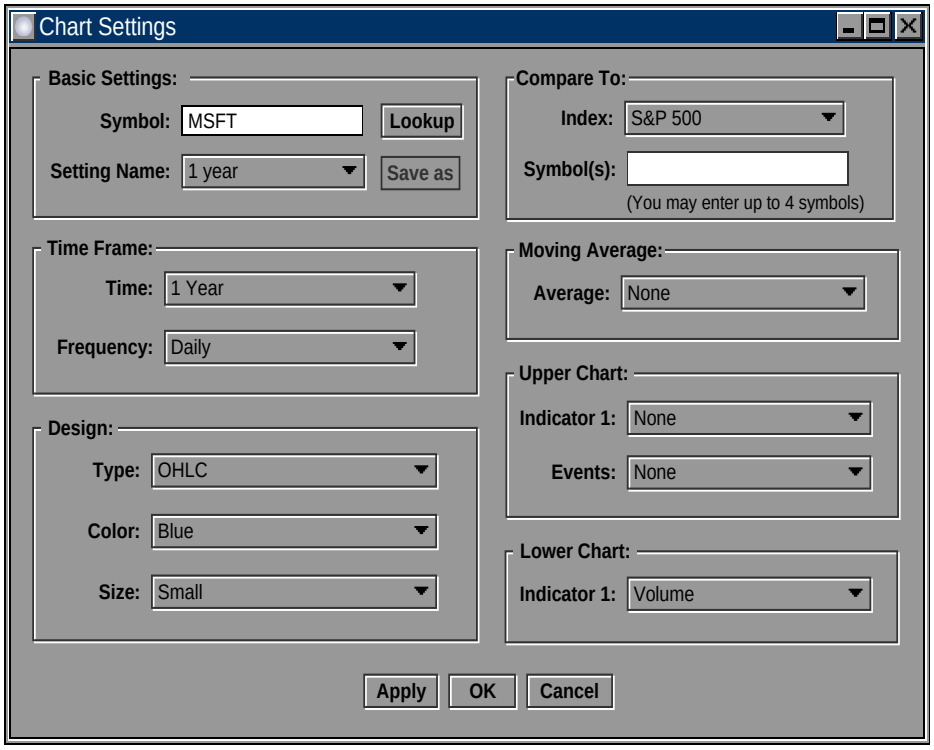
Time	Frequency
Intraday	5 minutes
5 days	Hourly
1 month	Daily
3 months	Daily
1 year	Daily/ SMA 25
All data	Weekly

USER-DEFINED SETTINGS. The pulldown menu also displays (at the top of the list) any settings defined by the user; in the illustration above "MSFT Intraday" indicates a user-defined setting. A separator line distinguishes user-defined settings from the pre-defined settings.

ADVANCED SETTINGS. A second separator (below the pre-defined settings) sets off the "Advanced Settings" option. When the user selects this option from the pulldown menu, Velocity opens the Chart Settings container.

2.6 The Chart Settings container

In the user selects "Advanced Settings" from the Chart container pulldown menu, Velocity opens the Chart Settings container. This modal window allows the user to configure a combination of settings for the way Big Chart displays a particular quote chart or all charts from a panel of pulldown menus (see "Chart Settings pulldown menus" on p. 10).

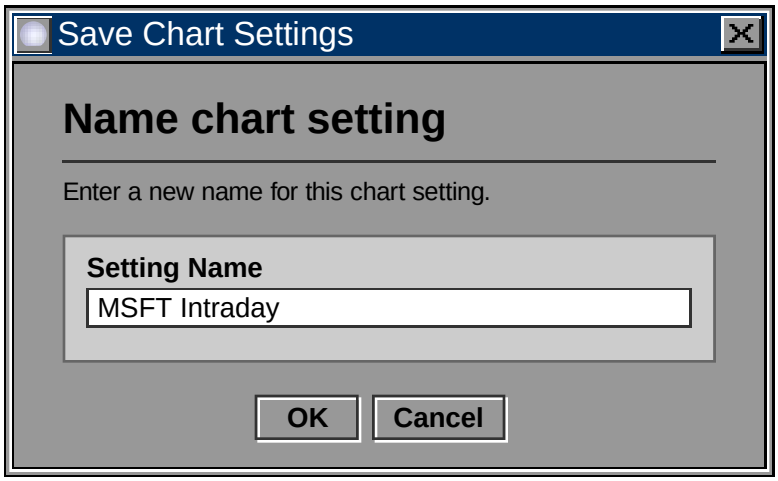


The stock symbol displayed in the Chart container is carried over to this window. The user can change this symbol if desired; if the user doesn't know the symbol for the stock desired, the LOOKUP button is available here.

