



HP 110 Portable Computer Owner's Manual

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GETTING STARTED

Congratulations on your purchase of the HP 110 Portable Computer! Use it at your desk (with or without a printer and disc drive) or put it in the carrying case and take it with you. The application programs you use the most are built in—Lotus™ 1-2-3™ for spreadsheet analysis, graphics, and information management; MemoMaker for document preparation; and Terminal Emulator for using your computer as a remote terminal.

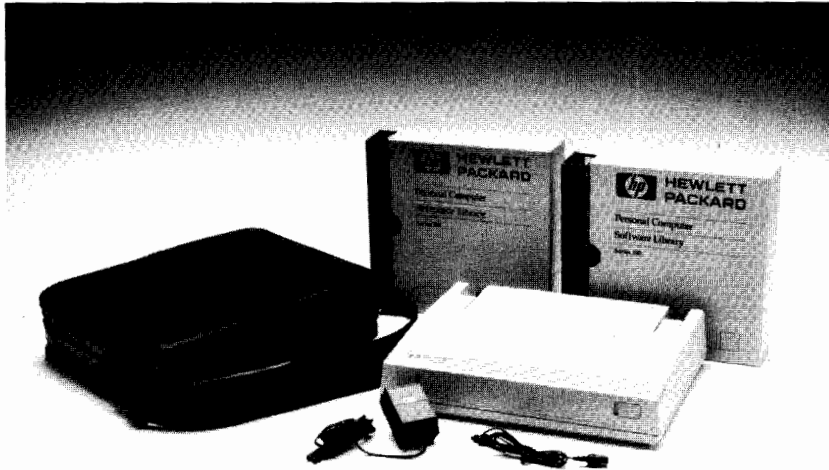
There is plenty of built-in memory to store your work—272K bytes of random access memory. The HP 110 Continuous Memory ensures that the files containing your work, such as spreadsheets and memos, will not go away—even if your display is turned off. The battery, installed at the factory, lets you use the HP 110 for approximately 16 hours before you need to connect the ac adapter/recharger.

You interact with the HP 110 using P.A.M.—the Personal Applications Manager. P.A.M. makes it easy to start application programs, manage your files, or change the system configuration.

In this chapter you will learn how to turn the display on and off, how the keyboard is arranged, and where information is stored in memory.

Unpacking Your Computer

As you unpack your computer, make sure you have everything you're supposed to have.



If you received any damaged equipment, be sure to contact your Hewlett-Packard dealer or sales representative.

The *Series 100 Support Guide* is a reference for the times when you need help. Look in the guide if you have questions about what kinds of support are offered by Hewlett-Packard, where your nearest dealer is, or what you should do when your unit needs servicing.

The manuals for the HP 110, the operating system (MS™-DOS), and the built-in application programs are described in the following section.

The HP 110 Portable Computer Owner's Manual

This manual contains information on the operation of your HP 110.

Chapter 1 gives you a chance to set up your computer and find out how it works.

In chapter 2, “The Personal Applications Manager—P.A.M.,” you will learn to start an application program, use the file manager, and change the system configuration using P.A.M.

Chapter 3 describes how to connect peripherals (such as a printer, plotter, external disc drive, or modem) using HP-IL or the serial interface.

Appendix A describes how to take care of the HP 110.

Appendix B provides you with technical information for the serial interface port.

Appendix C gives instructions for the user-diagnostic programs that came with your computer (one built-in and the other on the disc labeled “Utilities Disc”).

Appendix D describes escape sequences, key code sequences, and the HP 110 character sets.

LOTUS™ 1-2-3™ User's Manual

This manual is a reference tool, designed to be used in conjunction with the 1-2-3 Electronic Tutorial and the on-line Help facility. After running the tutorial, read those sections of particular interest to further acquaint yourself with the basics of 1-2-3. Then use 1-2-3 for awhile, returning to the manual when you have specific questions.

MemoMaker User's Manual

This manual contains instructions on how to use MemoMaker, the built-in editor. Use MemoMaker for taking notes, writing memos, or doing short reports.

MS™-DOS Operating System User's Guide

P.A.M. uses the instructions it receives from you to talk to the operating system, MS-DOS, which in turn gives instructions to the computer and any peripherals you may have connected. This manual describes the MS-DOS command set and is included for the advanced user.

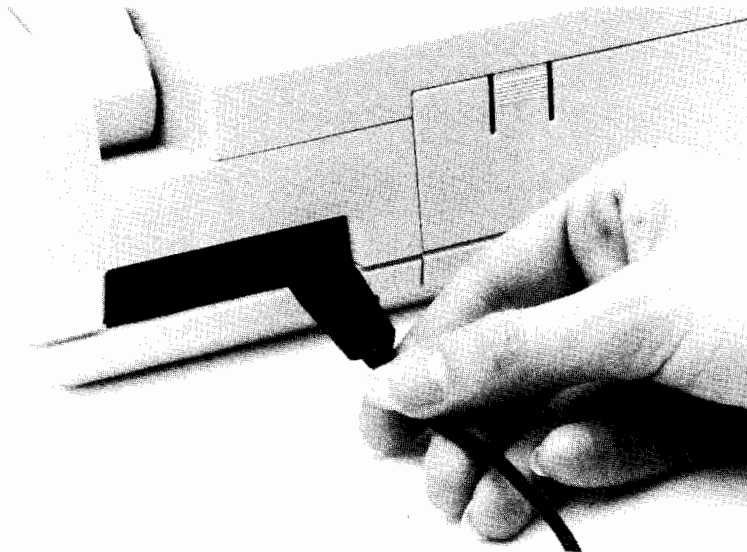
This manual describes the steps necessary to connect the HP 110 to another computer as a remote terminal through the built-in modem, or directly, using the serial port.

Installing the Recharger

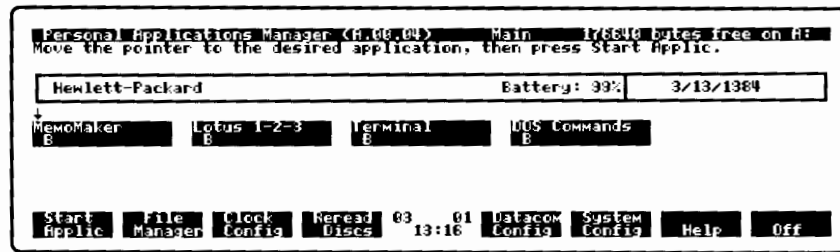
When your HP 110 Portable Computer left the factory, the battery was fully charged. However, by the time you get ready to turn the display on, you may find the battery initially discharged. If so, you can operate your computer immediately by using the ac adapter/recharger included with your unit. To connect the ac adapter/recharger:

Insert the power plug of the ac adapter/recharger into an ac power outlet.

Insert the adapter plug into the adapter receptacle on the back of the computer.



You can keep track of how much charge is left in the battery by looking at the indicator in the P.A.M. screen:



The battery indicator tells you what percentage of the battery charge remains. The low battery message appears when there is approximately 20 percent of the battery charge remaining. You should then plan to connect your ac recharger/adaptor. Appendix A, "Operating Information," contains more information about the power supply.

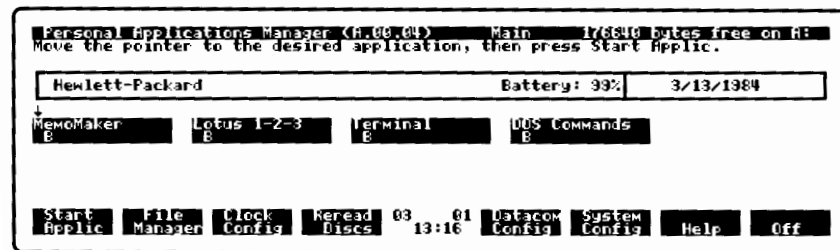
Turning the Display On and Off



Open your HP 110 by sliding the latches on the front edge toward the middle of the case, then lift the display.

Pressing almost any key turns the display on. (The keys that do not turn the display on are **(Shift)**, **(CTRL)**, and **(Extend char)**.)

Try pressing the space bar now. Initially, the Personal Applications Manager is displayed:



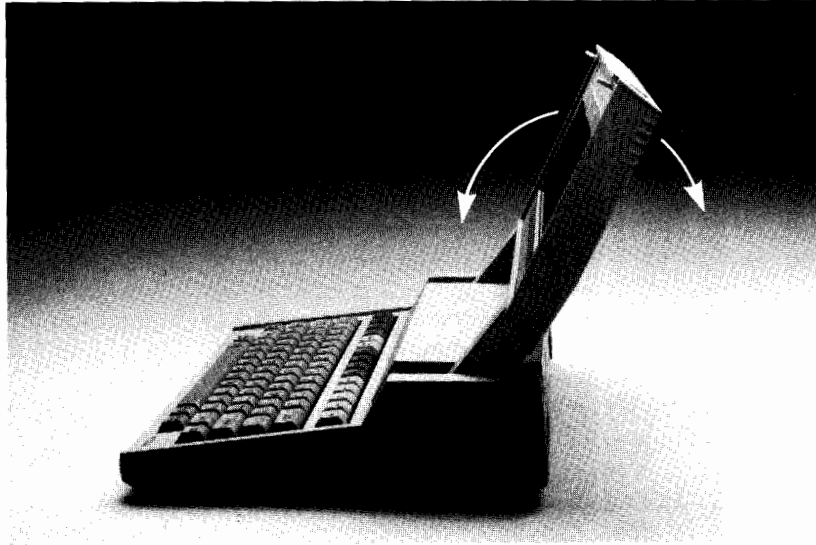
The display can be turned off using **Off** (**F8**) while the P.A.M. screen is displayed. However, don't worry about turning the display off. When the recharger is not connected, the display automatically turns off if it is idle for more than 5 minutes to conserve power.



Pressing the space bar (or one of the other keys) turns the display back on. The previous display contents will still be there.

Adjusting the Display

There are two adjustments you can make to optimize display quality.



First, you want to position the display to minimize glare:



Second, use the contrast key, , in the lower right corner of the keyboard. Hold it down to increase contrast. To decrease contrast, hold the  key down while pressing the contrast key.

Note: Holding down the contrast key for 15 seconds causes the system to reset. If you are running an application, any data not stored is lost. Programs and data stored on drives A and B are not affected by a reset.

The Keyboard

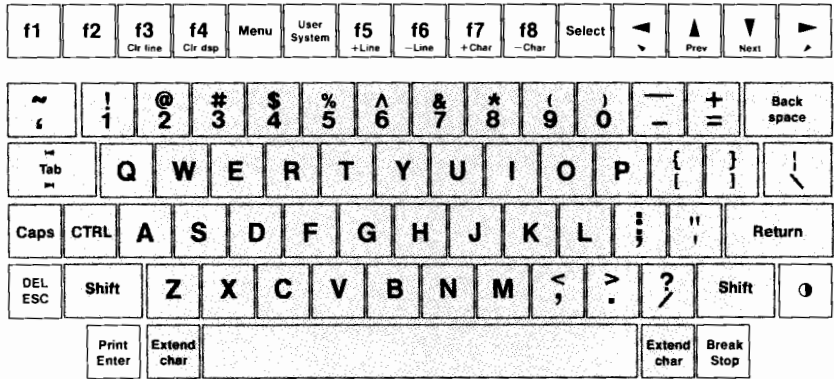
The keyboard has some keys that probably look familiar, plus others that you may not have seen before (such as  and ). The HP 110 keyboard is described here in six groups (according to function):

- Alphanumeric Keys
- Display Control Keys
- Edit Keys
- Function Keys
- Function Control Keys
- Terminal Control Keys

You probably won't need to use some of the keys until later; different groups of keys are useful depending on the application. For example, the edit group of keys is especially useful in MemoMaker and the terminal control group of keys is used mostly when communicating with another computer.

Alphanumeric Keys

Some of the keys in this group work just like the keys on a typewriter ((Shift), (Return), (A)-(Z), (0)-(9), and the tab keys). One of the keys you may not be familiar with is (CTRL) (used mostly in Terminal Emulator), which modifies the action of another key. (Shift) (Print) allows you to make a copy of what is on the display (if you have a printer connected).



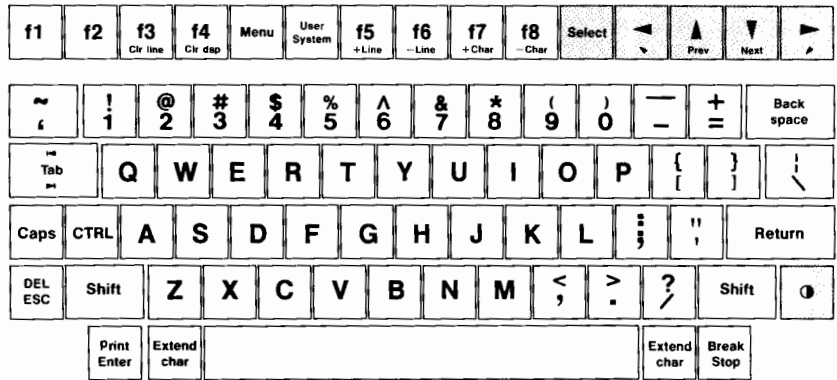
1: Starting



1: Starting

Display Control Keys

This group of keys allows you to move the cursor around on the screen and in the work space defined by the application—enabling you to determine where the next character is typed and to view other areas of the work space. The contrast key optimizes the quality of the display by allowing you to adjust the contrast; it is also used to reset the HP 110.

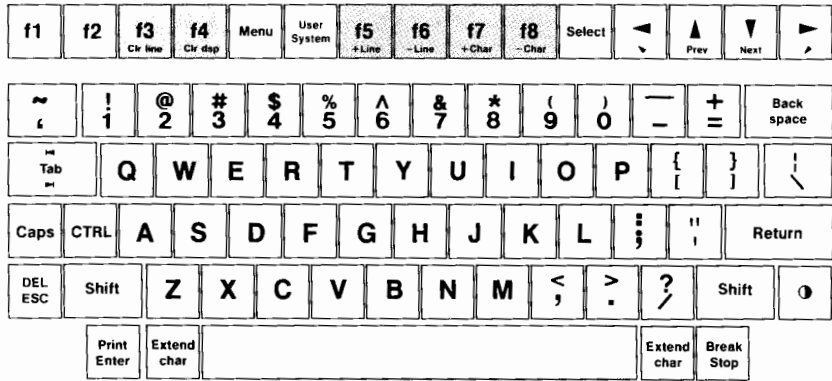


Key	Description
◀, ▲, ▼, ▶	Moves the cursor (or pointer in the P.A.M. screen) one space left, up, down, or right. The cursor determines where the next character will appear on the display.
Extend char ▼, Extend char ▲	Moves the cursor to the top (▼) or bottom (▲) of the work space. The work space is defined by the current application. For example, moving the cursor to the top of the work space (▼) in 1-2-3 would move the cursor to the top of the spreadsheet.
Extend char Prev	Allows you to view the previous screen.
Extend char Next	Allows you to view the next screen.
Select	Selects the item on the menu where the pointer is currently pointing. If the pointer is at MemoMaker, pressing Select causes that application to start.
☉, Shift ☉	Used to control display contrast or reset the computer. Increase contrast by holding down ☉; decrease contrast by holding down Shift and ☉. To reset the computer, hold down the contrast key for 15 seconds. Any files that have been stored are not affected by the reset. However, if you are in the middle of an application (such as writing a letter using MemoMaker), any work that has not been stored is lost. Another way to reset your computer is to simultaneously press Shift CTRL Break.



Edit Keys

Text can be easily added or deleted using the edit keys. Read the following descriptions to become familiar with the different functions such as (Clr line), (Clr dsp), and (-Line).



Edit Keys

Key	Description
Extend char Clr line	Clears the current line from the cursor to the end of the line.
Extend char Clr dsp	Clears the display from the cursor position to the end of the work space (defined by the application).
Extend char +Line	Inserts a blank line preceding the one in which the cursor is located. The line in which the cursor is located and subsequent lines are pushed down one line and the cursor is moved to the left margin of the blank line.
Extend char -Line	Deletes the line where the cursor is located. Subsequent lines are scrolled up to take its place and the cursor is moved to the left margin.
Extend char +Char	Allows you to insert characters into a line without overwriting existing characters. The new characters are inserted at the cursor position. The existing characters are shifted right one character position for each character entered. Characters shifted past the right margin are lost. To get out of this mode, press Extend char +Char again.
Extend char -Char	This key deletes the character at the cursor position. Characters to the right of the deleted character (up to the right margin) will be shifted left one character position for each character deleted.

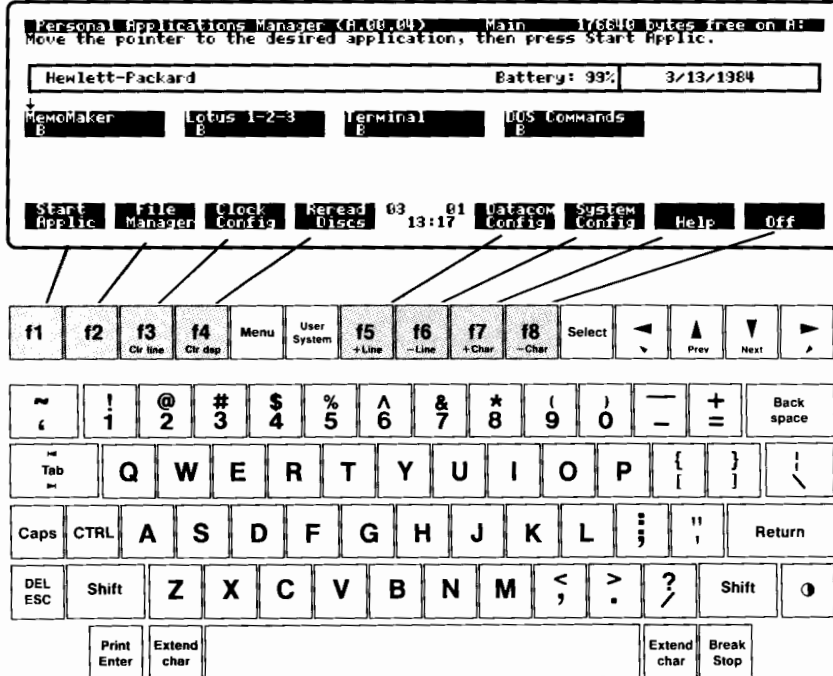
1:Starting

When typing in the top line of P.A.M., you can edit the line using **Back Space**, or clear the line using **Extend char** **Clr line**, **Extend char** **-Line** or **CTRL** **(X)**.

Function Keys

1: Starting

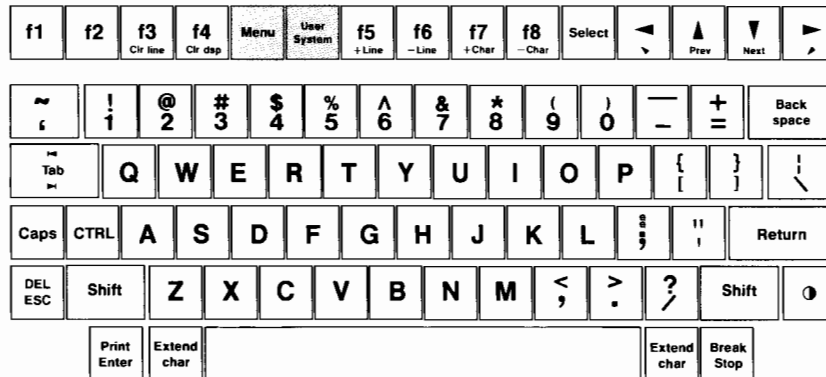
This group of keys is used to access the functions shown across the bottom of the screen. These keys are defined by the application that is currently running. When the main P.A.M. screen is displayed, the function keys can start an application, set the date and time, reread discs, configure the system, run the file manager, display a help screen, and turn the display off.



Function Control Keys

These keys allow you to choose whether the function key labels are displayed and whether the user or system function keys are active (if you are running the terminal emulation program). The two keys in this group are:

1: Starting

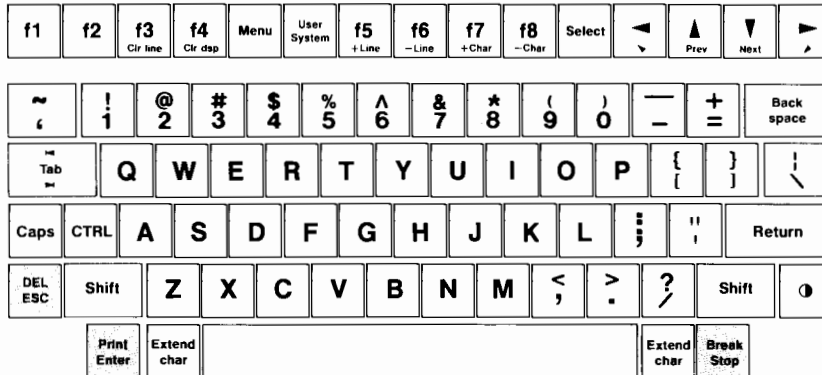


Key	Description
<input type="button" value="Menu"/>	Alternately turns the function key labels on and off; even though the labels are not displayed, the current function keys are still active.
<input type="button" value="Shift"/> <input type="button" value="User"/>	Selects the user function keys.*
<input type="button" value="System"/>	Selects the system function keys.*
* Not all application programs have more than one set of function keys.	



Terminal Control Keys

When you communicate with another computer using the built-in modem or a peripheral modem (connected to the serial interface port), you will need to use this group of keys.



Key	Description
DEL	Sends the delete character to the host computer.
ESC	Sends the escape character to the host computer.
Enter	Sends the current line to the host computer.
Break	Sends a break signal to the host computer. This usually halts an operation and sets the host computer to respond to instructions.
Stop	Halts transmission of information from the host computer. It does not disconnect you from the host. If transmission is halted, pressing this key resumes transmission of information from the host computer.

Disc Organization

The HP 110 has two mediums for mass storage: flexible discs (if you have an external disc drive) and electronic discs. An electronic disc is a section of memory designated as a high-speed mass storage device. Mass storage operations to and from an electronic disc in memory can be performed considerably faster than flexible disc operations. There are two electronic discs inside HP 110 memory—drive A and drive B.

Drive A is the read/write disc; you can use it just like a peripheral disc to store programs and data. Data on this disc is preserved as long as the battery contains a charge; it is not affected by resetting the computer.

Drive B is the read only disc. It is a permanent disc—not affected by resetting the computer or having a discharged battery. It is also write-protected—new programs and data cannot be stored on drive B. This disc contains the operating system (MS-DOS) and the application programs built into the HP 110: 1-2-3, MemoMaker, and Terminal Emulator.

The applications on the P.A.M. screen are labeled with a disc drive identifier. For example, the 1-2-3 program is stored on the read only disc and is labeled with “B”:

```
Lotus 1-2-3
B
```

External disc drives are labeled starting with drive C. As many as eight single disc drives or four dual disc drives can be connected (drives C, D, E, F, G, H, I, J). Connecting peripheral disc drives is described in chapter 3.

Summary

In this chapter, you learned:

- How to turn the display on and off.
- How to optimize display quality.
- How the keyboard is arranged.
- That programs and data can be stored on an internal electronic disc, drive A.

You are now ready to proceed to chapter 2. You will learn about how to interact with P.A.M. to start applications, manage files, and change the way your system is configured (such as designating a serial interface printer).

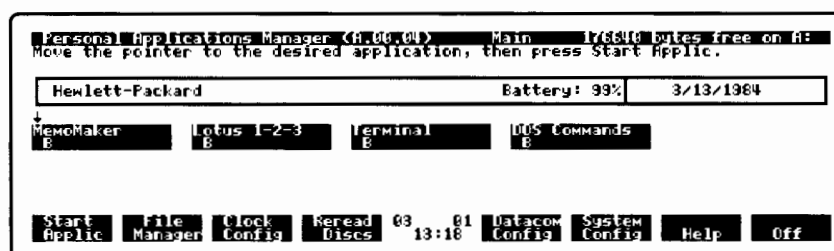
THE PERSONAL APPLICATIONS MANAGER—P.A.M.

2:P.A.M.

What Does P.A.M. Do?

The Personal Applications Manager does just that—manages everything that has to do with running programs on your HP 110. And that includes getting your system ready (**Clock Config**, **Datacom Config**, and **System Config**), causing an applications program to begin (**Start Applic**), and taking care of the files you create with the applications programs (**File Manager**).

You will see the main P.A.M. screen the first time you turn the HP 110 on, whenever you exit an application, or whenever you reset your computer:



A brief description of what the function keys do is available by pressing **Help** (**(f7)**).

Press **Help** on the main P.A.M. screen to see a menu of all the Help screens. Press **Help** any time it is a choice on your function keys for a brief description of the applicable functions.

While P.A.M. offers an easy way for you to interact with the HP 110, experienced MS-DOS users may prefer to enter MS-DOS commands from the keyboard. Anytime P.A.M. is displayed, you can type an MS-DOS command. What you type appears on the third line of the P.A.M. screen. Pressing **(Return)** causes the system to execute that command. MS-DOS commands can also be entered from the main File Manager screen.

If MS-DOS doesn't understand the command it received, an error message appears:

```
Bad command or file name
Press any key to return to P.A.M.
```

To leave the main P.A.M. screen and interact with the HP 110 using the MS-DOS command interpreter, move the pointer on the screen to **DOS Commands** and press **(Select)**, **(Return)**, or **Start Applic (f1)**. Return to the main P.A.M. screen by typing `exit` and pressing **(Return)**.

Refer to the *MS-DOS Operating System User's Guide* if you have questions about MS-DOS commands.

Setting Up the HP 110

Before you begin to use your computer, there are some configuration options that you may need to change. P.A.M. can reset the time and date (**Clock Config**), set up communications for several peripherals (**Datacom Config**), or change the default system settings, such as changing the printer from HP-IL to serial or HP-IB (**System Config**).

Clock Configuration **Clock Config**

P.A.M. keeps track of the time and date—even if the display is turned off. Follow these steps to change the time zone, time, or date:

1. Press the function key corresponding to **Clock Config** (**f3**) to see the Clock Configuration menu:

Clock Configuration

Time zone: **-12h** Month: **March**
Hour: **13** Day: **13**
Minutes: **19** Year: **1984**
Seconds: **22**

Next Choice **Previous Choice** **13:19** **Default Values** **Help** **Exit Config**

2:P.A.M.

To return to the main P.A.M. screen at this point (without making any changes) press **Exit Config** (**f8**).

2. Move through the menu using the tab or cursor keys. To change an entry on the menu, use **Next Choice** (**f3**) or **Previous Choice** (**f4**). Anytime you want to return to the default entries, press **Default Values** (**f5**).
3. Save the displayed configuration by pressing **Exit Config** (**f8**).

The entries on the menu are described in the following table:

Clock Configuration Menu

Field	Choices
Time zone:	0h GMT, +1h thru +13h, -1h thru -12h, including -3h ADT, -4h AST/EDT, -5h EST/CDT, -6h CST/MDT, -7h MST/PDT, -8h PST
Hour:	00-23
Minutes:	00-59
Seconds:	00-59
Month:	January-December
Day:	01-31
Year:	1984-2039



HP 110 System Configuration **System Config**

The way the system is configured determines how the read/write memory is divided between the system and the electronic disc, how the automatic timeout works (when the recharger is not connected), what the cursor looks like, how characters look on the display, what happens when a key is pressed, and how the HP 110 Portable Computer communicates with peripherals.

2:P.A.M.

Press **System Config** ((f6)) on the main P.A.M. screen to display the System Configuration menu:

System Configuration	
Memory / Edisc: 38K / 178K	Beep: Long
External disc drives: None	Plotter Interface: HP-IL
Disc write verify: Off	Printer: HP Graphics only
Power Save mode: On	Printer Interface: HP-IB:29
Display timeout: 5 min	Print pitch: Expanded-Compressed
Cursor: Underscore	Print line spacing: No Config
Console Mode: HP	Printer skip perf: No Config
Console Font: HP	
<div>Next Choice Previous Choice 09:22 Default Values Help Exit Config</div>	

Move through the menu using the tab or cursor keys. To change an entry on the menu, use **Next Choice** ((f3)) or **Previous Choice** ((f4)). Anytime you want to return to the default entries, press **Default Values** ((f5)). To save the configuration displayed, press **Exit Config** ((f8)).

