

stocks

COLLABORATORS

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Chapter 1

stocks

1.1 Stocks V3.02a Help

(c) Copyright 1991, 1992, 1993 Bug Free Development

Stocks is a powerful technical analysis tool used for charting stock price and volume data. Numerous mathematical formulas can be applied to the data in the form of

Studies

. These studies are plotted with the stock price/volume data to allow you to forecast future price movements from previous actions.

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Bug Free Development

1.2 Stocks: Copyright, License and Disclaimer

The Stocks program and its documentation are (c) Copyright 1991, ←
1992,
1993 Bug Free Development All rights reserved.

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law. Individuals who make unauthorized copies of software may be subject to civil and criminal penalties. Registered copies of the Stocks program are serialized and tracked to the original licensee who is liable for any infringements of copyright.

Registration

1.3 Stocks: Features

The Stocks program is extremely fast while supporting an extensive feature list:

- * Displays Multiple Studies in a Single Window
- * Daily, Weekly, and Monthly period ranges
- * Traditional Bar Charts using High, Low, and Close
- * Japanese Candlesticks using High, Low, Open, and Close
- * Point & Figure Three-box Reversal Charts
- * Configurable Trading Rules that Generate Buy/Sell Signals
- * Compare Historical Data with Trading Rules to Evaluate Effectiveness
- * Plots Company Earnings
- * Arithmetic and Log Scales for Price and Volume
- * Automatically Scales Price and Volume Legend to Fit Window
- * Support for Displays on Workbench and a Custom Public Screen
- * Prints Numerous Studies on a Single Page
- * Stock Lists
- * Configurable Display and Print Options
- * Support for HP LaserJet and Postscript Printers
- * On-Line HyperText Help
- * ASCII Data Files for Easy Maintenance

1.4 Stocks: Introduction

The Stocks program processes historical stock data formatted as ASCII text files. The use of ASCII representation of data allows you to easily enter or correct your price/volume data. In addition to price/volume data, the Stocks program supports stock split, trailing four quarter earnings plots and allows you to customize your environment using both an ASCII configuration file for system defaults and configuration changes on a per stock basis. See the section on

Configuration File

for more information on configuring your system. Data can be charted using periods of a single day, weekly summaries and monthly summaries.

The stocks program may be invoked from the WorkBench or by using the CLI by specifying an operation and a stock data file.

For example:

```
stocks -d cbm
```

would instruct the Stocks program to display the price/volume data for the stock located in file CBM in the directory pointed to by

Default Path

. See the section

Command Line Options

for a complete

description of all the command line options.

1.5 Stocks: Installation

To use the Stocks program your system must have the following minimum system requirements:

an Amiga 500,600,1200,2000,2500,3000,4000 with a color display.

AmigaDos 2.0+

512 Kilobytes Memory

1 Floppy Disk

Installation instructions:

copy stocks program to C:

copy the default configuration file stocks.config to the S: directory.

copy the stocks.guide help text to a directory specified by the

environmental variable AmigaGuide/Path.

After you have copied the program and help file, edit the stocks.config for your machine and preferences. See the Section on

Configuration File
for a complete description of configuration options.

1.6 Stocks: Command Line Options

If the stocks program is executed from the CLI. The format for the command is:

```
STOCKS [operation] [options] [stock file]
```

or

```
STOCKS [operation] [options] -L
```

An operation and stock filename or the filename of a list of stocks must be specified when the Stocks program is invoked. The options are well optional.

The following values are supported:

Operation Description

- C Check the current period's stock price/volume against buy/sell conditions.
- D Display stock price/volume/studies in a window.
- F Generate a Point-and-Figure chart for the specified stock file.
- P Plot the stock chart to the printer.
- T Trade based on buy/sell conditions against all historical data in the stock file.

Option Description

- L Plot all the stocks specified in a list file
- .
- M Plot a monthly summary of the stock price/volume/studies.
- W Plot a weekly summary of the stock price/volume/studies.

The default period for charting data is days. To chart using weekly or monthly summary specify `-W` or `-M` command options or use the

Weekly
or

Monthly
menu options.

1.7 Stocks: List File

A list file is an ASCII file containing a set of stock files that are to be displayed. Each stock data filename is contained on a separate line. If no list filename is specified on the command line, the default list file (`STOCKS.LIST`) located in the directory specified by the default directory is used.

The command syntax for specifying a list file other than the default is:

`-L=filename`

where

filename is the name of a file containing a list of stock filenames to display, print or process.

An example of a list file is:

aapl dec cbm ibm msft

where aapl, dec, cbm, ibm, and msft are the names of stock data files.

1.8 Stocks: Menus

The Stocks program sports a standard Amiga menu interface. ↔

Holding the right mouse button while the pointer is in the Stocks display window changes the title bar to a menu strip.

The following table describes the menu structure for the Stocks program:

Program

About...

Open...

Close

Preferences...

Printer Setup...

Print
Quit
Chart
Daily
Weekly
Monthly
Point & Figure
Candlesticks
Earnings
Trading
Price Scale
Volume Scale
Studies
AVG A
AVG B
AVG C
GANN
MACD
PTPS
PERCENT R
RSI
STOCHASTICS
TREND LINE
VPT
AVG VOLUME

1.9 Stocks: Menu/ Program/ About...

Selecting the About menu choice brings up a dialog box ↔ containing the version of the Stocks program, a copyright notice and registration

information.

If you are using the evaluation version of the program, that fact is stated in the dialog box along with the following gadgets: AGREE, REGISTRATION, and CANCEL. If you don't agree to the

license and warranty information outlined in this document, press CANCEL and don't use the program. If you do agree with the license and warranty press AGREE to continue.

If you have registered and need to enter the registration information, select REGISTRATION. This will open another dialog box containing a form to enter the registration information. Registration requires that you agree to the license and warranty and that you pay a software license fee. See the section on

Registration

for more information on

how to register.

If you are a registered user, the dialog box registration information contains your name and serial number.

1.10 Stocks: Menu/ Program/ Open...

Selecting the Open menu choice brings up a file requester dialog box. Select the directory and stock filename to be displayed.

The keyboard shortcut key for OPEN is to press right-Amiga-O.