In this example, "MSFT" is the symbol displayed. If the user modifies any other settings in this panel, the grayed-out SAVE AS button is enabled. To save this new combination of settings, the user clicks the SAVE AS button, which opens the Save Chart Settings container.

2.7 The Save Chart Settings container

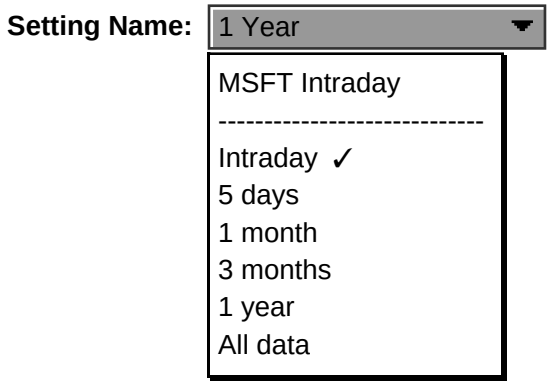
The "Save Chart Settings" container appears when the user clicks the SAVE AS button in the Chart Setting container. This container is a modal container with a text field and OK/CANCEL buttons. Any combination of user preferences may be saved as a customized setting.

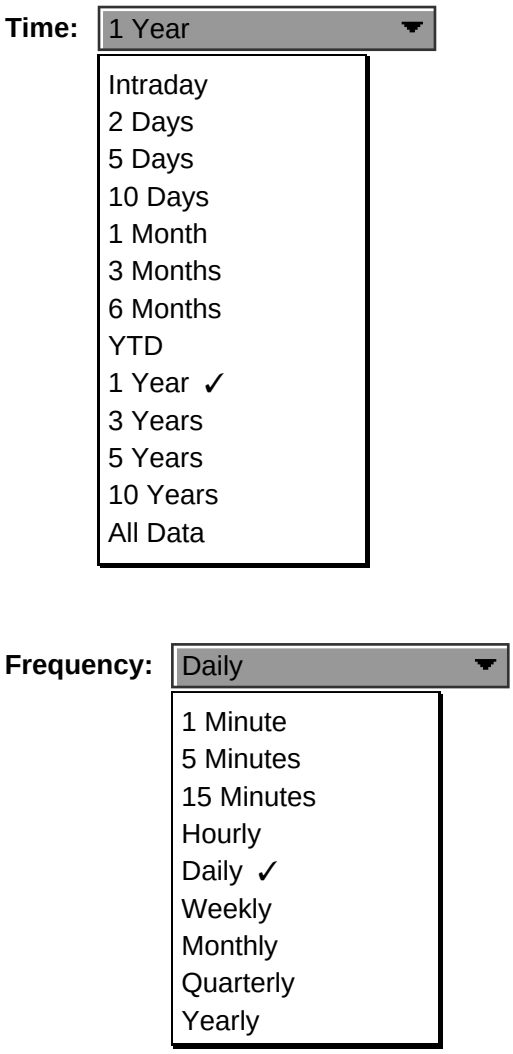


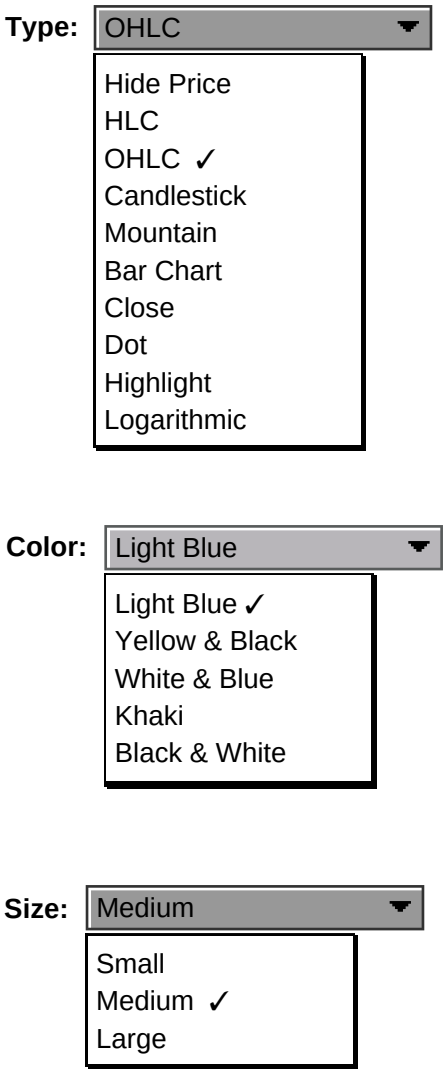
The user can enter any name for a new combination of settings. When the user clicks the OK button, the new name will appear as a selection at the top of the pulldown menu in the Chart container.

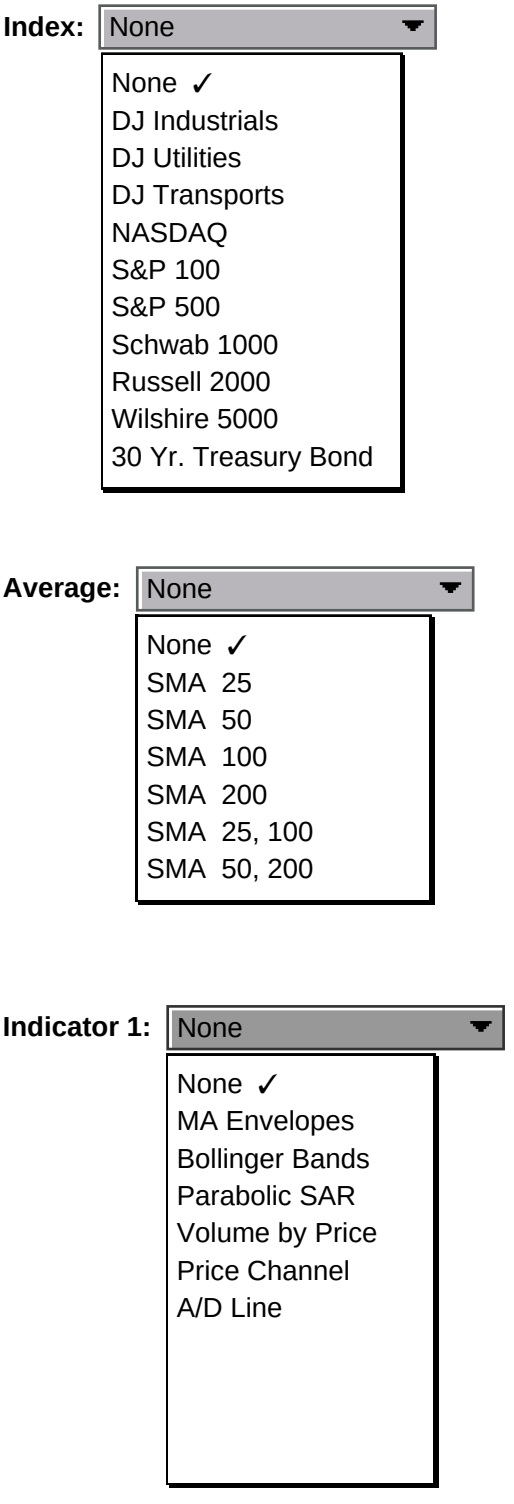
2.8 Chart Settings pulldown menus

The Chart Settings container allows the user to set the following preferences:




Time:
1 Year
Intraday
2 Days
5 Days
10 Days
1 Month
3 Months
6 Months
YTD
1 Year ✓
3 Years
5 Years
10 Years
All Data
Frequency:
Daily
1 Minute
5 Minutes
15 Minutes
Hourly
Daily ✓
Weekly
Monthly
Quarterly
Yearly


