SAVANT CORPORATION

THE TECHNICAL INVESTOR™

THE SAVANT INVESTOR SERIES™

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(Continued On Inside Back Cover)

HELLO!

and welcome to THE SAVANT INVESTOR SERIES, the first investment management and analysis package designed to handle all your investment needs. Independently, each program is the most sophisticated of its kind presently available. Together, they form a complete investment management package.

THE TECHNICAL INVESTOR contains an easy-to-use technical database program, a state-of-the-art plotting package, and a sophisticated communications package that gives you all you need to follow financial instruments and analyze their technical status.

THE FUNDAMENTAL INVESTOR contains a powerful analysis program, a fundamental database program, and communications ability to update your fundamental data automatically.

THE INVESTOR'S PORTFOLIO™ gives you a sophisticated portfolio management and analysis program, including features not available in other portfolio programs on the market today. Like the other programs in THE SAVANT INVESTOR SERIES, it also includes a full communications package.

Best of all, all three programs work together. Because they do, it takes less effort to follow your investments. For example, when you update the prices in your technical database, the prices of stocks in your portfolio are updated also. Or when one of your stocks split, you tell the program once, and all necessary prices and ratios in all three databases are adjusted. Or you can use the charting capabilities of THE TECHNICAL INVESTOR to plot the value of your portfolio, and so on.

All told, you have just purchased one part of the most powerful, sophisticated investment program available for IBM personal computers. We are confident that after you become familiar with THE SAVANT INVESTOR SERIES, you'll agree.

THE SAVANT INVESTOR SERIES™

THE TECHNICAL INVESTOR™

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HARDWARE REQUIREMENTS

THE SAVANT INVESTOR SERIES programs require an IBM PC/XT/AT, IBM Personal System/2, or equivalent, 640k or more memory, and the PC DOS 2.0 or later operating system. THE INVESTOR'S PORTFOLIO, THE TECHNICAL DATABRIDGE, and THE FUNDAMENTAL DATABRIDGE require a fixed disk system; the other programs will run on either a fixed disk or dual floppy disk system.

In addition, THE TECHNICAL INVESTOR Charting module requires one of the following IBM-type graphics adapters (others may be added in the future):

- Color Graphics Adapter (CGA)
- Enhanced Graphics Adapter (EGA)
- Video Graphics Array (VGA)
- Multi-Color Graphics Adapter (MCGA)

The EGA or VGA card, when connected to a color monitor, will do multi-color charting. The EGA card should have at least 128k RAM installed if it is attached to an Enhanced Personal Color Display (high-resolution color monitor).

A Hayes Smartmodem (300, 1200, or 2400 baud) is required if you plan to use the communications section. An IBM or Epson dot-graphics printer can be used for printing reports or charts. Other modems and printers may be added from time to time; see the "System Parameters" section of this manual for more information.

INTRODUCTION

As a new owner of one of the programs in THE SAVANT INVESTOR SERIES, we'd like to take this opportunity to thank you for your interest in our company.

The basics of sound investing have not changed with the introduction of the personal computer. What has changed, though, is the time required for a person to perform the necessary research to analyze their investments. Because you have purchased one of THE SAVANT INVESTOR SERIES programs, you probably already realize the potential of this application in both home and office.

As personal computers become more available, less expensive and easier to use, those who don't learn to use the capabilities these machines offer will find themselves at a competitive disadvantage. As such, properly used this program is a powerful tool that can help you in your study and analysis of investments. It will help you decide what investments are right for you.

This software has been developed to allow you to perform in-depth investment analysis in a fraction of the time it used to take. Each program in THE SAVANT INVESTOR SERIES is designed to be easy to use for both the beginning investor and beginning computer user. However, each one is powerful and versatile enough to satisfy the demands of the professional investor. As you develop your investing skills, you won't have to purchase more sophisticated investment software.

We have not attempted in this manual to write a basic text for investment analysis. While we do explain the basics of any functions and indicators that are included in the program, we assume that you have a general understanding of the logic and theory underlying the program. If you do not feel comfortable with your understanding and want to learn more, we suggest you read some of the references noted in "Appendix Y: Investment References".

THE SAVANT INVESTOR SERIES programs will help you organize the way you handle you investments. You'll be able to analyze more information in less time, and, in this way, improve your probability of making successful investments.

Good luck!

THE FIRST STEP

The disks supplied by Savant Corporation should not be used for day-to-day operation (except for any copy-protected disks). The first thing you should do is make a working copy of each copyable disk and store the originals in a safe place.

The general information and tutorial sections in this manual provide the information needed to operate THE SAVANT INVESTOR SERIES programs. If you run into a problem, see "Appendix H: Technical Support" for more information about getting help. Please note that whenever you call or write for assistance, you need to provide the serial number of your program. You can find the serial number on the program disk label and on the bottom of the next page.

Registered owners of Savant programs are notified whenever a new program or service is available. In addition, we often make updated versions of our programs available for a reduced fee, but we make this offer only to registered owners. Savant Corporation requires that you return all original disks to receive updated versions of the program.

We are always interested in your thoughts about our programs and our service. It is important to us to know if you find anything confusing or disconcerting in our programs or manuals, so that we can improve them. Such improvements are included in our periodic updates, which quite often are based largely on suggestions from our customers.

We are also very interested in hearing any suggestions you may have concerning additional features for this program, or ideas for new programs. Of course we enjoy hearing what you like about our programs, too.

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2. SOME PRELIMINARY INFORMATION

ENTERING INFORMATION

Throughout this manual, single keys are always referred to by enclosing whatever is written on the key in angled brackets like these: ⟨ ⟩. If there are two things written on the key, both will be included in the brackets, separated by a slash: ⟨7/Home⟩. If what is written on the key is a shape rather than a letter or number, then the shape or function of the key will be described in the brackets; for example, ⟨4/left-arrow⟩ or ⟨Shift⟩. Remember, anything in one set of angled brackets refers to one key.

Two individual keys separated by a plus sign, such as ⟨Alt⟩ + ⟨Q⟩, means press the second key (⟨Q⟩) while holding down the first key (⟨Alt⟩).

The ⟨Enter⟩ Key

Throughout this manual and the program, whenever you are asked to enter something, it means type the appropriate information, then press the ⟨Enter⟩ key.

When one key will always be enough to answer a question (for example, when the computer asks you a question with a yes or no answer, or when you are asked to choose from a list of five items labeled A through E), you do not need to press the ⟨Enter⟩ key after typing your answer. You can always tell if the ⟨Enter⟩ key must be pressed by looking at the line where you are being asked for information: if it ends in a question mark (?), you need press only one key and the program will continue. If the line ends in a colon (:), you must complete your input, or indicate that you have no input, by pressing the ⟨Enter⟩ key.

The only exception to this involves the cursor keys and the function keys. In some parts of the program, you can enter something or use the function keys or cursor control keys to issue commands. In such cases, a colon will be visible asking you for the information you want to enter, and the screen will be clearly labeled with the function and cursor control keys you can use. You do not have to press ⟨Enter⟩ after pressing a function or cursor control key, even though the colon is present. While this exception may sound a bit confusing now, you'll find it is quite natural when you actually use the program.

Sometimes you will not want to enter any information; this can occur when you do not want to change the data on the input line, or, if you are being asked to enter a number, when you want to enter a zero. If so, just press the ⟨Enter⟩ key by itself, and you'll proceed to the next part of the program.

The ⟨Esc⟩ Key

Whenever you are entering input on any line which requires pressing ⟨Enter⟩ to complete the operation, you can press the ⟨Esc⟩ key instead of ⟨Enter⟩ to escape from or abort whatever you are doing. For example, if you accidentally type the wrong information and have not yet pressed ⟨Enter⟩, pressing ⟨Esc⟩ will return the information on that line to whatever it was before you started changing it.

Another way to look at it is that the difference between the functions of the ⟨Enter⟩ and ⟨Esc⟩ keys is that ⟨Esc⟩ will cause a logical abort of the operation you are doing, while ⟨Enter⟩ will cause a logical completion and move you on to the next step.

Pressing ⟨Esc⟩ during a printing operation will abort the printout immediately (if you don't have a print buffer or spooler installed — if you do, you'll also have to clear the buffer or spooler to have the printing stop immediately).

The specific response to the ⟨Esc⟩ key is defined for each section of the program in the Reference Section of this manual.

⟨Alt⟩ + ⟨F1⟩, ⟨Alt⟩ + ⟨F5⟩, ⟨Alt⟩ + ⟨F6⟩ and ⟨Alt⟩ + ⟨F9⟩

⟨Alt⟩ + ⟨F1⟩, ⟨Alt⟩ + ⟨F5⟩, ⟨Alt⟩ + ⟨F6⟩ and ⟨Alt⟩ + ⟨F9⟩ are key combinations that, like ⟨Esc⟩, can be used anytime you are being asked for input on a line that requires an ⟨Enter⟩ to complete the operation. In such cases, they function equivalent to an ⟨Esc⟩ followed by a jump to the location specified below.

In addition, these key combinations will function on input lines where the ⟨Enter⟩ key is not required (and the ⟨Esc⟩ key consequently does not function). In these cases, they result in an immediate jump to the location specified below.

⟨Alt⟩ + ⟨F1⟩: End the Program. Pressing this key pair results in a jump to the end of the program, returning you to DOS (that is, returning you to the point you were at just before starting the program).

⟨Alt⟩ + ⟨F5⟩: Return to Main Menu. Pressing this key pair results in a jump to the Main Menu. This is the normal method of returning to the Main Menu.

⟨Alt⟩ + ⟨F6⟩: Go Directly to Another Module. When you press this key pair, you will be prompted to enter a two-letter code for the module you wish to execute. The two letters are the first letter of the major category, and the first letter of the subcategory as shown on the Main Menu screen. Thus, to execute the "FUNDAMENTAL Data" module, you would press FD. Similarly, "COMMUNICATIONS Price" is CP, and so on. You can also move directly to the System Parameters module in this way by entering SP.

⟨Alt⟩ + ⟨F9⟩: Restart the Module. Pressing this key pair results in a jump to the beginning of the module you are in. (The module refers to the program section or subcategory you executed from the Main Menu.)

Illegal Input

Another thing you'll notice about THE SAVANT INVESTOR SERIES programs is that they usually won't let you make illegal or improper entries. If the command or information you enter isn't expected, the computer will beep, show you a message explaining what is wrong, then ask you to re-enter the information.

Miscellaneous

Either upper- or lower-case letters are always accepted for all input and commands.

When you want to use a new (unused) disk to store data, you must first format the disk before you start the program. If you do not know how to format disks, see the Format command in your DOS manual.

EDITING INPUT LINES

A very convenient feature of THE SAVANT INVESTOR SERIES programs is the ability to edit an input line anytime you are entering data. If you are familiar with editing a BASIC program line, you'll find editing input lines in these programs very similar. If you are not familiar with editing lines in BASIC, then reading this section will save you time later in correcting mistakes.

The following functions are available on every input line:

BACKSPACE: use the ⟨4/left-arrow⟩ key on the keypad. This key moves the cursor one space to the left without changing anything on the line.

FORWARD SPACE: use the ⟨6/right-arrow⟩ key on the keypad. This key moves the cursor one space to the right without changing anything on the line.

TAB RIGHT: the ⟨Tab⟩ key (the key with the left- and right-pointing arrows on the left side of the keyboard) will cause the cursor to jump 5 spaces to the right.

TAB LEFT: ⟨Shift⟩ + ⟨Tab⟩ will cause the cursor to jump 5 spaces to the left.

JUMP TO THE BEGINNING: pressing the ⟨7/Home⟩ key will move the cursor to the beginning of the input line.

JUMP TO THE END: pressing the ⟨1/End⟩ key will move the cursor to the end of the input line.

DELETE EVERYTHING FROM THE CURSOR ON: ⟨Ctrl⟩ + ⟨1/End⟩ will delete everything on the input line from the cursor position through the end of the line.

DELETE A CHARACTER: two methods may be used to delete characters on the input line —

1. Pressing the ⟨./Del⟩ key will delete the character at the cursor; the cursor will not move.

2. The ⟨large-left-arrow⟩ key at the top right of the keyboard just above the ⟨Enter⟩ key will cause a destructive backspace; that is, pressing this key will delete the character just to the left of the cursor and move the cursor one space to the left.

In both cases, everything to the right of the deleted character will move one space to the left in order to fill the blank created.

INSERT A CHARACTER: when you press the ⟨0/Ins⟩ key, you turn on the "insert" mode. You can tell when you are in this mode because the cursor is larger than normal (unless you have changed the default cursor size). Anything you type when you are in "insert" mode will be inserted into the input line at the cursor position. Everything to the right of the cursor will move one space to the right to make room for each inserted character. When you are finished inserting, press the ⟨0/Ins⟩ key again to turn off the insert mode. The cursor will return to normal size.

ENTER THE LINE: anytime you press ⟨Enter⟩, everything on that input line will be taken as input, regardless of the cursor position.

ENTERING DATES

By the very nature of investing, and the fact that money has a time value, you will frequently be entering dates in THE SAVANT INVESTOR SERIES. In all cases, when asked for a date you may just hit ⟨Enter⟩ and today's date will be entered for you. If you want to enter another date, you have considerable latitude in how you do it. THE SAVANT INVESTOR SERIES programs will accept almost anything that might be reasonably interpreted as a valid date. Examples of valid input include:

September 5, 1982
SEP 5, 1982
5 Sept 1982
9/5/82
9,5,1982
9/5.1982
Septmber 5, 1982
(note misspelling OK)

Many other variations will be accepted. Once you have entered the date, it will always be displayed in the form month/day/year (if you choose American date display) or day-month-year (if you choose European date display; see "The Main Menu:System Parameters" for more information on European date display), regardless of how you entered it. All examples in this manual assume American date entry and display.

If you don't enter a year, the current year will be assumed; that is, 2/5 will be interpreted as Feb. 5 of this year.

Dates are also checked for validity. If you make a mistake, you'll hear a beep and a message will appear at the bottom of the screen telling you the nature of the error. The input line will be blanked out and the cursor will be set so that you can re-enter the date. For example, if you enter 2/29/82, you'll be told that this date is not acceptable since February only had 28 days in 1982 (that is, 1982 was not a leap year).

Dates will be accepted between 1920 and 2019. This limitation allows you to unambiguously define a year with two digits: 9/5/82 instead of 9/5/1982. What this means is that any two digit year from 20 to 99 will be interpreted as 1920 to 1999. And any two digit year from 00 to 19 will be interpreted as 2000 to 2019.

For the program to work properly, it is important that you always have the correct date and time set on your computer. If you don't know how to set the date and time, see the first part of the Tutorial section of this manual.

ENTERING NUMBERS

The investment community sometimes uses decimals and sometimes uses fractions when displaying numbers. Security prices are generally expressed in fractional form, but dividends are generally expressed in decimal form. For example, an interest rate may be expressed as 7.5 percent or as 7 1/2 percent.

THE SAVANT INVESTOR SERIES will accommodate everyone. Whenever you are asked to enter a number, you can use either form. The following are examples of valid input:

9.25
9 1/4
9
9.0
.23
23/57
467/17
3 54/32

All numbers are treated internally with six significant figures. In order to permit a compressed data storage format that fits more data on a disk than would otherwise be possible, prices (i.e., technical data) are stored on disk rounded to the nearest 256th. Fundamental data is stored on the disk to 5 significant digits, and is always displayed in decimal form. (You may choose how many decimal places you want displayed: see "The Main Menu: System Parameters" in the Reference Section of this manual.)

SECURITY SYMBOLS

THE SAVANT INVESTOR SERIES uses symbols to identify securities. Security symbols can be from 1 to 8 characters long and can consist of letters, numbers and the following characters:

\+ − . % / * _

You can enter symbols in upper- or lower-case letters — either will be accepted, but lower-case will be converted to upper-case.

You may use anything as a symbol that meets these requirements, but if you want to update a file automatically by modem, you *must* use the correct symbol as recognized by the database service you will be using (usually the same symbol used by the exchanges). Consult your database manual(s) if you are uncertain of the symbol for any security. Some securities, such as mutual funds, sometimes have different symbols on each database. Make sure you use the correct symbol for your database.

Included with the symbol is a one-letter "security type" that the program uses to differentiate between the various types of securities. The security type, preceded by a comma, follows the symbol. The programs consider the security type to be part of the symbol, which allows you to use the same symbol with different security types. For example, IBM,S is a completely different symbol from IBM,X.

The following table shows the acceptable security types.

SECURITY TYPES

Security Type	Code
Bonds	B
Commodities	C
stocks (montHly prices)	H
market Indices	I
stocks (weeKly prices)	K
Mutual funds	M
Options	O
Stocks (common, preferred)	S
Treasury issues	T
Warrants	W
user-defined	X
user-defined	Y
user-defined	Z

3. THE TUTORIAL

NOTES ON THIS TUTORIAL

The tutorial which follows is somewhat different than some you may be used to. Its purpose is not to teach you every possible command that the program can execute: it is our experience that most people don't want to know that much detail about the entire program when they first use it. So this tutorial is set up to teach you the basics you need to know to operate the program, and to give you an idea of the other, more detailed things the program can do.

When you finish the tutorial, you can expect to understand how the program is structured, how to execute the most important commands, and what other things can be done by consulting the Reference Section of this manual. Hopefully, this way you won't get bored with the tutorial long before it is over, but will still learn enough to quickly begin to use the power of THE TECHNICAL INVESTOR. If you want to understand all of the capabilities of the program, we strongly suggest you read through all of the Reference Section of this manual as you become comfortable with the general operation of the program.

In the tutorial, this typestyle is used to identify instructions that you should carry out on your keyboard in order to follow the tutorial.

This typestyle is used for general commentary and explanation.

In THE SAVANT INVESTOR SERIES, symbols are always used to identify companies. Unless you are going to be entering information manually, you must use the same symbols that brokers and the exchanges use. Consult your broker or database manual to determine the correct symbol for each company. This program is designed to work automatically with several databases. See "Appendix D: About the Databases" for more information.

A note about stopping in the middle of the tutorial: if you decide you don't want to finish the tutorial all in one sitting, you can stop at any of the capitalized (bold) subchapter headings, then restart from that point later.

OVERVIEW

THE TECHNICAL INVESTOR is divided into two main areas or categories. The first is the TECHNICAL database and charting section. The second is the part of the program that you use for COMMUNICATION (using your modem and telephone) with the supported databases.

There are three subcategories, or modules, in the TECHNICAL database/charting section:

> "Data" - this module is where you enter information about the securities whose prices and volumes you are going to be plotting. It is in this part of the program that you set up data files for the securities you want to follow. This is also where you manually enter and edit prices and volumes.
>
> "Chart" - this module is where you actually do all your technical analysis (i.e., plotting or charting).
>
> "Files" - this module is where you go to see what securities are already on your data disk, and how much data is stored for each security. What you see when you execute this subcategory is called the "Directory", and that is just what it is: a directory or listing of all the securities for which data is stored on your disk.

There are also three subcategories in the COMMUNICATIONS section:

> "Fund." - this module is used with THE FUNDAMENTAL INVESTOR to retrieve fundamental data from the supported databases; it is not used with THE TECHNICAL INVESTOR.
>
> "Price" - this module is where you get automatic retrieval of prices and volumes from the supported databases. You can ask for just the latest prices, or you can ask for historical prices. "Appendix D: About the Databases" describes the supported databases and the information available on each.

"Terminal" - this module allows you to use your computer as a general purpose terminal for communicating with other computers over the telephone lines. There are two types of terminal programs: those which automatically log you on to the supported databases, then turn control over to your keyboard; and a general-purpose terminal program, which you control from your keyboard during the entire session. You can use the general purpose terminal to communicate with almost any commercial database, such as The Source or Compuserve.

Finally, two modules are provided in which you enter information that is used throughout the program:

"List" - this module is used to create Lists of security symbols which can be used by various sections of the program. For example, if you often retrieve prices for the same group of securities, you can ask for the prices for that List instead of each individual security.

"System Parameters" - this module is where you enter information about your system, such as printer and modem type, data base passwords, and so on.

A typical course of action, then, might be for you to create a file for the security you want to follow using the "TECHNICAL Data" module, then collect historical quotes for that security using the "COMMUNICATIONS Price" module, then plot the data you retrieved using the "TECHNICAL Chart" module. After that, you probably would keep the data in that file up-to-date by getting the lates prices on a regular basis, again using the "COMMUNICATIONS Price" module.

SETTING UP THE PROGRAM

Before you start the program the very first time, you must setup your system. If you are using a dual floppy disk system you must initialize the three disks that the program comes on: the "Startup/Main Menu Disk", "Program Disk" and "Communications Disk". If you are using a fixed disk system, you must setup the program on your fixed disk.

First, startup or "boot" the system using DOS 2.0 or later.

Next, follow the instructions below for your type of system.

Fixed disk system

For a fixed disk system, all procedures described in this manual assume that

1. your fixed disk has been properly set up and formatted as described in the DOS manual.

2. the fixed disk is designated drive C. If your fixed disk is not drive C:, replace the letter C with the correct drive designation.

3. the DOS COMMAND.COM file resides in the root directory of your fixed disk.

The SETUP routine copies the program files into a directory named SIS (for Savant Investor Series) on your fixed disk. The sample data supplied with the program is copied into a subdirectory of SIS named DEMODATA (C:\SIS\DEMODATA). SETUP will not disturb the program files for any other THE SAVANT INVESTOR SERIES programs already in the SIS directory. (If you do have another Savant program in the SIS directory, you will have to re-enter your system parameters.)

When the system is properly loaded, you'll see the DOS prompt C⟩ on your monitor next to the blinking cursor. Now, do the following:

Insert THE SAVANT INVESTOR SERIES "Startup/Main Menu Disk" in drive A. Type

A:SETUP FIXED

and press ⟨Enter⟩. (Important: the C⟩ prompt must be showing when you start this procedure.)

*Then follow the instructions on the monitor, changing the disks in drive A as requested. Continue until you see "Fixed Disk Setup Complete" and the DOS prompt C⟩ on the monitor.**

Dual floppy disk system

When DOS is properly loaded, you'll see the DOS prompt A⟩ on your monitor next to the blinking cursor. Now, do the following:

First, place a copy of THE SAVANT INVESTOR SERIES "Startup/ Main Menu Disk" in drive A.

We suggest you use a copy, rather than the original, in case the disk is damaged before you finish the tutorial.

Next, place a complete copy of the original or master DOS 2.0 (or later) disk in drive B. Type

SETUP FLOPPY

and press ⟨Enter⟩.

Now follow the instructions on the monitor, changing the disks in drive B as requested. Continue until you see "Floppy Disk Setup Complete" and the DOS prompt A⟩ on the monitor.

* Those who are technically oriented may wish to note that the SETUP routine appends the statements "buffers = 15" and "files = 15" to the CONFIG.SYS file in your root directory. If a CONFIG.SYS file does not exist, one is created for you.

STARTING UP THE PROGRAM

At this point you have setup your fixed or floppy disks and are ready to start the program. Follow the instructions below for your type of system.

Fixed disk system

If you've been following the tutorial, at this point your computer should be on and the DOS prompt C⟩ should be visible.

Start the program by entering

CD\SIS

and then

SIS

Dual floppy disk system

Your computer should be on and the DOS prompt A⟩ should be visible.

Place a copy of the "Startup/Main Menu" disk in drive A and a copy of the "Sample Data" disk in drive B. Start the program by entering

SIS

Setting the date and time

If you have not previously set the date and time of the internal clock in your computer, you'll be asked to enter the date, and then the time, before anything else happens. The IBM personal computers use 24-hour "military" time, so if it is after 12 noon, don't forget to add 12 to the hour. For example, 2:30 in the afternoon should be entered as 14:30.

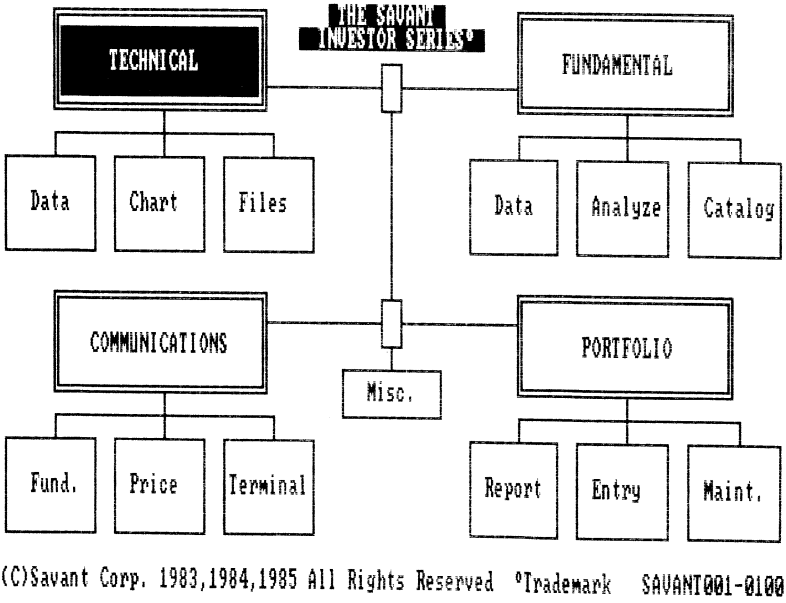
If the program asks for it, enter the date, then the time.

USING THE MAIN MENU

After you enter the date and time, or immediately if you have already set the internal clock, your computer's display monitor will look like Figure 3-1. This display is called the Main Menu. It is from this display that you control the rest of the program.

While viewing the Main Menu, use the cursor control keys (⟨4/left-arrow⟩, ⟨6/right-arrow⟩, ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩) on the key-pad to control the position of the filled-in block. The block will move in the direction of the arrow on the key.

Press the ⟨2/down-arrow⟩ key and watch the filled-in block move down. Press the ⟨6/right-arrow⟩ key, and watch it move right. Go ahead and move the block around until you feel comfortable with it. Note the block will only move if there is a path in the direction you tell it to go; otherwise, it ignores the keystroke.



THE MAIN MENU
FIGURE 3 – 1

To start execution of any part of the program, all you have to do is move the filled-in block to the subcategory (one of the small squares labeled in lower-case letters) you want to execute, then press ⟨Enter⟩.

Note that the boxes under FUNDAMENTAL are used with THE FUNDAMENTAL INVESTOR, and those under PORTFOLIO are used with THE INVESTOR'S PORTFOLIO; unless you have also purchased these programs, you will not be able to run them. Also, pressing ⟨Enter⟩ in the main category boxes or the small transition boxes between the main categories will have no effect.

Using the tutorial with a fixed disk

Data for THE SAVANT INVESTOR SERIES programs can be stored in any subdirectory on your fixed disk. The SETUP routine has set the program to read data from the C:\SIS\DEMODATA subdirectory, the directory to which the sample data was copied. Later in this tutorial we will show you how to create a subdirectory in which to store your own data.

You can check (and in the future change the data directory) by using the Main Menu command DD.

While viewing the Main Menu display, type

DD

The program will display the current data disk drive and/or directory on the line near the bottom of the monitor (see Figure 3-2). Just press ⟨Enter⟩ to indicate that C:\SIS\DEMODATA is correct and you do not want to make any changes.

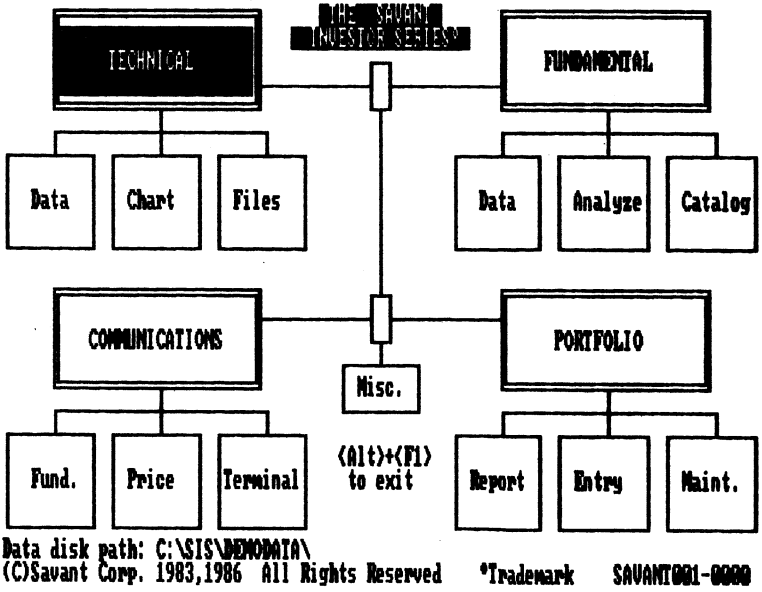
Using the tutorial with a floppy disk system

On floppy disk systems, the disk you need to have in the program disk drive (usually drive A) depends upon which part of the program, or module, you want to execute. The Main Menu, List and System Parameters modules are stored on the "Startup/Main Menu Disk". The "Communications Disk" is used for the three COMMUNICATIONS modules: Price, Fund., and Terminal. The three TECHNICAL modules (Data, Chart, and Files) are stored on THE TECHNICAL INVESTOR "Program" disk.

If you attempt to execute a module that is not on the disk in the program disk drive, you will get a message that the module is not installed. Remove the disk currently in the program disk drive and replace it with the required disk. Then press ⟨Enter⟩ again to execute the module.

Remove the disk from drive A and replace it with the "Program Disk".

You should now have the "Program" disk in drive A, and a data disk (in this case, the "Sample Data" disk) in Drive B. With a few exceptions, this is the normal method of running THE SAVANT INVESTOR SERIES programs: after startup, either the "Program" disk or the "Communications" disk in drive A, and a data disk in drive B. (You can change the standard drives if you want; see "The Main Menu: System Parameters" in the Reference section.)



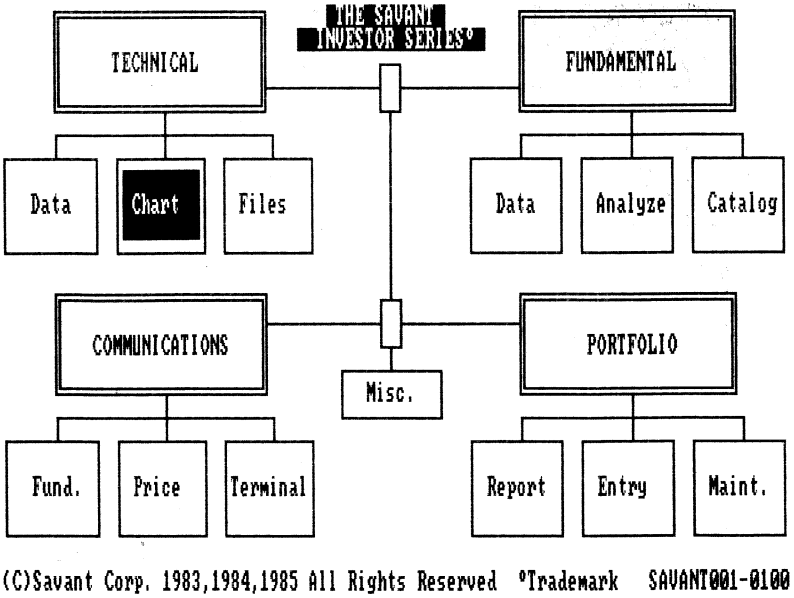
CHECKING THE DATA DIRECTORY
FIGURE 3 – 2

TYPICAL CHARTING

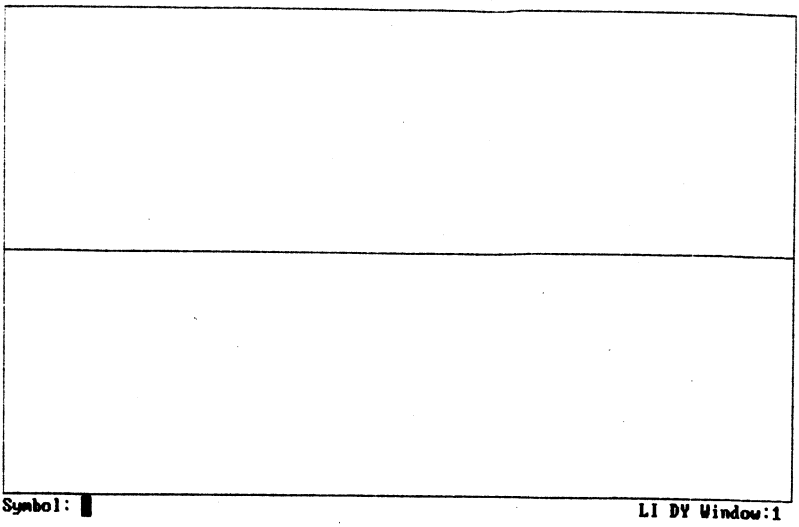
Let's move this tutorial into high gear by jumping straight to the major part, or module, of the program. This is, of course, the Charting module. Access to this and all other parts of the program is through the Main Menu display.

To start the Charting module, move the filled-in block to the "Chart" subcategory under "TECHNICAL" (see Figure 3-3) and press ⟨Enter⟩. What you'll see next will look like Figure 3-4.

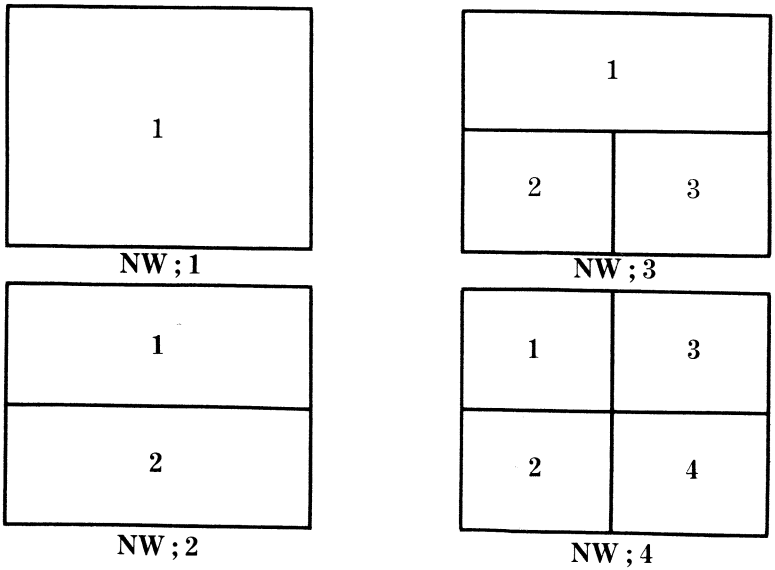
The Charting module is organized around "windows". There are 1, 2, 3, or 4 windows visible at any time; you can choose how many you want to see. The number and location of each visible window is shown in Figure 3-5 when 1, 2, 3 and 4 windows are visible.



EXECUTING THE CHARTING MODULE
FIGURE 3 – 3



THE FIRST CHARTING MODULE DISPLAY
FIGURE 3 – 4



LOCATION OF WINDOWS
FIGURE 3 – 5

The Charting module starts by setting up two windows, each to be plotted with a linear vertical axis and with a horizontal axis marked in calendar days.

THE TECHNICAL INVESTOR has sophisticated auto-charting capabilities that are set when you buy the program, but which you can turn off and on or change anytime you wish. These automatic features are just two of many "user procedures" which you can define; we'll be talking about how to use user procedures to define your own plotting commands later.

The two automatic user procedures are:

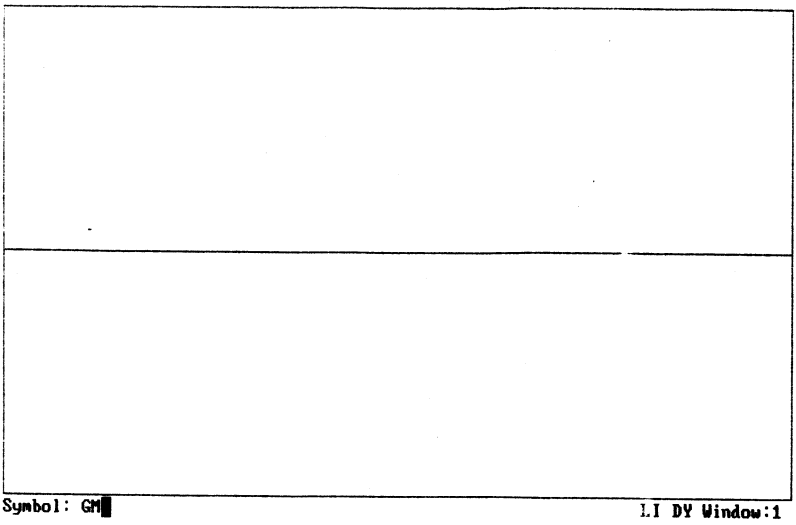
a *Startup* procedure which executes immediately upon entering the Charting module. You can use this procedure to change the way the program starts up. For example, you can have the Startup procedure set up three windows instead of the two the program would normally start with.

an *Autoplot* procedure that automatically executes after you enter a security symbol. You can use this feature to set up a sequence of plots that you want to repeat for each security.

These features, as well as user procedures in general, will be covered later in this tutorial. All are explained in detail under "TECHNICAL Charting: Command Descriptions" in the Reference Section of this manual.

When you purchase the program, the Startup procedure is set to turn the grid feature on, turn Autoplot on, then ask you for a security symbol. The Autoplot procedure is set to clear both windows and plot price bars on window 1 and volume bars on window 2, then ask for another symbol to plot.

User input to the program is displayed on a line near the bottom of the monitor which we call the "command line". The prompt that appears on this line tells you what information the program is expecting you to enter. Since the Startup procedure is set to ask for a security symbol, the first prompt when you start the Charting module is "Symbol: " (see Figure 3-6), which means the program is expecting you to enter a security symbol. Once you enter a symbol, the Autoplot procedure will take over and plot the charts for you.

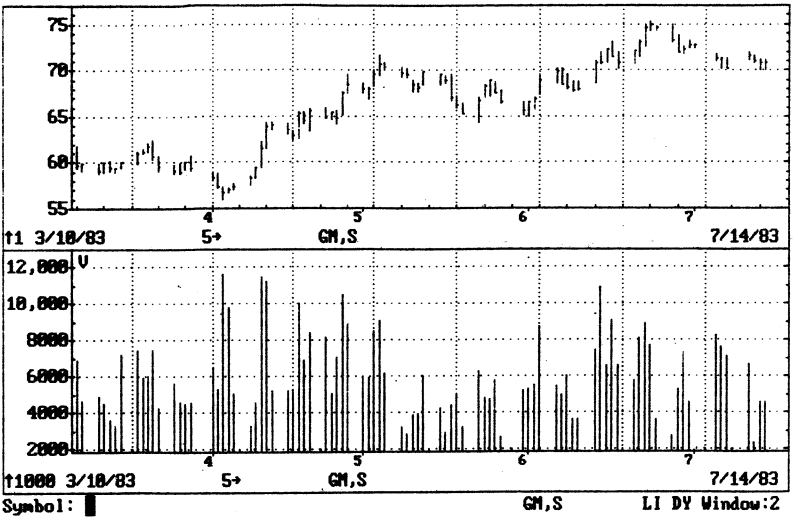


ENTERING A SYMBOL TO BE PLOTTED
FIGURE 3 – 6

To see this work, plot a chart for General Motors by entering their symbol (as shown in Figure 3-6):

GM

As soon as you press the ⟨Enter⟩ key, the Autoplot procedure will take over, and you'll see price bars appear on window 1, and volume bars on window 2. When the plot is complete, the monitor will look like Figure 3-7, and you'll be asked for another symbol, just as the Autoplot procedure is set to do. The Autoplot will do this each time you enter a new symbol. We will discuss later how to turn the Autoplot feature off so that you can do different types of charting.



THE COMPLETED CHART
FIGURE 3 – 7

Regardless of its physical size, each window is organized in the same manner. The meaning of the information shown on each window follows (refer to Figure 3-7):

1. The vertical axis is labeled in units of price or volume, depending upon what is being plotted. You can tell if the axis refers to volume by the V in the upper left-hand corner of the window.

2. The distance or scaling between the notches or tick marks on the vertical axis is noted by the number with the upward-pointing arrow in the lower left-hand corner of the window. This means each notch is $1 on window 1, and 1000 *units* of volume on window 2. As in the business section of your newspaper, volume is often reported in units of 100 shares for stocks, and $1000 for bonds.

3. Similarly, the number with the right-pointing arrow tells the distance between the notches on the horizontal axis. Thus, there are 5 days between each tick mark on both windows.

4. The two dates on the bottom line refer to the first and last day of data on the chart. So for the present example, the chart runs from 3/10/1983 to 7/14/1983.

5. The small numbers (4,5,6,7) under the horizontal axis refer to the first point for that month (April, May, June, July). In other words, the tick mark next to the 5 indicates the horizontal position of the first point on the chart in May 1983.

6. The letters in roughly the bottom middle of the window are the symbol of the security whose data is visible on the plot. In this case, the security is GM,S (General Motors stock).

The command line at the bottom of the monitor is where all charting commands are entered. Also shown on that line is information about the "selected window" (the window currently being used for plotting). From left to right, the information shown on the command line is:

- the symbol of the "active security" (that is, the symbol currently being used for plotting on the selected window
- whether the vertical axis is linear (**LI**) or logarithmic (**LG**)
- whether the horizontal axis is plotted by calendar date (**DY**) or sequentially (**SQ**)
- the number of the selected window

In Figure 3-7, then, window 2 is the selected window, and on window 2 GM,S is the symbol of the active security, and the plotting mode is linear for the vertical axis and daily for the horizontal axis. We'll be covering all these things later in the tutorial.

Your working copy of the sample data disk for THE TECHNICAL INVESTOR has assorted data for various securities. Among them are International Business Machines (IBM,S), Fidelity Magellan Fund (FIDM-X,M), General Motors (GM,S), Royal Dutch (RD,S), and Texaco (TX,S).

Go ahead and plot one or two of these securities: just enter the symbol and the Autoplot feature will take it from there.

Here's another feature: if you can't remember the symbols of all the securities on your data disk, enter a ? (question mark) instead of an actual symbol. The first security (alphabetically sorted) in your directory will appear on the command line. Use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the rest of the securities. Press ⟨Enter⟩ when you get to the security you want to plot.

Enter the symbol for the Dow Jones Industrial Average (DJ-30) using this method. Enter a

?

then use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to find DJ-30. Then just press ⟨Enter⟩.

By now you've probably noticed that the horizontal and vertical axes are always intelligently labeled with easy-to-use numbers. They are marked in units of 5's, 100's, 250's, etc., thus making the charts much easier to read. You can change the horizontal or vertical range on any window; see the available commands under "TECHNICAL Charting: Command Descriptions" in the Reference Section.

Now let's look at a few of the commands available in the Charting module:

A+	Autoplot on	turn on the Autoplot feature. When you purchase the program, the Autoplot procedure is defined as **** ; PB ; SW ; 2 ; VB ; ES.** (You'll understand what this string of commands means shortly.)
A–	Autoplot off	turn off the Autoplot feature, that is, turn off the user procedure which executes automatically after a new symbol is entered.
CW	Clear Window	clear the selected window.
DY	DailY mode	plot (or replot) the data with the horizontal axis measured in calendar days. This is the default mode.
ES ; x1	Enter Symbol	enter security symbol x1 .

LI	LInear mode	plot (or replot) the data with a linear vertical axis. This is the default mode.
LG	LoGarithmic mode	plot (or replot) the data with a logarithmic vertical axis.
NW ; s1	Number of Windows	set the number of windows displayed to s1, where s1 can be 1, 2, 3 or 4.
PB	Price Bars	plot price bars on the selected window.
SW ; s1	Select Window	select window s1 for subsequent commands, where s1 can be 1, 2, 3 or 4.
SQ	SeQuential mode	plot (or replot) the data with the horizontal axis marked in sequential entries.
VB	Volume Bars	plot volume bars on the selected window.

Either upper- or lower-case letters are accepted for all commands.

Note that the commands above, like all commands in the Charting module, are two letters long. When a command needs an argument (such as the number of windows for the **NW** command or the security symbol for **ES**), the two-letter command must be followed by the appropriate information. There are two ways to do this: you can either enter the command by itself and THE TECHNICAL INVESTOR will prompt you for the argument, or you can enter the command followed by a semicolon followed by the argument, all on one line.

Look for a moment at the description of the **A+** command, specifically at the definition of the Autoplot procedure. Note that the last command in the procedure is the **ES** command, but the symbol of the security to be plotted is not included. As we just said, if you don't enter the required argument, the program will prompt you for it. That is why each chart you've plotted so far ends with the request for another symbol: you are being prompted for the argument of the **ES** command.

When you enter the symbol, the **ES** command executes and, if the Autoplot feature is on, the Autoplot procedure executes automatically right after that. With the Autoplot procedure defined this way, you can continue entering symbols and generating charts indefinitely, until you turn the Autoplot feature off.

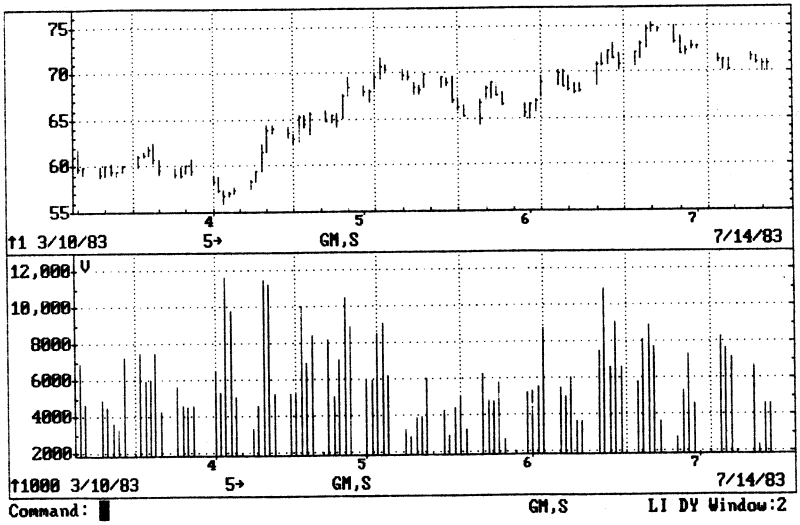
Let's go through some examples. First, assuming you've plotted some other securities, put the General Motors charts back up on the monitor by entering

GM

When the plotting is through, your screen should again look like Figure 3-7.

Next, instead of entering another symbol to plot, press the ⟨Esc⟩ key.

This will return you to what we call command mode, or the state in which the program is asking for a command. You can always tell when you are in command mode by the prompt "Command:" on the command line. (See Figure 3-8.)



THE COMMAND MODE
FIGURE 3 – 8

Note that anytime you are being asked for the arguments of a command (in this case the symbol for the **ES** command), you can press ⟨Esc⟩ to abort that command and return to the command mode.

Now, turn Autoplot off by entering

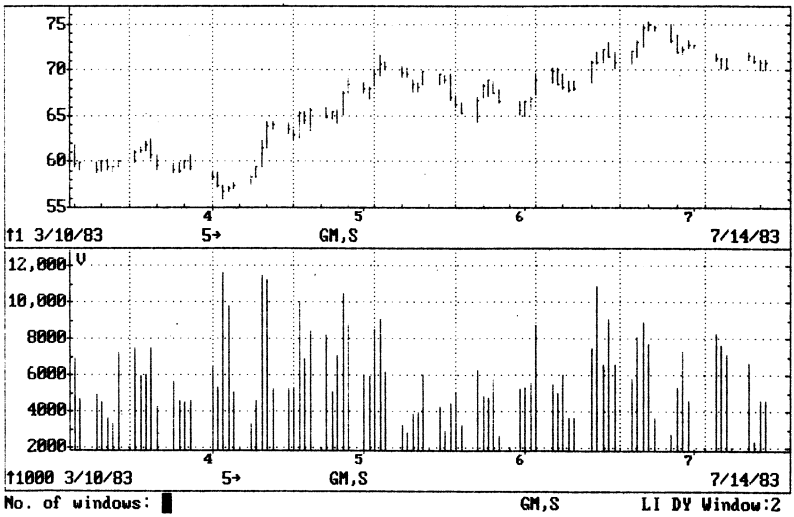
A –

Command description:
A – *turn Autoplot feature off*

With the General Motors plots still visible on your monitor, enter the command which sets the number of visible windows:

NW

Note that we left off the number of windows to display. So, as we said, the program will ask for the missing information, as shown in Figure 3-9.



PROMPTING FOR AN ARGUMENT
FIGURE 3 – 9

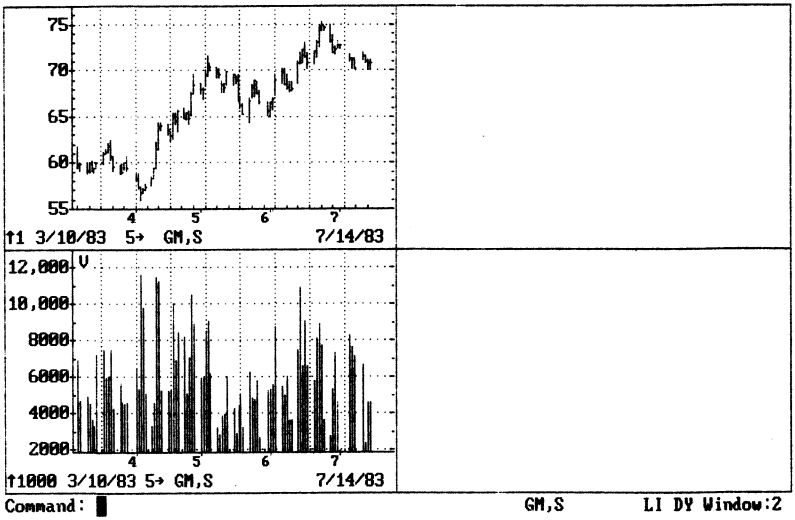
Enter a

4

which will set up 4 windows.

Command description:
NW *; 4 set Number of Windows to 4*

When the command has finished executing, your monitor will look like Figure 3-10. Note when the program processed the **NW** ; 4 command, the General Motors plots were not lost, but were just replotted on the appropriate window.



FOUR WINDOWS
FIGURE 3 – 10

To save time in entering commands, you can string multiple commands together by separating them with semicolons. For example, the command to select another security for plotting — that is, make a new symbol the "active security" — is the Enter Symbol or **ES** command. The command to select which window to plot on is **SW**, for Select Window. And the command to plot Price Bars is **PB** and to plot Volume Bars is **VB.**

So to plot Honeywell on windows 3 and 4, you could enter:

SW ; 3
ES ; HON
PB
SW ; 4
VB

or, alternatively, you could enter:

SW ; 3 ; **ES** ; HON ; **PB** ; **SW** ; 4 ; **VB**

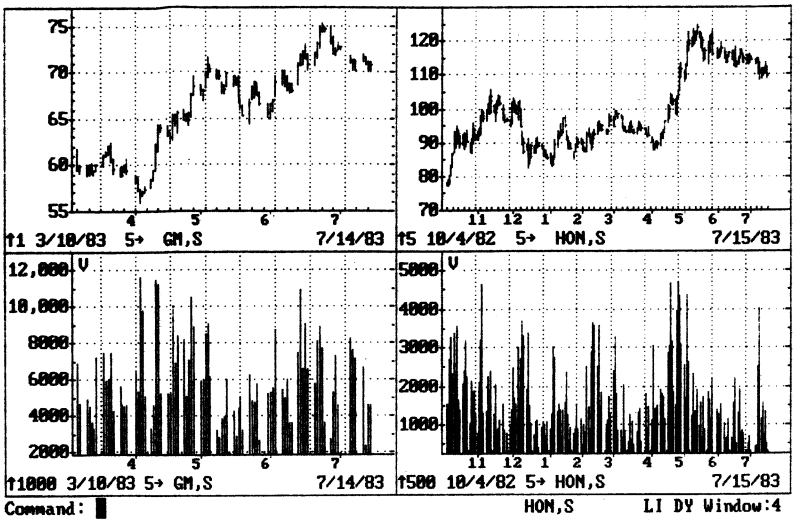
Enter these commands, combining the first three on one line, but entering the last two one at a time (just to demonstrate the different ways in which you can enter commands):

SW *; 3* ; ***ES*** *; HON* ; ***PB***
SW *; 4*
VB

Command description:

SW *; 3*	*Select Window 3*
ES *; HON*	*Enter Symbol for Honeywell for the selected window (i.e., window 3)*
PB	*plot Price Bars on the selected window (i.e., window 3)*
SW *; 4*	*Select Window 4*
VB	*plot Volume Bars on the selected window (i.e., window 4)*

Note that, when starting with a clear window, you do not have to re-enter a symbol if you wish to use the active security from the previously selected window. Thus, it is not necessary to re-enter the symbol for Honeywell before plotting on window 4. As you stand now, your monitor should look like Figure 3-11, showing both the General Motors and the Honeywell chart.