1.11 Stocks: Menu/ Program/ Close

Selecting the Close menu performs the same action as pressing the Close-Window-Gadget, that is it closes the currently displayed stock chart. If you are displaying a single stock, the Stocks program will exit when you close the display window.

If you are displaying a list of stocks, the next stock file in the list is displayed. To exit the program while displaying a list of stocks, select

Quit

from the Program menu.

The keyboard shortcut key for CLOSE is to press 'C' or right-Amiga-C.

1.12 Stocks: Menu/ Program/ Preferences

The Preferences menu choice has a number of sub-menu choices ←→
 . Each
 sub-menu brings up a dialog box allowing you to configure the default
 operating parameters for the sub-menu topic. This is a convenient way
 to modify the configuration information found in the

Configuration File
 using a graphical interface.

The sub-menu items are:

```
-----
Program...
Chart...
-----
Moving Average A...
Moving Average B...
Moving Average C...
-----
Gann...
MACD...
Parabolic...
Percent R...
RSI...
Stochastics...
Trend Lines...
-----
Average Volume...
Volume Price Trend...
-----
```

The Program... sub-menu selection allows you to configure information
 about the

```
Default Path
/
Screen Colors
/
Interlace
/
Resolution
/
Type
/
Window Size
/
Trading Rules
.
```

The Chart... sub-menu item selection allows you to configure
 information about

```
Candlesticks
/
Earnings
/
```

Trading

,

Price Scale

, and

Volume Scale

The other sub-menu selections allows you to configure ←
information

about the various

Studies

.

Each dialog box contains gadgets for SAVE, USE, or CANCEL. Selecting SAVE causes the configuration to be written to the STOCKS.CONFIG file. The USE selection allows you to use the current configuration without modifying the permanent configuration stored in STOCKS.CONFIG. Selecting CANCEL causes any changes made to be ignored.

1.13 Stocks: Menu/ Program/ Printer Setup

The Printer Setup menu choice opens a dialog box containing the printer destination and a print driver. You can select whether chart printouts go directly to the PAR: device or to a file. Selecting File allows you to enter a filename. The default filename is 'T:stocks.plot'.

The dialog box also contains gadgets for SAVE, USE, or CANCEL. Selecting SAVE causes the configuration to be written to the STOCKS.CONFIG file. The USE selection allows you to use the current configuration without modifying the permanent configuration stored in STOCKS.CONFIG. Selecting CANCEL causes any changes made to be ignored.

1.14 Stocks: Menu/ Program/ Print

Choosing the Print menu selection causes the currently displayed stock and selected studies to be printed to the PAR: device or a file.

When the Stocks program is printing a file, a progress window is displayed. You can terminate a printout by pressing the Close-Window-Gadget on the progress display.

The keyboard shortcut key for PRINT is to press 'P' or right-Amiga-P.

1.15 Stocks: Menu/ Program/ Quit

Selecting the Quit menu choice causes the Stocks program to exit. Quit will terminate the display of a list file.

The keyboard shortcut key for QUIT is to press 'Q' or right-Amiga-Q.

1.16 Stocks: Menu/ Chart/ Daily

Selecting Daily causes the Stocks program to chart stock data using a period of one day. If the data file contains weekly or monthly summary data, it is ignored. Only daily data is displayed.

The keyboard shortcut key for DAILY is to press 'D' or right-Amiga-D.

1.17 Stocks: Menu/ Chart/ Weekly

Selecting Weekly causes the Stocks program to chart stock data using a period of one week. If the data file contains monthly summary data, it is ignored. Daily data included in the file is tallied by week and is combined with the weekly information when displayed.

The keyboard shortcut key for WEEKLY is to press 'W' or right-Amiga-W.

1.18 Stocks: Menu/ Chart/ Monthly

Selecting Monthly causes the Stocks program to chart stock data using a period of one month. Daily and weekly data included in the file are tallied by month and are combined with the monthly information when displayed.

The keyboard shortcut key for MONTHLY is to press 'M' or right-Amiga-M.

1.19 Stocks: Menu/ Chart/ Point & Figure

The Point and Figure menu selection allows you to plot P&F studies. This type of study is among the oldest forms of charting used. It is also called the three-box reversal system. X's are plotted while the stock is making upward price progress and O's are used during a down trend. See the studies section on Point and Figure for more information.

The keyboard shortcut key for POINT & FIGURE is to press 'F'.

1.20 Stocks: Menu/ Chart/ Candlesticks

The Candlesticks menu option toggles between traditional bar charting and Japanese Candlesticks. If the Candlestick menu option is checked, Japanese Candlestick charting is enabled. To enable traditional bar charting, click on the Candlestick menu option to deselect Candlesticks.

Candlesticks

1.21 Stocks: Menu/ Chart/ Earnings

The Earnings menu selection allows you to choose whether the stock earnings data is plotted with price information. If enabled, the Stocks program will calculate the average price to earnings ratio (PE) for all the entered earnings data using a weighted average formula. The Stocks program scales earnings by multiplying the earnings per share value by the average PE. These values are plotted as dots with a line connecting them. The actual earnings per share is printed at the bottom of the price window. Losses are represented by plotting the dot at the bottom of the window. Under some circumstances, the range of earnings is greater than the size of the price scale. Under that case, the highest or lowest earnings are plotted at the upper or lower boundary of the price window.

1.22 Stocks: Menu/ Chart/ Trading

The Trading menu option allows you to graphically represent buy/sell signals based on rules you configured using the

Customized Trading Rules

. A line connecting two dots shows the buy and sell period. Above the sell dot is the percent gained or lost on the trade.

The Stocks program assumes an average of the high and low price on period after the buy/sell signal as an approximate purchase/sale price when figuring the percent gain or loss. If a sell signal has not yet been generated, the sell dot is placed on the last period charted and the current profit or loss percentage is displayed.

1.23 Stocks: Menu/ Chart/ Price Scale

The Price Scale menu choice contains a sub-menu option allowing you to select either an arithmetic or logarithmic scale. The default scale is

arithmetic. An arithmetic scale consists of values that increase at a constant rate. For example each label is one dollar apart. A logarithmic scale consists of values that increase at a logarithmic rate. That is to say the distance from one to two is the same as from two to four or three to six.