Type:
OHLC
Hide Price
HLC
OHLC ✓
Candlestick
Mountain
Bar Chart
Close
Dot
Highlight
Logarithmic
Color:
Light Blue
Light Blue ✓
Yellow & Black
White & Blue
Khaki
Black & White
Size:
Medium
Small
Medium ✓
Large


Index:
None
None ✓
DJ Industrials
DJ Utilities
DJ Transports
NASDAQ
S&P 100
S&P 500
Schwab 1000
Russell 2000
Wilshire 5000
30 Yr. Treasury Bond
Average:
None
None ✓
SMA 25
SMA 50
SMA 100
SMA 200
SMA 25, 100
SMA 50, 200
Indicator 1:
None
None ✓
MA Envelopes
Bollinger Bands
Parabolic SAR
Volume by Price
Price Channel
A/D Line

Events: None

- None ✓
- Show Splits
- Show Earnings
- Show Dividends
- Show All Events

Indicator 1: Volume

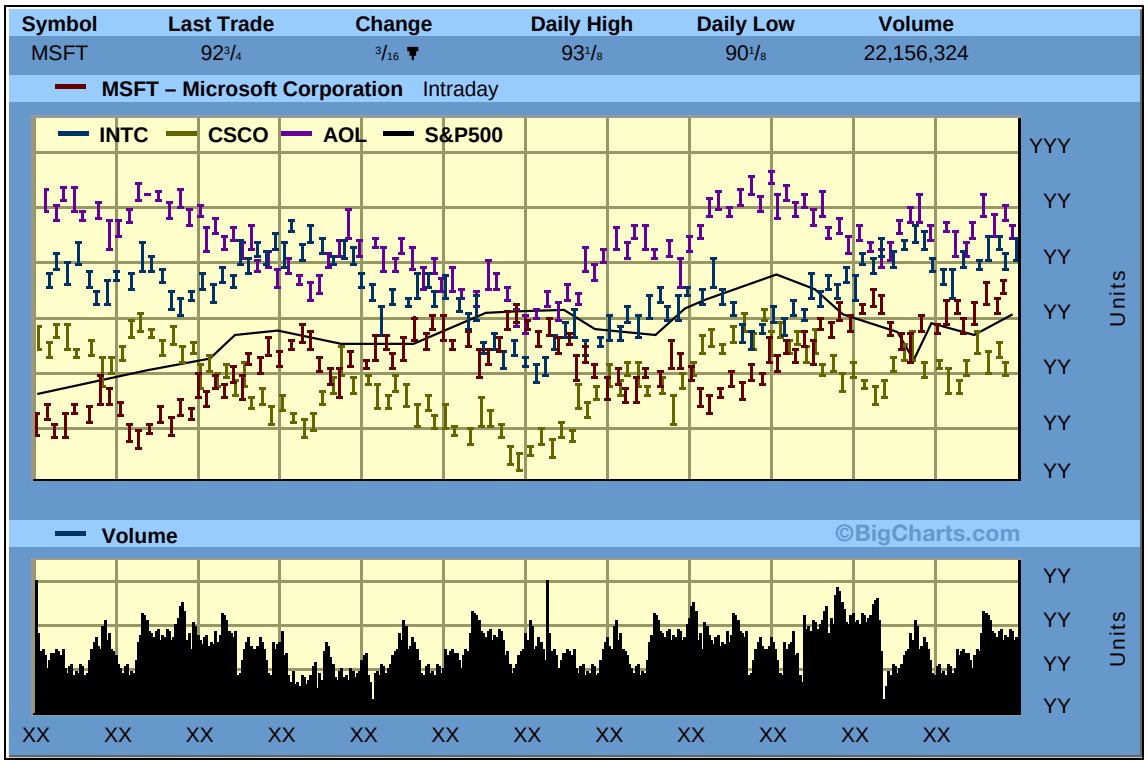
- None
- Volume ✓
- Volume+
- RSI
- MACD
- OBV
- Fast Stochastic
- Slow Stochastic
- ROC
- Williams %R
- Money Flow
- Vol Accumulation
- Volatility Fast
- Volatility Slow
- Momentum
- Ultimate Oscillator
- % Short Interest
- Rolling EPS
- P/E Ratio
- P/E Ranges
- Rolling Dividend