GENERAL MOTORS AND HONEYWELL CHARTS
FIGURE 3-11

Now try this: enter

NW;1

and watch the General Motors price bar plot be blown up to full size. Next, enter

NW;4
SW;4

Command description:
NW;1 *set Number of Windows to 1*
NW;4 *set Number of Windows to 4*
SW;4 *Select Window 4*

to reset 4 windows and select window 4.

Voilà, all four charts are back. This is always the case: the **NW** command will not erase any information, just rearrange it in the form you request.

On occasion, you might want to plot charts on semi-log axes. The **LG** (log) and **LI** (linear) mode commands make this easy. If the window to be plotted is clear, and you want the next plot to have a logarithmic vertical axis, just enter **LG** to set the log mode. If the window already has a plot on it, go ahead and enter **LG** anyway: the chart will immediately be replotted with a logarithmic vertical axis.

With window 4 still selected (check the number after "Window: " at the bottom right corner of the monitor to be sure) replot the chart with a log axis by entering

LG

Command description:

LG *set the selected window to plot in log mode*

Similarly, the horizontal axis can be shifted between calendar day plotting (**DY**), and sequential plotting (**SQ**). Calendar day plotting marks the horizontal axis in calendar days, then plots the price for each entry on the date of the entry. On price or volume bar charts, this means that weekends and missing data will be visible as blank spots in the plot.

Sequential plotting, on the other hand, marks the horizontal axis in terms of entries, then plots each entry one by one, equally spaced, regardless of date. This can be useful for weekly, monthly or randomly spaced data, any of which may be included in any file on the disk.

Select window 3; clear it, set the sequential mode, then plot volume bars for the active security (which is still HON) by entering

SW;3;CW;SQ;VB

Command description:

SW;3	*Select window 3*
CW	*Clear the selected window*
SQ	*Set the selected window to plot in sequential mode*
VB	*plot volume bars*

Note that the **CW** command resets the **LI** and **DY** modes, but not the active security.

Many other commands are described under "TECHNICAL Charting: Command Descriptions" in the Reference Section of this manual. Commands are available to move plots, save plots, recall plots, define and edit user procedures, use a cursor to draw lines, draw point and figure charts, erase lines, and plot a variety of things such as moving and exponential averages, volume indicators and linear regressions. We'll cover many of these later in this tutorial.

Spend a few moments trying out different combinations of all the commands we have discussed so far. When you are comfortable with the way the commands are entered, return to the Main Menu by pressing ⟨Alt⟩ + ⟨F5⟩ (which, you'll remember, means hold down the ⟨Alt⟩ key and press ⟨F5⟩).

PERSONALIZING THE PROGRAM

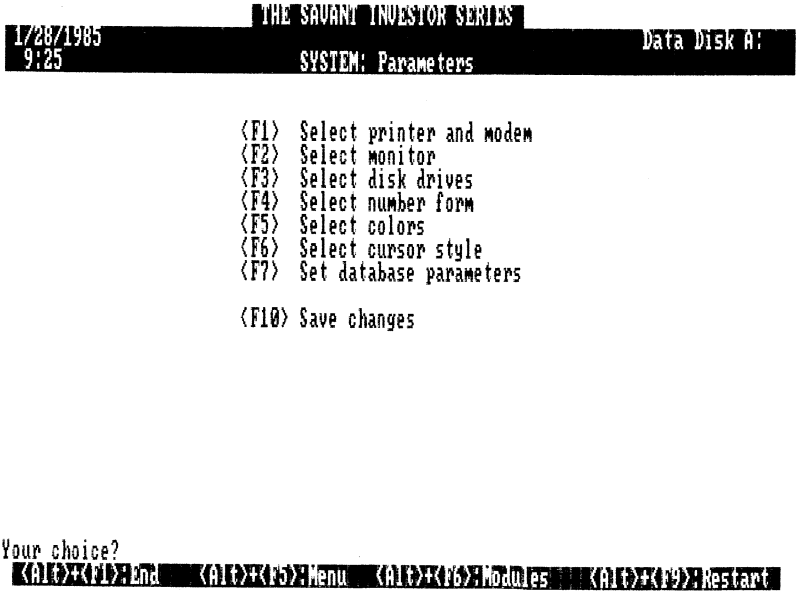
In order for THE SAVANT INVESTOR SERIES programs to work properly and display information the way you want it, several things must be defined in advance. We call this "setting the system parameters". System parameters tell the program what kind of printer you are using, what colors you want displayed on the monitor, how you want numbers displayed, and so on. Once you have set the system parameters for your computer and your tastes, you probably will rarely go back to this part of the program.

If you are using a dual floppy disk system, replace the "Program Disk" with the "Startup/Main Menu" disk.

To gain access to this module, type

SP

(for System Parameters). Press the ⟨Enter⟩ key to confirm your choice when asked. If you make a mistake, just press the ⟨Esc⟩ key and start over.



THE SYSTEM PARAMETERS MENU
FIGURE 3 – 12

The next thing you see will look like Figure 3-12.

This is where you choose which system parameters you want to change; it is called the main System Parameter menu. As you can see, there are several categories of system parameters. Right now, we'll only cover the parameters necessary for you to continue the tutorial.

Printers and Modems

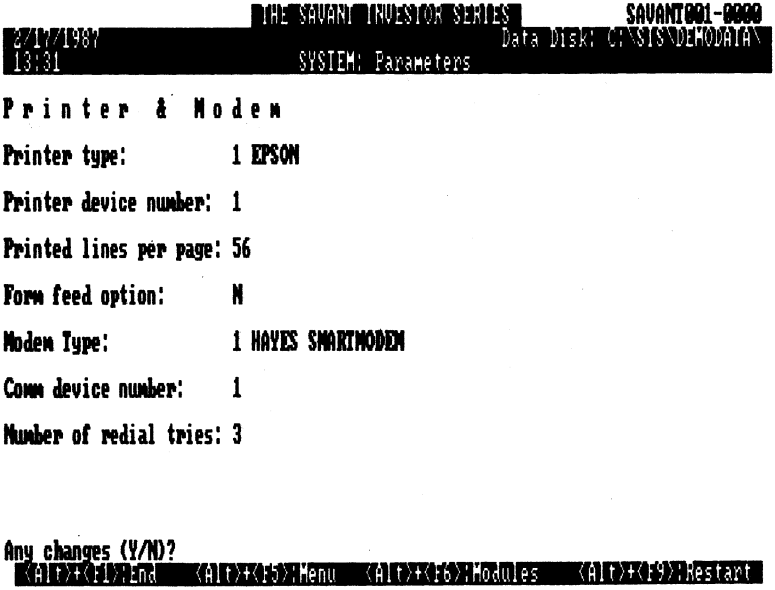
To see how the System Parameters module works, press ⟨F1⟩ to set information about your printer and modem.

Your monitor will look similar to Figure 3-13.

Next, press ⟨Y⟩ to indicate you want to make changes to the parameters on this display monitor.

The cursor will jump to the top line, labeled "Printer type:".

Enter the number corresponding to the brand of printer you own, or just press ⟨Enter⟩ if you have an IBM graphics printer.



SYSTEM PARAMETERS – PRINTERS
FIGURE 3–13

Next, press ⟨Enter⟩ three more times to move the cursor to the line labeled "Modem type:".

The meaning of the system parameters we are skipping is described in detail under "The Main Menu: System Parameters" in the Reference section of this manual. You can come back to this module at any time and change these or any other system parameters.

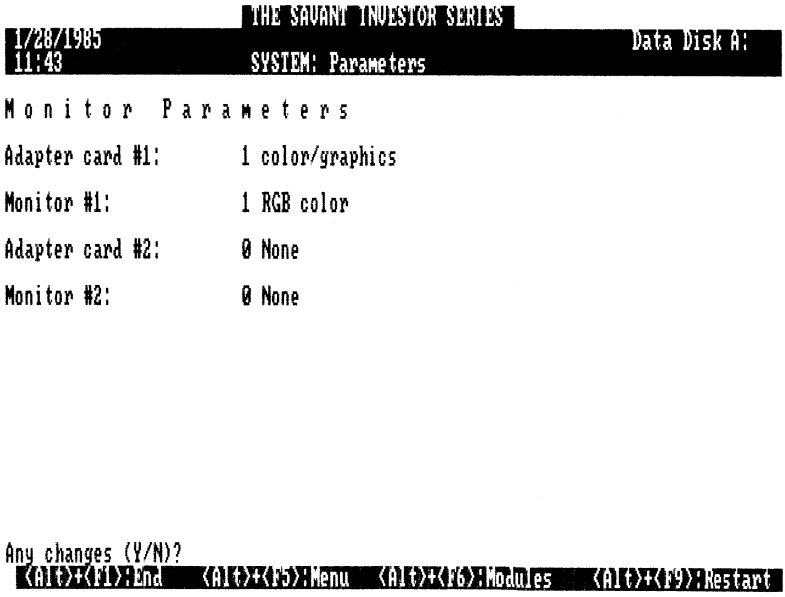
At this point, the right side of the display monitor shows the supported modems.

Choose the number corresponding to your brand, and press ⟨Enter⟩. If you don't have a modem, just press ⟨Enter⟩.

Next, press ⟨Esc⟩ to jump back to the bottom of the monitor, and press ⟨N⟩ to return to the main System Parameter menu.

The second group of parameters we'll cover here involves monitors.

Press ⟨F2⟩, and your monitor will look like Figure 3-14.



SYSTEM PARAMETERS - MONITORS
FIGURE 3-14

Monitors

THE SAVANT INVESTOR SERIES programs automatically determine what kind of video adapter card and monitor you have when you setup the program, and sets these parameters accordingly. However, the program can not always tell the difference between a color and a non-color monitor attached to a video adapter card.

Press ⟨Y⟩ to indicate you want to make changes.

If you have the original IBM Color/Graphics Adapter (CGA) or equivalent, the line labeled "Adapter card #1:" should already have a 1 on it. If you have an IBM Monochrome display adapter, there should be a 2 on the line. Finally, if you have an IBM Enhanced Graphics Adapter (EGA) or equivalent, a 3 should already be entered.

Unless the number is incorrect, press ⟨Enter⟩ to move to the next line, then enter the number corresponding to the type of monitor attached to your video adapter card.

Next, answer the same questions for your second adapter card and monitor. If you do not have a second video adapter card/monitor or do not want the program to use the second card/monitor, just enter 0 (zero).

Finally, when everything is correct, press ⟨N⟩ in response to the question "Any changes(Y/N)?".

Database Information

The last set of system parameters we'll look at in the tutorial are the database parameters. THE SAVANT INVESTOR SERIES programs can access information from several different sources. It can communicate entirely automatically with several databases once you have told it a few pieces of information, that is, once you have set the communications parameters.

To choose the database section, press ⟨F7⟩ while looking at the main System Parameters menu.

The next thing you'll see will be the names of the presently supported databases.

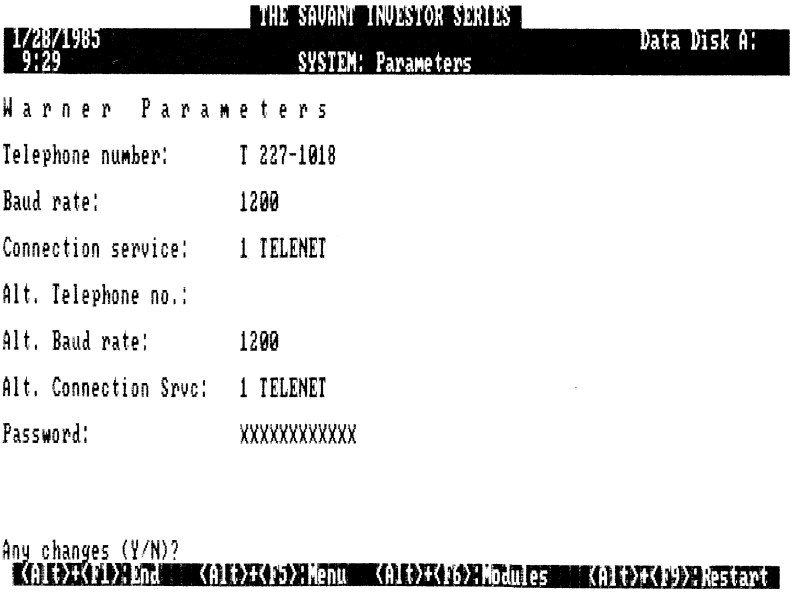
Enter the letters corresponding to the database you want to use, and your display monitor will look similar to Figure 3- 15.

Information on the databases is available from the database companies; also see "Appendix D: About the Databases". If you want to use the features of several databases, then go through the following for each database you will be using.

Answer the question "Any changes (Y/N)?" with a ⟨Y⟩ in order to be able to enter new information.

The cursor will jump to the top input line, ready for you to enter a telephone number.

You can use parentheses and dashes in the phone number if you wish, since most "smart" modems will ignore them. Don't forget to include an area code if necessary. If you are using Dow Jones Cable TV access, no number is necessary; just press ⟨Enter⟩. If your modem has special dialing commands, such as T to indicate Touch-Tone dialing, you can enter those commands on this line also.



COMMUNICATIONS PARAMETERS
FIGURE 3-15

Enter the telephone number used to access this database, just as you would normally dial it. When you are finished, hit the ⟨Enter⟩ key, and the cursor will jump to the next input line.

As before, you can skip any entry just by pressing ⟨Enter⟩, and the cursor will move to the next input line.

Next, enter the baud rate that goes along with your modem and the telephone number you just entered.

This is normally 300 or 1200. If you are not sure which baud rate is correct, check the information you received from the database company. If you still don't know, try 1200 baud first, and if the communications doesn't work, then come back to the System Parameters and try 300, then 2400.

Next is the connection service. The choices depend upon the database you are using. A numbered tally of the connection services available for the database you have chosen will appear on the right side of the display monitor. Make sure the connection service you choose matches the telephone number you entered.

Enter the number of the connection service corresponding to the telephone number you entered above.

If you wish, you can enter a second telephone number, baud rate and connection service as an alternate in case the first one is busy or doesn't answer.

Enter an alternate telephone number, baud rate, and connection service, or press ⟨Enter⟩ three times to move to the password line.

On the password line, enter your password exactly as given to you by the database when you set up your account. With some databases you must enter a userid or charge code on this line also. Make sure the password is correct before you press ⟨Enter⟩, since for security reasons it will not be displayed on the monitor after you press ⟨Enter⟩. If you think you might have made a mistake, re-enter the password. (See "Appendix D: About the Databases" if you need more information about how to enter the password.)

Assuming that all the entries are correct, press ⟨N⟩ to indicate you don't want to make any more changes, and you'll be returned to the main System Parameter menu.

As noted above, if you plan to use more than one database, repeat these steps for each database you will be using. Alternatively, you can come back to this section at any time before you try to access the second database and fill in the data.

Now you are ready to save the changes you have made in the system parameters. To do so, all you do is press ⟨F10⟩ while viewing the main System Parameter menu. If you exit from the System Parameters module without pressing ⟨F10⟩, none of the changes you made will be stored, and the system parameters will remain as they were before you entered the System Parameters module.

If you are using a floppy disk drive to run the program, you must save the new system parameters on every program disk ("Startup/Main Menu", "Program Disk", and "Communications Disk") for each program in THE SAVANT INVESTOR SERIES. If you are running the programs from a fixed disk, there is only one copy of the System Parameters file, so you can ignore this discussion and skip to "Other System Parameters", below.

To save the system parameters on each disk, just place each disk in the program disk drive, one at a time, and press ⟨F10⟩ for each.

If you are using a floppy disk system, remove the "Startup/Main Menu Disk" from the program disk drive (drive A), and replace it with the "Communications Disk" and press ⟨F10⟩. When the disk operating light goes off, remove the "Communications Disk" and replace it with the "Program Disk". Then press ⟨F10⟩ again. We'll be using the "Program Disk" next, so you can leave it in drive A.

Remember to do this every time you change any system parameter.

Other System Parameters

While we haven't covered all of them in this tutorial, you can see that there are many other system parameters you can set. You can choose the colors that will be displayed on your monitor, the number of decimals or the smallest fraction displayed, the number of lines printed on each page of printer output, the drive and directory for the data, and more. All of these are explained in detail under "The Main Menu: System Parameters" in the Reference section of the manual.

Remember that you'll probably rarely use the System Parameters module. You'll only need it if you change printers, or decide you want to see a different smallest fraction displayed, or your password or the connection service phone number changes, etc.

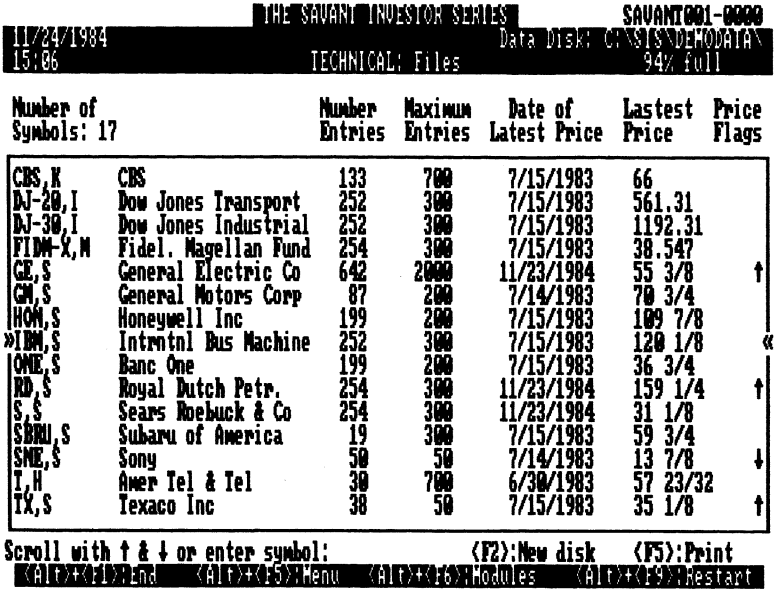
Press ⟨Alt⟩ + ⟨F5⟩ to return to the Main Menu.

DISPLAYING THE FILES ON YOUR DATA DISK

Back at the Main Menu now, lets look at the "Files" subcategory under "TECHNICAL". This module tells you the symbols, names, and other information about the securities with technical files in your directory.

If you are using a dual floppy disk system, make sure that the "Program Disk" is in the program disk drive.

Use the cursor control keys to move the filled in block to the TECHNICAL subcategory labeled "Files", then press ⟨Enter⟩. In a few seconds, your monitor will look like Figure 3-16.



THE FILES DIRECTORY DISPLAY

FIGURE 3 – 16

If your printer is hooked up, turned on and ready to go, you can print the information on the printer by pressing function key ⟨F5⟩. Press ⟨Esc⟩ to abort printing if you don't want the entire listing.

To inspect the directory of files, you have several options. You can scroll through the directory using the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys. Or you can jump to a specific security by entering the symbol of that security. Or you can just jump to a general area of the directory by entering up to 8 characters. For example, if you enter a Q, the window will jump to the Q's if any exist, or to the general area where symbols starting with Q would be if there were any in the directory.

Use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the directory, then move the window directly to Exxon by entering Exxon's symbol:

XON

Finally, move the window to where any symbols starting with a Q would be by entering

Q

The meaning of the data in the directory listing is as follows:

- the security symbol along with the security type. The security type is a one character code that tells the program what type of security this symbol represents. S means stocks, O means options, B means bonds, and so on. A complete list of security types is given in "Preliminary Information: Security Symbols" at the beginning of this manual.
- the name of the security
- the number of entries or days of data presently stored in the file
- the maximum number of entries in the file (After you have reached this number of entries, THE TECHNICAL INVESTOR automatically throws out the oldest data when you update prices. You can raise or lower the maximum number at any time.)
- the date of the latest price for that security
- the latest price for that security
- price flags which indicate whether the most recent price of the security is above the high or below the low price flag (The high and low price flags will be discussed in "Editing the Database" later in the tutorial.)

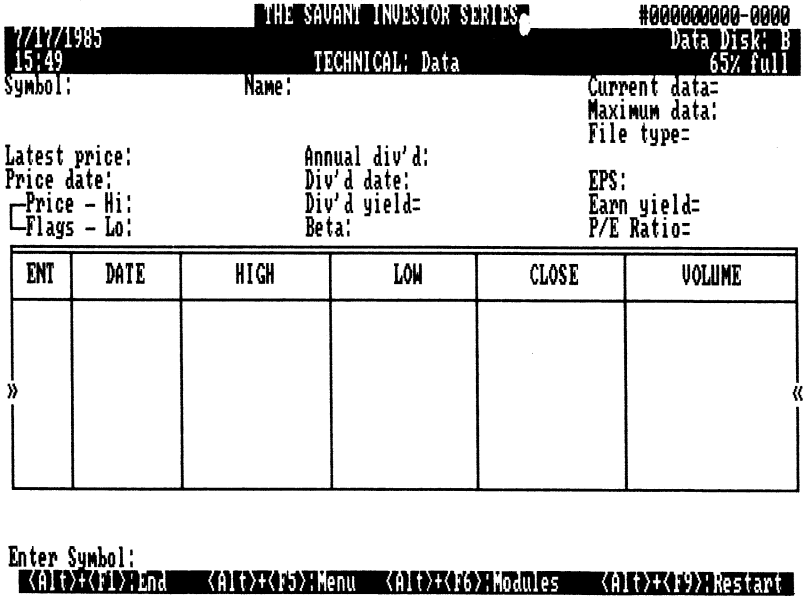
Return to the Main Menu by pressing ⟨Alt⟩ + ⟨F5⟩.

EDITING THE DATABASE

You can manually enter and edit data in your technical database.

On the Main Menu again, using the cursor control keys, move the filled-in block to the "Data" subcategory under "TECHNICAL", and press ⟨Enter⟩.

What you'll see next will look like Figure 3-17. Notice the blinking cursor next to the highlighted "Enter Symbol:". This is the command line, where all input will occur.



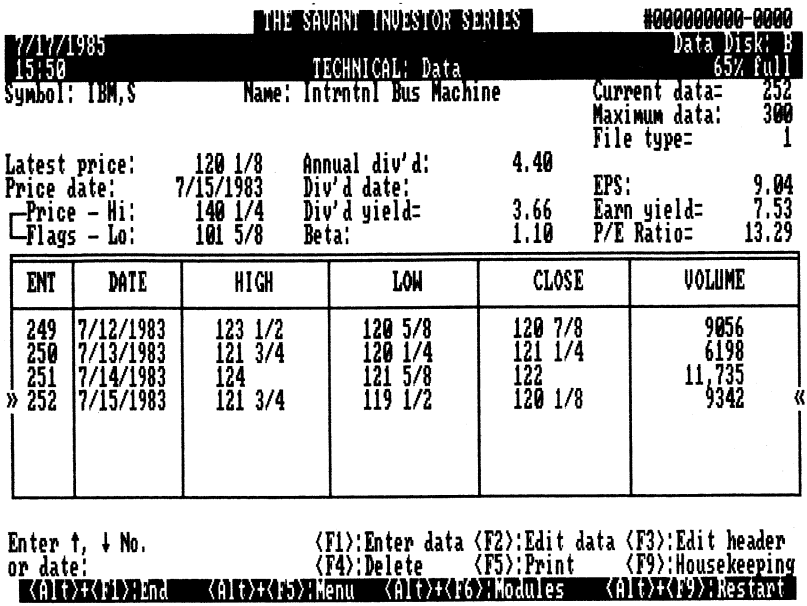
EDITING THE DATABASE: THE FIRST DISPLAY
FIGURE 3 – 17

(Note: the sample data disk comes with some of the data purposely incorrect. When you've completed the tutorial, all the data will be correct.)

To edit the price and volume data stored for IBM, just enter

IBM

THE TECHNICAL INVESTOR will search the disk for IBM's data and display it (see Figure 3-18). In the heading area you can see information such as the number of entries currently in the file (252), the maximum number of entries (300), the annual dividend ($4.40), the high and low price flags (the prices which trigger a message notifying you that the security has moved above or below the respective price; 140¼ and 101⅝), and more.



CALLING UP IBM'S DATA

FIGURE 3-18

Now you have several choices. If you want to see data that doesn't appear in the window, use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the data. Or enter a date, and the program will jump to that date (or a date near that date if that date doesn't exist in the file). Or type in an entry number (the data for the first day in the file is entry 1, for the tenth day is entry 10, etc.), press ⟨Enter⟩, and the program will jump to that entry.

To edit a particular line of data, move that line to the center of the window using any of the methods above (it will be highlighted), then press the ⟨F2⟩ key. One by one, edit the information as it appears on the command line. If you don't want to change something, just press ⟨Enter⟩ and the program will move to the next item. Continue until you've gone through all the items; after you press ⟨Enter⟩ on the last item, any

changes you made will be stored by the program, and you'll be returned to command mode. Alternatively, if you change your mind any time before you press the last ⟨Enter⟩, you can press ⟨Esc⟩ and you'll be returned to command mode with all the data unchanged.

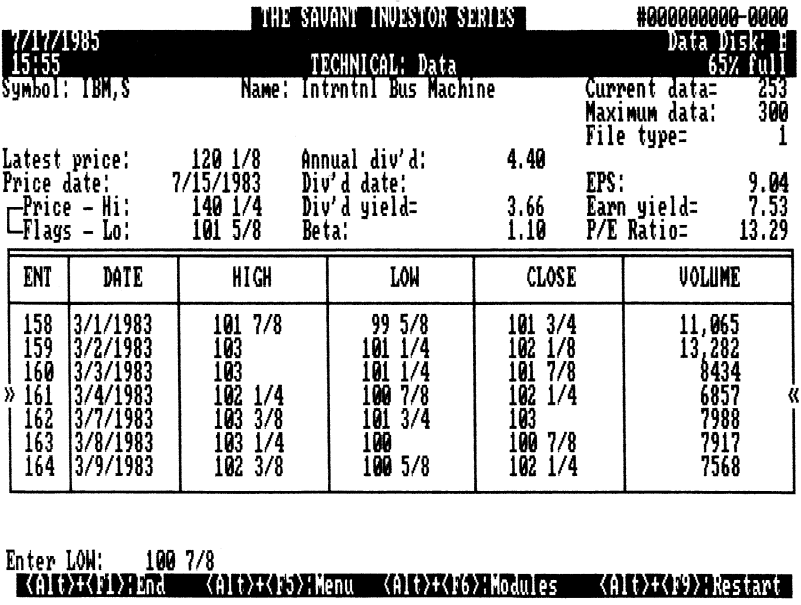
For example, let's edit the data for March 4, 1983 for IBM. Enter

3/4/83

(or any other acceptable form of this date) to bring the data for this date into view.

Press ⟨F2⟩ to start the edit procedure.

To edit the low price for the day, press ⟨Enter⟩ to skip over the date, and hit ⟨Enter⟩ again to skip over the high for that day. Your screen will now look like Figure 3-19.



EDITING PRICE AND VOLUME DATA

FIGURE 3-19

Edit the low from 100⅞ to 101⅛ by typing in the new price, or by using the methods noted under "Editing Input Lines" in the General Information Section of this manual. When you have finished, press ⟨Enter⟩ and the new price will be entered. Then press ⟨Enter⟩ twice more (once each for the close and volume).

After pressing ⟨Enter⟩ for the volume, the change you made will be saved, and you'll be returned to command mode.

This procedure works for editing everything on the line; i.e., you can edit all the prices, the volume or the date. When you edit the date, there is one difference: the program will pause after you have entered the new date, and move the prices and volume from the old date location to the new date location before allowing you to continue with the editing.

When you want to enter an entire line of new data, press the ⟨F1⟩ function key. For example,

Press ⟨F1⟩, and enter the following information for IBM (one item at a time) as you are prompted:

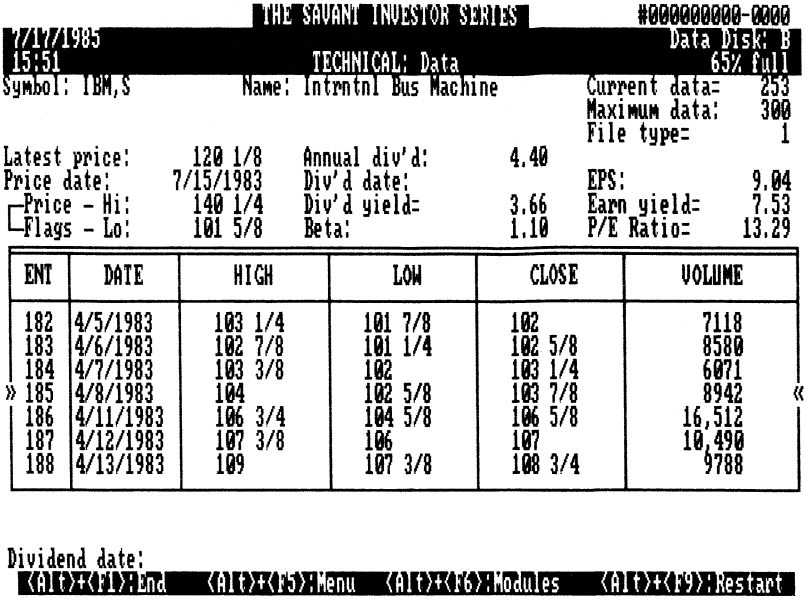
(date:)	*4/8/83*
(high:)	*104*
(low:)	*102⅝*
(close:)	*103⅞*
(volume:)	*8942*

After you press ⟨Enter⟩ for the volume, the data disk will be updated with this new data, and you will be returned to the command mode. If you press ⟨Esc⟩ before pressing ⟨Enter⟩ for the volume, you will be returned to command mode, and none of the information you entered will be saved.

To edit any of the data in the header at the top of the monitor (including symbol, company name, etc.), just press ⟨F3⟩. Then, from the menu that will appear on the command line, choose the item you want to edit and press the appropriate function key. Enter the new information for that item, then press ⟨Enter⟩ again to return to command mode.

For example, let's enter a dividend date for IBM of 12/5/84.

Press ⟨F3⟩, then press ⟨F5⟩ to choose the dividend date, and your monitor will look like Figure 3-20.



EDITING THE HEADER

FIGURE 3 – 20

Next, enter the new dividend date:

December 5, 1984

and the dividend date will be entered and you'll be returned to the edit header mode.

When a security price falls to or below the low price flag, or rises to or above the high price flag, you will be notified when you call up the data for that security, and when you get the latest price by modem. On the monitor, you'll see a flashing diamond next to the appropriate flag. On the summary report after a latest price update, the security will be marked with a message in the rightmost column. You can disable the flags by setting them equal to zero.

Before returning to command mode, change the Low Price Flag to 110¼.

Press ⟨F7⟩, then enter

110¼

From now on, you'll be notified whenever IBM falls to or below 110¼.

Press ⟨Enter⟩ once more to return to command mode.

To delete a date from the file, move the date to be deleted to the center of the box on the screen. Then press ⟨F4⟩. You'll be asked if you are sure you want to delete the data, and if you answer affirmatively, the date will be deleted from the file.

Delete the data for 12/11/82. Move that date to the center of the window by entering

12/11/82

Press ⟨F4⟩, then ⟨Y⟩, and the data for this date will be deleted.

Finally, you can list any of the data on your printer. Press ⟨F5⟩ while in the command mode, and then pick a date to start, and another (later) date to end. If you just press the ⟨Enter⟩ key for the starting date, the listing will start with the first entry in the file. If you press ⟨Enter⟩ for the ending date, the listing will continue until the last entry in the file. A list of the data between the two dates picked will be sent to the printer. You can stop the printing at any time by pressing the ⟨Esc⟩ key.

For example, to print the data from March 1 to March 31, 1983, press ⟨F5⟩, then enter

3/1/83

for the starting date, and enter

3/31/83

for the ending date, and the data will begin printing on your printer.

Note that if no data exists for the date you entered, the listing starts or stops with the next entry in the file.

To edit data for another symbol (RD, for example), press ⟨Enter⟩ when in command mode, and you'll be asked for a new symbol. Or just press ⟨Alt⟩ + ⟨F9⟩

When you are ready, get back to the Main Menu by pressing ⟨Alt⟩ + ⟨F5⟩.

MORE CHARTING

Let's look at some of the more sophisticated charting abilities of THE TECHNICAL INVESTOR.

Using the cursor control keys, move the filled-in block to the "Chart" subcategory under "TECHNICAL" on the Main Menu, then press ⟨Enter⟩.

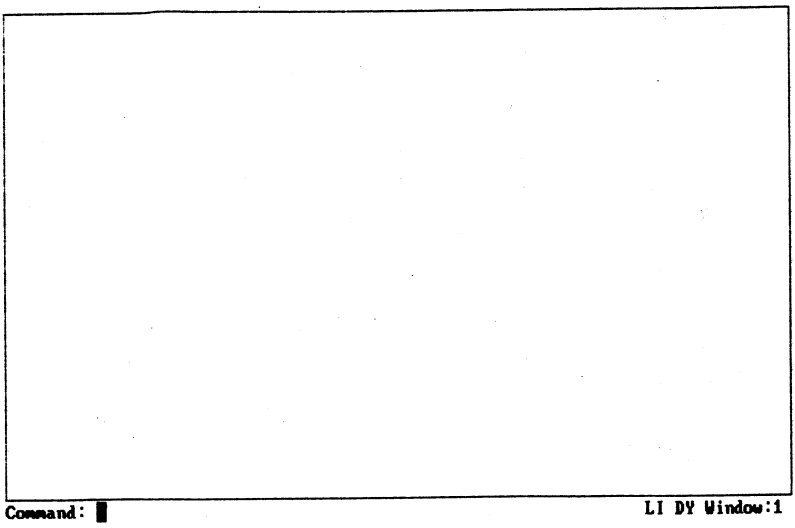
We'll set the program up with one window this time. Since the Startup procedure turns Autoplot on, the first display you'll see will ask you for the symbol of the security you want to plot.

Press ⟨Esc⟩ to get to the command mode (since we don't want to enter a symbol to be plotted right now; we'll discuss how to change the Startup procedure later in this section). Once in command mode, set the number of windows to 1 using the ***NW*** *command, and turn the Autoplot feature off:*

NW *; 1 ;* ***A*** *–*

Command description:

NW *; 1*	*set Number of Windows to 1*
A *–*	*turn Autoplot feature off*



ONE WINDOW
FIGURE 3 – 21

Your monitor will look like Figure 3-21. Note that when you set up only one window, you do not have to enter the **SW** ; 1 command to select that window.

Now let's take a look at some of the commands we're going to cover in this part of the tutorial:

CP ; n1	Closing Prices	plot an n1-entry exponential average of the closing prices on the selected window.
DM	Drawing Mode	enter the drawing mode.
DP ; x1. . .	Define Procedure	define user procedure x1.
EA ; n1	Exponential Average	plot an n1-entry exponential average of price or volume data on the selected window.
EP ; x1	Edit Procedure	edit user procedure x1.
HP ; n1	High/ask Prices	plot an n1-entry exponential average of the high or ask prices on the selected window.

LP ; n1	Low/bid Prices	plot an n1-entry exponential average of the low or bid prices on the selected window.
MA ; n1	Moving Average	plot an n1-entry simple moving average of the price or volume data on the selected window.
NV ; n1	Negative Volume Indicator	plot an n1-entry exponential average of the negative volume indicator on the selected window.
PF	Point & Figure	plot a point & figure chart on the selected window.
RW ; s1 ; s2	Replicate Window	put a copy of window s1 on window s2.
UP	Undo last Plot	replot the selected window leaving off the last plot.
XP ; x1	eXecute Procedure	execute user procedure x1.
**	clear/reset	clear all four windows and reset default conditions.
??	look at command menu	display the charting commands on the command line.

These and all other commands are discussed under "TECHNICAL Charting: Command Descriptions" in the Reference Section of this manual.

To try out some of these new commands, start by calling up the data for Honeywell by entering its symbol:

ES;HON

Command description:
ES;HON *Enter Symbol for Honeywell*

Now, plot a 5 entry simple moving average of the closing prices by using the command:

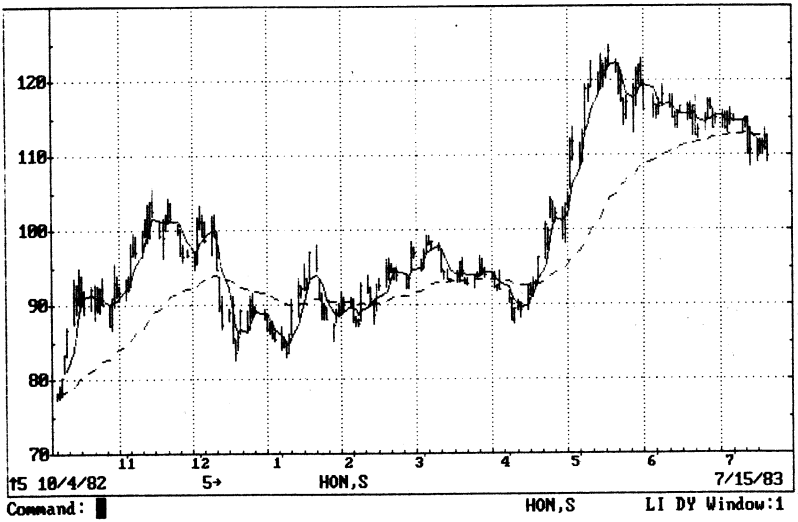
MA;5

Command description:
***MA;5** — plot a 5 entry simple moving average*

Next, plot a 50 entry exponential average of the closing prices, then plot price bars:

EA;50
PB

Command description:
***EA;50** — plot a 50 entry exponential average*
***PB** — plot price bars*



MOVING AND EXPONENTIAL AVERAGES
FIGURE 3 – 22

Your monitor will now look like Figure 3-22. Note that the **EA** and **MA** commands (as well as **WA**, the weighted moving average command, and **TE**, **TM** and **TW**, the commands which plot trading bands around these three types of moving averages) plot averages of price data if there is either nothing or a price plot on the selected window. They plot averages of volume data if there is a volume plot on the selected window. As we noted earlier, a volume plot is signified by the letter V in the upper left corner of the window.

*Now let's erase the last command (which was **PB**) by issuing the Undo last Plot command:*

UP

Command description:
UP *Undo last Plot*

Note that the window is replotted, but the result of the last plotting command is left off. The **UP** command removes *plots* from the selected window only; it has no effect on **NW**, **A–**, **SW** or other control commands. See the detailed discussion in "TECHNICAL Charting: Command Descriptions" in the Reference Section for a discussion of plotting and control commands.

Now, let's move the existing plot to window 3, then display 3 windows, plot a 10 day exponential average of low prices on window 2, and plot the volume bars and negative volume indicator (5 day exponential average) on window 1. Sound complicated? It's not really.

Just enter

RW;1;3
NW;3
SW;2;LP;10;SW;1;CW;VB;NV;5

Command description:

RW;1;3	*Replicate window 1 on window 3*
NW;3	*set Number of Windows to 3*
SW;2	*Select Window 2*
LP;10	*plot a 10-entry exponential average of the Low/ask Prices on the selected window*
SW;1	*Select Window 1*
CW	*Clear the selected Window*
VB	*plot Volume Bars on the selected window*
NV;5	*plot a 5-entry exponential average of the Negative Volume indicator on the selected window*

Note how you can move a copy of a chart to a window that is not displayed, then display that window and the chart will be there.

Finally, replot window 1 in sequential mode. As we noted earlier, sequential mode is where each entry is plotted one right after the other, regardless of date.

Enter

SQ

Command description:

SQ	*Set SeQuential mode*

Note how the gaps (i.e., the weekends) between the volume bars disappear in sequential mode. Change back to daily mode (**DY**) to compare if you wish.

You can draw lines using the line (**LN**), horizontal line (**HL**) and vertical line (**VL**) commands, or by using a cursor. To draw lines using a cursor, enter the Drawing Mode with the command **DM**.

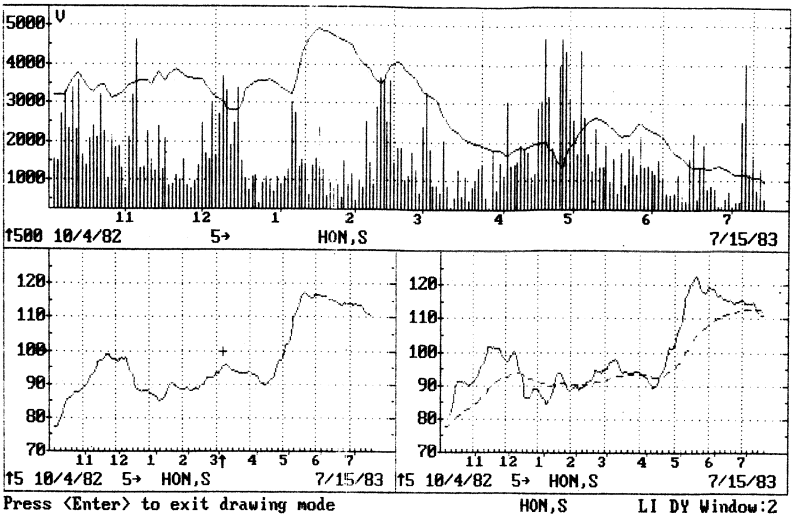
Select window 2 and start the Drawing Mode by entering

SW;2;DM

Command description:

SW;2	*Select window 2*
DM	*initiate Drawing Mode*

Note the appearance of a cursor and arrows on the selected window as shown in Figure 3-23. You control the cursor using the cursor control keys. In addition, the ⟨7/Home⟩, ⟨9/PgUp⟩, ⟨1/End⟩ and ⟨3/PgDn⟩ keys will move the cursor in the appropriate diagonal direction.



THE DRAWING MODE CURSOR
FIGURE 3 – 23

There are two cursor speeds: normal or slow speed, and fast speed. To use fast speed, hold down the ⟨Shift⟩ key and press the cursor key for the direction you want the cursor to move.

Press ⟨H⟩ to draw a horizontal line at the cursor position or ⟨V⟩ to draw a vertical line. Or mark a spot by pressing the space bar, move the cursor, and press ⟨L⟩ to draw a line between the marked spot and the present cursor position.

Try drawing several lines using each of these methods. Press ⟨Enter⟩ to return to the command mode when you are done.

For a different kind of plot, lets try a point & figure chart for Royal Dutch (RD). Point and figure charts can be done on any size window, however, we recommend you only use one (full-size) window to do point & figure charting. This is because point and figure charts can lose their meaning if scaled down.

Enter the following commands:

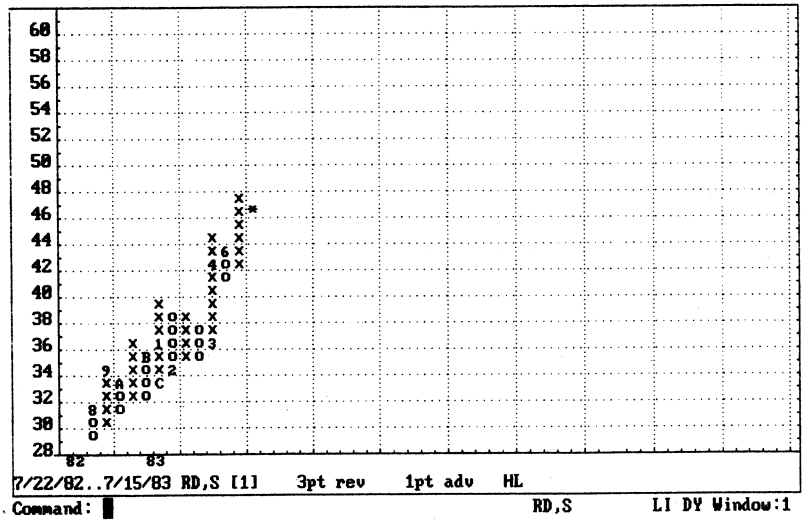
;NW;1;ES;RD;PF

Command description:

**	*clear all windows and select window 1*
NW;1	*set Number of Windows to 1*
ES;RD	*Enter Symbol for Royal Dutch*
PF	*plot Point & Figure chart*

The ** command clears all of the windows, whether or not they are visible, and selects window 1; it does not affect the number of windows set.

You should now see a point & figure chart like Figure 3-24 on your monitor.



POINT AND FIGURE CHART
FIGURE 3 – 24

There are many other commands for point & figure charts. You can change the vertical axis box size (**BS**) and breakpoint (**BR**), the number of boxes required for an advance (**AV**) or reversal (**RV**), and more.

The horizontal axis on the point & figure chart is labeled a bit differently than the other charts. Since the axis cannot be directly measured in time, the date range is shown on the left side of the window. The number in brackets ([1]) is the scaling factor for the chart; see the point & figure command in "TECHNICAL Charting: Command Descriptions" in the Reference Section.

To draw the support and resistance lines normally used on point & figure charts, enter the drawing mode as above, move the cursor to the point at which you want the line to start, and press ⟨U⟩ for an upward sloping line or ⟨D⟩ for a downward sloping line. Though intended for point and figure charts, these two cursor commands also work on regular charts, and the other cursor commands also work on point & figure charts, should you want to use them for any reason.

User Procedures

Now, as promised, let's look at changing the Startup procedure. Actually, there are four kinds of procedures you can set and change in THE TECHNICAL INVESTOR:

USER PROCEDURE NAMES

Type	Name(s)
Standard user procedures:	A to Z
Autoplot procedure:	>
Startup procedure:	?
Shift functions:	! @ # $ % ^ & * ( )

All user procedures have a name, which must be a letter from A to Z, or one of the following characters:

> ? ! @ # $ % ^ & * ( )

User procedures are defined by typing the Define Procedure command (**DP**) followed by the one character name of the user procedure, followed by the commands you want to have included in that procedure.

For example, lets set up user procedure C to set 1 window, clear it, and turn the Autoplot feature off. Enter

DP;C

then enter

NW;1;CW;A−

Command description:

DP;C	*Define user Procedure C*
NW;1	*set Number of Windows to 1*
CW	*Clear selected Window (i.e., window 1) (Remember that NW;1 results in window 1 being selected automatically)*
A−	*turn Autoplot feature off*

Note that **DP** ; C could have been entered on the same line with the rest of the procedure if the C was followed by a semicolon. Pressing ⟨Enter⟩ after **A−** is what tells the program that you are finished defining the procedure; the procedure itself (everything from **NW** through **A−**) must be on one line, separated by semicolons.

Now, execute user procedure C by entering

XP;C

Command description:

XP;C	*eXecute user Procedure C*

Your monitor will show one blank window when the procedure has finished executing. You can execute any type of user procedure with the **XP** command, including the Startup and Autoplot procedures.

Suppose that you now decide that you want user procedure C to set and clear 2 windows instead of one. That is easy to do using **EP**, the Edit Procedure command.

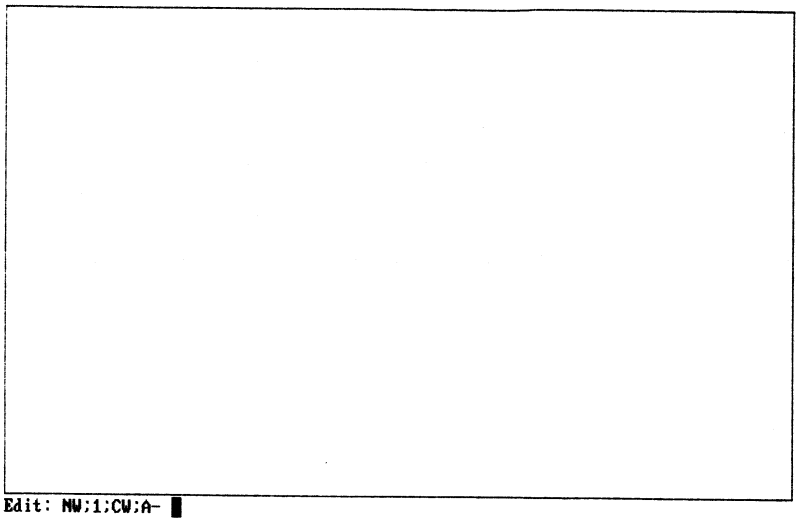
To edit user procedure C, enter

EP;C

Command description:

EP;C	*Edit user Procedure C*

Your monitor will look like Figure 3-25. The procedure is displayed on the command line, so that you can edit it using the normal input line editing described in the General Information Section.



EDITING A USER PROCEDURE
FIGURE 3 – 25

Edit the procedure to read as follows:

NW;2;SW;1;CW;SW;2;CW;A –

Command description:

NW;2	*set Number of Windows to 2*
SW;1	*Select Window 1*
CW	*Clear selected Window (i.e., window 1)*
SW;2	*Select Window 2*
CW	*Clear selected Window (i.e., window 2)*
A –	*turn Autoplot feature off*

When you have finished editing the procedure, just press ⟨Enter⟩.

Next, execute the procedure and plot price bars on window 1 by entering:

XP;C;SW;1;PB

Now, as to the method of changing the Startup and Autoplot procedures. They are treated just like user procedure C above, except that the name of the Startup procedure is ? (that is, a question mark), and the name of the Autoplot procedure is > (that is, a greater-than sign). Thus, to change the Startup procedure, just type **DP**;?; followed by the commands you want, followed by ⟨Enter⟩. (Note that the main difference between **DP** and **EP** is that **DP** clears the old user procedure.)

The last type of user procedure is that which can be executed either by name or by pressing a function key while holding down the ⟨Shift⟩ key. The names of these procedures correspond to the characters on the top row of number keys. In other words, shift function 1 is associated with !, shift function 2 with @, shift function 3 with #, etc.

User procedure ! will execute when you press ⟨Shift⟩ + ⟨F1⟩ or when you enter **XP**;! and user procedure * will execute when you enter **XP**;* or press ⟨Shift⟩ + ⟨F8⟩.

When you buy the program, ⟨Shift⟩ + ⟨F5⟩ is defined as ***CW*** *(clear window). Clear window 1 (the selected window) by pressing ⟨Shift⟩ + ⟨F5⟩.*

Next, we'll redefine shift function 5 to turn Autoplot off, enter the symbol for IBM, then plot prices bars on window 1.

Enter

DP;%;A−;ES;IBM;SW;1;PB

Command description:

DP;%	*Define Procedure % (i.e., shift function 5)*
A−	*turn Autoplot feature off*
ES;IBM	*Enter Symbol for IBM*
SW;1	*Select Window 1*
PB	*plot Price Bars on selected window (i.e., window 1)*

The Autoplot feature must be turned off whenever you execute this procedure (or any procedure that contains an **ES**, **CE** or ***E** command). If the Autoplot is on, the above procedure will execute through **ES** ; IBM, and then the Autoplot procedure will execute. After Autoplot has executed, the program will complete procedure %.

Press ⟨Shift⟩ + ⟨F5⟩ to execute the procedure. IBM price bars will be plotted on window 1, just as the procedure defines.

*Reset shift function 5 back to **CW** by entering*

DP ; % ; CW

Command description:

DP ; %	*Define Procedure % (i.e., shift function 5)*
CW	*Clear Window*

There is one more command we'll mention in this section: the **??** command, which displays all the other charting commands on the command line. After entering **??**, use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the commands until you find the one you want. Then just press ⟨Enter⟩ to execute it, or ⟨Esc⟩ to return to the command mode.