The choices for the items on the System Configuration menu are described in the following table:

System Configuration Menu

Field	Choices	Description
Memory/Edisc:	256K/16K-96/176K	Random Access Memory consists of a total of 272K and is divided into two sections: system memory and electronic disc memory, drive A. Select a larger system memory area (and a smaller electronic disc) or a smaller system memory area (and a larger electronic disc). The choices vary according to how much space is not used on the electronic disc. It may be necessary to delete one or more files from drive A in order to designate more system memory.
External disc drives:	1-8, None	Up to eight external disc drives can be connected at one time.
Disc write verify	On, Off	Verifies that the data written on a disc has been correctly recorded. When verify is on, the system runs slower.
Power Save mode	On, Off	To save power, the central processor is halted while an application is waiting for input. For some applications it may be desirable to disable this feature.

2:P.A.M.



System Configuration Menu (Continued)

2:P.A.M.

Field	Choices	Description
Display timeout:	1–10 min., 15 min., 20 min., 25 min., 30 min., Off, .5 min.	The display turns off automatically (whenever the recharger is not connected) to conserve power. The default of 5 minutes can be decreased, increased, or disabled (Off).
Cursor:	Underscore, Box	The default cursor can be specified as a blinking underline (_) or a box (■). The cursor in P.A.M., MemoMaker and 1-2-3 is always a blinking underline.
Console Mode:	HP, Alt	HP console mode generates HP escape sequences upon keyboard input. Alt mode sends alternate sequences. Output is not affected. Refer to appendix D, tables 4 and 5 for lists of these escape sequences.
Console Font:	HP, Alt	Change the default set of HP characters to the alternate character set. Refer to appendix D, table 1, for a list of the character sets.
Beep	Long, Short	Selects a long beep or a short beep.
Plotter Interface:	HP-IL, Serial, HP 82164A, HP-IB:00–HP-IB:30	Select the appropriate interface.*

System Configuration Menu (Continued)

Field	Choices	Description
Printer:	HP Graphics only, Alpha only, HP Graphics/Alpha	<p>Select the mode in which the (Print) key operates.</p> <ul style="list-style-type: none"> • HP Graphics only mode dumps the screen exactly as it appears to graphics printers, including the HP 82906A, the HP 2631G, and the HP 2225B ThinkJet. • Alpha only mode causes standard character codes to be sent to the printer. The printer then prints the screen using its own character set—which may not be the same as the characters shown on the screen. • HP Graphics/Alpha mode prints a graphics screen exactly as it is displayed. Text screens are copied in Alpha mode.
Printer Interface:	HP-IL, Serial, HP 82164A, HP-IB:00– HP-IB:30	Select the appropriate interface.*

2:P.A.M.



System Configuration Menu (Continued)

2:P.A.M.

Field	Choices	Description
Print pitch:	No config., Normal, Expanded, Compressed, Expanded-Compressed	Select print pitch, or if using a non-HP printer, no print pitch configuration.
Print line spacing:	No config., 6 lines/inch, 8 lines/inch	Select 6 or 8 printed lines per inch, or if using a non-HP printer, no print line spacing configuration.
Printer skip perf:	No config., Yes, No	Select No if you don't want your printer to skip over the perforation, or no configuration if using a non-HP printer.

* Serial peripherals may require changes in the Datacom Configuration menu. They can be connected directly to the HP 110 using the serial port or indirectly using the HP 82164A HP-IL/RS-232-C Interface.

Use the HP 82169A HP-IL/HP-IB Interface to connect HP-IB plotters or printers. HP-IB peripherals should be last on the HP-IL loop.

Refer to the owner's manual for the peripheral if you have questions about datacom settings or addresses.

HP 110 Datacom Configuration **Datacom Config**

Connecting serial peripherals to the HP 110 may require you to change some of the settings that determine how data is sent to peripherals. If you designate a serial printer or plotter in the System Configuration menu, then you may need to make changes to the default settings in the Datacom Configuration menu. Refer to the owner's manual for the serial peripheral to find out what the configuration should be.

If your serial peripheral is connected using the HP 82164A HP-IL/RS-232-C Interface, then make the changes to the entries labeled HP 82164A.

From the main P.A.M. screen, go to the Datacom Configuration menu by pressing **Datacom Config** ((f5)):

Datacom Configuration	
Serial port: Modem	HP 82164A baud rate: 300
Serial baud rate: 300	HP 82164A word length: 7 bits
Serial word length: 7 bits	HP 82164A stop bits: 1
Serial stop bits: 1	HP 82164A parity: Even
Serial parity: Even	HP 82164A xon/xoff pacing: On
Serial xon/xoff pacing: On	HP 82164A CTS line: Ignore
Serial CTS line: Ignore	HP 82164A DSR line: Ignore
Serial DSR line: Ignore	HP 82164A DCD line: Ignore
Serial DCD line: Ignore	
Next Choice	Previous Choice
00:29 Default Values	
Help	Exit Config

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Move through the menu using the tab or cursor keys. To change an entry on the menu, use **Next Choice** ((f3)) or **Previous Choice** ((f4)). Anytime you want to return to the default entries, press **Default Values** ((f5)). To save the configuration displayed, press **Exit Config** ((f8)).

The choices for the items on the datacom menu are described in the following table:

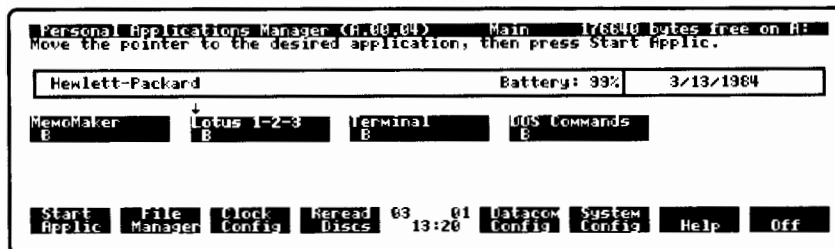
Datacom Configuration

Field	Choices
Serial port:	Modem, RS-232*
Serial baud rate:	300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19200, 50, 75, 110, 135, 150
Serial word length:	7 bits, 8 bits
Serial stop bits:	1, 2
Serial parity:	Even, Odd, None
Serial xon/xoff pacing:	On, Off
Serial CTS line:	Ignore, Observe
Serial DSR line:	Ignore, Observe
Serial DCD line:	Ignore, Observe
HP 82164A baud rate:	300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 19200, 50, 75, 110, 135, 150
HP 82164A word length:	7 bits, 8 bits†
HP 82164A stop bits:	1, 2†
HP 82164A parity:	Even, Odd, None
HP 82164A xon/xoff pacing:	On, Off
HP 82164A CTS line:	Ignore, Observe
HP 82164A DSR line:	Ignore, Observe
HP 82164A DCD line:	Ignore, Observe
* When RS-232 is selected, the system consumes substantially more power. When the serial port is not in use, select Modem.	
† When 8 bits is selected as the word length, 1 stop bit must be selected.	

Starting an Application Program

Once your system is properly configured and the main P.A.M. screen is displayed, you are ready to run one of the built-in application programs shown on the displayed directory.

Applications are selected using a pointer on the screen. With the tab or cursor keys, move the pointer to the name of the application you want to use. Move the pointer now to **Lotus 1-2-3**:



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Then, press **Select**, **Return** or **Start Applic (f1)** to run 1-2-3.

If you started the 1-2-3 program just now, you can exit and return to the main P.A.M. screen by following these instructions:

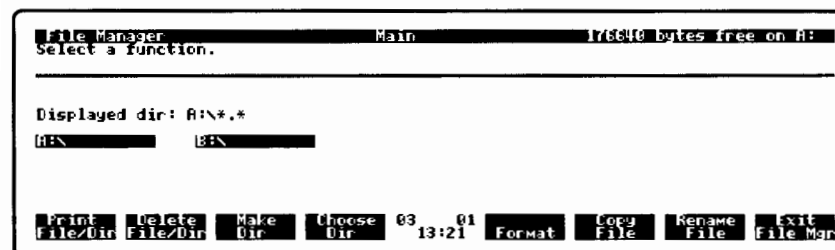
1. Press any key to display the 1-2-3 work sheet.
2. Press **/** to display the 1-2-3 menu.
3. Type **Q** to quit 1-2-3.
4. Type **Y** to confirm that you want to quit 1-2-3.

Installing application programs in the main P.A.M. screen is described on page 2-24.

Using the File Manager

You will be creating files when you begin to use application programs. In 1-2-3 you will create files to store work sheets and graphs; in MemoMaker you will create files to store memos, letters, reports, etc. Terminal Emulator files store the information required by the system to connect to a host computer, such as THE SOURCEsm.

Press **File Manager (f2)** to display the File Functions screen.



The File Manager allows you to:

- Print a file or directory ((f1)).
- Delete a file or directory from a disc ((f2)).
- Make a new directory on a disc ((f3)).
- Look at other directories ((f4)).
- Prepare new discs for use ((f5)).
- Make a copy of a file on a disc ((f6)).
- Rename a file ((f7)).

Choosing a File Name

File names consist of one to eight consecutive characters. You can use any characters except for , [] ? \ / = * ; - < > .

```
SECTION1
ACCTSREC
AIRLINES
KBTD!25
D!WAHL83
MEMO#123
```

There are some file names to avoid that are used by the operating system or one of the built-in applications. They are:

```
AUX   CON   NUL   PRN   PLT   LPT1   LPT2   PAM
```

In addition to the eight-character file name, files can be further identified by a file extension. A file extension consists of three characters (with the same character restrictions as file names) separated from the file name with a period. For example, you may put Accounts Receivable data in a different file each month. You could add a file extension to the file name ACCTSREC to distinguish the files for each month:

```
ACCTSREC.JAN
ACCTSREC.APR
ACCTSREC.JUL
ACCTSREC.OCT
```

Some file extensions are reserved by the operating system (MS-DOS) or by an application program for their own use. They are:

```
.BAR   .COM   .DIF   .EXE   .HLP   .IN$
.LIN   .LNK   .RM$   .TXT   .PIE   .VC
.MNU   .MSG   .WKS   .PIC   .PRN
```

File names must include a drive identifier if they are not located on the default drive (initially drive A). If a file is stored in drive A (the read/write disc), it is referred to as **A : *file name***. The same file stored on a disc in drive C becomes **C : *file name***.

Using More Than One Directory

A directory is a list. Think of a phone directory, which is a list of people's names, their addresses, and their phone numbers. A disc directory is very similar to a phone directory; it is a list of files, their sizes, and the last date they were altered.

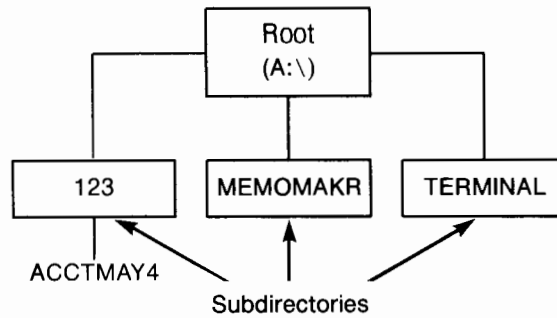
If things are simple, you have only one directory. For example, in Monmouth, Oregon (where fewer than 5,000 people live) all the listings are in one phone book. On a flexible disc, where there are generally few files, you would probably keep it simple and have one directory.

Think now of New York; what would happen if New York only had one big directory? Queens listings would be included with Manhattan, the Bronx, and so on, all in alphabetical order by last name. To find a name, you would have to look through a huge directory. Therefore, the listings are divided by boroughs. When you have too many files for one directory, you can create subdirectories.

Subdirectories are smaller groups of files. You could have separate directories for each application that has data files stored on the same disc. For example, you could create three subdirectories named **123**, **MEMOMAKR**, and **TERMINAL**; data files for these applications can be stored under the appropriate name.

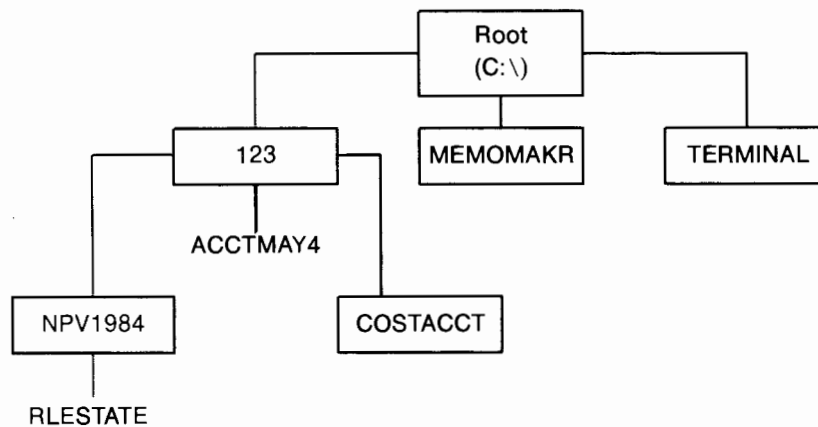
The top level of a directory is called a root. A root is always present on each disc; you don't create a root.

If a directory (for drive A) looked like this:



the file ACCTMAY4 in the 123 directory on disc A: would have the file name A:\123\ACCTMAY4.

If you wanted to group the 1-2-3 files under two subdirectories (NPV1984 and COSTACCT) in the 123 directory, the directory for this disc when stored in drive C would look like this:



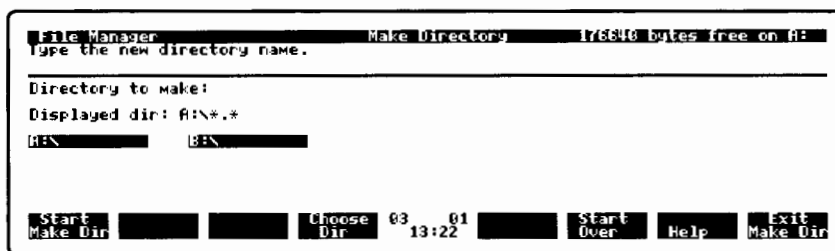
The name you type to access a file is called the path name. For example, to access a file in the NPV1984 directory, RLESTATE, on drive C, you would refer to C:\123\NPV1984\RLESTATE. This would tell the operating system to look under the subdirectory 123, then the subdirectory NPV1984 to find the file RLESTATE; this is the path you want followed. The path name for this file becomes C:\123\NPV1984\RLESTATE.

The backslash character serves as a delimiter in a file name. Enter the directory names separated by the backslash character. If a file name is appended, it should be separated from the last directory name by a backslash. The first backslash in the file name A:\123\ACCTMAY4 tells P.A.M. to look for that file starting with the root directory. If omitted, the directory path is assumed to begin with the current directory.

If you do not designate a drive identifier or directory name, P.A.M. looks for the file on the default drive. The default drive (and available space) is displayed in the upper right corner of the display in both P.A.M. and the File Manager. Initially, the default drive is drive A (the read/write disc).

Creating Subdirectories **Make Dir**

To create a subdirectory, press **Make Dir** ((f3)) in the File Functions screen:



Type a new directory name, such as 123; the full path name (drive:\path\directory name) appears on the screen.

The directory you create will become a subdirectory of the directory you are in unless you specify otherwise. If you indicate another directory (for example, C:\USER\PERRI\file name), the file becomes part of the indicated directory.

Press **Return** and select **Start Make Dir** ((f1)).



While the directory is being created, the message Making the Directory. Please Wait. appears on the screen.

The new directory name appears on the screen if it's part of this directory.

When you are done, press **Exit Make Dir** ((f8)).

Listing Files in Other Directories **Choose Dir**

The File Manager allows you to choose and list a directory. Note that the File Manager screens list drives A and B, plus additional drives that are connected, as part of the directory. This makes it easy to go to another directory.

Anytime that you want to see a file in a different directory, press **Choose Dir** (**F4**) in the File Functions screen. The Choose Directory screen appears:

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```
File Manager Choose Directory 176840 bytes free on A:
Move the pointer to, or type the name of the directory to display.
Directory to display: A:\      <DIR> 1/1/80 12:00a
Displayed dir: A:\*.*
A:\      B:\
Start Display Set Wildcard 03 01 13:24 Start Over Help Exit Choose
```

Point to the directory and press **Select**, or type in the directory.

Expanded directory information is shown across the top of the screen for the file or directory where the arrow is pointing. The information includes the file or directory name, the number of bytes, and the time and date the file was last edited.

Subdirectories are indicated by a backslash (\) following the name of the subdirectory.

You can move around in the directory listing using the tab keys. If you press **Tab**, the arrow moves to the next file, even if it's on the following page. Press **Shift Tab** to move backwards. The cursor keys also work to move around in the directory.

All of your directory listings may not appear on the first page. To view directory listings not on the first page of the P.A.M. screen, press **Extend char Prev** or **Extend char Next**.

Included in subdirectory listings are the entries ".", which indicates this directory and "..", which indicates the next level up in the path name.

For example, in the path name C:\USER\PERRI\file name the subdirectory USER would appear in the listing as “.”, since USER represents the next level of directory. Whenever you list files in the root directory, “.” does not appear because there are no higher levels.

If you do not wish to see all of the files in a directory press

Set Wildcard ((f3)) to indicate which files you want to see. You can set a file name as a wildcard, or use an *, or a ?. An asterisk indicates *any letters*. For example if your files were named:

```
LETTER
FINANCE
FILE1
FILE1.BAK
FILE2
```

the wildcard FIL* would find FILE1, FILE2, and FILE1.BAK. A wildcard of F* would find FINANCE, FILE1, FILE1.BAK, and FILE2.

Use a ? in place of any *one letter*, such as FILE? for FILE1 and FILE2.

After pressing **Set Wildcard** ((f3)), type in the new wildcard and press **Return** or just press **Return** for the default wildcard. *.* will list all the files.

If you want to see a directory that is not listed on the screen, type its full path name (for example A:\User\Steve) in response to Select the directory to display.

Move the pointer to the name of the directory on the screen; press **Start Display** ((f1)).

All of the files (unless a wildcard has been set) found in the current directory are listed on the screen. This includes all subdirectories found in the current directory.

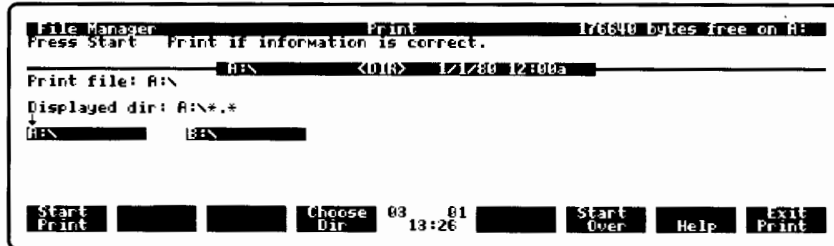
Press **Exit Choose** ((f8)).

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Printing a File or Directory **Print File/Dir**

Press **Print File/Dir** (**F1**) to print a file or directory. File names are printed along with available information about each file. If you want to print a file in another directory, press **Choose Dir** (**F4**).

To print a file, move the pointer to the name of the file or directory you want printed. Press **Select** or **Return**. You can also type the file name and press **Return**. The full path name (*drive:\path\file name*) appears after **Print file:**.



If you change your mind about which file to print, press **Start Over** (**F6**) or move the pointer to another file name.

To start printing, press **Start Print** (**F1**) or **Return**.

Refer to "HP 110 System Configuration" on page 2-4 for information on specifying printer settings.

Deleting a File or Directory **Delete File/Dir**

This command allows you to delete either files or directories. A directory, however, can only be deleted when all of the files in it have been deleted.

Press **Delete File/Dir** ((f2)) in the File Functions screen; the delete screen appears:

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File Manager

Delete

17516 bytes free on A:

Move the pointer to, or type the name of the file or directory to delete.

A:\

<018>

1/1/80 12:00a

Delete file: A:\

Displayed dir: A:*.*

A:\

B:\

123\

Start
Delete

Choose
Dir

03 01
13:36

Start
Over

Help

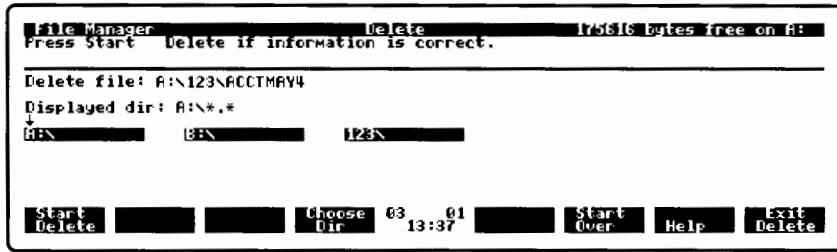
Exit
Delete

(If you want to look at another directory, press **Choose Dir** ((f4)).)



Move the pointer to a file or directory name on the screen. Press **(Select)** or **(Return)**. The full path name of the file (*drive:\path\file name*) appears after **Delete file:**.

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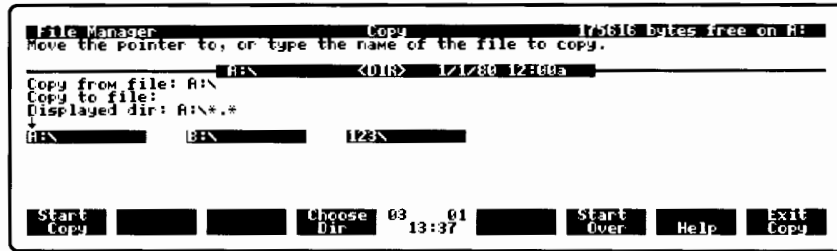
If you change your mind about which file to delete, press **Start Over** **(f6)**, then move the pointer to a new file name.

Press **Start Delete** **(f1)** to delete the file pointed to on the screen.

After the file is deleted, the list of files reappears. Note that the deleted file or directory no longer appears on the screen. Press **Exit Delete** **(f8)** to return to the main P.A.M. screen.

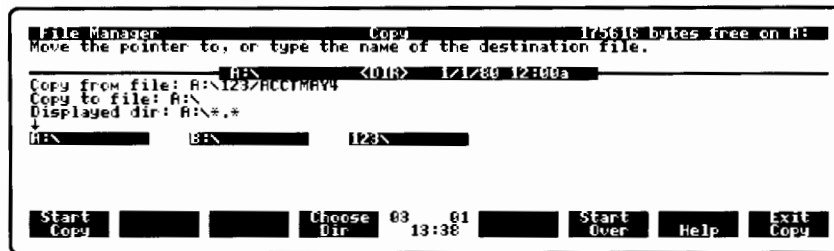
Copying a File **Copy File**

To make a copy of a file, press **Copy File** **(f6)** in the File Functions screen.



If you want to look at another directory, press **Choose Dir** **(f4)**.

Move the pointer to the name of the file to be copied and press **Select** or **Return**; the name of the file appears after **Copy from file:** on the screen.



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If you decide on another file, press **Start Over** ((f6)). After you have the pointer at the file to be copied, you are asked to name the new copy.

You probably want to choose a new name for the new copy; type a valid file name and press **Return**. If you want to copy over an existing file, move the pointer to that file name on the screen.

If the file copy is to go to another disc, type the full path name (for example C:\Steve\file name or C:\file name) which is the disc, directory, and file name, or choose the new drive by selecting the drive in the directory.

The full path name always appears. If you omit the drive designator and directory name, then the current drive and directory are used with the file name.

If you change your mind about the files, press **Start Over** ((f6)).

When you have the file names as you want them, press **Start Copy** ((f1)) or **Return**. The message **Copying specified file(s)** appears at the top of the screen. Press any key to return to the Copy menu.

To copy all files in the root directory of a disc, point to the drive to copy from, press **Select**; point to the drive to copy to, press **Select**. Press **Start Copy** ((f1)).

Wildcards can be used to copy several files with similar names. In the example on page 2-17, wildcard **FILE*** would copy **FILE1**, **FILE2** and **FILE1.BAK**.

Press **Exit Copy** ((f8)) if you don't want to copy any more files.

Renaming a File **Rename File**

From the File Functions screen, press **Rename File** ((f7)).

2:P.A.M.

```
File Manager          Rename          175516 bytes free on A:
Move the pointer to, or type the name of the file to rename.
A:\          <018>  1/12/86 12:38aa
Rename file: A:\
Rename file to:
Displayed dir: A:\*.*
A:\          B:\          123\

Start  Choose 03 01 Start
Rename Dir 13:39 Over Help Exit
Rename
```

If you want to look at another directory, press **Choose Dir** ((f4)).

Move the pointer to the file to be renamed (or type the file name) and press **Select** or **Return**.

The old file name is now on the screen next to **Rename File**:. Type the new file name:

```
File Manager          Rename          175516 bytes free on A:
Type the new file name.
actinfo
Rename file: A:\123\ACCTMAY4
Rename file to:
Displayed dir: A:\*.*
A:\          B:\          123\

Start  Choose 03 09 Start
Rename Dir 13:40 Over Help Exit
Rename
```

Press **Return**.

If you change your mind, press **Start Over** ((f6)); if you are ready to rename, press **Start Rename** ((f1)) or **Return**.

When the file is renamed, the directory list reappears with the new name:

File Manager Rename 175616 bytes free on A:
Move the pointer to, or type the name of the file to rename.
Rename file: A:\
Rename file to:
Displayed dir: A:*.*
A:\ B:\ C:\ HDD0.INFO I28N
Start Rename Choose Dir 03 01 13:41 Start Over Help Exit Rename

Press **Exit Rename** ((f8)) to return to the File Functions screen.

Formatting a Disc **Format**

Before a flexible disc can be used for the first time, it must be formatted. Press **Format** ((f5)) on the File Functions screen to format a new disc.

The Format screen prompts you for the disc drive identifier and a disc label (volume name):

File Manager Format 175616 bytes free on A:
Enter the disc to format. (All data currently on disc will be lost.)
Drive to format:
Volume label:
Displayed dir: A:*.*
A:\ B:\ C:\ HDD0.INFO I28N
Start Format Start Over Help Exit Format

The volume name is optional and can contain up to 11 characters (such as LOTUSDATA, APRIL/MEMOS, or COST ACCT).

CAUTION

If you format a disc containing files, those files are permanently lost.

For example, format a disc in drive C with a volume name of HP110DATA. First, type C after Drive To Format:. Then, type HP110DATA after Volume Label:. Then, type HP110DATA after Volume Label:.

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When you are ready to start formatting, press **Start Format** ((f1)). While the disc is being formatted, the message **Formatting disc. Please wait.** will appear.

When the format operation is complete, press **Start Over** ((f6)) to format another disc or press **Exit Format** ((f8)) to return to the main P.A.M. screen.

Installing Application Programs in P.A.M.

The listing of applications on the main P.A.M. screen is created from information stored in files named PAM.MNU. The applications listed initially in P.A.M. are from PAM.MNU files stored on the electronic disc drives (drive A and drive B).

You must create a PAM.MNU file on each external disc containing applications you want listed in the P.A.M. screen. (You can also edit the PAM.MNU file on drive A.) The PAM.MNU file is a standard text file which can be created using MemoMaker. Up to 20 different applications programs can be listed on the main P.A.M. screen. (Use **Prev** and **Next** to view entries not initially displayed.)

For example, to create a PAM.MNU file for two application programs (BROKER.EXE and WINEYARD.EXE) stored on a disc currently residing in drive C, follow these instructions:

1. Move the pointer on the main P.A.M. screen to **MemoMaker**. Press **Select** or **Start Applic** ((f1)).

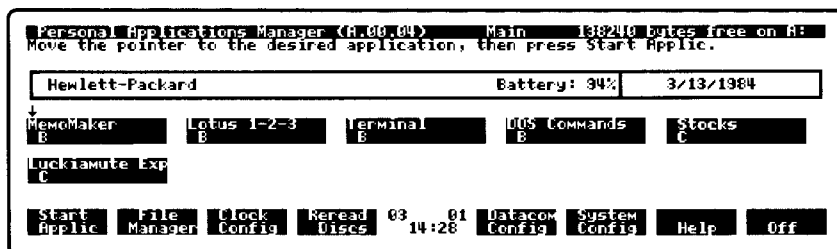
- The PAM.MNU file requires two lines in the file for each application that is to appear in the main P.A.M. screen. P.A.M. expects the label to be the first line of the entry and the file name plus any parameters required by your program (a standard MS-DOS command line) to be the second line:

```
Stocks
BROKER.EXE
Luckiamute Exp
VINEYARD.EXE
```

In addition, any line starting with a number sign (#) is ignored by P.A.M.—allowing lines in the file to be used for comments. You can optionally add comment lines anywhere in the file:

```
#Portfolio of stocks for J.Dobbs.
Stocks
BROKER.EXE
#This program keeps track of expenses for
#Luckiamute Vineyards.
Luckiamute Exp
VINEYARD.EXE
```

- Press **File Keys** ((f1)), then **Save Memo** ((f2)).
- Type C:\PAM.MNU in response to Enter File Name.
- Press **MEMOMAKR Main** ((f8)) to return to the main MemoMaker screen.
- Press **Exit MEMOMAKR** ((f8)) to return to P.A.M. The labels **Stocks** and **Luckiamute Exp** are now on the main P.A.M. screen:



Anytime you return to P.A.M. from an application (such as MemoMaker), P.A.M. rereads all discs making certain that application programs from all current PAM.MNU files appear in the P.A.M. screen.

If you change discs in one of the drives while the P.A.M. screen is displayed, you will need to press **Reread Discs** ((f4)) to update the P.A.M. screen.

Scheduling Alarms

You can use your HP 110 to schedule alarms—either message alarms or alarms to tell your HP 110 to run a program (execution alarms). Alarms are scheduled by creating or editing a file called PAM.ALM. Each line in this file contains one alarm. The HP 110 knows to look for alarms in this file. To create or edit this file:

1. Select **MemoMaker** on the main PAM screen.
2. Each line in this file sets an alarm. The format for each line is:
MM/DD/YY hh/mm message
where MM = month: 1-12.
DD = day: 1-31.
YY = year: 00-79 means 2000-2079, 80-99 means 1980-1999. You can also use four digits for the year.
hh = hour: 24 hour clock, 00-23.
mm = minutes: 00-59.
message = a message to you or a message to the computer to do something. If it is a message that is something to be executed by the HP 110, the message must be preceded by >. The message must fit in the remaining space on the line.
3. Once you have entered your alarms, select **File Keys** ((f1)), then **Save Memo** ((f2)).
4. Type PAM.ALM as the file name.
5. Exit MemoMaker.

The alarms in the file must be arranged in chronological order. Alarms in the past are not set. Each alarm must be less than 80 characters (the length of one line), because the system sees each line as a separate alarm.

If you want to add alarms in the future, go into MemoMaker, press **Get Memo** ((f5)) and type in PAM.ALM as the file name.

If the HP 110 is off when an alarm occurs, the alarm will wake up the computer. Press any key to stop an alarm. If no key is pressed, the alarm will stop after 10–15 seconds.

If you are in an application when the alarm rings, the first key you hit will turn the alarm off, and will also be accepted by the application. Return to P.A.M. to see the alarms that went off while you were in the application. Be sure to save the data you were working on before going into P.A.M.

Up to eight alarms are remembered. If the alarms are message alarms, the messages are displayed. If any of the alarms are execution alarms, only the first execution alarm will be executed when you return to P.A.M. The others will be lost.

After you view the alarm, press any key to go back to P.A.M. or the File Manager.

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Answering the Phone

When your HP 110 is connected to a telephone jack, and the telephone rings, you will hear a low tone for every ring. If you are in P.A.M. or the File Manager, and the file AUTOANSR.BAT exists, the HP 110 will execute that file. If you are in an application, you will hear the low tone and must go out of the application to respond to the ringing phone.

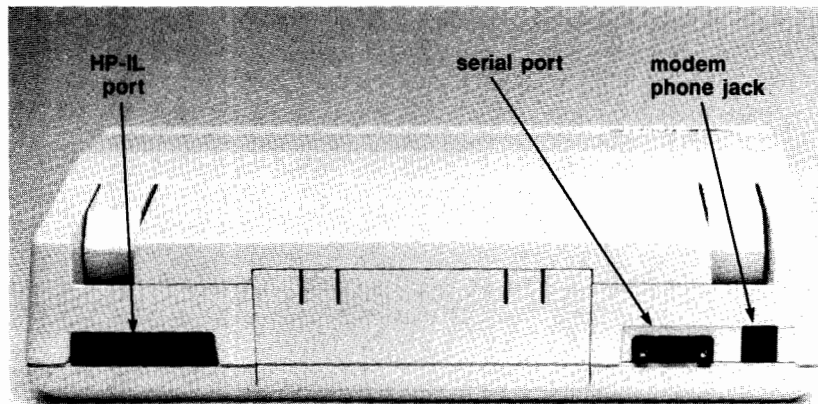
The file AUTOANSR.BAT should contain instructions on how you want the HP 110 to respond to the ringing phone. For more information on using the modem, refer to the *Terminal Emulator User's Manual*.



USING THE HP 110

WITH PERIPHERALS

Built in to your HP 110 are two interfaces and a modem. These interfaces make it possible for your HP 110 to talk to peripherals.



You can connect printers, plotters, or disc drives to the connector marked “HP-IL”; a printer, plotter, or modem to the serial port; or directly connect the HP 110 to a modular phone jack using the built-in modem.

Although you do not need peripherals to use your computer, you may want to use a printer or plotter with 1-2-3 to make copies of the graphs you create or to obtain printed copies of spreadsheets or MemoMaker documents. Adding a disc drive enables you to store files on flexible discs; as many as eight peripheral disc drives can be connected.

If you are connecting serial interface peripherals, use the Datacom Configuration menu ((f5) on the main P.A.M. screen) described in chapter 2 to specify to the system what you are connecting.

Use the System Configuration menu ((f6) on the main P.A.M. screen), also described in chapter 2, to designate the printer type, the printer interface, the “pitch” (normal, expanded, compressed, or expanded-compressed), and the number of printed lines per inch. You can also choose to skip the perforation (yes or no). The plotter interface (if other than HP-IL) must be designated here also.

The Federal Communications Commission (FCC) requires specific procedures for installation and operation of equipment that uses public communications lines. Therefore, you should read the instructions at the end of this chapter before connecting the HP 110 to a telephone line.

Each peripheral comes with its own manual. Refer to the individual owner's manual for complete installation instructions.

Connecting HP-IL Peripherals

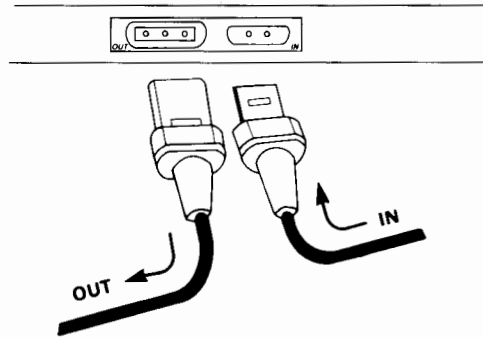
The Hewlett-Packard Interface Loop allows you to connect one or more peripherals in a loop without worrying about how to address what you connect. Connecting the plotter, printer, or disc drive is all that is required to set up the loop. The following HP-IL peripherals are compatible with your HP 110:

- HP 9114A 3½-Inch Single Flexible Disc Drive (battery operated)
- Thinkjet Printer (battery operated)
- HP 7470A (option 003) Graphics Plotter

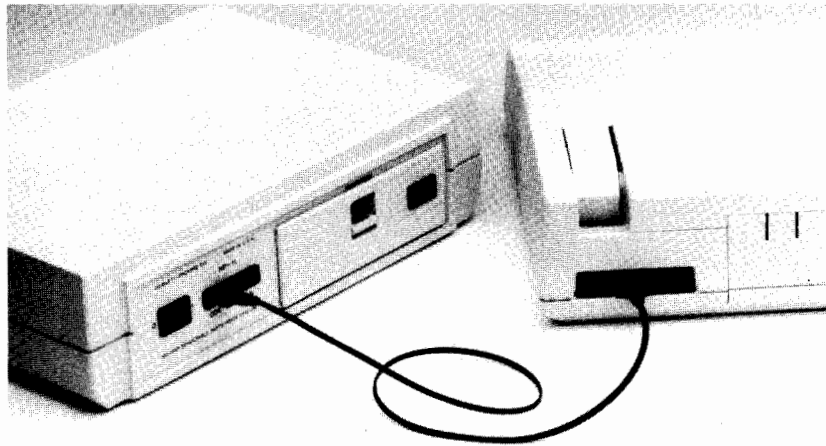
Check with your local dealer for information about other HP-IL peripherals that may be available.

The peripherals are connected to your computer (and to each other) using HP-IL cables. One 1 meter cable is shipped with the HP 110 and one is shipped with each peripheral.

The connectors indicate the direction of information transfer as shown below:

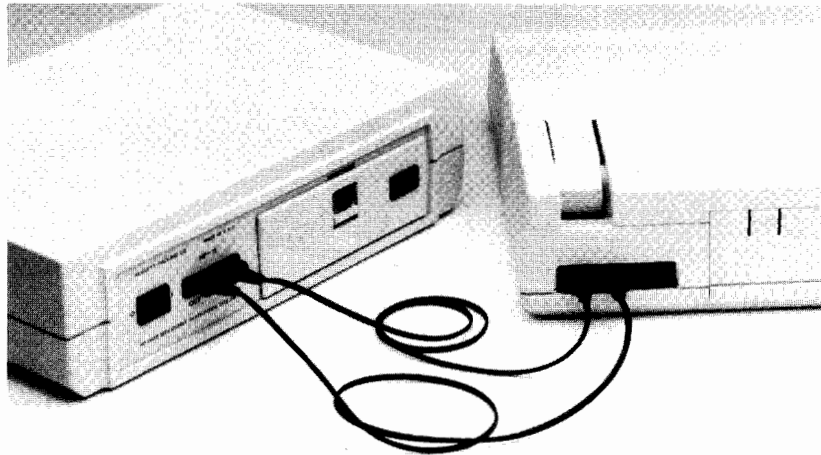


When only one peripheral is connected, the first HP-IL cable runs from the IN receptacle in the back of the computer to the OUT receptacle on the peripheral:

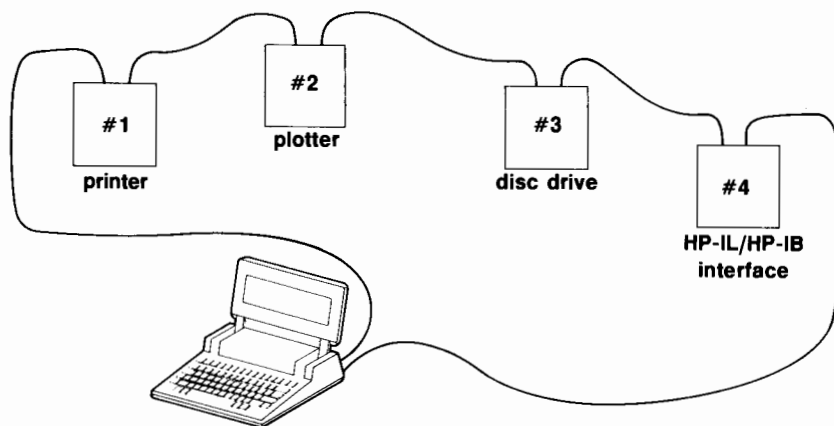


The other HP-IL cable connects the IN receptacle on the peripheral to the OUT receptacle on the HP 110:

3:Peripherals



If you are connecting more than one peripheral, HP-IL cables should be connected from the OUT receptacle on the previous peripheral to the IN receptacle on the next peripheral. Repeat this procedure until all peripherals are connected. The loop is completed when the OUT receptacle on the last peripheral is connected to the IN receptacle on the computer.



Instructions and data on the Hewlett-Packard Interface Loop originate from the computer and travel to the first peripheral, on to the second and continue around the circuit until that information returns to the HP 110. If the information isn't intended for a particular peripheral, it travels to the next peripheral in the loop. When the information reaches its destination, that peripheral responds as directed and then passes on the information.

Note: All peripherals in the loop must be switched on for information to travel from one peripheral to another. Any peripheral in the loop not switched on halts all loop operations.

If you wish to space the peripherals farther apart than permitted by their cables, connect additional HP-IL cables in appropriate locations in the loop. The maximum distance between any two devices is 10 meters (33 feet) with standard cables. Standard HP-IL cables are:

HP 82167A	.5 meter
HP 82167B	1 meter
HP 82167D	5 meters



Connecting Serial Peripherals

Serial peripherals can be connected using the built-in serial port, or the HP 82164A HP-IL/RS-232-C Interface. (Refer to "Connecting HP-IL Peripherals" for information on putting the HP-IL/RS-232-C interface in the HP-IL loop.)

Hewlett-Packard offers two serial cables for use with the built-in serial port: HP 92221P for connecting printers/plotters; and HP 92221M for connecting modems. Removal of the serial cable when not in use will minimize the chances of electromagnetic interference with other nearby electrical devices. Refer to appendix B for a technical description of the built-in serial port.

To enable the HP 110 to send information through the serial port or the HP-IL/RS-232-C Interface out to a printer, plotter or modem, you may need to make some changes in the System Configuration menu and the Datacom Configuration menu. Read "Setting Up the HP 110" in chapter 2 before you configure the system.

For example, to connect a serial HP 82905B (opt. 240) printer:

1. Use an HP 92221P cable (or the equivalent) to connect the printer to the computer.
2. Turn on the printer and the computer.
3. Select **System Config** ((f6)) and change Printer Interface to Serial.
4. Press **Exit Config** ((f8)) to return to P.A.M.
5. Select **Datacom Config** ((f5)).
6. Refer to that section of your printer manual that discusses the printer parameters (appendix D in the *HP 82905B Printer Owner's Manual*). The HP 82905B printer accepts data according to the following parameters:

Baud	4800 bits/sec
Startbits	1 bit
Data bits	8 bits
Stop bits	1 bit
Parity check	none

Change the Serial fields to match the printer parameters:

Datacom Configuration	
Serial port: RS-232	HP 82164A baud rate: 300
Serial baud rate: 4800	HP 82164A word length: 7 bits
Serial word length: 8 bits	HP 82164A stop bits: 1
Serial stop bits: 1	HP 82164A parity: Even
Serial parity: None	HP 82164A xon/xoff pacing: On
Serial xon/xoff pacing: On	HP 82164A CTS line: Ignore
Serial CTS line: Ignore	HP 82164A DSR line: Ignore
Serial DSR line: Ignore	HP 82164A DCD line: Ignore
Serial DCD line: Ignore	

08:30

To send data to the printer, press **File Manager** ((f2)) on the main P.A.M. screen. Press **Print File/Dir** ((f1)) to print.

If you are using the HP-IL/RS-232-C Interface instead of the built-in serial port, follow the directions above except:

1. Refer to the peripheral owner's manual and to the *HP-IL/RS-232-C Interface Owner's Manual* for cable information.
2. On the System Configuration menu, change Printer Interface to HP 82164A (step 3 above).
3. On the Datacom Configuration menu, change the HP 82164A column instead of the Serial column (step 6 above).

Datacom Configuration	
Serial port: Modem	HP 82164A baud rate: 4800
Serial baud rate: 300	HP 82164A word length: 8 bits
Serial word length: 7 bits	HP 82164A stop bits: 1
Serial stop bits: 1	HP 82164A parity: None
Serial parity: Even	HP 82164A xon/xoff pacing: On
Serial xon/xoff pacing: On	HP 82164A CTS line: ignore
Serial CTS line: ignore	HP 82164A DSR line: ignore
Serial DSR line: ignore	HP 82164A DCD line: ignore
Serial DCD line: ignore	

Next Choice
Previous Choice
08:31
Default Values
Help
Exit Config

Connecting HP-IB Peripherals

The HP 82169A HP-IL/HP-IB Interface enables you to use HP-IB peripherals, such as printers, plotters and disc drives, with your HP 110. You can use HP-IL and HP-IB devices at the same time. The *HP-IL/HP-IB Interface Owner's Manual* explains how to connect the interface and describes HP-IB addressing and communications.

You will need an HP-IB cable for each HP-IB peripheral. HP-IB cables available are:

HP 10833D	.5 meter
HP 10833A	1 meter
HP 10833B	2 meters
HP 10833C	4 meters

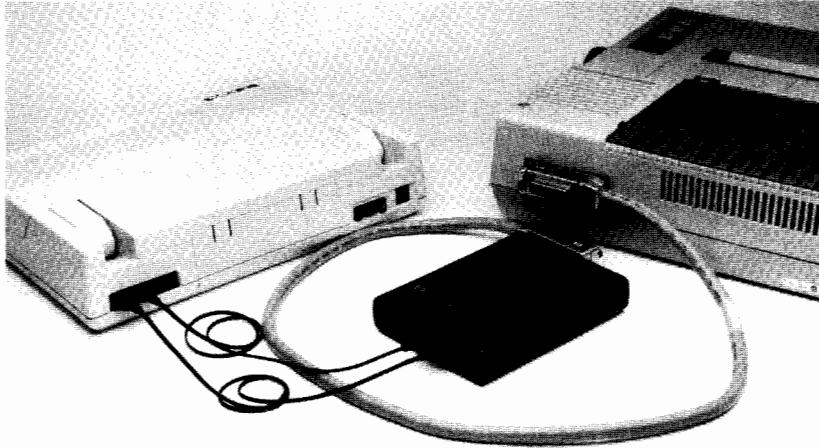
Use the System Configuration menu to designate the plotter or printer interface. Select HP-IB, with the address the same as the HP-IB address on the peripheral.

To connect an HP-IB printer:

1. Determine the HP-IB address on the printer. Refer to your printer owner's manual for information about HP-IB addresses.
2. Set the mode on the HP-IL/HP-IB Interface to 0—translator mode. Refer to "Mode/Address Switch" in the *HP-IL/HP-IB Interface Owner's Manual* for information about the mode setting.
3. Connect the HP-IB cable from the printer to the interface. (Be sure the ac adapter is connected to the interface and plugged into an ac outlet.)
4. Connect the HP-IL cables from the interface to the computer and back again, as described in "Connecting HP-IL Peripherals."

5. Turn on the printer and the HP 110.
6. Press **(f6)** to go to the System Configuration menu.
7. Move the pointer to **Printer Interface**.
8. Use **Next Choice** (**(f3)**) and **Previous Choice** (**(f4)**) to change the setting to the appropriate HP-IB address to match the address on the printer.

You are now ready to send information to the printer.



Connecting External Disc Drives

In addition to the built-in electronic read/write disc (drive A) and read only disc (drive B), you can connect as many as eight external disc drives. The external disc drives are referenced starting with drive C. If two additional disc drives are added to the loop, the HP 110 labels them drive C and drive D. Drives are assigned first to all HP-IL discs from lowest to highest address, then to HP-IB discs from lowest to highest address.

You can use HP-IL or HP-IB disc drives. Refer to "Connecting HP-IL Peripherals" or "Connecting HP-IB Peripherals" in this chapter for instructions on connecting HP-IL or HP-IB peripherals.

To connect an HP 9114A disc drive:

1. Connect the HP-IL cables from the computer to the disc drive and back to the computer, as described in "Connecting HP-IL Peripherals," page 3-2.
2. Turn on the disc drive and the computer.
3. Press **System Config** ((f6)).
4. Use the cursor keys to move to **External disc drives**.
5. Use **Next Choice** ((f3)) to change the number of external disc drives to 1.
6. Press **Exit Config** ((f8)).

Connecting a Second HP 110

The HPLINK program enables drives A and B of an HP 110 to be accessed by another HP 110. Running HPLINK causes the HP 110 to look like a disc drive to a second HP 110. To use this feature:

1. Connect two HP 110s together using HP-IL cables.
2. Run HPLINK on the HP 110 you wish to act like a disc drive. To run HPLINK, type HPLINK in the main P.A.M. screen command line and press **(Return)**.
3. On the other HP 110, change the System Configuration menu, **External disc drives** to 2.
4. Transfer information between the two HP 110s just as you would between a disc drive and an HP 110. On the HP 110 running HPLINK, drive A becomes drive C and drive B becomes drive D.
5. Pressing any key on the HP 110 which is acting as a disc drive will stop the HPLINK program.

You can add HPLINK to your P.A.M. screen by creating an entry in your PAM.MNU file. Refer to page 2-24 for details.



Using the Built-In Modem

The HP 110 Portable Computer has a built-in modem that provides data communication capability in the United States.

The Federal Communications Commission (FCC) requires specific procedures for installation and operation of equipment that uses public communication lines. *Therefore you should read this section carefully before attempting to connect your modem.*

Note: The HP 110 may also be used with external modems that connect to the serial port. Refer to the manuals that accompany these modems for installation instructions and telephone company requirements.

Description

The built-in modem has the following features:

- Data rate of 300 bits/second (300 baud).
- Standard connection through the telephone network with any 300-baud modem that conforms to the Bell 103/113 modem protocol.
- Full duplex, asynchronous operation.
- Originate mode or answer mode operation.
- Automatic dialing (pulse or tone).
- Manual dialing.
- Ring detect and automatic answer.
- Manual answer.

Installation Instructions

The HP 110 Portable Computer is registered with the FCC for direct connection to a telephone line. It is designed to be used with a standard single-party telephone line; connection to pay telephones or party lines is prohibited. If you are unsure about the suitability of your telephone line, contact your telephone company.

Before you connect the computer to the telephone line, FCC rules require that you notify your telephone company. You should tell them of your intention to connect an FCC registered device to your telephone line. They need to know the telephone number along with the following information:

- Manufacturer: Hewlett-Packard
- Model Number: HP 110
- The FCC registration number
- The ringer equivalence number

The FCC registration number and the ringer equivalent number can be found on the bottom face of your HP 110.

If you plan to connect the HP 110 to different telephone lines, furnish the telephone company with a list of these numbers to avoid notifying them every time you move your computer. Notify the telephone company again when the HP 110 is permanently removed from the line.

A modular telephone jack is required along with a cable that connects the HP 110 to the telephone jack. If you have a telephone jack with four round holes, you will need an adapter plug that converts your jack from four-prong to modular. If you don't have the proper type of telephone jack or cable, you can obtain either one from an electronics store.

If you want to plug the HP 110 into a modular jack into which a telephone set is currently connected (that is, if you want to replace a telephone with the HP 110), the telephone must have the same kind of modular jack as the computer. Unplug the cable from the telephone then plug the loose end of this cable into the jack on the rear panel of the HP 110.

The plugs on the cable can be inserted into the jacks in only one way. The small plastic tab will snap in when the plug is properly connected. When you pull gently on the cable, it should not pull out of the jack until you press the plastic tab.

You may wish to share a single wall jack between a telephone set and the HP 110. You may do this by purchasing a "Y" adapter and extra cable from an electronics or telephone supply store. Note that you cannot simultaneously carry on a voice call and use the HP 110 modem. However, you can listen to the HP 110 transferring data on the telephone set.

Telephone Company Rights and Responsibilities

The circuitry in your HP 110 is designed to protect both the phone line and the computer from damage caused by high voltages and is approved by the Federal Communication Commission. However, the telephone company has the legal right to discontinue service if the HP 110 should somehow cause harm to the telephone network. In this case, the telephone company shall:

- Promptly notify you of the service interruption.
- Give you the opportunity to correct the situation that caused service to stop.
- Inform you of your right to bring a complaint to the FCC concerning the service interruption.

The telephone company may make changes in its facilities and services which may affect the operation of your equipment. However, you shall be given adequate notice in writing to allow you to maintain uninterrupted service.

Obtaining Service

If you have problems with normal telephone calls when the HP 110 is connected to the line (but not in use), you must determine if the HP 110 is the cause. Disconnect your computer. If the trouble continues, contact your telephone company to have your line checked.

If the trouble stops when the HP 110 is disconnected, you will need to have your computer repaired. Obtaining service is described in the *Series 100 Support Guide*.

Do not attempt to service the HP 110 yourself. Doing so violates FCC rules and may damage the telephone network.

OPERATING INFORMATION

**Power Supply Information**

The HP 110 Portable Computer is powered with a 6-volt, 2.5 Ah battery pack. It consumes the least amount of power when the display is turned off. More power is consumed while programs are running or when the serial interface is in use. While the HP 110 is not powered from an ac outlet, a fully charged battery pack typically allows more than 16 hours of continuous operation at room temperature (approximately 25°C or 77°F).

Low-Battery Safeguards

When the battery voltage drops below a predetermined level, the Low Battery indicator turns on in the lower left corner of the display. It is possible to type over the low battery message; it will reappear every 8 minutes as long as the battery is low.

A screenshot of the HP 110 Portable Computer's monochrome display. The screen is divided into several sections. At the top, it shows "MEMOMAKER" and "Get Memo". Below that, it displays "Line: 1 Column: 1 Length: 0" and "Memo: NAMELESS Directory: A:\". The main area of the screen is empty, with the prompt "Enter file name." at the bottom. In the lower left corner, a "Low Battery!" warning is displayed. At the bottom of the screen, there is a status bar showing "NAMELESS Document", "File #", "04 01", "04:07", and buttons for "Help" and "Cancel Get".

At this point, you have from 1½ hours to 2 months of use remaining—depending on if you are running an application or not using the computer at all.

If the battery is not charged during this time period, the HP 110 halts normal operations, including any currently executing program, beeper output, display output, or HP-IL operation.

However, the battery continues to power the clock and preserve memory. Nothing happens when a key is pressed that normally turns the display on. At this point, to prevent losing memory, connect the computer to an ac outlet to recharge the battery.

If you are unable to connect the recharger immediately, clock settings and information in memory are preserved from 1 week to 1 month.

After the battery is recharged for 30 minutes, reactivate the display by pressing and holding the contrast key, **(C)**.

Battery Recharging

Recharging the battery overnight or whenever power is available will assure you of having a full charge during the day as well as maximizing battery life.

WARNING

The battery pack is *NOT* serviceable or replaceable by the user.

Do not attempt to incinerate or mutilate the battery pack—the pack may burst or release toxic materials.

Do not connect together or otherwise short-circuit the battery pack terminals—the pack may melt or cause serious burns.

The recharger will provide at least a 95 percent charge after being connected 12 hours—if the unit is off (20 hours if the unit is on). The battery pack is never in danger of becoming overcharged.

Should the battery pack reach a point where it no longer accepts a charge, you will need to contact your Hewlett-Packard dealer or sales representative and have your unit serviced.

Environmental Limits

The HP 110 can be operated in temperatures ranging between 0° and 45°C (32° to 113°F).

When not in use, your computer should be stored away from extreme temperatures. For example, do not store your computer in the trunk of a car. Very hot or very cold temperatures can adversely affect the life of the battery and the display.

Exposing the HP 110 from one extreme temperature to another will cause stresses in your computer that will also tend to decrease its reliability.

Clock Accuracy

The system clock is regulated by a quartz crystal accurate to within 5 minutes per month for worst-case operating temperatures. A more typical accuracy is 1½ minutes per month. The clock crystal is affected by temperature, physical shock, humidity, and aging. Optimum accuracy is achieved at $25 \pm 5^\circ\text{C}$ ($77 \pm 9^\circ\text{F}$). When an extreme change in environment occurs, the clock may require readjustment.

Adjust the system clock by selecting **Clock Config** (**F3**) in the main P.A.M. screen.

Potential for Radio/Television Interference (for U.S.A. Only)

The HP 110 generates and uses radio frequency energy and if not installed and used properly—that is, in strict accordance with the instructions in this manual—may cause interference to radio and television reception. It has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. In the unlikely event that your HP 110 does cause interference to radio or television reception (which can be determined by removing all power to the HP 110 and then resetting it), you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer and ac adapter/recharger into a different ac outlet so that the computer and the receiver are on different branch circuits.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 004-000-00345-4.

Cleaning Information

The HP 110 can be cleaned with a soft cloth dampened either in clean water or in water containing a mild detergent. Don't use an excessively wet cloth or allow water inside the computer. Avoid abrasive cleaners, especially on the display.

Disc Handling and Care

Magnetic media such as discs require a clean, dust-free environment. However, there are a few recommendations to keep in mind when using and storing discs.

Note: You should be aware that 3½-inch discs have a built-in limit to the number of times a disc is used. After a disc has revolved in a drive about 1.5 million times, the light on the front of the drive blinks on and off while the disc drive makes a clicking noise. Duplicate any disc that causes this condition.

If you do not duplicate the disc, you can continue to use this disc for approximately .5 million revolutions of the disc. Continued use will cause the disc to be marked as worn out. The drive will no longer permit writing to this disc.

Temperature and Humidity

Since extreme humidity or temperature differences between the working and storage areas may alter the size of the media, do not expose the disc to excessive heat or sunlight (such as leaving a disc in an automobile). In addition, care should be taken when discs are moved from one area to another. (A rapid change in temperature or humidity may result in system errors, or damage to the discs.)

If the working and storage areas cannot be kept at the same relative humidity and temperature, allow ample time (typically one hour or more) for the media to achieve a balance with the room atmosphere before use. The maximum rate of temperature change must not exceed 20°C (68°F) per hour.

Contaminants

Airborne contaminants and particles of a certain size and hardness may scratch either the coating on the flexible disc or the disc drive head and cause premature wear on the disc, resulting in loss of information.

To prevent excessive wear, avoid bringing contaminants into contact with your discs (such as food particles, eraser crumbs or cigarette ashes).

Magnetic Fields

The data on magnetic media can be erased by magnetic fields. Magnetic fields are found in power generating equipment such as motors, alternators, transformers, and data processing equipment such as disc drives.

Therefore, do not place flexible discs on top of disc drives. Also, since there are magnets within a telephone receiver, do not store your flexible discs near a telephone, and do not place a telephone on top of your disc drive.

Storage

Safeguards should be taken to protect vital data such as business records, media, or other information that is either very expensive or impossible to duplicate.

Be sure to keep the metal shutter on a 3½-inch disc pushed to the right (to cover the read area) when the disc is not in use. Most 3½-inch discs do this automatically to protect the disc's surface.

Replace the disc if it becomes physically damaged (creased, folded, or torn), or if the recording surface becomes contaminated by fingerprints, smoke particles, etc.

Never attempt to clean your flexible discs. The inside surface of the disc jacket is covered with a special material that cleans the disc as it rotates. Any other method of cleaning may cause solvent damage to the media or scratch the disc, causing it to lose data.

SERIAL COMMUNICATION PORT

TECHNICAL INFORMATION

This section presents some of the more technical operating aspects of the built-in serial port. You may not need some of the material presented in this section for your specific application. You may want to read only those parts of this section that apply to your application.

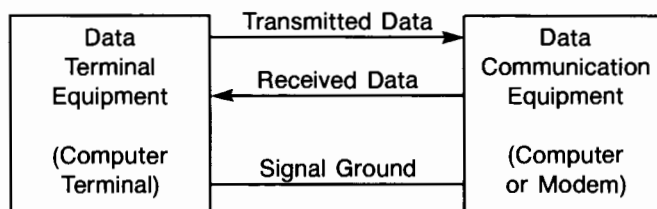
RS-232-C Description

RS-232-C is a serial input/output (I/O) interfacing method that transmits data one bit at a time over one transmission wire. For example, an eight-bit character would take eight sequential transmissions to complete the character. In contrast, parallel I/O transmits each bit simultaneously over several wires. Sending an eight-bit character would take eight separate wires, one wire for each bit, and all eight bits would be sent simultaneously. One disadvantage of serial I/O is that it is much slower than parallel I/O. But the major advantage of serial I/O is that it is much less expensive than parallel I/O, especially over long distances.

RS-232-C can be a very difficult interface to work with because RS-232-C is only *partially* specified by the Electronic Industries Association Standard of 1969. Additionally, RS-232-C was made general enough to include most of the serial interfaces that were developed prior to the 1969 standard. Thus, you may sometimes encounter an RS-232-C device that does not work with another RS-232-C device without some sort of cable modification or special setting of configuration switches on the peripheral device.

Equipment Configurations

Serial I/O devices are described according to the function that they perform. These functions are Data Terminal Equipment (DTE), Data Communication Equipment (DCE), and current loop operation. Current loop operation is not supported by the HP 110 Serial Interface.



A Data Terminal Equipment (DTE) is a device at any location in a network where information can enter or exit. Examples of DTE are:

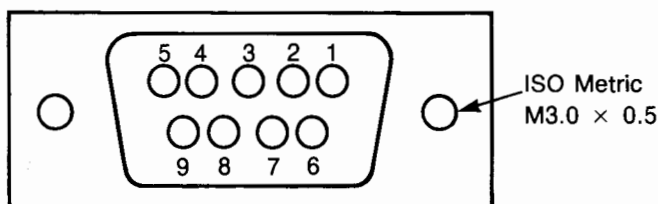
- Remote terminals.
- Remote terminal interfaces—printers, plotters, etc.
- Host computer.
- Host computer interface—printers, plotters, etc.

A Data Communication Equipment (DCE) is a device used to convey information between locations. Examples of DCE are:

- Modems.
- Modem interfaces.
- Communication links (telephone lines, for example).

The following table provides technical information about the built-in serial port. The serial port complies with certain industry standards, and these standards are listed below the table.

Nine-pin female D subminiature connector as viewed from the back of the product:



Series Port Technical Data

Pin Number	RS-232-C Circuit Designator	Equivalent RS-232-C Number	V.24 Circuit Designator	Signal Description
1	CD	20	108/2	Data Terminal Ready
2	BA	2	103	Transmitted Data
3	BB	3	104	Received Data
4	CA	4	105	Request To Send
5	CB	5	106	Clear To Send (Ready for Sending)
6	CC	6	107	Data Set Ready
7	AB	7	102	Signal Ground (Common Return)
8	CF	8	109	Received Line Signal Detector (Carrier Detect)
9	CE	22	125	Ring Indicator (Calling Indicator)

All signals are from the point of view of Data Terminal Equipment.

Conforms to:

EIA RS-232-C Electrical Specification
(a 9-pin female connector has been used instead of a 25-pin male connector)

CCITT V.28 Electrical Specification

Two serial cables are available from Hewlett-Packard:

- HP 92221P—DTE to DTE for interfacing with printers, plotters, terminals and other computers.
- HP 92221M—DTE to DCE for use with modems.



Both of these cables have a male 9 pin connector for plugging into your HP 110 and a male 25 pin connector on the opposite end for plugging into your peripheral. Since the majority of devices have female connectors built in, we do not currently offer a cable with a female 25 pin connector. However, a gender converter box is available to give you this configuration if necessary.

- HP 92222F—female to female gender converter.

If your peripheral requires a cable wiring configuration other than the ones implemented by our standard cables, you can make a custom configuration using an HP 92221 cable and an HP 92222W custom wiring kit.

- HP 92222W custom wiring kit comes with:
 - two 25-pin male connectors
 - two 25-pin female connectors
 - jumper wires
 - Locking hardware
 - case

Serial Modem Cable

Cable Type: DTE to DCE
P/N 92221M

Signals	9-Pin (Male)	25-Pin (Male)
(CD) DTR	1	20
(BA) TxD	2	2
(BB) RxD	3	3
(CA) RTS	4	4
(CB) CTS	5	5
(CC) DSR	6	6
(AB) GND	7	7
(CF) DCD	8	8
(CE) RING	9	22
(AA) PGND	SHELL	SHELL
		1

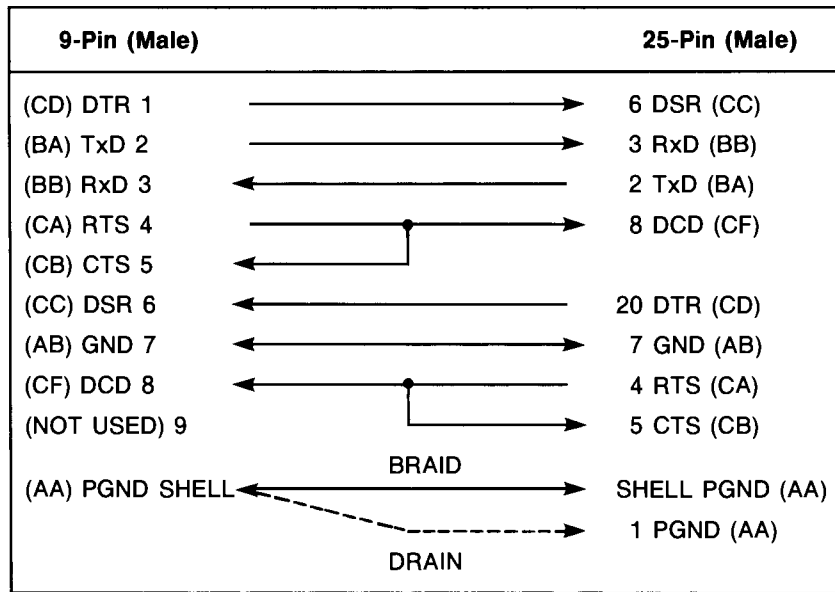
BRAID
DRAIN

Serial Printer Cable

Cable Type: DTE to DTE

P/N 92221P

(Null Modem Cable)



Appendices

DIAGNOSTICS



If you suspect your computer is not working correctly, you can determine if there is a problem before having your unit serviced. Two types of tests are available. One is a built-in test stored on the read only disc (drive B); the other is a longer, more extensive test on the disc labeled "Utilities Disc."

If you have an external drive connected, run the disc-based diagnostic test.

Obtaining service is described in the *Series 100 Support Guide* that came with your computer.

If you suspect the computer is not working correctly, but it passes all of the tests, refer to the manuals shipped with the HP 110 Portable Computer for operating information. If you still experience difficulty, write or call Hewlett-Packard (refer to the *Series 100 Support Guide*) for additional help.

Using the Built-In Diagnostic Test

If no external disc drive is connected or if you cannot access the external disc, then run the test stored on the read only disc.

The display must be off to start this test. If the display is on, press (f8) in the main P.A.M. screen to turn the display off. To start the diagnostic test, hold down the (Shift) and (Extend char) keys, then press (f8).

The read only disc program tests the central processing unit (CPU) and part of memory as it loads. You will see this message on the display initially for about 10 seconds:

Built-in self-test initialization: Please stand by.

After the initial tests are completed, the self-test menu is displayed:

```
Built-in self-test, version 1.0:
f1: ROM test
f2: RAM test
f3: HP-IL test
f4: All of the above
f5: Exit

Use function keys f1-f4 to select test.
Use f5 to exit.
```

You can choose to run the ROM (read only disc), RAM (read/write disc), or HP-IL (Hewlett-Packard Interface Loop) tests individually—or you can press **(f4)** to run all of the tests.

NOTE: Do not press the contrast key (**(D)**) while testing the read/write disc. Doing so could cause any information stored on the read/write disc to be lost.

An error message or failure code on the display indicates a test did not pass and service is required. Record the error message or failure code on the service card contained in the *Series 100 Support Guide*.

Press **(f5)** to exit the diagnostic test and return to the main P.A.M. screen.

Using the Disc-Based Test

The disc-based program tests include the CPU (the central processing unit), ROM (read only disc), RAM (read/write disc), LCD (display), keyboard, HP-IL, modem, beeper, and timer. The disc-based RAM test is more exhaustive than the built-in RAM test.

To start the disc-based tests, insert the “Utilities Disc” into an external disc drive. Turn on the display. On the main P.A.M. screen, type *disc drive identifier*: TEST and press **(Return)**. Refer to chapter 3 for information about external disc drives.

Example: If you have one external disc drive connected to your HP 110, the disc drive identifier is C. Type C: TEST **(Return)**.

Disc-based self-test, version 1.0:

f1: System test	Shift f1: Beeper test
f2: CPU test	Shift f2: Timer test
f3: ROM test	
f4: RAM test	
f5: LCD test	
f6: Keyboard test	
f7: HP-IL test	
f8: Modem test	Shift f8: Exit

Use function keys f1-f8, Shift f1, and Shift f2 to select test.
Use Shift f8 to exit.

You can run each test individually or press (f1) to run all of the tests.

NOTE: Do not press the contrast key ((O)) while testing the read/write disc. Doing so could cause any information stored on the read/write disc to be lost.

An error message or failure code on the display indicates a test did not pass and service is required. Record the error message or failure code on the service card (contained in the *Series 100 Support Guide*).

Testing the HP-IL Interface

To test the HP-IL, select HP-IL test ((f3) for the built-in test and (f7) for the disc-based test). With an HP-IL cable connected from the OUT port to the IN port, choose (f1) from the HP-IL test menu:

HP-IL test options:

f1: No devices on the loop.
f2: One or more devices on the loop.
f5: Exit

Use function keys f1-f2 to select option.
Use f5 to exit.

If a failure occurs (indicated by a Bad loop error message), rerun the test with another HP-IL cable. Otherwise, obtain service for your computer.

If the HP-IL test passes with no devices on the loop, connect your HP-IL loop with devices and rerun the HP-IL test using the second option, f2: One or more devices on the loop.

This test indicates if the loop path is working and how many devices appear on the loop. If this test fails, rerun the test with one device at a time until the device that is not working is found.

Appendix D

REFERENCE TABLES



The table below includes the HP character set and the Alternate set. The character set is changed by going to the System Configuration menu, moving to Console Font and selecting HP or Alt.

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
		0	0	0
0	0	1	1	1
1	0	2	2	2
2	0	3	3	3
3	0	4	4	4
4	0	5	5	5
5	0	6	6	6
		7	7	7
		8	10	8
		9	11	9
		10	12	A
Y	0	11	13	B
F	0	12	14	C
		13	15	D
S	0	14	16	E
2	0	15	17	F
0	0	16	20	10
0	0	17	21	11

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
0	0	18	22	12
0	0	19	23	13
0	0	20	24	14
0	0	21	25	15
0	0	22	26	16
0	0	23	27	17
0	0	24	30	18
0	0	25	31	19
0	0	26	32	1A
		27	33	1B
0	0	28	34	1C
0	0	29	35	1D
0	0	30	36	1E
0	0	31	37	1F
		32	40	20
!	!	33	41	21
"	"	34	42	22
#	#	35	43	23

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
\$	\$	36	44	24
%	%	37	45	25
&	&	38	46	26
'	'	39	47	27
(	(	40	50	28
)	)	41	51	29
*	*	42	52	2A
+	+	43	53	2B
,	,	44	54	2C
-	-	45	55	2D
.	.	46	56	2E
/	/	47	57	2F
0	0	48	60	30
1	1	49	61	31
2	2	50	62	32
3	3	51	63	33
4	4	52	64	34
5	5	53	65	35
6	6	54	66	36
7	7	55	67	37
8	8	56	70	38
9	9	57	71	39
:	:	58	72	3A
;	;	59	73	3B
<	<	60	74	3C
=	=	61	75	3D
>	>	62	76	3E
?	?	63	77	3F
@	@	64	100	40
A	A	65	101	41
B	B	66	102	42
C	C	67	103	43

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
D	D	68	104	44
E	E	69	105	45
F	F	70	106	46
G	G	71	107	47
H	H	72	110	48
I	I	73	111	49
J	J	74	112	4A
K	K	75	113	4B
L	L	76	114	4C
M	M	77	115	4D
N	N	78	116	4E
O	O	79	117	4F
P	P	80	120	50
Q	Q	81	121	51
R	R	82	122	52
S	S	83	123	53
T	T	84	124	54
U	U	85	125	55
V	V	86	126	56
W	W	87	127	57
X	X	88	130	58
Y	Y	89	131	59
Z	Z	90	132	5A
[	[	91	133	5B
\	\	92	134	5C
]	]	93	135	5D
^	^	94	136	5E
_	_	95	137	5F
`	`	96	140	60
a	a	97	141	61
b	b	98	142	62
c	c	99	143	63

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
d	d	100	144	64
e	e	101	145	65
f	f	102	146	66
g	g	103	147	67
h	h	104	150	68
i	i	105	151	69
j	j	106	152	6A
k	k	107	153	6B
l	l	108	154	6C
m	m	109	155	6D
n	n	110	156	6E
o	o	111	157	6F
p	p	112	160	70
q	q	113	161	71
r	r	114	162	72
s	s	115	163	73
t	t	116	164	74
u	u	117	165	75
v	v	118	166	76
w	w	119	167	77
x	x	120	170	78
y	y	121	171	79
z	z	122	172	7A
€	€	123	173	7B
l	l	124	174	7C
›	›	125	175	7D
~	~	126	176	7E
⌘	⌘	127	177	7F
	ç	128	200	80
	ü	129	201	81
	é	130	202	82

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
	à	131	203	83
	ä	132	204	84
	â	133	205	85
	á	134	206	86
	ç	135	207	87
	ê	136	210	88
	ë	137	211	89
	è	138	212	8A
	ì	139	213	8B
	í	140	214	8C
	î	141	215	8D
	â	142	216	8E
	ã	143	217	8F
	é	144	220	90
	ê	145	221	91
	ë	146	222	92
	ö	147	223	93
	ö	148	224	94
	ö	149	225	95
	ü	150	226	96
	ü	151	227	97
	ý	152	230	98
	ö	153	231	99
	ü	154	232	9A
	ê	155	233	9B
	£	156	234	9C
	¥	157	235	9D
	¥	158	236	9E
	ƒ	159	237	9F
	á	160	240	90
À	í	161	241	91

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
À	ó	162	242	A2
É	ú	163	243	A3
Ê	ñ	164	244	A4
Ë	ñ	165	245	A5
Ì	ò	166	246	A6
Í	ó	167	247	A7
Î	ú	168	250	A8
Ï	ñ	169	251	A9
Ê	ñ	170	252	AA
Ë	ñ	171	253	AB
Ì	ñ	172	254	AC
Ó	í	173	255	AD
Ô	«	174	256	AE
Õ	»	175	257	AF
Ö		176	260	B0
Û		177	261	B1
Ü		178	262	B2
Ý	í	179	263	B3
Þ	í	180	264	B4
ß	í	181	265	B5
À	í	182	266	B6
Á	ñ	183	267	B7
Â	í	184	270	B8
Ã	í	185	271	B9
Ä	í	186	272	BA
Å	í	187	273	BB
Æ	í	188	274	BC
Ç	í	189	275	BD
Ð	í	190	276	BE
Ñ	í	191	277	BF
Ò	í	192	300	C0

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
É		193	301	C1
Ê		194	302	C2
Ë		195	303	C3
Ì		196	304	C4
Í		197	305	C5
Î		198	306	C6
Ï		199	307	C7
Ê		200	310	C8
Ë		201	311	C9
Ì		202	312	CA
Ó		203	313	CB
Ô		204	314	CC
Õ		205	315	CD
Ö		206	316	CE
Û		207	317	CF
Ä		208	320	D0
Å		209	321	D1
Æ		210	322	D2
Ç		211	323	D3
Ð		212	324	D4
Ñ		213	325	D5
Ò		214	326	D6
Ó		215	327	D7
Ô		216	330	D8
Õ		217	331	D9
Ö		218	332	DA
Û		219	333	DB
Ä		220	334	DC
Å		221	335	DD
Æ		222	336	DE
Ç		223	337	DF

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
Á	α	224	340	E0
Â	β	225	341	E1
Ã	Γ	226	342	E2
Ä	π	227	343	E3
Å	Σ	228	344	E4
±	ο	229	345	E5
±	μ	230	346	E6
ó	τ	231	347	E7
ò	ϕ	232	350	E8
õ	θ	233	351	E9
ö	Ω	234	352	EA
ÿ	δ	235	353	EB
ÿ	ω	236	354	EC
Ù	φ	237	355	ED
Υ	Ε	238	356	EE
Υ	Π	239	357	EF

HP Char	Alt Char	Character Code		
		Dec	Oct	Hex
Þ	≡	240	360	F0
þ	±	241	361	F1
	≥	242	362	F2
	≤	243	363	F3
	ƒ	244	364	F4
	↓	245	365	F5
—	+	246	366	F6
¼	≈	247	367	F7
½	ο	248	370	F8
¾	•	249	371	F9
ø	▪	250	372	FA
«	√	251	373	FB
■	n	252	374	FC
»	z	253	375	FD
±	■	254	376	FE
		255	377	FF

Terminal Escape Sequences

The console driver has two modes of operation: HP and Alternate. Each mode has its own set of escape sequences. Table 2 below lists the HP Terminal Escape Sequences. Refer to Table 3, page D-8, for a list of Alternate Terminal Escape Sequences. All escape sequences are active at all times as they are not affected by the mode setting.

Table 2. HP Terminal Escape Sequences

Escape Sequence	Function
ESC A	Cursor up
ESC B	Cursor down
ESC C	Cursor right
ESC D	Cursor left
ESC F	Home down
ESC H	Home up
ESC I	Forward tab
ESC J	Clear to end of display
ESC K	Clear to end of line
ESC L	Insert line
ESC M	Delete line
ESC P	Delete character
ESC Q	Enter insert character mode
ESC R	Leave insert character mode
ESC S	Roll up
ESC T	Roll down
ESC U	Next page
ESC V	Previous page
ESC ^	Send terminal status
ESC '	Sense relative cursor position
ESC a	Sense absolute cursor position
ESC h	Home up
ESC i	Back tab
ESC &a col x row Y ¹	Relative addressing
ESC &a row y col X ¹	Relative addressing
ESC &a col X ¹	Relative addressing

Table 2. HP Terminal Escape Sequences (Continued)

Escape Sequence	Function
ESC &a row Y ¹	Relative addressing
ESC &a col c row R ²	Absolute addressing
ESC &a row r col C ²	Absolute addressing
ESC &a row R ²	Absolute addressing
ESC &a col C ²	Absolute addressing
ESC &j@	Turn off softkey menu
ESC &jB	Turn on application menu
ESC &s{0,1}P ³	Toggle caps mode
ESC &d{@,A,B,...O} ⁴	Display enhancements
ESC &f@a key k llen d slen L label string ⁵	Softkey setup
ESC *s^	Send terminal ID

¹ col is a decimal number between 0 and 79 specifying the screen column to which you wish to move the cursor.
row is a decimal number between 0 and 15 specifying the screen row to which you wish to move the cursor.
² col is a decimal number between 0 and 79 specifying the column coordinate (within the terminal buffer) of the character at which you want the cursor positioned.
row is a decimal number between 0 and 47 specifying the row coordinate (within the terminal buffer) of the character at which you want the cursor positioned.
³ {0,1} 0 disables caps mode; 1 enables caps mode.
⁴ {@,A,B...O} @ is the normal screen display; A indicates blinking display; B indicates inverse display; C indicates inverse and blinking. The letters beyond C repeat the four choices.
⁵ key is 1 through 8 for application softkeys.
llen, label length, indicates the number of characters in the label which is used for the menu entry.
slen, string length, indicates the number of characters in the definition string (32 max).
label is a string of characters of length llen.
string is a string of characters of length slen.

Table 2. HP Terminal Escape Sequences (Continued)

Escape Sequence	Function
ESC &k{0,1}\ ⁶	HP mode / Alt mode
ESC *dQ	Alpha cursor on
ESC *dR	Alpha cursor off
ESC &s{0,1}A ⁷	Transmit functions off/on
ESC d	Transmit entire current line of text

⁶ {0,1} 0 is HP mode; 1 is Alt mode.
⁷ {0,1} 0 turns transmit functions off; 1 turns transmit functions on.

Table 3. Alternate Terminal Escape Sequences

Escape Sequence	Function
ESC [line ; column H ¹	Cursor position
ESC [line ; column F ¹	Cursor position
ESC [# of lines A ²	Cursor up
ESC [# of lines B ²	Cursor down
ESC [# of columns C ³	Cursor right
ESC [# of columns D ³	Cursor left
ESC [6n	Request cursor position
ESC [s	Save cursor position
ESC [u	Restore cursor position
ESC [0J	Erase to end of screen
ESC [1J	Erase from beginning of screen
ESC [2J	Erase all of screen
ESC [0K	Erase to end of line

¹ line indicates the line number.
column indicates the column number.
² # of lines indicates the number of lines to move the cursor up or down.
³ # of columns indicates the number of columns to move the cursor backwards or forwards.

Table 3 Alternate Terminal Escape Sequences (Continued)

Escape Sequence	Function
ESC [1K	Erase from beginning of line
ESC [2K	Erase entire line
ESC [0m	All attributes off
ESC [5m	Blink on
ESC [7m	Inverse video on
ESC [10m	Download primary (default) font
ESC [11m	Download secondary (alternate) font
ESC [=10h	Graphics mode
ESC [=7h	Wrap at end of line
ESC [=8h	80 × 16 alpha mode
ESC [?71	No wrap at end of line
ESC [P	Delete character
ESC [M	Delete line
ESC [L	Insert line
ESC [I	Insert character



Console Modes

Tables 4 and 5 show the sequences that are returned by the various keys. Items in parentheses indicate that the operation is performed but not transmitted to the application. All keys not in this table return standard ASCII character codes. Refer to table 4 for the HP Keyboard Encoding and Table 5 for the Alternate Keyboard Encoding. The Console Mode is changed by going to the System Configuration menu, moving to Console Mode and selecting HP or Alt.

When transmit functions is off, the map is the same except that some keys operate locally and don't transmit. Those keys are:

- cursor keys
- clear line (extend F3)
- clear disp (extend F4)
- insert line (extend F5)
- delete line (extend F6)
- insert char (extend F7)
- delete char (extend F8)
- enter

Table 4. HP Keyboard Encoding Mode

Key	Normal	Control	Shift	Extend	Shift Control	Shift Extend	Extend Control	Extend Shift Control
f1	ESC p	ESC p	ESC p	(cursor)	ESC p	(beep)	(beep)	(beep)
f2	ESC q	ESC q	ESC q	(beep)	ESC q	(beep)	(beep)	(beep)
f3	ESC r	ESC r	ESC r	ESC K	ESC r	ESC K	ESC K	ESC K
f4	ESC s	ESC s	ESC s	ESC J	ESC s	ESC J	ESC J	ESC J
f5	ESC t	ESC t	ESC t	ESC L	ESC t	ESC L	ESC L	ESC L
f6	ESC u	ESC u	ESC u	ESC M	ESC u	ESC M	ESC M	ESC M
f7	ESC v	ESC v	ESC v	ESC Q	ESC v	ESC Q	ESC Q	ESC Q
f8	ESC w	ESC w	ESC w	ESC P	ESC w	ESC P	ESC P	ESC P
◀	ESC D	ESC D	ESC D	ESC h	ESC D	ESC h	ESC h	ESC h
▶	ESC C	ESC C	ESC C	ESC F	ESC C	ESC F	ESC F	ESC F
▲	ESC A	ESC A	ESC S	ESC V	ESC A	ESC V	ESC V	ESC V
▼	ESC B	ESC B	ESC T	ESC U	ESC B	ESC U	ESC U	ESC U
Select	ESC &P	ESC &P	ESC &P	ESC &P	ESC &P	ESC &P	ESC &P	ESC &P
Stop	^S/^Q	^C	^C	^S/^Q	(reset)	^S/^Q	^S/^Q	(reset)*
Enter	ESC d	(^P)	(prt scr)	ESC d	(prt scr)	(prt scr)	(^P)	(prt scr)
Menu	(Menu)	(Menu)	(Menu)	(Menu)	(Menu)	(Menu)	(Menu)	(Menu)
System	(beep)	(beep)	(beep)	(beep)	(beep)	(beep)	(beep)	(beep)
ESC	ESC	ESC	DEL	ESC	DEL	DEL	ESC	DEL
Tab	^I	^I	ESC i	^I	ESC i	ESC i	^I	ESC i
Return	^M	^M	^M	^M	^M	^M	^M	^M
space	space	space	space	space	space	space	space	space
Backsp	^H	^H	^H	^H	^H	^H	^H	^H

* Reboot with drive B: as the default drive.

Table 5. Alternate Keyboard Encoding Mode

Key	Normal	Control	Shift	Extend	Shift Control	Shift Extend	Extend Control	Extend Shift Control
f1	00 3B	00 5E	00 54	00 68	00 5E	00 68	00 68	00 68
f2	00 3C	00 5F	00 55	00 69	00 5F	00 69	00 69	00 69
f3	00 3D	00 60	00 56	00 75	00 60	00 6A	00 6A	00 6A
f4	00 3E	00 61	00 57	00 76	00 61	00 6B	00 6B	00 6B
f5	00 3F	00 62	00 58	—	00 62	00 6C	00 6C	00 6C
f6	00 40	00 63	00 59	—	00 63	00 6D	00 6D	00 6D
f7	00 41	00 64	00 5A	00 52	00 64	00 6E	00 6E	00 6E
f8	00 42	00 65	00 5B	00 53	00 65	00 6F	00 6F	00 6F
◀	00 4B	00 73	00 47	00 47	00 73	00 47	00 77	00 77
▶	00 4D	00 74	00 4F	00 4F	00 74	00 4F	00 75	00 75
▲	00 48	00 49	(scroll up)	00 49	00 49	00 49	00 84	00 84
▼	00 50	00 51	(scroll dn)	00 Q	00 51	00 Q	00 76	00 76
Select	—	(cursor)	—	—	—	—	—	—
Stop	^S/^Q	^C	^S/^Q	—	(Reset)	—	—	(Reset)*
Enter	—	^P	(Print Scr)	—	—	—	—	—
Menu	00 43	00 66	00 5C	00 70	00 66	00 70	00 70	00 70
System	00 44	00 67	00 5D	00 71	00 67	00 71	00 71	00 71
ESC	ESC	ESC	7F	ESC	ESC	ESC	ESC	ESC
Tab	^I	00 0F	00 0F	^I	00 0F	^I	^I	^I
Return	^M	^M	^M	^M	^M	^M	^M	^M
space	space	space	space	space	space	space	space	space
Backsp	^H	—	^H	^H	—	^H	^H	^H

* Reboot with drive B: as the default drive.

SUBJECT INDEX

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CHAPTER 1

INTRODUCTION

What Is MS-DOS?

What Is An Operating System?

Why Is MS-DOS So Important?

About This Manual

Syntax Notation

MS-DOS Files

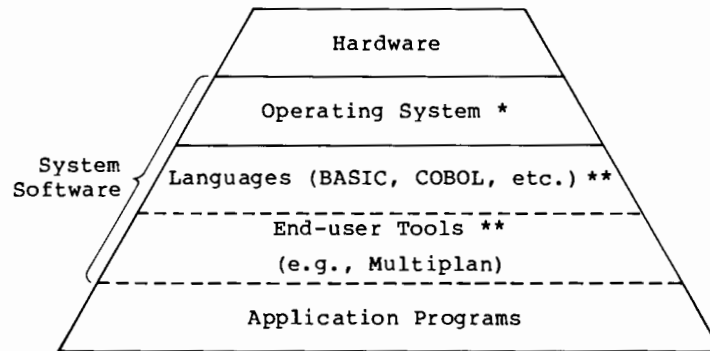
1.1 WHAT IS MS-DOS?

Microsoft(R) MS(tm)-DOS is a disk operating system for 8086/8088-based computers. Through MS-DOS, you communicate with the computer, disk drives, and printer, managing these resources to your advantage.

1.2 WHAT IS AN OPERATING SYSTEM?

An operating system is your "silent partner" when you are using the computer. It provides the interface between the hardware and both you (the user) and the other system software. An operating system can be compared to the electricity in a house--you need it for the toaster and the blender to work, but you are not always aware that it's there.

An operating system (OS) is the piece of system software most closely associated with the hardware. The OS is unique to the microprocessor (computer). For example, MS-DOS runs on the 8086/8088 microprocessor family and will not run on another microprocessor (like the Z8000) unless major parts of the OS are rewritten. Figure 1 illustrates how the hardware, the system software and the application software are related.



* Must adapt to new hardware

** If adapted to operating system, these don't change

Figure 1. Hardware/Software Relationships

MS-DOS is a disk operating system that enables you to create and keep track of files, run and link programs, and access peripheral devices (for example, printers and disk drives) that are attached to your computer. MS-DOS is an important advance in microprocessor operating systems.

1.3 WHY IS MS-DOS SO IMPORTANT?

All Microsoft languages (BASIC Interpreter, BASIC Compiler, FORTRAN, COBOL, Pascal) are available under MS-DOS. Users of MS-DOS are assured that their operating system will be the first that Microsoft will support when any new products or major releases are announced.

1.4 ABOUT THIS MANUAL

This manual describes MS-DOS and how to use it. This chapter introduces some basic MS-DOS concepts; Chapter 2 discusses how to start using MS-DOS and how to format and back up your disks.

Chapter 3 tells you about files--what they are and how to use them. Chapters 4 through 6 introduce MS-DOS commands.

If you want to know more, the MS-DOS Programmer's Reference Manual describes system architecture, how to install device drivers, and system calls and interrupts.

1.5 SYNTAX NOTATION

The following syntax notation is used throughout this manual in descriptions of command and statement syntax:

- [] Square brackets indicate that the enclosed entry is optional.
- < > Angle brackets indicate data you must enter. When the angle brackets enclose lower case text, you must type in an entry defined by the text; for example, <filename>. When the angle brackets enclose upper case text, you must press the key named by the text; for example, <RETURN>.
- { } Braces indicate that you have a choice between two or more entries. At least one of the entries enclosed in braces must be chosen unless the entries are also enclosed in square brackets.
- ... Ellipses indicate that an entry may be repeated as many times as needed or desired.
- | A bar indicates an OR statement in a command. When used with an MS-DOS filter, the bar indicates a pipe.
- CAPS Capital letters indicate portions of statements or commands that must be entered, exactly as shown.

All other punctuation, such as commas, colons, slash marks, and equal signs, must be entered exactly as shown.

1.6 MS-DOS FILES

File Name	Funciton of File
COMMAND.COM	MS-DOS command processor
* MSDOS.SYS	MS-DOS operating system
* IO.SYS	Hardware-operating system interface
CHKDSK.COM	Checks disks
FORMAT.COM	Formats disks
SYS.COM	Transfers system
DISKCOPY.COM	Backup utility
RECOVER.COM	Recovers disks
PRINT.COM	Print spooler
MORE.COM	Reviews text

SORT.EXE	Sorts text
FIND.EXE	Finds a string in a list of files or standard input
EXE2BIN.EXE	Converts .EXE files
CONFIG.SYS	System configuration file
RESTORE.EXE	Restores files
BACKUP.EXE	Backs up files

You will recognize this list of files when you have learned the DIR (Show Directory) command described in the next chapter. The two files preceded by an asterisk (*) are "hidden" files and will not appear when you enter a DIR command.

In the next chapter, you will learn how to start your MS-DOS system and how to format and back up your disks.



CHAPTER 2

GETTING STARTED

What Happens When You First Load MS-DOS?

How To Enter The Date And Time

How To Change The Default Drive

How To Format Your Disks

 The FORMAT Command

How To Back Up Your Disks

 The DISKCOPY Command

Automatic Program Execution

Files

 What Is A File?

 How MS-DOS Keeps Track Of Your Files

 The DIR (Show Directory) Command

 The CHKDSK (Check Disk) Command

How To Turn The System Off

2.1 WHAT HAPPENS WHEN YOU FIRST LOAD MS-DOS?

Follow your computer manufacturer's instructions to insert and load the MS-DOS disk into your system. Loading MS-DOS takes from 3 to 45 seconds, depending on the size of memory in your computer.

Once MS-DOS has been loaded, the system searches the MS-DOS disk for the COMMAND.COM file and loads it into memory. The COMMAND.COM file is a program that processes the commands you enter and then runs the appropriate programs. It is also called the command processor.

When the command processor is loaded, you will see the following display on your screen (the underscore represents the cursor):