1.24 Stocks: Menu/ Chart/ Volume Scale

The Volume Scale menu choice contains a sub-menu option allowing you to select either an arithmetic or logarithmic scale. The default scale is arithmetic. An arithmetic scale consists of values that increase at an constant rate. For example each label is one thousand shares apart. A logarithmic scale consists of values that increase at a logarithmic rate. That is to say the distance from one to two is the same as from two to four or three to six.

1.25 Stocks: Menu/ Studies

The Stocks program supports a number of studies to graph relationships between historical price and volume data. The Studies menu allows you to enable or disable the display of these studies. Your analysis of these

The following is a list of studies supported by the Stocks program:

Moving Average A

Moving Average B

Moving Average C

Gann Charts

MACD

Parabolic Time Price

Percent R

Relative Strength Index

Stochastics

Trend Lines

Volume Price Trend

Average Volume

Select the menu item to enable or disable each study.

1.26 Stocks: Window Format

The Stocks program displays and prints stock charts using a segmented page. The page is broken into a number of sections. In the top section price data, moving averages, Gann lines, trend lines, and earnings data are displayed. If enabled the moving average convergence/divergence study is then charted. The next section contains the Relative Strength and Stochastics studies. The final section contains volume data, as well as volume price trend and average volume studies.

```
-----
|*| Chart Title and Date Range
-----
```

```
P
R           Price Data
I
C
E           Price Moving Averages

S
C           Gann Lines
A
L
E           Trend Lines

-----
```

```

                Moving Average Convergence/Divergence

```

```
MACD
-----
```

```
90
70           Relative Strength Index
50
30           Stochastics
10
   RSI & Stochastics
-----
```

```
V
O
L           Volume Data
U
M
E           Volume Price Trends

S
C           Volume Moving Average
A
L
E

-----
```

1.27 Stocks: Configuration File

The configuration file (STOCKS.CONFIG) must be located in the S: directory and contains the default settings for the Stocks program. When the Stocks program is first run, it loads the configuration information from this file.

The following is a list of options which may be configured:

- Chart Period
- Chart Candlestick
- Chart Earnings
- Chart Trading
- Chart Price Scale
- Chart Volume Scale
- Default Path
- Printer Type
- Screen Colors
- Screen Interlace
- Screen Resolution
- Screen Type
- Window Size
- Studies

Trading Rules

Any line beginning with a ';' in the configuration file is considered a comment and is ignored by the Stocks program.

Example

1.28 Stocks: STOCKS.CONFIG Example

The following is an example a stocks.config file:

```
;
; Stocks - Version 03.02a
```

```

;
Screen = 640 X 400
Window = 640 X 384
HiRes = On
Interlace = On
;
Color 1 = 10, 10, 10
Color 2 = 0, 0, 0
Color 3 = 15, 15, 15
Color 4 = 6, 7, 12
Color 5 = 0, 14, 0
Color 6 = 15, 3, 3
Color 7 = 15, 0, 15
Color 8 = 15, 15, 4
;
Path = ""
Printer "LASERJET"
;
Study Avg A = On, Color 8, P1 = 5, P2 = 0
Study Avg B = On, Color 7, P1 = 20, P2 = 0
Study Avg C = On, Color 6, P1 = 50, P2 = 0
Study Avg Volume = On, Color 4, P1 = 20, P2 = 0
Study Gann = Off, Color 4
Study MACD = On, Color 8
Study Percent R = On, Color 4
Study PTPS = Off, Color 5
Study RSI = On, Color 3
Study Stochastics = On, Color 4
Study Trend Line = On, Color 4
Study VPT = On, Color 3
;
Chart Candlesticks = On
Chart Earnings = On, Color 3
Chart Trading = Off, Color 5
Chart Price Scale = Arithmetic
Chart Volume Scale = Arithmetic
;

```

1.29 Stocks: Configuration/Chart Period

This allows you to configure the default period to display. The default value is DAILY. ←

Command Syntax:

CHART PERIOD = DAILY/WEEKLY/MONTHLY

For more information about this topic see the sections on

```

Menus/ Chart/ Daily
,
Menus/ Chart/ Weekly
,

```

Menus/ Chart/ Monthly

.

1.30 Stocks: Configuration/Chart Candlesticks

This allows you to configure the default mode for formatting price. If ON (enabled) the price high, low, open, and close values are displayed using

Japanese Candlestick format. If this characteristic is OFF, traditional price high, low, and close values are displayed. The default value is ON.

Command Syntax:

CHART CANDLESTICKS = ON/OFF

For more information about this topic see the section on

Menus/ Chart/ Candlesticks

.

1.31 Stocks: Configuration/Chart Earnings

This allows you to configure default characteristics for the Earnings display. Configuration information include the default selection, ON or OFF as well as the color to display the data in.

CHART EARNINGS = ON/OFF, COLOR number

where

ON/OFF Allows you to configure the default selection when the Stocks program is executed.

COLOR Allows you to configure the color that is used to display the earnings data.

For more information about this topic see the section on

Earnings Data

and

Menus/ Chart/ Earnings

.

1.32 Stocks: Configuration/Chart Trading

This allows you to configure default characteristics for the [Trading](#) display. Configuration information include the default selection, ON or OFF as well as the color to display the data in.

CHART TRADING = ON/OFF, COLOR number

where

ON/OFF Allows you to configure the default selection when the Stocks program is executed.

COLOR Allows you to configure the color that is used to display the trading points.

For more information about this topic see the section on [Trading Rules](#) and [Menus/ Chart/ Trading](#).

1.33 Stocks: Configuration/Chart Price Scale

This allows you to configure the default Price Scale. [Configuration](#) options include arithmetic or log. The default setting is Arithmetic.

CHART PRICE SCALE = ARITHMETIC/LOG

where

ARITHMETIC/LOG Allows you to configure the default price scale

For more information about this topic see the section on [Menus/ Chart/ Price Scale](#).

1.34 Stocks: Configuration/Chart Volume Scale

This allows you to configure the default Volume Scale. [Configuration](#) options include arithmetic or log. The default setting is Arithmetic.