Enter

??

*then scroll through the commands using the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ until you find the **MM** command, then press ⟨Enter⟩.*

As you can see, the **MM** command returns you to the Main Menu. You could alternately press ⟨Alt⟩ + ⟨F5⟩ if you prefer.

In this part of the tutorial, we have discussed many of the commands available in the Charting module. However, there are many more still: plotting commands including several volume indicators, relative strength plots, oscillator plots, regression lines, trading bands, and more; and control commands that let you set the range of the vertical and horizontal axes, print all user procedures on your printer, view numerical price and volume data on the command line, include variables in your user procedures, repeat a user procedure for a List of securities, and more. If you want to use the full power of this program, read through the "TECHNICAL Charting" chapters in the Reference Section for a complete description of all available commands.

DEFINING A DATA FILE

Now that you know how to chart data for a security that is on your data disk, let's learn how to set up a data file for a new security.

On the Main Menu, move the filled-in block to the "Data" subcategory under "TECHNICAL", and press ⟨Enter⟩.

To create a file for a new security, just enter the symbol of that security at the "Enter symbol: " prompt. The program will search the directory for a technical file using that symbol. If none is found, you'll be asked if you want to create a file for that symbol. If you answer yes, you'll be asked for some information about the security.

As an example, let's define a file for Citicorp (CCI).

Enter

CCI,S

as the symbol, and your monitor will look like Figure 3-26. Next, press ⟨Y⟩ when asked if you want to create a new file.

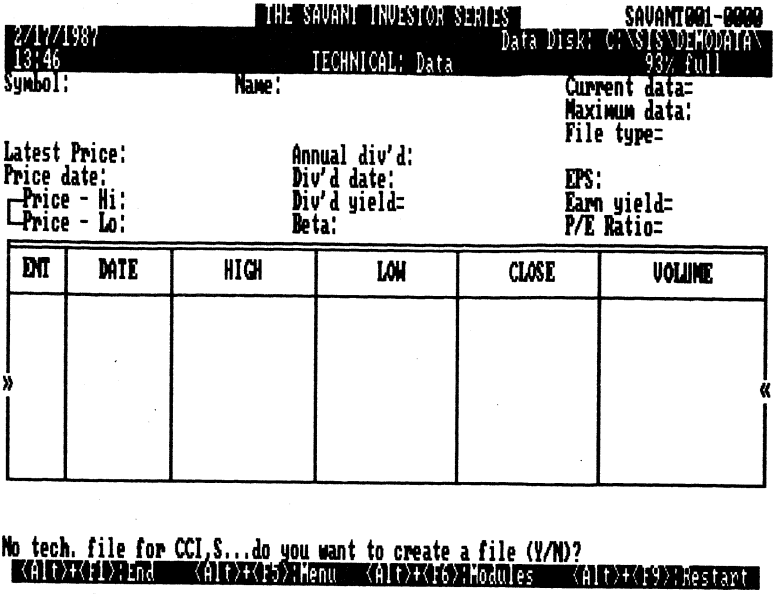
Note: if you exclude the security type, the program will search the directory for any technical file with a symbol that matches. If it does not find one, it will assume that you want to create a file with the security type S (for stock). If you want to create a file for any other security type, you should include the security type with the symbol, as we did for CCI,S.

If you plan to do automatic updating of prices by telephone, the symbol you enter for a security must be the one used by the databases, which is usually the same symbol used by the exchanges. The program will accept symbols up to 8 characters long; symbols can contain letters, numbers, and the following characters:

\+ - . % / * _

Next, enter the name of the security when asked:

Citicorp



DEFINING A DATA FILE
FIGURE 3–26

Next you'll be asked to set the maximum number of entries in the file. This is the maximum number of entries that will be stored in the file; once you have this much data the program will automatically begin deleting the oldest data to make room for the new. You can change this number at any time. For more details, see "TECHNICAL Data: Creating New Data Files" in the Reference Section.

For this example, set the maximum number of entries to 250 (roughly the number of trading days in a year) by entering

250

Last, you'll be asked for the file type. This is a number which tells the program how many items you want to store for each entry. For example, if you want to store the high, low, and closing price, and the volume for each entry (the normal information for stocks traded on the NYSE, the AMEX and many other exchanges), that is a type 1 file. If you only want to store a bid price, an asked price, and volume for each entry, that is a type 22 file.

A detailed explanation of file types can be found in "TECHNICAL Data: Creating New Data Files" in the Reference Section. For now, note that type 1 will always work. We recommend that you use type 1 until you become familiar with the program and the various database services.

Because we want to store high, low, close, and volume data for Citicorp, enter

1

for the file type.

When you press ⟨Enter⟩ for the file type, the new file will be defined and added to your data disk. If you press ⟨Esc⟩, you'll be returned to the command mode and the file will not be defined.

To return to the Main Menu, press ⟨Alt⟩ + ⟨F5⟩.

UPDATING PRICES BY TELEPHONE

(If you don't have a modem or don't plan to do any updating by telephone, you can skip to "ENTERING STOCK SPLITS" below.)

If you are using a dual floppy disk system, replace the "Program Disk" with the "Communications Disk". Then move the filled-in block to the "Price" subcategory under "COMMUNICATIONS", and press ⟨Enter⟩. If you are using a fixed disk system, just go ahead to the "Price" subcategory and press ⟨Enter⟩

The program will next ask you which database you want to use for the update. Those databases for which you have entered passwords will be highlighted.

Enter the letter corresponding to the database you want to use.

Next, if your printer is off or not connected, you'll be warned and requested to press ⟨Esc⟩ to continue. If your printer is ready, no message will be displayed.

Next, as shown in Figure 3-27, you'll be asked for the symbols of the securities you want to update. The request can be answered four ways:

1. If you want to check the data of just a few securities, enter the security symbols, separated by blanks:

   RCA XON GE

   If a security for which you are requesting a price is not on the data disk, you can request a price anyway; it will not be stored on your disk, but it will be included in the update summary report. When the security is not on your data disk, you must follow the symbol with a comma and the security type. For example

   RCA ALBN,S F,S XON

   will fetch the latest data for Ford (F) stock and Allied Bancshares (ALBN) stock whether or not they are on the disk, and for RCA and Exxon (XON) assuming they are on the data disk. See "COMMUNICATIONS: Price" in the Reference section for more information.

ENTERING SYMBOLS FOR A PRICE UPDATE
FIGURE 3 – 27

2. If you update the same group of securities often, but don't want to update every security on the data disk each time you update this group, you can create a List of these securities and enter the List name. (Creating a List will be covered later in this tutorial.) For example,

   #LIST1

3. You can enter multiple List names and/or symbols separated by spaces. For example:

   #LIST1 IBM,S XON #LIST2 RCA

4. If you want to update the data for all the securities on your data disk, just press ⟨Enter⟩.

For this update, enter

IBM XON F,S GM GE

Next, you'll be asked if you want daily, weekly or monthly data (that is, the high, low, close and average daily volume for each day, week or month). Enter D, W, or M to choose daily, weekly or monthly, or just press ⟨Enter⟩ for daily data.

Press ⟨Enter⟩ to indicate you want the most recent prices available on the database.

You will now be asked to enter the number of days of data you want retrieved. (If you had asked for a weekly or monthly update, you would have been asked for the number of weeks or months of data, respectively.)

1. If you want just the latest prices, press ⟨Enter⟩, or enter a 1.

2. If you want historical data, there are several ways to request the data. Once your database is established, the most common way will be to enter a question mark (?), which tells the program to determine how much data is required to bring your files up-to-date. Alternatively, you could enter the number of calendar days, weeks or months as requested. See "COMMUNICATIONS Price" in the Reference Section for more information. The maximum data you can request depends upon the database you are using. See "Appendix D: About the Databases" for details.

Press the ⟨Enter⟩ key to retrieve the latest prices only.

Next, if in the System Parameters section you indicated that you are using an acoustic coupler, the program will pause, allow you to dial the phone, then ask you to press ⟨Enter⟩ after you hear the computer tone and have put the telephone handset in the coupler.

If you have an acoustic coupler, dial your database access phone number, put the handset in the cradle when you hear the computer tone, then press ⟨Enter⟩. If you have a "smart"-type modem, you don't have to do anything.

From here on the program takes over. It will connect with your database, give the appropriate commands and password and request data for the securities you want updated. You can follow what is happening by watching your monitor.

When all the data have been retrieved, the program will hang up the phone, then update the prices on your data disk for those securities for which quotes were retrieved. Because you did a latest price update, a summary report of the latest prices and volumes will be printed on your printer.

The last column of the summary report includes flags (one-letter codes) which warn you of the following:

D	this stock went ex-dividend today (Dow Jones database only)
E	check this security for a possible error due to transmission problems
H	this security price is at or above its high price flag
L	this security price is at or below its low price flag
S	check this security for a possible stock split because the price dropped by 20 percent or more since the last update

Note that the S flag is included since the databases do not include information in the price files telling you when a stock has split. When you see this flag, check if the stock actually split or whether it just had a major drop in price. If it split, adjust the data on your disk(s) for the split by following the procedure in the next part of the tutorial.

The E flag is an indication of possible noise on the transmission line. You should see the E flag rarely if ever, since the program attempts to filter out most noise. If you do see an E flag, it means you should check the line of data closely. If you do see an error, correct it manually in the "TECHNICAL Data" module using the editing feature discussed earlier, or just repeat the telephone data retrieval for that specific security.

After the summary report is finished printing, you will be asked if you want to do any more updates; if you answer no, a statistical summary of the securities you updated will be printed, after which you'll be returned to the Main Menu. If you answer yes, you'll be returned to the beginning of the "COMMUNICATIONS Price" module for another update. If you had requested historical data, the program would skip the summary report and statistical summary. Note that the phone is hung up after each update, so you will not be billed by the database for the time between updates.

Before we leave this part of the tutorial, let's do one more update and retrieve a year of daily data for the file we created earlier, Citicorp.

Press ⟨Y⟩ saying that you do want to do another update. When you are told to insert the new data disk, just press ⟨Enter⟩ to indicate you want to use the same disk. Then enter the letter corresponding to the database you want to use for this update.

In response to the request for symbols or a List name, enter

CCI

Next, press ⟨Enter⟩ to request daily data, and enter

365

for the number of calendar days of data you want.

Note: Whenever you request more than the latest price for a symbol (that is, more that 1 day of daily data, 1 week of weekly data, etc.), you must have previously defined a file on your data disk for each security for which you are requesting data. If such a file has not been defined, the symbol will be ignored and the data will not be retrieved.

If you are not sure how much data you need to bring your files up-to-date, you can enter a ? (instead of a number) when asked for how many days, weeks, etc., of data you want. If you do this, the program will determine the last day of data in the file for each symbol you entered, then retrieve just the data necessary to update each security. You should avoid using the ? when you know you just want the latest price.

Press ⟨N⟩ when asked if you want to do another update and you'll be returned to the Main Menu.

ENTERING STOCK SPLITS

If you are using a dual floppy disk system, replace the "Communications Disk" with the "Program Disk".

When a stock split or stock dividend occurs, you can have THE TECHNICAL INVESTOR adjust your data files for you.

From the Main Menu, move the filled-in block to the "Data" subcategory under "TECHNICAL" and press ⟨Enter⟩ to access this feature.

To adjust for a stock split, all you need do is enter the symbol of the stock to be adjusted, choose the appropriate functions keys (Housekeeping - ⟨F9⟩, then Stock Split - ⟨F1⟩), enter the split, then enter the date the split was effective.

For example, let's adjust the Banc One data for a 3 for 2 split that occurred on December 15, 1982.

First, enter the symbol of the security we are working with:

ONE

Next, enter

12/15/82

and notice the price range change that occurred on December 15, 1982.

Now, press ⟨F9⟩ to access the area where several different housekeeping functions reside.

In addition to adjusting for stock splits, the "Housekeeping" section includes routines to delete security files, and move and copy security files from one disk to another. (*Never* use the DOS commands to delete or copy individual security files; the program will not function properly if you do. See "TECHNICAL Data: Housekeeping" in the Reference Section for more information.)

Press ⟨F1⟩ to execute the stock split/stock dividend adjustment routine.

Next you'll enter the split or stock dividend in the form normally used: 3 for 4 (for a 3 for 4 split) or 5% (for a 5% stock dividend — the percent sign or the letters pct must be included).

Referring to Figure 3-28, for Banc One's 3 for 2 split, just enter

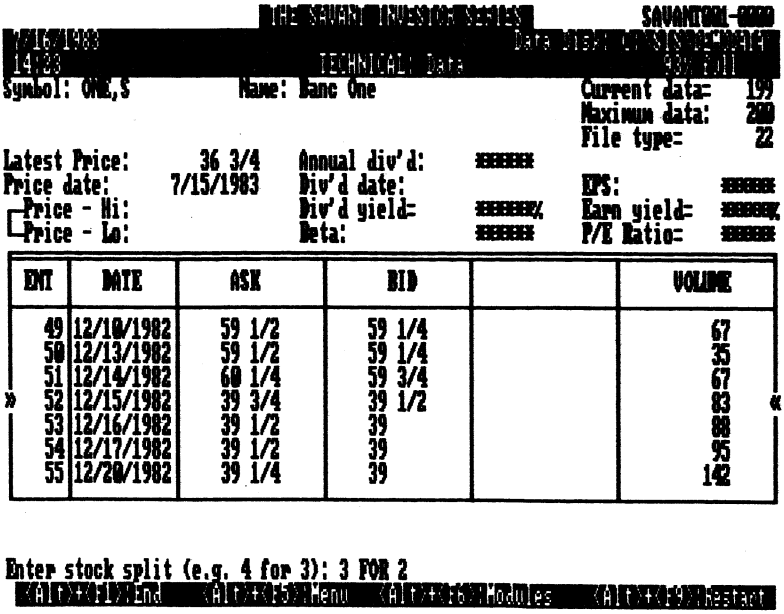
3 FOR 2

The next question asks for the date the stock split was effective: all prices and volumes before (but not including) this date will be adjusted for the split.

For our example, enter

15 December 1982

or any other valid form of this date.



ENTERING A STOCK SPLIT
FIGURE 3 – 28

Finally, confirm that the split information was properly interpreted by pressing ⟨Y⟩ when asked. If you made a mistake, pressing ⟨N⟩will give you the chance to re-enter the information.

As usual, you can press ⟨Esc⟩ to abort the procedure anytime up to the point you actually answer this last question. After that, it is too late, and to correct an error you would have to go back and do the exact opposite split for the same days (e.g., do a 1 for 2 with the same effective date to correct an erroneous entry of a 2 for 1 split.)

When the adjustment for the split is completed, you'll be returned to the Housekeeping command mode. Note that the data on your screen has been adjusted.

Press ⟨Enter⟩ to return to the Technical Data command mode, and ⟨Enter⟩ again if you want to look at the data for another security.

When you are ready, press ⟨Alt⟩+⟨F5⟩ to return to the Main Menu.

CREATING A LIST OF SECURITIES

If you are using a dual floppy disk system, replace the "Program Disk" with the "Startup/Main Menu Disk".

In many places in THE SAVANT INVESTOR SERIES, when you are asked to enter company symbols, you also have the option of entering a List name instead. For example, if you have a group of companies for which you plan to update prices often, it is much easier to define them as a List, rather than type them all in for each update. You can also use Lists in the "TECHNICAL Charting" module to repeat a sequence of plots for all the securities in a List; see the **RE** command description for more information.

For example, suppose you want to check on five of your securities several times during the trading day, but only want to update all of them once a day. A List will make the task easier by allowing you to enter the one List name each time you check on the prices, rather than entering all five security symbols each time.

In this section of the tutorial, we'll look at how to create a securities List.

To enter the List module, type ML while viewing the Main Menu. Once the module is loaded, your monitor will display the names of all the Lists presently on the data disk (see Figure 3-29).

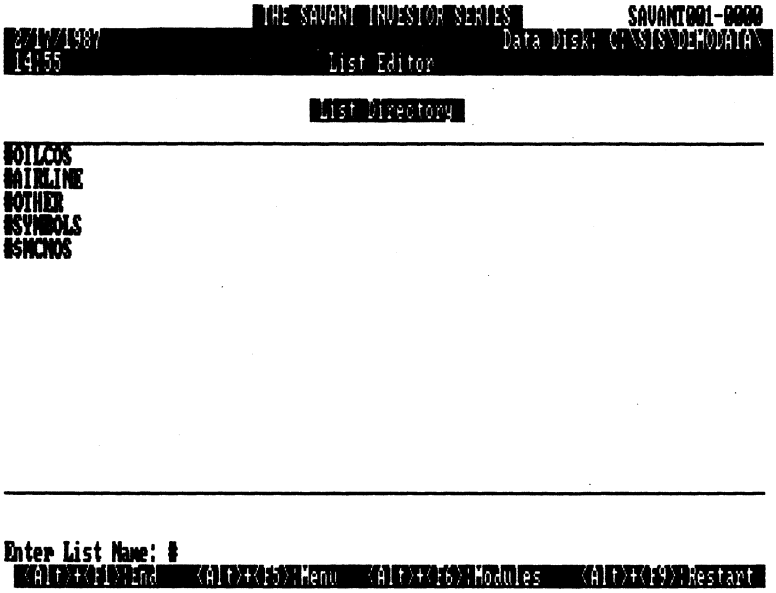
The first thing you'll be asked for is the name of the List you want to work with. All List names start with a # (pound or number) sign. As a reminder, the pound sign is written for you when you are creating or editing a List. You must remember to include it any other time you use a List. If you forget, the program will think your List name is a security symbol.

Including the # sign, List names may be up to 8 characters long, and may contain letters or numbers.

For this example, enter the name

#TESTING

If you make a mistake, use the editing features described in "Editing Input Lines" in chapter 2 to correct the name, or press ⟨Esc⟩ to abort the command and return to the List command mode. After you have entered the List name, answer Y to the question "List not found . . . do you want to create one (Y/N)?".



CREATING A LIST OF SECURITIES
FIGURE 3 – 29

Next, enter the security symbols for the List, one at a time. Continue entering symbols until you are through, then press ⟨Enter⟩ once to return to the command mode. Press ⟨Enter⟩ again to save the List; alternatively, press ⟨Esc⟩ and the List will not be saved.

For this example, enter each of the following:

TX
XON
IBM
TXN
GE
F,S

When you are finished, press ⟨Enter⟩ to indicate you are through adding symbols, then ⟨Enter⟩ again to save the List.

You've now created a List with these 6 securities in it. Should you later want to retrieve prices on these securities, you can enter #TESTING (instead of all 6 symbols) when you tell the program which symbols to update.

The security symbols on a List do not have to be included in the files on your data disk *if you will only be using the List to retrieve the latest prices.* If the securities in your List are already on your data disk, the program will look up the security type and enter it for you. However, if the security is not on your data disk, you must follow the security symbol by a comma and the security type. If you do not enter a security type for a symbol which is not on your data disk, you will be prompted to enter it.

Now return to the Main Menu using a slightly different method: instead of pressing ⟨Alt⟩ + ⟨F5⟩, press ⟨Alt⟩ + ⟨F6⟩. Instead of going directly to the Main Menu, you'll be asked for the code of the module you want to go to. Each module in the program has a code, as explained in chapter 2. For now, use the code for the Main Menu: MM.

Press ⟨Alt⟩ + ⟨F6⟩, then enter

MM

to return to the Main Menu.

CLOSING NOTES

You've now completed the introductory tutorial for THE TECHNICAL INVESTOR, and you should be familiar enough with the program to begin using it to analyze your investments. Nevertheless, we strongly suggest that as you become comfortable with the program, you take the time to read through the Reference section to learn more. You'll get the full benefit from THE TECHNICAL INVESTOR only if you understand its capabilities in detail.

A few notes before you go on:

Fixed disk systems

You can store data in any directory or subdirectory on your fixed disk. (See your DOS manual for more information on how to use directories.) The SETUP routine stored the sample data in a subdirectory of SIS called DEMODATA (\SIS\DEMODATA). You can use the Main Menu command DD to change or create new data directories. We are going to create a directory called \SIS\DATA in which to store your own data.

While viewing the Main Menu, press the ⟨D⟩ key twice. The current data directory will be presented on the command line for editing. Change the data directory to:

C:\SIS\DATA

and press ⟨Enter⟩. You will be told that the directory does not exist and asked if you want to create one. Press ⟨Y⟩ to create the new directory.

All data files you create now will be stored in the \SIS\DATA directory. *To avoid losing valuable data, get into the habit of backing your data files up often*; see the **BA** command in "4. The Main Menu: Main Menu Commands" for more information.

Floppy disk systems

Remember to make backup copies of your data disks often. From personal experience, we can guarantee that somehow, someday you'll spill coffee on a disk, misplace it, or the power to your computer will fail just as the program writes to the disk (which may ruin all the data on it), and so on. To avoid losing valuable data, get into the habit of backing up your disks, and back them up often.

Next, a note about switching data disks: THE TECHNICAL INVESTOR is designed so that you can use multiple data disks if you want. There are specific times when you should switch disks, though. If you change disks at some other time, you run the risk of destroying the data on one or both disks, or at least causing the program to "bomb".

To avoid any problems, a simple rule to remember is that you can change disks:

- anytime you are viewing the Main Menu
- anytime that you are being asked to enter a security symbol
- whenever the program prompts you to insert or remove a data disk

We strongly recommend you do not remove or change data disks at any other times, and *never* when the disk drive is operating.

Finally, a comment on using THE TECHNICAL INVESTOR with other programs in THE SAVANT INVESTOR SERIES. While it is not necessary for you to do so, to realize the full benefits of integration you must keep all of your data — fundamental, technical and portfolio — on the same floppy disk or in the same directory on a fixed disk.

When you have finished the tutorial and are ready to exit the program, press ⟨Alt⟩ + ⟨F1⟩.

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4. THE MAIN MENU

PROGRAM SETUP

Some programs in THE SAVANT INVESTOR SERIES can be run from either a dual floppy disk system or a fixed disk system; others require a fixed disk. In either case, before you use the program the first time you must follow the SETUP routine as described in the first part of the tutorial ("Setting Up the Program"). The SETUP routine copies the program to your fixed disk and determines the following information about your system:

Data disk drive/directory

Video adapter card and monitor

Monitor colors and cursor style

You normally will use the SETUP routine only when you first setup the program on your computer or when you get an updated version of the program from Savant. However, if you change the video adapter card, monitor or program drive, you will need to re-initialize your program by running the INSTALL routine. INSTALL will re-initialize the information shown above and set the key disk drive (used only by copy-protected programs) to drive A.

To run INSTALL, do the following for your type of system:

Fixed disk system

With the fixed disk prompt showing next to the blinking cursor, make sure you are in the SIS subdirectory by entering

CD\SIS

Then

INSTALL

After running INSTALL you must use the Main Menu **DD** command (described later in this section) to set the data path for your system.

Dual floppy disk system

With the DOS prompt A) showing next to the blinking cursor, put the "Startup/Main Menu Disk" in drive A. Then enter

INSTALL

After you run INSTALL, you should start the program and save the new system parameters on each "Program Disk", "Communications Disk" and "Startup/Main Menu Disk" you are using; see "The Main Menu: System Parameters" later in this chapter for more information.

RUNNING THE PROGRAM

Fixed disk system

With the fixed disk prompt showing, enter the following (end each line by pressing the ⟨Enter⟩ key):

```
CD\SIS
SIS
```

Floppy disk system

With the A⟩ prompt showing, put the "Startup/Main Menu" disk in drive A and the data disk in drive B. Enter

```
SIS
```

Prior to reaching the Main Menu, the program checks to see if the date set in your system appears to be current. If it is not, you will be required to enter a new date and time before the Main Menu will appear. The IBM personal computers use 24-hour "military" time, so if it is after 12 noon, you need to add 12 to the hour when you enter the time: 5:00 pm, for example, is entered as 17:00.

Note: Make sure that any new (unused) floppy data diskettes not supplied by Savant are "formatted" before you use them the first time. If you do not know how to format floppy diskettes, see the Format command in your DOS manual for instructions.

MAIN MENU COMMANDS

The Main Menu is the same for all the programs in THE SAVANT INVESTOR SERIES. All of the features of each program can be accessed through the Main Menu.

The simplest way to execute a program from the Main Menu is to use the cursor control keys to move the filled-in block to one of the subcategories (one of the squares labeled with lower-case letters), then press ⟨Enter⟩. This will execute that module of the program if it is installed. The cursor control keys will only move the filled-in block in a direction along which there is a logical path; any other instructions will be ignored.

Note: On floppy disk systems, the correct diskette must be in the default drive (usually drive A) for a particular module to execute. If it is not, you will get an error message asking you to insert the correct diskette.

An alternate method of accessing the modules from the Main Menu is to type the two letters describing the module you want to execute, then press ⟨Enter⟩. The two letters are the first letter of the major category, and the first letter of the subcategory. Thus, to execute the "COMMUNICATIONS Price" module, you can type CP, then press ⟨Enter⟩. Or to execute the "FUNDAMENTAL Analyze" module, enter FA. The filled-in block will jump to the appropriate location once you type the second letter.

Other functions can be accessed from the Main Menu that are not visible on your monitor. A menu of these miscellaneous commands can be found by moving the filled-in block to the block marked "Misc." in the lower center part of your display monitor. (You do not have to display this menu before executing these commands.)

The commands are executed by pressing the appropriate keys as described below. The letters are not displayed as you type them. If you are not sure which key(s) you have pressed, just press ⟨Esc⟩ to clear whatever you've typed, then restart. Invalid two-letter commands are ignored.

The Main Menu commands are:

BA BAckup data/support files

This command applies only to fixed disk systems. If you are storing your data on a floppy diskette, use the DOS Diskcopy command to back up your data files.

The **BA** command backs up all files in the data path, including technical, fundamental, and portfolio files and Lists, and all support files (e.g., system parameters, user procedures, Master Catalog equations, etc.). Before you begin the backup procedure you need to have enough floppy diskettes to hold all of the data and support files. These diskettes should either be blank or contain unimportant data; all existing information on the backup diskettes will be erased.

To back up your data/support files, press the ⟨B⟩ key and then the ⟨A⟩ key. The program will ask what floppy drive to backup files to, where drive A is the default. Press ⟨Enter⟩ to use drive A or enter any other floppy disk drive letter. Then the program will prompt you to insert the first backup diskette and press ⟨Enter⟩. You can also enter F if you want to first format the backup diskette.

If all of your data/support files fit on one diskette, you will be returned to the Main Menu after the backup is complete.

If more than one diskette is required, you will be prompted for the additional diskette(s). Number the diskettes as they are used, because to restore the files you must insert the diskettes in the same order. When the backup is complete you will be asked to reinsert the first backup diskette and press ⟨Enter⟩. This marks the diskette that the backup has been successfully completed. *You will not be able to restore your data/support files unless the backup is completed, including this final step.*

Note: You will not be able to restore your data/support files if any one of the backup diskettes becomes unusable. To help protect yourself from this eventuality, we strongly recommend that you keep several sets of backup diskettes and rotate them each time you do a backup.

DA display/change the DAte

When you press the ⟨D⟩ key and then the ⟨A⟩ key, the date to which the computer's internal calendar is set will be displayed. You may change the date and press ⟨Enter⟩, or press ⟨Esc⟩ to keep the old date. Some computer systems will remember any changes you make here even if you turn the computer off. Others require the date to be reset each time you boot the computer.

DD display/change the Data Drive/directory

When you press the ⟨D⟩ key twice, the current data disk drive and/or directory is displayed on the command line. You may change it to any legitimate DOS path as described in your DOS manual. If the directory you enter does not exist, the program will ask if you want to create the directory. If you answer yes, the directory will be created on your fixed disk.

Note that using the **DD** command to change the data directory is identical to changing it in the System Parameters module. On a floppy disk system, you must use the System Parameters module to change the data disk drive; see "The Main Menu: System Parameters" later in this chapter if you are using a floppy disk system.

If you are storing data on floppy diskettes rather than a fixed disk, you can switch data disks anytime you are viewing the Main Menu screen.

ML Make List

When you press the ⟨M⟩ key and then the ⟨L⟩ key, the List module will be loaded. The List module is discussed later in this chapter.

RE ReStore data/support files

The **RE** command restores the files backed up with the **BA** command. Data files will be restored to the current data path, regardless of what the data path was when the backup was made. Note that after the **RE** procedure is completed, your data files, Lists, user procedures, etc. will be *exactly* as they were when the backup was made.

To restore the data/support files, press the ⟨R⟩ key and then the ⟨E⟩ key. The program will ask what floppy drive to restore from. Press ⟨Enter⟩ to use drive A, otherwise enter the letter of the drive you want to use. Then the program will prompt you to insert the first backup diskette and press ⟨Enter⟩. The program will restore the data and support files, prompting you for additional backup diskettes, if any, as they are needed. When the operation is complete you will be returned to the Main Menu.

Note: Data and support files cannot be partially restored; *once you begin the restore operation, you must complete it.* If any one backup diskette in a set should become unusable, you must restore from a *different set* of backup diskettes.

SP System Parameters

When you press the ⟨S⟩ key and then the ⟨P⟩ key, the program will tell you to press ⟨Enter⟩ if you want to change the systems parameters. The System Parameters module is discussed in the following section.

TI display/change the TIme

When you press the ⟨T⟩ key and then the ⟨I⟩ key, the time to which the computer's internal clock is set will be displayed on the command line. You may change the time and press ⟨Enter⟩, or press ⟨Esc⟩ to keep the old time. Some computer systems will remember any changes you make here even if you turn the computer off. Others require the time to be reset each time you boot the computer.

One last Main Menu command: ⟨Alt⟩ + ⟨F1⟩ will exit the program and return you to DOS.

SYSTEM PARAMETERS

This section of the program lets you select certain features that will make the program work with your hardware, and will set up certain defaults for program operation. Putting it another way, this section personalizes the program for you and your system.

Most of the features you set in this part of the program remain constant once selected; most likely you won't change them again unless you acquire new hardware, or one of your database passwords changes, etc.

To invoke this section, press the ⟨S⟩, then the ⟨P⟩ key (for System Parameters) while viewing the Main Menu. Press ⟨Enter⟩ to confirm your choice.

The System Parameters section of the program is set up such that you can make as many changes as often as you wish during each session. None of the changes you make will be saved until you tell the program to do so by pressing the ⟨F10⟩ key. In other words, if you end the session by returning to the Main Menu *without* pressing ⟨F10⟩, *none* of the system parameters will be changed.

The system parameters you can change are broken into several different areas, each of which is accessed by pressing a function key.

Each area is organized in the same manner: when you press the function key, you'll see the system parameters as presently defined displayed on the screen. Near the bottom of the screen will be a yes/no question, asking if you want to change any of the parameters displayed. If you do not want to change any of them, just press ⟨N⟩ and you'll be returned to the main system parameters screen.

If you want to change anything, press ⟨Y⟩, and the cursor will jump to the top item in the displayed list. Edit or type in a new value for the item, then press ⟨Enter⟩, or just press ⟨Enter⟩ to leave that item unchanged and move on to the next item.

Continue through the list until you reach the end, or until you have pressed ⟨Enter⟩ after the last item you want to change. At this point you can press ⟨Esc⟩ to bypass the rest of the items, or just press ⟨Enter⟩ enough times to finish the list.

You'll be asked again if you want to make any changes. Press ⟨N⟩ if you are through with this screen, or ⟨Y⟩ if you want to go back and change something else.

It is not always possible to perform validity checks on your entries. While the program can check some values, it is not possible to check such things as your database password, telephone numbers, etc. So be careful to enter things properly.

Remember to save any changes you make by pressing ⟨F10⟩ before you exit the module. If you are running the progam on a floppy disk drive, you must save the system parameters on each program disk, including the "Startup/Main Menu Disk" and "Communications Disk", for each program you have in THE SAVANT INVESTOR SERIES. Place each program disk in the program disk drive (usually drive A) and press ⟨F10⟩ for each one.

Return to the Main Menu by pressing ⟨Alt⟩ + ⟨F5⟩.

Each of the System Parameters sections is described below:

⟨F1⟩ Select Printer and Modem

This area is used to tell the program what kind of printer you have, the printer device number, the number of lines per page, and so on.

Printer type

When the cursor is on this line, the names of the currently-supported printers will appear on the right side of the monitor. Select the printer type that matches your printer, and enter the number just to the left of the appropriate printer name.

If your printer type is not shown, then select "Other". For this case, no control codes other than form feed are sent to the printer.

Note: whenever you change the printer type, then press ⟨F10⟩ on the main system parameter screen, the print screen function for graphics will be disabled. To enable the print screen function again, you must exit to DOS and restart the program. *This is necessary only if you plan to use the print screen routines in the charting module of THE TECHNICAL INVESTOR.*

Printer device number

The IBM personal computers allow you to have up to three printers at once hooked up to your machine. If you have more than one, enter the number of the printer you want to use. (If you have only one, it is usually defined as printer number 1; try 1 first, and if the program will not print anything, then try 2, then 3.)

If you are familiar with IBM personal computers, this number is the same as the logical device number for the parallel ports: 1 is LPT1:, 2 is LPT2:, and 3 is LPT3:.

Printed lines per page

You can print a maximum of 66 lines on an 8½ by 11 inch piece of paper. However, a few lines are usually left blank to provide margins at the top and bottom of each printed sheet. If you are using a different size paper or prefer different margins, enter the number of lines to be printed here.

Form feed option

The only valid entries here are Y and N (for yes or no). If you enter Y, a form feed will be issued at the end of each report. If you enter N, the printer will space up 5 lines at the end of each report. Both N and Y result in the same printed output.

In either case, you must properly set your printer's "top of form" to the appropriate line on the paper. Generally, the "top of form" will be properly set if you position the paper to where the first printed line should appear on the page, and then turn your printer off and back on again. See your printer manual if you need more information.

Modem type

When the cursor is on this line, the names of the currently-supported modems will appear on the right side of the monitor. Select the modem type that matches your modem, and enter the number just to the left of the appropriate modem name.

The acoustic modem is a general class of modems where you must manually dial the phone and place the telephone handset into the modem. No commands are sent or received between the computer and modem.

(Note: All supported modems must be set to return English word result codes, also called verbose replies. See your modem manual for instructions.)

Comm device number

Since the IBM personal computers are capable of supporting two communications devices at once, this is the number of the communications device you want to use. If you only have one device, the correct choice is usually 1, though if your modem doesn't work using 1 as the choice, try 2.

If you are familiar with IBM personal computers, 1 is equivalent to choosing serial port COM1:, and 2 is equivalent to choosing COM2:.

Number of redial tries

Sometimes when you telephone your database, the line will be busy or there will be no answer. When this happens, the program will try calling repeatedly until a connection is made, or until the maximum number of redial tries is reached. If you specified an alternate telephone number (discussed later under databases), then each redial try will alternate between the two numbers. If you did not specify an alternate number, then the primary number will be tried repeatedly. Normally, 3 is a reasonable value: if the database is not reached in 3 tries, you should try again later.

⟨F2⟩ Select Monitor

Several types of monitors and video adapter cards can be used with THE SAVANT INVESTOR SERIES programs:

- The IBM monochrome adapter has 640 x 350 resolution for text, but no dot graphics capability. It must be connected to an IBM Monochrome Display ("IBM Personal Computer Display"). The monochrome adapter will work with each module of THE SAVANT INVESTOR SERIES except for the Charting module of THE TECHNICAL INVESTOR, which requires dot graphics.

- The IBM Color Graphics Adapter (CGA) has dot graphics and text capability in 640 x 200 resolution. It may be connected to a composite or RGB color monitor. The CGA card, even when attached to a color monitor, will *not* do multi-color charting in the "TECHNICAL Charting" module.

- The IBM Enhanced Graphics Adapter (EGA) has both text and dot graphics capabilities. It may be attached to any of the following monitor types:

  IBM Enhanced Personal Color Display (640 x 350 resolution)
  IBM Monochrome Display (640 x 350 resolution)
  RGB color monitor (640 x 200 resolution)

  The EGA card, when attached to a color monitor, will do multi-color charting in the "TECHNICAL Charting" module. In order to get the full 16 possible colors on the Enhanced Personal Color Display, the Enhanced Graphics Adapter must have at least 128k total installed memory.

- The IBM Video Graphics Array (VGA) has both text and dot graphics capabilities in 640 x 480 resolution. It may be connected to an IBM 8505 monochrome monitor, or an IBM 8512 or 8513 color monitor. The VGA card, when attached to a color monitor, will do multi-color charting in the "TECHNICAL Charting" module.

- The IBM Mult-Color Graphics Adapter (MCGA) has both text and dot graphics capabilities in 640 x 480 resolution. It may be connected to an IBM 8505 monochrome monitor, or an IBM 8512 or 8513 color monitor. The MCGA card, even when attached to a color monitor, will *not* do multi-color charting in the "TECHNICAL Charting" module.

Adapter card #1

Choose the number corresponding to the type of video adapter card you have in your system. If you have two video adapter cards, enter the number of the graphics-capable card here.

Monitor #1

Choose the number corresponding to the type of monitor attached to Adapter card #1.

Adapter card #2

If you have two video adapter cards in your system, select the number corresponding to the second adapter card. If you only have one card or do not wish to use adapter card/monitor #2, enter zero.

Monitor #2

Choose the number corresponding to the type of monitor attached to Adapter card #2.

⟨F3⟩ Select Disk Drives

This area allows you to select the drive and/or directory for the data and also the "key" disk drive for copy-protected programs.

Data disk drive (path)

Enter the disk drive and/or directory where the data will be stored. For a fixed disk system, you may use any legitimate DOS path as described in your DOS manual. For a dual floppy disk system, the data drive will usually be drive B. (Note that this parameter can also be changed using the Main Menu **DD** command.)

Key disk drive

This is the drive that will contain the key disk which unlocks a copy-protected program. The key disk drive is usually drive A. If you have more than one program in THE SAVANT INVESTOR SERIES and have a fixed disk system, Savant can personalize a key disk that works with all the programs.

Fixed disk

The valid responses to this question are Y or N (for yes or no). Answer Y if you will be using a fixed disk.

⟨F4⟩ Select Number Form

This area allows you to set the form in which security prices and dates are displayed, both on your screen and in printed reports. You can also choose between American and European style date display.

Whatever you select here has no effect on the internal handling of numbers or the accuracy of calculations. This selection only affects the manner in which numbers are displayed.

Smallest fraction size

This question refers to the smallest fractional increment that will be displayed. As received, the program is set to round all displayed fractions to the nearest 1/16. However, you may choose fractions between 1/64 and whole numbers as the smallest increment. When the cursor is at this line, a list will appear at the right side of the screen. Enter the number corresponding to the desired fraction.

Number of decimal places

This selection determines the number of decimal places that will be displayed: all decimal numbers will be displayed rounded to the number of places chosen. As received, the program is set to display 2 decimal places. You may choose any number from 0 to 4. Enter the appropriate number.

You should be aware that price data is rounded to the nearest 1/256 when stored on disk. Thus, numbers displayed may sometimes differ slightly in the third and fourth decimal place from the values you entered. Fundamental data is stored rounded to 5 significant digits.

Date convention

This parameter refers to the style in which dates are input and output. 1 is American style, where dates are written month/day/year. 2 or 3 are identical, and refer to the European/Australian/Japanese style, where dates are written day-month-year. Enter the number corresponding to the manner in which you want to enter and display dates.

In the program, you can tell which form is being used by looking at the delimiter: dates written with slashes (xx/xx/xx) are American style, while dates written with dashes (xx-xx-xx) are European style.

All decimal numbers are written American style (commas separating thousands, and a decimal point separating units from fractions) regardless of the setting of this parameter.

Display format

This parameter applies to THE TECHNICAL INVESTOR only. It determines how security prices will be displayed on the monitor and in reports. Normally, you will choose 0 for default, which will use whatever format is normal for each security type. If you want all prices to be displayed in the same format, regardless of the security type, you can choose 1 for decimal display or 2 for fractional display.

⟨F5⟩ Select Colors

If you have a color monitor, you may select the color scheme you desire for your text displays. Default colors will be set if you choose a color monitor in the monitor section.

At each line, a list of available colors will appear on the right side of the screen. Select the desired color by entering the number to the left of your choice. The color of the screen will not change until you return to the previous menu by answering N to the question at the bottom of the screen (Any changes (Y/N)?).

Foreground color

This is the color of most of the text that appears on your screen. If you were writing with a pen, this would be analogous to your ink color.

Background color

This is the color of the screen behind the text characters, analogous to the color of the paper used when writing with ink of the foreground color.

Border color

This is the color is the border that appears around the edge of your screen. The amount of space here (and the quality of the color) may vary depending on the type and quality of your monitor.

Highlight color

This is the color of the text when highlighted for emphasis. Highlighting is normally used to indicate some action required

on your part; e.g., input lines and error messages are highlighted. The highlight color should be a color distinctly different from the foreground color that shows up well on the background color.

Blink color

Blinking text is used occasionally for special emphasis or effects. This is the color of the blinking text.

⟨F6⟩ Select Cursor Style

Some people prefer large cursors, some just an underline. This area allows you to set the size of the cursor. The cursor size is automatically set when you select the monitor type (see "⟨F2⟩ Select Monitor" in this section). If you want to change the cursor size, do so after you have selected the monitor type.

The cursor is set by defining the lines which will be on. If you are using a 640 x 200 resolution monitor, the cursor has 8 lines, numbered 0 at the top to 7 at the bottom. Thus, starting at line 0 and ending at line 7 results in a full size cursor, while starting at line 7 and ending at line 7 results in a single line cursor. Similarly, on 640 x 350 resolution monitors, the cursor is numbered 0 at the top and 13 at the bottom. (For the 640 x 200 resolution monitors, numbers larger than 7 will be divided by 8, and the remainder used as the cursor line number.)

Cursor start position

This is the number of the first line that you want illuminated.

Cursor stop position

This is the number of the last line that you want illuminated.

⟨F7⟩ Select Database Parameters

The first thing you'll be asked for is the database you want to use. Type the letter next to the database. (Databases for which you have already entered passwords will be highlighted.)

Several databases are supported by THE SAVANT INVESTOR SERIES. In order to use any of these you must obtain a password as described in "Appendix D: About the Databases". The information you need to access each database is very similar and will be discussed together.

Direct lines to the databases are provided in some cities, but most access is through a third party Connection Service (also known as a packet switcher) such as Tymnet or Telenet. This service provides a link between your telephone and the actual database. Many cities have more than one service available and, sometimes, several telephone numbers for each service. Be sure that the information you enter here is consistent; that is, the telephone number, baud rate and connection service must all match. The program cannot validate this for you.

Telephone number

This is the telephone number that you want to use to connect to the database. This will usually be the number of the connection service and will be given to you by the database company when you get your password. If you are familiar with your modem's dialing commands, you may include them on this line.

Baud rate

This is the speed at which your modem will communicate with the database. The value will depend on the type of modem you have and capabilities of the local connection service you use. Normally this will be either 300 or 1200 baud. 300 baud means that about 30 characters per second are sent over the phone lines. 1200 baud means that about 120 characters per second are sent. Thus, 1200 baud means you can send and receive data in one quarter of the time compared to 300 baud. Even though you usually have to pay a premium for using 1200 baud, the premium is usually less than 4 times the 300 baud cost. So besides being much faster, 1200 baud is usually also cheaper to use.

In some cities, a connection service will provide both 300 and 1200 baud service. Sometimes this is through the same telephone number and sometimes through different telephone numbers. Be sure that the value you enter here matches the phone number you entered above. Valid entries are 300, 1200, or 2400.

Connection service

When the cursor is on this line, a list will appear on the right side of the screen listing the connection services available. Choose the service that matches the telephone number entered previously by entering the number to the left of the desired service.

The following is a brief description of the connection services presently supported by THE SAVANT INVESTOR SERIES.

TYMNET TELENET UNINET	These are third party services available throughout the US.
DATAPAC	This is a third party service similar to the above but available throughout Canada.
DOWNET	This is a direct link to Dow Jones that is available in some cities.
CABLE	This is a cable TV link to Dow Jones that is available in some cities. If you choose this service, you do not need to enter a telephone number, but you must enter the appropriate baud rate (300, 1200 or 2400).
DIRECT	This is a direct link to the database that is sometimes available.
MANUAL	This provides for manual log on via any service. This is mainly provided to allow access through future services not otherwise supported. Details on how to use the manual log on are provided under "COMMUNICATIONS Terminal" in the Reference section.

Other connection services may be added in the future.

Alt. telephone no.
Alt. baud rate
Alt. connection srvc.

These are alternates to the items above and are optional. If you have more than one telephone number for connecting to the database, you should enter the telephone number, baud rate and connection service for the alternate. In the event that the primary number does not answer or is busy, the alternate will be automatically dialed. (See the "⟨F1⟩ Select Printer and Modem" section above.)

Password

The password and user ID for each database you use must be entered here. Enter it exactly as given to you. Do not add or delete any spaces or other stray characters. Make sure the password is correct before you press the ⟨Enter⟩ key to enter it, because it will not be displayed. If you do make a mistake, you will have to re-enter the entire password. If you are not sure about the correct way to enter the password and user ID, see "Appendix D: About the Databases".

⟨F10⟩ Save Changes

Pressing ⟨F10⟩ will save any changes you have made in the system parameters. If you exit this module without pressing ⟨F10⟩, any changes you made will not be saved and the system parameters will be exactly the same as they were when you entered the module.

If you have more than one program disk, you can save the new system parameters on each by simply inserting the appropriate program disk into the program disk drive and pressing ⟨F10⟩. You may repeat this for any number of program disks. When you save the system parameters on other program disks, the present state of all system parameters will be saved on each disk, not just those changed in this session.

LISTS

The List module allows you to create a symbol or Master Catalog item List. These Lists can be used in many ways throughout THE SAVANT INVESTOR SERIES. If you regularly update one or more groups of securities, you will probably find that Lists are very helpful: you can just enter the name of the List and all securities in the List will be updated.

Accessing the List Module

You access the List module the same way, whether you are going to create a new List or edit an existing one. The Lists are stored in the data directory or disk, so you must have the correct disk in your data disk drive (or fixed disk path selected) prior to entering the List module.

To access the List module, while viewing the Main Menu press the ⟨M⟩ key and then the ⟨L⟩. When the module is loaded, the monitor will display the names of all the currently defined Lists on your data disk or directory. You will then be prompted to enter a List name.

Creating a List

All List names must start with a "#" sign. If the List is to contain Master Catalog item numbers, the second character must be a dollar sign ($) (see "Master Catalog Item Lists" below). All other characters in the List name must be letters or numbers. Including the # sign, List names can be up to 8 characters long.

When you enter a List name (note the # sign has been typed for you), the program will search the data disk for the List.

If the List is on your disk, the cursor will again appear at the lower left of the monitor, asking you to issue one of the displayed commands. There are only two choices: ⟨F1⟩ to edit the List, or ⟨F2⟩ to delete it. If you press ⟨F2⟩ (and confirm your choice by pressing ⟨Y⟩ when asked), the List will be removed from your data disk, and you'll be returned to the beginning of the module and asked for a List name. If you press ⟨F1⟩, you'll be put into the "Edit List" command mode.

If the List is not on your data disk, you'll be asked if you want to create a new List with that name. If you answer ⟨N⟩, you'll be returned to the beginning of the module and asked to enter another List name. If you answer ⟨Y⟩, you'll be put directly into the ⟨F1⟩: Add List Members mode described below.

Editing an Existing List

You can tell when you are in the "Edit List" mode by the prompt

Edit List
command?

When you see this prompt, you can issue the commands described below:

⟨F1⟩: Add List Members

Press ⟨F1⟩ to add members (either security symbols or Master Catalog items) to the List. The symbols must be legal symbols as described in "Some Preliminary Information: Security Symbols" in this manual. Catalog items (used with THE FUNDAMENTAL INVESTOR only) are entered as their Master Catalog number. A List must contain all symbols or all catalog numbers; you cannot mix the two.

You'll be prompted to enter the new List members, one by one. Each time you press ⟨Enter⟩, the member will be added to the List on the display, and you will be asked for another. You can enter up to 1000 members in each List. When you've finished, press ⟨Enter⟩ once more to return to the "Edit List" command mode.

Instead of a symbol, you can also enter a List name when asked for a member. If you do, the program will add the entire contents of the List whose name you enter to the List you are editing. Any duplicate members will be detected and only entered once. You'll be warned if the total number of members exceeds 1000, and allowed to either fill the List to 1000 (ignoring the extra members), or cancel the command and not add any of the members.

⟨F2⟩: Delete List Members

Press ⟨F2⟩ to delete members from the List. When prompted, enter the symbol or the Master Catalog number of the item you wish to delete; it will disappear from the displayed List and you will be returned to Edit List mode. You must enter the security type to delete a symbol.

⟨F3⟩: Alphabetize

Press ⟨F3⟩ to put the List into alphabetical order.

⟨9/PgUp⟩ and ⟨3/PgDn⟩: Page Up and Page Down

Use these keys to page through Lists that won't all fit on one display page.

⟨Enter⟩: Save Changes

To save the edited List and return to command mode, press ⟨Enter⟩, then press ⟨Enter⟩ again and you'll be returned to the beginning of the List module.

⟨Esc⟩: Abort Edit

To *not* save the changes you made in this session, press ⟨Esc⟩ and you'll be returned to the beginning of the List module.

Master Catalog Item Lists

Lists of catalog item numbers (for use with THE FUNDAMENTAL INVESTOR only) can be created using the List module. The procedure is exactly the same as creating security symbol Lists with the following exception: the second character in the List name must be a dollar sign ($). For example

#$NEW or #$TOP

Other than this, just enter numbers instead of security symbols into the List. Master Catalog item Lists can be used when creating new fundamental data disks and when retrieving fundamental data with your modem.

More About Lists

You can enter the special List name #ALL any place a security List is a valid entry. This is equivalent to entering all the securities in your data directory or floppy disk.

Any place a security List is a valid entry, you can also enter a List name followed by a comma and the security type. For example, if you have a List named #RESULTS, then entering

#RESULTS,B

is equivalent to entering a List containing only the bonds in #RESULTS.

In the COMMUNICATIONS modules, when updating prices or adding one List to another in the "Add List Members" mode, you can follow a List name with a < = or > = and then a letter. This will allow you to only use members of the List which begin with certain letters of the alphabet. For example, #RESULTS,S< = F is equivalent to entering a List containing only the stocks in #RESULTS with a symbol begin with the letters A through F.

Lists are stored on your data disk in files which are named X.LST, where X is the List name without the # sign. You can use the DOS Copy command to copy individual Lists from one disk to another. You can *not* use the DOS Copy command to move any other individual files on your data disks; see "Appendix E: Merge Utility" for information on how to move other files.

When you have finished creating, editing and deleting your Lists, press ⟨Alt⟩ + ⟨F5⟩ to return to the Main Menu.

5a. TECHNICAL DATA

To execute this module, move the filled-in block on the Main Menu screen to the "Data" subcategory under "TECHNICAL" (or type TD), and press ⟨Enter⟩. When the Data module is loaded, the prompt

Enter Symbol:

will be visible on the command line.

At this point you can create a new data file (see "Creating New Data Files" below) or you can work with an existing data file (see "Viewing and Editing Existing Data Files" later in this chapter). Before we describe these two operations, however, a couple of general notes:

Changing data disks

THE TECHNICAL INVESTOR can store data on as many floppy disks as you want. Each floppy disk can store data for up to 100 securities, while a fixed disk subdirectory can have as many as 2500 data files. You can change floppy data disks whenever the "Enter Symbol: " prompt is visible on the command line. Just remove the current disk from the data disk drive and replace it with the new data disk. Do not change data disks at any other time while you are in the "TECHNICAL Data" module. If you want to start a new (additional) floppy data disk, just put a blank, formatted disk in the data disk drive. The program will take it from there.