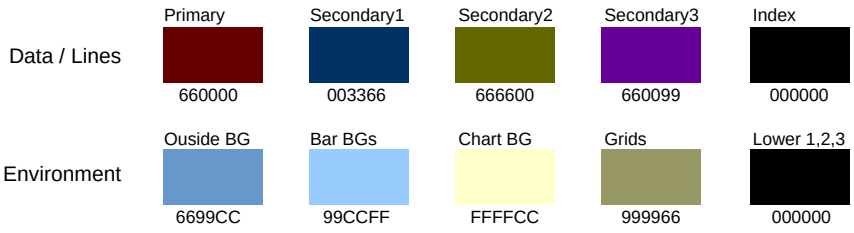
2.9 Color settings

Most of the pulldown menus in the Chart Settings container allow the user to configure what kind of data are displayed. The Color settings pulldown menu allows the user to choose from a number of Velocity palettes to determine how the chart *looks*.

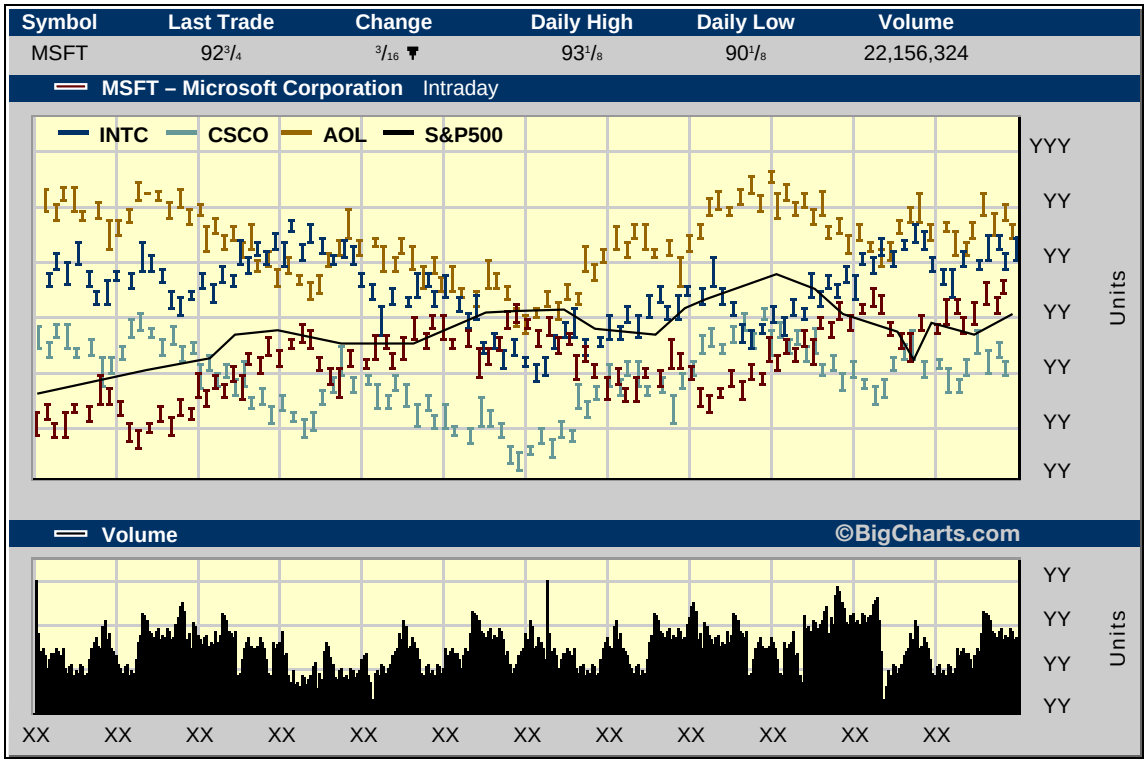
The screens below illustrate the range of palettes available. The colors are keyed to colors already used in Velocity. For each illustration the hexadecimal code is provided for the palette used.