CHART VOLUME SCALE = ARITHMETIC/LOG

where

ARITHMETIC/LOG Allows you to configure the default price scale

For more information about this topic see the section on

Menus/ Chart/ Volume Scale

.

1.35 Stocks: Configuration/Default Path

This allows you to configure the default directory path to prepend to stock filename or stock list filename before attempting to open the file.

Command Syntax:

```
PATH = "path"
```

For example:

```
PATH = "Work:Files/Stocks/"
```

1.36 Stocks: Configuration/Printer Type

This allows you to specify what format printer you are using. The current version of the Stocks program supports a number of printer types.

Command Syntax:

```
PRINTER = "printer type"
```

where printer type is:

```
LASERJET      HP LaserJet and compatible printers.
OKIDATA       Okidata Microline 92/3 dot matrix printer.
POSTSCRIPT    Postscript printer.
```

1.37 Stocks: Configuration/Screen Type and Size

This allows you to display your stock data on a customized public screen or the Workbench screen. If you specify a custom public screen, you can its define the number of colors, the color palette and the screen size.

Selecting WORKBENCH causes the Stocks program to display its data on the Workbench screen. If you choose a custom public screen, you must specify the size of the screen. To display two or more stock charts simultaneously, run the stocks program two or more times. Each invocation will result in another window displayed on either the Workbench or your custom public screen.

Command Syntax:

```
SCREEN = WORKBENCH
      or
SCREEN = number1 X number2
```

In the second case, a custom public screen number1 pixels wide and number2 pixels tall is used.

The default setting for SCREEN is a public screen named 'Stocks' with a display size of 640 x 400 pixels.

1.38 Stocks: Configuration/Screen Interlace

This allows you to configure the interlace mode on your custom screen. Interlaced screens offer twice the number of pixel rows but may cause some screens to flicker. The default value is ON.

Command Syntax:

```
INTERLACE = ON/OFF
```

This characteristic does not apply if the default screen type is Workbench.

1.39 Stocks: Configuration/Screen Resolution

This allows you to configure whether a high resolution custom display is enabled. The default is ON.

Command Syntax:

```
HIRES = ON/OFF
```

This characteristic does not apply if the default screen type is Workbench.

1.40 Stocks: Configuration/Screen Colors

The number of colors currently used by the Stocks program for a custom screen is eight. You can change the color palette of the custom screen by specifying the red, green, and blue levels for each of the eight colors displayed on the screen.

Command Syntax:

```
COLOR N1 = N2, N3, N4
```

where

```
N1 = the color number
N2 = red level
N3 = green level
```


N4 = blue level.

The following are the default color mappings and uses for each color:

Color	R	G	B	Description	Uses
-----	-----	-----	-----	-----	-----
1	10	10	10	Gray	Background
2	0	0	0	White	Relative Strength On Balance Volume Earnings
3	15	15	15	Black	Price Volume
4	6	7	12	Blue	Gann Percent R Stochastics Avg Volume
5	0	14	0	Green	Parabolic Time Price Trading Buy/Sell Points
6	15	3	3	Red	Moving Average C
7	15	0	15	Purple	Moving Average B
8	15	15	4	Yellow	Moving Average A

Note: This characteristic does not apply if the default screen type is Workbench.

1.41 Stocks: Configuration/Window Size

This allows you to customize the size of the display window ↔ within the screen.

Command Syntax:

WINDOW = number1 X number2

The format specifies a window sized number1 pixels in width and number2 pixels in height. Windows are opened if the -D

Command Line Option
is used.

1.42 Stocks: Configuration/Studies

You can customize the studies you wish to see and the colors to graph the studies with.

Command Syntax:

```
STUDY study-name = ON/OFF [, COLOR N][, optional parameters]
```

The information in brackets is optional (DO NOT INCLUDE BRACKETS) in your command syntax.

study-name refers to the following studies:

AVG A

AVG B

AVG C

GANN

MACD

PTPS

PERCENT R

RSI

STOCHASTICS

TREND LINE

VPT

AVG VOLUME

ON/OFF indicates whether the study is to be displayed or printed by default. When you are operating the Stocks program in display mode (interactively), you can enable or disable studies through the

Studies Menu

.

Adding ', COLOR N' to your configuration command, changes the color used to graph the study to the color you specified. You may use the

Screen Colors

option to change the palette choice for the color.

Additional parameters maybe configured for the different studies. Refer to the individual study sections for a description of the additional configuration options.

1.43 Stocks: Configuration/Trading Rules

The Stocks program allows you to define buy and sell rules ←
. This allows you to create your own computerized trading system by telling the Stocks program what conditions you require to buy a stock and what conditions need to exist before you will sell the stock. The Stocks program graphs the purchase and sell points based on your rules and includes the percent gained or lost on that trade.

The Stocks program is currently limited to 'Long' trades. Short selling is not currently supported.

To enter buy rules enter a configuration record:

```
BUY WHEN trade-condition [FOLLOWED BY trade-condition ...]
```

where

trade-condition is defined as a mathematical expression using math operators:

(,), +, -, *, /, % (modulo divide)

relational operations:

<, <=, =, >=, >, <> (not equal to)

conditional operations:

AND, OR, NOT

and study elements:

PRICE HIGH
PRICE LOW
PRICE CLOSE
PRICE OPEN
PRICE AVG
VOLUME

AVG A

AVG B

AVG C

AVG VOLUME

MACD

PTPS

PERCENT R

RSI

STOCHASTICS

VPT

To specify the value for the current period follow the study ←
element

with '[0]'. To specify the value for the previous period use [1], to indicate two periods ago use [2], etc.

It generally makes sense to compare values which have the same scale. That is comparing PRICE CLOSE to AVG A, RSI to STOCHASTICS (both are on a scale of 0 - 100), or VOLUME to AVG VOLUME. Trying to compare PRICE to STOCHASTICS or PRICE to VOLUME is allowed but doesn't make tremendous sense since these studies are based on different scales.

for example:

```
BUY WHEN (AVG C[0] > (AVG C[1] + AVG C[2] + AVG C[3])/3)
```

would instruct the Stocks program to indicate a buy condition when today's moving average C is greater than the last three moving average Cs combined.