Notes about Savant data files

Savant data files are stored in a compressed file format that stores information more efficiently than other file formats. THE TECHNICAL INVESTOR maintains a master directory file in each subdirectory or on each floppy data disk. This master directory file contains information necessary for the proper operation of the program.

Never use DOS commands (i.e., delete, erase, or copy) to delete or copy individual Savant data files. If you do, the master directory information will not be updated to reflect the changes and the program will not function properly. See "Housekeeping" later in this chapter for information on how to move, copy, or delete individual data files.

You can, however, copy an *entire* data disk or directory to a *blank* disk or directory. We encourage you to do so often to backup your data files. See the Diskcopy command in your DOS manual for information on copying floppy disks. See the **BA** command in "4. The Main Menu: Main Menu Commands" for information on backing up data from a fixed disk directory.

CREATING NEW DATA FILES

This section tells how to create a technical data file for a stock or other security. Before you set up a data file you should decide how much data you want to save, and what type of data you want to store. For example, do you want to save 500 daily entries consisting of the high, low, close and volume. Or will 100 weekly entries containing just the close and volume suffice.

THE TECHNICAL INVESTOR will store almost any type of data in a file: daily, weekly, monthly, or any other period longer than a day. (THE TECHNICAL INVESTOR just stores one entry for each day, even though you can retrieve prices as many times a day as you wish.) You can also store any combination of daily, weekly or monthly data.

Security symbols

Before you setup a new data file, you will have to decide what security symbol to use. You can use any valid symbol as described in "General Information: Security Symbols". Remember that the symbol includes a one-letter security type. The following notes should help you decide what security type to use:

- The security type is considered part of the symbol. This allows you to use the same symbol with different security types. For example, IBM,S is a completely different symbol from IBM,K.

- The security type decides whether the security's prices will be displayed as fractions or decimals on the monitor and in reports. The following table shows how the prices are displayed for each security type. The prices will be displayed in this manner unless you tell the program otherwise (see "The Main Menu: System Parameters" for information on how to change the price display mode).

- Types X, Y, and Z are general purpose types, and can be used for whatever data you may wish to keep. These three security types (and any type not shown in the above table) can not be automatically updated by modem from the databases (the symbols will be ignored). You may enter data manually or from your own text or DIF files with the auxilliary program THE TECHNICAL DATABRIDGE™ (call or write Savant for more information).

DISPLAY MODE FOR SECURITY TYPES

Security	Type	Display
Bonds	B	Fraction
Commodities	C	Decimal
stocks (montHly prices)	H	Fraction
Market Indices	I	Decimal
stocks (weeKly prices)	K	Fraction
Mutual Funds	M	Decimal
Options	O	Fraction
Stocks (common, preferred)	S	Fraction
Treasury Issues	T	Fraction
Warrants	W	Fraction
User Defined	X	Decimal
User Defined	Y	Decimal
User Defined	Z	Fraction

- Each security type will accept numbers from 0 to 8,838,607 in the volume field and from 1/256 to 32767 in the price field. Security types I, X, Y and Z will also accept numbers from −32767 to 0 in the price field.

- Security types K and H are equivalent to type S except during updating with your modem (see "COMMUNICATIONS: Prices" for details). When using databases that support this feature, type K will automatically retrieve weekly data and type H will automatically retrieve monthly data.

- Option symbols may vary among the different database services. For example, some databases put a hyphen or a space between the company symbol and the option code. Security type O allows you to omit the extra character and use the same symbol for each database. For example, using security type O you would use HONKL in place of HON − KL or HON KL. This allows you to use one symbol for several databases. If you want to use the actual database symbol, use security type S.

- Letters other than those shown as valid security types in the above table will be accepted, but we recommend you not use them for technical data files; they are reserved for use with other programs in THE SAVANT INVESTOR SERIES.

Defining a New Data File

To define a data file, enter the new symbol at the "Enter Symbol: " prompt. After you enter the symbol, the program will search the existing technical data files. If a file does not exist for that symbol, the program will ask if you want to create a new file. If you do not include a security type with the symbol, the program will assume type S (stocks). If you answer yes, you'll be prompted for the following information:

Security Name

The name can be up to 20 characters long and can be abbreviated in any way you desire. In fact, you can put anything here you want, since the name is used only for identification in tables, listings, etc. If the symbol is already being used for fundamental or portfolio data, the name will be taken from the existing data and this question will be skipped.

Maximum Entries

This is the maximum number of entries which you want to store for this security. The number you enter as the maximum is used to reserve space for that many entries in the file. Doing this makes sure there will always be room on the disk for the maximum number of entries, and it improves program performance by keeping files from becoming fragmented.

When you update prices manually or by modem, THE TECHNICAL INVESTOR *automatically deletes the oldest data* to make room for the newest if the current number of entries equals the maximum set here.

You can change the maximum number of entries anytime you wish. If you reduce the size of the file, enough of the oldest data will be deleted to get the file down to its new size. See "Editing the Header" later in this section for more information.

Type of File

It is customary to record three prices (high, low and close) and a volume for most securities. Sometimes you may wish to use other combinations. For example, if you are dealing with a market index, you may only need one price and a volume, or perhaps just a price or just a volume.

THE TECHNICAL INVESTOR allows for all of these possibilities. You can choose the type of data file you want to maintain for each security. The following table describes the valid file types. The column called "Labels" shows the labels that will appear on listings and printouts for the corresponding type. Type 2 and type 22 are identical except for the labels. Similarly, types 4 and 24, 5 and 25, and 6 and 26 are also related pairs.

DATA FILE TYPES

Type	Description	Labels
1	3 prices + volume	high/low/close/volume
2	2 prices + volume	high/low/volume
3	3 prices	high/low/close
4	2 prices	high/low
5	1 price + volume	close/volume
6	1 price	close
7	1 volume	volume
22	2 prices + volume	bid/ask/volume
24	2 prices	bid/ask
25	1 price + volume	price/volume
26	1 price	price

By choosing the appropriate type, you can save disk space and thus be able to put more information on a single disk. The following table will give you an idea of how much disk space is required for each file type:

APPROXIMATE NUMBER OF BYTES REQUIRED PER FILE

File type	100 entries	500 entries	1000 entries	15,000 entries
1	1480	7080	14,080	210,080
2, 3 or 22	1180	5580	11,080	165,080
4, 5, 24, or 25	880	4080	8080	120,080
6, 7, or 26	580	2580	5080	75,080

Until you become familiar with the program and the various database services, or if conserving disk space is not a problem, we recommend that you always use file type 1. Note that, *once a file is created, its type cannot be changed.** If you just press ⟨Enter⟩ when prompted for the file type, the program will assume a type 1 file.

Some securities and possible file types are shown below. You can use any file type for any security; these are just typical examples.

TYPICAL FILE TYPES

Security	File Type
Bonds	1
Commodities	1
Options	1 or 3
Market indices	1,3,5,6 or 7
Mutual funds	1,3, or 26
Stocks	1 or 22
Treasury issues	24
Warrants	1 or 22

After you have entered the file type, the data file will be created on your data disk. You will then be able to enter information as discussed below in "Viewing and Editing Existing Data Files". Press ⟨Enter⟩ if you want to return to the "Enter Symbol: " prompt.

Defining Several Files at Once

If you want to create several data files at once, you can enter a List name when prompted for a symbol. You'll then be asked for the maximum number of entries and the file type to be used for the files. A file will then be created automatically for each symbol in the List which doesn't already have a file. After the files are created, you can add the company name, dividend, etc. to each.

* unless you have THE TECHNICAL DATABRIDGE

VIEWING AND EDITING EXISTING DATA FILES

When you enter a symbol for which a data file is already defined, the data for that security will be displayed on your monitor. Remember to include the security type with the symbol if you have more than one type for that symbol.

If you don't remember what symbols are in that directory, you can enter a question mark (?) instead of a symbol. When you do, the first symbol, along with the security name, will be presented on the command line. You can scroll through all the securities by using the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys. When you get to the security you want to work with, just press ⟨Enter⟩.

Once you have entered a valid symbol, you are in "command mode"; that is, you can enter any of a number of commands using the function and other keys on the keyboard. You can tell when you are in command mode by the prompt

Enter ↑ , ↓ , No.
or date:

You return to the "Enter Symbol: " prompt by pressing ⟨Enter⟩ when in command mode, or by pressing ⟨Alt⟩ + ⟨F9⟩ anytime.

When you first enter a symbol, the latest data for that security will be displayed on the monitor. To view the rest of the data, you have three choices:

1. Use the ⟨8/up-arrow⟩, ⟨2/down-arrow⟩, ⟨9/PgUp⟩, ⟨3/PgDn⟩, ⟨7/Home⟩, or ⟨1/End⟩ keys to scroll through the data.

2. Enter the date of the data you wish to see. If there is no data for that date, the program will move to the entry nearest that date).

3. Enter the entry number of the data you want to see. For example, if you want to see the tenth entry's data, enter 10.

In addition to viewing the data, you can use the function key menu to do the following:

⟨F1⟩: Enter Data

To enter data, just press the ⟨F1⟩ key while in command mode; it doesn't matter what date is centered in the window. The first thing you'll be asked for is the date for the data you want to enter. Enter the date. (If you are entering data for today's date, you can just press ⟨Enter⟩).

If an entry already exists for the date you enter, you'll be asked if you want to replace the existing entry. If you respond with a ⟨Y⟩, the existing entry will be deleted and you'll continue by entering the new data. If you respond with a ⟨N⟩, you'll be returned to command mode.

If you enter a date for which no data presently exists, you'll be asked to enter the data, one by one, on the command line. Enter each value as requested. To abort the procedure, press ⟨Esc⟩.

When appropriate to the file type, THE TECHNICAL INVESTOR checks to see that the high is the highest number, the low the lowest and the close is in between. If you violate this principle, a message will appear at the bottom of the screen and you will be prompted to re-enter the data. Also, zero will not be accepted as a valid price for any security type (other than X, Y and Z).

(Though it is rare, it is possible for an ask price of a security to be less than the bid price, so this entry is allowed.)

⟨F2⟩: Edit Data

To edit data, move the entry you want to edit to the center (highlighted) line in the window, using any of the three methods described above. Then press the ⟨F2⟩ key.

Next, you'll be asked to enter a date. You can either press the ⟨Enter⟩ key to go on to the next value to be edited, or you can enter a corrected date. If you enter a new date, the program will move the entire entry from the old date to the new date, then allow you to continue editing the rest of the entry.

After changing the date, or just pressing ⟨Enter⟩, the program will move on and ask you to edit the next value in the entry (the high price in a type 1 file, or the ask price in a type 22 file, etc.).

By pressing ⟨Enter⟩ multiple times, you can skip to the value you want to edit. When you are finished editing, continue pressing ⟨Enter⟩ to move through the rest of the values in the entry. Or you can press ⟨Esc⟩ to abort the editing session and jump back to command mode. If you press ⟨Esc⟩, none of the edited values will be changed.

After you press ⟨Enter⟩ for the last value to be edited, you'll be returned to command mode.

⟨F3⟩: Edit Header

The header refers to the information about each security at the top of your display monitor (e.g., symbol, security name, etc.). You can edit this information whenever you are in command mode by pressing ⟨F3⟩. See "Editing the Header" later in this chapter for details on what each piece of information means and how it can be changed.

⟨F4⟩: Delete

To delete an entry, move the entry to the center of the window using any of the methods described earlier. Press ⟨F4⟩.

You'll be asked if you are sure you want to delete this entry. Pressing ⟨Y⟩ will delete the entry and return you to command mode. Pressing ⟨N⟩ or ⟨Esc⟩ will not delete the entry, and will return you to command mode.

⟨F5⟩: Print

To print data on your printer, make sure your printer is on, then press the ⟨F5⟩ key; it doesn't matter what is showing in the window. The first thing you'll see will say "Enter starting date or entry number:". Enter a date, and the listing will begin with the first date in the file that is on or after the date entered. Enter an entry number between 1 and the number of entries shown at the top of the screen as "Current Data", and the listing will start with that entry number. Or, just press the ⟨Enter⟩ key and the listing will begin with the first entry in the file.

Next, you will be prompted to "Enter the ending date or entry number:". Enter a date, and the listing will end with the last date in the file that is on or before the date entered. Enter an entry number, and the listing will end with that entry number. Just press ⟨Enter⟩, and the listing will go to the end of the file. If you enter an ending date or entry number that is less than the starting entry, no listing will occur.

Once the listing on the printer has begun, pressing ⟨Esc⟩ will cause the listing to stop and you will be returned to command mode. Otherwise, you will be returned to command mode when the listing is finished.

⟨F9⟩: Housekeeping

The "Housekeeping" functions include adjusting for stock splits, and moving, copying, or deleting data files. These functions are accessed by pressing ⟨F9⟩ and are explained in detail in "Housekeeping" later in this chapter.

EDITING THE HEADER

After pressing ⟨F3⟩ while in command mode, you are in the "Edit Header" mode, which you can identify by the prompt

Edit header
command?

At this point, you'll be shown the menu of items which can be edited. Press the function key corresponding to the item you wish to edit, and the appropriate old information will appear on the command line. Correct the information using the editing procedures described in "Editing Input Lines" in the General Information Section of this manual, then press ⟨Enter⟩.

Continue editing by pressing the appropriate function keys until you are through, then press ⟨Enter⟩ one more time to return to the Command mode.

Each item on the header is discussed further below. Refer to the previous section on "Defining a File" for descriptions of what is meant by security type, maximum entries, and the other headings listed.

⟨F1⟩: Symbol and Security Type

Occasionally a symbol will be changed by one of the exchanges or you may need to change the security type. To do this, press ⟨F1⟩ when in the "Edit header" mode. The old symbol and security type will be displayed on the command line. Edit it, then press ⟨Enter⟩.

⟨F2⟩: Name

To change the name assigned to a security, press ⟨F2⟩ when in the "Edit header" mode. The current name will be displayed on the command line for editing. Edit the name as you desire, then press the ⟨Enter⟩ key.

⟨F3⟩: Latest Price and Latest Price Date

This refers to the latest closing price (and the date of that price) entered for this security on this data disk, including the price stored for THE FUNDAMENTAL INVESTOR or THE INVESTOR'S PORTFOLIO data files. If there is no closing price for the file type, the average of the high/ask and low/bid price is displayed. If only one price is stored for the file type, then that price is displayed.

Normally, you will not need to change this, but if you do, just press ⟨F3⟩ when in the "Edit header" mode. First the latest price will be presented on the command line for editing. After you have edited the price and pressed ⟨Enter⟩, the latest price date will be presented on the command line for editing.

⟨F4⟩: Dividend

This refers to the annual dividend paid by a stock, or the annual interest payment for a bond. Press ⟨F4⟩ when in the "Edit header" mode to change this value. When you have finished editing the number, press ⟨Enter⟩.

⟨F5⟩: Dividend Date

This refers either to the last date on which a dividend was paid or to the ex-dividend date of the security (the last date on which you can buy the security and be entitled to the next dividend). To change this date, press ⟨F5⟩ while in the "Edit header" mode. Correct the date, then press ⟨Enter⟩.

⟨F6⟩: Price Flag - Hi

If your security should reach this price or above, you will be notified in both the latest price update summary report (by an "H" in the rightmost column — see "COMMUNICATIONS: Updating Prices" for more information) and whenever you select the security in the "Data" subcategory under "TECHNICAL" (by a flashing diamond near the price flag).

To change the high price flag, press ⟨F6⟩ when in the "Edit header" mode. Press ⟨Enter⟩ when you have completed editing the value.

To disable the high price flag function, enter zero for the price.

⟨F7⟩: Price Flag - Lo

If your security should fall to this price or below, you will be notified in both the latest price update summary report (by an "L" in the rightmost column) and whenever you select the security in the "Data" subcategory under "TECHNICAL" (by a flashing diamond next to the low price flag).

To change the low price flag, press ⟨F7⟩ when in the "Edit header" mode. Press ⟨Enter⟩ when you have completed editing the value.

To disable the low price flag function, enter zero for the price.

⟨F8⟩: Maximum Data

This refers to the maximum number of entries which will be saved in the file. To change this number, press ⟨F8⟩ when in the "Edit header" mode, edit the number to the new value you want, then press ⟨Enter⟩. You can reduce or increase the number at will, with the following conditions:

1. The largest file size is 15000 entries.

2. When you reduce the size of a file, enough of the oldest data is deleted to bring the number of entries down to the new maximum.

3. Reducing the size of a file requires that the file be rewritten to free up disk space no longer needed. Because of this, there may be a noticable delay when slightly reducing the size of large files. Also, if the file you are reducing in size is very large (about 15 years of daily data for a type 1 file), there may not be enough room on the disk to rewrite the file. If this should occur, an error message will be displayed. You can still reduce the size by using the Move File command in the Housekeeping section of the program: just move the file to another disk, reduce the size, then move it back.

⟨F9⟩: Beta

Beta refers to a measure of the price movement of a security relative to the price movement of the market as a whole. Values for beta can be found, among other places, in references published by Value Line and Standard & Poor's. Press ⟨F9⟩ when in the "Edit header" mode to change this value. When you have finished editing the number, press ⟨Enter⟩. (For detailed information about beta, see the American Association of Microcomputer Investor's Journal, V4, No.1, February 1982, pp. 26-30.)

⟨F10⟩: Earnings per Share

This refers to the annual earnings per share of the corporation. To change this value, press ⟨F10⟩ while in the "Edit Header" mode. After editing the value, press ⟨Enter⟩.

Other information in the header:

Current Data

Current data refers to the number of entries presently in the file. It can not be edited directly; rather, you must enter or delete entries.

File Type

File type refers to the type of data stored in each entry, and the labels used in the various reports in this program to describe that data. As noted in the previous section, the file type cannot be changed once you have defined the file, unless you have THE TECHNICAL DATABRIDGE.

% Dividend Yield

This ratio is automatically calculated by dividing the annual dividend by the latest price and multiplying by 100. It cannot be edited directly. Instead, the latest price and/or the annual dividend must be changed.

Price/Earnings Ratio

This ratio, usually called the P/E ratio, is automatically calculated by dividing the latest price per share by the annual earnings per share. It cannot be edited directly. Instead, the latest price and/or the earnings per share must be changed.

% Earnings Yield

This ratio is automatically calculated by dividing the annual earnings per share by the latest price per share and multiplying by 100. It cannot be edited directly. Instead, the latest price and/or the earnings per share must be changed. Note that this ratio is just the inverse of the P/E ratio expressed as a percentage.

Data Disk Drive or Path
XX.X% full

The top line refers to the currently defined data disk drive or fixed disk path. This can be changed while viewing the Main Menu (see "The Main Menu: Main Menu Commands") or in the System Parameters module (see "The Main Menu: System Parameters" for more information).

The second line (XX.X%) gives you an up-to-date look at the status of your data disk. It reports the percent of the total disk space currently being used by any type of file.

Date and Time

The present system date and time are displayed on the left side of the banner at the top of the monitor. American-style dates are displayed with slashes (/); European-style dates with dashes (-).

HOUSEKEEPING

The housekeeping functions are accessed by pressing the ⟨F9⟩ key when you are in command mode. This puts you in the "Housekeeping mode", which you can identify by the prompt:

Housekeeping
command?

The commands grouped under housekeeping include adjusting for stock splits and stock dividends; moving the data file from the present data disk to another data disk; making a copy of the data file on another data disk; and deleting the entire file from the data disk. Each command is discussed below.

⟨F1⟩ Split Stock

This command adjusts the data in the active security data file for stock splits. In order for historical prices and volumes to remain meaningful when a stock splits, the prices and volumes must be adjusted based on the amount of the split. For example, if a stock splits 2 for 1, then there are twice as many shares outstanding after the split as before, and thus the price per share is reduced by a factor of 2. Similarly, the volume would double for a constant dollar amount of trading.

This command adjusts the data in your file so that the prices and volumes before and after the split or dividend are continuous.

To invoke this command, press ⟨F1⟩ when in the "Housekeeping mode".

Note that a normal stock split is usually a ratio of two numbers, like 4 for 3, 2 for 1, etc. Stock dividends are usually given in percentage, like a 15% stock dividend. The command will accept either, but make sure you include %, pct, or percent when entering a stock dividend.

You will be asked to enter the stock split or dividend. The following are examples of the types of entries that are accepted for splits:

4 for 3
4/3

The following are examples of the types of entries that are accepted for stock dividends:

15%
15 pct
15 percent

Next you'll be asked to enter the date of the split. All data prior to this date will be adjusted.

Finally, you'll be given the opportunity to confirm the data you have entered; THE TECHNICAL INVESTOR will tell you the factor it is going to use to adjust the prices and volumes, and the number of entries it is going to adjust. For example, with a 5 for 4 split, the message would read:

Prices will be multiplied by .8 for the first XXX entries

(Note the corresponding message "Volumes will be divided by .8 for the first XXX entries" is not displayed.)

The .8 is arrived at by dividing 4 by 5, and XXX is the number of entries in the file prior to the date you entered. If this is correct, press ⟨Y⟩ for yes and the adjustment will proceed. If something looks wrong, press ⟨N⟩ for no and you can re-enter the information.

In order to maintain consistency with normal trading prices, adjusted prices (for security type S only) are rounded as follows:

Adjusted price greater than 1 —	nearest ⅛
Adjusted price less than 1 but greater than ¼ —	nearest 1/16
Adjusted price less than ¼ —	nearest 1/32

These rounded prices are stored in your file; prices will still be displayed on your screen rounded to the fraction you set in the "System Parameters" section.

⟨F2⟩ Move File

This command allows you to move the active security data file from one data disk to another. The program will move the file from the data drive to the destination drive as defined below. When this command has completed execution, the active data file will be on the new disk, and will be erased from the old disk.

Never move an individual data file using the DOS Copy command. THE TECHNICAL INVESTOR maintains its own directory on each data disk which contains information necessary to the proper operation of the program. If you use the DOS Copy command, this information will not be transferred, and the program will not function properly with the new data disk.

To invoke this command, press ⟨F2⟩ when in the "Housekeeping mode".

If you are using a dual floppy disk system, you'll be told to place the disk you are moving the file *from* into the data disk drive (it should already be there), and the disk you are moving the file *to* into the program disk drive. (This is one of the few times you will not have your program disk in the program disk drive.)

If you have told the program (in the System Parameters section) that you are using fixed disk, you'll be prompted for the destination drive and/or path.

Press ⟨Enter⟩ when you are ready to begin. For your reference, the entry number is displayed on the monitor as the data for the entry is moved from drive to drive. Note that once this process has begun, ⟨Esc⟩ will *not* abort the process. Do not open disk drive doors or turn the power off to your computer during this operation; if you do, you may lose all of the data on both disks.

When the move is complete, if necessary, you will be asked to replace the program disk. Do so, then press ⟨Enter⟩ to continue; you'll be returned to the beginning of the "Data" subcategory program and asked for a new symbol.

⟨F3⟩ Copy File

This command allows you to make a copy of the active security data file on another data disk; the data file will remain intact on the original disk. The program will copy the file from the data drive to the destination drive as defined below.

Never copy an individual data file using the DOS Copy command. THE TECHNICAL INVESTOR maintains its own directory on each data disk which contains information necessary to the proper operation of the program. If you use the DOS Copy command, this information will not be transferred, and the program will not function properly with the new data disk.

To invoke this command, press ⟨F3⟩ when in the "Housekeeping mode".

If you are using a dual floppy disk system, you'll be told to place the disk you are copying the file *from* into the data disk drive (it should already be there), and the disk you are copying the file *to* into the program disk drive. (This is one of the few times you will not have your program disk in the program disk drive.)

If you have told the program (in the System Parameters section) that you are using fixed disk, you'll be prompted for the destination drive and/or path.

Press ⟨Enter⟩ when you are ready to begin. For your reference, the entry number is displayed on the monitor as the data for the entry is moved from drive to drive. Note that once this process has begun, ⟨Esc⟩ will *not* abort the process. Do not open disk drive doors or turn the power off to your computer during this operation; if you do, you may lose all of the data on both disks.

When the operation is complete, if necessary, you will be asked to replace the program disk. Do so, then press ⟨Enter⟩ to continue; you'll be returned to the beginning of the "Data" subcategory program and asked for a new symbol.

⟨F4⟩ Delete File

This command allows you to delete the data file of the active security from the disk. If you no longer need the file, deleting it will make room for new, more useful data. To invoke this command, press ⟨F4⟩ while in the "Housekeeping mode".

Never delete a data file using the DOS Erase command. THE TECHNICAL INVESTOR maintains its own directory on each data disk, which contains information necessary to the proper operation of the program. If you use the DOS erase command, this information will not be correct, and the program will not function properly.

You will be asked to confirm that you want to delete this stock. If you want to proceed, press ⟨Y⟩ for yes. ⟨N⟩ or ⟨Esc⟩ will return you to the "Housekeeping mode".

Once the file has been deleted, you'll be returned to the beginning of the "Data" subcategory program and asked for a new symbol.

5b. TECHNICAL CHARTING

GENERAL INFORMATION

To enter the Charting module, move the filled-in block on the Main Menu to the "Chart" subcategory under "TECHNICAL", then press ⟨Enter⟩.

The Charting module offers you considerable plotting power and flexibility to help you interpret security data. The information contained in this section should be carefully studied so that you will understand how the Charting module operates.

The basis of technical analysis is that what has worked in the past will work in the future. But of course, there are no guarantees: sometimes methods that have been very profitable become unprofitable. Thus, even in the hands of experienced technical investors, these routines will not produce any guaranteed buy and sell signals. When investing, always use your good judgement and all of the information available to you.

Technical indicators

Included with the command description of many of the plotting commands is a theory section in which we present a brief overview of the technical indicator and some of the more common interpretations. Remember, as we said at the beginning of this manual: these charts are just tools to be used by a knowledgeable technical investor. It is not our purpose to teach the theories of technical investing in this manual. Rather, we hope just to give you an idea of how some of these tools are used. See "Appendix Y: References" for a list of investment-related literature.

Windows

Each chart is plotted on its own independently-controlled "window". From one to four windows may be displayed, and the number of windows displayed can be changed at any time. The program remembers what you have plotted on each window, even if that window is no longer visible.

Each window may consist of one or more plots for one or more securities. Charts may be swapped between windows, copied, or saved on disk for later recall.

Selected Window / Active Security

The window currently being used for plotting is referred to as the "selected window". You can always tell which is the currently selected window by looking in the lower right-hand corner of the display monitor. The number next to *Window:* indicates the currently selected window. The current window remains "selected" until a command is issued which selects another window.

The "active security" refers to the security currently being used for plotting on the selected window. Each window can have a different security assigned to it. Whenever you select a different window, the security associated with the new window automatically becomes the active security. If the new window does not have a security associated with it, the security for the previous window remains active. You can change active securities for the selected window at any time (see the **ES** command description for details).

User procedures

One of the most powerful features of THE TECHNICAL INVESTOR is the ability to define your own "user procedures". A user procedure contains a sequence of commands. If you generally plot data in a certain way, you can combine all of the commands needed to produce your typical plot into one or more procedures. User procedures can call other user procedures and can be assigned to function keys. As a result, pressing one key can perform very complex operations.

You can also set up a user procedure to execute automatically upon entering the Charting module (the "Startup" procedure), and a different user procedure to execute automatically after a security symbol has been entered (the "Autoplot" procedure). Because it can execute every time you enter a new symbol, it is important to understand the Autoplot feature: see the **A+/A−** command description for details.

Printing charts

You can print out an image of what is on your monitor at any time by pressing the ⟨PrtSc/✻⟩ key while holding down the ⟨Shift⟩ key, or by using the command provided (**PS**). Be sure that you have selected the correct printer in the System Parameters section (see "The Main Menu: System Parameters") before attempting to print anything.

CHARTING COMMANDS

The Charting module uses a two-letter command structure. Some of these commands you will use often, others hardly at all. We suggest that you review all available commands, so that you are aware of everything that THE TECHNICAL INVESTOR can do.

The Charting commands are divided into two types: control commands and plotting commands. Control commands are used to setup or control the environment in which the plotting commands work. Plotting commands do just what you'd think: they draw something on the monitor.

Commands are entered on the bottom line of the monitor, called the command line. Commands may be entered any time the prompt on the command line reads "Command: ". If you want to enter a command and the prompt does not read "Command: ", press ⟨Esc⟩ until the "Command: " prompt appears.

Arguments

Some commands require additional information, called arguments, to be entered after the two-letter command. Arguments for those commands which require them must be entered immediately after each command. You can enter just the command and be prompted for the necessary arguments at each step. Or, you can enter the command and each of its arguments on one command line. Semicolons(;) must be used between the commands and each argument to separate them from each other. Entered in this way, the entire command will then be executed immediately, with unnecessary prompts suppressed.

You can also enter several commands (with their arguments) on one command line and all will be executed immediately, with unnecessary prompts suppressed. Again, you must include all the necessary arguments for each command, separating them from the commands and each other with semicolons, before adding the next command.

Commands and arguments can be entered as upper- or lower-case letters. All commands are described in the form

XX ; x1 ; x2 . . .

where XX is the command, and x1, x2 and so on are arguments. Arguments are listed as follows:

d1, d2, etc. a date, such as 7/14/83 or any other acceptable form of the date

– or –

a positive number, representing an absolute entry number from the beginning of the file, where 1 is the oldest entry in the file, 100 is the 100th entry in the file, and so on. Note that as a special case, 0 will be interpreted to mean the *latest* entry in the file

– or –

a negative number, representing an absolute entry number from the end of the file, where −1 is the most recent entry in the file, and −100 is the 100th most recent entry in the file, and so on. Again, 0 will be interpreted as equivalent to the *most recent* entry.

You can enter any format for d1, d2 etc. The program will figure out which format you mean.

n1, n2, etc. a number of entries, such as 4 entries or 3 entries. In some cases, a direction as indicated by a plus or minus sign can be included (such as −3, meaning three entries back, or 5, meaning five entries forward).

p1, p2, etc. an absolute value for whatever is plotted on the vertical axis (normally price or volume) is required, such as 35 (for a price of $35) or 1200 (for a volume of 1200).

s1, s2, etc. a window number is required; 1, 2, 3, or 4 are the only possible legal entries. Sometimes the legal entries are limited to the number of windows set with the **NW** control command.

x1, x2, etc. some other value is required and will be explained in the command description.

Default conditions

When the command descriptions that follow refer to a "default" condition, it means the case in which no relevant command has yet been issued. For example, the **F** − command turns the price flags feature off, and the **F** + command turns it on. If neither the **F** + nor **F** − command has been executed, then the price flags feature will be assumed by the program to be off (**F** −). Thus, **F** − is the default condition for the price flags feature.

When you first select a window for plotting, several default conditions exist (which you can change if you desire). Unless otherwise instructed, the program will plot the most recent 250 entries, regardless of (whether the data is daily, weekly, or monthly. The horizontal axis will be plotted in calendar days and the vertical axis will be linear.

Commands that require arguments can be returned to their default setting (if one exists) by pressing ⟨Enter⟩ when being prompted for the argument.

Mathematical symbols

Some mathematical symbols are used when discussing equations used to calculate the indicators. For example, P_i represents the closing price on day i, H_i is the high price for day i, L_i is the low price for day i and V_i represents the volume on day i. P_{i-1} is the closing price on the day before day i. In other words, if day i is today, then day $i-1$ is yesterday and day $i-2$ is the day before yesterday, etc.

Command descriptions

The following tables summarize the commands available. There are also several other commands which you may notice being processed on occasion. These are internal commands and should not be used.

CONTROL COMMANDS

A+/A–	turn Autoplot on/off
AV	point and figure AdVance size
BR	point and figure BReakpoint
BS	point and figure Box Size
CA	Change Axes color
CB	Change Border color
CE	Clear screen and Enter symbol
CN	Change Next plot color
CO	Change color Order
CW	Clear Window
CX	Change teXt color
D+/D–	Dotted lines on/off
DD	Data Drive/directory
DL	Display Legend
DM	start Drawing Mode
DP	Define user Procedure
DW	Decrement Window
DY	set DailY mode
EP	Edit user Procedure
ES	Enter Symbol
F+/F–	Flags on/off
FL	FiLl user-equation buffer
G+/G–	Grid on/off
HD	Horizontal Default range
HS	Horizontal range Set
IW	Increment Window
KS	checK Status
L+/L–	allow Overlays on/off
LG	set LoGarithmic mode
LI	set LInear mode
MM	return to Main Menu
NA	display security NAme
NL	New Line
NP	New Page
NW	set Number of Windows
O+/O–	turn moving average Offset on/off
PA	PAuse
PP	Print user Procedures
PS	Print Screen
RC	Recall Chart
RE	REpeat
RP	RePlot
RR	Report Results
RV	point and figure ReVersal size
RW	Replicate Window
S+/S–	turn point & figure autoScaling on/off
SC	Save Chart
SL	point and figure ScaLe factor
SQ	set SeQuential mode
SW	Select Window
UP	Undo last Plot

CONTROL COMMANDS (cont.)

UV	Use Values for point and figure
V+/V–	fixed Vertical axis on/off
VS	Vertical range Set
VW	VieW data
XP	eXecute user Procedure
XW	eXchange Windows
******	clear/reset
***E**	clear/reset and Enter symbol
??	look at command menu

PLOTTING COMMANDS

CD	plot Cumulative Difference
CP	plot Closing Prices
DF	plot DiFference
DV	plot Daily Volume indicator
DX	plot Directional movement indeX
EA	plot Exponential Average
EQ	plot user EQuation
HL	draw Horizontal Line
HP	plot High/ask Prices
KD	plot stochastics oscillator
LN	draw LiNe
LP	plot Low/bid Prices
LR	plot Linear Regression
MA	plot Moving Average
NV	plot Negative Volume indicator
OB	plot On-Balance volume indicator
OS	plot OScillator function
PB	plot Price Bars
PF	plot Point & Figure chart
PR	plot Percentage Ratio
PT	plot Price volume Trend indicator
PV	plot Positive Volume indicator
RA	plot RAtio
RI	plot Relative strength Index (Wilder)
RL	draw speed Resistance Lines
RS	plot Relative Strength chart
TE	plot Trading band on Exponential average
TM	plot Trading band on Moving average
TW	plot Trading band on Weighted moving average
VA	plot Volume Accumulation
VB	plot Volume Bars
VL	draw Vertical Line
VP	plot Volume Points
WA	plot Weighted moving Average
WR	plot Williams percent-R

A−/A+ AUTOPLOT

Function:

A− Turn the Autoplot feature off
A+ Turn the Autoplot feature on

Structure:

A−
A+

Type: Control commands

Applies to: All windows

Description: The Autoplot feature is a special user procedure that executes automatically immediately after an enter symbol (**ES**) command has been executed. This is true even if the **ES** command is embedded in a user procedure: in such a case the Autoplot procedure will be executed after the **ES** command and before the rest of the user procedure. These two commands turn the Autoplot feature off and on.

The Autoplot feature defaults to off if has not been set.

Cautions: If plotting begins automatically after an **ES** command, even though you haven't set **A+**, check the Startup and other user procedures you've used to make sure they don't include an **A+** command.

Examples: To turn the Autoplot feature on, enter

A+

To turn the Autoplot feature off, enter

A−

Related Commands: Define user procedure (**DP**); enter symbol (**ES**); check status (**KS**)

AV — P&F ADVANCE SIZE

Function: Change the number of boxes required for an advance on point & figure charts

Structure: **AV** ; x1

Type: Control command

Applies to / Uses: All windows

Description: Normally, when a security price is moving upward an "X" is placed in each box as soon as it is reached. The **AV** command allows you to change this, so that x1 boxes are required before an X is placed. Similarly, for decreasing prices, the normal one box decline for plotting an "O" is changed to x1.

For example, after entering **AV** ; 2 an upward movement of two boxes is required before an X is plotted, or two boxes downward before an O is plotted. When the X or O is plotted, all of the boxes from the last one plotted to the new box are filled in.

The number of boxes required for an advance (upward or downward) is shown at the bottom of each point & figure chart when either one or two windows are displayed.

The new value applies to all point & figure charts plotted after the command is issued. Existing charts are not replotted.

Cautions: x1 must be between 0 and 99

Example: To set the number of advance boxes required to 3, enter

AV ; 3

Related Commands: Point & figure chart (**PF**); P&F reversal size (**RV**)

BR P&F BREAKPOINT

Function: Change the breakpoint for section x1 on the point and figure vertical scale to price p1

Structure: **BR** ; x1 ; p1

Type: Control command

Applies to: All windows

Description: As described under the **PF** command, the point and figure chart is setup with a vertical scale that has box sizes of ¼ point for prices less than 5, ½ point for prices between 5 and 20, etc. The **BR** command can be used to change where these breakpoints occur.

To change the breakpoint for the first section from a price of 5 to 2, enter **BR** ; 1 ; 2. After this command, prices less than 2 will have a box size of ¼ point and prices between 2 and 20 will have a box size of ½, etc.

The new breakpoint applies to all point and figure charts plotted after the command is issued. Existing charts are not replotted.

The following table shows the default settings. Note that the breakpoint for each section changes the upper price limit; the lower price limit is changed by the breakpoint for the previous section. Section 9 does not have a breakpoint because it has no upper price limit.

POINT & FIGURE DEFAULT CONDITIONS

Section	Price Range	Box Size
1	less than 5	¼
2	5 – 20	½
3	20 – 100	1
4	100 – 500	2
5	500 – 1000	5
6	1000 – 5000	10
7	5000 – 10,000	20
8	10,000 – 20,000	50
9	20,000 and above	100

The default conditions may be restored by pressing ⟨Enter⟩ when being prompted for the breakpoint (x1). In this case, the argument p1 is not required.

Cautions: x1 must be between 1 and 8. p1 must be between 1/32 and 32767

Note that the price you set as the breakpoint for section 2 must be greater than the price set as the breakpoint for section 1, and the price for the breakpoint of section 3 must be greater than breakpoint for section 2, etc.

Example: To change the breakpoint for section 3 to 80, enter

BR;3;80

Related Commands: Point & figure chart (**PF**); P&F box size (**BS**)

BS P&F BOX SIZE

Function: Change the box size in section x1 on the vertical scale of point and figure charts to x2

Structure: **BS** ; x1 ; x2

Type: Control command

Applies to / Uses: All windows

Description: As described in the **PF** command description, the point and figure chart has box sizes that vary along the vertical scale. The default chart has box sizes of ¼ point for prices less than 5, ½ point for prices between 5 and 20, etc. The **BS** command can be used to change these box sizes.

To accomplish this, the vertical scale is divided into nine sections as defined by the breakpoints (see the table with the **BR** command description). You may change the box size in any of these sections independently.

The new box size applies to all point and figure charts plotted after the command is issued. Existing charts are not replotted.

The table with the **BR** command description shows the default conditions. These default conditions may be restored by pressing ⟨Enter⟩ when being prompted for the section number (x1). In this case, the argument x2 is not required.

Cautions: x1 must be between 1 and 9. x2 must be between 1/256 and 5000

Example: To change the box size for section 7 to 15, enter

BS ; 7 ; 15

Related Commands: Point & figure chart (**PF**); P&F breakpoint (**BR**)

CA CHANGE AXIS COLOR

Function: Change the color of the chart axes

Structure: **CA**;x1

Type: Control command

Applies to: All windows

Description: This command changes the color of the chart axes on all subsequent plots. x1 refers to the color number described under the **CO** command.

Entering a 0 (zero) for x1 resets the default color.

This command is not affected by and does not affect the system parameter default colors.

Cautions: The color number must be 1 to 7 or 9 to 15.

This command requires a color monitor and the IBM EGA or VGA card in order to function as described above. If your system has the IBM CGA or MCGA card, this command changes the color of the entire display. See "System Parameters: Select Monitor" in the Reference Section of this manual for more information.

Example: To specify that the axes be shown in blue, enter

CA;1

Related Commands: Change border color (**CB**); change next plot color (**CN**); change color order (**CO**); change text color (**CX**)

CB CHANGE BORDER COLOR

Function: Change the color of the window borders

Structure: **CB**;x1

Type: Control command

Applies to: All windows

Description: This command changes the color of the window borders. x1 refers to the color number described under the **CO** command. It also sets the color of lines drawn with the **VL, HL, LN** and **DM** commands.

This command is not affected by and does not affect the system parameter default colors. The special case **CB**;0 (zero) resets the default color.

Cautions: The color number must be 1 to 7 or 9 to 15.

This command requires a color monitor and the IBM EGA or VGA card in order to function as described above. If your system has the IBM CGA or MCGA card, this command changes the color of the entire display. See "System Parameters: Select Monitor" in the Reference Section of this manual for more information.

Example: To change the color of the border to magenta, enter

CB ; 5

Related Commands: Change axis color (**CA**); change next plot color (**CN**); change color order (**CO**); change text color (**CX**); drawing mode (**DM**); horizontal line (**HL**); draw line (**LN**); and vertical line (**VL**)

CD CUMULATIVE DIFFERENCE

Function: Plot an n1 entry exponential average of the cumulative difference between the active security and security x1

Structure: CD;x1;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command is similar to the Difference (**DF**) command, except that instead of plotting the difference between the two securities for each date, the sum of the differences are plotted. The table below shows how the cumulative difference is calculated:

CUMULATIVE DIFFERENCE CALCULATION

	Active security price	Reference security price	Price difference (DF)	Cumulative difference (CD)
1	11 ½	10 ½	1.0	1.0
2	11	11 ½	-0.5	0.5
3	12 ¼	12	0.25	0.75
4	12	11	1.0	1.75
5	11 ¾	12	-0.25	1.5
6	12 ½	10 ¼	2.25	3.75
7	12 ¾	10	2.75	6.5
8	12 ½	10 ½	2.0	8.5

This command uses closing prices for the plot. If the file type does not have closing prices, then the average of the high and low price is used. If there is only one price, then it is used.

A maximum of 600 entries can be plotted using this command. When this limit is exceeded only the first (left-most) 600 entries will be plotted; the remainder of the chart will be left blank.

If n1 is 1, the actual (unaveraged) data will be plotted. The position at which the average is plotted depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600

If you are plotting in the sequential mode (**SQ**), make sure the data for all securities is the same; see the **ES** and **SQ** commands for more information.

Both the active security and the reference security data files must reside in the same fixed disk directory or floppy disk.

Example: To plot a 5-entry exponential average of the cumulative difference between the active security and IBM, enter

CD;IBM;5

Related Commands: Difference (**DF**); turn moving average offset off and on (**O−** and **O+**)

CE CLEAR AND ENTER

Function: Clear and reset the selected window and set x1 as the active security symbol

Structure: **CE** ; x1

Type: Control command

Applies to/Uses: Selected window

Description: This command is equivalent to using a **CW** command followed by an **ES** command, except that less computer time is required to perform the operations.

Cautions: See the **CW** and **ES** command descriptions for details.

Example: To clear and reset the active window and assign Honeywell data to that window, enter

CE ; HON

Related Commands: Clear window (**CW**); enter symbol (**ES**); reset and enter (***E**); clear/reset (******)

CN CHANGE NEXT PLOT COLOR

Function: Change the color of the next plot

Structure: **CN**;x1

Type: Control command

Applies to: Selected window

Description: This command overrides the normal sequence of colors in which plots are drawn, and puts the next plot on the selected window in the color that you specify. x1 refers to the color number described with the **CO** command. The colors revert to the normal sequence after the first plot following the **CN** command is drawn.

This command is not affected by and does not affect the system parameter default colors.

Cautions: The color number must be 1 to 7 or 9 to 15

If you issue a **CN** command for a window, then change the selected window before plotting anything, the **CN** command will be cancelled.

This command requires a color monitor and the IBM EGA or VGA card in order to function as described above. If your system has the IBM CGA or MCGA card, this command changes the color of the entire display. See "System Parameters: Select Monitor" in the Reference Section of this manual for more information.

Example: To specify that the next plot be red, regardless of what color comes next in the sequence, enter

CN;4

Related Commands: Change axis color (**CA**); change border color (**CB**); change color order (**CO**); change text color (**CX**)

CO CHANGE COLOR ORDER

Function: Change the order of the colors for progressive plots

Structure: CO;x1

Type: Control command

Applies to: All windows

Description: This command changes the order of the colors in which subsequent plots are drawn on the same window. The available colors and the number which refers to each color is shown in the following table. x1 consists of a sequence of color numbers, separated by spaces. Each number represents the color to be used at that point in the sequence. You may use any sequence and colors may be repeated if you want.

COLOR NUMBERS

Color	Normal Intensity	Bright Intensity
Blue	1	9
Green	2	10
Cyan	3	11
Red	4	12
Magenta	5	13
Yellow	6	14
White	7	15

This command is not affected by and does not affect the system parameter default colors.

Cautions: The numbers in x1 must be valid color numbers and must be separated by spaces.

This command requires a color monitor and the IBM EGA or VGA card in order to function as described above. If your system has the IBM CGA or MCGA card, this command changes the color of the entire display. See "System Parameters: Select Monitor" in the Reference Section of this manual for more information.

Example: To change the order of color progression to cyan, bright blue, magenta, bright red, white, bright yellow and bright green, enter

CO;3 9 5 12 7 14 10

Related Commands: Change axis color (**CA**); change border color (**CB**); change next plot color (**CN**); change text color (**CX**)

CP CLOSING PRICES

Function: Plot an n1 entry exponential average of the closing prices

Structure: **CP**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command will plot closing prices. If the file type of the active security has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

The default value for n1 is 1. When n1 is 1, the actual (unaveraged) prices are plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be a number between 1 and 600

Example: To plot a 4-entry exponential average of closing prices, enter

CP;4

Related Commands: Plot high/ask price (**HP**); plot low/bid price (**LP**); turn moving average offset off and on (**O−** and **O+**)

CW CLEAR WINDOW

Function: Clear and reset the selected window

Structure: **CW**

Type: Control command

Applies to: Selected window

Description: This command clears the selected window, resets daily mode, resets the horizontal range to the **HD** setting, or to the last 250 entries if no **HD** command has been issued. **CW** also resets the vertical axis to linear mode and automatic scaling. It does not reset the active security symbol, that is, it doesn't reset the **ES** command.

Cautions: If you have been using other than default ranges and modes, don't forget to reset the ranges on your axes, or the log or sequential mode after this command. If you prefer other than the default conditions, you can set up a function key user procedure to clear the windows and reset your conditions. For example,

DP ; ! ; CW ; LG ; SQ ; HS ; −100 ; −1

will set up function key ⟨F1⟩ to clear the selected window, set logarithmic and sequential modes, and plot the last 100 entries.

Example: To clear the selected window, enter

CW

Related Commands: Clear and enter (**CE**); clear/reset (******); reset and enter (***E**)

CX CHANGE TEXT COLOR

Function: Change the color of the text

Structure: **CX**;x1

Type: Control command

Applies to: All windows

Description: This command changes the color of the text that appears on your screen. x1 refers to the color number described under the **CO** command.

This command is not affected by and does not affect the system parameter default colors. The special case **CX**;0 (zero) resets the default color.

Cautions: The color number must be 1 to 7 or 9 to 15.

This command requires a color monitor and the IBM EGA or VGA card in order to function as described above. If your system has the IBM CGA or MCGA card, this command changes the color of the entire display. See "System Parameters: Select Monitor" in the Reference Section of this manual for more information.

Example: To specify that the text be shown in white, enter

CX;7

Related Commands: Change axis color (**CA**); change border color (**CB**); change next plot color (**CN**); change color order (**CO**)

D –/D + DOTTED LINES OFF/ON

Function:

D – Turn dotted lines off
D + Turn dotted lines on

Structure:

D –
D +

Type: Control commands

Applies to: All windows

Description: These commands turn the dotted lines feature on and off. With this feature on, overlay plots (i.e., any plot drawn on a window after the first one) will be drawn with different types of dotted and dashed lines. This command is useful to help distinguish between plots drawn on the same window.

The dotted line feature remains on until turned off using the **D –** command. The default condition is dotted lines on if you are using a monochrome monitor, or dotted lines off if you are using a color monitor.

Cautions: None

Example: To turn the dotted lines feature off, enter

D –

Related Commands: None

DD DATA DRIVE/DIRECTORY

Function: Change the current data drive and/or directory

Structure: **DD** ; x1

Type: Control command

Applies to / Uses: All windows

Description: This command changes the designated data disk drive and/or directory to x1, where x1 is a legitimate DOS path. Changing the data directory with this command is equivalent to changing the data drive/directory in the System Parameters module.

The program reads data only from the current data drive and/or directory. Data for all symbols entered after issuing this command will be stored on and retrieved from the drive and/or directory defined by x1.

Cautions: All windows, whether displayed or not, will be cleared when this command is entered.

Use the full DOS path, including the disk drive (e.g., use C:\SIS\DATA\STOCKS, not DATA\STOCKS).

Example: To make the C:\SIS\DATA directory the current data directory, enter

DD ; C:\SIS\DATA

Related Commands: None

DF DIFFERENCE

Function: Plot an n1 entry exponential average of the difference between the active security and security x1

Structure: **DF**;x1;n1

Type: Plotting Command

Applies to / Uses: Selected window / active security

Description: The difference plot is defined as a plot of the price of the active security minus the price of the reference security x1.

For each security, the command uses closing prices as the basis for the chart. If the file type for either security has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

In daily mode (**DY**), points will be plotted for each data only when the active security and the reference security (x1) both have prices available for that date. In sequential mode (**SQ**), the difference of each consecutive set of points is plotted regardless of date.

If n1 is 0 or 1, the actual (unaveraged) data will be plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O−** and **O+**).

A maximum of 600 entries can be plotted using this command. When this limit is exceeded only the first (left-most) 600 entries will be plotted; the remainder of the chart will be left blank.

Cautions: n1 must be between 1 and 600

If you are plotting in sequential mode (**SQ**), make sure the data for both securities are the same; see the **ES** and **SQ** commands for more information.

Both the active security and the reference security data file must reside in the same fixed disk directory or floppy disk.

Examples: To plot the 5-day average of the advance/decline difference, first enter

ES;NYAD

assuming that NYAD and NYDE are stored on your data disk, and then enter

DF;NYDE;5

To plot a 12-day exponential average of the difference of the the active security to the Dow Jones Industrial Average, enter

DF;DJ-30;12

Related Commands: Cumulative difference (**CD**)

DL

DISPLAY LEGEND

Function: Describes the plots on the selected window

Structure: **DL**

Type: Control command

Applies to/Uses: Selected window

Description: This command shows the legend for the selected window in the lower left-hand corner of the window. This feature is useful when several plots have been put on the same window.

Cautions: None

Example: To show the legend for the selected window, enter

DL

Related Commands: None

DM DRAWING MODE

Function: Put the system into Drawing Mode in order to draw lines using a cursor

Structure: **DM**

Type: Control command

Applies to: Selected window

Description: When you execute this command, a cursor will appear at roughly the center of the selected window. The cursor can be moved around on the display by using the cursor control keys. In addition, the four corner keys (⟨7/Home⟩, ⟨9/PgUp⟩, ⟨1/End⟩ and ⟨3/PgDn⟩) on the keypad will move the cursor diagonally.

Depending on the type of keyboard you have, the distance the cursor moves on each jump can be increased by holding down either the ⟨Shift⟩ or ⟨Ctrl⟩ key while pressing the cursor keys. On most keyboards with ten function keys, the ⟨Shift⟩ key will work. On most keyboards with twelve function keys, the ⟨Ctrl⟩ key will work. You can reverse the function of the ⟨Shift⟩ key by pressing the ⟨Num Lock⟩ key once; this makes the normal jump big and the ⟨Shift⟩ jump small. Pressing ⟨Num Lock⟩ again returns the system to the original state.

The following Drawing Mode subcommands allow you to draw lines on the selected window:

⟨Space Bar⟩	mark the current cursor position. The cursor mark is used in conjunction with the ⟨C⟩, ⟨F⟩, ⟨L⟩ and ⟨R⟩ subcommands described below to draw a line between the mark and the cursor.
⟨C⟩	draw a line connecting the cursor and the cursor mark. The cursor mark is made with the space bar as described below.