Light Blue color setting (default)





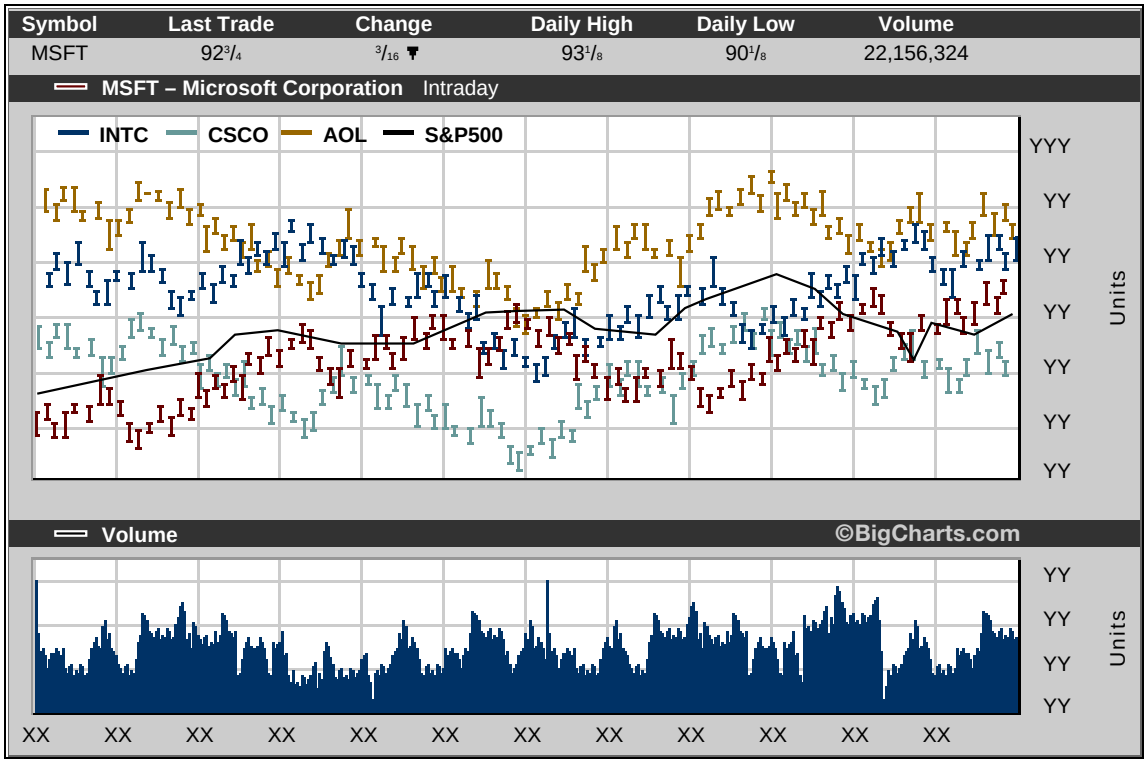
Yellow & Black color setting



	Primary	Secondary1	Secondary2	Secondary3	Index
Data / Lines	660000	003366	333399	996600	000000

	Ouside BG	Bar BGs	Chart BG	Grids	Lower 1,2,3
Environment	CCCCCC	003366	FFFFCC	CCCCCC	000000