The FOLLOWED BY operator allows multi-period events to be monitored. You can specify you are interested in a stock if the first event occurs, but that you desire to wait until the confirming event happens.

for example:

```
BUY WHEN PRICE CLOSE[0] > PRICE HIGH[1] FOLLOWED BY STOCHASTICS[0] < 10
```

would instruct the Stocks program to get ready to issue a buy signal when today's closing price is greater than yesterday's high price. But to wait until the stochastics indicator is less than 10. The stocks program will wait indefinitely for the FOLLOWED BY event to occur.

A similar syntax is used to customize sell rules. Just substitute SELL WHEN for BUY WHEN in the previous syntax definition.

1.44 Stocks: Data File Format

The format used by the Stocks program for data files is a simple ←
ASCII
file. These data files contain a number of stock record types:

Comments

Configuration

Price Data

Earnings Data

Stock Splits

1.45 Stocks: Data File/Comments

Any line that can not be interpreted as one of the other known record types is considered a comment and is ignored by the Stocks program.

1.46 Stocks: Data File/Price & Volume

Stock data records are recognized as lines which have a '/' in the third position in the row. This is interpreted as the date the shares traded using the form mm/dd/yy. Following the date is one or more spaces or tabs the volume of total number of shares traded for that period. After the volume one or more spaces or tabs and the high price for the period. Then the low price, closing price and optionally the opening price. The format is as follows:

```
MM/DD/YY VOLUME HIGH-PRICE LOW-PRICE CLOSE-PRICE OPEN-PRICE
```

Commas in the volume number are ignored.

Fractions of shares are represented as true fractions. The Stocks program recognizes fractions in halves, fourths, eighths, sixteenths, thirty-seconds, and sixty-fourths. These fractions of a dollar MUST FOLLOW the whole dollar value after a single space.

for example:

```
04/26/91    2270100    16 1/4    15          15 3/4
04/29/91    593000     15 3/4    14 3/4     15
04/30/91    263800     15 1/4    14 1/4     14 1/4    14 1/2
```

The Stocks program calculates the period represented by each stock price record by the number of days between records. Any records which are greater than seven days apart are assumed to be an entire month. Records greater than five days apart are assumed to be week summaries.

1.47 Stocks: Data File/Company Earnings

Earnings data is entered using an earnings record. Earnings records are denoted by a line beginning with 'E=' and a the trailing four quarters earnings value. If enabled, the Stocks program will calculate the average price to earnings ratio (PE) for the entered earnings using a weighted average formula. The Stocks program will also plot the earnings data in the price window by multiplying the earnings per share value by the average PE.

1.48 Stocks: Data File/Stock Splits

Sometimes, companies adjust the price and number of shares of stock outstanding by implementing a split. To record such an event in the stocks data file, a stock split record is entered prior to the first day of the new price.

When this is done, the value of the company stays the same, each stock owner holds more or less shares of less or greater value.

When a stock split record is encountered by the Stocks program, all prior price and volume values are adjusted by the split information. Volumes are multiplied by the number of equivalent new shares then divided by the number of shares prior to the split. Prices and Earnings are multiplied by the old number of shares and then divided by new number of shares.

Stock splits are specified by a data record beginning with 'S' and having the form:

$S_n=o$

where

n is the new number of shares owned

o is the previous number of shares prior to the split.

For example,

$S_2=1$

indicates the stock has just split two for one. Each old share is now two new shares. A if a stock closed at \$10 per share and 1000 shares traded during the day prior to the split, after the split the same day would graphed as a \$5 close with 2000 shares traded. The total dollar volume is the same \$10,000 worth of shares traded.

$S_1=3$

is the format to use to configure a three for one reverse split where three old shares are now equal to one new share. A if a stock closed at \$3 per share and 3000 shares traded during the day prior to the split, after the split the same day would graphed as a \$9 close with 1000 shares traded. The total dollar volume is the same \$9,000 worth of shares traded.

1.49 Stocks: Data File/Custom Study Configuration

Records in a stock data file that begin with ':' are ←
 considered
 configuration records and are processed by the configuration
 interpreter in the same manner as the
 Configuration File
 . This allows
 you to further customize the display and chart preferences for a

particular stock.

For example, you may want to display the volume data on an arithmetic scale for most stocks but use logarithmic scale for a particular stock. Another example where this feature is useful is to tune the study parameters for each stock.

Some configuration options are not allowed on an individual stock basis. These options are generally screen, window, and printer settings.

Allowable options include:

- Chart Period
- Chart Candlestick
- Chart Earnings
- Chart Trading
- Chart Price Scale
- Chart Volume Scale
- Studies
- Trading Rules

Invalid options are:

- Default Path
- Printer Type
- Screen Colors
- Screen Interlace
- Screen Resolution
- Screen Type
- Window Size

1.50 Stocks: Studies (Formulas Applied to Stock Data)

The Stocks program supports a number of studies to graph relationships between historical price and volume data. Your analysis of these changes in the stock prices could help you forecast the future direction of the stock. Each study uses a default set of graph criteria located in the

configuration file
 . These default setting can
 be customized for each individual stock by including
 Custom Configuration Records
 in the individual
 stock data file
 .

The following is a list of studies supported by the Stocks program:

Moving Averages

Gann Charts

MACD

Parabolic Time Price

Percent R

Relative Strength Index

Stochastics

Trend Lines

Volume Price Trend

Average Volume

Point and Figure

All studies are displayed or printed in conjunction with the price and volume data. Many of the studies are overlaid in window panes right on top of the price/volume data allowing you to see the actual detailed information about price and volume while interpreting the studies.

Changing the period (daily, weekly, or monthly), changes the data used to calculate the studies.

1.51 Stocks: Studies/Moving Averages

The Stocks program supports three moving averages labeled A, B, and C.

You can configure the period of each average and can display all three moving averages at once. Moving averages A and B are also used to calculate

MACD

.

Avg A is the first moving average. The default period for the average

is 5 days. You can modify this by specifying a different period after the color.

The

configuration file
format is:

AVG A = ON/OFF, COLOR n1, P1 = n2, P2 = n3

where

n1 is the new color
n2 is the new period
n3 represents the type of moving average formula.