⟨D⟩ ⟨U⟩	draw a downward (⟨D⟩) or upward (⟨U⟩) sloped line at the cursor position. The line will begin at the cursor, move one tick mark down or up on the vertical axis for each tick mark to the right on the horizontal axis, and extend to the end of the window. These subcommands are for use mainly with point & figure charts.
⟨F⟩ ⟨R⟩	draw a line between the cursor and the cursor mark. The line will extend from the right-most (⟨F⟩) or left-most (⟨R⟩) of the two points through the other point to the end of the window. The cursor mark is made with the space bar as described above.
⟨H⟩ ⟨V⟩	draw a horizontal (⟨H⟩) or vertical (⟨V⟩) line at the cursor position. The line will extend across the entire window.
⟨L⟩	draw a line between the cursor and the cursor mark. The line will extend across the entire window.
⟨P⟩	draw a line at the cursor position parallel to the last line drawn with the ⟨C⟩, ⟨F⟩, ⟨L⟩, or ⟨R⟩ commands.
⟨Enter⟩	return to command mode.

Note that for purposes of the undo last plot (**UP**) control command, each line is considered a separate plot.

The **CB** command sets the color of lines drawn with this command.

Cautions: None

Examples: To put the program into drawing mode, enter

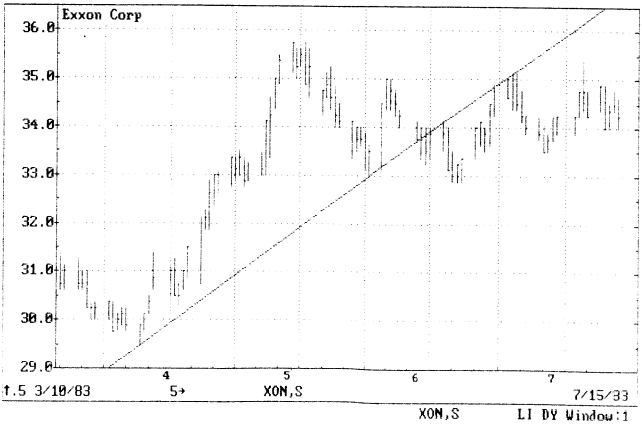
DM

To draw a line, move the cursor using the keys on the keypad to any point and press the ⟨Space Bar⟩ to mark the point. Move the cursor again to a second point, press ⟨L⟩, and a line will be drawn between the cursor mark and the cursor.

Related Commands: Plot point & figure chart (**PF**); draw horizontal line (**HL**); draw line (**LN**); draw vertical line (**VL**); change border color (**CB**)

Theory: The drawing mode can be used to draw support, resistance and trend lines. A support line is a line drawn below the general price pattern such that when the stock price approaches this line, it tends to go no further, and usually "bounces" back upward. A resistance line is a line drawn above the general price pattern such that, when the price approaches this line, its advance is stopped and it usually retreats. Thus, the price tends to move between the support and resistance lines. These lines are generally constructed as straight lines that form a channel in which the price fluctuates. Any price breakout of this channel signals a new trend in the direction of the breakout.

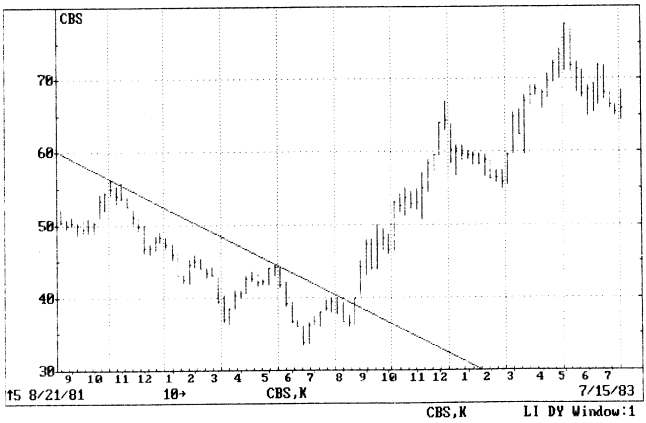
The support line is constructed by drawing a line between successive lows as shown in Figure 5b-1. You can draw such a line by positioning the cursor at the appropriate points to define the line. If the price trend is upward, the support line will slope upward and is called the bullish support line. If the price trend is downward, the support line will slope downward and is known as the bearish support line.



SUPPORT LINE
FIGURE 5b – 1

The resistance line is constructed by drawing a line between successive highs as shown in Figure 5b-2. If the price trend is upward, the resistance line will slope upward and is known as the bullish resistance line. If the price trend is downward, the resistance line will slope downward and is known as the bearish resistance line.

The bullish support line and the bearish resistance line are the primary lines of concern since any penetration of these lines would represent a reversal of the current trend. Thus, if the price trend is upward and the price drops below the bullish support line, this may signal a new bearish trend. Similarly, if the price trend is downward and the price rises through the bearish resistance line, this may signal a new bullish trend.



RESISTANCE LINE
FIGURE 5b – 2

DP DEFINE PROCEDURE

Function: Define a user procedure

Structure: **DP**;x1;x2;x3 . . .

Type: Control command

Applies to: All windows

Description: A user procedure is a string of commands that can be stored for later execution using a single command or shift function key. This allows you to repeatedly execute even the most complicated string of commands very easily.

To define a user procedure, type **DP** followed by a semicolon (;), the procedure name (x1), another semicolon, then string the commands for the user procedure (x2;x3 . . .) right behind just like you would normally type them. Press ⟨Enter⟩ to finish the definition. The ⟨Enter⟩ is important; it is what tells the program that you are through defining the procedure, and that the next command is not part of the procedure, but rather should be executed immediately.

You can define user procedures containing any legal commands, with one exception: you cannot define a user procedure which contains a **DP** command. The program will produce erratic results if you do. You can, however, get around this restriction by defining the procedure with the edit procedure (**EP**) command; see the **EP** command description for more information.

The main difference between the **DP** and **EP** commands is that the **DP** command is used to define a new procedure. If there is an existing procedure with the same name as the procedure you are defining, the old procedure will be automatically erased. With the **EP** command, the existing procedure is presented on the command line for editing.

While you can include any command other than a **DP** in a user procedure (including the **XP** command), several commands require input from the keyboard: e.g., **PA**, **VW** and **ES**;?. If you include any of these commands in your procedures, the program will stop, await your input, then continue with the rest of your procedure after you exit the command.

Each user procedure may be up to 70 characters long, including semicolons. Thirty-eight user procedures can be defined. Each procedure is named by a letter or a symbol. Twenty-six of the user procedures are named A through Z (upper- or lower-case letters; it doesn't matter). The remaining procedures are named with characters as described below.

All user procedures are stored on the program disk, so they will remain constant even if you change data disks.

Shift function procedures

Ten user procedures can be assigned to the shift function keys. Execute these procedures by holding down the ⟨Shift⟩ key and pressing the appropriate function key. These procedures are named by the characters on the number keys across the top of the keyboard. It is easy to remember which characters are associated with each shift function: the number of the function key matches the number on the key with the character.

For example, the procedure that is assigned to ⟨Shift⟩ + ⟨F8⟩ is named by the character "*". You define the procedure for ⟨Shift⟩ + ⟨F8⟩ by entering

DP;*

Startup Procedure

A special user procedure, called the Startup procedure, executes automatically each time you enter the Charting module. This feature allows you to change the default settings or to execute the same string of commands each time you enter the module.

The Startup procedure is assigned to the symbol ? and can be redefined by entering

DP;?

and then entering the new command sequence.

When you buy THE TECHNICAL INVESTOR, the Startup procedure (defined **G+ ; A+ ; ES**) will turn on the grid feature, turn on the Autoplot procedure (described below) and then ask you to enter a symbol to be plotted. If no Startup procedure is defined, the program will default to a condition similar to **** ; NW ; 2**.

Autoplot Procedure

The Autoplot procedure is named >. If the Autoplot feature is on, the Autoplot procedure will execute immediately after you complete any enter symbol (**ES**, **CE**, or ***E**) command. This is useful if you want to plot the same chart(s) each time you enter a new symbol.

The Autoplot feature is turned on by issuing an **A+** command, and turned off by issuing an **A−** command.

When you buy the program, the Autoplot procedure is defined as **** ; PB ; SW ; 2 ; VB ; ES** (clear and reset all windows and select window 1, plot price bars, then select window 2, plot volume bars, and then ask for another symbol). If you do not want these commands to execute each time you enter a new symbol, either turn the Autoplot off by issuing an **A−** command, or define a new Autoplot procedure.

The Autoplot procedure can be redefined by entering

DP;>

and then entering the new Autoplot procedure.

DEFINING SPECIAL PROCEDURES

Procedure Name	How to define
Shift Function 1	**DP; !**
Shift Function 2	**DP;@**
Shift Function 3	**DP;#**
Shift Function 4	**DP;$**
Shift Function 5	**DP;%**
Shift Function 6	**DP;^**
Shift Function 7	**DP;&**
Shift Function 8	**DP;***
Shift Function 9	**DP; (**
Shift Function 10	**DP;)**
Startup	**DP; ?**
Autoplot	**DP;>**

Variables in user procedures

Another feature of user procedures is the ability to include variables. These variables can be assigned values at the time the procedure is executed, thereby allowing you to use the procedure for many different purposes.

Nine variables can be used; they are denoted as %1, %2, etc. up to %9. These may be placed anywhere within a user procedure. The same variable may be used in different procedures, or more than once in the same procedure.

For example, a procedure to plot the exponential average for any given number of entries may be defined by entering

DP;R;**EA**;%1

This defines user procedure R to be an exponential average for %1 days. A value is assigned to the variable %1 when you execute the procedure by placing a \ (backslash) after the procedure name, followed by the value you want to use. For details on executing procedures with variables, see the execute procedure (**XP**) command description.

You may also perform simple arithmetic on the variables: a single operation of addition (+), subtraction (-), multiplication (*) or division (/). You must surround the operation with parentheses. And you may not do more than one operation. For example, (2*%3) will multiply of the value of %3 by 2. However, (3*(%5+3)) is not allowed since there are two arithmetic operations.

For example, a procedure for a momentum plot over a given number of entries (%2), where the final average is equal to ⅓ the number of entries in the momentum calculation, is:

DP;A;**OS**;C;0;0;C;%2;0;(%2/3)

Cautions:

If you include an enter symbol command (**ES**, **CE**, or ***E**) in any of your user procedures, make sure the Autoplot feature is correctly set before you execute the procedure.

Do not include a **DP** command in any user procedure you define with the **DP** command, or erratic results will occur.

If you expect your user procedure to require more than 38 characters, press ⟨Enter⟩ after the procedure name to allow you to enter the full 70 characters.

Examples: To define user procedure E to select window 1, clear it, then set the linear and daily modes, enter

DP ; E ; SW ; 1 ; CW ; LI ; DY

To define user procedure # (shift function 3) to plot price bars for the last 100 data points, enter

DP ; # ; HS ; −100 ; 0 ; PB

To define the Autoplot procedure to plot a 5-day exponential average of high prices on window 1 and an 8-day exponential average of closing prices on window 2, enter

DP ; > ; SW ; 1 ; HP ; 5 ; SW ; 2 ; CP ; 8

To define the Startup procedure to start the Charting module with three windows set and window 2 in sequential logarithmic mode, enter

DP ; ? ; NW ; 3 ; SW ; 2 ; LG ; SQ

To define user procedure Q to plot trading bands 3% above and 3% below a variable day moving average, enter:

DP ; Q ; TM ; %1 ; 3 ; TM ; %1 ; −3

To define loop procedure R (see the **RE** command description for more information on loop procedures) to plot price bars for each security on your disk (pausing between each plot), enter

DP ; R ; ** ; A− ; NW ; 1 ; *E ; #ALL ; PB ; PA ; RE

Alternatively, a more versatile approach would be to combine this with a user procedure variable:

DP ; R ; ** ; A – ; NW ; 1 ; *E ; %1 ; PB ; PA ; RE

Now, if you want to execute this procedure for a single stock, say IBM, you would define %1 to be equal to IBM. Or, if you want to execute this procedure for every security in #MYLIST, define %1 to be equal to #MYLIST. See the **XP** command description for details on how to define variables.

Several other examples of user procedures come defined on your program disk. You can use the **PP** command to print them out.

Related Commands: Edit user procedure (**EP**); execute user procedure (**XP**); print user procedures (**PP**); check status (**KS**); pause (**PA**); repeat (**RE**)

DV DAILY VOLUME INDICATOR

Function: Plot an n1-entry exponential average of the daily volume indicator

Structure: **DV** ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: While something of a misnomer, this command still has validity and will function when used on weekly or other non-daily data.

Since the absolute value of the daily volume indicator is not significant, but the relative value is, this plot is always expanded to fit the selected window. This is true regardless of the last **VS** command issued. If **DV** is the first plotting command issued for a window, the vertical axis will be scaled to the absolute volume for reference purposes only.

The default value for n1 is 1. When n1 is 1, the actual (unaveraged) daily volume indicator is plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600

Example: To plot a 4-entry exponential average of the daily volume indicator, enter

DV ; 4

Related Commands: Turn moving average offset on and off (**O+** and **O−**)

Theory: The daily volume indicator is calculated using the following formula:

$$DV_i = DV_{i-1} + V_i \left(\frac{P_i - L_i}{P_i} - \frac{H_i - P_i}{P_i} \right)$$

where DV_i is the value of the daily volume indicator for day i.

This indicator increases if the closing price is above the midpoint of the high and low, and decreases if the closing price is below the midpoint of the high and low. An uptrend is thought to be bullish and a downtrend bearish. As with other volume indicators, it is the trend of the plot that is important, not the absolute number.

DW DECREMENT WINDOW

Function: To select the window that is one number lower than the currently selected window

Structure: **DW**

Type: Control command

Applies to / Uses: Selected window

Description: This command will select the window that is one number less than the presently selected window. For example, if window 3 is selected, **DW** will select window 2. In this case, **DW** is equivalent to the command **SW**;2.

If this command is issued on window 1, then the highest window visible will be the new selected window.

DW is similar to the **SW** command, except that the number of the window selected is determined automatically.

Cautions: None

Example: To select window 1 when window 2 is currently selected, enter

DW

Related Commands: Select window (**SW**); Increment window (**IW**)

DX DIRECTIONAL MOVEMENT INDEX

Function: Plot a positive or negative directional movement indicator, directional movement index, or average directional movement index rating.

Structure: **DX** ; x1 ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The **DX** command plots one of four different types of directional movement indicators over a period of n1 entries. The type of indicator plotted depends on x1, which is a one-letter code as follows:

x1	Type of chart plotted
P	Positive Directional Movement Indicator
N	Negative Directional Movement Indicator
I	Directional Movement Index
R	Average Directional Movement Index Rating

The default value for n1 is 14.

Cautions: n1 must be between 1 and 600.

The position at which the average is plotted depends on the moving average offset commands (**O+** and **O−**).

Because high, low and close prices are required for the calculations, the **DX** command should be used only with file types that store all three prices (i.e., file type 1 and 3). If the file type has no closing price, the average of the "high/ask" and "low/bid" price is used as the closing price. If the file type has only one price, that price is used as the high, low and close.

Example: To plot a 14-entry average of the positive directional movement indicator, enter

DX ; P ; 14

To plot a 5-entry average of the average directional movement index rating, enter

DX ; R ; 5

Related Commands: Moving average offset on/off (**O +** /**O −**)

Theory: These studies are based on Wilder's Directional Movement Index. The meaning of each of the four different charts follows:

Positive Directional Movement Indicator (PDMI)
Negative Directional Movement Indicator (NDMI)

The PDMI indicator is a measure of the uptrend of the security prices; the larger the value, the more strongly the price is trending upward. Similarly, the NDMI indicator is a measure of the strength of the downtrend; the larger the value, the more strongly the price is trending downward.

The general equation to calculate both the PDMI and NDMI indicators is:

$$\frac{\text{trend measurement}}{\text{range of price movement}}$$

The actual procedure to calculate this equation is fairly detailed; the following explanation gives a general idea of how it is done. (For a detailed discussion on how to calculate the equation, see Wilder's NEW CONCEPTS IN TECHNICAL TRADING SYSTEMS in the list of references at the end of this manual.)

Trend measurement: On days when the price trend is up, this number is called an "uptrend measurement", and is essentially the difference between the high prices from one day to the next. On days when the price trend is down this number is called an "downtrend measurement", and is essentially the difference between the low prices from one day to the next. When no price trend is evident, both the uptrend and downtrend are defined as zero.

Range of price movement: The range over which the security is trading is related to the difference between the high and low price for the entry being calculated and the previous day's close.

The PDMI indicator is the average value of the equation on any "uptrend" days during the past n1 entries. Days with negative or no trend are ignored when calculating the PDMI indicator. The average value of the equation on "downtrend" days is the NDMI indicator.

These two charts are often plotted on top of each other, with a period of 14 days for the average (n1) being common. When these two indicators cross, the theory holds that the upward and downward trends are equal. Whichever line crosses over and becomes the top line is the dominant trend. Therefore, when the PDMI indicator is the dominant trend after a crossover, a possible buy is indicated. When the NDMI indicator is dominant after a crossover, a possible sell is indicated.

Directional Movement Index (DMI)

The equation to calculate this index is

$$DMI_i = ABS\left(\frac{PDMI_i - NDMI_i}{PDMI_i + NDMI_i}\right)$$

The result is smoothed for n1 entries using a function similar to exponential averaging. This chart measures the strength of the upward or downward trend on a scale from 0 to 100: the stronger the trend, the larger the value of the index. Note that this chart does NOT tell whether the trend is up or down, just how strong it is. The DMI is often used in conjunction with the PDMI and the NDMI to determine the strength of a trend change between PDMI/NDMI crossovers.

Average Directional Movement Rating (DMR)

The DMR is further smooths out the DMI chart, making major trend changes more easily observed. The DMI is calculated with the following formula:

$$DMR_i = \frac{DMI_i + DMI_{i-n1}}{2}$$

DY — DAILY MODE

Function: Set the daily plotting mode

Structure: **DY**

Type: Control command

Applies to: Selected window

Description: All subsequent plots on the selected window will be plotted on a scale where the horizontal axis is marked in calendar days. In other words, you will see gaps in the plot for weekends, holidays and missing data. If, for example, you only have weekly data, you will see a six day gap between each data point.

The **DY** command is associated with the selected window. That is, you can set **DY** for a window, then switch back and forth between windows, and the program will remember the mode for each window.

If you issue the **DY** command for an empty window, the first plot will have a daily horizontal axis. If you issue the **DY** command for a window that is plotted in the **SQ** mode, the window will immediately be replotted in the **DY** mode.

One of the advantages of the **DY** mode is that it makes it much easier to notice missing and erroneous data when plotting daily data. This is the default condition: if neither the daily nor sequential mode have been set for the selected window, daily plotting will be used.

Cautions: None

Example: To set the horizontal axis scaling to the daily mode for the selected window, enter

DY

Related Command: Set sequential mode (**SQ**)

EA EXPONENTIAL AVERAGE

Function: Plot an n1 entry exponential average of price or volume data

Structure: **EA**;n1

Type: Plotting Command

Applies to / Uses: Selected window / active security

Description: The average plotted will be of price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The average plotted will be of the volume data if the vertical axis on the window refers to volume. You can tell if the vertical axis refers to volume by a V in the upper left corner of the window. Plotting commands which produce a vertical axis referring to volume include **VB**, **VP**, and the volume indicators.

When plotting prices, this command uses the closing price as the basis for plotting. If the file type has no closing price (i.e., the file type has one or two prices), the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

The default value for n1 is 1. If n1 is 1, the actual (unaveraged) data is plotted.

The position at which the average is drawn depends upon the moving average offset commands (**O**+ and **O**−).

Cautions: n1 must be a number between 1 and 600

Example: To plot a 5-entry exponential average of the price or volume data displayed on the selected window, enter

EA;5

Related Commands: Plot simple moving average (**MA**); plot weighted moving average (**WA**); plot trading bands (**TE**, **TM** and **TW**); moving average offset on/off (**O+**/**O−**)

Theory: Most charting systems make extensive use of various moving averages. A moving average represents a smoothed out line of the prices or volumes being plotted. There are several ways to define a moving average: the simple, weighted, and exponential moving average. In many cases, the actual line plotted with these different averages will be very nearly the same. There is enough difference, however, that some people have a distinct preference for one above the others in some situations.

The exponential moving average and a general discussion on using moving averages are covered here. The simple moving average is discussed with the **MA** command description and the weighted moving average with the **WA** command description.

One of the problems with the simple moving average is that each data point is given equal weight. So, if the price takes a sudden move up or down, the average responds rather slowly. Sometimes it is desirable to use an average that puts more emphasis on recent price moves, but still retains the smoothing function of the moving average. One such average is the exponential moving average.

To calculate the exponential average each day, you only need to know yesterday's average and today's price. Unlike the other moving averages, you do not need to maintain a record of the past n1 entries. The exponential average is calculated by subtracting yesterday's average from today's price and multiplying the result by 2/(n1+1), and then adding this result to yesterday's average. Mathematically, this is represented by:

$$EA_i = EA_{i-1} + 2\left(\frac{P_i - EA_{i-1}}{n1 + 1}\right)$$

where n1 is the number of days for the average, EA_i is the new average for day i and EA_{i-1} is the average for the day before day i.

For example, if the five-day exponential average calculated yesterday is 22.68 and today's price is 23¼, then the new average is

$$EA = 22.68 + 2\left(\frac{23.25 - 22.68}{6}\right) = 22.87$$

Moving averages can be used alone or in combination with other indicators. One of the more common uses of moving averages is as indicators comparing a stock price with the moving average of the stock price.

For example, first plot the price bars for a stock (using the **PB** command), then plot a twelve-day exponential average of the stock price using **EA**;12. One interpretation of the resulting curves is that when the price crosses above the moving average line, the stock should be bought and when the price crosses below the moving average line, the stock should be sold.

By using different length averages, the sensitivity of the method can be changed. Using a short term average tends to produce many buy and sell signals with small advances and declines. Using a longer term average tends to produce fewer buy and sell signals corresponding to more significant advances and declines.

Frequently, two or more moving averages of the same stock are compared instead of comparing the price with a moving average. Generally, one of these is a short term average and the other a longer term average. For example, you might plot the 12-day moving average and the 50-day moving average on the same plot. When the short term average crosses above the long term average, this is thought to be bullish, and similarly, when the short term average falls below the long term average, a bearish condition is signaled.

EP EDIT USER PROCEDURE

Function: Edit a user procedure

Structure: **EP**;x1

Type: Control command

Applies to: All windows

Description: You may edit an existing user procedure by entering **EP** followed by a semicolon and the name of the procedure (x1).

After you have entered the procedure name, the procedure will be displayed on the command line. You can then edit it as you desire using the editing features described under "Editing Input" in the General Information Section of this manual. When you are finished, press ⟨Enter⟩, and the edited procedure will be saved. Alternatively, press ⟨Esc⟩ and the edit will be cancelled with the procedure remaining unchanged.

The same restrictions that apply to the **DP** command apply to the **EP** command with one exception; you can get around the restriction against using a **DP** command in a user procedure by defining the procedure with **EP**. If you want to define a procedure that itself defines procedures, do the following:

1. Issue the **EP** command in the normal way (whether or not there is already a procedure stored under the name you are using doesn't matter).

2. Clear any existing procedure by pressing ⟨Ctrl⟩ + ⟨1/End⟩.

3. Type in the procedure as you normally would in a **DP** command, except that you must end each **DP** command in the procedure with a } (a close brace) instead of pressing the ⟨Enter⟩ key. You don't need to surround the } with semicolons. Press ⟨Enter⟩ when you are finished.

This feature is particularly useful when you wish to use the shift function keys for several sets of applications. You can define several user procedures, each of which in turn defines the shift function keys. Then each time you execute one of these user procedures, the shift function keys are quickly and easily redefined for the new purpose.

The "}" symbol is a subcommand of the **EP** command; it should not be used anywhere else.

Cautions: Make sure you understand the restrictions on user procedures; see the **DP** command for details.

Examples: To edit the Autoplot procedure, enter

EP ; >

To set up user procedure ! (shift function 1) to:

a) set 2 windows
b) define shift function 3 (user procedure #) to plot price bars for the last 100 data points
c) define shift function 4 (user procedure $) to save window 2 in memory location 7
d) turn the Autoplot feature off

enter

EP ; !

When the existing user procedure ! is displayed (if any), type ⟨Ctrl⟩+⟨1/End⟩ to clear it, then enter

NW;2;DP;#;HS;−100;0;PB } DP;$;SW;2;SC;7 } A+

Related Commands: Define user procedure (**DP**); execute user procedure (**XP**); print user procedure (**PP**); check status (**KS**)

EQ USER EQUATION

Function: Plot a user-defined equation

Structure: **EQ** ; x1 ; x2 ; x3 ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The **EQ** command calculates the equation defined by the arguments x1, x2, and x3, and plots the result averaged over n1 entries. x1 and x3 represent what we call "source functions", and x2 is an operator.

The general form for a user-defined equation is

[Source Function]	[+ − / or *]	[Source Function]	[Final Average]
x1	x2	x3	n1

x1 and x3: Source functions

In general, three arguments are required to describe each source function: the source function type, the number of entries over which to average the source function, and the offset. Each source function is defined using the following format:

Type ; Entries to average ; Offset

Type: The source function type can be any of the following:

USER EQUATION SOURCE FUNCTION TYPES

Source Function	Description
C	Closing price
F1 or F2	**FL** buffer #1 or #2
H	High/ask price
K	Constant value
L	Low/bid price
V	Volume

The source functions generate a number for each entry (or date) being plotted.

- For types C, H, L and V, that number will be the appropriate data from the active security's data file.

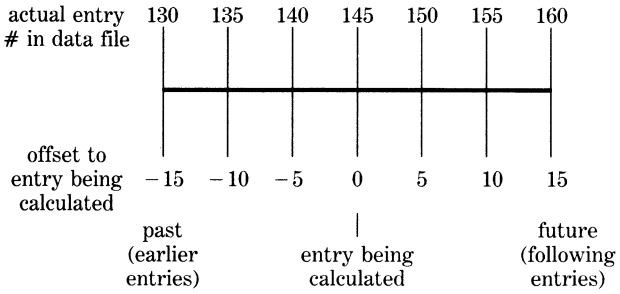
- For types F1 and F2, that number will taken from the appropriate user equation buffer. The **FL** command must be executed before source types F1 or F2 can be used (see the **FL** command description for details).

- Finally, type K means to use the same number for each entry. The number to use is the only other argument required to define the source function. In other words, for source function type K, only one additional argument is required: the constant to be used in the equation.

Entries: Each source function except type K can be averaged. The first argument following the source function type is the number of entries to use for an exponential average of the source function. A value of 1 tells the program to use the actual (unaveraged) value.

Offset: For each source function except K, the final argument in the source function definition is the time offset. With the offset you can use source functions from different points in time. For example, you may want to plot the 30-day average for each day minus the 30-day average 10 days previous.

When considering time offsets, it helps to think of the equation being calculated for an entry in the middle of the file, rather than at the end. The following scale shows the offsets when the equation is being calculated for the 145th entry in the file.



The offset is expressed as an entry relative to the entry being calculated, where the entry being calculated is defined as 0. Positive numbers refer to entries that follow the entry being calculated. Negative numbers refer to entries that precede the entry being calculated.

For example, an offset of −10 means to use the value of the source function 10 entries previous to the entry being calculated. An offset of 5 means to use the value 5 entries in the future.

Source function examples: The source function that tells the program to use the actual (unaveraged) low/bid price 15 entries previous to the entry being calculated is

L;1;−15

To use the 7-entry average of the volume calculated for the date 2 entries later than the current entry, the source function would be

V;7;2

To use the actual (unaveraged) contents of user-equation buffer #1 with no time offset, the source function would be

F1;1;0

Finally, a source function with the constant value of 100 is

K ; 100

When using K as the source function type, the only argument required is the value of the constant. The number of entries over which to average and the offset are irrelevant and must not be included in the source function definition.

x2: Operator

x2 is one of the following operators:

USER EQUATION OPERATORS

Operator	Function
+	Addition
–	Subtraction
*	Multiplication
/	Division

If x2 is " + ", then x3 is added to x1. If x2 is " – ", then x3 is subtracted from x1, etc.

n1: Final average

The final argument in the user equation definition (n1) is the number of entries over which to calculate an exponential average of the entire equation. Again, a value of 1 tells the program to plot the actual (un-averaged) equation. If you want to average (or smooth) the plot over 10 entries, the final argument should be 10.

Additional information:

The source function types H, L, C, and V always refer to data for the active security. Source function types F1 and F2 can be used to compare data for two different securities. Execute the **FL** command with the first security as the active security, then enter another symbol and execute the **EQ** command.

The default value of the number of entries over which to average is 1, and the default value for the time offset is 0 (zero). The program will assume the default values if you just press ⟨Enter⟩ when being prompted for the argument.

Cautions:

When C is used as a source function type for a security that has no closing prices, the average of the high/ask and low/bid prices will be used (if available). If either C, H, or L is used for a security that has only one price stored, that price will be used.

Before F1 or F2 can be used as a source function type, the appropriate user equation buffer must be filled. See the **FL** command description for details.

The current status of the **O+/O−** commands will affect the position at which the exponential average of the entire equation is plotted. The **O+/O−** commands have no effect, however, on how the individual source functions are calculated.

The values used for the number of entries over which to average, for source functions and for the entire equation, must be between 1 and 600.

The values used for the offsets of the source functions must be within the range of the data stored in the security file.

Examples: The user equation command allows you to plot many equations not otherwise available. This versatility, however, makes the user equations relatively complicated. You may wish to assign user equations that are used often to a user procedure to minimize the keystrokes necessary to plot the equation each time.

The examples below should help you understand how the user equations work. (The examples refer to daily data. When working with weekly or monthly data files, the same examples would hold true except that the averages and offsets would be in weeks or months, respectively, instead of days.)

EQ; H;10;0; / ;L;10;0; 5

x1 x2 x3 n1

divides the 10-day average of the high/ask price (H;10;0) by the 10-day average of the low/bid price (L;10;0), with the result averaged over 5 days. The offset in both cases is 0, indicating no time offset for either source function.

EQ; V;6;−15; * ;K;100; 1

x1 x2 x3 n1

multiplies the 6-day average of the volume 15 entries in the past (V;6;−15) by 100. The unaveraged equation is plotted.

EQ; C;1;0; − ;C;1;−1; 0

x1 x2 x3 n1

plots the difference between the current unaveraged closing price (C;1;0) and the previous entry's unaveraged closing prices (C;1;−1). If this equation had been loaded into F1 using the **FL** command, then

EQ; F1;1;0; / ;C;1;0; 10

x1 x2 x3 n1

would plot that difference in closing prices (F1;1;0) divided by the actual closing price (C;1;0), with the result averaged over 10 days. That plot, multiplied by 100, is the 10-day average of the percentage change in closing prices from day to day.

Related Commands: Fill user-equation buffer (**FL**); moving average offset on/off (**O+**/**O−**)

ES ENTER SYMBOL

Function: Set x1 as the active security symbol

Structure: **ES**;x1

Type: Control command

Applies to: Selected window

Description: All subsequent plotting on the selected window will be for this security; the security remains assigned to that window until you issue another **ES** command for that window. This means you can have different symbols assigned to each window if you desire, then switch back and forth between windows without re-entering symbols.

When you switch to a blank window, the active symbol and horizontal range for the last window you were on becomes the default active symbol and horizontal range for the new window. In other words, you do not have to reissue the **ES** or **HS** commands if you want to do further plotting using data for that same security. If you do issue an **ES** command on a blank window, the **HS** would be reset to **HS**;0;0.

If you enter a ? (question mark) for x1, the symbols in the directory will be displayed on the command line in alphabetical order. Use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the symbols, then press ⟨Enter⟩ to enter the displayed symbol. Or press ⟨Esc⟩ to return to the command mode.

You can overlay plots of different securities by entering the symbol of the first security, plotting as desired, then without clearing the window entering the symbol of the second security and plotting as desired. Note that, to be visible on the window, the data for the second security must fall into the range displayed on the vertical axis. If it doesn't, you can issue as **VS** command to expand the range.

In daily mode (**DY**), the data for the second security must also fall into the range displayed on the horizontal axis; if it doesn't, you can issue an **HS** command to expand the range.

However, in sequential mode (**SQ**), the plots for all securities will start at the entry nearest the date indicated on the left side of the horizontal axis and then continue for the same number of entries, regardless of date. Thus, unless all entries for all the overlayed securities are the same (that is, unless corresponding entries have the same dates), the overlay will not be accurate. If you are not sure if the data is the same, use the daily mode (**DY**).

See the **RS** command for one way to directly compare the prices of securities.

Cautions: If the Autoplot feature is on, the Autoplot procedure will be executed automatically after you execute the **ES** command.

If you overlay plots of securities, make sure you understand the difference between **DY** and **SQ** modes.

Example: To assign Exxon data to the selected window, enter the symbol for Exxon (XON) like this:

ES;XON

Related Commands: Turn Autoplot on/off (**A+**/**A–**); clear and enter (**CE**); reset and enter (***E**)

F −/F + FLAGS OFF/ON

Function: **F −** turns high and low price flags off
F + turns high and low price flags on

Structure:
F −
F +

Type: Control command

Applies to: All windows

Description: These commands turn the flags feature on and off. All price charts plotted after this feature is turned on will have the high and low price flags highlighted with a dashed line.

The high and low price flags are input in the "TECHNICAL Data" module. If you want to change the flags for any particular file, you must enter this module and edit the appropriate file. If the vertical scale for a chart does not include the prices to be flagged, the flags will not be shown. The vertical scale must be changed to show the flags. If no flags are entered for a file, the **F +** will have no effect on the charting.

The flags feature remains on until turned off using the **F −** command. The default condition is flags off.

Cautions: None

Example: To turn the flag feature on, enter

F +

Related Commands: None

FL FILL USER EQUATION BUFFER

Function: Stores calculations for later use in a user equation

Structure: **FL** ; x1

Type: Control command

Applies to / Uses: Selected window / active security

Description: The **FL** command stores the calculated results of a plotting command in a special segment of the computer's memory called a "user-equation buffer". These results can be used later in a user equation (see the **EQ** command description for details). Two user-equation buffers are available. The argument x1 tells the program which buffer to use. x1 can be either 1 or 2, indicating user-equation buffer #1 or #2, respectively.

FL will work with any plotting command whose result can be averaged, including the **EQ** command. The **FL** command *must immediately precede* the plotting command whose calculations are to be stored. If the next command is an invalid plotting command (that is, one that is not averaged such as **HL**, **LR**, **PB**, or **PF**) or a control command, the **FL** command will be ignored. The results will be stored in the appropriate user-equation buffer as they are calculated and plotted on your monitor.

The stored data is used by the user equation (**EQ**) command. The calculations are stored until another **FL** command is issued for the same buffer, a reset command (****** or ***E**) is issued, or until you leave the Charting module. The results stored in the user- equation buffers can be used twice in the same equation and by more than one equation.

Cautions: The **FL** command can be used with the user equation command (**EQ**) with one restriction: a user-equation buffer cannot be filled with an equation that uses calculations stored in the same buffer. For example,

FL;1;**EQ**;F1;1;0;+;K;2;1

is not allowed because it attempts to load user-equation buffer #1 with a calculation that uses the values already stored in buffer #1. However, the command string:

FL;1;**EQ**;F2;1;0;+;K;2;1

is allowed because the equation uses buffer #2, not buffer #1.

Note that if you use the contents of a user-equation buffer to plot a chart, then change the contents of the same user-equation buffer by issuing *another* **FL** command, any subsequent replots of the original chart will use the *new* contents of the buffer. Thus, the replotted chart will be different. Replots occur whenever you issue the **RP** command, and are issued automatically by the **DY**, **HS**, **LG**, **LI**, **RW**, **NW**, **SQ**, **XW** or **VS** commands.

Example: To store the 10-entry average of the on-balance volume indicator in the user-equation buffer #1, enter

FL;1;OB;10

To divide these values by the closing price, use

EQ;F1;1;0;/;C;1;0;1

Related Commands: User equations (**EQ**); reset and enter (***E**); clear/reset (******)

G –/G + GRID OFF/ON

Function: G – Turn grid lines off
G + Turn grid lines on

Structure: G –
G +

Type: Control commands

Applies to: All windows

Description: These commands turn the grid feature off and on. All charts plotted after this feature has been turned on (G +) will have grid lines across them. The grid lines are drawn horizontally at each vertical scale number and vertically at appropriate increments of horizontal tick marks.

The grid feature remains on until turned off using the G – command. The default condition is grid off.

Cautions: None

Example: To turn on the grid, enter

G +

Related Commands: None

HD HORIZONTAL DEFAULT RANGE

Function: To change the default values for the horizontal range to be n1 to n2

Structure: **HD** ; n1 ; n2

Type: Control command

Applies to: All windows

Description: Normally, the default horizontal range is set to plot the most recent 250 entries for a security. This is equivalent to the command **HS** ; −250 ; 0. A command of **HS** ; 0 ; 0 will reset the horizontal range to the default conditions (see the **HS** command).

This command (**HD**) is used to change the default range, so that the command **HS** ; 0 ; 0 will result in something other than the most recent 250 entries. For example, to change the default range to the last 100 entries, enter **HD** ; −100 ; 0. After this command, any **HS** ; 0 ; 0 will result in setting the horizontal range to the most recent 100 entries. Also, a clear window (**CW**) or clear/reset (**) command will reset to these new default values.

Cautions: n1 and n2 must be between −15000 and 15000. n1 must be logically less than n2

HS ; −250 ; 0 will be reset as the default range each time you enter or restart the Charting module. Include the **HD** command in your Startup procedure if you want to use different default values.

Example: To change the horizontal default range to the most recent 300 days, enter

HD ; −300 ; 0

Related Commands: Horizontal range set (**HS**)

HL HORIZONTAL LINE

Function: Draw a horizontal line at position p1

Structure: **HL**;p1

Type: Plotting Command

Applies to: Selected window

Description: This command draws a horizontal line at the vertical axis position specified. (Note the drawing mode (**DM**) allows you to draw horizontal lines at a spot on the window you choose using a cursor.)

The **CB** command sets the color of lines drawn with this command.

Cautions: The value for p1 must be in the range of the vertical axis of the plot, or an out of range marker (an inverse OR) will be displayed in the upper-right corner of the window.

Example: To draw a horizontal line at 35 dollars, enter

HL;35

Related Commands: Draw vertical line (**VL**); draw line (**LN**); enter drawing mode (**DM**); change border color (**CB**)

HP — HIGH/ASK PRICES

Function: Plot an n1 entry exponential average of high/ask prices

Structure: **HP**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command plots the high price of a security, or the asking price of an over-the-counter security, or the only price if the file type contains only one price.

If n1 is 0 or 1, the actual (unaveraged) prices will be plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O−** and **O+**).

Cautions: n1 must be between 0 and 600

Example: To plot the actual (unaveraged) high prices of a security, enter

HP;0

Related Commands: Plot closing prices (**CP**); plot low/bid prices (**LP**); turn moving average offset off and on (**O−** and **O+**)

HS HORIZONTAL RANGE SET

Function: Set the range for the horizontal axis to be d1 to d2

Structure: **HS**;d1;d2

Type: Control command

Applies to: Selected window

Description: If the selected window has no plots on it, d1 to d2 will be the range for the first plot. If the selected window already contains plots, the window will automatically replot with the horizontal scale from d1 to d2.

If no **HS** command has been issued, the horizontal range will be the horizontal default (**HD**) setting, or the most recent 250 entries if no **HD** command has been issued.

When you switch to a blank window, the **HS** of the previously selected window will be assigned.

The special case **HS** ; 0 ; 0 sets the horizontal axis to the values set by the (**HD**) command, or to the last 250 entries if no **HD** command has been issued.

You can use actual dates or entry numbers to set the range. When you use entry numbers instead of dates to set the range, the program will check the data file of the active security for the dates of those entries, and then use those dates to set the horizontal range. Any additional data plotted on the window must fall within those dates, or it will not be plotted (with one exception: see the **SQ** command).

In conjunction with the **VS** command, the **HS** command can be used to expand or zoom into any section of a plot, simply by setting the ranges to see just that section. Using the Function key user procedures, you can set function keys to expand the vertical and/or horizontal dimensions to any degree you wish at the press of a button.

Cautions: d1 must be logically less than d2; that is, even though you can enter dates or absolute entry numbers from the beginning or end of the file, the entry indicated by d1 must be less than the entry indicated by d2.

The ******, ***E**, **CS** and **CE** commands reset the horizontal range to the values set by the **HD** command, or to the last 250 entries if no **HD** command has been issued.

Example: To plot all entries between March 4, 1982 and the last entry in the file, enter

HS;3/4/82;0

Related Commands: Set vertical range (**VS**); horizontal default range (**HD**)

IW INCREMENT WINDOW

Function: To select the window that is one number higher than the currently selected window

Structure: **IW**

Type: Control command

Applies to: Selected window

Description: The **IW** command increments the selected window by one. For example, if more than one window is visible and window 1 is the selected window, **IW** will make window 2 the selected window.

If the command is used on the highest visible window, window number 1 becomes the selected window. For example, if you enter **IW** while window 4 is selected, then window number 1 will be selected.

IW is similar to the **SW** command, except the number of the window selected is determined automatically.

Cautions: None

Example: Assuming at least three windows are visible, to select window 3 while on window 2, enter

IW

Related Commands: Select window (**SW**); decrement window (**DW**)

KD STOCHASTIC OSCILLATOR

Function: Plot a stochastic oscillator

Structure: **KD** ; n1 ; n2 ; n3

Type: Plotting command

Applies to: Selected window

Description: Plots a stochastic oscillator consisting of an n3-entry simple moving average of an n2-entry simple moving average of the "fast" stochastic. The fast stochastic is the current price expressed as a percent of the distance between the highest high and lowest low price over the most recent n1 entries.

Stochastic oscillators can be plotted several ways, but typically are either simple moving averages of the fast stochastic (sometimes called the %K line), or simple moving averages *of the* simple moving average of the fast stochastic (sometimes called the %D line).

The table below shows how **KD** can plot any of the commonly used stochastic lines:

	Value of arguments *	
Line plotted	**n2**	**n3**
Fast stochastic	1	1
%K line	greater than 1	1
%D line	greater than 1	greater than 1

* In all cases, n1 is the number of entries over which to determine the highest high and lowest low prices.

The default value for n1 is 5 entries, and the default value for n2 or n3 is 1. The program will assume the default values if you just press ⟨Enter⟩ when being prompted for the argument.

Cautions: n1 must be an integer between 1 and 100. n2 and n3 must be integers between 1 and 300.

Because high, low and close prices are required for the calculations, the **KD** command is only valid with file types that store all three prices (i.e., file type 1 and 3).

Examples: To plot the 10-entry fast stochastic line, enter

KD;10;1;1

To plot the 3-entry average (%K line) of the 12-entry fast stochastic, enter

KD;12;3;1

To plot the 3-entry average of the 3-entry average (%D line) of the 8-entry stochastic, enter

KD;8;3;3

To plot both a 3-entry average %K and a 3-entry average %D line of the 6-entry stochastic on the same chart, enter

KD;6;3;1;**KD**;6;3;3

Related Commands: Use values (**UV**); Williams Percent-R (**WR**)

Theory: Stochastics refer to a type of plot where the current price of a security on each day is plotted as a percentage of the difference between the recent high and the recent low price. (Many different variations are used in plotting this basic line, the most common of which are described below.)

The recent high and low prices are determined for each point plotted by looking at the high and low for the previous n1 entries. The equation for plotting this line (which is sometimes called the "fast stochastic") is

$$\text{Fast stochastic} = 100 \left(\frac{C - LL_{n1}}{HH_{n1} - LL_{n1}} \right)$$

where C is the closing price for the entry being calculated, LL_{n1} is the lowest low price during the previous n1 entries, and HH_{n1} is the highest high price during the previous n1 entries.

This means that the fast stochastic will be equal to 0 if the current closing price (C) is equal to the lowest low (LL_{n1}), and will be equal to 100 if the current price is equal to the highest high (HH_{n1}). If the current closing price is exactly midway between the lowest low and the highest high, the fast stochastic will be 50.

For example, suppose that during the past n1 days, the lowest low was 20 and the highest high was 30, the fast stochastic will have the following values for different current closing prices:

Current Closing Price	Value of Fast Stochastic
20	0
22	20
25	50
29	90
30	100

Often, a simple moving average of this line is plotted in addition to or instead of the fast stochastic itself. This moving average is sometimes called the "K" or "%K" line.

%K line = simple moving average of the fast stochastic

(See the **MA** command description for an explanation of simple moving averages.) A simple moving average *of the simple moving average line*, sometimes called the "D" or "%D" line, is also used on occasion.

%D line = simple moving average of the %K line

In the same way that moving average crossovers are sometimes used to indicate changes in the trend of a securities price, it is common to plot both a %K line and a %D line on the same chart. Typical values might be 6 entries for the determination of the recent high and low (N), 3 entries for the %K line simple moving average, and 3 entries for the %D line average of the %K line. As with many moving average crossovers, the shorter moving average (%K) crossover of the longer or smoother average (%D) may indicate the price of the security has topped (when %K crosses over %D heading down) or bottomed (when %K crosses %D heading up).

Note: to further confuse the issue, some authors refer to the unaveraged fast stochastic itself as the %K line, and the single simple moving average as the %D line. A command to generate %K and %D lines using these definitions would be:

KD;6;1;1;**KD**;6;3;1

KS CHECK STATUS

Function: Check the status of the on/off flags, and display the user procedures

Structure: **KS**

Type: Control command

Applies to: All windows

Description: Executing this command will display the status of the on/off flags (e.g., **A−**/**A+**, **G−**/**G+**, and **S−**/**S+**) on the command line. It also shows you the current setting of the **HD** command. Press ⟨Enter⟩ to return to command mode, or use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through all the user procedures.

You can execute whatever user procedure is displayed on the command line by pressing ⟨Enter⟩, or you can return to command mode by pressing ⟨Esc⟩.

Cautions: None

Example: To check the status of the flags, enter

KS

Next, to see the user procedure definitions, press the ⟨2/down-arrow⟩ key until you see the user procedure you want to execute, then press ⟨Enter⟩ to execute it.

Related Command: Print user procedures (**PP**)

L+/L− ALLOW OVERLAY ON/OFF

Function:

L+ Allows you to overlay incompatible charts

L− Allows you to overlay only compatible charts

Structure:

L+
L−

Type: Control commands

Applies to / Uses: All windows

Description: Under the default setting (**L−**), the program will only allow you to overlay charts with compatible vertical scales. For example, if you have prices plotted on a window, you would not be allowed to plot a volume plot on the same window unless you first clear the existing plot. Instead, you would get the error message "Invalid command: not allowed on this window". When **L+** is set, however, you can overlay many, though not all, incompatible charts.

Cautions: This command will allow you to overlay plots which are not usually directly compared.

If you plot a chart whose values do not fall within the current vertical range setting, you will have to rescale the vertical axis (see the **VS** command description) before the entire chart will be visible.

Example: To overlay incompatible charts, you must first enter

L+

Related Commands: None

LG LOGARITHMIC MODE

Function: Set the vertical axis to be displayed with a logarithmic scale

Structure: **LG**

Type: Control command

Applies to: Selected window

Description: If you execute the log axis command with linear plots already on the selected window, the window will immediately be replotted with a logarithmic vertical axis. If there are no plots on the selected window, the first plot will have a logarithmic vertical axis.

The axis for each window can be independently set; when you switch back and forth between windows, the program will remember the proper setting for the selected window. The current setting for the selected window is shown on the bottom right side of your display monitor.

Cautions: The vertical axis is reset to linear by the ******, ***E**, **CE** and **CW** control commands.

Example: To set the log mode, enter

LG

Related Command: Set linear mode (**LI**)

LI LINEAR MODE

Function: Set the vertical axis to be displayed with a linear scale

Structure: **LI**

Type: Control command

Applies to: Selected window

Description: If the plots on the selected window are logarithmic, issuing the linear axis command will cause the window to be immediately replotted with a linear vertical axis. If there are no plots on the selected window, the first plot will have a linear vertical axis.

The axis for each window can be independently set; when you switch back and forth between windows, the program will remember the proper setting for the selected window. The current setting for the selected window is shown on the bottom right side of your display monitor.

This is the default condition: if neither the **LI** nor **LG** commands have been issued, the program will assume linear mode.

Cautions: None

Example: To set the linear mode, enter

LI

Related Command: Set logarithmic mode (**LG**)

LN DRAW LINE

Function: Draw a line between the point at d1,p1 and the point at d2,p2

Structure: **LN**;d1;p1;d2;p2

Type: Plotting command

Applies to: Selected window

Description: The first point is at vertical position p1 and horizontal position d1. The second point is at vertical position p2 and horizontal position d2. The line will be drawn from the leftmost of these two points and continue on through the other point to the end of the window.

If you enter otherwise legitimate values for d1, p1, d2 or p2 which are outside the range of the present axes on the selected window, the portion of the line which falls in the window area will be drawn, and the inverse letters OR will appear in the upper left corner of the window indicating part of the plot was out of range.

The **CB** command sets the color of lines drawn with this command.

Cautions: d1 must be logically less than d2; that is, d1 must fall under or to the left of d2 on the window. If you enter a date for d1 or d2 for which no data exists in the file, the program will find a date near the date you requested. If you use an entry number for d1 or d2 that extends past either end of the file, the program will use the first or last entry in the file, as appropriate.

Examples: To draw a line between the point at $35 and March 21, 1983 and the point at $44 and July 30, 1983, enter

LN;3/21/83;35;7/30/83;44

To draw a line between the point at 1200 volume and the 4th entry in the file, and the point at 1800 volume and the 6th entry from the end of the file (for this example the file must contain at least 9 entries), enter

LN;4;1200;-6;1800

Related Commands: Enter drawing mode (**DM**); draw horizontal line (**HL**); draw vertical line (**VL**); change border color (**CB**)

LP LOW/BID PRICES

Function: Plot an n1 entry exponential average of low/bid prices

Structure: **LP**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command plots the low prices of a security, or the bid prices of an over-the-counter security, or the only price if the file type contains one price.

The default value for n1 is 1. When n1 is 1, the actual (unaveraged) prices are plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600

Example: To plot a 10-entry exponential average of the low prices of the active security for the selected window, enter

LP;10

Related Commands: Plot closing prices (**CP**); plot high/ask prices (**HP**); turn moving average offset off and on (**O−** and **O+**)

LR LINEAR REGRESSION

Function: Plot a "least-squares" linear regression line of the price or volume data

Structure: **LR**

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The regression will be on price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The regression will be on volume data if the vertical axis plotted on the window refers to volume. You can tell if the axis refers to volume by the appearance of a V in the upper left corner of the window. Plotting commands which produce a vertical axis referring to volume are **DV**, **NV**, **OB**, **PT**, **PV**, **VB**, and **VP**.

If price data are being used, the command uses the closing price as the basis for the plot. If the file type has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

Cautions: None

Example: To plot a linear regression of price or volume data on the selected window, enter

LR

Related Commands: None

Theory: A linear regression produces a straight line that represents the best fit of the data to a straight line. Mathematically, it is constructed by finding a line such that the sum of the squares of the vertical differences between the line and each data point is a minimum. The linear regression may be used on either price or volume plots. If the data plotted show a definite trend up or down, then the linear regression may be useful to highlight the base trend. If the data fluctuate substantially, the linear regression will have little significance.

MA MOVING AVERAGE

Function: Plot an n1 entry simple moving average of price or volume data

Structure: **MA**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The average plotted will be of price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The average plotted will be of volume data if the vertical axis plotted on the window refers to volume. You can tell if the axis refers to volume by the appearance of a V in the upper left corner of the window. Plotting commands which produce a vertical axis referring to volume are **DV**, **NV**, **OB**, **PT**, **PV**, **VB**, and **VP**.