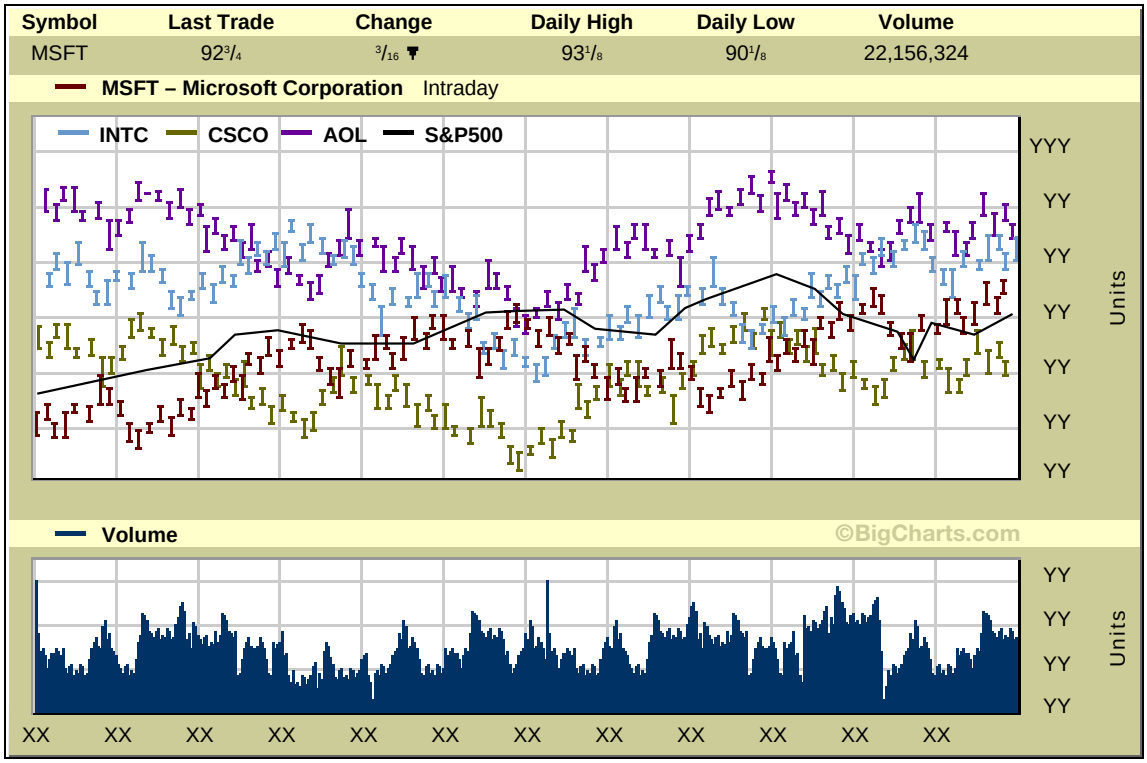
White & Blue color setting



	Primary	Secondary1	Secondary2	Secondary3	Index
Data / Lines	660000	003366	333399	996600	000000

	Ouside BG	Bar BGs	Chart BG	Grids	Lower 1,2,3
Environment	CCCCCC	333333	FFFFFF	CCCCCC	003366