Avg B is the second moving average. The default period for the average is 20 days. You can modify this by specifying a different period after the color.

The

configuration file
format is:

AVG B = ON/OFF, COLOR n1, P1 = n2, P2 = n3

where

n1 is the new color
n2 is the new period
n3 represents the type of moving average formula.

Avg C is the third moving average. The default period for the average is 50 days. You can modify this by specifying a different period after the color.

The

configuration file
format is:

AVG C = ON/OFF, COLOR n1, P1 = n2, P2 = n3

where

n1 is the new color
n2 is the new period
n3 represents the type of moving average formula.

n3 is calculated using a formula. The formula is AVERAGE_TYPE + DATA_TYPES. AVERAGE_TYPE is equal to 0 for simple, 1 for weighted, 2 for exponential moving averages. DATA_TYPES are 16 for price close, 32 for price open, 64 for price high, 128 for price low.

For example:

n3 = 16 instructs the Stocks program to calculate a simple moving average based on the closing prices.

n3 = 192 instructs the Stocks program to calculate a simple moving

average based on an average of the high and low prices.

n3 = 17 instructs the Stocks program to calculate a weighted moving average based on the closing prices.

n3 = 194 instructs the Stocks program to calculate an exponential moving average based on an average of the high and low prices.

The Stocks program calculates and plots the moving averages as a line charts in a window pane shared the price data and other studies graphed on the price scale.

1.52 Stocks: Studies/GANN

A Gann chart utilizes Gann's theory that stock and commodity prices tend to move in trends which follow certain ratios. Those ratios relate price and time. Common ratios are formed by taking one unit of price and increasing the unit of time such as one day, two days, four days, etc. Also, ratios can be formed by two, four, eight units of price for a single period of time.

The Stocks program attempts to calculate meaningful dates in a stock's history and plots the Gann Trend Lines from those key dates. Key dates are generally the highest and lowest points that the stock reached as well as days where Moving Average B changes direction.

The Stocks program calculates and plots the Gann Trend Lines as a line chart in a window pane shared the price data and other studies graphed on the price scale.

The configuration file format is:

GANN = ON/OFF, COLOR number

where

ON/OFF Allows you to configure the default selection when the Stocks program is executed.

COLOR Allows you to configure the color that is used to display the Gann study data.

1.53 Stocks: Studies/MACD

The MACD study is constructed by taking the difference between

Moving Average A
and
Moving Average B
. The Moving Average

Convergence-Divergence (MACD) study was developed by George Appel and is determined as follows:

$$\text{MACD} = \text{MA.A} - \text{MA.B}$$

where

MACD = MACD Line
MA.A = Moving Average A
MA.B = Moving Average B

The Stocks program calculates and plots the MACD study as a histogram chart in a window pane below the price pane. The scale for the window pane is adjusted so the distance from the tallest MACD bar to the lowest MACD bar fits within the window pane.

1.54 Stocks: Studies/Percent R

The Percent R study (%R) was developed by Larry Williams and ←
is used

to display the closing price of a stock relative to the range of prices from lowest to highest during a given period. The default range for the period is 14 days. The Williams %R indicator was first introduced by Larry Williams in the mid-1970's and is very similar to Wilder's

RSI
and Lane's
Stochastics

.

It is calculated as follows:

$$\%R = 100 \times (H - C) / (H - L)$$

where

%R = Williams %R indicator
H = Highest price within a time period
L = Lowest price within a time period
C = The latest closing price

The Stocks program calculates and plots the %R study as a solid blue line in a small window pane below the price window.

1.55 Stocks: Studies/PTPS

PTPS stands for Parabolic Time Price System. It is based on the assumption that a stock follows a trend that forms a parabola as the stock gains or loses momentum. Price acceleration is assumed to take place as the trend continues. The PTPS provides an excellent mechanism for setting stop-loss price levels. The formula used to calculate PTPS is:

Long Trades:

$$\text{SAR} = \text{SAR}_y + \text{AF} \times (\text{H} - \text{SAR}_y)$$

Short Sales:

$$\text{SAR} = \text{SAR}_y - \text{AF} \times (\text{L} - \text{SAR}_y)$$

where

SAR = Stop and Reverse Point
 SAR_y = Yesterday's SAR
 AF = Acceleration factor (0 < AF ≤ 0.02)
 H = Highest price since opening the long position
 L = Lowest price since opening the short position

The Stocks program calculates and plots the PTPS study as a line chart in a window pane shared the price data and other studies graphed on the price scale.

1.56 Stocks: Studies/RSI

RSI stands for Relative Strength Index. It is an oscillator that measures the stocks closing price relative to the range of prices during a given period. It was developed by J. Welles Wilder and is used to indicate the strength left in a price trend. It is very similar to Williams's %R and Lane's Stochastics.

It is calculated as follows:

$$\text{RSI} = 100 - (100 / (1 + \text{RS}))$$

$$\text{RS} = \frac{\text{Average of 14 day closes Above previous day}}{\text{Average of 14 day closes Below previous day}}$$

The value for RSI is always between 0 and 100 with the oscillator considered 'Bullish' if the RSI is below 30 and 'Bearish' if RSI is above 70.

The Stocks program calculates and plots the RSI study as a solid white line in a window pane shared with the Stochastics study. This window pane is located below the MACD and price panes. The scale for the RSI and Stochastics window pane is 0 to 100.

1.57 Stocks: Studies/Stochastics

Stochastics is an other oscillator similar to Williams's %R and Wilder's RSI in that it relates the stock's closing price to the price range for a given period. The Stochastics study was invented by Dr. George Lane and is calculated as follows:

$$\%K = 100 \times (C - L) / (H - L)$$

$$\%D = (\%K + \%K1 + \%K2) / 3$$

where

%D = %K Smoothed by simple moving average of 3 to 5 days

%K = Raw K

%K1 = %K from previous day

%K2 = %K from two days ago

C = The current closing price

H = Highest price in a time period

L = Lowest price in a time period

The default period for the %K in the Stochastics study is five days. %D should be smoothed by a moving average of three to five days.