If price data are being used, the command uses the closing price as the basis for the plots. If the file type has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

If n1 is 0 or 1, the actual (unaveraged) data will be plotted.

The position at which the average is drawn depends upon the moving average offset commands (**O−** and **O+**).

Cautions: n1 must be between 0 and 600

Example: To plot a 4-entry simple moving average of price or volume data on the selected window, enter

MA ; 4

Related Commands: Plot exponential average (**EA**); plot weighted moving average (**WA**); plot trading bands (**TE**, **TM** and **TW**); turn moving average offset off and on (**O−** and **O+**)

Theory: A general discussion of moving averages can be found with the exponential average (**EA**) command description. This description focuses on the simple moving average.

The simple moving average is just the average of a certain number of past data points. If you are maintaining daily records, a five-day simple moving average is just the average of the past five days of data. To calculate the simple moving average for closing prices, sum the closing price for today with the closing prices for the past four days and divide the sum by five. Mathematically, this is represented as follows for an n1-entry simple moving average:

$$MA_i = \frac{P_i + P_{i-1} + P_{i-2} + \cdots + P_{i-n1+1}}{n1}$$

where MA_i is the value of the simple moving average on day i.

MM RETURN TO MAIN MENU

Function: Exit the charting module and return to the Main Menu

Structure: **MM**

Type: Control command

Applies to: All windows

Description: This command can be included in a user procedure to return to the Main Menu, or it can be issued instead of ⟨Alt⟩ + ⟨F5⟩ to end the charting session.

Cautions: All windows not saved using the **SC** command will be lost.

Example: To return to the Main Menu, enter

MM

Related Commands: None

NA DISPLAY SECURITY NAME

Function: Displays the name of the active security

Structure: **NA**

Type: Control command

Applies to: Selected window / active security

Description: When **NA** is invoked, the name of the active security is displayed in the upper left-hand corner of the selected window.

Cautions: **NA** always displays the name of the active security. If you enter a new symbol for a window that already has plots on it from another security, **NA** will display the name of the new security, not the one for which the plots were made.

Example: To display the name of the active security, enter

NA

Related Commands: None

NL NEW LINE

Function: Send x1 line feed commands to the printer

Structure: **NL**;x1

Type: Control command

Applies to/Uses: Printer

Description: This command will send x1 line feed commands to your printer. It can be used after the **PS** command when doing several screen dumps, such as in a loop procedure, to skip some space between the graphs.

Cautions: None

Example: To plot the price bars, printout the screen and then skip a line, enter

PB;PS;NL;1

Related Commands: New page (**NP**); print screen (**PS**)

NP NEW PAGE

Function: Send a form feed command to the printer

Structure: **NP**

Type: Control command

Applies to/Uses: Printer

Description: This command will send a form feed command to your printer. This is often useful when doing screen dumps where you want to skip over the paper perforations.

Many printers will lose track of the top of form during a graphics printout; this command may thus give unpredictable results. However, if your printer does "remember" the top of form after a graphics printout, then this command will work.

You may include this command after the **PS** command in a procedure (or loop) to cause the printer to go to the next top of form.

Cautions: This command will give unpredictable results with some printers.

Example: To plot the price bars, printout the screen and then go to the top of form, enter

PB;PS;NP

Related Commands: New Line (**NL**); Print Screen (**PS**)

NV NEGATIVE VOLUME INDICATOR

Function: Plot an n1 entry exponential average of the negative volume indicator

Structure: **NV**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: Since the absolute value of the negative volume indicator is not significant, but the relative value is, this plot is always expanded to fit the selected window. This is true regardless of the last **VS** command issued. If **NV** is the first plotting command issued for a window, the vertical axis will be scaled to the absolute volume for reference purposes only.

The default value for n1 is 1. When n1 is 1, the actual (unaveraged) negative volume indicator is plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O−** and **O+**).

Cautions: n1 must be between 0 and 600

Example: To plot a 3-entry exponential average of the negative volume indicator, enter

NV;3

Related Commands: Plot positive volume indicator (**PV**); turn moving average offset off and on (**O−** and **O+**)

Theory: The negative volume indicator will show an upward trend if the price tends to increase on decreasing volume and will show a downward trend if the price tends to decrease on decreasing volume. It is calculated using the formula:

$$\text{if } V_i \geq V_{i-1}: \quad NV_i = NV_{i-1}$$
$$\text{if } V_i < V_{i-1}: \quad NV_i = NV_{i-1}(P_i / P_{i-1})$$

where NV_i is the negative volume indicator for day i. In other words, if the volume decreases from yesterday to today, then the negative volume indicator is equal to yesterday's indicator times the ratio of today's price over yesterday's price. If the volume remains constant, or increases, then the negative volume indicator does not change.

An upward trend of the negative volume indicator is thought to be bullish by some, bearish by others. One theory is that unsophisticated investors tend to trade on days of high and rising volume whereas more informed investors tend to trade during periods of declining volume. So the direction of the market on days of declining volume reflects accumulation or distribution of stock by informed investors. Thus, by this theory, an upward trend is bullish.

However, another theory holds that rising prices are accompanied by rising volume and falling prices are accompanied by falling volume, thus the negative volume indicator will normally trend downward. A downward trend is considered normal and an upward trend signals an abnormal market condition.

NW NUMBER OF WINDOWS

Function: Set the number of windows displayed to s1

Structure: **NW** ; s1

Type: Control command

Applies to: All windows

Description: If the number of the selected window at the time you issue the **NW** command is larger than s1, window s1 will become the selected window. If the number of the selected window is less than or equal to s1, the selected window will not change.

If only one window is being displayed, it is defined as window 1. If two windows are being displayed, the top is window 1 and the bottom is window 2. If three are being displayed, the top is 1, the lower left is 2 and the lower-right is window 3. If four are displayed, the top left is 1, the bottom left is 2, the top right is 3 and the bottom right is window 4.

When you change the number of displayed windows, the program remembers what is on each window and stores it until you display that window again. Thus, you can plot on four windows, do an **NW** ; 1 to make window 1 appear full size, then do an **NW** ; 4 and all four plots will still be there.

Cautions: If you do not set the number of windows, the program will set up two windows (**NW** ; 2).

Example: To display 3 windows, enter

NW ; 3

Related Commands: Select window (**SW**); increment window (**IW**); decrement window (**DW**)

O+/O− MOVING AVERAGE OFFSET

Function:

O+ Turn the moving average offset on
O− Turn the moving average offset off

Structure:

O+
O−

Type: Control commands

Applies to: All windows

Description: These two commands affect most plotting commands which plot averages. See the individual command descriptions if you are unsure as to whether or not a plotting command is affected.

If the moving average offset feature is off (**O−**), all subsequent plots representing moving averages (whether simple, weighted or exponential) will be plotted at the current day (that is, not offset in time). Although this is not mathematically correct, it is conventional. This is the default condition.

If the moving average offset feature is on (**O+**), all subsequent plots representing moving averages (whether simple, weighted or exponential) will be offset to the mathematically correct point in time. The mathematically correct point is a function of both the number of entries over which to average and the type of average being plotted.

Note that you can plot an offset of any given number of entries using the **EQ** command.

Cautions: The state of the **O+/O−** commands affects all subsequent plotting: suppose you plot a chart with the offset off, then turn the offset on. All future plots, including any replots of the chart you are working on caused by things such as a new **NW** command, will be with the offset on.

This feature is turned off by the ****** and ***E** commands.

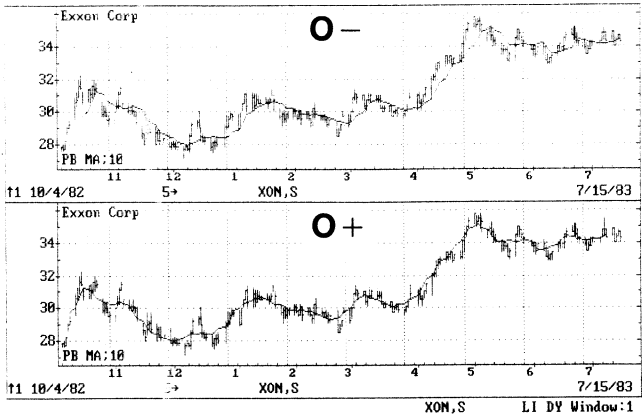
Examples: To turn the moving average offset on, enter

O+

Related Commands: Most commands which plot a moving, weighted or exponential average.

Theory: Although moving averages are generally plotted on the day represented by the last data point, this is not mathematically correct. Mathematically, the average should be plotted at the midpoint between the first and last day in the average. For example, for a five-day moving average, the average calculated should be plotted at the position of the third day, i.e., at the midpoint between the current day and five days past.

Most of the common trading systems are based on the average being plotted at the current day (not offset). THE TECHNICAL INVESTOR allows you the option of plotting either way. Figure 5b-3 shows a simple moving average plotted with (O+) and without (O−) an offset.



MOVING AVERAGE OFFSET
FIGURE 5b−3

OB ON-BALANCE VOLUME INDICATOR

Function: Plot an n1 entry exponential average of the on-balance volume indicator

Structure: **OB**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: Since the absolute value of the on-balance volume indicator is not significant, but the relative value is, this plot is always expanded to fit the selected window. This is true regardless of the last **VS** command issued. If **OB** is the first plotting command issued for a window, the vertical axis will be scaled to the absolute volume for reference purposes only.

The default value for n1 is 1. If n1 is 1, the actual (unaveraged) on-balance volume indicator will be plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600

Example: To plot a 6-day exponential average of the on-balance volume indicator, enter

OB;6

Related Commands: Turn moving average offset off and on (**O−** and **O+**)

Theory: On-balance volume is thought to represent the overall accumulation or distribution of stock. If the price increases, the on-balance volume is adjusted upward by the current volume and if the price decreases, the on-balance volume is adjusted downward by the current volume. Mathematically, it is represented by the formula:

$$\text{if } P_i = P_{i-1}: \quad OB_i = OB_{i-1}$$

$$\text{if } P_i > P_{i-1}: \quad OB_i = OB_{i-1} + V_i$$

$$\text{if } P_i < P_{i-1}: \quad OB_i = OB_{i-1} - V_i$$

If the on-balance volume is positive or increasing, then the stock is said to be under accumulation and the price is expected to rise. Similarly, if the on-balance volume is decreasing, the price is expected to follow suit and also decrease.

Specific trading methods involving on-balance volume generally require more complex analysis, but the basis of those systems is as described here.

OS OSCILLATOR FUNCTION

Function: Plot an oscillator function

Structure: OS;x1;x2;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The oscillator function plots points obtained by subtracting one value from another and then averaging the result. We call these "values" source functions. Specifically, we subtract the value of the "right source function" (x2) from the value of the "left source function" (x1) and then average the result over n1 entries.

For example, you might want to plot the difference between the high and the low price of a stock for each entry in a data file. Or, you might want to subtract each day's closing price from the previous day's closing price, so as to plot a curve which shows how much the security moved up or down each day.

It takes three pieces of information to define each source function: the source function type, the number of entries over which to average the source function, and the offset. Each source function is defined using the following format:

Type;Entries;Offset

Type: The source function type can be any of the following:

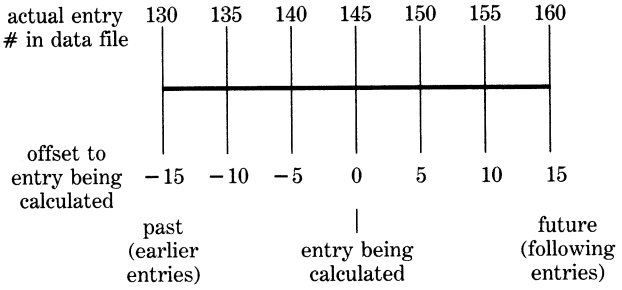
OSCILLATOR COMMAND SOURCE FUNCTIONS

Source Function	Description
H	High/ask price
L	Low/bid price
C	Closing price
V	Volume

Entries: Each source function can be averaged. The first argument following the source function type is the number of entries to use for the exponential average of the source function. A value of 0 (zero) or 1 will result in the actual (unaveraged) value being used.

Offset: The final argument in the source function definition is the offset. The oscillator function is often used to subtract a source function calculated at one point in time from a source function calculated at a different point in time. The offset determines the point in time to be used.

Use the following scale as a reference for this discussion. The 0 indicates the current entry for which the oscillator is being calculated.



To define an oscillator that subtracts the value 10 entries in the past from the value 5 entries in the future, the offset for the left source function would be 5 (5 entries in the future) and the offset for the right source function would be −10 (10 entries in the past).

Similarly, if you want to subtract the value 15 entries in the past from the current value, the offset for the left source function (x1) would be 0, and the offset for the right source function (x2) would be −15 (15 entries in the past).

For example, to use the 20-entry average of the low/bid price 10 entries in the past, the source function would be

L;20;−10

To use the actual (unaveraged) value for the volume 3 days in the future, the source function would be

V;0;3

The final argument in the oscillator definition (n1) will take the exponential average of the entire oscillator function (i.e., the value obtained after the right source function has been subtracted from the left source function). Again, a value of 0 or 1 will cause the actual (unaveraged) oscillator to be plotted. If you want to average, or smooth, the oscillator over 10 entries, the final argument should be 10.

A final note: the left and right source always refer to data for the same security. If you would like to subtract the closing prices of one security from the closing prices of another security, see the **DF** and **CD** command descriptions.

Cautions: If C is used as a source function type for a security that has no closing prices, the average of the high/ask and low/bid prices will be used.

If either C, H or L is used as the source function type for a security that has only one price stored, that price will be used.

The current status of the **O−/O+** commands will affect the position at which the exponential average of the oscillator function is plotted. The **O−/O+** commands have no effect, however, on how the individual source functions are calculated.

The values used for the number of entries over which to average must be between 0 and 600. This holds true for the averages of the source functions and for the entire oscillator function.

The values used for the offsets of the source functions must be within the range of the data stored in the security file.

Examples: The oscillator plot is very powerful, and allows you to plot many functions not otherwise available. This versatility, however, makes the oscillator definition relatively complicated. You may wish to assign oscillators that are used often to user procedures in order to minimize the keystrokes necessary to plot the oscillator each time.

Carefully studying the examples below will help you understand how the oscillator function works. Blank spaces are used in the examples to separate the source functions. These are not required, and are used here only to make the commands easier to read. The examples below refer to daily data. When working with weekly or monthly data files, the same examples would hold true except that the averages and offsets would be in weeks or months, respectively, instead of days.

OS; H;0;5; L;0;−4; 7

In this case the left source function is H;0;5, and the right source function is L;0;−4. Thus, this oscillator subtracts the actual (unaveraged) low/bid prices 4 days in the past (L;0;−4) from the actual high/ask prices 5 days in the future (H;0;5). The resulting curve will then be averaged (smoothed) over 7 days. (The plot will stop 5 days from the end of your data because the high/ask price 5 days in the future is not available past that point.)

OS; C;20;−12; C;0;0; 1

subtracts the actual closing price at the current day (C;0;0) from the 20-day average of the closing price 12 days in the past (C;20;−12). The 1 indicates that the actual (unsmoothed) oscillator will be plotted.

OS; C;0;0; C;0;−12; 5

subtracts the actual closing price 12 days in the past (C;0;−12) from the actual closing price at the current day (C;0;0). The oscillator is then averaged over 5 days.

OS; H;0;0; L;0;0; 0

subtracts the actual low/bid price at the current day (L;0;0) from the actual high/ask price at the current day (H;0;0). The unaveraged oscillator is plotted.

OS; C;0;0; C;0;−1; 0

subtracts the actual closing price one day in the past (C;0;−1) from the actual closing price at the current day (C;0;0). The unaveraged oscillator is plotted. (This oscillator plots the slope of the closing price curve.)

Related Commands: Turn moving average offset on and off (**O−** and **O+**)

Theory: The oscillator function permits an endless variety of different plots. It has the general form:

$$OS_i = x1_{i+o1} - x2_{i+o2}$$

where OS_i represents the oscillator function as calculated on day i. x1 and x2 represent the source functions as described above. o1 and o2 represent the positive or negative offsets from day i. The best way to understand the oscillator is to study some examples.

Some trading systems are based on momentum, or rate of change indicators. The 12 day rate of change indicator can be constructed using the following command sequence:

OS;C;0;0;C;0;−12;5

This gives a 5-day exponential average of the difference between the closing price and the closing price 12 days previous. Different offsets and averages may be used, but a momentum plot can give an indication of the overall trend of the stock and some advance warning of changes in the trend. The peaking of a momentum curve can be a signal that the strength of a bullish trend is decreasing.

An interesting application of the oscillator plot is to plot an approximation of the slope of a moving average. For example, this command

OS;C;6;1;C;6;−1;1

produces a plot of the difference between the 6 day exponential average of one day in advance and one day past. A high or low in this plot will usually precede a high or low in the price.

Another use of the oscillator plot is to find cycles in the stock price data. By plotting current prices minus prices at various past offsets, you can sometimes bring out these cycles and use them to predict future price activity.

PA PAUSE

Function: To pause until a key is pressed

Structure: **PA**

Type: Control command

Applies to: All windows

Description: When the pause command is encountered, the program stops until a number, letter or character key is pressed.

This command is primarily used with the loop procedure to allow viewing of a chart before the next one is plotted.

Cautions: None

Example: To pause at the end of a loop procedure, define the procedure like this:

ES;#LIST;**PB**;**EA**;50;**PA**;**RE**

Related Command: Repeat (**RE**)

PB PRICE BARS

Function: Plot price bars

Structure: PB

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: These are the typical high, low and close lines you see on many stock market charts. The high and low are connected by a line and the close is shown as a tick mark on the line. For over-the-counter stocks, a line connecting the bid and ask prices is plotted. If only one price is included in the file type being used, then points are plotted.

Cautions: If the file type you are plotting has only one price, make sure that the grid is off (**G –**) so that you will be able to see the price point plotted.

Example: To plot prices bars for the active security on the selected window, enter

PB

Related Command: Plot volume bars (**VB**)

PF POINT & FIGURE CHART

Function: Plot a point and figure chart

Structure: **PF**

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command plots a point and figure chart for the active security. The default chart is a 3 point reversal, 1 point advance chart, with standard box sizes and breakpoints.

Although any window may be used for this plot, we recommend that prior to this command you execute an **NW** ; 1 ; **CW** command to select one window (full size) and clear it. Since a point & figure chart cannot be scaled and retain its normal meaning, the full display should be used for these plots. Even so, sometimes the full monitor will not be big enough. In such a case, you can use the **HS** or **VS** commands to change the range to see isolated areas of the plot. Note that for point & figure charts, the **HS** command changes the range of data used to construct the plot, not the horizontal axis, and the **VS** command changes the lower or starting point on the vertical scale; the upper end of the vertical axis will be set by the size of the "units" being plotted.

If you do want to see the entire point & figure chart on any window, you can issue the **S+** (turn point & figure autoscaling on) command before the **PF** command, and the chart will be scaled to fit the display. The scaling factor for the chart will appear in brackets ([ ]) on the bottom of the selected window. (See the **S+**/**S−** commands.)

This command uses the high and low prices as the default basis for the plot. If the file type has one price only, then that price is used. See the **UV** command description for information on how to change the default basis.

The latest price of the security being plotted is marked on the point and figure chart. It is noted by an asterisk in the rightmost vertical column in the box corresponding to the price.

There are several other commands which affect point and figure charts. They are: **SL** (sets a given scaling rather than calculating one automatically);**AV** (sets the number of boxes move required for a advance); **RV** (sets the number of boxes move required for a reversal); **BS** (sets the size of the units or boxes on the vertical axis) and **BR** (sets the breakpoint between different box sizes).

There are two special commands in the Drawing Mode you can use to draw trend lines on point & figure charts. Enter the Drawing Mode by giving the **DM** command. Press ⟨U⟩ to draw an upward sloping line from the cursor point at the correct angle for the bullish support and resistance lines. Press ⟨D⟩ to draw a downward sloping line from the cursor position at the correct angle for the bearish support and resistance lines.

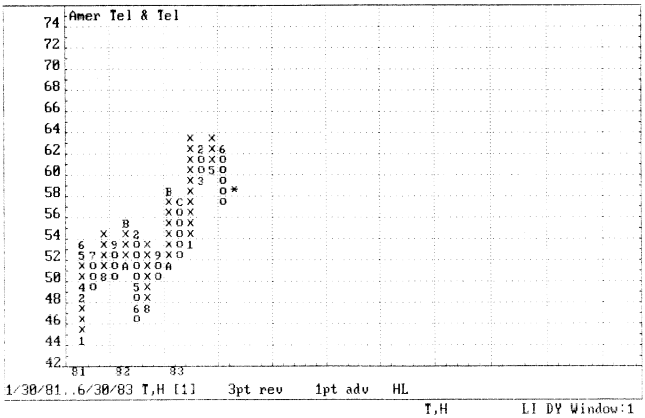
Cautions: Make sure you know the status of the related commands when using this command.

Example: To plot a point & figure chart, enter

PF

Related Commands: Turn point & figure autoscaling off and on (**S−** and **S+**); point & figure scale factor (**SL**); point & figure advance size (**AV**); point & figure reversal size (**RV**); point & figure breakpoint (**BR**); point & figure box size (**BS**); use values (**UV**); enter drawing mode (**DM**)

Theory: All of the charts discussed so far have time as the horizontal axis. The point & figure chart plots price against price activity; the time dimension is removed. As shown in Figure 5b-4, this produces charts that look very different.



POINT AND FIGURE CHART
FIGURE 5b – 4

A point and figure chart is normally constructed on graph paper that is divided into squares or boxes. The boxes are labeled vertically in units of price. For example, we could label the bottom box as 20, the one above it as 20½ and the next as 21, etc. In this case, each box size is equal to ½ point. It is customary to make the box sizes larger at higher prices and smaller at lower prices. This allows a fairly constant interpretation of the chart at high and low price levels, where each box represents a similar percentage of the price.

The size of a unit or box varies depending on the price as follows:

P&F CHART UNIT SIZE

Price Range	Box Size
less than 5	¼
5 – 20	½
20 – 100	1
100 – 500	2
500 – 1000	5
1000 – 5000	10
5000 – 10,000	20
10,000 – 20,000	50
20,000 and above	100

The points along the vertical price axis where the box sizes change are called breakpoints. In the default case, we use a box size of ¼ point for prices less than 5, ½ point for prices between 5 and 20, 1 point for prices between 20 and 100, etc. Here the box sizes are ¼, ½, 1, etc. and the breakpoints are 5, 20, 100 etc. The breakpoints and box sizes may be changed using the **BR** and **BS** commands.

A "one point advance - three point reversal" point & figure chart is constructed on graph paper having the vertical axis boxes marked in the "units" noted in the preceding table. To start, pick a starting date and closing price. The price that day defines your first box: if the price was 34⅜, then you are in box 34.

Next, look at the prices the next day. If the high price goes up, but not enough to get to the next unit, then do nothing. If the high price stays the same, do nothing. If the high price has moved up enough to reach the next unit (that is, if it is 35 or above), put an X in the box next to the 35. As the high price continues to move up, put an X in each box in the same column as the high price enters each new unit. If the high price jumps two or more units, fill in the intermediate boxes with X's.

If the *high* price goes down, look at the low price. If it goes down over one or more days, but not enough to drop to the third unit below the top X, then do nothing.

If, however, over a period of one or more days, the low price goes down to the 3rd unit below the highest X, then move over one column to the right and fill in O's from one box below the top X box to the present unit box. Now continue to fill in O's as the low price drops into each lower unit. Finally, when the *low* price stops going down and the high price turns around enough to go up by at least three units (over one or more days), then move right one column and start marking X's again from one box above the lowest O and continuing to the current unit.

Note, then, that a price reversal of three units is required to change from X's to O's or back. Each time the price changes direction by at least three units, move over one column to the right and record the appropriate mark. This of course is where the name "three point reversal" comes from. The number of boxes required for advance or reversal may be changed with the **AV** and **RV** commands.

To give some indication of time, the first mark in each new month is sometimes written as the number of the month. In other words, the first X or O marked for March would be replaced by a 3, and the first for April by a 4. (Because of the limited room on the monitor, the program uses A, B and C instead of 10, 11 and 12 for October, November and December.) Note that some month numbers may never be written if you are tracking a particularly non-volatile stock.

To summarize: on a three point reversal chart, if the price is rising an X is marked in each box as the high price reaches the value assigned to the box. If the low price drops by three boxes from the highest X in the current column, then an O is plotted in the next vertical column, and subsequent price drops are marked with

O's in each box as they are reached. This is called a 1 point advance, 3 point reversal chart: it takes only one box movement to record an X or an O in the current direction (up or down), but three boxes movement to record a reversal and move to the next column.

Many of the patterns generated by the point & figure chart are thought to be significant. Generally, if a column of X's goes higher than the previous column of X's, a buy signal is generated. If a column of O's goes below the previous column of O's, a sell signal is given.

Support and resistance line have similar significance to those for the price charts, but they are constructed differently. A support or resistance line starts at a point and goes upward or downward through successive corners of the unit boxes. The bullish support line starts at the lowest price and trends upward. The bearish resistance line starts at the highest price and trends downward. (These lines can be constructed using the Drawing Mode U and D subcommands: just issue the **DM** command after you have plotted your point & figure chart.)

PP PRINT USER PROCEDURES

Function: Print all user procedures on your printer

Structure: **PP**

Type: Control command

Applies to: All windows

Description: This command gives you a printed copy of all your user procedures, including the function key procedures !, @, #, $, %, ^, &, *, (, and), the Startup procedure ? and the Autoplot procedure).

Cautions: Make sure your printer is connected, turned on, and on-line.

Example: To print the present definitions of your user procedures on your printer, enter

PP

Related Commands: Define user procedures (**DP**); edit user procedures (**EP**); execute user procedures (**XP**); check status (**KS**)

PR PERCENTAGE RATIO

Function: Plot an n1 entry exponential average of the percentage ratio of the active security to security x1

Structure: **PR**;x1;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command is similar to the ratio (**RA**) command, except that instead of plotting the ratio of the two securities for each date, a normalized ratio is plotted.

Mathematically, the percentage ratio is defined as

$$PR_i = 100 \left(\frac{P_i}{P_i + R_i} \right)$$

where P_i is the price of the active security on day i and R_i is the price of the reference security (x1) on day i.

This command uses closing prices for the plot. If the file type does not have closing prices, then the average of the high and low price are used. If there is only one price, then it is used.

A maximum of 600 entries can be plotted using this command. When this limit is exceeded only the first (left-most) 600 entries will be plotted; the remainder of the chart will be left blank.

If n1 is 1, the actual (unaveraged) data will be plotted. The position at which the average is plotted depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600

If you are plotting in the sequential mode (**SQ**), make sure the data for all securities is the same; see the **ES** and **SQ** commands for more information.

Both the active security and the reference security data files must reside in the same fixed disk directory or floppy disk.

Example: To plot a 7-entry exponential average of the percentage ratio of the active security to GM, enter

PR;GM;5

Related Commands: Ratio (**RA**); relative strength chart (**RS**); turn moving average offset off and on (**O−** and **O+**)

PS PRINT SCREEN

Function: Print the image of the screen on your printer

Structure: **PS**

Type: Control command

Applies to: All windows

Description: Invoking this command will result in an image of the screen being printed on your graphics-capable printer (see list of supported printers at the beginning of this manual).

You may also print the screen on your printer at any time by pressing ⟨Shift⟩ + ⟨PrtSc/*⟩.

See "Appendix B: Alternate Printer Routines" if you want to use a screen dump routine different than the one included with this program.

Cautions: Make sure your printer is connected, turned on, and on-line.

If this command doesn't work (i.e. nothing happens), and you've just changed the printer type in the system parameters section, make sure you exit to DOS and restart the program to set the new print screen routine for the new printer.

Example: To print the contents of your screen on your printer, enter

PS

Related Commands: New line (**NL**); new page (**NP**)

PT PRICE VOL. TREND INDICATOR

Function: Plot the price volume trend indicator

Structure: **PT** ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The trend (or relative value) of the price volume trend indicator is significant, not the absolute value. Therefore this plot is always expanded to fit the selected window. This is true regardless of the last **VS** command issued. If **PT** is the first plotting command issued for a window, the vertical axis will be scaled to the absolute volume for reference purposes only.

The horizontal position at which the average is drawn depends upon the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600

Example: To plot the actual price volume trend indicator, enter

PT ; 1

Related Commands: Turn moving average offset on/off (**O+**/**O−**)

Theory: The price volume trend is calculated by adding or subtracting the volume in proportion to the price change. It is represented by the formula:

$$PT_i = PT_{i-1} + V_i \left(\frac{P_i - P_{i-1}}{P_{i-1}} \right)$$

This is similar to the on balance volume, except that the magnitude of the price change is taken into consideration. See the on balance volume **OB** command description for details.

PV POSITIVE VOLUME INDICATOR

Function: Plot an n1 entry exponential average of the positive volume indicator

Structure: **PV**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The trend (or relative value) of the positive volume indicator is significant, not the absolute value. Therefore this plot is always expanded to fit the selected window. This is true regardless of the last **VS** command issued. If **PV** is the first plotting command issued for a window, the vertical axis will be scaled to the absolute volume for reference purposes only.

If n1 is 0 or 1, the actual (unaveraged) positive volume indicator will be plotted.

The horizontal position at which the average is drawn depends upon the moving average offset commands (**O−** and **O+**).

Cautions: n1 must be between 0 and 600

Example: To plot the unaveraged positive volume indicator, enter

PV;1

Related Commands: Plot negative volume indicator (**NV**); turn moving average offset off and on (**O−** and **O+**)

Theory: The positive volume indicator is similar to the negative volume indicator (see the **NV** command description) except that the value is adjusted by the fractional change in price when the volume increases. It is calculated by the formula

$$\text{if } V_i > V_{i-1}: \quad PV_i = PV_{i-1}\,(P_i / P_{i-1})$$
$$\text{if } V_i \leq V_{i-1}: \quad PV_i = PV_{i-1}$$

where PV_i is the positive volume indicator for day i. In other words, if the volume increases from yesterday to today, then the positive volume indicator is equal to yesterday's indicator times the ratio of today's price over yesterday's price. If the volume remains constant or decreases, the positive volume indicator does not change.

The positive volume indicator generally has an upward trend. A downtrend is an indication of abnormal conditions.

RA RATIO

Function: Plot an n1 entry exponential average of the ratio of the active security relative to security x1

Structure: **RA**;x1;n1

Type: Plotting Command

Applies to / Uses: Selected window / active security

Description: The ratio plot is defined as a plot of the price of the active security divided by the price of the reference security (x1). This is similar to the relative strength chart except that the values are not scaled to a starting value of 100.

For each security, the command uses closing prices as the basis for the chart. If the file type for either security has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

In daily mode (**DY**), points will be plotted for each date only when the active security and the reference security (x1) both have prices available for that date. In sequential mode (**SQ**), the ratio of each consecutive set of points is plotted, regardless of date.

If you want to plot the ratio of several securities against the same reference security, just issue a **ES** command for the new security, then an **RA** to plot the ratio of the new security against the same reference security you used for the first chart. As always, the first security plotted sets the vertical and horizontal axes, and these ranges may not be wide enough for the additional securities. If so, you can use the **VS** and **HS** commands to change the range of the axes.

If n1 is 0 or 1, the actual (unaveraged) data will be plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O−** and **O+**).

Cautions: n1 must be between 0 and 600

If you are plotting in sequential mode (**SQ**), make sure the data for both securities are the same; see the **ES** and **SQ** commands for more information.

Both the active security and the reference security data files must reside in the same fixed disk directory or floppy disk.

Examples: To plot the 5-entry average of the New York Stock Exchange advance/decline ratio, first enter the number of issues advancing (NYAD) using the **ES** command, then plot a ratio to the number of issues declining (NYDE) by entering

RA;NYDE;5

To plot a 12-day exponential average of the ratio of the active security to the Dow Jones Industrial Average, enter

RA;DJ-30;12

Related Commands: Relative strength (**RS**); percentage ratio (**PR**)

RC RECALL CHART

Function: Recall a window image saved as number x1 and plot it on the selected window

Structure: **RC ; x1**

Type: Control command

Applies to: Selected window

Description: x1 can be any whole number from 0 to 9, inclusive.

A saved window may be recalled to a window different than that from which it was saved. If recalled on a different size window, the plot size will be adjusted accordingly.

Cautions: Whatever is on the selected window will be lost.

The data directory (or floppy data disk) you were using when you saved the chart must be used when you recall the chart. Also, the program saves the *commands* required to reconstruct that chart, so the data file itself must still be in the data directory.

Example: To recall a window saved as number 7, enter

RC ; 7

and the chart will be recalled to the selected window.

Related Command: Save chart (SC)

RE — REPEAT

Function: To repeat a sequence of commands for a List of securities

Structure:

ES;#LIST;.....;**RE**
CE;#LIST;.....;**RE**
***E**;#LIST;.....;**RE**

Type: Control command

Applies to: All windows

Description: The repeat command is used only in conjunction with the **ES**, **CE** or ***E** commands and a List name, in what are called "loop procedures". Loop procedures allow you to perform the same sequence of operations on each security in a List. Thus, if you frequently analyze a series of securities by the same method, you can automate the procedure.

The loop procedure has the following structure:

ES;#LIST;.....;**RE**

#LIST represents the name of a security List created using the List module. The special List name #ALL may be used to include every security on the data disk. You may also use the **CE** or ***E** command in place of **ES**.

The dots represent any valid sequence of commands. The looping part of a procedure must begin with **ES**, **CE**, or ***E** and end with **RE** (repeat); everything from **ES**, **CE** or ***E** through **RE** will be repeated for each security in #LIST.

Because loop procedures generally involve several commands to execute, they are usually assigned to a user procedure to minimize the number of keystrokes necessary to execute them.

When entering a loop procedure, everything from the List name (or user procedure variable) to the **RE** command must be entered on one line. If you wish to write a long procedure that requires more than one line, use the form:

ES;#LIST;XP;A;XP;B;. . . . . .;XP;Q;RE

where procedure A contains the first part of the command sequence, procedure B the second part, and so on.

Cautions: Any errors encountered while looping will cause the loop to stop and all subsequent commands will be lost.

Examples: To plot price bars and a 50-entry moving average of each security in a List named #MYLIST, and print the charts on your printer, enter

ES ; #MYLIST ; PB ; EA ; 50 ; PS ; CW ; RE

If you want to plot a 10-entry average of the relative strength index on window 1, and the actual closing prices on window 2 for each symbol on your data disk, pausing after each one is plotted, enter

NW ; 2 ; *E ; #ALL ; RI ; 10 ; IW ; CP ; 0 ; PA ; RE

Related Commands: Clear and enter symbol (**CE**); enter symbol (**ES**); pause (**PA**); reset/enter (***E**)

RI RELATIVE STRENGTH INDEX

Function: Plot the relative strength index

Structure: **RI** ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command plots an n1-entry simple moving average of the relative strength index. If n1 is 0 or 1, the program will plot the 14-entry relative strength index.

Horizontal lines are plotted at values of 30 and 70, provided that these values are on the vertical scale. These values are the normally-used extreme points for interpreting this index.

Cautions: n1 must be between 1 and 600.

Example: To plot a 14-day average of the relative strength index, enter

RI ; 14

Related Commands: None

Theory: The relative strength index should not be confused with the relative strength plot (**RS**), which compares a security to a reference security or index. The relative strength index is a measure of the trend of a security or index based upon its closing prices. The index varies between 0 and 100. High numbers indicate that the closing prices are trending upward and low numbers indicate that the closing prices are trending downward.

It is calculated as follows:

$$RI = 100 - \frac{100}{1 + AU / AD}$$

where AU is an n1-entry simple moving average of the closing price change for those days where the price closed up from the previous day and AD is an n1-entry simple moving average of the price change for those days where the price closed down from the previous day. n1 is the number of days chosen for the computation (i.e., **RI**;n1)

The relative strength index calculated by the **RI** command is similar to that developed by Welles Wilder, except that the response time is quicker.

This index will often show a top or bottom before the security price. A top is indicated when the index peaks at a value above 70, a bottom when the index bottoms below 30. Chart patterns similar to those familiar on price bar charts are frequently seen with this index, such as head and shoulder formations, triangles, etc. A double top or bottom where the second does not exceed the extreme of the first is considered a strong indication of a reversal. Similarly, divergence between price and the relative strength index is often a strong indication of an imminent turning point. For example, if price is increasing and the relative strength index is decreasing, beware of an approaching peak.

RL SPEED RESISTANCE LINES

Function: Plot the 1/3 and 2/3 speed resistance lines

Structure: **RL**

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: For an uptrend in prices, the ⅓ and ⅔ speed resistance lines are constructed by choosing a past major low and a more recent major high. The ⅔ line is drawn from the low point through a point below the major high at ⅔ of the difference between the high and the low, and extended to the end of the chart. The ⅓ line is drawn similarly, but to a point ⅓ of the difference between the high and the low. For a downtrend in prices, the lines are constructed similarly using a recent low and an earlier high.

For example, let's assume an uptrend in prices. When you invoke the **RL** command, a cursor will appear on the selected window. Using the cursor, you must select an appropriate low point. The cursor will be at a point selected as a likely candidate. If you accept this point, just press ⟨Enter⟩. If you prefer some other base point, just move the cursor using the cursor control keys until you find the point you like, then press ⟨Enter⟩.

Next, you will be asked to select an appropriate high point. Again, the cursor will appear in a spot chosen as a likely candidate. If you like this high point, just press ⟨Enter⟩. Otherwise, move the cursor to the point you desire and then press ⟨Enter⟩.

While the cursor is on the window, the cursor speed can be controlled by holding down the ⟨Shift⟩ key while pressing the cursor keys. While the ⟨Shift⟩ key is pressed, the cursor will take bigger jumps in the direction specified by the key. You can reverse the function of the ⟨Shift⟩ key by pressing the ⟨Num Lock⟩ key once;

this makes the normal speed fast and the ⟨Shift⟩ speed slow. Pressing ⟨Num Lock⟩ again returns the system to the original state.

This command must be preceded by any command which plots price data on the window; if the vertical axis on the selected window does not refer to prices (i.e., if the window is blank or the axis refers to volume or an oscillator function), the **RL** command will be rejected.

The command uses the actual (unaveraged) "high/ask" and "low/bid" prices to choose the suggested major high and low points (regardless of the actual plot on the window). If the file type has one price, then that price is used.

Cautions: Sometimes there are no well defined low and high reference points for the speed resistance lines: the prices may have pretty much steadily risen or fallen over the period plotted. In such cases the speed resistance lines have no real meaning.

For purposes of the undo last plot command (**UP**), the ⅓ and ⅔ speed resistance lines are considered two different plotting commands; in other words, you must issue the **UP** command twice to erase both lines.

Example: To plot the speed resistance lines, enter

RL

and a cursor will appear on the selected window at a suggested base point. Use the cursor control keys to move the cursor to your preferred base point and press ⟨Enter⟩, or just press ⟨Enter⟩ if you agree with the suggested base point. When the cursor reappears at a suggested end point, either move the cursor to your preferred end point and press ⟨Enter⟩, or just press ⟨Enter⟩ if you agree with the suggested end point. The ⅓ and ⅔ speed resistance lines will then be plotted.

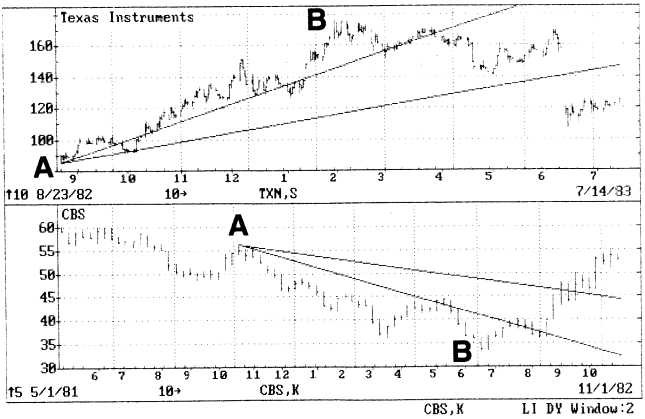
Related Commands: None

Theory: Speed resistance represent special kinds of support and resistance lines. The ⅓ and ⅔ speed resistance lines are constructed as follows (refer to Figure 5b-5):

For an uptrend in prices, select a recent high point in the price chart (point B), then select a major low that preceded this high (point A).

Next, draw a line from point A to a point directly below point B at the price equal to the price of A plus ⅔ the price difference between B and A. Extend this line to the edge of the chart. This is the ⅔ resistance line.

Repeat with a second line that starts at A and goes through the point directly below B at the price equal to the price of A plus ⅓ of the price difference between B and A. This is the ⅓ resistance line.



SPEED RESISTANCE LINES
FIGURE 5b – 5

The ⅔ speed resistance line is thought to represent a support line, in that the price moves should remain above this line. However, if the price drops below this line, then the ⅓ line becomes the new support line. If the ⅓ line is also penetrated, then a new trend is established and the price is expected to continue downward.

Referring to Figure 5b-5 again, for a downtrend in prices, select a recent low (point B) and then a high that preceded this low (point A). Draw a line from A through the point directly above B at the price equal to the price of A minus ⅔ of the price difference between A and B. This is the ⅔ resistance line. Repeat for a line drawn from A through the point directly above B at a price equal to the price of A minus ⅓ of the price difference between A and B.

The intrepretation is similar to the uptrend case, except that the ⅔ line is thought to represent resistance. If the ⅔ line is penetrated, the ⅓ line becomes the new resistance line. If the ⅓ line is also broken, then a new bullish trend is signaled.

Note that the individual ⅓ and ⅔ lines are sometimes labeled differently, and sometimes drawn using different base or reference points, though in such cases the general interpretation remains the same. You can use any method you like: just manually position the cursor wherever you want the reference points to be.

RP REPLOT WINDOW

Function: Replots the currently selected window

Structure: **RP**

Type: Control command

Applies to: Selected window

Description: Issuing the **RP** command results in the selected window being replotted. This is primarily used when some control command has been changed and you want it to take effect for an existing chart.

For example, on a point and figure chart, if you want to change the number of boxes for a reversal, you can do so using the **RV** command. However, the **RV** command applies only to charts plotted subsequently. The **RP** command will replot the existing chart with the new reversal.

Cautions: None

Example: To replot the chart on the selected window, enter

RP

Related Commands: None

RR REPORT RESULTS

Function: Print the results of a calculation on your printer

Structure: **RR**

Type: Control command

Applies to: Selected window/active security

Description: Many of the plotting commands generate and plot values that are the results of calculations (such as averages). This command allows you to print the results of these calculations on your printer.

Only the results from the next command issued will be printed. If the next command is a plotting command which does not produce calculated values (**HL**, **LN**, **LR**, **PB**, **PF**, **RL**, **VB** or **VL**), or a control command, the **RR** command will be cancelled.

Cautions: Make sure your printer is connected, turned on, and on-line.

Example: To print the results of a ten-day average of on-balance volume indicator, enter

RR;OB;10

Related Commands: None

RS RELATIVE STRENGTH CHART

Function: Plot the n1-entry exponential average of a relative strength chart of the active security relative to security x1

Structure: **RS** ; x1 ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The relative strength chart is defined as a plot of the price of the active security divided by the price of the reference security x1, with each entry adjusted proportionately so that the first point on the plot has a value of 100.

For each security, the command uses closing prices as the basis for the chart. If the file type for either security has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

Points will be plotted for each date only when the active security and the reference security (x1) both have prices available for that date. The first point on the plot will be set at 100 on the vertical axis, allowing you to read the vertical axis directly in percent.

If you want to plot the relative strengths of several securities against the same reference security, just issue an **ES** command for the new security, then an **RS** to plot the relative strength of the new security against the same reference security you used for the first chart. As always, the first security plotted sets the vertical and horizontal axes, and these ranges may not be wide enough for the additional securities you plot. If so, you can use the **VS** and **HS** commands to change the range of the axes.

As a special case, you can enter an @ (⟨Shift⟩ + ⟨@/2⟩) for x1. When you do, the security will be referenced to a constant value, allowing you to compare several securities to each other without the interference of a reference security. For each security you want to compare, enter the symbol with an **ES** command and follow it with an **RS**;@ command. By doing this, you can compare a constant dollar investment in each security: since all the plots start at 100, you can directly read what a $100 investment in each security would have been worth over the period of the chart.

If n1 is 1, the actual (unaveraged) data will be plotted.

A maximum of 600 entries can be plotted using this command. When this limit is exceeded only the first (left-most) 600 entries will be plotted; the remainder of the chart will be left blank.

The position at which the average is plotted depends upon the moving average offset setting (**O**+/**O**−).

Cautions: n1 must be between 1 and 600

If you are plotting in sequential mode (**SQ**), make sure the data for all securities is the same; see the **ES** and **SQ** commands for more information.

The active and reference security data files must reside in the same fixed disk directory or floppy disk.

Example: To plot a 5-day average of the relative strength of the active security versus the Dow Jones Industrial Average, enter

RS;DJ-30;5

To compare XON and HON to each other (unaveraged), enter the symbol for XON and then plot the actual relative strength against a constant value. Then enter the symbol for HON and, on the same window,

plot the relative strength for it against a constant. To do this, enter:

ES ; XON ; **RS** ; @ ; 1 ; **ES** ; HON ; **RS** ; @ ; 1

Related Commands: Percentage ratio (**PR**); ratio (**RA**); moving average offset on/off (**O**+/**O**−)

Theory: The relative strength plot provides a way to compare two or more stocks against each other or a base stock or index. Generally, the relative strength is defined as the price of a stock divided by the price of a market index, such as the Dow Jones 65 stock composite or the Standard & Poor's 500. Thus, a plot of the relative strength will trend upward if the stock is rising faster than the index, or if it is falling slower than the index. Similarly, the relative strength will trend downward if the stock price is rising less rapidly than the index, or if it is falling faster than the index. In other words, an uptrend signals a stock that is outperforming the market, a downtrend signals a stock that is performing more poorly than the market. Mathematically, the relative strength can be represented as follows:

$$RS_i = \frac{P_i}{R_i}$$

where R_i is the price of the reference index or stock. For ease of use, we define the first point to be 100 and all other points are scaled to this one. This puts all relative strength plots on the same scale so that trends can be easily compared.

Relative strength plots are frequently treated much like price plots. That is, moving averages and trend lines are used and chart formations have similar significance. You can use the drawing mode (**DM**) on a relative strength chart to draw trend lines.

Multiple stocks can be compared against the reference or against each other to point out the stocks which have been the superior performers.

RV P&F REVERSAL SIZE

Function: Change to x1 the number of boxes required for price reversal on the point and figure chart

Structure: **RV**;x1

Type: Control command

Applies to: All windows

Description: This command will change the number of boxes required for a reversal on a point and figure chart. The default value is 3: normally a price reversal equal to three boxes on the vertical axis is required to have a reversal. This may be changed by entering **RV**;x1, where x1 is the number of boxes required for a reversal.

The new value applies to all point and figure charts plotted after the command is issued. Existing charts are not replotted.

Cautions: x1 must be between 0 and 99

Example: To change to a 10 point reversal, enter

RV;10

Related Commands: Point & figure chart (**PF**); P&F advance size (**AV**); P&F box size (**BS**);P&F breakpoint (**BR**)

RW REPLICATE WINDOW

Function: Make a copy of window s1 and move that copy to window s2

Structure: **RW** ; s1 ; s2

Type: Control command

Applies to: Windows s1 and s2

Description: When this command has finished executing, you will have two identical copies of window s1. This is useful for cases where a plot is getting cluttered and you want to split it into two plots, or where you want to compare several ways of plotting the data.

You can move a chart to a window not currently displayed. If you do, the chart will be there when you display that window using the **NW** control command.

Cautions: Whatever is on window s2 will be lost.

Example: To make a copy of window 2 and move it to window 3, enter

RW ; 2 ; 3

Related command: Exchange windows (**XW**)

S−/S+ POINT & FIGURE AUTOSCALING

Functions:
S− Turn point & figure autoscaling off
S+ Turn point & figure autoscaling on

Structure:
S−
S+

Type: Control commands

Applies to: All windows

Description: These commands turn off and on (i.e., disable and enable) the automatic scaling of point & figure charts (see the **PF** command). When autoscaling is off, all point & figure charts will be plotted normally, even if they extend off the window. This is the default condition (**S−**).

When autoscaling is on, all subsequent point & figure charts will be scaled to fit the selected window. The scaling factor used is shown in brackets at the lower-left corner of the window. For example, [2] means that the plot was scaled by a factor of two; thus, the one box move required to plot a point would be two boxes on an unscaled chart, and the three box reversal would be a six box reversal on an unscaled chart. Note, therefore, that the chart produced by such a scaling may not have the same meaning or significance as an unscaled chart. However, for particularly volatile stocks, the scaling can be useful to help you determine the overall trend of the chart.

Cautions: Scaling factors other than [1] may not retain the normal meaning of point & figure charts.

Examples: To turn on automatic scaling of point & figure charts, enter

S+

Related Commands: Plot point & figure charts (**PF**); check status (**KS**)

SC SAVE CHART

Function: Save the selected window as image number x1

Structure: SC;x1

Type: Control command

Applies to: Selected window

Description: Ten memories are provided for this purpose: x1 can be any whole number from 0 to 9.

Cautions: Charts with several overlay plots may be too complex to save. If a chart is too complex to save, you will get an error message when you enter the **SC** command.

The program saves the *commands* required to reconstruct that chart, so the data file itself must still be in the data directory when you recall the chart with the **RC** command.

Example: To save the chart on the selected window in memory 7, enter

SC ; 7

Related Command: Recall chart (**RC**)

SL P&F SCALE FACTOR

Function: Changes the point and figure scale factor to x1

Structure: SL;x1

Type: Control command

Applies to: All windows

Description: This command manually sets the point & figure scale factor to x1. This is the same scale factor that is set automatically when the point & figure autoscaling function is turned on using the S+ command.

All box sizes are multiplied by x1, but the number of boxes required for advance or reversal remains unchanged. This provides a way to force a chart to fit on a window. However, a scaled chart (one with x1 greater than 1) may not have the same meaning as an unscaled chart.

Autoscaling is turned off by this command (see the S− command).

The new value applies to all point and figure charts plotted after the command is issued. Existing charts are not replotted.

Cautions: x1 must be between 0 and 99

Example: To set the point and figure scale factor to 4, enter

SL;4

Related Commands: Point & figure autoscaling (S−/S+)

SQ SEQUENTIAL MODE

Function: Set the sequential plotting mode

Structure: **SQ**

Type: Control command

Applies to: Selected window

Description: All subsequent plots on the selected window will be plotted on a scale where the horizontal axis is marked in terms of entries. In other words, weekends, holidays and missing data are all skipped; the next entry in the file will always be plotted at the next point, regardless of its date.

The **SQ** command is associated with the selected window. That is, you can set **SQ** for one window, then switch back and forth between windows, and the program will remember the mode for each window.

If you issue the **SQ** command for a window that already has plots in the daily (**DY**) mode, the window will immediately be replotted in the **SQ** mode.

Cautions: A note about overlaying plots of different securities on the same window while in sequential mode (**SQ**): the plots for all securities will start at the date indicated on the left side of the horizontal axis, if there is an entry for that date. If there isn't, the next entry in the file is plotted instead, regardless of date. The same goes for the second point on the plot, and so on. Thus, unless all entries for all the overlayed securities are the same (that is, unless corresponding entries have the same dates), the overlay will not be accurate. If you are not sure if the data is the same, use the daily mode (**DY**). See the **ES** command for more information.

Example: To set sequential mode for the selected window, enter

SQ

Related Commands: Set daily mode (**DY**)

SW SELECT WINDOW

Function: Change the selected window to s1

Structure: **SW** ; s1

Type: Control command

Applies to: Selected window

Description: All subsequent commands that pertain to the "selected" window will be applied to window s1. s1 must be one of the displayed windows.

s1 defaults to 1 if the **SW** command has not been issued.