Khaki color setting

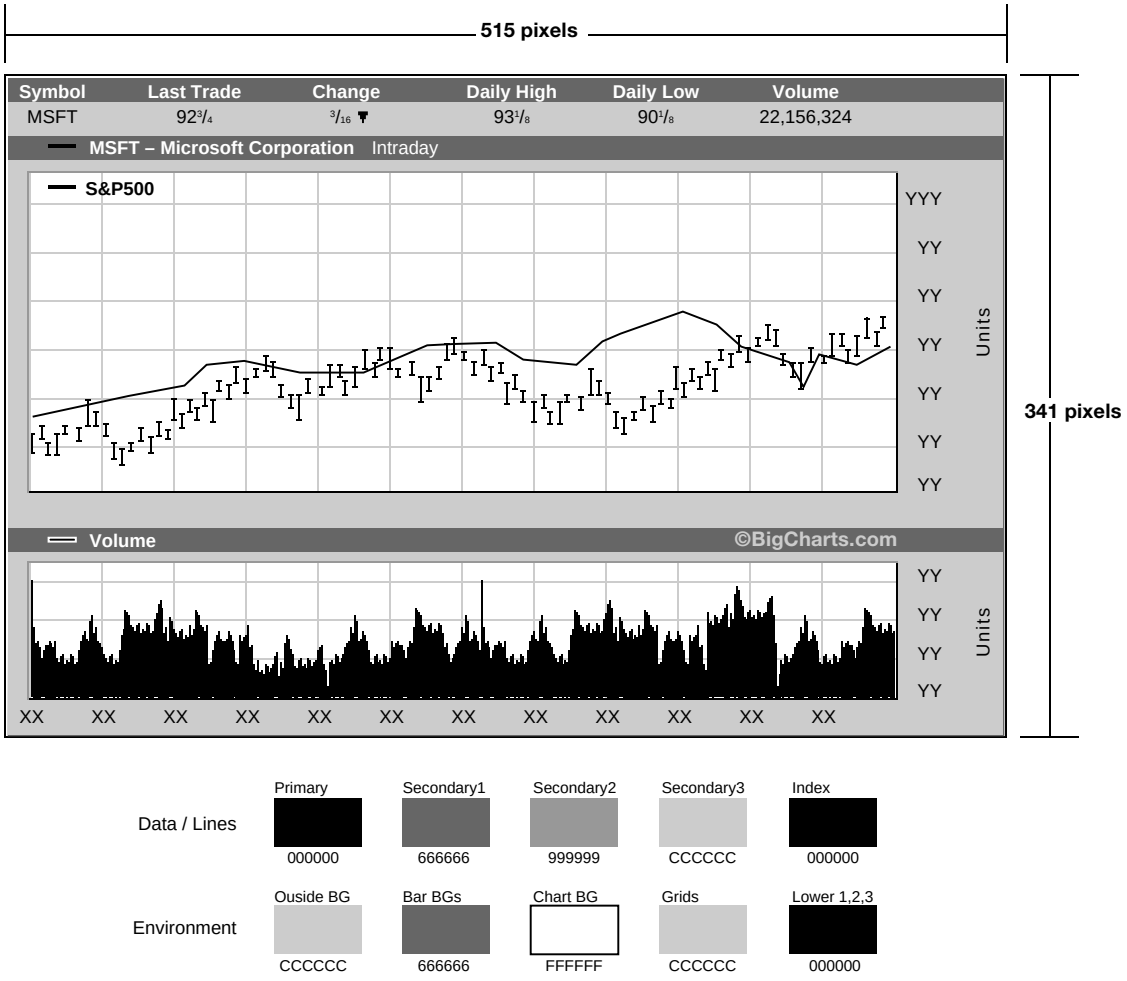


	Primary	Secondary1	Secondary2	Secondary3	Index
Data / Lines	660000	6699CC	666600	660099	000000

	Ouside BG	Bar BGs	Chart BG	Grids	Lower 1,2,3
Environment	CCCC99	FFFFCC	FFFFFF	CCCCCC	003366

USERS WITH BLACK AND WHITE PRINTERS. The final color setting shown here is the Black & White color setting. It is provided primarily for users who have only black and white printers—i.e., users for whom the color feature is not particularly helpful when the chart is printed.

Black & White color setting



2.10 Size settings

The size settings "Small" / "Medium" / "Large" correspond to the dimensions set by Big Charts and refer only to the size of the gif generated by Big Charts—not to the size of the Chart container itself, which will necessarily vary.

NOTE: The size of the chart gif is dependent upon a business decision to include or not include the real time quote provided by Big Charts. In this version of the interface design specification, chart gifs are shown with the quotes included.

The dimensions for each setting when the quote is *included* are:

SMALL. 430 pixels by 250 pixels.

MEDIUM. 515 pixels by 341 pixels.

LARGE. 720 pixels by 550 pixels.

The dimensions for each setting when the quote is *excluded* are:

SMALL. 430 pixels by 230 pixels.

MEDIUM. 515 pixels by 311 pixels.

LARGE. 720 pixels by 512 pixels.

3 Future Enhancements

Future charting developments may include the following modifications to the interface design:

- a UI that is completely designed by Schwab—using a direct data feed provided by a market data vendor
- the user would be able to chart multiple symbols by executing multiple pop-up windows or access a URL that would configure multiple charts in a screen
- using the right mouse button to select charts from a pulldown menu

4 Revision History

In previous versions of this document, the following items appeared in "Charting features overview" on p. 5. They have been either revised or discarded in the current version.

- The user could launch the charting tool from multiple windows.

- The user could chart Watch Lists (up to *n* number of symbols) and the Market Indices watch list.
- The user could zoom in and out on a selected area of the chart display.