The value for %K & %D is always between 0 and 100 with the oscillator considered 'Bullish' if it is below 20 and 'Bearish' if it is above 80.

The Stocks program calculates and plots the Stochastics study as two lines charted in a window pane shared with the RSI study. The window pane is located below the MACD and price panes. %K is plotted as a dashed blue line and %D is represented by a solid blue line. The scale for the RSI and Stochastics window pane is 0 to 100.

1.58 Stocks: Studies/Trend Lines

Trend lines are used to represent the limit that a stock movement will reach. The rate of ascent or decent of a stock price is used to calculate the slope of the trend line and the stock should stay above the trend line if the price is rising and below a falling trend line. If the stock price breaks the line, the trend of future prices may be

reversing.

The Stocks program attempts to calculate meaningful dates in a stock's history and plots the trend lines from those key dates. Key dates are generally the highest and lowest points that the stock reached as well as days where Moving Average B changes direction.

Additionally, you may display your own trend lines by pressing the left-mouse-button at the starting-point where you wish to display the trend and press the left-mouse-button again at the end-point. The stocks program will draw a line between those two mouse click points.

The Stocks program calculates and plots the Trend Lines as a blue lines in a window pane shared the price data and other studies graphed on the price scale.

1.59 Stocks: Studies/Volume Price Trend

VPT stands for Volume Price Trend. The VPT study attempts to display whether money is flowing into or out of an equity. If heavy trading occurs on days where the price is higher than the previous day, it is generally assumed that money is flowing into the stock. If heavy trading occurs and the stock closes down, money is leaving.

A variation on VPT is On-Balance Volume or OBV. The idea behind OBV is to weight the volume by the change in price. The assumption is the greater the difference in price from one day to the next, the more impact this change should have on the running volume balance being maintained.

To calculate VPT, the Stocks program maintains a running balance of volume. If the stock price is above the previous day's price, the volume is added to the running balance. If the price is lower, the volume is subtracted from the balance. The running balance is then scaled to fit in the volume window pane and is displayed as a dashed white line.

1.60 Stocks: Studies/Average Volume

Average volume is used to smooth out minor variations in volume. The default period is 10 days.

The Average Volume study is plotted as a solid blue line in the same window as regular volume.

1.61 Stocks: Studies/Point & Figure

This type of study is among the oldest forms of charting used. It is also called the three-box reversal system. Only price movements are plotted in P&F charts, volume and time are ignored. With Point and

Figure charts, minor fluctuations in price are ignored and long term trends become more apparent.

P&F charts consist of columns of X's and O's. X's are plotted while the stock is making upward price progress and O's are used during a down trend. Originally, P&F charts were plotted on graph paper using a fixed scale. The Stocks program preserves the fixed scale but does not generate graph paper lines.

The following fixed scale is used for P&F charts:

\$0.00 -	\$4.75	each X or O represents	\$0.25
\$5.00 -	\$20.50	each X or O represents	\$0.50
\$21.00 -	\$99.00	each X or O represents	\$1.00
\$100.00 +		each X or O represents	\$2.50

As long as the price is increasing, only the high price for the day is used. If the high price mapped to the P&F scale yields an empty box, the space at the top of the current column is filled with an 'X'. Only when a new high is resulting in a new 'X' is NOT plotted, is the low price is evaluated.

If the low price when mapped to the P&F scale yields a square three boxes below the highest 'X' in the current column, a three-box reversal is signaled and a new column filled with O's is started. The 'O' column starts one square below the previous column's highest X and filled with O's up to the current low. At this point the trend is down and only price lows are examined. As long as lower lows results in more O's being drawn, only the lows are examined. If a new 'O' is not drawn, the high price is examined.

If the high price when mapped to the P&F scale yields a square three boxes above the lowest 'O' in the current column, a three-box reversal is signaled and a new column filled with X's is started.

This process repeats indefinitely plotting X's during up trends and O's during down trends.

1.62 Stocks: Candlesticks

Japanese Candlesticks plot more information than traditional bar charts. In addition to price high, low and close, Candlesticks provide price open. Candlesticks are broken into three parts, the main body, a skinny line above the body and a skinny line below the body.

Price High:

The top of the skinny line above the body represents the high price for the period. If there is NO skinny line above the main body, the top of the main body is the high price for the period.

Price Low:

The bottom of the skinny line below the body represents the low price for the period. If there is NO skinny line below the main body, the bottom of the main body is the low price for the period.

Open and Close Prices:

The main body is either dark, white or a straight horizontal line. A dark body indicates the stock opened higher than the close. In this case, the open is the top of the main body and the close is the bottom of the main body. If the body is white, the stock opened low and closed up. The top of the main body is the close and the bottom of the body is the open. If there is a single horizontal line with no dark or white body, the open and close prices are the same.

If there is no opening price data in the
stock data file
, it will be

charted with the assumption that the open price equaled the close price. Weekly displays from data files that do include daily data use Monday's close price as the open price for the week. Also, monthly displays use the first of the month as the open price.

The following examples are given to interpret the candlestick symbols.

White Bodied Candlestick

```

*      <- Highest Price for period
*
*
***   <- Closing Price for period
* *
* *
* *
* *
***   <- Opening Price for period
*
*
*      <- Low Price for period

```

=====

Dark Bodied Candlestick

```
*      <- Highest price for period
*
*
***    <- Opening Price for period
***
***
***
***
***
***
***    <- Closing Price for period
*
*
*      <- Low Price for period
```

=====

High and Close are the Same

```
***    <- High & Closing Price for period
* *
* *
* *
* *
* *
* *
***    <- Opening Price for period
*
*
*      <- Low Price for period
```

=====

Open and Low are the Same

```
*      <- Highest price for period
*
*
***    <- Closing Price for period
* *
* *
* *
* *
* *
***    <- Low and Opening Price for period
```

=====

Open and Close are the Same

```
*   <- Highest price for period
*
*
*** <- Opening and Closing Price for period
*
*
*   <- Low Price for period
```

1.63 Stocks: Registration

Upon registering the Stocks program you will receive a key that unlocks the features of the Stocks program. You will also receive a program

RS
to aid in the automation of the process of updating stock data. You will also receive
SP
, a portfolio management program that is integrated with the stock database. As a registered user, you will receive the latest version of the Stocks program and will be notified when new versions are available.