The positions of windows 1, 2, 3 and 4 depend upon the **NW** command; see the **NW** command for more information.

Cautions: When you switch to a blank window, the **ES** and **HS** of the last window you worked on will be used, and **VS** will be set for **VS** ; 0 ; 0.

Example: To select window 2 for subsequent plots, enter

SW ; 2

Related Commands: Set number of windows (**NW**); decrement window (**DW**); increment window (**IW**)

TE EXPONENTIAL TRADING BAND

Function: Plot a trading band x1 percent from the n1 entry exponential average

Structure: **TE ; n1 ; x1**

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: Normally, this command is executed twice, once to form the band above the average, and again to form the band below the average.

The band plotted will be on the averaged price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The band plotted will be on the averaged volume data if the vertical axis plotted on the window refers to volume. You can tell if the vertical axis refers to volume by the V in the upper left corner of the window. Plotting commands which produce a vertical axis referring to volume include **VB**, **VP** and the volume indicators.

When plotting prices, the closing price are used as the basis for plotting. If the file type has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

If n1 is 1, the actual (unaveraged) data will be plotted.

The position at which the average is drawn depends upon the moving average offset commands (**O+**/**O−**).

Cautions: n1 must be between 1 and 600

Example: To plot a band 3 percent above the 6 entry exponential average and three percent below the 6 entry exponential average, enter

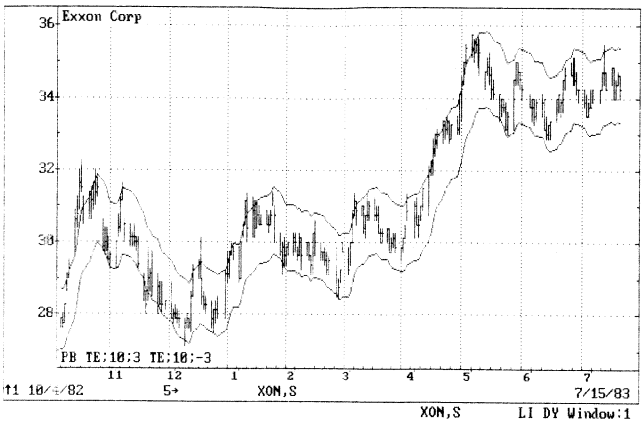
TE ; 6 ; 3 ; TE ; 6 ; -3

Related Commands: Plot moving and weighted trading bands (**TM** and **TW**); plot exponential, moving, and weighted average (**EA**, **MA** and **WA**); moving average offset on/off (**O+/O−**)

Theory: Trading bands are identical to moving averages, except that they are offset either up or down by a constant percentage. Trading bands may be constructed using the simple, weighted or exponential moving averages. The **TE** command plots the exponential average, the **TM** command plots simple moving average bands, and the **TW** command plots weighted moving average bands.

A trading band might be constructed of two lines that are 3% above and 3% below the exponential moving average. This forms a channel around the prices. By varying the percentage offset, you can usually find a channel within which the prices tend to stay. Prices that break out of this channel may signal a new trend in the stock price. A sell signal is generated when the price goes below the lower trading band, and a buy signal is generated when the price gets above the upper trading band.

Figure 5b-6 shows a typical trading band construction. Note that the bands do not have to be symmetrical, that is, a trading band may be constructed with lines 3% above and 2% below the moving average, or with any other percentages you desire.



TRADING BANDS
FIGURE 5b – 6

Using trading bands instead of single moving average lines reduces the whipsaw nature of moving average signals. They will, in effect, filter out most of the small advances and declines and only produce buy and sell signals for the more substantial price movements.

TM MOVING TRADING BAND

Function: Plot a trading band x1 percent from the n1 entry simple moving average

Structure: **TM** ; n1 ; x1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: Normally, this command is executed twice, once to form the band above the average, and again to form the band below the average.

The band plotted will be on averaged price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The band plotted will be on averaged volume data if the vertical axis plotted on the window refers to volume. You can tell if the vertical axis refers to volume by the V in the upper left corner of the window. Plotting commands which produce a vertical axis referring to volume include **VB**, **VP** and the volume indicators.

When plotting prices, the closing price are used as the basis for plotting. If the file type has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

If n1 is 1, the actual (unaveraged) data will be plotted.

The position at which the average is drawn depends upon the moving average offset commands (**O+**/**O−**).

Cautions: n1 must be between 1 and 600

Example: To plot a band 2 percent above and below the 10-day moving average, enter

TM ; 10 ; 2 ; **TM** ; 10 ; 2

Related Commands: Plot exponential and weighted trading bands (**TE** and **TW**); plot exponential, moving and weighted average (**EA**, **MA** and **WA**); moving average offset on/off (**O** + / **O** −)

Theory: See the **TE** command description

TW WEIGHTED TRADING BAND

Function: Plot a trading band x1 percent from the n1 entry weighted moving average

Structure: **TW** ; n1 ; x1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: Normally, this command is executed twice, once to form the band above the average, and again to form the band below the average.

The band plotted will be on averaged price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The band plotted will be on averaged volume data if the vertical axis plotted on the window refers to volume. You can tell if the vertical axis refers to volume by the V in the upper left corner of the window. Plotting commands which produce a vertical axis referring to volume include **VB**, **VP** and the volume indicators.

When plotting prices, the closing price is used as the basis for plotting. If the file type has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

If n1 is 1, the actual (unaveraged) data will be plotted.

The position at which the average is drawn depends upon the moving average offset commands (**O+**/**O−**).

Cautions: n1 must be between 1 and 600

Example: To plot a band 5 percent above the 4 entry weighted moving average, enter

TW;4;5

Related Commands: Plot exponential and moving trading bands (**TE** and **TM**); plot exponential, moving and weighted average (**EA**, **MA** and **WA**); moving average offset on/off (**O**+/**O**−)

Theory: See the **TE** command description

UP — UNDO LAST PLOT

Function: Replot the selected window, leaving off the most recent plot

Structure: **UP**

Type: Control command

Applies to: Selected window

Description: This command erases the last plotting command issued for the selected window.

You can issue the command multiple times, each time erasing the most recent plot. Or you can move between windows, erasing the latest plot(s) on each.

Cautions: Undoing the last plot on a window is equivalent to issuing a **CW** command.

Example: To replot the selected window leaving off the most recent plot, enter

UP

Related Commands: None

UV — USE VALUES

Function: Change the basis for point & figure, stochastic oscillator and Williams Percent-R charts

Structure: **UV** ; x1

Type: Control command

Applies to: All windows

Description: The point & figure chart normally uses high prices for plotting X's when the security price is moving upward and low prices for plotting O's when the price is moving downward. The stochastic oscillator and Williams Percent-R charts both use the high price to determine the highest price for a period, and the low price to determine the lowest price for a period.

The **UV** command will change this default condition, where x1 is a two-letter code that specifies which types of prices to use. The first letter indicates the price that will be used for advancing prices in point & figure charts and also as the high price for a period in stochastic oscillators and Williams Percent-R charts. The second character indicates the price that will be used for declining prices in point & figure charts and also as the low price for a period in stochastic oscillators and Williams Percent-R charts. x1 must be one of the following:

HH: high/high
HC: high/closing
HL: high/low
CC: closing/closing
CL: closing/low
LL: low/low

The new basis applies to all charts plotted after the command is issued. Existing charts are not replotted.

Cautions: None

Example: To use the closing price as the basis for point and figure charts for both increasing and decreasing prices, enter

UV ; CC

Related Commands: Stochastic oscillator (**KD**); point & figure chart (**PF**); Williams Percent-R (**WR**)

V+/V− FIXED VERTICAL AXIS ON/OFF

Function:

V+ Plots the vertical axis at a fixed position

V− Plots the vertical axis at the optimum position

Structure:

V+
V−

Type: Control commands

Applies to / Uses: All windows

Description: Under the default setting (**V−**), the program determines how much space is needed for the largest price or volume label along the left-hand side of the chart. The vertical axis is then drawn as far to the left as possible, leaving the maximum amount of room for the horizontal axis. However, when plotting charts for different securities, the vertical scales can be offset (i.e., not lined up).

The **V+** setting forces the program to leave the maximum amount of space for the vertical labels so that the vertical axes are always lined up.

Cautions: None

Example: To cause all vertical axes to be lined up, enter

V+

Related Commands: None

VA VOLUME ACCUMULATION

Function: Plot an n1-entry exponential average of the volume accumulation indicator

Structure: **VA**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: Because the absolute value of this volume indicator is not significant, this plot is always expanded to fit the selected window. This is true regardless of the last **VS** command issued. If **VA** is the first plotting command issued for a window, the vertical axis will be scaled to the absolute volume for reference purposes only.

The default value of n1 is 1. If n1 is 1, the actual (unaveraged) volume accumulation indicator is plotted.

The position at which the average is plotted depends on the moving average offset commands (**O+** and **O−**).

Cautions: n1 must be between 1 and 600.

Example: To plot a 10-day average of the volume accumulation indicator, enter

VA;10

Related Commands: Moving average offset on/off (**O+**/**O−**)

Theory: The volume accumulation indicator is adjusted upward or downward by a percentage of the day's volume, depending upon where the closing price is relative to the day's high and low prices. If the closing price is above the midpoint between the high and low, the volume accumulation indicator increases. When the closing price is below the midpoint, the volume accumulation indicator decreases.

The equation to calculate the volume accumulation indicator is:

$$VA_i = VA_{i-1} + V_i \left(\frac{(P_i - L_i) - (H_i - P_i)}{H_i - L_i} \right)$$

The volume accumulation indicator can be thought of as an intraday version of the on-balance volume indicator, and the interpretation is similar. In general, the volume accumulation indicator should follow the same trend as the prices. When the volume accumulation and price trends diverge, a possible reversal of the price trend is indicated.

VB VOLUME BARS

Function: Plot volume bars

Structure: **VB**

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This is the typical bar graph you often see on stock market charts, where the volume is plotted as a line whose height represents the value of the volume.

Cautions: None

Example: To plot volume bars, enter

VB

Related Commands: Plot price bars (**PB**); plot volume points (**VP**)

VL VERTICAL LINE

Function: Draw a vertical line at position d1

Structure: **VL**;d1

Type: Plotting command

Applies to: Selected window

Description: This command draws a vertical line at the horizontal axis position specified. Note the drawing mode (**DM**) allows you to draw vertical lines at a spot on the window you choose using a cursor.

The **CB** command sets the color of line drawn with this command.

Cautions: The value for d1 must lie in the range of the horizontal axis on the selected window.

Example: To draw a vertical line at entry number 25, enter

VL;25

Related Commands: Draw horizontal line (**HL**); draw line (**LN**); enter drawing mode (**DM**); change border color (**CB**)

VP VOLUME POINTS

Function: Plot an n1 entry exponential average of the volume

Structure: **VP**;n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: This command differs from the volume bar (**VB**) command in that it plots a line and will average the points on the line if desired.

If n1 is 0 or 1, the actual (unaveraged) volume will be plotted.

The position at which the average is plotted depends upon the moving average offset commands (**O−** and **O+**).

Cautions: n1 must be between 0 and 600

Example: To plot a 30-entry exponential average of the volume, enter

VP;30

Related Commands: Plot volume bars (**VB**); turn moving average offset off and on (**O−** and **O+**)

VS VERTICAL RANGE SET

Function: Set the range for the vertical axis to be p1 to p2

Structure: VS;p1;p2

Type: Control command

Applies to: Selected window

Description: If there are no plots on the selected window, this will be the range for the first plot. If there are already plots on the window, the window will be replotted with this range.

In conjunction with the **HS** command, the **VS** command can be used to expand or zoom into any section of a plot, simply by setting the ranges to see just that section. Using Function key user procedures, you can set function keys to expand the vertical and/or horizontal dimensions to any degree you wish at the press of a button.

If you define the axis such that part of the data lies outside the range of the plot, then that data will not be plotted; only data that falls in the range you set will be plotted. If some data does fall off the window, an inverse OR (for Out of Range) marker will appear in the upper right-hand corner of the window.

The default condition is automatic scaling to fit the data that falls in the horizontal range being plotted. You may reset the **VS** command to automatic scaling by entering the special case**VS;0;0.**

When overlaying plots of different securities on the same window, the plots of each additional security must fall in the range of the vertical axis displayed on the window. If this is not wide enough, you will see the inverse OR marker indicating out of range; just issue a **VS** command with a wider range to correct the problem.

A note about volume indicators (**DV**, **NV**, **OB**, **PT** or **PV**): for these plots the absolute value of the indicator is not important; what is important are the relative values. For this reason, all volume indicator plots are expanded to fit the selected window, regardless of any **VS** commands issued.

Cautions: p1 must be less than p2.

The ******, ***E**, **CE** and **CW** commands reset the vertical range to automatic scaling.

Example: To set the vertical axis to extend from 35 to 90, enter

VS;35;90

Related Command: Horizontal range set (**HS**)

VW

VIEW DATA

Function: Display numerical values of price and volume data

Structure: **VW**

Type: Control command

Applies to / Uses: Selected window / active security

Description: When **VW** is invoked, a cursor will appear on the selected window which can be moved around using the cursor control keys. You must already have a plot of price or volume data on the window.

Price and volume data will be displayed at the bottom of the screen on the command line in the form

DDDD H:xxx L:xxx C:xxx V:xxx [VVVV]

where DDDD is the date, xxx is the actual numerical value of the high, low, close and volume for the entry at the horizontal position of the cursor, and VVVV is the physical location of the cursor position measured on the vertical axis. For over-the-counter stocks, A:xxx B:xxx V:xxx show the actual asked, bid and volume data.

The speed of cursor movement can be controlled by holding down the ⟨Shift⟩ key while pressing the cursor keys. While the ⟨Shift⟩ key is pressed, the cursor will take bigger jumps in the direction specified by the key. You can reverse the function of the ⟨Shift⟩ key by pressing the ⟨Num Lock⟩ key once; this makes the normal speed fast and the ⟨Shift⟩ speed slow. Pressing ⟨Num Lock⟩ again returns the system to the original state.

To return to command mode, just press ⟨Enter⟩.

Cautions: **VW** always displays the data of the active security. If you plot, say, price bars, then enter a new security with the **ES** command, the **VW** command will display the data for the new, active security, not for the price bars on the plot.

Example: To see the numerical value of the data for the active security, enter

VW

To return to command mode, just press ⟨Enter⟩.

Related Commands: None

WA WEIGHTED MOVING AVERAGE

Function: Plot the n1 entry weighted moving average of price or volume data

Structure: **WA** ; n1

Type: Plotting command

Applies to / Uses: Selected window / active security

Description: The average plotted will be of price data if nothing has been plotted on the window, or if the vertical axis on the window refers to prices.

The average plotted will be of the volume data if the vertical axis plotted on the window refers to volume. Plotting commands which produce a vertical axis referring to volume include **VB**, **VP** and the volume indicators.

When plotting prices, the closing price are used as the basis for plotting. If the file type has no closing price (i.e., the file type has one or two prices), then the average of the "high/ask" and "low/bid" price is used. If the file type has one price, then that price is used.

If n1 is 1, the actual (unaveraged) data will be plotted.

The position at which the average is drawn depends upon the moving average offset commands (**O+**/**O−**).

Cautions: n1 must be between 1 and 600

Example: For example, to plot a 12-entry weighted moving average, enter

WA;12

Related Commands: Plot exponential average (**EA**); plot moving average (**MA**); plot trading bands (**TE**, **TM** and **TW**); moving average offset on/off (**O+**/**O−**)

Theory: A general discussion of moving averages can be found with the exponential average **EA** command description. This description focuses on the weighted moving average.

One of the problems with the simple moving average is that each data point is given equal weight. So, if the price takes a sudden move up or down, the average responds rather slowly. Sometimes it is desirable to use an average that puts more emphasis on recent price moves, but still retains the smoothing function of the moving average. One such average is the weighted moving average.

The formula for a weighted average is

$$WA_i = \frac{(n1)P_i + (n1-1)P_{i-1} + (n1-2)P_{i-2} + \cdots + (1)P_{i-n1+1}}{\frac{1}{2}(n1(n1+1))}$$

where WA_i is the value of the weighted moving average for day i, and n1 is the number of days in the average.

A five-day moving average is calculated by multiplying the current day price by 5, yesterday's price by 4, the previous day's price by 3, etc., and then adding up these numbers and dividing by 15, as shown in the following example:

Day	Price		Factor		
1	23½	x	5	=	117.500
2	21¾	x	4	=	87.000
3	22⅛	x	3	=	66.375
4	23⅞	x	2	=	47.750
5	23½	x	1	=	23.500
	Totals		15		342.125

Weighted Average = 342.125/15 = 22.8

Weighted moving averages for different periods are calculated in a similar fashion.

WR WILLIAMS PERCENT-R

Function: Plot the Williams Percent-R line

Structure: **WR** ; n1 ; n2 ; n3

Type: Plotting command

Applies to: Selected window

Description: The Williams Percent-R line is the inverse of the stochastic oscillator (see the **KD** command description for information on the stochastic oscillator). In other words, each point is subtracted from 100 before it is plotted:

$$\%R \text{ line} = 100 - \text{stochastic}$$

The default value for n1 is 5, and the default value for n2 and n3 is 1. The program will assume the default values for the argument if another value is not used.

Cautions: n1 must be an integer between 1 and 100. n2 and n3 must be integers between 1 and 300.

Example: To plot the 5-entry Williams Percent-R line averaged over 3 entries, enter

WR ; 5 ; 3 ; 1

Related Command: Stochastic oscillator (**KD**)

XP EXECUTE USER PROCEDURE

Function: Execute a user procedure

Structure: **XP**;x1

Type: Control command

Applies to: All windows

Description: To execute any user procedure, just type **XP** followed by a semicolon and the name of the procedure you wish to execute (x1). All thirty-eight user procedures can be executed in this way.

Shift function procedures

The shift function procedures can be executed either by holding down the ⟨Shift⟩ key and pressing the function key or by entering **XP**, followed by a semicolon (;), then the symbol which names the shift function. It is easy to remember which function key goes with which user procedure: the function key number is the same number that appears on the key that names the user procedure.

While you cannot embed a shift function key in a user procedure, you can use the **XP** command and the name of the shift function procedure you want to execute (e.g., use **XP**;@ to execute shift function 2 in a user procedure.)

Startup procedure

The Startup procedure is named ?. It executes automatically every time you enter the Charting module. You can also execute the Startup procedure at any time by entering

XP;?

Autoplot procedure

The Autoplot procedure is named >. It executes immediately after you complete any enter symbol (**ES**), clear and enter symbol (**CE**), or reset and enter symbol (***E**) command if the Autoplot feature is on (that is, if the **A+** control command has been issued). The Autoplot procedure can also by executed by entering

XP;>

When you buy THE TECHNICAL INVESTOR, the special user procedures are defined as follows:

INITIAL SPECIAL PROCEDURE ASSIGNMENTS

Procedure Name	Symbol	Initial Definition
Shift function 1	!	**PB**
Shift function 2	@	**VB**
Shift function 3	#	**MA**;12
Shift function 4	$	**MA**;50
Shift function 5	%	**CW**
Shift function 6	^	**ES**
Shift function 7	&	**DY**
Shift function 8	*	**SQ**
Shift function 9	(	******;**PB**;**EA**;12;**EA**;50;**SW**;2;**VB**;**NV**;1
Shift function 10	)	**OS**;C;0;0;C;0;−12;5
Startup	?	**G+**;**A+**;**ES**
Autoplot	>	******;**PB**;**SW**;2;**VB**;**ES**

Variables

Variables in user procedures must have values assigned at the time the procedure is executed. The variables are defined by placing one or more backslashes (\) after the procedure name, followed by the value(s) you want to use. When the procedure is executed, each variable is replaced with its definition.

For example, assume that procedure R was defined to plot the exponential average over a given number of entries by entering

DP;R;**EA**;%1

Then, to plot a 12-entry exponential average using procedure R, you would enter

XP;R\12

When procedure R is executed, the %1 is replaced by 12, resulting in the command **EA**;12. Later, if you wanted to plot a 6-entry exponential average, you would enter

XP;R\6

and a 6-entry average, **EA**;6, would be plotted.

If you are using more than one variable, each is assigned a definition by following the procedure name with successive backslashes and values. For example, to assign definitions to %1, %2, and %4, use the form

XP;A\12\5\\7

This sets %1 equal to 12, %2 equal to 5, and %4 equal to 7. Note the double backslash line where the definition for %3 would go. When entered in this way, %3 is not changed, that is, it retains the last definition you gave it. All definitions must be entered on the same line as the procedure name.

Definitions do not have to be numbers, they may be security symbols or List names. One common use is to assign security symbols using a procedure like this:

DP;B;******;**ES**;%1;**PB**;**EA**;%2;**EA**;%3

This procedure will clear and reset the windows, enter a symbol, then plot price bars and two exponential averages. To execute it for IBM, plotting a 25- and a 200-entry exponential average, enter

XP;B\IBM\25\200

When %1 is encountered, it is replaced by IBM. %2 is replaced by 25 and %3 is replaced by 200.

The same variable may be used in different procedures, or more than once in the same procedure, but each time it is encountered, it is replaced by the same definition.

Once a variable has been defined, you do not have to redefine it each time you use it (unless you want its value to change); it retains the last definition you gave it as long as you remain in the Charting module. For example, it you want to repeat the same chart described above for RCA, you can just enter

XP;B\RCA

Since you did not redefine %2 and %3, they remain the same (25 and 200). If you want to produce the same plot again, but this time for Honeywell with 25- and 150-entry averages (instead of 25 and 200), you could enter

XP;B\HON\\150

Care should be exercised when using these variables, since whatever you assign as a definition is substituted in the procedure. If these are not carefully planned, you may have a substitution that results in an error, and the entire procedure will be aborted. It is usually helpful to print out your procedure definitions so that whenever you execute them you'll remember what definitions you must specify.

Cautions: If the procedure you are executing has an **ES** command in it, make sure you know if the autoplot feature is on or off (**A+**/**A−**).

Examples: To execute user procedure Q, enter

XP;Q

Suppose that a loop procedure had been assigned to user procedure A in the following manner

DP;A;***E**;%2;. . . . . ;**RE**

where . . . . . represents the commands in the loop procedure. To execute this procedure for every security in #MYLIST, you would enter

XP;A\\#MYLIST

To execute the same procedure for a single security, say HON, enter

XP;A\\HON

To execute the procedure for every security in that data directory, enter

XP;A\\#ALL

Related Commands: Define user procedure (**DP**); edit user procedure (**EP**); print user procedures (**PP**); check status (**KS**)

XW EXCHANGE WINDOWS

Function: Exchange the chart on window s1 with the chart on window s2

Structure: **XW** ; s1 ; s2

Type: Control command

Applies to: Windows s1 and s2

Description: You can use this command to swap charts between windows, whether or not they are presently displayed. When you swap charts with a window that is not visible, then display the window using the **NW** command, the swapped chart will be there.

s1 and s2 must be 1 to 4, and not equal to each other.

Cautions: None

Example: To swap windows 2 and 3 so that what was on window 2 will be on window 3 and vice versa, enter

XW ; 2 ; 3

Related Command: Replicate window (**RW**)

** CLEAR/RESET

Function: Clear and reset all 4 windows

Structure: **

Type: Control command

Applies to: All windows

Description: This command does the following:

- clears all four windows, whether displayed or hidden
- selects window 1
- sets the daily (**DY**) and linear (**LI**) mode for all 4 windows
- for all 4 windows, sets the vertical range to autoscaling and horizontal range to the last values set with the **HD** command, or to the last 250 entries in the file if no **HD** command has been issued during the session
- turns moving average offset off (**O**–) and point & figure autoscaling off (**S**–)
- clears the user equation buffers

Settings other than those mentioned above are not affected. The number of windows set (**NW**) is not changed, and the most recent active security becomes the active security of window 1.

Cautions: If you have been using other than default conditions, don't forget to reset ranges on your axes, the log or sequential mode, or any of the off/on commands. See the **DP** command for instructions on how to set up a function key to clear all windows, then reset your desired conditions.

Example: To clear and reset all windows, enter

**

Related Commands: Clear window (**CW**); reset and enter (***E**); clear and enter (**CE**)

*E RESET AND ENTER

Function: Clear and reset all 4 windows and set x1 as the active security symbol

Structure: ***E** ; x1

Type: Control command

Applies to/Uses: All windows

Description: This command is equivalent to using a ** command followed by an **ES** command, except that less computer time is required to perform the operations.

Cautions: See the ** and **ES** command descriptions for details.

Example: To clear and reset all 4 windows and assign Royal Dutch as the active security, enter

***E** ; RD

Related Commands: Clear window (**CW**); enter symbol (**ES**); clear and enter (**CE**); clear/reset (**)

??

COMMAND MENU

Function: Display all command descriptions on the command line

Structure: ??

Type: Control command

Applies to: All windows

Description: This command allows you to scroll through all the commands available in the charting module. Just use the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the commands until you find the one you want.

When the command you want to execute is displayed, press ⟨Enter⟩ to execute the displayed command, or you can press ⟨Esc⟩ to return to the command mode without executing any command.

Cautions: None

Example: To see the list of all valid commands, enter

??

Related Commands: None

5c. TECHNICAL FILES

DIRECTORY OF FILES

This module allows you to view and/or print the directory of all technical data files in your fixed disk directory or floppy data disk. It also displays information about the files. To execute this module, move the filled-in block on the Main Menu to the "Files" subcategory under "TECHNICAL" (or type TF), and press ⟨Enter⟩.

You will see a listing of each security on the data disk, including the symbol, company name, number of entries in the file, maximum number of entries allowed, date of last update, security type, and an up or down arrow if the latest price of the security is above the high or below the low price flag. Each of these items is explained in detail under "TECHNICAL Data: Creating New Data Files".

Up to fifteen securities will be displayed on the screen at any time. The symbols are listed in alphabetical order. The date of the last update is the most recently dated entry in the file (not necessarily the last one entered).

To view the rest of the securities, you have several choices:

1. Enter the symbol of the security you wish to see, and the directory will jump to that symbol.

2. Enter up to eight letters, and the directory will jump to the area where symbols starting with those letters would be if there were any.

3. Press the ⟨8/up-arrow⟩ and ⟨2/down-arrow⟩ keys to scroll through the securities.

If you want a listing of the directory on your printer, just press ⟨F1⟩. Once the listing to the printer has started, you can abort it by pressing the ⟨Esc⟩ key.

If you want to look at the directory of a different floppy data disk, remove the data disk you are using from your data disk drive (usually drive B) and replace it with the data disk whose directory you want to see, then press ⟨F2⟩.

Should you forget to press ⟨F2⟩, no damage will be done. The program will just not know you have changed disks until you enter a symbol to be searched for, at which time it will figure out that you have changed disks and will display the new directory.

6. THE INVESTOR'S PORTFOLIO

Chapter 6 is reserved for THE INVESTOR'S PORTFOLIO, a separately available portfolio management and analysis program featuring program and data integration with other programs in THE SAVANT INVESTOR SERIES.

Among the many features of THE INVESTOR'S PORTFOLIO are:

- multiple standard report formats
- automatic dividend and gain accounting
- long, short and open positions

Whenever you retrieve updated data for your technical data files, the value of your portfolio(s) is automatically recalculated. THE TECHNICAL INVESTOR will plot the value of your portfolio, allowing you to monitor its performance over time.

Call or write Savant Corporation for information about THE INVESTOR'S PORTFOLIO.

7. THE FUNDAMENTAL INVESTOR

Chapter 7 is reserved for THE FUNDAMENTAL INVESTOR, a separately available fundamental database and analysis program. THE FUNDAMENTAL INVESTOR features complete integration with other programs in THE SAVANT INVESTOR SERIES.

Fundamental data (income statement and balance sheet items) can be:

- obtained on subscription diskettes
- downloaded via modem from a supported database
- entered manually
- entered from text or DIF files with THE FUNDAMENTAL DATABRIDGE™

THE FUNDAMENTAL INVESTOR can screen data on 2,500 companies at one time using up to 100 screening criteria, and then make a List of the remaining companies. THE TECHNICAL INVESTOR can then create technical files for the companies in that List and download historical price data for charting. Whenever you update prices for your technical files, any fundamental equations which use the price, such as the price/earnings ratio or price/book value ratio are automatically recalculated.

Call or write Savant Corporation for information about THE FUNDAMENTAL INVESTOR.

8. COMMUNICATIONS

Modules that are included in the COMMUNICATIONS section of THE SAVANT INVESTOR SERIES programs are:

- the "Fundamental Update" module which automatically retrieves fundamental data from the databases (used with THE FUNDAMENTAL INVESTOR only)

- the "Price Update" module which automatically retrieves price data from the databases

- the "Terminal" module which allows you to log on to most commercial databases. You can use the Terminal module to automatically connect with the supported databases to take advantage of features like current news on industries and corporations or Wall Street Week transcripts. Or you can also log on to non-supported databases.

Be sure that you have correctly entered all applicable database and communications parameters (see "The Main Menu: System Parameters") before attempting to use the COMMUNICATIONS modules.

PRICE UPDATE

To access this section of the program, move the filled-in block on the Main Menu to the "Price" subcategory under "COMMUNICATIONS" (or type CP), and press ⟨Enter⟩.

The computer's internal calendar must be set to the correct date for this module to operate properly. If the date displayed in the upper left-hand corner of the monitor is not correct, return to the Main Menu and use the DA command to enter the correct date.

The program will first ask you to choose which database you want to use for this update. The names of the supported databases will appear on your monitor; the ones for which you have entered passwords will be highlighted. Enter the letter corresponding to the database you want to use.

Next, if your printer is off or off-line, you'll be warned and asked to press ⟨Esc⟩ to continue. This is done because the printer is used to display messages that come from the database, and is used for a summary report at the end of a latest price update. A printer is not required, however; the program will continue with or without a printer after you press ⟨Esc⟩.

Defining the Securities to be Updated

Next, you'll be asked to enter symbols or a List name of the securities for which you want to retrieve prices. The Price module will retrieve prices and store the data for any Savant data file in the current data directory or floppy disk, whether those files are technical, fundamental or portfolio.

You can enter the securities to be updated in any of three ways:

a) Press ⟨Enter⟩, and all the securities with data files will be updated.

b) Enter a List name (see "The Main Menu: Lists" in this manual) and the securities in that List will be updated.

c) Enter the symbols of individual securities, separated by blanks.

   If you are entering individual security symbols, you can enter multiple symbols, up to a total of 50 characters in length (including the spaces). Each one should be separated from the others by a space. For example:

   TXN,S IBM,S HON,S STK,S ONE,S

   If your data files contain more than one security type for a symbol (e.g., IBM,K and IBM,S), you must include the security type when requesting prices. Otherwise the program will search the directory for that symbol and use the first one it locates, regardless of the security type. Thus, if a particular symbol is used with only one security type, you may omit the security type. (See "Some Preliminary Information: Security Symbols" for more information on symbols and security types.)

You can retrieve the *latest price only* for symbols which have *not* been entered into any type of Savant data file, but you *must* include the security type with the symbol. Simply include the symbols of these securities (up to 100) with the rest of the symbols to be updated. These quotations will be retrieved and included in the Summary Report (discussed later in this chapter), but will not be stored on the disk.

Some security types (e.g., X, Y and Z) can not be used for retrieving prices. Any symbol with an invalid security type will be ignored during the communications update. The following security types *can* be used for retrieving prices:

SECURITY TYPES

Security Type	Code
Bonds	B
Commodities	C
Stocks (monthly)	H
Market Indices	I
Stocks (weekly)	K
Mutual Funds	M
Options	O
Stocks (common, preferred)	S
Treasury Issues	T
Warrants	W

You can mix List names with the security symbols:

RCA,S #LIST1 TDY GM #LIST2

and the program will retrieve data for all the securities in the Lists, as well as the ones individually typed in. Symbols are updated alphabetically. Any duplicate symbols that appear will be detected and will not be retrieved twice.

You can use the special List name #ALL to update all the securities in your data directry and fetch quotes for other securities too:

CBM,S MYG,S LNC+,S #ALL

Entering #ALL by itself is equivalent to just pressing the ⟨Enter⟩ key: all the securities will be updated.

If you want to retrieve prices for only those securities with fundamental data, you may do so by following the List name with a /FO. Similarly, /TO will retrieve prices for only those securities with technical files, and /PO for those securities in portfolio files.

For example, to retrieve prices for the members of a List named #AIRLINES which have fundamental data, enter

#AIRLINES/FO

If you want to retrieve prices for every security with a technical file, simply enter

#ALL/TO

The following are examples of proper entries:

IBM HON,S TXN BAC.,B ABC,W BARO,T #LIST6

BAC. GMAI X.O SUOZ AXC.

#ALL/TO TXNJR,O HONDE,O RCAGI,O GMAI,O

IBM

Defining the Type of Data

After you've entered the symbol(s) and/or List(s) you want to retrieve, you'll be asked what kind of data you want: daily, weekly or monthly. When retrieving the latest price, daily refers to the most recent closing price available. Weekly means the closing price for the previous week. Monthly means last month's closing price.

Enter the type of data you want to store for these securities. For latest price quotes, you will probably select daily, though monthly is useful if you wish the prices to be the most recent month-end price rather than yesterday's close. Normally, however, weekly and monthly are used only with THE TECHNICAL INVESTOR.

Note: for many of the supported databases, the program will retrieve weekly data for securities with file type K, or monthly data for securities with file type H, regardless of what you enter here. To determine which databases support this feature, just try an update or call the Savant technical support line.

Enter D, W, or M to indicate your choice, or just press ⟨Enter⟩ for Daily data.

Defining the Amount of Data

This question refers to how many days, weeks, or months worth of data you want for each security. Only THE TECHNICAL INVESTOR data files store more than the most recent price, so if you are using any other program in THE SAVANT INVESTOR SERIES, just press ⟨Enter⟩ in response to this question.

In fact, if there is no technical data file for a security being updated, *the program will not retrieve data unless you request the latest price only.* This is a safety feature that prevents you from accidentally retrieving large amounts of data that will not be saved. If none of the symbols you are updating have technical data files, this question will be skipped altogether.

If you do have technical data files, you have several choices in how to answer this question. You can do any of the following:

Just press ⟨Enter⟩

When you just press the ⟨Enter⟩ key in response to this question, the program will retrieve just the *latest price* quote available for each symbol.

Question mark

If you enter a question mark (?) the program will automatically bring all your technical data files up-to-date; you don't have to know how much data you need.

A couple of notes: if there is no data in a file, ? will request enough data to fill the file. Also, depending upon the time of day and/or the database used, the ? may only retrieve data up through yesterday; that is, the latest price you get may be yesterday's close.

Time period

When you enter a number, the program will retrieve that many *calendar* days, weeks, or months (depending upon the type of data you requested) for each symbol. Optionally, you can follow the number with the word DAYS, or the word WEEKS, or MONTHS or YEARS (or just the first letter of the word), in which case the program will request enough data to cover that period of time, regardless of the type of data (daily, weekly or monthly) you requested. Finally, you can enter the number followed by the words TRADING DAYS, in which case the program will retrieve that many trading days, as opposed to calendar days.

For example,

12 MONTHS
52 w
365 days
1 Y

will all retrieve enough data to cover the past year, regardless of the type of data you requested. That is, the program will retrieve 250 (trading) days if you requested daily data, 52 weeks if you requested weekly data, or 12 months if you requested monthly data.

It is OK to overlap data: if you are not sure if data for a certain day exists in a file, you can go ahead and request it anyway. If the data already exists, the program will just overwrite the earlier data with the later data. Also, regardless of how much data you request, the program will not retrieve more than the maximum number of entries that will fit in each file.

Each database has different amounts of data available. If you ask for more data than the database has, the program will retrieve as much data as is available. See "Appendix D: About the Databases" for information about what data is available on each database.

Be careful about requesting large amounts of data for many securities; it may take some time to complete the update. You can always abort the update by pressing ⟨Esc⟩; the program will immediately begin the log off procedure if you do. (Note that it may take several seconds before you see anything on the monitor indicating that the logoff has occurred.)

Retrieving the Data

Now that you have told the program what data to retrieve, the computer will take over. It will dial the phone (if you have a "smart"-type modem), establish communications, retrieve the requested data and then disconnect from the database and hang up the phone. You can follow the logon commands by watching the bottom of your monitor.

Data retrieval may take many minutes if you have a long List and/or are using 300 baud. If you are requesting latest prices only, for most databases the data which is retrieved is temporarily stored and the data files are updated after the telephone is hung up. After the data files are updated, the summary report, described below, will begin printing (if your printer is turned on).

If you are requesting historical data, the data files will be updated after each security, and no update summary report will be printed.

If the program detects a serious communications error, it will throw out the data, and the security involved will not be updated. Thus, on occasion, you may notice that some of your securities were not updated even though others were. If this occurs, you must either re-request the data for the securities in question, or manually enter the correct data.

When the summary report has finished printing, you'll be asked if you want to do any more updates. If you say no, the statistical summary (discussed below) will be printed, after which you'll be returned to the Main Menu. If you say yes, you'll be returned to the beginning of the "COMMUNICATIONS Price" module for another update session. This time, you'll be prompted to change the data disk after you have entered the symbols to be updated. Change data disks, if necessary, and press ⟨Enter⟩. Just press ⟨Enter⟩ if you want to use the same data disk again.

Summary Report

The summary report, a sample of which is shown below, is similar to that found in the stock market section of your daily newspaper. It is printed out after *latest price* updates, that is, when you press ⟨Enter⟩ or enter a 1 for the amount of data you want.

FIGURE 8-1 DAILY QUOTES - 3/16/1987 - 14:08 (Warner)

LATEST PRICE UPDATE SUMMARY REPORT

SYMBOL	NAME	ASK HIGH	BID LOW	CLOSE	-----PRICE CHANGE----- Actual	 Percent	VOLUME	--VOLUME CHANGE-- Actual	 Percent	FLAGS
******	Stocks									
ACY,S	American Cyanamid	97 1/8	95 3/4	96 1/2	+ 2 1/2	+2.659	3035	+2271	+297.251	
ALK,S	ALASKA AIR GROUP INC	25 5/8	24 7/8	25	- 5/8	-2.439	1563	-31	-1.944	
BUD,S	ANHEUSER-BUSCH COMPA	36 1/4	35 5/8	35 3/4	- 3/8	-1.038	2980	-760	-20.320	
CCI,S	Citicorp	52 1/8	50 1/2	52 1/8	.....	.....	10899	.....	.....	
CPQ,S	COMPAQ COMPUTER CORP	30 1/4	28 7/8	29	-1 1/8	-3.734	9820	-8192	-45.480	
EK,S	EASTMAN KODAK CO	76	75	75 1/8	+ 3/4	+1.008	15024	+1091	+7.830	
FRX,S	FOREST LABORATORIES	29 1/8	28 1/4	28 1/2	- 3/4	-2.564	381	-303	-44.298	
GM,S	General Motors	78 1/8	77 1/8	77 7/8	- 1/8	-.160	6150	-374	-5.732	
HON,S	HONEYWELL INC	69 3/4	69 1/8	69 1/4	- 1/4	-.359	2868	+1910	+199.373	
IBM,S	INT'L BUSINESS MACH.	146	144 5/8	144 7/8	+ 5/8	+.433	18819	-3109	-14.178	H
MKC,S	Marion Laboratories	63 1/8	60 3/4	60 3/4	-2 1/4	-3.571	1808	-714	-28.310	
RD,S	ROYAL DUTCH PET	112 7/8	112 1/8	112 3/8	+ 1/8	+.111	4479	-4556	-50.426	
SNE,S	SONY	21 3/4	21 1/2	21 3/4	- 1/8	-.571	326	-812	-71.353	
TX,S	TEXACO INC	34 3/4	34 1/2	34 5/8	- 1/8	-.359	7163	+485	+7.262	

FIGURE 8-1 (continued)

******	Options								
FUO,O	Ford Sept 75 put	3 1/8	3	3 1/8	+ 1/8	+4.166	24	+18	+300.000
MKCCJ,O	MKC March 55 call	11 1/2	11	11	-1 3/4	-13.725	4	+3	+300.000
MKCOJ,O	MKC March 55 put	1/16	1/16	1/16	.....	.....	3	.....	.....
RDHT,O	RD August 100 call	14	14	14	+ 2 1/2	+21.739	5	.....	.....
******	Mutual funds								
FIDM-X,M	Fidelity Magellan	62.13	60.27	61.2	-.175	-.285	.....	.....	.....
FOSF,M	Fidelity Foreign	34.92	33.87	34.395	+.317	+.929	.....	.....	.....
PHYB,M	Pioneer II	35	34.5	34.5	-.25	-.719	414	+137	+49.458
RYVF,M	Royce Value Fund			9.48	.....	.....	.....	.....	.....
******	Indices								
DJ-30,I	Dow Jones Industrial	2282.38	2245.03	2258.66	+56.859	+2.582	.....	.....	.....
MCYA,I	BOND YIELD AVERAGE			8.99	-.01	-.111	.....	.....	.....
NYAD,I	NYSE Advances			653	-230	-26.047	.....	.....	.....
NYDE,I	NYSE Declines			857	+204	+31.240	.....	.....	.....
SP-500,I	S&P 500	291.79	289.88	289.89	-1.329	-.456	.....	.....	.....

Each part of the summary report is explained below:

The Symbol and Name are the symbol and name of the security whose price was retrieved.

The High/Ask, Low/Bid, Close and Volume are the data just retrieved. Note that even though the databases return high, low and closing prices and volume for each security symbol requested, THE FUNDAMENTAL INVESTOR and THE INVESTOR'S PORTFOLIO store only the closing price.

The Price and Volume Change columns are the actual and percentage difference between the closing price or volume listed and the closing price or volume the last time you updated that security. The volume information is included only if you are using THE TECHNICAL INVESTOR to store historical data for that symbol.

The flags column will normally be blank, but will warn you of several occurrences with the following codes:

D - the stock has gone ex-dividend on the date of the latest prices (Dow Jones database only).

L - the security price has fallen to or below the Low Price Flag you set in the "TECHNICAL Data" or "PORTFOLIO Maintenance" modules.

H - the security price has risen to or above the High Price Flag you set in the "TECHNICAL Data" or "PORTFOLIO Maintenance" modules.

S - the stock price has dropped by 20% or more since the last update; this *may* be a sign of a split, or it just may be a major drop in the price of the security. Thus an S flag does not necessary mean a stock split has occurred, just that the price change is so significant that one may have occurred.

E - a transmission error may have occurred. Note that this flag does not necessarily mean a transmission error has occurred; just that one in possible. Check the data for this security and determine if it appears reasonable.

Statistical Report

At the end of the summary report is a Statistical Summary for each of the security types updated. If you do multiple updates, this section will not be printed until the final update is completed (i.e., you answer no to the question "Any more updates?"). The meaning of the statistics for each security type is as follows:

a) No. this security type: the total number of securities (of this type) updated

b) Net price change: the total price change of one share of each security

c) Average price change: line b divided by line a

d) Total volume: the total volume

e) Net volume change: the sum of the volume changes

f) Avg. volume change: line e divided by line a

g) Up volume: the total volume of all securities up in price

h) Unchanged volume: the total volume of all securities unchanged in price

i) Down volume: the total volume of all securities down in price

j) No. incr in price: the number of securities up in price

k) No. unch in price: the number of securities unchanged in price

l) No. decr in price: the number of securities down in price

m) No. incr in volume: the number of securities up in volume

n) No. unch in volume: the number of securities unchanged in volume

o) No. decr in volume: the number of securities down in volume

p) Price adv/dec (advance/decline ratio): line j divided by line l

q) Volume adv/dec: line m divided by line o

r) TRIN (short term trading index): line p divided by the results of (line g divided by line i)

Automatic Timer and Special Reports

The "COMMUNICATIONS Price" section also allows you to have the program log on to your chosen database at any time in the following 24 hours, and allows you to print out the equivalent of the Latest Price Update Summary Report at any time you wish.

On the screen where you choose the database you want to use, you can also press ⟨F9⟩ or ⟨F10⟩ to choose these features:

⟨F9⟩: Special Report

This feature allows you to get a special report similar to the one that is automatically generated at the end of a latest prices update, except that it will be for all the securities in the data directory, and you may choose the number of entries used in computing the change in price and volume.

You'll be prompted to enter the number of entries you want to use in computing the price changes ("Enter number of entries for difference:"). If, for example, you enter 5, the difference between the most recent value and the value 5 entries earlier will be used to compute the price and volume changes. Note that if your data files do not all contain the same dates, the report will contain price and volume changes for a variety of ending dates.

⟨F10⟩: Timer

This feature allows you to set a time for the data update to begin. You'll be prompted to enter a time ("Enter time for automatic start (hr:min):"). Enter the time *in 24 hour or "military" format* for the update to begin. For example, if you want the update to start at 7:30 pm, enter 19:30 (7:30 plus 12 hours for 24 hour format). The program will then wait until 19:30 to dial the telephone. You can abort the automatic start at any time before that by pressing ⟨Esc⟩.

This feature is useful for retrieving quotes unattended in the evening when the database rates are lower. Caution: if you frequently experience noisy telephone lines, use this feature with care as you may end up with invalid data, incomplete updates, or have other difficulties arise because of noisy telephone lines.

Other Special Features

See "Appendix D: About the Databases" for more information about special features of the supported databases, such as the automatic retrieval of company names, dividend and earnings per share information.

COMMUNICATIONS TERMINAL

THE SAVANT INVESTOR SERIES programs provide a Terminal module so that you can communicate directly with any supported database or with any other service such as Compuserve or The Source. Information retrieved using the Terminal module will *not* be stored in Savant data files.

When you are updating data disks, the program handles all communications with the database for you. In the Terminal module, however, you must do all the work: you must issue the proper commands and requests to your modem and to the service you are using. Refer to your modem manual and the information from the service you are using for the necessary information. It is beyond the scope of this manual to discuss specific brands of modems or the many services available and the information they provide.

Two types of connections are available using the Terminal module. The Database Terminal connects you with your choice of the supported databases. In these cases, all of the logon procedures are handled for you automatically.

The General Purpose Terminal simply puts you into direct connection with your modem. You must issue all commands to dial the phone (if you have a "smart"-type modem), connect to whatever service you desire, request whatever information you want, and log off when you're finished. The general purpose terminal requires some general knowledge of communications and procedures, and may be a bit complex for the novice computer user.

You choose which type of terminal you want by pressing ⟨D⟩ for Database Terminal, or ⟨G⟩ for General Purpose Terminal, when you first enter the Terminal module.

The functions keys have special meanings when you are in either the Database or General Purpose Terminal; what they do is described later in this section. Right now, each of the terminals will be described.

Database Terminal

When you choose this terminal, you'll be asked which database you wish to logon to. The names of the supported databases will appear on your monitor, and the ones for which you have entered passwords will be highlighted. See "Appendix D: About the Databases" for more information about the individual databases.

When you are ready to log off, just press ⟨Esc⟩; the log off procedure will be handled for you and your phone will be hung up if you are using a "smart"-type modem.

General Purpose Terminal

When you select the General Purpose Terminal, you are presented with some communications parameters. Normally the default values are acceptable, so just press ⟨N⟩ in response to the question "Any changes (Y/N) ? ".

If you do want to make changes, just press ⟨Y⟩ and the cursor will move to the first parameter. You can just press ⟨Enter⟩ to leave a parameter unchanged, or enter a new value as described below. Each time you press ⟨Enter⟩, the cursor moves down one line until you return to the question "Any changes(Y/N)? ". If you answer ⟨Y⟩, you will repeat the process described above and can make additional changes. If you answer ⟨N⟩, you will enter the General Purpose Terminal mode.

The communications parameters are:

Baud Rate — Must be 300, 1200 or 2400; represents the speed of the communications link you will use.

Duplex Mode — Must be either F or H.

F stands for FULL duplex: all characters you send are echoed back from the receiving end. The characters displayed on your monitor are the echoed characters. If different from the key you pressed, then an error occurred in communication. Most services operate in full duplex.

H stands for HALF duplex: nothing is echoed back. The characters on your monitor are the ones you typed. You have no way of telling if a communication error occurred.

Parity — Must be E, O, S, M or N. These are defined as follows.

E	Even parity
O	Odd parity
S	Space parity
M	Mark parity
N	No parity

Parity is used to validate data transmitted and received. Most services use Even or No parity. Check with each service you are using to determine the correct choice.

Data Bits — Must be 7 or 8. Seven is normally used unless you are receiving a binary file, in which case 8 must be used. To use 8, the service you are communicating with must also support 8 bits.

Stop Bits — Must be 1 or 2. Normally this should be 1 unless the service you are communicating with requires 2.

Function Keys

While in the Terminal module (both Database and General Purpose), the function keys perform the following:

⟨F1⟩: Save All to Disk

A highlighted message will appear on the monitor asking you to enter a file name. Enter whatever name you desire, but it must correspond to the proper filename conventions as specified in your DOS manual. If you do not specify a disk drive and/or path the file will be written to the data directory. Also, if you do not enter a file extension an extension of .TXT will be used. Thus, if you enter the name MYFILE, and the data directory specified in the System Parameters is C:\SIS\DATA, the complete file specification will be C:\SIS\DATA\MYFILE.TXT.

After you enter a valid file name, everything displayed on your screen will be saved as a text file (with the name you entered) until you press ⟨F1⟩ again. The filename will be shown in the upper-left corner of the screen as a reminder.

To terminate the save to disk, just press ⟨F1⟩ again. (To view the data you have saved, return to DOS and use the DOS "Type" or DOS "Print" command.

⟨F2⟩: Save Display to Disk

This is similar to ⟨F1⟩, except that only what is currently displayed on your monitor will be saved.

You will be asked for a file name as described under ⟨F1⟩ above. Once the display is saved, the file will be closed and nothing else will be saved. This is especially useful if something is on the monitor you want to save that you did not expect, and thus did not issue an ⟨F1⟩ prior to receiving it.

⟨F3⟩: Display Elapsed Time

A highlighted message will appear on the monitor giving you the elapsed time in minutes since you began the communication session.

⟨F4⟩: Half/Full Duplex

Pressing ⟨F4⟩ will toggle between Half and Full Duplex operation. If you do not see the characters you are typing on your monitor, you probably have full duplex selected in a half duplex communication. If you see each character you type twice, you probably have half duplex selected on a full duplex communication. In either case, the situation should be fixed by simply pressing ⟨F4⟩.

⟨F5⟩: Handshaking Off
⟨F6⟩: Handshaking On

Some services permit a "handshaking" operation during communications where certain ASCII characters are transmitted to indicate to the other computer to start or suspend communications. This is usually used when one system is slower than the other, and the slower system needs time to catch up; it can't process the data as quickly as it is received. The characters used are ASCII (American national Standard Code for Information Interchange) 19 to stop transmission and ASCII 17 to resume communications. This protocol is sometimes referred to as XON/XOFF.

The "COMMUNICATIONS Terminal" module is fast enough so that you should never need handshaking for receiving. You may, however, need it for transmitting to a slower program at some time. The default is OFF.

The service you are using must support handshaking for you to use this feature; only press ⟨F6⟩ if you are sure the other party in the communication supports it.

⟨F7⟩: Break

Some services support what is called a "break" key. This is used to get the attention of the other computer while it is transmitting to you. For example, a break is sometimes used to interrupt a long transmission. Just press ⟨F7⟩ to break.

⟨F9⟩: Help Menu

Pressing ⟨F9⟩ will put a menu of the function keys on your screen. Thus, you only have to remember one key (F9). Any time you want to use a function key and cannot remember which one, just press ⟨F9⟩ and look at the menu.

⟨F10⟩: Finished Log on

Pressing ⟨F10⟩ signals the completion of manual log on and returns control to the program. This function key is only used during manual log on to the databases, that is, only when you have set the connection service to MANUAL in the system parameters section. If you are not in a manual log on situation, ⟨F10⟩ will be inactive and will not appear in the Help Menu described above.

See the description of the Manual Log on procedure at the end of this section.

⟨Shift⟩ + ⟨PrtSc/*⟩: Print Screen

A copy of what is on your screen will be printed on your printer.

⟨Ctrl⟩ + ⟨PrtSc/*⟩: Print All

Everything written to your screen after pressing this combination of keys will also be printed on your printer. Note that this may slow down the communication process unless you have a fast printer. You might want to save everything to disk and then type it out later using the DOS Type command; see the Type command in your DOS manual for more information.

Pressing ⟨Ctrl⟩ + ⟨PrtSc/*⟩ a second time turns off the echoing to your printer, and returns the program to its normal state.

⟨Esc⟩: Quit

Pressing ⟨Esc⟩ will immediately discontinue communications.

If you are using a database terminal, you will be logged off of the database. If you have a "Smart"-type modem, the phone will also be hung up.

If you are using the general purpose terminal, no log off will be done, and the phone will be hung up.

In any case, you will be returned to the Main Menu after pressing ⟨Esc⟩.

MANUAL LOG ON

A manual log on procedure is provided so that you can access the supported databases through any network or direct service that may be added in the future. To do so, select MANUAL as the connection service in system parameters (see "The Main Menu: System Parameters").

When you select any update or database terminal in the COMMUNICATIONS section, the telephone will be dialed for you using the number you entered in the system parameters section. You will then be given keyboard control of communications.

Follow the directions you've received to sign on using the new service. When you get to the point described below, press ⟨F10⟩ and the program will take over again:

(Warner:)	log in please:
(Merlin:)	:ENTER USER CODE PLEASE -
(Dow Jones:)	WHAT SERVICE PLEASE????

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APPENDIX A: TECHNICAL SUPPORT

THE SAVANT INVESTOR SERIES programs are some of the most sophisticated and versatile investment programs available. In order to familiarize yourself with all of the capabilities of this program, we strongly urge you to take the time to work through the tutorial and read the reference section. We feel that we have put together well-organized and complete manuals to help you learn to use THE SAVANT INVESTOR SERIES programs to their fullest capabilities. We also realize that occasionally you might need a little help.

Only registered owners of THE SAVANT INVESTOR SERIES programs are eligible for technical support. Support is available for current versions of Savant programs and for non-current versions for a period of one year after the updated version has been released. Support is provided by Savant Corporation in the United States and many other countries. If you purchased the program outside of the United States, contact your dealer for information on obtaining technical support.

When you have suggestions, complaints, compliments or just need a little help, write or call your authorized representative. When you do need technical assistance, we need to know a few things:

Registration (serial) number
Complete hardware description
Utility software being used, if any

In addition, we need to know as much about the problem as you can tell us. Please be ready to tell us where in the program the problem occurred, any error codes that were generated, and the circumstances leading up to the problem. It will be most helpful if you can give us the *exact* sequence of keystrokes that reproduces the problem. With this information, we will do our best to solve your problem as quickly as possible.

For assistance, write or call

SAVANT CORPORATION
P.O. Box 440278
Houston, Texas 77244-0278

Technical support line: (713) 497-0772

The charges for technical support, if any, may be changed from time to time. For the current cost, call or write to the above address.

APPENDIX B: ALTERNATE PRINTER ROUTINES

Installing Non-supported Printers

You may be able to install a non-supported brand of printer if it has a wide (132-column) carriage. Some narrow (80-column) carriage printers can be used if they have a condensed print mode that can be turned off and on by sending 4 or fewer ASCII characters to the printer.

If you are using THE TECHNICAL INVESTOR, you must have a graphics capable printer for which you can obtain a print screen routine such as described under "Alternate Print Screen Routines" below. Once you have obtained the print screen routine, follow the instructions in this section for your type of printer *before* installing the print screen routine as described in the following section.

To install a non-supported printer, follow the applicable instructions:

Any printer (narrow or wide carriage) w/ acceptable condensed print mode commands:

1. Select the "Other" option when choosing the printer in the System Parameters module. Save the system parameters as discussed in "The Main Menu: System Parameters" in the Reference section.

2. Exit the program and:

   - Dual floppy disk system: have the DOS prompt A⟩ showing next to the blinking cursor and the "Utilities" disk in drive A.

   - Fixed disk system: have the DOS prompt C⟩ showing next to the blinking cursor and be in the SIS subdirectory.

3. Type

   PTRINSTL

   press ⟨Enter⟩ and follow the instructions on the monitor.

Wide carriage printers w/o acceptable condensed print mode commands:

Just choose the "Other" option when choosing the printer type in the System Parameters module.

Alternate Print Screen Routines

(required for use with THE TECHNICAL INVESTOR only)

If you do not own one of the supported printers, or if you have a supported brand of printer but prefer using a graphics print screen routine other than the one included with this program, you can do so. However, the screen dump routine you choose must work through the PrtSc interrupt, and must be in a .COM file format with a terminate-but-stay-resident return to DOS.

In less technical words, it must be a routine that you can load into the computer once, then use any other programs you want and still maintain the ability to have a graphics screen dump by pressing the ⟨Shift⟩ + ⟨PrtSc/*⟩ combination. (Possible places you might find such a print screen routine are your printer dealer and the printer manufacturer.)

If you have a program like this and want to use it instead of the supplied routine, carry out the instructions which follow.

Dual Floppy Disk System:

With the DOS prompt A⟩ visible, place a working copy of your "Startup/Main Menu Disk" in drive A. Put the disk containing your screen dump routine in drive B. Then enter

COPY B:XXXXXXXX.COM A:PS.COM

but type the name of the file containing your screen dump routine in place of XXXXXXXX. For example, if your routine is in a file named prtscr.com, you would enter

COPY B:PRTSCR.COM A:PS.COM

This copies your screen dump routine onto the copy of the "Startup/Main Menu Disk", and names that copy PS.COM, thus replacing the PS.COM file that came with the program.

Fixed disk systems:

With the DOS prompt C⟩ visible, place your screen dump program in drive A, type

COPY A:XXXXXXXX.COM C:\SIS\PS.COM

but type the name of the file containing your screen dump routine in place of XXXXXXXX. For example, if your routine is in a file named prtscr.com, you would enter

COPY A:PRTSCR.COM C:\SIS\PS.COM

This copies your screen dump routine onto the fixed disk, and names that copy PS.COM, thus replacing the PS.COM file that came with the program.

From now on, anytime you press the ⟨Shift⟩+⟨PrtSc/*⟩ combination, or use the **PS** charting command, your print screen routine will be used. Note, however, that the ⟨Esc⟩ may not abort a screen dump any more, unless your routine is designed to stop when the ⟨Esc⟩ key is pressed.

Should you ever want the original screen dump program back again, start the program normally. Go to the system parameters section (if you are using a dual floppy system, *leave your "Startup/Main Menu Disk" in drive A* and change the printer type to anything other than what is presently is, then return to the main system parameters screen and press ⟨F10⟩. Then go back and change the printer type back to the correct number for your printer, return to the main system parameter screen, and press ⟨F10⟩ again. Finally, exit, then restart the program. This procedure will reset the original print screen routine.

APPENDIX C: SUMMARY OF ERROR MESSAGES

During the course of normal operation, you may receive some of the following error messages. They are generally accompanied by a beep and a highlighted message at the bottom of the screen. You must usually press ⟨Esc⟩ to acknowledge the message before continuing. This is to insure that the message does not go unnoticed.

What follows is an alphabetical list of error and warning messages, what they mean, and suggested courses of action.

Can't compute because range is too large

In the charting program, you have tried to plot an indicator whose range is too large to handle. This should be very rare and will occur only when the minimum value is less than -8,000,000 or the maximum is greater then 8,000,000.

Can't find support file X

Your program disk is missing the support file named X. This message can be due to a defective disk, a DOS error while copying files, or if you have erased support files from your program directory. Trying running the INSTALL routine (see chapter 4). If that doesn't work, see if file X has 0 bytes in the \SIS directory (or on your working copy of the "Program Disk"). If so, delete file X using the DOS Del command and re-setup the program following the instructions in chapter 3.

Charting requires a graphics adapter

You have tried to access the Charting module of THE TECHNICAL INVESTOR without a graphics adapter. The Charting module requires an IBM Color Graphics Adapter (CGA), IBM Enhanced Graphics Adapter (EGA), IBM Video Graphics Array (VGA), or IBM Multi-Color Graphics Array (MCGA). If you have any of these cards installed, go to the System Parameter module and make sure that the graphics-capable adapter is selected as adapter card number 1.

Check your modem

The computer has indicated that your modem is not ready. Check to be sure that it is plugged in, turned on and connected to your computer. If you have more than one serial port, make sure that you have selected the correct communications port in the system parameter section.

Check your printer

The computer has indicated that your printer is not ready. Check to be sure that it is plugged in, turned on and connected to your computer.

Close not between high and low

You have entered a value for the closing price of a type 1 file that is not between the high and low price.

Command stream interrupted

This message is generated when you press ⟨Esc⟩ during the execution of a command. Control is returned to the command mode and any pending commands are cancelled.

Communications error xx:yy

An error occurred during communications for which recovery was not possible. This is generally caused by noise on the lines or a hardware problem. Try again to establish communications. If the error occurs repeatedly, note the numbers xx and yy that appear with this message and report the problem to Savant (see "Appendix A: Technical Support" for more information).

[XX] Connection failed . . . do you wish to dial again?

The connection failed during communications for one of the following reasons as indicated by the number in brackets [XX]:

1	Telephone line busy
2	No answer on telephone line
3	Carrier was lost
10	Host computer not responding
11	Host computer temporarily not available
12	Host computer unavailable
14	⟨Esc⟩ was pressed during communications
15	Irreparable communications error
20	Time out reached
21	Time out reached
23	⟨Esc⟩ was pressed during communications
25	Time out reached
30	Unknown Dow Jones error message received
40+	Failure after repeated attempts

If you respond by pressing ⟨Y⟩, the phone will be dialed again and communications reattempted. If you respond by pressing ⟨N⟩, you will be returned to the Main Menu.

Data disk full

You have attempted to place more data on a disk than its capacity.

Device I/O error

An unspecified error has occurred in communicating with your printer, modem or disk drives. Check each to make sure they are properly connected, on-line and powered up.

Disk error

An error was encountered while reading from or writing to either the program disk or the data disk. This message should normally not occur on fixed disk systems. If it does occur, reboot the system and run the INSTALL routine as described in Chapter 4. If this doesn't work, you may have a defective fixed disk.

Several things may cause this message on a floppy disk system:

- The disk drive door may be open; close it and try again.
- The floppy disk may be dirty; remove and re-insert the disk.
- The disk drive itself might be dirty; clean it with one of the commercially available cleaning kits or take it to a service technician for repair.
- The floppy disk may have developed a defective spot; use your backup disk.

If you frequently get this error message with different disks, you may have a defective disk drive.

Disk is write protected

Your program or data disk is write protected. You must remove the write protect tab from the disk. Both the program and data disks will not function if write protected.

[XXX:XXX] Error: see manual or contact Savant

An undocumented error has occured. You may proceed by pressing ⟨Esc⟩. You may have lost some of the work preceeding such an error.

Make a note of the numbers that appear in the brackets, and what you were doing prior to the error's occurrence. See "Appendix A: Technical Support" for information on how to report this error.

Error in date

You have entered an erroneous date. This message will usually also tell you whether the month, day or year was in error. Considerable lattitude is provided in inputing dates, but sometimes your input cannot be reliably interpreted. Or, you have entered an invalid date such as March 32 or February 29 (if it is not a leap year). Check your entry and re-enter the correct date.

File already on destination disk

You have attempted to copy or move a data file to a data disk where a file already exists under the same symbol. Move or copy the file to another disk, or change the symbol of one of the files.

File not found

Your program or data disk is missing a file. This can occur if you have copied or erased files from your disks using the DOS Copy or Erase commands. This error can also occur due to a defective disk, or if you have improperly switched disks during the operation of the program. Make sure you have the proper disks in the proper drives. If so, then try using your backup copies of the program and/or data disks.

High less than close

You have entered a value for the high price of a type 1 file that is less than the value for the closing price.

Incomplete program disk or improper default drive

One or more files are missing from your program disk or the default drive is not set to the program disk drive. When you first start the program, the default drive must be set to the program disk drive.

Input not recognizable

Your entry for a stock split was not able to be interpreted. Considerable latitude is provided on entering this information but sometimes your input just cannot be interpreted. Use one of the following formats: 2/1, 2 for 1, 25%, 25 percent, 25 pct.

Insufficient disk space

There is not sufficient disk space available for the operation you requested. Use a data disk with more space or request an operation that requires less disk space.

Insufficient disk space - copy to new disk first

You attempted to change the size of a technical data file while there is not sufficient free space on your data disk. You can copy the data file to another disk and then change the size.

Insufficient disk space for list

You have attempted to create a security list when there is not sufficient disk space for the list.

Insufficient disk space for new file

Your data disk does not have room for the technical data file you are attempting to create. You should move data files to a separate disk, delete files, or start a new data disk.

Invalid argument

You have entered a charting command argument which cannot be carried out. This message usually has additional information explaining the nature of the problem. It is generally caused by a maximum value entered that is less than a minimum value, or a starting point that is after the stopping point. Re-enter the correct command arguments.

Invalid baud rate

You entered an invalid baud rate. This must be 300, 1200 or 2400. Re-enter a correct number.

Invalid color

You entered a color number that is outside the valid range. Enter a valid number.

Invalid command

You have entered a command which either does not exist or cannot be carried out under the current conditions. This message usually has additional information explaining the nature of the problem.

Invalid comm device

You entered a comm device number that is not 1 or 2. Enter either 1 or 2.

Invalid connection service

You entered an invalid connection service number. Re-enter a valid number. The valid range is given with this message.

Invalid drive letter

You entered an invalid drive letter. The valid range is given with this message. Re-enter a valid letter.

Invalid List name - #ALL is reserved

You attempted to define a new List using the name #ALL. This name is reserved and cannot be used for a List name. The name #ALL is used to indicate a List containing all securities on your data disk.

Invalid modem type

You entered a modem type number that is outside the valid range. The valid range is given with this message. Re-enter a valid number.

Invalid path

You entered a disk drive identifier or subdirectory path that could not be interpreted. Check your DOS manual for the proper format for paths and try again.

Invalid printer device number

You entered a printer device number that is out of range. Only 1, 2 or 3 are valid printer devices. Enter a valid number.

Invalid printer type

In the System Parameter module you entered a printer type number that is out of range. The valid range is given with this message. Enter a valid number.

Invalid range

You have entered a number which is not within the allowable range. This message usually has additional information giving the allowable range. Re-enter the correct value.

Invalid response

You entered an invalid response. The valid responses are given with the message. Enter a valid response.

Invalid symbol

You entered an invalid ticker symbol. Ticker symbols must contain only numbers, letters or the characters

\+ − . % / * _

The first character must be a letter or a number.

Invalid time

You entered an invalid time. Time must be expressed in 24-hour "military" format and entered as HH:MM where HH is the hour and MM is the minutes. Add 12 to the hour of any time past noon.

Invalid type

You specified a data file type that is not within the allowable range. The allowable range is given with this error message.

List is full, do you wish to keep this partial addition?

While adding one list to another, the maximum number of symbols in the list was reached. If you press ⟨Y⟩, all the symbols that fit in the list will be retained. If you press ⟨N⟩, none of the symbols in the list being added will be retained; the list will remain as it was before you tried to add the second list.

List is full, no more additions allowed

You have attempted to put more security symbols in a list than it can hold. Either delete some securities from the list to make room or start a new list.

List L not found

You requested a List named L that is not on your data disk.

Low greater than close

You have entered a value for the low price of a type 1 file that is greater than the closing price.

Low greater than high

You have entered a value for the low price of a type 1 file that is greater than the value of the high price.

Maximum number of files exceeded

You have tried to define too many security files on your data disk. The limit is 100 technical files for a floppy disk, and 2000 for a fixed disk system. Use another floppy disk or fixed disk directory.

Missing security type

A ticker symbol was specified for updating that does not have a valid security type.

Modem not ready...do you want to try again?

Proper communications cannot be established with your modem. Check to see that it is powered and on-line, and properly connected to your computer's serial port. Also, be sure that, if you have more than one serial port, the proper port is selected in the system parameters section. If you respond by pressing ⟨Y⟩, communications will be reattempted. If you press ⟨N⟩, you will be returned to the Main Menu.

Monthly data available since XXX

You have requested a monthly historical update for more time than is available on the database selected. Enter a smaller number or choose the other database if appropriate.

Name must be 1 to 7 characters long

You entered a name for a list of securities that is less than one character or more than 7 characters long. Re-enter a name within these limits.

No password for this database

You cannot access a database until a password is entered into the system parameters for that database.

Number of securities exceeded

The maximum number of companies that may be updated at once has been exceeded. Use Lists to carry out the update in several pieces.

Only XXX days or YYY weeks available

You have requested a historical update for more time than is available on the database selected. Enter a smaller number or choose the other database if appropriate.

Out of memory

The program requires 512K of RAM. If you do not have at least 512K, you will have to install additional RAM before you can run this program.

If your computer has at least 512K, try re-booting the system or check the postion of the internal switches that are used to set memory. Also check that you have not reserved too much memory for print spoolers, ram disks, etc.

Out of range (XXX-XXX)

You have entered a number which is outside the valid range. The numbers inside the parentheses tell you the valid range.

Place program disk in drive x

A valid program disk was not found in the program disk drive as defined in the System Parameters section. Place the program disk in the proper drive.

Printer not ready

Your printer is either turned off, not connected to the computer, not on-line (not selected) or defective. Investigate and fix. Also, be sure that you have the proper printer device number in the system parameters.

Printer out of paper

Your printer is out of paper. Put a new supply of paper in your printer.

Symbol is already in the list

You have tried to add a security symbol to a list which already has that symbol in it. Duplicates are not permitted.

Symbol is too long (1 to 8 characters)

You have entered a symbol that is less than one or more than eight characters long. Re-enter a proper symbol.

Symbol not found

You have requested a security symbol that does not exist on the current data disk. If the symbol resides on a different data disk, you may change data disks and try again. If you made an error in the symbol, then re-enter the correct symbol.

Symbol to be deleted was not found

You have entered a symbol to delete that cannot be found on the current data disk. Either enter a different symbol that does exist or change data disks to one containing the desired symbol.

This date is already in the file, do you want to write over it?

You have tried to enter a new date, or edit an existing date to a date that already exists in the file. If you intend to write over the existing entry, press ⟨Y⟩, otherwise press ⟨N⟩.

This module is not installed

You have tried to access a module from the Main Menu or using ⟨Alt⟩ + ⟨F6⟩ that is not present in the program disk drive. Insert the disk containing that module into the program disk drive (or copy it onto your fixed disk), and press ⟨Esc⟩ to continue.

Warner must mount another disk for this request...

Sometimes when requesting historical data from Warner, especially very old data (more than about 5 years), Warner will have to mount another disk pack in order to service your request. This will result in a small delay while the operator makes the switch. Normally this will take two or three minutes. Once the disk is mounted, the historical update will continue where it left off. If for some reason the disk is not mounted within the time specified on the screen, the session will be terminated. (You can press ⟨Esc⟩ to end the session sooner.) This message will often occur repetitively (about once per minute) while the disk is being mounted.

APPENDIX D: ABOUT THE DATABASES

THE SAVANT INVESTOR SERIES programs support several databases. Presently supported are the Warner Computer Systems, Inc. database, Remote Computing's Merlin database, and the Dow Jones News/Retrieval database.

Each of these databases requires a different format for entering the password in the System Parameters section. The format for the three presently supported databases is as follows:

Warner:	XXXXXX,ZZZZZZ
Merlin:	XXXXXX ZZZZZZ
Dow Jones:	ZZZZZZZZZ
Ford Investor Services:	XXXXXX ZZZZZZ

where user ID's are designated by X's and passwords by Z's. This information must be entered in this exact sequence, including commas and spaces.

Options symbols may vary among the databases. For example, some databases put a hyphen or a space between the company symbol and the option code. The security type O is provided for options to allow you to omit the extra character, and use the same symbol for each database. For example, using file type O you would use HONKL in place of HON-KL or HON KL. Again, you *must* specify security type O to take advantage of this feature.

In addition, each database may use different symbols for some preferred stocks, warrants, mutual funds and market indices. Make sure you use the proper symbol for the database you are using.

Warner Computer Systems, Inc.

The Warner database contains both latest and historical prices and fundamental data. A summary of the information that can be retrieved with THE SAVANT INVESTOR SERIES programs follows. To get information and a Warner account, call them at 800-626-4634 (212-661-2860 in New York or 201-489-1580 in New Jersey) from 8:00 a.m. to 6:00 p.m. Eastern Time, Monday through Friday, and ask for the "Customer Support Department". Tell them you have purchased one of THE SAVANT INVESTOR SERIES programs, and would like to set up an account.

Price data (all THE SAVANT INVESTOR SERIES programs)

The Warner database has prices for common and preferred stocks, warrants, options, mutual funds and various market indices. The prices are updated early each evening, the latest price available during the day is yesterday's close.

For historical data (THE TECHNICAL INVESTOR only), Warner generally has 10 years of prices and volume for each security in its database. The data is "cleaned"; that is, erroneous prices are searched for and corrected before they are permanently entered into the database. The data can be retrieved quickly: you can get a year's worth of daily data in less than 90 seconds at 1200 baud.

Fundamental data (THE FUNDAMENTAL INVESTOR only)

Warner has the entire Disclosure II database, including over 150 data items on more than 10,000 companies. Master Catalog items 5 through 199 are reserved for Disclosure II data (catalog items 5 through 165 are currently in use).

SELECTED WARNER SYMBOLS

Symbol	Name
AMEX	American Stock Exchange Average
AXAD	American Stock Exchange Advances
AXDE	American Stock Exchange Declines
AXUC	American Stock Exchange Unchanged
AVOL	American Stock Exchange Volume
DJ – 30	Dow Jones Industrial Average
DJ – 20	Dow Jones Transportation Average
DJ – 15	Dow Jones Utilities Average
DJ – 65	Dow Jones Composite Average
DJCI	Dow Jones Commodity Index
MBDJ	Dow Jones Municipal Bond Index
GOLF	Gold-London PM Fixing
MCYA	Moody's Corporate Bond Yield Average
MB3A	Moody's Corporate AAA Bond Yield Average
COMP	NASDAQ Composite Index
TRAN	NASDAQ Transportation Index
UTIL	NASDAQ Utilities Index
NYSE	New York Stock Exchange Average
NYAD	New York Stock Exchange Advances
NYDE	New York Stock Exchange Declines
NYUC	New York Stock Exchange Unchanged
NVOL	New York Stock Exchange Volume
SP – 500	Standard & Poors 500 Composite
TB91	US Treasury 91 Day Bills Yield
T182	US Treasury 182 Day Bills Yield
VLIC	Value Line Composite
VLII	Value Line Industrials
VLIU	Value Line Utilities
VLIR	Value Line Rails
CXIN - T	Toronto Stock Exchange Index
XRCD	Canadian Dollar Exchange Rate
XRNG	Dutch Guilder Exchange Rate
XRNK	Norwegian Krone Exchange Rate

See the information you receive from Warner for additional symbols.

WARNER DATABASE: HISTORICAL DATA AVAILABLE

Security	Daily Data	Weekly Data	Monthly Data
Bonds	NA	NA	NA
Commodities	NA	NA	NA
Market Indices	variable	variable	variable
Mutual Funds	9+ years	9+ years	9+ years
Options	variable	NA	NA
Stocks	9+ years	9+ years	9+ years
Treasury Issues	NA	NA	NA
Warrants	9+ years	9+ years	9+ years

WARNER DATABASE: LATEST PRICES AVAILALE

Security	Daily Data	Weekly Data	Monthly Data
Bonds	NA	NA	NA
Commodities	NA	NA	NA
Market Indices	variable	variable	variable
Mutual Funds	yesterday	last week	last month
Options	yesterday	NA	NA
Stocks	yesterday	last week	last month
Treasury Issues	NA	NA	NA
Warrants	yesterday	last week	last month

Explanations:

yesterday — yesterday's closing prices are available today

last week — data is available Saturday through Friday for the previous week

last month — data is available from the first through the last day of the month for the previous month

variable — the amount of data available and frequency at which it is updated depends upon the specific index or option; see the information supplied by Warner for more information

NA — no data available

Hale System's Merlin database

The Merlin database contains data on commodities and some foreign currencies, as well as many other types of securities and market indices. A summary of the information that can be retrieved with THE SAVANT INVESTOR SERIES programs follows. To get information and a Merlin account, call Hale Systems at 516-484-4545. Tell them you have purchased one of THE SAVANT INVESTOR SERIES programs, and would like to set up an account.

Price data

The Merlin database contains prices and volumes on commodities, stocks, bonds, warrants, mutual funds, options and some currencies. For THE TECHNICAL INVESTOR, the most recent 1000 days (140 weeks or 33 months) is available for most stocks, bonds, warrants and commodities. Merlin also contains some market indices not found on other databases.

Each database may use different symbols for some preferred stocks, warrants, mutual funds and indices. Contact Hale Systems for a complete list of the symbols available on Merlin. Note: Some Merlin symbols have blanks or spaces included in the symbol. Since THE SAVANT INVESTOR SERIES programs do not accept spaces in symbols, use underscores (_) in place of spaces. The COMMUNICATIONS programs will convert the underscore to a space for updating.

Special features of Merlin

With the Merlin database, you can also retrieve and save the company name, as well as dividend and earnings information, that goes with each symbol. Just add a forward slash (/) and the letter N (for Names) or F (for Fundamental) at the end of the input line containing the symbols you are updating when you enter them in the "COMMUNICATIONS Price" module. Note that this feature works only on the Merlin database.

For example, suppose you have just created a number of files automatically by entering a List name #NEWFILES in the "TECHNICAL Data" or "FUNDAMENTAL Data" modules. You can automatically retrieve the company names for those

symbols in the "COMMUNICATIONS Price" section. When asked for the symbols you want to update, just enter

#NEWFILES/N

then continue as you normally would. The company names for the symbols in the List will be retrieved in addition to the prices you requested. If the company name is longer than 20 characters, only the first 20 characters will be saved.

Similarly, ending the line of symbols with /F will retrieve the dividend and earnings per share for each company, and /N/F will retrieve both. If you already have company names, dividend or earning per share for any symbol, the new information will replace any information presently in your files.

SELECTED MERLIN SYMBOLS

Symbol	Name
NYE	New York Stock Exchange Index
NHI	New York Stock Exchange New Highs
NLO	New York Stock Exchange New Lows
NISC	New York Stock Exchange Common Issues Traded
ASE	American Stock Exchange Index
AHI	American Stock Exchange New Highs
ALO	American Stock Exchange New Lows
OTC	OTC Composite
OPU	Odd Lot Purchases
WLS	Wilshire 5000 Equity Index
PRT	Prime Rate
DRT	Discount Rate
ED1	Eurodollar 1 Month
BWK83	May 1983 Barley
BPS99	British Pound
FCH85	March 1985 Feeder Cattle
CAN83	July 1983 New York Cocoa
CFX84	November 1984 Coffee
CNV87	October 1987 Cotton
FPS99	Pork Bellies Spot
SCF83	Chicago January 1983 Soybeans
WKH87	March 1987 Kansas City Wheat

See the information you receive from Hale Systems for additional symbols.

MERLIN DATABASE: HISTORICAL DATA AVAILABLE

Security	Daily Data	Weekly Data	Monthly Data
Bonds	1000 days	140 weeks	33 months
Commodities	1000 days	140 weeks	33 months
Market Indices	1000 days	140 weeks	33 months
Mutual Funds	1000 days	140 weeks	33 months
Options	variable	variable	NA
Stocks	1000 days	140 weeks	33 months
Treasury Issues	1000 days	140 weeks	33 months
Warrants	1000 days	140 weeks	33 months

MERLIN DATABASE: LATEST PRICES AVAILABLE

Security	Daily Data	Weekly Data	Monthly Data
Bonds	yesterday	last full week	last full month
Commodities	variable	last full week	last full month
Market Indices	variable	last full week	last full month
Mutual Funds	variable	last full week	last full month
Options	variable	last full week	NA
Stocks	yesterday	last full week	last full month
Treasury Issues	variable	last full week	last full month
Warrants	variable	last full week	last full month

Explanations:

yesterday — yesterday's closing prices are available today

last week — data is available Saturday through Friday for the previous week

last month — data is available from the first through the last day of the month for the previous month

variable — the amount of data available and frequency at which it is updated depends upon the specific index or option; see the information supplied by Hale Systems for more information

N/A — no data available

Dow Jones News/Retrieval

When the markets are open, the Dow Jones database has the latest prices from the exchanges, delayed 15 minutes. Thus, the closing price for each day is available shortly after the market closes. The Dow Jones database also has current news and other information available. A summary of the information that can be retrieved with THE SAVANT INVESTOR SERIES programs follows.

To get information and an account with Dow Jones, call 800-522-3567 (609-520-8349 in New Jersey or Canada) from 8:00 a.m. to 11:00 p.m. Eastern Time, Monday to Friday, and 8:00 a.m. to 5:00 p.m. Eastern Time on Saturdays.

Retrieving Prices

Latest prices and volumes can be retrieved on common and preferred stocks, warrants, bonds and options. Mutual funds, Treasury issues, and the Dow Jones averages are available after the market closes only.

For historical data (THE TECHNICAL INVESTOR only), Dow Jones has price and volume data for the past 12 months for all stocks in its database, the Dow Jones Averages and some warrants. Historical data is not available for bonds, mutual funds, options, and treasury issues.

The following special symbols and security type must be used with the Dow Jones database to retrieve data on the Dow Jones Averages:

DJIA,J	Dow Jones Industrial Average
DJCA,J	Dow Jones Composite Average
DJTA,J	Dow Jones Transportation Average
DJUA,J	Dow Jones Utilities Average

Special features of Dow Jones

The Dow Jones database also has current news and other information available; you can use the Database Terminal program in THE SAVANT INVESTOR SERIES programs to access this news database. This database provides timely information on companies and industries. By entering the appropriate symbol, you can retrieve stories on a particular company or industry group.

Directions for accessing the current news database on Dow Jones are contained in The Dow Jones News/Retrieval Fact Finder, available from Dow Jones. We will just give you a few of the basics so you can access the News before you get a copy of the Fact Finder.

Getting Dow Jones News: Log on to Dow Jones by selecting "COMMUNICATIONS Terminal" on the Main Menu. Then press ⟨D⟩ (to select the Database terminal), and then ⟨D⟩ again (to select Dow Jones).

You will be logged on automatically. Once you see the Dow Jones copyright notice and the message ENTER QUERY, enter the following:

//DJNEWS

Next, you'll again see the message ENTER QUERY. For the most recent story on a company, enter a period followed by the security symbol. For example, to get the most recent story on IBM, enter

.IBM

For the most recent headlines of stories on a company, enter a period and the symbol followed by one space and 01, like this:

.IBM 01

To read any of the stories shown in the headlines, just enter the two letter code at the beginning of the desired headline listed on the display monitor. For example, to see story AC, just enter

AC

To return to the headlines, enter the page number of the headlines desired. To return to the first page of headlines enter

01

When finished, just press ⟨Esc⟩ and you will be logged off and returned to the Main Menu.

See the information you receive from Dow Jones for more details.

DOW JONES DATABASE: HISTORICAL DATA AVAILABLE

Security	Daily Data	Weekly Data	Monthly Data
Bonds	NA	NA	NA
Commodities	NA	NA	NA
Dow Jones Indices	1 year	1 year	NA
Mutual Funds	NA	NA	NA
Options	NA	NA	NA
Other Indices	NA	NA	NA
Stocks	1 year	1 year	since 1979
Treasury Issues	NA	NA	NA
Warrants	1 year	1 year	since 1979

DOW JONES DATABASE: LATEST PRICES AVAILABLE

Security	Daily Data	Weekly Data	Monthly Data
Bonds	15 min. old	NA	NA
Commodities	NA	NA	NA
Dow Jones Indices	after market closes	last week	NA
Mutual Funds	after market closes	NA	NA
Options	15 min. old	NA	NA
Other Indices	NA	NA	NA
Stocks	15 min. old	last week	last month
Treasury Issues	after market closes	NA	NA
Warrants	15 min. old	last week	NA

Explanations:

15 min. old — data is available during the trading day with a 15 minute delay, except over-the-counter stocks, which are updated six times daily

after market closes — data for today is available shortly after the market closes

last week — data is available Saturday through Friday for the previous week

last month — data is available from the first through the last day of the month for the previous month

1 year — data is available for the most recent 12 month period

since 1979 — data is available beginning with January, 1979

NA — no data available

Ford Investor Services

The Ford database (for use the THE FUNDAMENTAL INVESTOR only) contains more than 70 items of fundamental data on about 2000 companies. To get information or set up an account, call Ford in San Diego at 619-755-1327 (tell them you will be using Savant Corporation's THE FUNDAMENTAL INVESTOR). Master Catalog items 1 through 4 and 500 through 599 are reserved for the Ford data.

Important: Before you can download data from Ford, the Master Catalog numbers of the items you want to retrieve must be entered in your fundamental data file. If you want to retrieve data for specific companies, the security symbols must also be included in your data file.

Downloading data for every company

As a special feature, you can retrieve data for every company in the Ford database without first entering the symbols in your data file. In the "COMMUNICATIONS: Fundamental" module, when you are prompted for the symbols you want to retrieve, enter the special List name

#ALLFORD

The program will download the requested data items for every company in the Ford database (currently 2000 companies). This method is faster per company than when you request data for specific symbols.

Downloading company names

If you follow the symbols/List names of the companies your want to retrieve with a forward slash (/) and the letter N, the company names will also be retrieved and stored in your data file. This feature is automatically included when you use the #ALLFORD option.

APPENDIX E: MERGE UTILITY

MERGE is a special utility program that is executed from DOS (*not* from the Main Menu). It allows you to combine the data from two data directories into one. In other words, it will merge technical or fundamental files from one directory (the "source" into another (the "destination"). Data files from the source directroy are added to the ones already in the destination directory.

Never copy an individual Savant data file using the DOS Copy command. THE SAVANT INVESTOR SERIES programs maintain their own master file in each directory which contains information necessary to the proper operation of the program. If you use the DOS Copy command, this information will not be properly transferred, and some or all of your data will be lost.

Executing MERGE

To execute the MERGE utility:

Fixed disk system

With the DOS prompt C⟩ showing next to the blinking cursor, make sure you are in the SIS subdirectory by entering

CD\SIS

Dual floppy disk system

With the DOS prompt A⟩ showing next to the blinking cursor, put a copy of the "Utilities" disk in drive A.

Then, in both cases, to merge all of the Savant data files on the source disk in drive X to the destination disk in drive Y, enter

MERGE X: Y:

Replace X and Y with the appropriate path or disk drive letter. For example use

MERGE A: B:

to merge all data (technical and fundamental) from drive A to drive B. Both X and Y must be specified, and they cannot be the same floppy disk drive.

Paths are allowed for fixed disk systems. They must be entered in the form

X:\ . . . \ . . .

You must include the disk drive letter and colon. See your DOS manual for more information on how to use paths and directories.

Special Options for MERGE

You can specify several options by following the last drive/path specification with the following code(s):

OPTION CODES FOR MERGE

Code	Description
/FO	FUNDAMENTAL ONLY: causes only fundamental data files to be merged. With this option, MERGE will ignore (not transfer) any technical data files.
/N	NO PROMPT: Eliminates the initial prompt (to put the appropriate disks into the appropriate drives and press any key). This allows operation automatically from within a batch file.
/O	OVERWRITE: will cause data on the destination disk to be overwritten (i.e., copied over), assuming that same type of data (technical or fundamental) exists for that symbol on the source disk. Without this option, MERGE will *not* write over existing data on the destination disk, regardless of how old that data is.
/R	SORT TECHNICAL: sorts the technical data by date after it has been merged. This feature "cleans up" technical data files that have somehow gotten damaged.

ERROR MESSAGES FOR MERGE (CONT.)

Number	Description
ERROR 3	Cannot find technical data file for xxxxxxxxx. No technical data file was found for the specified security; the data for this symbol was not merged.
ERROR 4	Cannot merge technical data. An error was encountered in merging the technical data. Most likely, this is due to a defective data disk or insufficient space on the destination data disk. Data for other securities may be merged if complete.
ERROR 5	Cannot update destination directory. The destination Savant directory file could not be updated. This may be caused by insufficient disk space on the destination disk.
ERROR 6	Insufficient memory. Insufficient memory was available for the MERGE operation. This may be because the computer doesn't have enough installed memory or because of the presence of other programs which take memory, such as ram disks and print spoolers. The MERGE utility requires 256K available memory.
ERROR 7	The Savant data manager is not installed. The program named DATAMGR.COM must be run before the MERGE utility to install the data manager.
ERROR 8	/FO and /TO are mutually exclusive and can only be used one at a time. Use only one of them or none at all.
ERROR 9	Defective source fundamental file. The fundamental data file on the source disk is defective.
ERROR 10	Defective destination fundamental file. The fundamental data file on the destination disk is defective.
ERROR 11	Unable to merge fundamental data. An error was encountered while merging fundamental data. This is probably due to a defective fundamental data file. Data for other securities may be merged if complete.

Notes on Merging Fundamental Data

If you are merging fundamental data to a disk that already has a fundamental file defined, only the catalog items already on the destination disk will be transferred. If you want to merge a catalog item from the source disk that does not already exist on the destination disk, add it to the destination disk using the "Edit by Item" option in the "FUNDAMENTAL Data" module before doing the merge.

If you are merging fundamental data to a disk without a fundamental file, all of the items will be transferred. If you want to transfer only selected items, first create a fundamental data file on that disk in the "FUNDAMENTAL Data" module using only the catalog items you want transferred, or transfer all of the items and then delete the ones you don't want.

Notes on Merging Technical Data

You cannot use MERGE to append data to a technical data file. The update option (/U) will cause technical files that exist to be overwritten completely. If you need to combine the data from two data files into one, you need to use THE TECHNICAL DATABRIDGE.

Error Messages

The MERGE utility may generate several error messages. There are two types: the first are the severe errors that cause the program to abort and return to DOS; the second are errors that pertain to the security being processed which only abort the processing of the current security. The latter type are numbered and displayed on the monitor as they occur; their meaning is:

ERROR MESSAGES FOR MERGE

Number	Description
ERROR 1	Cannot find source/destination drives. You must give the disk drive specifiers when you call this utility program, e.g., MERGE A: B:
ERROR 2	Cannot find source directory file. No Savant directory file was found on the source disk. You may have the wrong disk in the drive, or the disk may be defective.

OPTION CODES FOR MERGE (CONT.)

Code	Description
/TO	TECHNICAL ONLY: causes only technical data files to be merged.
/U	UPDATE: merges data only for those securities that already have that type of data (i.e., technical or fundamental) on the destination disk. You could use this option if, for example, you want to transfer selected fundamental information to a new disk or directory. You could create a fundamental data file on the new disk containing only those companies whose information you want to transfer. Then, use MERGE with the /U option. Only the fundamental data for the companies in the fundamental data file on the new disk will be transferred.
/XP	EXCEPT PRICES: merges all information except prices onto the data disk if the symbol already exists on the destination disk. This option is useful when the latest security price on the destination disk is more recent than the latest price on the source disk.

More than one option can be specified at a time (as long as they are not inconsistent, e.g., you cannot specify /TO and /FO at the same time).

Sample merge commands:

MERGE A: B: /O/TO

merges technical files on drive A to drive B, overwriting the files on the disk in drive B that also exist on the disk in drive A

MERGE C:\SIS\ A: /FO/XP

merges fundamental files in the SIS directory on drive C to drive A, but does not merge the prices of those symbols that already exist on the disk in drive A.

APPENDIX F: MAKING A COPY OF A FLOPPY DISK

To make a copy of a floppy disk, you can refer to the Diskcopy command in your DOS manual, or follow this procedure.

Fixed disk system:

1. With the computer on and the DOS prompt C⟩ showing, place the disk to be copied from in drive A. This disk is called the "Source" disk.

2. Enter the following commands *exactly* as shown:

```
C:
CD\
DISKCOPY A: A:
```

   The letters can be upper- or lower-case; it doesn't matter. *CAUTION: be sure you enter the command exactly as shown, or you can destroy all the data on your source disk.*

3. Next the computer will ask you to put the "source" diskette in drive A: (it should already be there), then press any key. Go ahead and press a key - the computer will read part of the source disk into memory.

4. When it is through reading the first part of the source disk, you'll be asked to put the "Target" disk in drive A:. Remove the source disk from drive A, and replace it with a blank or unneeded floppy disk. Make sure this new disk in drive A is a a disk with no (or unimportant) data on it, because all data on the disk in drive A will be destroyed. This disk is the "Target" disk.

5. Continue switching the floppy disks back and forth in drive A as instructed. The number of switches you will have to make depends upon the amount of memory your computer has, other programs in memory, and the disk being copied, among other things.

Dual floppy disk system:

1. With the computer on and the DOS prompt A⟩ showing, place a copy of your master DOS disk in drive A, and a blank or unneeded floppy disk in drive B. Make *sure* the disk in drive B is a disk with *no* (or unimportant) data on it, because all data on the disk in drive B will be destroyed.

2. Type the following command *exactly* as shown:

   A:DISKCOPY A: B:

   followed by ⟨Enter⟩. The letters can be upper- or lower-case; it doesn't matter.

3. Next the computer will ask you to put the "source" diskette in drive A, and the "target" diskette in Drive B. The blank, unused disk in drive B is the target disk. Remove the DOS disk from drive A and replace it with the disk you wish to copy; this is the source disk.

4. Press any key. The disk will be copied. (This takes about a minute. If you see a message that says "Formatting while copying", you can ignore it; it just means the disk in drive B was a new rather than a used disk.)

When asked if you want to copy another disk, press ⟨N⟩ (or ⟨Y⟩ if you want to copy another disk). Remove the disk you just copied from the disk drive and label it, and you are done.

If the computer is going to be writing information onto the disk you just made (such as on a data disk), do not put a tab over or otherwise cover the write-protect notch. (The write protect notch is the small cut-out on the upper right corner of the disk as you look at the top of the disk.) When you cover the write protect notch, the computer will not write anything on that disk, even if you tell it to.

APPENDIX Y: INVESTMENT REFERENCES

This is a general bibliography of investment-related literature. The brief description of each book is not intended to be a comprehensive review, but rather a guideline to aid in the selection of references for those who want to broaden their investment knowledge. The investment analysis techniques that are discussed may be available in one or more of THE SAVANT INVESTOR SERIES programs. All of the techniques discussed are not necessarily available in any Savant program.

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ANALYSIS FOR INVESTMENT DECISIONS, American Association of Individual Investors, Chicago, IL, 1981

This is a home study course that covers a broad range of investment topics, such as, stocks, bonds, options, mutual funds and commodities.

Appel, Gerald and Hitschler, W. Frederick, STOCK MARKET TRADING SYSTEMS, Dow Jones-Irwin, Homewood, IL, 1980

This book has a good description of moving averages, especially the exponential moving average. Also, it has a good description of the momemtum oscillator with application to trading systems.

Arms, Richard W. Jr., VOLUME CYCLES IN THE STOCK MARKET: MARKET TIMING THROUGH EQUIVOLUME CHARTING, Dow Jones-Irwin, Homewood, IL, 1983

This is the presentation of the equivolume charting method. It involves charting price against volume, rather than the more common price against time.

Bowen, William M. IV and Ganucheau, Frank P. III, THE INVESTOR'S EQUATION, Probus, Chicago, IL, 1984

This book presents a method of stock valuation and selection based on financial data and P/E ratios.

CHARACTERISTICS AND RISKS OF STANDARDIZED OPTIONS, The Options Clearing Corporation, Chicago, IL, 1985

This is a pamphlet available from many brokers that gives a very good general description of put and call options, including index options.

Clasing, Henry K. Jr., THE DOW JONES-IRWIN GUIDE TO PUT & CALL OPTIONS, Dow Jones-Irwin, Homewood, IL, 1978

This is a good introduction to put and call stock options.

Cleeton, Claud E., THE ART OF INDEPENDENT INVESTING, Prentice-Hall, Englewood Cliffs, NJ, 1976

This book focuses on moving averages and cycle analysis.

Cohen, A. W. THREE POINT REVERSAL METHOD OF POINT & FIGURE STOCK MARKET TRADING, Chartcraft, Inc. Larchmont, NY, 1980

This small book is an excellent treatise on point & figure charting. It is easy to read with a lot of examples.

Cohen, Jerome B.; Zinbarg, Edward D.; and Zeikel, Arthur, GUIDE TO INTELLIGENT INVESTING, Dow Jones-Irwin, Homewood, IL, 1977

This is a very general introductory book. It describes the stock market and some general investment techniques.

Coppock, E. S. C., ENCYCLOPEDIA OF STOCK MARKET TECHNIQUES, Investor's Intelligence, Larchmont, NY, 1970

This is large compendium of papers by various authors on a range of stock market analysis and investment techniques. It includes descriptions of the short term trading index (also know as TRIN or the Arm's index), cycles, various option subjects, point & figure charts and the Elliott wave principle.

Dreman, David, CONTRARIAN INVESTMENT STRATEGY, Random House, New York, NY, 1979

This is a discussion of contrarian investment methods of buying out-of-favor stocks as determined primarily by their P/E ratio.

Edwards, R. D. and Magee, J., TECHNICAL ANALYSIS OF STOCK TRENDS, John Magee Inc., Boston, MA, 1966

This is a rather old book, but still quite valid. It is a very detailed description of chart patterns and the most probable course of the market following various patterns. It includes such topics as double tops and bottoms, head and shoulder patterns, triangles and wedges. The descriptions are detailed with many examples.

FORBES STOCK MARKET COURSE, Forbes, Inc., New York, NY, 1980

This is an introduction to the stock market and various investment techniques. It has a good description of how to interpret financial information and company annual reports.

Fosback, Norman G., STOCK MARKET LOGIC, The Institute for Econometric Research, Fort Lauderdale, FL, 1976

This is a fairly comprehensive study of many traditional market analysis techniques, both technical and fundamental. He tests many of the techniques against historial market behavior.

Graham, Benjamin; Dodd, David L.; and Cottle, Sidney, SECURITY ANALYSIS: PRINCIPLES AND TECHNIQUE, McGraw-Hill, New York, NY, 1962

This book, originally published in 1934, is one of the most famous treatises on fundamental analysis. Its principles are generally accepted as valid today. Topics include financial statement analysis and stock valuation. A discussion of net current asset value is presented.

Granville, Joseph E., GRANVILLE'S NEW STRATEGY OF DAILY STOCK MARKET TIMING FOR MAXIMUM PROFIT, Prentice-Hall, Englewood Cliffs, NY, 1976

Although this book describes many technical indicators, it concentrates on volume and its meaning in the market. A discussion of on balance volume is presented.

Hardy, C. Colburn, DUN & BRADSTREET'S GUIDE TO YOUR INVESTMENTS, Lippincott & Crowell, New York, NY, 1981

This is a very general discussion of investments, the stock market being one topic discussed.

Hurst, J. M., THE PROFIT MAGIC OF STOCK TRANSACTION TIMING, Prentice-Hall, Englewood Cliffs, NJ, 1970

This is a discussion of some cycle analysis methods, especially using envelopes and channels.

Kaufman, P. J., COMMODITY TRADING SYSTEMS AND METHODS, John Wiley & Sons, New York, NY, 1978

A highly theoretical and mathematical approach to various technical analysis methods.

Kaufman, P. J., TECHNICAL ANALYSIS OF COMMODITIES, John Wiley & Sons, New York, NY, 1980

A very mathematical discussion of such topics as moving averages, regression, Box-Jenkins, and volatility.

McMillan, Lawrence G., OPTIONS AS A STRATEGIC INVESTMENT, New York Institute of Finance, New York, NY, 1980

This is an excellent presentation of put and call options, what they are, how they are valued, and various trading strategies, both individually and in combinations. The descriptions are very detailed with a lot of examples.

Merrill, Arthur A., FILTERED WAVES, Analysis Press, Chappaqua, NY, 1977

This is a presentation of the filtered wave technique developed by the author. It is a method of removing the less important swings from a chart to leave only the major moves.

Mesler, Donald T., STOCK INDEX OPTIONS, Probus, Chicago, IL, 1985

This is a general description of stock index options, what they are and how they are traded. Not much in the way of analysis is included.

Montgomery, Douglas C. and Johnson, Lynwood A., FORECASTING AND TIME SERIES ANALYSIS, McGraw-Hill, New York, NY, 1976

A very theoretical and highly mathematical treatise on regression techniques such as ARIMA and Box-Jenkins. This book is only for the very mathematically inclined.

Murphy, John J., TECHNICAL ANALYSIS OF THE FUTURES MARKETS, New York Institute of Finance, New York, NY, 1986

This is a very comprehensive presentation of many of the traditional and more modern technical analysis techniques. Although the title refers to commodities, most of the methods presented are also applicable to stocks. Topics include moving averages, patterns, trend, volume analysis, oscillators, stochastics, point and figure and cycles.

Pring, Martin J., TECHNICAL ANALYSIS EXPLAINED, McGraw-Hill, New York, NY, 1980

This is a good presentation of many traditional technical analysis methods. It is not as comprehensive as some others, but its easy to read and detailed discussions are especially good for beginners.

Rorro, Thomas A., ASSESSING RISK ON WALL STREET, Sobaro, Annandale, VA, 1984

This is a detailed discussion of risk/profit concepts for stocks and options.

Touhey, John C., STOCK MARKET FORECASTING FOR ALERT INVESTORS, Amacom, New York, NY, 1980

This is a discussion of market indicators and a technique for market forecasting based on eleven indicators. Indicators include the S&P 500, interest rates, time deposits, etc.

Wilder, J. Welles, Jr., NEW CONCEPTS IN TECHNICAL TRADING SYSTEMS, Trend Research, Greensboro, NC, 1978

Wilder presents several of his special techniques for technical analysis. He gives a detailed description with many examples. Topics covered include relative strength index, parabolic system, directional movement, and volatility index.

Williams, Larry, THE SECRET OF SELECTING STOCKS FOR IMMEDIATE AND SUBSTANTIAL GAINS, Windsor Books, Brightwaters, NY, 1986

This book includes a discussion of Williams' accumulation/distribution method as well as a variety of other topics and a trading system.

RECOMMENDED READING

TECHNICAL ANALYSIS

Introductory

Cohen, THREE POINT REVERSAL METHOD OF POINT & FIGURE STOCK MARKET TRADING

Fosback, STOCK MARKET LOGIC

Murphy, TECHNICAL ANALYSIS OF THE FUTURES MARKETS

Pring, TECHNICAL ANALYSIS EXPLAINED

Advanced

Appel and Hitschler, STOCK MARKET TRADING SYSTEMS

Granville, GRANVILLE'S NEW STRATEGY OF DAILY STOCK MARKET TIMING FOR MAXIMUM PROFIT

Wilder, NEW CONCEPTS IN TECHNICAL TRADING SYSTEMS

FUNDAMENTAL ANALYSIS

Introductory

FORBES STOCK MARKET COURSE

Fosback, STOCK MARKET LOGIC

Advanced

Graham, Dodd and Cottle, SECURITY ANALYSIS PRINCIPLES AND TECHNIQUE

OPTIONS

Introductory

CHARACTERISTICS AND RISKS OF STANDARDIZED OPTIONS, The Options Clearing Corporation

Clasing, THE DOW JONES-IRWIN GUIDE TO PUT & CALL OPTIONS

Mesler, STOCK INDEX OPTIONS

Advanced

McMillan, OPTIONS AS A STRATEGIC INVESTMENT.

APPENDIX Z: INDEX

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(Continued From Inside Front Cover)

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