To register the Stocks program send \$40 to
Bug Free Development

Include the following information:

Your Name
Address
Phone Number

Any electronic mailing addresses.
What version of the Stocks program you have been evaluating.

Your name will be added to our registration database and you will be sent a registration serial number. When you receive the registration information, enter it into the Stocks program by clicking on the Registration gadget. The registration fill-in form is pretty self explanatory. You must be exact when entering the information (even upper/lower case).

When you register, you agree to all terms involved in licensing the Stocks program. This includes agreeing with the copyright notice. Breaking a copyright IS a felony in the eyes of the law.

1.64 Stocks: Support

Support for the Stocks Program is available through CompuServe, the Internet, and US Mail. ←

For the purposes of supporting the Stocks program, communications via CompuServe and Internet Mail are encouraged. Should there be a need to communicate with me (Jim) or Bug Free Development via telephone, please send mail to me at

Bug Free Development
stating your phone
number, the nature, and need to speak voice. If it is felt that a telephone conversation is warranted I will call you.

1.65 Stocks: Bug Free Development

Bug Free Development is a New Hampshire Business. It was formed as a means of marketing and supporting the Stocks program and other computer related business interests.

The US Mail address for Bug Free Development is ...

Bug Free Development
P.O. Box 7042
Nashua, NH 03060

The CompuServe Mail address for Bug Free Development is ...

71171,3015

The Internet Mail address for Bug Free Development is ...

71171.3015@CompuServe.com

Correspondence should be addressed to Jim.

1.66 Stocks: References

The following is a list of reference books that do an excellent job discussing technical analysis:

"Technical Analysis of the Futures Markets"

Author: John J. Murphy
Publisher: Prentice-Hall
ISBN: 0-13-898008-X

Describes: A Comprehensive Guide to Trading Methods and

Applications.

"New Concepts in Technical Trading Systems".

Author: J. Welles Wilder, Jr.
Publisher: Hunter Publishing Company
ISBN: 0-89459-027-8

Describes: The Parabolic Time/Price System and
The Relative Strength Index.

"How to Use the Three-Point Reversal Method of Point & Figure"

Author: A. W. Cohen
Publisher: Chartcraft, Inc.

Describes: The Point & Figure Method

1.67 Stocks: Portfolio Management Program

The portfolio management program provides a mechanism for monitoring the value of your stock portfolio. It is integrated with the stock database and allows you to see in an instant what your portfolio is worth and when stock options are going to expire.

It also provides you with a transaction detail of your stock investments including cash deposits, withdrawals, purchases and sales of stocks and options. There are totals for your current cash position, equity position, and option value.

The program automatically adjusts quantities and prices based on stock splits recorded in the stock database.

The transaction list is an ASCII file. Here is a sample of a portfolio transaction database.

```
D) 01/01/93 20000
B) 01/04/93 MSFT 100 @89.375
B) 02/11/93 C Mar 35 CBU 100 @1.9375
S) 03/19/93 C Mar 35 CBU 100 @3.75
S) 06/01/93 MSFT 100 @96.25
B) 09/11/93 C Dec 35 IBM 400 @1.25
B) 10/04/93 AAPL 200 @23.25
```

Here is a sample of the output of the portfolio management program.

SP - Version 01.07 - Date: 30 Oct 93

T R A N S A C T I O N D E T A I L

Date	Description	Value	Commission	Profit
Balance				
01/01/1993	Deposit 20000.00	20000.00		
20000.00				
01/04/1993	Buy 100 of MSFT @89.38	8937.50	33.50	11029.00
02/11/1993	Buy 100 of CBU @1.94	193.70	20.00	10815.30
	Mar Call @35.00			
03/19/1993	Sell 100 of CBU @3.75	375.00	20.00	141.30
	Mar Call @35.00			
06/01/1993	Sell 100 of MSFT @96.25	9625.00	33.50	620.50
09/11/1993	Buy 400 of IBM @1.25	500.00	20.00	20241.80
	Dec Call @35.00			
10/04/1993	Buy 200 of AAPL @23.25	4650.00	42.00	15549.80

			169.00	761.80
15549.80				
	YTD Deposits	20000.00		
	YTD Withdrawals	0.00		

E Q U I T Y S U M M A R Y

Stock	Quantity	Price	Change	Current	Value
Commission Profit					
AAPL	200	23.25	7.50	30.75	6150.00
84.00 1416.00					

				6150.00	
84.00 1416.00					

O P T I O N S S U M M A R Y

Expires	Stock	Quantity	Price	Change	Current	Value
Commission Profit						
12/17	48 IBM	400 C 35.00	9.75	46.00	4400.00	138.00
3762.00						

				4400.00	138.00	
3762.00						

1.68 Stocks: Update Database Program

More information about the RS program will be provided to registered users.

1.69 Stocks: Index

```

@{ " Bug Free Development " link BugFreeDev }
@{ " Candlesticks " link Candlesticks }
@{ " Command Line Options " link CLI }
@{ " Configuration File " link configFile }
@{ " Configuration/Chart Candlesticks " link configCandlesticks }
@{ " Configuration/Chart Earnings " link configEarnings }
@{ " Configuration/Chart Period " link configPeriod }
@{ " Configuration/Chart Price Scale " link configPriceScale }
@{ " Configuration/Chart Trading " link configTrading }
@{ " Configuration/Chart Volume Scale " link configVolumeScale }
@{ " Configuration/Default Path " link configPath }
@{ " Configuration/Printer Type " link configPrinter }
@{ " Configuration/Screen Colors " link configColors }
@{ " Configuration/Screen Interlace " link configInterlace }
@{ " Configuration/Screen Resolution " link configResolution }
@{ " Configuration/Screen Type and Size " link configScreen }
@{ " Configuration/Studies " link configStudies }
@{ " Configuration/Trading Rules " link configTradingRules }
@{ " Configuration/Window Size " link configWindow }
@{ " Copyright, License and Disclaimer " link Copyright }
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@{ " Data File/Stock Splits " link dataFileSplits }
@{ " Features " link Features }
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