```
MS-DOS Version 2.00
Copyright 1981, 1982 Microsoft Corp.

Command V. 2.02
Current date is Wed 1-02-1981
Enter new date: _
```

You must now enter today's date and time at your terminal.

2.2 HOW TO ENTER THE DATE AND TIME

Type today's date in an mm-dd-yy format, where:

mm is a one- or two-digit number from 1-12
(representing month)

dd is a one- or two-digit number from 1-31
(representing day of month)

yy is a two-digit number from 80-99 (the 19 is
assumed), or a four-digit number from
1980-2099 (representing year)

Any date is acceptable in answer to the new date prompt as long as it follows the above format. Separators between the numbers can be hyphens (-) or slashes (/). For example:

6-1-82 or 06/01/82

are both acceptable answers to the Enter new date: prompt.

If you enter an invalid date or form of date, the system will prompt you again with Enter new date:.

After you respond to the new date prompt and enter your

answer by pressing the <RETURN> key (or <ENTER> key on some terminals), you will see a prompt similar to this:

```
Current time is 8.30:14.32
Enter new time: _
```

Enter the current time in the hh:mm format, where:

```
hh      is a one- or two-digit number from 0-23
        (representing hours)

mm      is a one- or two-digit number from 0-59
        (representing minutes)
```

MS-DOS uses this time value to keep track of when you last updated and/or created files on the system. Notice that MS-DOS uses 24-hour time; for instance, 1:30 p.m. is written 13:30.

Example:

```
Current time is 0:00:14.32
Enter new time: 9:05
```

You should only use the colon (:) to separate hours and minutes. If you enter an invalid number separator, MS-DOS will repeat the prompt.

NOTE

If you make a mistake while typing, press the control key on your keyboard, hold it down, and then press the C key. This <CONTROL-C> function will abort your current entry. You can then re-answer the prompt or type another command. To correct a line before you press <RETURN>, use the <BACKSPACE> key to erase one letter at a time.

You have now completed the steps for starting MS-DOS.

2.3 HOW TO CHANGE THE DEFAULT DRIVE

After you have answered the new time prompt, a message is displayed that looks like this:

```
A>_
```

The A> is the MS-DOS prompt from the command processor. It tells you that MS-DOS is ready to accept commands. If you have inserted the MS-DOS disk into a drive other than A:, the command processor prompt will reflect that drive (for example, B>). However, usually you will load MS-DOS in drive A:.

The A in the previous prompt represents the default disk drive. This means that MS-DOS will search only the disk in drive A: for any filenames you may enter and will write files only to that disk unless you specify a different drive. You can ask MS-DOS to search the disk in drive B: by changing the drive designation or by specifying B: in a command. To change the disk drive designation, enter the new drive letter followed by a colon. For example:

```
A>      (MS-DOS prompt)
A>B:    (you have typed B: in response to
        the prompt)
B>      (system responds with B: and drive B:
        is now the default drive)
```

The system prompt B> will appear and MS-DOS will search only the disk in drive B: until you specify a different default drive.

2.4 HOW TO FORMAT YOUR DISKS

You must "format" all new disks before they can be used by MS-DOS.

A blank disk must be formatted with the MS-DOS FORMAT command. The FORMAT command changes the disk to a format that MS-DOS can use; it also analyzes the disk for defective tracks. If the disk is not already blank, formatting it will destroy any data that exists on the disk. Although this can be a convenient way to make a blank disk,

it is recommended that the MS-DOS DELETE command be used for this purpose. Refer to Chapter 5, "MS-DOS Commands," for more information on the DELETE command.

2.4.1 The FORMAT Command

The syntax of the FORMAT command is:

FORMAT d:



where:

d: is the drive designation (the drive that contains the disk to be formatted)

FORMAT B:

MS-DOS issues the following message:

Press any key to begin formatting (X:)

After you insert the new disk in drive B: and press any key on the keyboard, the system responds:

Formatting...

while MS-DOS is formatting your disk.

When the formatting is finished, MS-DOS will issue a message similar to this:

Formatting...Format complete

Volume label (11 characters. RETURN for none)?

Volume labels are useful to identify disks--they are like a

name tag for each disk. When you assign a unique volume label to a disk, you can always be sure that you know which disk you are using. The volume label you assign to a disk is displayed by issuing the MS-DOS VOL command (refer to Chapter 5, "MS-DOS Commands," for more information on the VOL command). Type a volume label in response to the above prompt if you want to identify this disk, and press <RETURN>. An example of a volume label is PROGRAMS. If you do not want to attach a label to this disk, simply press the <RETURN> key. You will see on your screen a message similar to this:

```
160256 bytes total disk space
12800 bytes used by system
143360 bytes available on disk
```

```
Format another (Y/N)?_
```

Type Y to format another disk. Type N to end the FORMAT program.

2.5 HOW TO BACK UP YOUR DISKS

It is strongly recommended that you make backup copies of all your disks. If a disk becomes damaged or if files are accidentally erased, you will still have all of the information on your backup disk. You should make a backup copy of your MS-DOS disk also. You can back up disks by using the MS-DOS DISKCOPY command. This command is described below.

2.5.1 The DISKCOPY Command

The DISKCOPY command copies the contents of a disk onto another disk. You can use this command to duplicate both the MS-DOS disk and a disk that contains your own files. DISKCOPY is the fastest way of copying a disk because it copies the entire disk in one operation, including MS-DOS system files if they exist.

The format of the DISKCOPY command is:

```
DISKCOPY [d:] [d:]
```

Drive1 is the disk drive that contains the disk that you want to copy; drive2 is the disk drive that contains the blank or "destination" disk. The blank disk must be formatted prior to running DISKCOPY.

For example, if you want to make a copy of your MS-DOS disk which is in drive A:, type

DISKCOPY A: B:

MS-DOS responds:

Insert source diskette into drive A:
Insert formatted target diskette into drive B:
Press any key when ready

Make sure the MS-DOS disk is in drive A: and insert a blank, formatted disk in drive B:. Press any character key after you have done this and MS-DOS will begin copying the MS-DOS disk. After MS-DOS has copied the disk, MS-DOS displays:

Copy complete
Copy another (Y/N)?

Type Y (for Yes) if you wish to copy another disk with DISKCOPY. If you type N (for No), the default drive prompt is displayed.

You now have a duplicate copy of your MS-DOS disk in drive B:. This duplicate copy can be saved as your backup copy of the MS-DOS disk.

Figure 2 illustrates the DISKCOPY command:

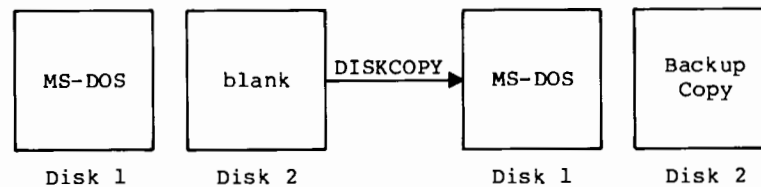


Figure 2. The DISKCOPY Command

Disks must be the same size and density to be copied with the DISKCOPY command. Refer to Chapter 5, "MS-DOS Commands," for more information on the DISKCOPY command.

NOTE

If either of the disks that you are using has defective tracks, DISKCOPY will not work. Use the COPY command to back up your disks in these cases. (COPY will skip over defective tracks.) Refer to Chapter 5, "MS-DOS Commands," for information on how to use COPY to back up your disks.

2.6 AUTOMATIC PROGRAM EXECUTION

If you want to run a specific program automatically each time you start MS-DOS, you can do so with Automatic Program Execution. For example, you may want to have MS-DOS display the names of your files each time you load MS-DOS.

When you start MS-DOS, the command processor searches for a file named AUTOEXEC.BAT on the MS-DOS disk. This file is a program that MS-DOS will run each time MS-DOS is started. Chapter 4, "Learning About Commands," tells you how to create an AUTOEXEC.BAT file.

2.7 FILES

2.7.1 What Is A File?

A file is a collection of related information. A file on your disk can be compared to a file folder in a desk drawer. For example, one file folder might contain the names and addresses of the employees who work in the office. You might name this file the Employee Master File. A file on your disk could also contain the names and addresses of employees in the office and could be named Employee Master File.

All programs, text, and data on your disk reside in files and each file has a unique name. You refer to files by their names. Chapter 3, "More About Files," tells you how to name your files.

You create a file each time you enter and save data or text at your terminal. Files are also created when you write and name programs and save them on your disks.

2.7.2 How MS-DOS Keeps Track Of Your Files

The names of files are kept in directories on a disk. These directories also contain information on the size of the files, their location on the disk, and the dates that they were created and updated. The directory you are working in is called your current or working directory.

An additional system area is called the File Allocation Table. It keeps track of the location of your files on the disk. It also allocates the free space on your disks so that you can create new files.

These two system areas, the directories and the File Allocation Table, enable MS-DOS to recognize and organize the files on your disks. The File Allocation Table is copied onto a new disk when you format it with the MS-DOS FORMAT command and one empty directory is created, called the root directory.

2.7.3 The DIR (Show Directory) Command

If you want to know what files are on your disk, you can use the DIR command. This command tells MS-DOS to display all the files in the current directory on the disk that is named. For example, if your MS-DOS disk is in drive A: and you want to see the listing for the current directory on that disk, type:

DIR A:

MS-DOS will respond with a directory listing of all the files in the current directory on your MS-DOS disk. The display should look similar to this:

Volume in drive A is DOS 2-0
Directory of A:\

COMMAND	COM	16276	10-29-81	11:48a
DEBUG	COM	11534	10-28-82	9:21a
CHKDSK	COM	6272	10-26-82	12:12p
SYS	COM	1400	10-29-82	6:30p
EDLIN	COM	4419	1-01-80	12:41a
RECOVER	COM	2281	10-29-82	5:37p
PRINT	COM	3899	10-27-82	12:19p
LINK	EXE	41856	8-31-82	1:14p
FORMAT	COM	5605	10-28-82	9:55a
EXEFIX	COM	1350	10-06-82	2:57p
SORT	EXE	1280	10-27-82	3:18p
MORE	COM	291	10-27-82	3:20p
FIND	EXE	5888	01-01-80	12:57a
CONFIG	SYS	33	10-18-82	5:02p
LOCATE	EXE	5888	10-27-82	12:53p
FC	EXE	10624	10-27-82	7:00p
LOGIN	COM	299	10-18-82	6:30p

20 File(s) 23040 bytes free

NOTE

Two MS-DOS system files, IO.SYS and MSDOS.SYS, are "hidden" files and will not appear when you issue the DIR command.

You can also get information about any file on your disk by typing DIR and a filename. For example, if you have created a file named MYFILE.TXT, the command:

DIR MYFILE.TXT

will give you a display of all the directory information (name of file, size of file, date last edited) for the file MYFILE.TXT.

For more information on the DIR command, refer to Chapter 5, "MS-DOS Commands."

2.7.4 The CHKDSK (Check Disk) Command

The MS-DOS command CHKDSK is used to check your disks for consistency and errors, much like a secretary proofreading a letter. CHKDSK analyzes the directories and the File Allocation Table on the disk that you specify. It then produces a status report of any inconsistencies, such as files which have a non-zero size in their directory but really have no data in them.

To check the disk in drive A:, type:

```
CHKDSK A:
```

MS-DOS will display a status report and any errors that it has found. An example of this display and more information on CHKDSK can be found in the description of the CHKDSK command in Chapter 5. You should run CHKDSK occasionally for each disk to ensure the integrity of your files.



Summary of Commands in This Chapter

COMMAND	PURPOSE	SYNTAX
FORMAT	Formats disks for MS-DOS	FORMAT [d:]
DISKCOPY	Copies disks	DISKCOPY [drive1:][drive2:]
DIR	Lists directory information	DIR [d:][filename]
CHKDSK	Checks for errors on disk	CHKDSK [d:]

In the next chapter, you will learn more about MS-DOS files.

CHAPTER 3

MORE ABOUT FILES

How To Name Your Files

Wild Cards

 The ? Wild Card

 The * Wild Card

Illegal Filenames

How To Copy Your Files

How To Protect Your Files

Directories

Filenames And Paths

 Pathnames

 Pathing And External Commands

 Pathing And Internal Commands

 Displaying Your Working Directory

 Creating A Directory

 How To Change Your Working Directory

 How To Remove A Directory

In Chapter 2, you learned that directories contain the names of your files. In this chapter, you will learn how to name and copy your files. You will also learn more about the MS-DOS hierarchical directory structure, which makes it easy for you to organize and locate your files.

3.1 HOW TO NAME YOUR FILES

The name of a typical MS-DOS file will look like this:

NEWFILE.EXE

The name of a file consists of two parts. The filename is NEWFILE and the filename extension is .EXE.

A filename can be from 1 to 8 characters long. The filename extension can be three or fewer characters. You can type any filename in small or capital letters and MS-DOS will translate these letters into uppercase characters.

In addition to the filename and the filename extension, the name of your file may include a drive designation. A drive designation tells MS-DOS to look on the disk in the designated drive to find the filename typed. For example, to find directory information about the file NEWFILE.EXE which is located on the disk in drive A: (and drive A: is NOT the default drive), type the following command:

DIR A:NEWFILE.EXE

Directory information about the file NEWFILE.EXE is now displayed on your screen.

If drive A: is the default drive, MS-DOS will search only the disk in drive A: for the filename NEWFILE and so the drive designation is not necessary. A drive designation is needed if you want to tell MS-DOS to look on the other drive to find a file.

Your filenames will probably be made up of letters and numbers, but other characters are allowed, too. Legal characters for filename extensions are the same as those for filenames. Here is a complete list of the characters you can use in filenames and extensions:

A-Z 0-9 \$ & #
% ' () - @
^ { } ~ ` !

All of the parts of a filename comprise a file specification. The term file specification (or filespec) will be used in this manual to indicate the following filename format:

[<drive designation:>]<filename>[<.filename extension>]

Remember that brackets indicate optional items. Angle brackets (<>) mean that you supply the text for the item. Note that the drive designation is not required unless you need to indicate to MS-DOS on which disk to search for a specific file. You do not have to give your filename a filename extension.

Examples of file specifications are:

```
B:MYPROG.COB
A:YOURPROG.EXT
A:NEWFILE.
TEXT
```

3.2 WILD CARDS

Two special characters (called wild cards) can be used in filenames and extensions: the asterisk (*) and the question mark (?). These special characters give you greater flexibility when using filenames in MS-DOS commands.

3.2.1 The ? Wild Card

A question mark (?) in a filename or filename extension indicates that any character can occupy that position. For example, the MS-DOS command:

```
DIR TEST?RUN.EXE
```

will list all directory entries on the default drive that have 8 characters, begin with TEST, have any next character, end with the letters RUN, and have a filename extension of .EXE. Here are some examples of files that might be listed by the above DIR command:

```
TEST1RUN.EXE
TEST2RUN.EXE
TEST6RUN.EXE
```

3.2.2 The * Wild Card

An asterisk (*) in a filename or filename extension indicates that any character can occupy that position or any of the remaining positions in the filename or extension. For example:

```
DIR TEST*.EXE
```

will list all directory entries on the default drive with filenames that begin with the characters TEST and have an extension of .EXE. Here are some examples of files that might be listed by the above DIR command:

```
TEST1RUN.EXE
TEST2RUN.EXE
TEST6RUN.EXE
TESTALL.EXE
```

The wild card designation *.* refers to all files on the disk. Note that this can be very powerful and destructive when used in MS-DOS commands. For example, the command DEL *.* deletes all files on the default drive, regardless of filename or extension.

Examples:

To list the directory entries for all files named NEWFILE on drive A: (regardless of their filename extensions), simply type:

```
DIR A:NEWFILE.*
```

To list the directory entries for all files with filename extensions of .TXT (regardless of their filenames) on the disk in drive B:, type:

```
DIR B:????????.TXT
```

This command is useful if, for example, you have given all your text programs a filename extension of .TXT. By using the DIR command with the wild card characters, you can obtain a listing of all your text files even if you do not remember all of their filenames.

3.3 ILLEGAL FILENAMES

MS-DOS treats some device names specially, and certain 3-letter names are reserved for the names of these devices. These 3-letter names cannot be used as filenames. They can be used as extensions. You must not name your files any of the following:

AUX	Used when referring to input from or output to an auxiliary device (such as a printer or disk drive).
CON	Used when referring to keyboard input or to output to the terminal console (screen).
PRN	Used when referring to the printer device.
NUL	Used when you do not want to create a particular file, but the command requires an input or output filename.

Even if you add device designations or filename extensions to these filenames, they remain associated with the devices listed above. For example, A:CON.XXX still refers to the console and is not the name of a disk file.



3.4 HOW TO COPY YOUR FILES

Just as with paper files, you often need more than one copy of a disk file. The COPY command allows you to copy one or more files to another disk. You can also give the copy a different name if you specify the new name in the COPY command.

The COPY command can also make copies of files on the same disk. In this case, you must supply MS-DOS with a different filename or you will overwrite the file. You cannot make a copy of a file on the same disk unless you specify a different filename for the new copy.

The format of the COPY command is:

COPY filespec [filespec]

For example:

COPY A:MYFILE.TXT B:MYFILE.TXT

will copy the file MYFILE.TXT on the disk in drive A: to a file named MYFILE.TXT on the disk in drive B:. A duplicate copy of MYFILE.TXT now exists.

Figure 3 illustrates how to copy files to another disk:

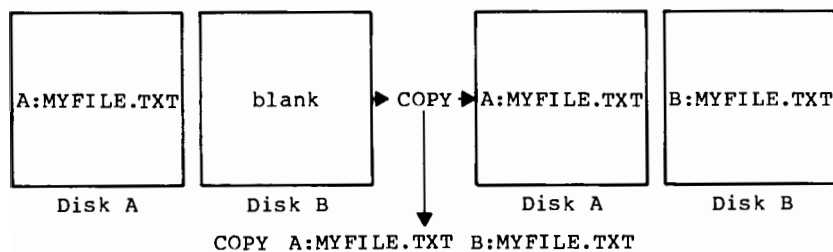


Figure 3. Copying Files to Another Disk

If you want to duplicate the file named MYFILE.TXT on the same disk, type:

```
COPY A:MYFILE.TXT A:NEWNAME.TXT
```

You now have two copies of your file on disk A--one named MYFILE.TXT and the other named NEWNAME.TXT. The following figure illustrates this example:

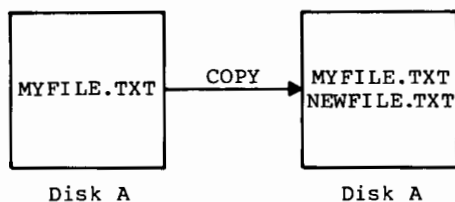


Figure 4. Copying Files on the Same Disk

You can also copy all files on a disk to another disk (i.e., make a backup copy) with the COPY command. Refer to Chapter 5, "MS-DOS Commands," for more information on this process.

3.5 HOW TO PROTECT YOUR FILES

MS-DOS is a powerful and useful tool in processing your personal and business information. As with any information system, inadvertent errors may occur and information may be misused. If you are processing information that cannot be replaced or requires a high level of security, you should take steps to ensure that your data and programs are protected from accidental or unauthorized use, modification, or destruction. Simple measures you can take--such as removing your disks when they are not in use, keeping backup copies of valuable information, and installing your equipment in a secure facility--can help you maintain the integrity of the information in your files.

3.6 DIRECTORIES

As you learned in Chapter 2, the names of your files are kept in a directory on each disk. The directory also contains information on the size of the files, their locations on the disk, and the dates that they were created and updated.

When there are multiple users on your computer, or when you are working on several different projects, the number of files in the directory can become large and unwieldy. You may want your own files kept separate from a co-worker's; or, you may want to organize your programs into categories that are convenient for you.

In an office, you can separate files by putting them in different filing cabinets; in effect, creating different directories of information. MS-DOS allows you to organize the files on your disks into directories. Directories are a way of dividing your files into convenient groups of files. For example, you may want all of your accounting programs in one directory and text files in another. Any one directory can contain any reasonable number of files, and it may also contain other directories (referred to as subdirectories). This method of organizing your files is called a hierarchical directory structure.

A hierarchical directory structure can be thought of as a "tree" structure: directories are branches of the tree and files are the leaves, except that the "tree" grows downward; that is, the "root" is at the top. The root is the first level in the directory structure. It is the directory that

is automatically created when you format a disk and start putting files in it. You can create additional directories and subdirectories by following the instructions in Chapter 4, "Learning About Commands."

The tree or file structure grows as you create new directories for groups of files or for other people on the system. Within each new directory, files can be added, or new subdirectories can be created.

It is possible for you to "travel" around this tree; for instance, it is possible to find any file in the system by starting at the root and traveling down any of the branches to the desired file. Conversely, you can start where you are within the file system and travel towards the root.

The filenames discussed earlier in this chapter are relative to your current directory and do not apply system-wide. Thus, when you turn on your computer, you are "in" your directory. Unless you take special action when you create a file, the new file is created in the directory in which you are now working. Users can have files of the same name that are unrelated because each is in a different directory.

Figure 5 illustrates a typical hierarchical directory structure:

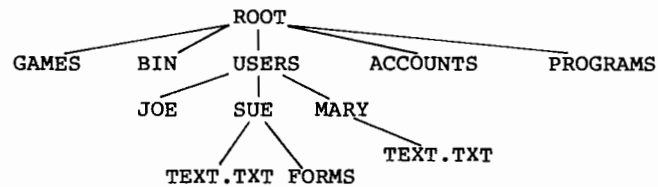


Figure 5. A Sample Hierarchical Directory Structure

The ROOT directory is the first level in the directory structure. You can create subdirectories from the ROOT by using the MKDIR command (refer to Chapter 5, "MS-DOS Commands," for information on MKDIR). In this example, five subdirectories of ROOT have been created. These include:

1. A directory of games, named GAMES
2. A directory of all external commands, named BIN (refer to Chapter 4, "Learning About Commands," for more information on the IN directory)
3. A USER directory containing separate subdirectories for all users of the system
4. A directory containing accounting information, named ACCOUNTS
5. A directory of programs, named PROGRAMS

Joe, Sue, and Mary each have their own directories which are subdirectories of the USER directory. Sue has a subdirectory under the \USER\SUE directory named FORMS. Sue and Mary have files in their directories, each named TEXT.TXT. Notice that Mary's text file is unrelated to Sue's.

This organization of files and directories is not important if you only work with files in your own directory; but if you work with someone else or on several projects at one time, the hierarchical directory structure becomes extremely useful. For example, you could get a list of the files in Sue's FORMS directory by typing:

```
DIR \USER\SUE\FORMS
```

Note that the backward slash mark (\) is used to separate directories from other directories and files.

To find out what files Mary has in her directory, you could type:

```
DIR \USER\MARY
```

3.7 FILENAMES AND PATHS

When you use hierarchical directories, you must tell MS-DOS where the files are located in the directory structure. Both Mary and Sue, for example, have files named TEXT.TXT. Each will have to tell MS-DOS in which directory her file resides if she wants to access it. This is done by giving MS-DOS a pathname to the file.

3.7.1 Pathnames

A simple filename is a sequence of characters that can optionally be preceded by a drive designation and followed by an extension. A pathname is a sequence of directory names followed by a simple filename, each separated from the previous one by a backward slash (\).

The syntax of pathnames is:

```
[<d>:][<directory>]\[<directory...>]\[<filename>]
```

If a pathname begins with a slash, MS-DOS searches for the file beginning at the root (or top) of the tree. Otherwise, MS-DOS begins at the user's current directory, known as the working directory, and searches downward from there. The pathname of Sue's TEXT.TXT file is \USER\SUE\TEXT.TXT.

When you are in your working directory, a filename and its corresponding pathname may be used interchangeably. Some sample names are:

\	Indicates the root directory.
\PROGRAMS	Sample directory under the root directory containing program files.
\USER\MARY\FORMS\1A	A typical full pathname. This one happens to be a file named 1A in the directory named FORMS belonging to the USER named MARY.

USER\SUE A relative pathname; it names the file or directory SUE in subdirectory USER of the working directory. If the working directory is the root directory (\), it names \USER\SUE.

TEXT.TXT Name of a file or directory in the working directory.

MS-DOS provides special shorthand notations for the working directory and the parent directory (one level up) of the working directory:

- . MS-DOS uses this shorthand notation to indicate the name of the working directory in all hierarchical directory listings. MS-DOS automatically creates this entry when a directory is made.
- .. The shorthand name of the working directory's parent directory. If you type:

DIR ..

then MS-DOS will list the files in the parent directory of your working directory.

If you type:

DIR ..\..

then MS-DOS will list the files in the parent's PARENT directory.



3.7.2 Pathing And External Commands

External commands reside on disks as program files. They must be read from the disk before they execute. (For more information on external commands, refer to Chapter 4, "Learning About Commands.")

When you are working with more than one directory, it is convenient to put all MS-DOS external commands into a separate directory so they do not clutter your other directories. When you issue an external command to MS-DOS, MS-DOS immediately checks your working directory to find that command. You must tell MS-DOS in which directory these external commands reside. This is done with the PATH command.

For example, if you are in a working directory named

\BIN\PROG, and all MS-DOS external commands are in \BIN, you must tell MS-DOS to choose the \BIN path to find the FORMAT command. The command:

```
PATH \BIN
```

tells MS-DOS to search in your working directory and the \BIN directory for all commands. You only have to specify this path once to MS-DOS during your terminal session. MS-DOS will now search in \BIN for the external commands. If you want to know what the current path is, type the word PATH and the current value of PATH will be printed.

For more information on the MS-DOS command PATH, refer to Chapter 5, "MS-DOS Commands."

3.7.3 Pathing And Internal Commands

Internal commands are the simplest, most commonly used commands. They execute immediately because they are incorporated into the command processor. (For more information on internal commands, refer to Chapter 4, "Learning About Commands.")

Some internal commands can use paths. The four commands, COPY, DIR, DEL, and TYPE have greater flexibility when you specify a pathname after the command.

The syntax of these four commands is shown below:

COPY <pathname pathname>

If the second pathname to COPY is a directory, all files are copied into that directory.

DEL <pathname>

If the pathname is a directory, all the files in that directory are deleted. Note: The prompt "Are you sure (Y/N)?" will be displayed if you try to delete a path. Type Y to complete the command, or type N for the command to abort.

DIR <pathname>

Displays the directory for a specific path.

TYPE <pathname>

You must specify a file in a path for this command. MS-DOS will display the file on your screen in response to the TYPE pathname command.

3.7.4 Displaying Your Working Directory

All commands are executed while you are in your working directory. You can find out the name of the directory you are in by issuing the MS-DOS command CHDIR (Change Directory) with no options. For example, if your current directory is \USER\JOE, when you type:

```
CHDIR<RETURN>
```

you will see:

```
A:\USER\JOE
```

This is your current drive designation plus the working directory (\USER\JOE).

If you now want to see what is in the \USER\JOE directory, you can issue the MS-DOS command DIR. The following is an example of the display you might receive from the DIR command for a subdirectory:

```
Volume in drive A has no ID
Directory of A:\USER\JOE

.                <DIR>            8-09-82    10:09a
..               <DIR>            8-09-82    10:09a
TEXT             <DIR>            8-09-82    10:09a
FILE1  COM       5243             8-04-82    9:30a
4 File(s)      8376320 bytes free
```

A volume ID for this disk was not assigned when the disk was formatted. Note that MS-DOS lists both files and directories in this output. As you can see, Joe has another directory in this tree structure named TEXT. The '.' indicates the working directory \USER\JOE, and the '..' is the shorthand notation for the parent directory \USER. FILE1.COM is a file in the \USER\JOE directory. All of these directories and files reside on the disk in drive A:.

Because files and directories are listed together (see previous display), MS-DOS does not allow you to give a subdirectory the same name as a file in that directory. For example, if you have a path \BIN\USER\JOE where JOE is a subdirectory, you cannot create a file in the USER directory named JOE.

3.7.5 Creating A Directory

To create a subdirectory in your working directory, use the MKDIR (Make Directory) command. For example, to create a new directory named NEWDIR under your working directory, simply type:

MKDIR NEWDIR

After this command has been executed by MS-DOS, a new directory will exist in your tree structure under your working directory. You can also make directories anywhere in the tree structure by specifying MKDIR and then a pathname. MS-DOS will automatically create the . and .. entries in the new directory.

3.7.6 How To Change Your Working Directory

Changing from your working directory to another directory is very easy in MS-DOS. Simply issue the CHDIR (Change Directory) command and supply a pathname. For example:

```
A>CHDIR \USER
```

changes the working directory from \USER\JOE to \USER. You can specify any pathname after the command to "travel" to different branches and leaves of the directory tree. The command "CHDIR .." will always put you in the parent directory of your working directory.

3.7.7 How To Remove A Directory

To delete a directory in the tree structure, use the MS-DOS RMDIR (Remove Directory) command. For example, to remove the directory NEWDIR from the working directory, type:

```
RMDIR NEWDIR
```

Note that the directory NEWDIR must be empty except for the . and .. entries before it can be removed; this will prevent you from accidentally deleting files and directories. You can remove any directory by specifying its pathname. To remove the \BIN\USER\JOE directory, make sure that it has only the . and .. entries, then type:

```
RMDIR \BIN\USER\JOE
```

To remove all the files in a directory (except for the . and .. entries), type DEL and then the pathname of the directory. For example, to delete all files in the \BIN\USER\SUE directory, type:

```
DEL \BIN\USER\SUE
```

You cannot delete the . and .. entries. They are created by MS-DOS as part of the hierarchical directory structure.

Summary of Commands in This Chapter

COMMAND	PURPOSE	SYNTAX
COPY	Copies files	COPY <filespec> [<filespec>]
PATH	Sets MS-DOS search path	PATH [pathname]
CHDIR	Displays working directory; changes directories	CHDIR [pathname]
MKDIR	Makes a new directory	MKDIR [pathname]
RMDIR	Removes a directory	RMDIR [pathname]

In the next chapter, you will learn about MS-DOS commands.

CHAPTER 4

LEARNING ABOUT COMMANDS

Introduction

Types Of MS-DOS Commands

Command Options

Information Common To All MS-DOS Commands

Batch Processing

The AUTOEXEC.BAT File

How to Create An AUTOEXEC.BAT File

Creating A .BAT File With Replaceable Parameters

Executing A .BAT File

Input And Output

Redirecting Your Output

Filters

Command Piping

4.1 INTRODUCTION

Commands are a way of communicating with the computer. By entering MS-DOS commands at your terminal, you can ask the system to perform useful tasks. There are MS-DOS commands that:

Compare, copy, display, delete, and rename files.

Copy and format disks.

Execute system programs such as EDLIN, as well as your own programs.

Analyze and list directories.

Enter date, time, and remarks.

Set various printer and screen options.

Copy MS-DOS system files to another disk.

Request MS-DOS to wait for a specific period of time.

4.2 TYPES OF MS-DOS COMMANDS

There are two types of MS-DOS commands:

Internal commands

External commands

Internal commands are the simplest, most commonly used commands. You cannot see these commands when you do a directory listing on your MS-DOS disk; they are part of the command processor. When you type these commands, they execute immediately. The following internal commands are described in Chapter 5:

BREAK	DEL (ERASE)	MKDIR (MD)	SET
CHDIR (CD)	DIR	PATH	SHIFT
CLS	ECHO	PAUSE	TIME
COPY	EXIT	PROMPT	TYPE
CTTY	FOR	REM	VER
DATE	GOTO	REN (RENAME)	VERIFY
	IF	RMDIR (RD)	VOL

External commands reside on disks as program files. They must be read from disk before they can execute. If the disk containing the command is not in the drive, MS-DOS will not be able to find and execute the command.

Any filename with a filename extension of .COM, .EXE or .BAT is considered an external command. For example, programs such as FORMAT.COM and COMP.COM are external commands. Because all external commands reside on disk, you can create commands and add them to the system. Programs that you create with most languages (including assembly language) will be .EXE (executable) files.

When you enter an external command, do not include its filename extension. The following external commands are described in Chapter 5:

BACKUP	MORE
CHKDSK	PRINT
DISKCOPY	RECOVER
FIND	RESTORE
FORMAT	SORT
EXE2BIN	SYS



4.3 COMMAND OPTIONS

Options can be included in your MS-DOS commands to specify additional information to the system. If you do not include some options, MS-DOS provides a default value. Refer to individual command descriptions in Chapter 5 for the default values.

The following is the format of all MS-DOS commands:

Command [options...]

where [options...] represents the following:

d:	Refers to disk drive designation.
filename	Refers to any valid name for a disk file, including an optional filename extension. The filename option does <u>not</u> refer to a device or to a disk drive designation.
.ext	Refers to an optional filename extension consisting of a period and 1-3 characters. When used, filename extensions immediately follow filenames.

filespec	Refers to an optional drive designation, a filename, and an optional three letter filename extension in the following format: [<d:>]<filename>[<.ext>]
pathname	Refers to a pathname or filename in the following format: [<directory>]\[<directory...>]\[<filename>]
switches	Switches are options that control MS-DOS commands. They are preceded by a forward slash (for example, /P).
arguments	Provide more information to MS-DOS commands. You usually choose between arguments; for example, ON or OFF.

4.4 INFORMATION COMMON TO ALL MS-DOS COMMANDS

The following information applies to all MS-DOS commands:

1. Commands are usually followed by one or more options.
2. Commands and options may be entered in uppercase or lowercase, or a combination of keys.
3. Commands and options must be separated by delimiters. Because they are easiest, you will usually use the space and comma as index delimiters. For example:

```
DEL MYFILE.OLD NEWFILE.TXT  
RENAME,THISFILE THATFILE
```

You can also use the semicolon (;), the equal sign (=), or the tab key as delimiters in MS-DOS commands.

In this manual, we will use a space as the delimiter in commands.

4. Do not separate a file specification with delimiters, since the colon and the period already serve as delimiters.
5. When instructions say "Press any key," you can press any alpha (A-Z) or numeric (0-9) key.
6. You must include the filename extension when referring to a file that already has a filename extension.

7. You can abort commands when they are running by pressing <CONTROL-C>.
8. Commands take effect only after you have pressed the <RETURN> key.
9. Wild cards (global filename characters) and device names (for example, PRN or CON) are not allowed in the names of any commands.
10. When commands produce a large amount of output on the screen, the display will automatically scroll to the next screen. You can press <CONTROL-S> to suspend the display. Press any key to resume the display.
11. MS-DOS editing and function keys can be used when entering commands. Refer to Chapter 6, "MS-DOS Editing and Function Keys," for a complete description of these keys.
12. The prompt from the command processor is the default drive designation plus a greater-than sign; for example, A>.
13. Disk drives will be referred to as source drives and destination drives. A source drive is the drive you will be transferring information from. A destination drive is the drive you will be transferring information to.

4.5 BATCH PROCESSING

Often you may find yourself typing the same sequence of commands over and over to perform some commonly used task. With MS-DOS, you can put the command sequence into a special file called a batch file, and execute the entire sequence simply by typing the name of the batch file. "Batches" of your commands in such files are processed as if they were typed at a terminal. Each batch file must be named with the .BAT extension, and is executed by typing the filename without its extension.

You can create a batch file by using the Line Editor (EDLIN) or by typing the COPY command. Refer to the "How to Create an AUTOEXEC.BAT File" section later in this chapter for more information on using the COPY command to create a batch file.

Two MS-DOS commands are available for use expressly in batch files: REM and PAUSE. REM permits you to include remarks and comments in your batch files without these remarks being executed as commands. PAUSE prompts you with an optional message and permits you to either continue or abort the batch process at a given point. REM and PAUSE are described in detail in Chapter 5.

Batch processing is useful if you want to execute several MS-DOS commands with one batch command, such as when you format and check a new disk. For example, a batch file for this purpose might look like this:

```
1: REM This is a file to check new disks
2: REM It is named NEWDISK.BAT
3: PAUSE Insert new disk in drive B:
4: FORMAT B:
5: DIR B:
6: CHKDSK B:
```

To execute this .BAT file, simply type the filename without the .BAT extension:

```
NEWDISK
```

The result is the same as if each of the lines in the .BAT file was entered at the terminal as individual commands.

Figure 6 illustrates the three steps used to write, save, and execute an MS-DOS batch file:

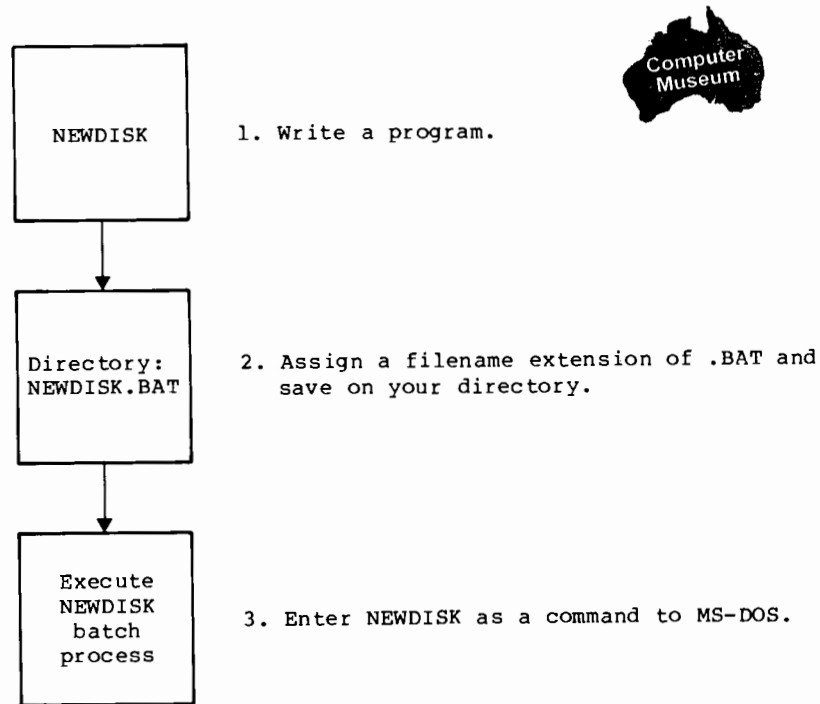


Figure 6. MS-DOS Batch File Steps

The following list contains information that you should read before you execute a batch process with MS-DOS:

1. Do not enter the filename BATCH (unless the name of the file you want to execute is BATCH.BAT).
2. Only the filename should be entered to execute the batch file. Do not enter the filename extension.
3. The commands in the file named <filename>.BAT are executed.
4. If you press <CONTROL-C> while in batch mode, this prompt appears:

Terminate batch job (Y/N)?

If you press Y, the remainder of the commands in the batch file are ignored and the system prompt appears.

If you press N, only the current command ends and batch processing continues with the next command in the file.

5. If you remove the disk containing a batch file being executed, MS-DOS prompts you to insert it again before the next command can be read.
6. The last command in a batch file may be the name of another batch file. This allows you to call one batch file from another when the first is finished.

4.6 THE AUTOEXEC.BAT FILE

As discussed in Chapter 2, an AUTOEXEC.BAT file allows you to automatically execute programs when you start MS-DOS. Automatic Program Execution is useful when you want to run a specific package (for example, Microsoft Multiplan(tm)) under MS-DOS, and when you want MS-DOS to execute a batch program automatically each time you start the system. You can avoid loading two separate disks to perform either of these tasks by using an AUTOEXEC.BAT file:

When you start MS-DOS, the command processor searches the MS-DOS disk for a file named AUTOEXEC.BAT. The AUTOEXEC.BAT file is a batch file that is automatically executed each time you start the system.

If MS-DOS finds the AUTOEXEC.BAT file, the file is immediately executed by the command processor and the date and time prompts are bypassed.

If MS-DOS does not find an AUTOEXEC.BAT file when you first

load the MS-DOS disk, then the date and time prompts will be issued. Figure 7 illustrates how MS-DOS uses the AUTOEXEC.BAT file:

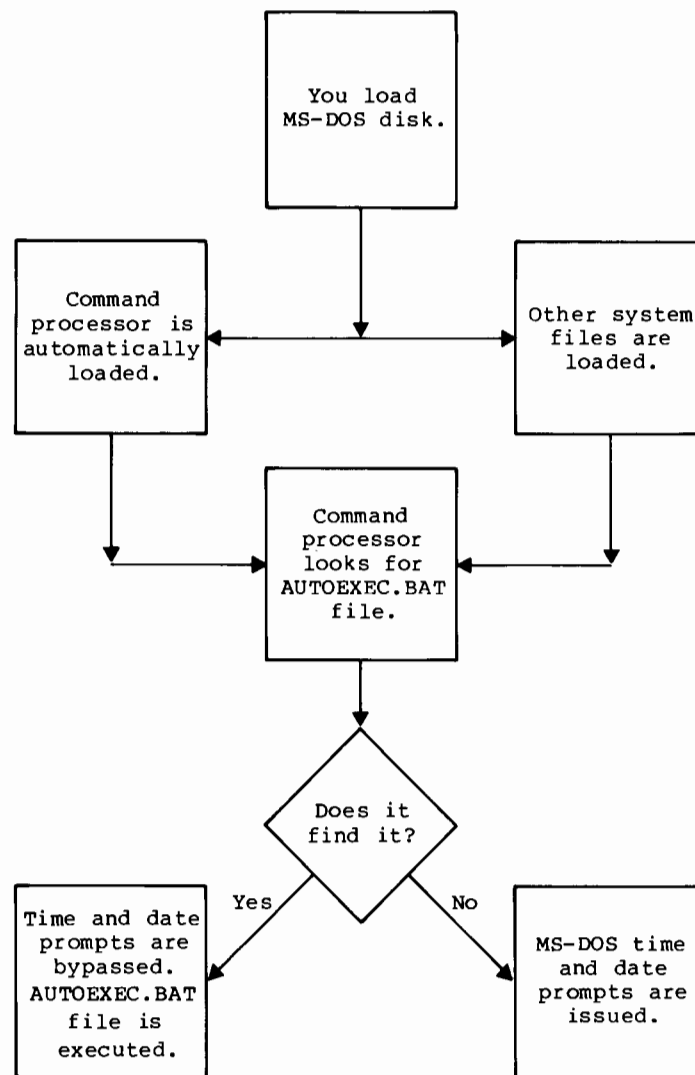


Figure 7. How MS-DOS Uses the AUTOEXEC.BAT File

4.6.1 How To Create An AUTOEXEC.BAT File

If, for example, you wanted to automatically load BASIC and run a program called MENU each time you started MS-DOS, you could create an AUTOEXEC.BAT file as follows:

1. Type:

```
COPY CON AUTOEXEC.BAT
```

This statement tells MS-DOS to copy the information from the console (keyboard) into the AUTOEXEC.BAT file. Note that the AUTOEXEC.BAT file must be created in the root directory of your MS-DOS disk.

2. Now type:

```
BASIC MENU
```

This statement goes into the AUTOEXEC.BAT file. It tells MS-DOS to load BASIC and run the MENU program whenever MS-DOS is started.

3. Press <CONTROL-Z>; then press the <RETURN> key to put the command BASIC MENU in the AUTOEXEC.BAT file.
4. The MENU program will now run automatically whenever you start MS-DOS.

To run your own BASIC program, enter the name of your program in place of MENU in the second line of the example. You can enter any MS-DOS command or series of commands in the AUTOEXEC.BAT file.

NOTE

Remember that if you use an AUTOEXEC.BAT file, MS-DOS will not prompt you for a current date and time unless you include the DATE and TIME commands in the AUTOEXEC.BAT file. It is strongly recommended that you include these two commands in your AUTOEXEC.BAT file, since MS-DOS uses this information to keep your directory current.



4.7 CREATING A .BAT FILE WITH REPLACEABLE PARAMETERS

There may be times when you want to create an application program and run it with different sets of data. These data may be stored in various MS-DOS files.

When used in MS-DOS commands, a parameter is an option that you define. With MS-DOS, you can create a batch (.BAT) file with dummy (replaceable) parameters. These parameters, named %0-%9, can be replaced by values supplied when the batch file executes.

For example, when you type the command line COPY CON MYFILE.BAT, the next lines you type are copied from the console to a file named MYFILE.BAT on the default drive:

```
A>COPY CON MYFILE.BAT
COPY %1.MAC %2.MAC
TYPE %2.PRN
TYPE %0.BAT
```

Now, press <CONTROL-Z> and then press <RETURN>. MS-DOS responds with this message:

```
1 File(s) copied
A>_
```

The file MYFILE.BAT, which consists of three commands, now resides on the disk in the default drive.

The dummy parameters %1 and %2 are replaced sequentially by the parameters you supply when you execute the file. The dummy parameter %0 is always replaced by the drive designator, if specified, and the filename of the batch file (for example, MYFILE).

NOTES:

1. Up to 10 dummy parameters (%0-%9) can be specified. Refer to the MS-DOS command SHIFT in Chapter 5 if you wish to specify more than 10 parameters.
2. If you use the percent sign as part of a filename within a batch file, you must type it twice. For example, to specify the file ABC%.EXE, you must type it as ABC%%.EXE in the batch file.

4.7.1 Executing A .BAT File

To execute the batch file MYFILE.BAT and to specify the parameters that will replace the dummy parameters, you must enter the batch filename (without its extension) followed by the parameters you want MS-DOS to substitute for %1, %2, etc.

Remember that the file MYFILE.BAT consists of 3 lines:

```
COPY %1.MAC %2.MAC
TYPE %2.PRN
TYPE %0.BAT
```

To execute the MYFILE batch process, type:

```
MYFILE A:PROG1 B:PROG2
```

MYFILE is substituted for %0, A:PROG1 for %1, and B:PROG2 for %2.

The result is the same as if you had typed each of the commands in MYFILE with their parameters, as follows:

```
COPY A:PROG1.MAC B:PROG2.MAC
TYPE B:PROG2.PRN
TYPE MYFILE.BAT
```

The following table illustrates how MS-DOS replaces each of the above parameters:

BATCH FILENAME	PARAMETER1 (%0) (MYFILE)	PARAMETER2 (%1) (PROG1)	PARAMETER3 (%2) (PROG2)
MYFILE	MYFILE.BAT	PROG1.MAC	PROG2.MAC PROG2.PRN

Remember that the dummy parameter %0 is always replaced by the drive designator (if specified) and the filename of the batch file.

4.8 INPUT AND OUTPUT

MS-DOS always assumes that input comes from the keyboard and output goes to the terminal screen. However, the flow of command input and output can be redirected. Input can come from a file rather than a terminal keyboard, and output can go to a file or to a line printer instead of to the terminal screen. In addition, "pipes" can be created that allow output from one command to become the input to another. Redirection and pipes are discussed in the next sections.

4.8.1 Redirecting Your Output

Most commands produce output that is sent to your terminal screen. You can send this information to a file by using a greater-than sign (>) in your command. For example, the command:

```
DIR
```

displays a directory listing of the disk in the default drive on the terminal screen. The same command can send this output to a file named MYFILES by designating the output file on the command line:

```
DIR >MYFILES
```

If the file MYFILES does not already exist, MS-DOS creates it and stores your directory listing in it. If MYFILES already exists, MS-DOS overwrites what is in the file with the new data.

If you want to append your directory or a file to another file (instead of replacing the entire file), two greater-than signs (>>) can be used to tell MS-DOS to append the output of the command (such as a directory listing) to the end of a specified file. The command:

```
DIR >>MYFILES
```

appends your directory listing to a currently existing file named MYFILES. If MYFILES does not exist, it is created.

If it is often useful to have input for a command come from a file rather than from a terminal. This is possible in MS-DOS by using a less-than sign (<) in your command. For example, the command:

```
SORT <NAMES >LIST1
```

sorts the file NAMES and sends the sorted output to a file named LIST1.

4.8.2 Filters

A filter is a command that reads your input, transforms it in some way, and then outputs it, usually to your terminal or to a file. In this way, the data is said to have been "filtered" by the program. Since filters can be put together in many different ways, a few filters can take the place of a large number of specific commands.

MS-DOS filters include FIND, MORE, and SORT. Their

functions are described below:

FIND	Searches for a constant string of text in a file
MORE	Takes standard terminal output and displays it, one screen at a time
SORT	Sorts text

You can see how these filters are used in the next section.

4.8.3 Command Piping

If you want to give more than one command to the system at a time, you can "pipe" commands to MS-DOS. For example, you may occasionally need to have the output of one program sent as the input to another program. A typical case would be a program that produces output in columns. It could be desirable to have this columnar output sorted.

Piping is done by separating commands with the pipe separator, which is the vertical bar symbol (|). For example, the command:

```
DIR | SORT
```

will give you an alphabetically sorted listing of your directory. The vertical bar causes all output generated by the left side of the bar to be sent to the right side of the bar for processing.

Piping can also be used when you want to output to a file. If you want your directory sorted and sent to a new file (for example, DIREC.FIL), you could type:

```
DIR | SORT >DIREC.FIL
```

MS-DOS will create a file named DIREC.FIL on your default drive. DIREC.FIL contains a sorted listing of the directory on the default drive, since no other drive was specified in the command. To specify a drive other than the default drive, type:

```
DIR | SORT >B:DIREC.FIL
```

This sends the sorted data to a file named DIREC.FIL on drive B:.

A pipeline may consist of more than two commands. For example:

```
DIR | SORT | MORE
```



will sort your directory, show it to you one screen at a time, and put --MORE-- at the bottom of your screen when there is more output to be seen.

You will find many uses for piping commands and filters.

Summary of Commands in This Chapter

COMMAND	PURPOSE	SYNTAX
REM	Adds comment line for batch files	REM [remark]
PAUSE	Suspends execution of a batch file	PAUSE [comment]
FIND	Searches for string of text	FIND string [filename]
MORE	Pages through a file 23 lines at a time	MORE
SORT	Sorts text	SORT

You will find more information on using these filters in the next chapter, "MS-DOS Commands".

CHAPTER 5

COMMANDS

Command Formats

Commands

Batch Processing Commands

5.1 COMMAND FORMATS

The following notation indicates how you should format MS-DOS commands:

1. You must enter any words shown in capital letters. These words are called keywords and must be entered exactly as shown. You can enter these keywords in any combination of upper/lowercase; MS-DOS will convert all keywords to uppercase.
2. You supply the text for any items enclosed in angle brackets (< >). For example, you should enter the name of your file when <filename> is shown in the format.
3. Items in square brackets ([]) are optional. If you wish to include optional information, do not include the square brackets, only the information within the brackets.
4. An ellipsis (...) indicates that you may repeat an item as many times as you want.
5. You must include all punctuation where shown (with the exception of square brackets), such as commas, equal signs, question marks, colons, or slashes.

5.2 COMMANDS

The following MS-DOS commands are described in this chapter. Note that synonyms for commands are enclosed in parentheses.

BACKUP	Backs up files from a fixed disk
BREAK	Sets CONTROL-C check
CHDIR	Changes directories; prints working directory (CD)
CHKDSK	Scans the directory of the default or designated drive and checks for consistency
CLS	Clears screen
COPY	Copies file(s) specified
CTTY	Changes console TTY
DATE	Displays and sets date
DEL	Deletes file(s) specified (ERASE)
DIR	Lists requested directory entries
DISKCOPY	Copies disks
EXE2BIN	Converts executable files to binary format
EXIT	Exits command and returns to lower level
FIND	Searches for a constant string of text
FORMAT	Formats a disk to receive MS-DOS files
MKDIR	Makes a directory (MD)
MORE	Displays output one screen at a time
PATH	Sets a command search path
PRINT	Background print feature
PROMPT	Designates command prompt
RECOVER	Recovers a bad disk
REM	Displays a comment in a batch file
REN	Renames first file as second file (RENAME)
RESTORE	Restores files
RMDIR	Removes a directory (RD)
SET	Sets one string value to another
SORT	Sorts data alphabetically, forward or backward

SYS	Transfers MS-DOS system files from drive A: to the drive specified
TIME	Displays and sets time
TYPE	Displays the contents of file specified
VER	Prints MS-DOS version number
VERIFY	Verifies writes to disk
VOL	Prints volume identification number

Batch Commands (Command extensions)

ECHO	Turns batch file echo feature on/off
FOR	Batch command extension
GOTO	Batch command extension
IF	Batch command extension
PAUSE	Pauses for input in a batch file
SHIFT	Increases number of replaceable parameters in batch process

NAME	TYPE
BACKUP	External

PURPOSE Backs up one or more files from a fixed disk to floppy disk.

SYNTAX BACKUP [<d:>][<path>][<filespec>] d: [/S][/M]
[/A][/P] [/D:<date>][/T:<time>][/L:fname]

COMMENTS The first parameter you specify is the fixed disk file(s) to back up. The second parameter is the backup disk drive. Unless otherwise specified, the old files on a backup floppy disk are erased before new files are added to it.

This backup program and the one supplied by IBM(r) are compatible. File and disk formats are the same as those used by the IBM backup program unless you set the /P switch or the /T switches described below. The files that are backed up with the /P switch are not guaranteed to be restorable by the IBM restore program.

The following switches are used with BACKUP:

- /S Back up subdirectories also.
- /M Only back up those files which have changed since the last backup.
- /A Add the files to be backed up to those already on the backup floppy disk. Do not erase old files on the floppy disk.
- /P Pack as many files as possible onto each floppy disk. Create a subdirectory on the floppy disk if that is the only way to fill the floppy disk. (WARNING: IBM Backup/Restore compatibility may be lost if this switch is used.)
- /D Only back up those files which were last modified at or after a certain date.
- /T Only back up those files which were last modified at or after a certain time.
- /L Make a backup log entry in the file specified. If no filename was given, the file BACKUP.LOG will be placed in the root directory of the files being backed up. The first line of the entry in the file will contain: [date time] where date and time are the backup dates and times. Each subsequent line in the entry will



correspond to one of the files that was backed up. These lines will consist of the file name and the number of the floppy disk that contains the file. This information can be used when you need to restore a particular file from a floppy disk. You will know exactly which disk to give RESTORE so that it will not have to search for files. If the backup log file already exists, the current entry is appended to the file.

The backup program sets the ERRORLEVEL in the following manner:

- 0 Normal completion
- 1 No files were found to back up
- 3 Terminated by user
- 4 Terminated due to error

NAME		TYPE
	BREAK	Internal

PURPOSE
Sets CONTROL-C check.

SYNTAX
BREAK [ON|OFF]

COMMENTS
If you are running an application program that uses CONTROL-C function keys, you will want to turn off the MS-DOS CONTROL-C function so that when you press <CONTROL-C> you affect your program and not the operating system. Specify BREAK OFF to turn off CONTROL-C and BREAK ON when you have finished running your application program and are using MS-DOS.

If you do not specify ON or OFF, MS-DOS displays the current setting of BREAK.

NAME	TYPE
CHDIR (CHANGE DIRECTORY)	Internal

SYNONYM

CD

PURPOSE

Changes directory to a different path; displays current (working) directory.

SYNTAX

CHDIR [pathname]

COMMENTS

If your working directory is \BIN\USER\JOE and you want to change your path to another directory (such as \BIN\USER\JOE\FORMS), type:

CHDIR \BIN\USER\JOE\FORMS

and MS-DOS will put you in the new directory. A shorthand notation is also available with this command:

CHDIR ..

This command will always put you in the parent directory of your working directory.

CHDIR used without a pathname displays your working directory. If your working directory is \BIN\USER\JOE on drive B:, and you type CHDIR <RETURN>, MS-DOS will display:

B: \BIN\USER\JOE

This command is useful if you forget the name of your working directory.

NAME	TYPE
CHKDSK (CHECK DISK)	External

PURPOSE
Scans the directory of the specified disk drive and checks it for consistency.

SYNTAX
CHKDSK [d:] <filespec> [/F] [/V]

COMMENTS
CHKDSK should be run occasionally on each disk to check for errors in the directory. If any errors are found, CHKDSK will display error messages, if any, and then a status report.

A sample status report follows:

```
160256 bytes total disk space
 8192 bytes in 2 hidden files
  512 bytes in 2 directories
30720 bytes in 8 user files
121344 bytes available on disk
```

```
65536 bytes total memory
53152 bytes free
```

CHKDSK will not correct the errors found in your directory unless you specify the /F (fix) switch. Typing /V causes CHKDSK to display messages while it is running.

You can redirect the output from CHKDSK to a file. Simply type:

```
CHKDSK A:>filename
```

The errors will be sent to the filename specified. Do not use the /F switch if you redirect CHKDSK output.

MESSAGES
<filename> contains
non-contiguous blocks
The file or files you named are not written
contiguously on the disk.

All specified file(s) are contiguous
The file or files you named are all written sequentially on disk.

The following errors will be corrected automatically if you specify the /F switch:

Cannot CHDIR to <filename>
Tree past this point not processed
CHKDSK is traveling the tree structure of the directory and is unable to proceed to the specified directory. All subdirectories underneath this directory will not be verified.

First cluster number is invalid
entry truncated
The file directory entry contains an invalid pointer to the data area. If you specified the /F switch, the file is truncated to a zero-length file.

Allocation error, size adjusted
An invalid sector number was found in the FAT. The file was truncated at the end of the last valid sector.

Disk error reading FAT
One of your File Allocation Tables has a defective sector in it. MS-DOS will automatically use the other FAT. It is a good idea to copy all your files onto another disk.

Disk error writing FAT
One of your File Allocation Tables has a defective sector in it. MS-DOS will automatically use the other FAT. It is a good idea to copy all your files onto another disk.

You must correct the following errors returned by CHKDSK, even if you specified the /F switch:

Incorrect DOS version
You cannot run CHKDSK on versions of MS-DOS that are not 2.0 or higher.

Insufficient memory

Processing cannot continue

There is not enough memory in your machine to process CHKDSK for this disk. You must obtain more memory to run CHKDSK.

Invalid drive specification

Specify a valid drive.

**Invalid parameter**

One of the switches that you have specified is wrong.

Invalid sub-directory entry

The subdirectory that you have specified either does not exist or is invalid. Check to see that you have entered the subdirectory name correctly.

Errors found, F parameter not specified

Corrections will not be written to disk

You must specify the /F switch if you want the errors corrected by CHKDSK.

Invalid current directory

Processing cannot continue

Your disk is bad. Replace the disk or make a copy from your backup system disk.

Cannot CHDIR to root

Processing cannot continue

CHKDSK is traveling the tree structure of the directory and is unable to return to the root directory. CHKDSK is not able to continue checking the remaining subdirectories to the root.

<filename> is cross linked on cluster

Make a copy of the file you want to keep, and then delete both files that are cross linked.

X lost clusters found in y chains

Convert lost chains to files (Y/N)?

If you respond Y to this prompt, CHKDSK will create a directory entry and a file for you to resolve this problem (files created by CHKDSK are named FILEnnnn).

If you respond N to this prompt, and have specified the /F switch, CHKDSK will display:

X bytes disk space freed

If you respond N to this prompt and have not specified the /F switch, CHKDSK frees the clusters and displays:

X bytes disk space would be freed

Probable non-DOS disk

Continue (Y/N)?

The disk you are using is a non-DOS disk. You must indicate whether or not you want CHKDSK to continue processing.

Insufficient room in root directory

Erase files in root and repeat CHKDSK

CHKDSK cannot process until you delete files in the root directory.

Unrecoverable error in directory

Convert directory to file (Y/N)?

If you respond Y to this prompt, CHKDSK will convert the bad directory into a file. You can then fix the directory yourself or delete it.

If you respond N to this prompt, you may not be able to write to or read from the bad directory.

Entry has a bad attribute (or size or link)

This message may be preceded by one or two periods to indicate which subdirectory is invalid. If you have specified the /F switch, CHKDSK will attempt to correct the error.

Cannot recover . entry, processing continued

The . entry (current directory) is defective.

Cannot recover .. entry

The .. (parent directory) entry is defective.

Directory is totally empty, no . or ..

The specified directory does not contain references to current and parent directories. Delete the specified directory and recreate it.

```
(.)(..) does not exist
This is an informational message from
CHKDSK. This message indicates either the
. or the .. directory entry is invalid.
```


NAME	CLS	TYPE	Internal
------	-----	------	----------

PURPOSE
Clears the terminal screen.

SYNTAX
CLS

COMMENTS
The CLS command causes MS-DOS to send the ANSI escape sequence ESC{2J (which clears your screen) to your console.

NAME	TYPE
COPY	Internal

PURPOSE

Copies one or more files to another disk. If you prefer, you can give the copies different names. This command also copies files on the same disk and concatenates files.

SYNTAX

COPY [<pathname>] [<pathname>] [/V] [A] [/B]
(to copy)

COPY <filespec> + <filespec> ... <filespec>
(to concatenate)

COMMENTS To copy files:

NOTE

If the source and destination files are in the working directory, you do not need to specify a complete pathname.

If the second pathname option is not given, the copy will be on the default drive and will have the same name as the original file (first pathname option). If the first pathname is on the default drive and the second pathname is not specified, the COPY will be aborted. (Copying files to themselves is not allowed.) MS-DOS will display the error message:

File cannot be copied onto itself
0 File(s) copied

The second option may take three forms:

1. If the second option is a drive designation (d:) only, the original file is copied with the original filename to the designated drive.
2. If the second option is a filename only, the original file is copied to a file on the default drive with the filename specified.

3. If the second option is a full file specification, the original file is copied to a file on the default drive with the filename specified.

The /V switch causes MS-DOS to verify that the sectors written on the destination disk are recorded properly. Although there are rarely recording errors when you run COPY, you can verify that critical data has been correctly recorded. This option causes the COPY command to run more slowly because MS-DOS must check each entry recorded on the disk.

The /A and /B switches indicate that the files being processed are ASCII or binary files. Each switch applies to the file specification preceding it and to all remaining file specifications on the command line, until another /A or /B is encountered.

The following discussion applies to the A and /B switches:

When used with a source file specification:

- /A Causes the file to be treated as an ASCII (text) file. Data in the file is copied up to but not including the first end-of-file mark (in EDLIN, this is CTRL-Z). The remainder of the file is not copied.
- /B Causes the entire file to be copied, including any end-of-file mark.

When used with a target file specification:

- /A Causes an end-of-file character to be added as the last character of the file.
- /B Causes no end-of-file character to be added.

When you are concatenating files (see below), the default switch is always /A.

To concatenate files:

The COPY command also allows file concatenation (joining) while copying. Concatenation is accomplished by simply listing any number of files as options to COPY, separated by +. For example:

```
COPY A.XYZ + B.COM + B:C.TXT BIGFILE.CRP
```

This command concatenates files named A.XYZ, B.COM, and B:C.TXT and places them in the file on the default drive called BIGFILE.CRP.

To combine several files using wild cards into one file, you could type:

```
COPY *.LST COMBIN.PRN
```

This command would take all files with a filename extension of .LST and combine them into a file named COMBIN.PRN.

In the following example, for each file found matching *.LST, that file is combined with the corresponding .REF file. The result is a file with the same filename but with the extension .PRN. Thus, FILE1.LST will be combined with FILE1.REF to form FILE1.PRN; then XYZ.LST with XYZ.REF to form XYZ.PRN; and so on:

```
COPY *.LST + *.REF *.PRN
```

The following COPY command combines all files matching *.LST, then all files matching *.REF, into one file named COMBIN.PRN:

```
COPY *.LST + *.REF COMBIN.PRN
```

Do not enter a concatenation COPY command where one of the source filenames has the same extension as the destination. For example, the following command is an error if ALL.LST already exists:

```
COPY *.LST ALL.LST
```

The error would not be detected, however, until ALL.LST is appended. At this point it could have already been destroyed.

COPY compares the filename of the input file with the filename of the destination. If they are the same, that one input file is skipped, and the error message "Content of destination lost before copy" is printed. Further concatenation proceeds normally. This allows "summing" files, as in this example:

```
COPY ALL.LST + *.LST
```

This command appends all *.LST files, except ALL.LST itself, to ALL.LST. This command will

not produce an error message and is the correct way to append files using the COPY command.

MESSAGES

Cannot do binary reads from a device

The copy cannot be done in binary mode when you are copying from a device. Remove the /B switch or specify an ASCII copy with the /A switch.

Content of destination lost before copy

A file to be used as a source file to the COPY command has been overwritten prior to completion of the copy. Example: COPY A + B B destroys the file B before it can be copied.

NAME	CTTY	TYPE
		Internal

PURPOSE

Allows you to change the device from which you issue commands (TTY represents the console).

SYNTAX

CTTY <device>

COMMENTS

The <device> is the device from which you are giving commands to MS-DOS. This command is useful if you want to change the device on which you are working. The command:

CTTY AUX

moves all command I/O (input/output) from the current device (the console) to the AUX port, such as a printer. The command:

CTTY CON

moves I/O back to the original device (here, the console). Refer to the "Illegal Filenames" section of Chapter 3, "More About Files," for a list of valid device names to use with the CTTY command.

NAME	DATE	TYPE
		Internal

PURPOSE

Enter or change the date known to the system. This date will be recorded in the directory for any files you create or alter.

You can change the date from your terminal or from a batch file. (MS-DOS does not display a prompt for the date if you use an AUTOEXEC.BAT file, so you may want to include a DATE command in that file.)

SYNTAX

DATE [<mm>-<dd>-<yy>]

COMMENTS

If you type DATE, DATE will respond with the message:

Current date is <mm>-<dd>-<yy>
Enter new date: _

Press <RETURN> if you do not want to change the date shown.

You can also type a particular date after the DATE command, as in:

DATE 3-9-81

In this case, you do not have to answer the Enter new date: prompt.

The new date must be entered using numerals only; letters are not permitted. The allowed options are:

<mm> = 1-12
<dd> = 1-31
<yy> = 80-99 or 1980-2099

The date, month, and year entries may be separated by hyphens (-) or slashes (/). MS-DOS is programmed to change months and years correctly, whether the month has 31, 30, 29, or 28 days. MS-DOS handles leap years, too.

MESSAGES

Invalid date

Enter new date:

If the options or separators are not valid,
DATE displays this message. Enter a valid
date.



NAME	TYPE
DEL (DELETE)	Internal

SYNONYM
ERASE

PURPOSE
Deletes all files with the designated file specification.

SYNTAX
DEL [pathname]

COMMENTS
If the pathname is *.* , the prompt Are you sure? appears. If a Y or y is typed as a response, then all files are deleted as requested. You can also type ERASE for the DELETE command.

NAME	TYPE
DIR (DIRECTORY)	Internal

PURPOSE
Lists the files in a directory.

SYNTAX
DIR [pathname] [/P] [/W]

COMMENTS
If you just type DIR, all directory entries on the default drive are listed. If only the drive specification is given (DIR d:), all entries on the disk in the specified drive are listed. If only a filename is entered with no extension (DIR filename), then all files with the designated filename on the disk in the default drive are listed. If you designate a file specification (for example, DIR d:filename.ext), all files with the filename specified on the disk in the drive specified are listed. In all cases, files are listed with their size in bytes and with the time and date of their last modification.

The wild card characters ? and * (question mark and asterisk) may be used in the filename option. Note that for your convenience, the following DIR commands are equivalent:

COMMAND	EQUIVALENT
DIR	DIR *.*
DIR FILENAME	DIR FILENAME.*
DIR .EXT	DIR *.EXT

Two switches may be specified with DIR. The /P switch selects Page Mode. With /P, display of the directory pauses after the screen is filled. To resume display of output, press any key.

The /W switch selects Wide Display. With /W, only filenames are displayed, without other file information. Files are displayed five per line.

NAME	TYPE
DISKCOPY	External

PURPOSE

Copies the contents of the disk in the source drive to the disk in the destination drive.

SYNTAX

DISKCOPY [d:] [d:]

COMMENTS

The first option you specify is the source drive. The second option is the destination drive.

The disk in the destination drive must be formatted prior to using DISKCOPY.

You can specify the same drives or you may specify different drives. If the drives designated are the same, a single-drive copy operation is performed. You are prompted to insert the disks at the appropriate times. DISKCOPY waits for you to press any key before continuing.

After copying, DISKCOPY prompts:

```
Copy complete
Copy another (Y/N)?_
```

If you press Y, the next copy is performed on the same drives that you originally specified, after you have been prompted to insert the proper disks.

To end the COPY, press N.

Notes:

1. If you omit both options, a single-drive copy operation will be performed on the default drive.
2. If you omit the second option, the default drive will be used as the destination drive.
3. Both disks must have the same number of physical sectors and those sectors must be the same size.

4. Disks that have had a lot of file creation and deletion activity become fragmented, because disk space is not allocated sequentially. The first free sector found is the next sector allocated, regardless of its location on the disk.

A fragmented disk can cause poor performance due to delays involved in finding, reading, or writing a file. If this is the case, you must use the COPY command, instead of DISKCOPY, to copy your disk and eliminate the fragmentation.

For example:

COPY A:*. * B:

copies all files from the disk in drive A: to the disk in drive B:.

5. DISKCOPY automatically determines the number of sides to copy, based on the source drive and disk.

MESSAGES

Copy not completed
DISKCOPY cannot copy the entire disk.

DISK error while reading drive A
Abort, Ignore, Retry?
Disk errors have been encountered during DISKCOPY processing. Refer to Appendix B, "Disk Errors," for information on this message.

Disks must be the same size
You cannot copy the contents of a disk with a different format using DISKCOPY. Use the COPY command to copy files onto the disk.

Source and target diskettes are not the same
format. Cannot do the copy

You must have the same size and kind of
disks to run DISKCOPY. Example: you
cannot copy from a single-sided disk to a
double-sided disk. Reformat the target
disk to be of the same type as the source
disk,

NAME	TYPE
EXE2BIN	External

PURPOSE

Converts .EXE (executable) files to binary format. This results in a saving of disk space and faster program loading.

SYNTAX

EXE2BIN <filespec> [d:][<filename>[<.ext>]]

COMMENTS

This command is useful only if you want to convert .EXE files to binary format. The file named by filespec is the input file. If no extension is specified, it defaults to .EXE. The input file is converted to .COM file format (memory image of the program) and placed in the output file. If you do not specify a drive, the drive of the input file will be used. If you do not specify an output filename, the input filename will be used. If you do not specify a filename extension in the output filename, the new file will be given an extension of .BIN.

The input file must be in valid .EXE format produced by the linker. The resident, or actual code and data part of the file must be less than 64K. There must be no STACK segment.

Two kinds of conversions are possible, depending on whether the initial CS:IP (Code Segment:Instruction Pointer) is specified in the .EXE file:

1. If CS:IP is not specified in the .EXE file, a pure binary conversion is assumed. If segment fixups are necessary (i.e., the program contains instructions requiring segment relocation), you will be prompted for the fixup value. This value is the absolute segment at which the program is to be loaded. The resulting program will be usable only when loaded at the absolute memory address specified by a user application. The command processor will not be capable of properly loading the program.

2. If CS:IP is specified as 0000:100H, it is assumed that the file is to be run as a .COM file with the location pointer set at 100H by the assembler statement ORG; the first 100H bytes of the file are deleted. No segment fixups are allowed, as .COM files must be segment relocatable; that is, they must assume the entry conditions explained in the Macro Assembler Manual. Once the conversion is complete, you may rename the resulting file with a .COM extension. Then the command processor will be able to load and execute the program in the same way as the .COM programs supplied on your MS-DOS disk.

MESSAGES

File cannot be converted

CS:IP does not meet either of the criteria specified above, or it meets the .COM file criterion but has segment fixups. This message is also displayed if the file is not a valid executable file.

File not found

The file is not on the disk specified.

Insufficient memory

There is not enough memory to run EXE2BIN.

File creation error

EXE2BIN cannot create the output file. Run CHKDSK to determine if the directory is full, or if some other condition caused the error.

Insufficient disk space

There is not enough disk space to create a new file.

Fixups needed - base segment (hex):

The source (.EXE) file contained information indicating that a load segment is required for the file. Specify the absolute segment address at which the finished module is to be located.

File cannot be converted
The input file is not in the correct
format.

WARNING -Read error in EXE file.
Amount read less than size in header
This is a warning message only.



NAME	TYPE
EXIT	Internal

PURPOSE
Exits the program COMMAND.COM (the command processor) and returns to a previous level, if one exists.

SYNTAX
EXIT

COMMENTS
This command can be used when you are running an application program and want to start the MS-DOS command processor, then return to your program. For example, to look at a directory on drive B: while running an application program, you must start the command processor by typing COMMAND in response to the default drive prompt:

A>COMMAND

You can now type the DIR command and MS-DOS will display the directory for drive B:. When you type EXIT, you return to the previous level (your application program).

NAME	TYPE
FIND	External
PURPOSE	Searches for a specific string of text in a file or files.
SYNTAX	FIND [/V /C /N] <string> [<filename...>]
COMMENTS	<p>FIND is a filter that takes as options a string and a series of filenames. It will display all lines that contain a specified string from the files specified in the command line.</p> <p>If no files are specified, FIND will take the input on the screen and display all lines that contain the specified string.</p> <p>Switches for FIND are:</p> <p>/V causes FIND to display all lines not containing the specified string.</p> <p>/C causes FIND to print only the count of lines that contained a match in each of the files.</p> <p>/N causes each line to be preceded by its relative line number in the file.</p> <p>The string should be enclosed in quotes. Example:</p> <p>FIND "Fool's Paradise" BOOK1.TXT BOOK2.TXT</p> <p>displays all lines from BOOK1.TXT and BOOK2.TXT (in that order) that contain the string "Fool's Paradise." The command:</p> <p>DIR B: | FIND /V "DAT"</p> <p>causes MS-DOS to display all names of the files on the disk in drive B: which do not contain the string DAT. Type double quotes around a string that already has quotes in it.</p>

MESSAGES

Incorrect DOS version
FIND will only run on versions of MS-DOS
that are 2.0 or higher.

FIND: Invalid number of parameters
You did not specify a string when issuing
the FIND command.

FIND: Syntax error
You typed an illegal string when issuing
the FIND command.

FIND: File not found <filename>
The filename you have specified does not
exist or FIND cannot find it.

FIND: Read error in <filename>
An error occurred when FIND tried to read
the file specified in the command.

FIND: Invalid parameter <option-name>
You specified an option that does not
exist.

NAME	FORMAT	TYPE	External
------	--------	------	----------

PURPOSE

Formats the disk in the specified drive to accept MS-DOS files.

SYNTAX

FORMAT d:[/V"label"]

COMMENTS

This command initializes the directory and file allocation tables.

The /V switch allows a quoted string following it to be used as the volume label.

Invalid characters in volume label
The volume label should contain only up to 11 alphanumeric characters.

NAME	MKDIR	TYPE	Internal
SYNONYM	MD		
PURPOSE	Makes a new directory.		
SYNTAX	MKDIR <pathname>		
COMMENTS	<p>This command is used to create a hierarchical directory structure. When you are in your root directory, you can create subdirectories by using the MKDIR command. The command:</p> <p style="text-align: center;">MKDIR \USER</p> <p>will create a subdirectory \USER in your root directory. To create a directory named JOE <u>under</u> \USER, type:</p> <p style="text-align: center;">MKDIR \USER\JOE</p>		
MESSAGES	<p>Unable to create directory</p> <p>MS-DOS could not create the directory you specified. Check to see that there is not a name conflict. You may have a file by the same name, or the disk may be full.</p>		

NAME	TYPE
MORE	External

PURPOSE
Sends output to console one screen at a time.

SYNTAX
MORE

COMMENTS
MORE is a filter that reads from standard input (such as a command from your terminal) and displays one screen of information at a time. The MORE command then pauses and displays the --MORE-- message at the bottom of your screen.

Pressing the <RETURN> key will display another screen of information. This process continues until all the input data has been read.

The MORE command is useful for viewing a long file one screen at a time. If you type:

TYPE MYFILES.COM | MORE

MS-DOS will display the file MYFILES.COM (on the default drive) one screen at a time.

NAME	PATH	TYPE	Internal
------	------	------	----------

PURPOSE
Sets a command search path.

SYNTAX
PATH [<pathname>[;<pathname>]...]

COMMENTS
This command allows you to tell MS-DOS which directories should be searched for external commands after MS-DOS searches your working directory. The default value is no path.

To tell MS-DOS to search your \BIN\USER\JOE directory for external commands, type:

PATH \BIN\USER\JOE

MS-DOS will now search the \BIN\USER\JOE directory for external commands until you set another path or shut down MS-DOS.

You can tell MS-DOS to search more than one path by specifying several pathnames separated by semicolons. For example:

PATH \BIN\USER\JOE;\BIN\USER\SUE;\BIN\DEV

tells MS-DOS to search the directories specified by the above pathnames to find external commands. MS-DOS searches the pathnames in the order specified in the PATH command.

The command PATH with no options will print the current path. If you specify PATH ;, MS-DOS will set the NUL path, meaning that only the working directory will be searched for external commands.

MESSAGES

No path
You typed PATH with no options but have not set a command search path.

NAME	TYPE
PRINT	External

PURPOSE

Prints a text file on a line printer while you are processing other MS-DOS commands (usually called "background printing").

SYNTAX

PRINT [[filespec] [/T] [/C] [/P]]...



COMMENTS

You will use the PRINT command only if you have a line printer attached to your computer. The following switches are provided with this command:

/T TERMINATE: this switch deletes all files in the print queue (those waiting to be printed). A message to this effect will be printed.

/C CANCEL: This switch turns on cancel mode. The preceding filespec and all following filespecs will be suspended in the print queue until you type a /P switch.

/P PRINT: This switch turns on print mode. The preceding filespec and all following filespecs will be added to the print queue until you issue a /C switch.

PRINT with no options displays the contents of the print queue on your screen without affecting the queue.

EXAMPLES:

PRINT /T Empties the print queue.

PRINT A:TEMP1.TST/C A:TEMP2.TST A:TEMP3.TST
 Removes the three files
 indicated from the print
 queue.

PRINT TEMP1.TST /C TEMP2.TST /P TEMP3.TST
 Removes TEMP1.TST from the
 queue, and adds TEMP2.TST
 and TEMP3.TST to the
 queue.

MESSAGES

All files canceled

If the /T (TERMINATE) switch is issued, the message "All files canceled by operator" will be output on your printer. If the current file being printed is canceled by a /C, the message "File canceled by operator" will be printed.

Cannot open (filename)

Either MS-DOS cannot find the specified file to print or the file does not exist. Check the command for a valid filename.

Errors on list device indicate that it may be offline. Please check it
Your printer is offline

(filename) file not found

You switched disks when a file was queued up, but before it started to print. Reissue the PRINT command for that filename.

List output is not assigned to a device

This message will be displayed if the "Name of list device" specified to the above prompt is invalid. Subsequent attempts will return the same message until a valid device is specified.

Name of list device [PRN:]

This prompt appears when PRINT is run the first time. Any current device may be specified and that device then becomes the PRINT output device. As indicated in the brackets, simply pressing <RETURN> results in the device PRN being used.

No files match d:XXXXXXXX.XXX

A filespec was given for files to add to the queue, but no files match a specification. NOTE: if there are no files in the queue to match the canceled filespec, no error message will appear.

PRINT queue is empty

There are no files in the print queue.

PRINT queue is full

There is room for 10 files in the queue.
If you attempt to put more than 10 files in
the queue, this message will appear on the
console.

Resident part of PRINT installed

This is the first message that MS-DOS
displays when you issue the PRINT command.
It means that available memory has been
reduced by several thousand bytes to
process the PRINT command concurrent with
other processes.

NAME	PROMPT	TYPE	Internal
------	--------	------	----------

PURPOSE Changes the MS-DOS command prompt.

SYNTAX PROMPT [<prompt-text>]

COMMENTS This command allows you to change the MS-DOS system prompt (for example, A>). If no text is typed, the prompt will be set to the default prompt, which is the default drive designation. You can set the prompt to a special prompt, such as the current time, by using the characters indicated below.

The following characters can be used in the prompt command to specify special prompts. They must all be preceded by a dollar sign (\$) in the prompt command:

Specify
This
Character: To Get This Prompt:

\$ - The '\$' character
t - The current time
d - The current date
p - The current directory of the
default drive
v - The version number
n - The default drive
g - The '>' character
l - The '<' character
b - The '|' character
_ - A CR LF sequence
s - A space (leading only)
h - A backspace
e - ASCII code X'1B' (escape)

EXAMPLES:

```
PROMPT $n
      Sets the default drive letter
      prompt.
PROMPT Time = $t$ _Date = $d
      Sets a two-line prompt which
      prints:
      Time = (current time)
      Date = (current date)
```

If your terminal has an ANSI escape sequence driver, then you can use escape sequences in your prompts. For example:

```
PROMPT $e[7m$n:$e[m
      Sets the prompts in inverse
      video mode and returns to
      video mode for other
      text.
```

NAME	TYPE
RECOVER	External
PURPOSE	Recovers a file or an entire disk containing bad sectors.
SYNTAX	RECOVER <filename | d:>
COMMENTS	<p>If a sector on a disk is bad, you can recover either the file containing that sector (without the bad sector) or the entire disk (if the bad sector was in the directory).</p> <p>To recover a particular file, type:</p> <p style="padding-left: 40px;">RECOVER <filename></p> <p>This will cause MS-DOS to read the file sector by sector and to skip the bad sector(s). When MS-DOS finds the bad sector(s), the sector(s) are marked and MS-DOS will no longer allocate your data to that sector.</p> <p>To recover a disk, type:</p> <p style="padding-left: 40px;">RECOVER <d:></p> <p>where d: is the letter of the drive containing the disk to be recovered.</p>
MESSAGES	<p>(xxxx) of (xxxx) bytes recovered This message tells you the number of bytes that MS-DOS was able to recover from the disk</p> <p>Warning - directory full The root directory is too full for RECOVER processing. Delete some files in the root directory to free space.</p>

NAME	TYPE
REM (REMARK)	Internal

PURPOSE
Displays remarks which are on the same line as the REM command in a batch file during execution of that batch file.

SYNTAX
REM [comment]

COMMENTS
The only separators allowed in the comment are the space, tab, and comma.

EXAMPLE:

```
1: REM This file checks new disks
2: REM It is named NEWDISK.BAT
3: PAUSE Insert new disk in drive B:
4: FORMAT B:/S
5: DIR B:
6: CHKDSK B:
```



NAME	TYPE
REN (RENAME)	Internal

SYNONYM
RENAME

PURPOSE
Changes the name of the first option (filespec) to the second option (filename).

SYNTAX
REN <pathname> <filename>

COMMENTS
The first option (filespec) must be given a drive designation if the disk resides in a drive other than the default drive. Any drive designation for the second option (filename) is ignored. The file will remain on the disk where it currently resides.

The wild card characters may be used in either option. All files matching the first filespec are renamed. If wild card characters appear in the second filename, corresponding character positions will not be changed.

For example, the following command changes the names of all files with the .LST extension to similar names with the .PRN extension:

```
REN *.LST *.PRN
```

In the next example, REN renames the file ABODE on drive B: to ADOBE:

```
REN B:ABODE ?D?B?
```

The file remains on drive B:.

MESSAGES
File not found
You tried to rename a filespec to a name already present in the directory.

NAME	RESTORE	TYPE	External
PURPOSE	Restores files backed up using either the Microsoft or the IBM backup program.		
SYNTAX	RESTORE <d:> [<d:> [<path>] [<filespec>] [/S] [/P] [/B:<date>] [/A:<date>] [/E:<time>] [/L:<time>] [/M] [/N]		
COMMENTS	<p>The first parameter you specify is the drive designator of the disk containing the backed up files. The second parameter is the file specification indicating which files you want to restore.</p> <p>This restore program and the one supplied by IBM are compatible except for the extra switches described below.</p> <p>The following switches are used with RESTORE:</p> <ul style="list-style-type: none">/S - Restore subdirectories also./P - If any hidden or read-only files match the file specification, prompt for permission to restore them./B - Only restore those files which were last modified on or before the given date./A - Only restore those files which were last modified on or after the given date./E - Only restore those files which were last modified at or earlier than the given time./L - Only restore those files which were last modified at or later than the given time./M - Only restore those files which have been modified since the last backup./N - Only restore those files which no longer exist on the destination disk. <p>The backup program sets the ERRORLEVEL in the following manner:</p> <ul style="list-style-type: none">0 Normal completion1 No files were found to back up3 Terminated by user4 Terminated due to error		

NAME		TYPE
	RMDIR (REMOVE DIRECTORY)	Internal

SYNONYM
RD

PURPOSE
Removes a directory from a hierarchical directory structure.

SYNTAX
RMDIR <pathname>

COMMENTS
This command removes a directory that is empty except for the . and .. shorthand symbols. You must delete all files first.

To remove the \BIN\USER\JOE directory, first issue a DIR command for that path to ensure that the directory does not contain any important files that you do not want deleted. Then type:

RMDIR \BIN\USER\JOE

The directory has been deleted from the directory structure.

NAME	TYPE
SET	Internal

PURPOSE

Sets one string value equivalent to another string for use in later programs.

SYNTAX

SET [<string=string>]

COMMENTS

This command is meaningful only if you want to set values that will be used by programs you have written. An application program can check all values that have been set with the SET command by issuing SET with no options. For example, SET TTY=VT52 sets your TTY value to VT52 until you change it with another SET command.

The SET command can also be used in batch processing. In this way, you can define your replaceable parameters with names instead of numbers. If your batch file contains the statement "LINK %FILE%", you can set the name that MS-DOS will use for that variable with the SET command. The command SET FILE=DOMORE replaces the %FILE% parameter with the filename DOMORE. Therefore, you do not need to edit each batch file to change the replaceable parameter names. Note that when you use text (instead of numbers) as replaceable parameters, the name must be ended by a percent sign.

If you type SET with no arguments, MS-DOS displays the current setting of SET.

NAME	TYPE
<code>SORT</code>	External

PURPOSE `SORT` reads input from your terminal, sorts the data, then writes it to your terminal screen or files.

SYNTAX `SORT [/R] [/+n]`

COMMENTS `SORT` can be used, for example, to alphabetize a file by a certain column. There are two switches which allow you to select options:

`/R` reverse the sort; that is, sort from Z to A.

`/+n` sort starting with column n where n is some number. If you do not specify this switch, `SORT` will begin sorting from column 1.

EXAMPLES:

This command will read the file `UNSORT.TXT`, reverse the sort, and then write the output to a file named `SORT.TXT`:

```
SORT /R <UNSORT.TXT >SORT.TXT
```

The following command will pipe the output of the `directory` command to the `SORT` filter. The `SORT` filter will sort the directory listing starting with column 14 (this is the column in the directory listing that contains the file size), then send the output to the console. Thus, the result of this command is a directory sorted by file size:

```
DIR | SORT /+14
```

The command:

```
DIR | SORT /+14 | MORE
```

will do the same thing as the command in the previous example, except that the MORE filter will give you a chance to read the sorted directory one screen at a time.

NAME	TYPE
SYS (SYSTEM)	External

PURPOSE

Transfers the MS-DOS system files from the disk in the default drive to the disk in the drive specified by d:.

SYNTAX

SYS <d:>

COMMENTS

SYS is normally used to update the system or to place the system on a formatted disk which contains no files. An entry for d: is required.

If IO.SYS and MSDOS.SYS are on the destination disk, they must take up the same amount of space on the disk as the new system will need. This means that you cannot transfer system files from an MS-DOS 2.0 disk to an MS-DOS 1.1 disk. You must reformat the MS-DOS 1.1 disk with the MS-DOS FORMAT command before the SYS command will work.

The destination disk must be completely blank or already have the system files IO.SYS and MSDOS.SYS.

The transferred files are copied in the following order:

IO.SYS
MSDOS.SYS

IO.SYS and MSDOS.SYS are both hidden files that do not appear when the DIR command is executed. COMMAND.COM (the command processor) is not transferred. You must use the COPY command to transfer COMMAND.COM.

MESSAGES

This command is not implemented on systems where MS-DOS is built into Read Only Memory (ROM).

NAME	TIME	TYPE
		Internal

PURPOSE
Displays and sets the time.

SYNTAX
TIME [<hh>[:<mm>]]



COMMENTS
If the TIME command is entered without any arguments, the following message is displayed:

Current time is <hh>:<mm>:<ss>.<cc>
Enter new time: _

Press the <RETURN> key if you do not want to change the time shown. A new time may be given as an option to the TIME command as in:

TIME 8:20

The new time must be entered using numerals only; letters are not allowed. The allowed options are:

<hh> = 00-24
<mm> = 00-59

The hour and minute entries must be separated by colons. You do not have to type the <ss> (seconds) or <cc> (hundredths of seconds) options.

MS-DOS uses the time entered as the new time if the options and separators are valid. If the options or separators are not valid, MS-DOS displays the message:

Invalid time
Enter new time: _

MS-DOS then waits for you to type a valid time.

NAME	TYPE	TYPE
		Internal

PURPOSE
Displays the contents of the file on the console screen.

SYNTAX
TYPE <filespec>

COMMENTS
Use this command to examine a file without modifying it. The only formatting performed by TYPE is that tabs are expanded to spaces consistent with tab stops every eighth column. Note that a display of binary files causes control characters (such as CONTROL-Z) to be sent to your computer, including bells, form feeds, and escape sequences.

NAME	VER	TYPE
		Internal

PURPOSE
Prints MS-DOS version number.

SYNTAX
VER

COMMENTS
If you want to know what version of MS-DOS you are using, type VER. The version number will be displayed on your screen.

NAME	TYPE
VERIFY	Internal

PURPOSE
Turns the verify switch on or off when writing to disk.

SYNTAX
VERIFY [ON|OFF]

COMMENTS
This command has the same purpose as the /V switch in the COPY command. If you want to verify that all files are written correctly to disk, you can use the VERIFY command to tell MS-DOS to verify that your files are intact (no bad sectors, for example). MS-DOS will perform a VERIFY each time you write data to a disk. You will receive an error message only if MS-DOS was unable to successfully write your data to disk.

VERIFY ON remains in effect until you change it in a program (by a SET VERIFY system call), or until you issue a VERIFY OFF command to MS-DOS.

If you want to know what the current setting of VERIFY is, type VERIFY with no options.

NAME	TYPE
VOL (VOLUME)	Internal

PURPOSE
Displays disk volume label, if it exists.

SYNTAX
VOL [d:]

COMMENTS
This command prints the volume label of the disk in drive d:. If no drive is specified, MS-DOS prints the volume label of the disk in the default drive.

MESSAGES
Volume in drive x has no label
The disk in the drive does not have a volume label.

5.3 BATCH PROCESSING COMMANDS

The following commands are called batch processing commands. They can add flexibility and power to your batch programs. The commands discussed are ECHO, FOR, GOTO, IF, and SHIFT.

If you are not writing batch programs, you do not need to read this section.

NAME	TYPE
ECHO	Internal

PURPOSE
Turns batch echo feature on and off.

SYNTAX
ECHO [ON |OFF| <message>]

COMMENTS
Normally, commands in a batch file are displayed ("echoed") on the console when they are seen by the command processor. ECHO OFF turns off this feature. ECHO ON turns the echo back on.

If ON or OFF are not specified, the current setting is displayed.

ECHO <message> is only useful if ECHO is off and you are using a batch file. By typing ECHO and a message in your batch file, you can print messages on the console.

NAME	TYPE
FOR	Internal

PURPOSE

Command extension used in batch and interactive file processing.

SYNTAX

```
FOR %%<c> IN <set> DO <command>
(for batch processing)
FOR %<c> IN <set> DO <command>
(for interactive processing)
```

COMMENTS

<c> can be any character except 0,1,2,3,...,9 to avoid confusion with the %0-%9 batch parameters.

<set> is (#<item>*)

The %%<c> variable is set sequentially to each member of <set>, and then <command> is evaluated. If a member of <set> is an expression involving * and/or ?, then the variable is set to each matching pattern from disk. In this case, only one such <item> may be in the set, and any <item> besides the first is ignored.

Examples:

```
FOR %%f IN ( *.ASM ) DO MASM %%f;
```

```
FOR %%f IN (FOO BAR BLECH) DO REM %%f
```

The '%%' is needed so that after batch parameter (%0-%9) processing is done, there is one '%' left. If only '%f' were there, the batch parameter processor would see the '%', look at 'f', decide that '%f' was an error (bad parameter reference) and throw out the '%f', so that the command FOR would never see it. If the FOR is not in a batch file, then only one '%' should be used.

MESSAGES

FOR cannot be nested
Nesting of FOR statements is illegal.

NAME	TYPE
GOTO	Internal

PURPOSE
Command extension used in batch file processing.

SYNTAX
GOTO <label>

COMMENTS
GOTO causes commands to be taken from the batch file beginning with the line after the <label> definition. If no label has been defined, the current batch file will terminate.

Example:

```
      :foo  
      REM looping...  
      GOTO foo
```

will produce an infinite sequence of messages:
REM looping....

Starting a line in a batch file with ':' causes the line to be ignored by batch processing. The characters following GOTO define a label, but this procedure may also be used to put in comment lines.

NAME	TYPE
IF	Internal

PURPOSE
Command extension used in batch file processing.

SYNTAX
IF <condition> <command>

COMMENTS
The parameter <condition> is one of the following:

ERRORLEVEL <number>
True if and only if the previous program executed by COMMAND had an exit code of <number> or higher.

<string1> == <string2>
True if and only if <string1> and <string2> are identical after parameter substitution. Strings may not have embedded separators.

EXIST <filename>
True if and only if <filename> exists.

NOT <condition>
True if and only if <condition> is false.

The IF statement allows conditional execution of commands. When the <condition> is true, then the <command> is executed. Otherwise, the <command> is ignored.

EXAMPLES:

```
IF NOT EXIST FOO ECHO Can't find file  
IF NOT ERRORLEVEL 3 LINK $1,,;
```



NAME	TYPE
PAUSE	Internal

PURPOSE
Suspends execution of the batch file.

SYNTAX
PAUSE [comment]

COMMENTS
During the execution of a batch file, you may need to change disks or perform some other action. PAUSE suspends execution until you press any key, except <CONTROL-C>.

When the command processor encounters PAUSE, it prints:

Strike a key when ready . . .

If you press <CONTROL-C>, another prompt will be displayed:

Abort batch job (Y/N)?

If you type Y in response to this prompt, execution of the remainder of the batch command file will be aborted and control will be returned to the operating system command level. Therefore, PAUSE can be used to break a batch file into pieces, allowing you to end the batch command file at an intermediate point.

The comment is optional and may be entered on the same line as PAUSE. You may also want to prompt the user of the batch file with some meaningful message when the batch file pauses. For example, you may want to change disks in one of the drives. An optional prompt message may be given in such cases. The comment prompt will be displayed before the "Strike a key" message.

NAME	SHIFT	TYPE
		Internal

PURPOSE

Allows access to more than 10 replaceable parameters in batch file processing.

SYNTAX

SHIFT

COMMENTS

Usually, command files are limited to handling 10 parameters, %0 through %9. To allow access to more than ten parameters, use SHIFT to change the command line parameters. For example:

```
if      %0 = "foo"
        %1 = "bar"
        %2 = "name"
        %3...%9 are empty
```

then a SHIFT will result in the following:

```
%0 = "bar"
%1 = "name"
%2...%9 are empty
```

If there are more than 10 parameters given on a command line, those that appear after the 10th (%9) will be shifted one at a time into %9 by successive shifts.

CHAPTER 6

MS-DOS EDITING AND FUNCTION KEYS

Special MS-DOS Editing Keys

Control Character Functions

6.1 SPECIAL MS-DOS EDITING KEYS

The special editing keys deserve particular emphasis because they depart from the way in which most operating systems handle command input. You do not have to type the same sequences of keys repeatedly, because the last command line is automatically placed in a special storage area called a template.

By using the template and the special editing keys, you can take advantage of the following MS-DOS features:

1. A command line can be instantly repeated by pressing two keys.
2. If you make a mistake in the command line, you can edit it and retry without having to retype the entire command line.
3. A command line that is similar to a preceding command line can be edited and executed with a minimum of typing by pressing a special editing key.

The relationship between the command line and the template is shown in Figure 8:

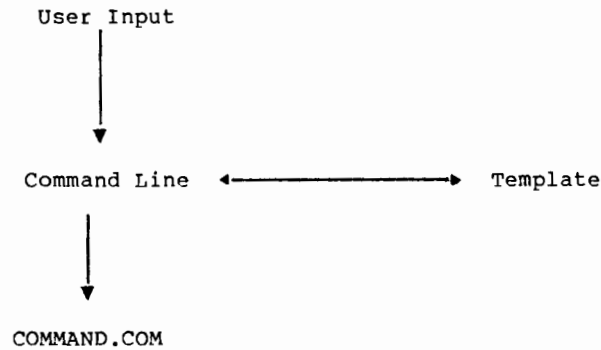


Figure 8. Command Line and Template

As seen in Figure 8, the user (you) types a command to MS-DOS on the command line. When you press the <RETURN> key, the command is automatically sent to the command processor (COMMAND.COM) for execution. At the same time, a copy of this command is sent to the template. You can now recall the command or modify it with MS-DOS special editing keys.

Table 6.1 contains a complete list of the special editing keys.

NOTE

The keys on your keyboard may not correspond to the specific keys in the following examples. Therefore, these MS-DOS editing keys will be referred to by FUNCTION rather than by name. When an example says to press the <SKIPl> key, find the key on your keyboard that corresponds to the "skip one character" editing function and press it. Some functions will require you to press two keys. Consult the operating manual for your terminal to determine which keys correspond to the MS-DOS editing functions described here.

You may wish to write in the keys on your keyboard that correspond to the editing keys described below. Space is provided in the following table to do this:

Table 6.1 Special Editing Functions

Key	Editing Function	Your Keyboard
<COPY1>	Copies one character from the template to the command line	
<COPYUP>	Copies characters up to the character specified in the template and puts these characters on the command line	
<COPYALL>	Copies all remaining characters in the template to the command line	
<SKIPl>	Skips over (does not copy) a character in the template	
<SKIPUP>	Skips over (does not copy) the characters in the template up to the character specified	
<VOID>	Voids the current input; leaves the template unchanged	
<INSERT>	Enters/exits insert mode	
<NEWLINE>	Makes the new line the new template	
<CONTROL-Z	Puts a CONTROL-Z (1AH) end-of-file character in the new template	

Examples:

If you type the following command:

```
DIR PROG.COM
```

MS-DOS displays information about the file PROG.COM on your screen. The command line is also saved in the template. To repeat the command, just press two keys: <COPYALL> and <RETURN>.

The repeated command is displayed on the screen as you type, as shown below:

```
<COPYALL>DIR PROG.COM<RETURN>
```

Notice that pressing the <COPYALL> key causes the contents

of the template to be copied to the command line; pressing <RETURN> causes the command line to be sent to the command processor for execution.

If you want to display information about a file named PROG.ASM, you can use the contents of the template and type:

```
<COPYUP>C
```

Typing <COPYUP>C copies all characters from the template to the command line, up to but not including C. MS-DOS displays:

```
DIR PROG._
```

Note that the underline is your cursor. Now type:

```
.ASM
```

The result is:

```
DIR PROG.ASM_
```

The command line DIR PROG.ASM is now in the template and ready to be sent to the command processor for execution. To do this, press <RETURN>.

Now assume that you want to execute the following command:

```
TYPE PROG.ASM
```

To do this, type:

```
TYPE<INSERT> <COPYALL><RETURN>
```

Notice that when you are typing, the characters are entered directly into the command line and overwrite corresponding characters in the template. This automatic replacement feature is turned off when you press the insert key. Thus, the characters "TYPE" replace the characters "DIR " in the template. To insert a space between "TYPE" and "PROG.ASM", you pressed <INSERT> and then the space bar. Finally, to copy the rest of the template to the command line, you pressed <COPYALL> and then <RETURN>. The command TYPE PROG.ASM has been processed by MS-DOS, and the template becomes TYPE PROG.ASM.

If you had misspelled TYPE as BYTE, a command error would have occurred. Still, instead of throwing away the whole command, you could save the misspelled line before you press <RETURN> by creating a new template with the <NEWLINE> key:

```
BYTE PROG.ASM<NEWLINE>
```

You could then edit this erroneous command by typing:



T<COPY1>P<COPYALL>

The <COPY1> key copies a single character from the template to the command line. The resulting command line is then the command that you want:

TYPE PROG.ASM

As an alternative, you can use the same template containing BYTE PROG.ASM and then use the <SKIP1> and <INSERT> keys to achieve the same result:

<SKIP1><SKIP1><COPY1><INSERT>YP<COPYALL>

To illustrate how the command line is affected as you type, examine the keys typed on the left; their effect on the command line is shown on the right:

<SKIP1>	-	Skips over 1st template character
<SKIP1>	-	Skips over 2nd template character
<COPY1>	T	Copies 3rd template character
<INSERT>YP	YP	Inserts two characters
<COPYALL>	TYPE PROG.ASM	Copies rest of template

Notice that <SKIP1> does not affect the command line. It affects the template by deleting the first character. Similarly, <SKIPUP> deletes characters in the template, up to but not including a given character.

These special editing keys can add to your effectiveness at the keyboard. The next section describes control character functions that can also help when you are typing commands.

6.2 CONTROL CHARACTER FUNCTIONS

A control character function is a function that affects the command line. You have already learned about <CONTROL-C> and <CONTROL-S>. Other control character functions are described below.

Remember that when you type a control character, such as <CONTROL-C>, you must hold down the control key and then press the C key.

Table 6.2 Control Character Functions

Control Character	Function
<CONTROL-N>	Toggles echoing of output to line printer.
<CONTROL-C>	Aborts current command.
<CONTROL-H>	Removes last character from command line and erases character from terminal screen.
<CONTROL-J>	Inserts physical end-of-line, but does not empty command line. Use the <LINE FEED> key to extend the current logical line beyond the physical limits of one terminal screen.
<CONTROL-P>	Toggles terminal output to line printer.
<CONTROL-S>	Suspends output display on terminal screen. Press any key to resume.
<CONTROL-X>	Cancels the current line; empties the command line; and then outputs a back slash (\), carriage return, and line feed. The template used by the special editing commands is not affected.

APPENDIX A

HOW TO CONFIGURE YOUR SYSTEM

In many cases, there are installation-specific settings for MS-DOS that need to be configured at system startup. An example of this is a standard device driver, such as an online printer.

The MS-DOS configuration file (CONFIG.SYS) allows you to configure your system with a minimum of effort. With this file, you can add device drivers to your system at startup. The configuration file is simply an ASCII file that has certain commands for MS-DOS startup (boot). The boot process is as follows:

1. The disk boot sector is read. This contains enough code to read MS-DOS code and the installation's BIOS (machine-dependent code).
2. The MS-DOS code and BIOS are read.
3. A variety of BIOS initializations are done.
4. A system initialization routine reads the configuration file (CONFIG.SYS), if it exists, to perform device installation and other user options. Its final task is to execute the command interpreter, which finishes the MS-DOS boot process.

D.1 CHANGING THE CONFIG.SYS FILE

If there is not a CONFIG.SYS file on the MS-DOS disk, you can use the MS-DOS editor, EDLIN, to create a file; then save it on the MS-DOS disk in your root directory.

The following is a list of commands for the configuration file CONFIG.SYS:

BUFFERS = <number>

This is the number of sector buffers that will comprise the system list. It is installation-dependent. If not set, 10 is a reasonable number.

FILES = <number>

This is the number of open files that the system calls 2FH through 57H can access. It is installation-dependent. If not set, 10 is a reasonable number.

DEVICE = <filename>

This installs the device driver in <filename> into the system list. (See below.)

BREAK = <ON or OFF>

If ON is specified (the default is OFF), a check for CONTROL-C as input will be made every time the system is called. ON improves the ability to abort programs over previous versions of the MS-DOS.

SHELL = <filename>

This begins execution of the shell (top-level command processor) from <filename>.

COUNTRY = <number>

This number is set by the equipment manufacturer to allow for international date, time, currency, and case conversion. Acceptable values are 1-99. This statement is only supported in versions of MS-DOS that are higher than 2.0.

A typical configuration file might look like this:

```
Buffers = 10
Files   = 10
Device  = \BIN\NETWORK.SYS
Break   = ON
Shell   = A:\BIN\COMMAND.COM A:\BIN /P
```

Note here that the Buffers and Files parameters are set to 10. The system initialization routine will search for the filename \BIN\NETWORK.SYS to find the device that is being added to the system. This file is usually supplied on disk with your device. Make sure that you save the device file in the pathname that you specify in the Device parameter.

This configuration file also sets the MS-DOS command EXEC to the COMMAND.COM file located on disk A: in the \BIN directory. The A:\BIN tells COMMAND.COM where to look for itself when it needs to re-read from disk. The /P tells COMMAND.COM that it is the first program running on the system so that it can process the MS-DOS EXIT command.

APPENDIX B

DISK ERRORS

If a disk or device error occurs at any time during a command or program, MS-DOS returns an error message in the following format:

```
<yyy> error <I/O action> drive <x>  
Abort,Ignore,Retry:_
```

In this message,<yyy> may be one of the following:

```
Write protect error  
Bad unit error  
Not ready error  
Bad command error  
Data error  
Bad call format error  
Seek error  
Non-DOS disk error  
Sector not found error  
No paper error  
Write fault error  
Read fault error  
Disk error
```



The <I/O-action> may be either of the following:

```
READING  
WRITING
```

The drive <x> indicates the drive in which the error has occurred.

MS-DOS waits for you to enter one of the following responses:

- A Abort. Terminate the program requesting the disk read or write.
- I Ignore. Ignore the bad sector and pretend the

error did not occur.

R Retry. Repeat the operation. This response is to be used when the operator has corrected the error (such as with NOT READY or WRITE PROTECT errors).

Usually, you will want to attempt recovery by entering responses in this order:

R (to try again)

A (to terminate program and try a new disk)

One other error message might be related to faulty disk read or write:

FILE ALLOCATION TABLE BAD FOR DRIVE x

This message means that the copy in memory of one of the allocation tables has pointers to nonexistent blocks. Possibly the disk was incorrectly formatted or not formatted before use. If this error persists, the disk is currently unusable and must be formatted prior to use.

APPENDIX C

MS-DOS MESSAGE DIRECTORY

[MS-DOS]	Abort, Retry, Ignore? If a disk or device error occurs at any time during a command or program, MS-DOS returns this message and asks you to abort the command or program, retry it, or ignore the error.
[PRINT]	All files cancelled by operator This message is displayed when you specify the /T switch with the PRINT command.
[CHKDSK]	All specified files are contiguous All files are allocated contiguously on the disk without fragmentation.
[CHKDSK]	Allocation error in file, size adjusted An invalid sector number was found in the FAT. The file was truncated at the end of the last valid sector.
[COMMAND]	Are you sure (Y,N)? MS-DOS displays this message if you try to delete *.* (all files in the current directory). Specify Y (for Yes) or N (for No).
[MS-DOS]	Bad call format reading drive (x:) Device error. See Appendix B.

[MS-DOS] Bad call format writing drive (x:)
Device error. See Appendix B.

[MS-DOS] Bad command error reading drive (x:)
Device error. See Appendix B.

[MS-DOS] Bad command error writing drive (x:)
Device error. See Appendix B.

[COMMAND] Bad command or file name
The command cannot find the file you asked it
to run. You either mistyped the filename or
the file does not exist on the disk.

[MS-DOS] Bad or missing (filename)
You specified an invalid device in the
CONFIG.SYS file. Check the accuracy of the
DEVICE statement in the CONFIG.SYS file.

[MS-DOS] Bad or missing Command Interpreter
MS-DOS cannot find the COMMAND.COM file on
the disk; either the file is missing from
the root directory, or the file is invalid.
Either restart the system or copy the
COMMAND.COM file from your backup MS-DOS
system disk onto the disk used to start
MS-DOS. You will also receive this message
if COMMAND.COM has been moved from the
directory it was originally in when you
started MS-DOS.

[MS-DOS] Bad unit error reading drive (x:)
Device error. See Appendix B.

[MSDOS] Bad unit error writing drive (x:)
Device error. See Appendix B.

[COMMAND] BREAK is off (or on)
This message tells you the current setting of
BREAK.

[CHKDSK] Cannot CHDIR to (filename) - tree past this point not processed
CHKDSK is traveling the tree structure of the directory and is unable to proceed to the specified directory. All subdirectories underneath this directory will not be verified.

[CHKDSK] Cannot CHDIR to root
Processing cannot continue
CHKDSK is traveling the tree structure of the directory and is unable to return to the root directory. CHKDSK is not able to continue checking the remaining subdirectories to the root.

[COMMAND] Cannot do binary reads from a device
This message appears during COPY command processing. The COPY cannot be done in binary mode when you are copying from a device. Remove the /B switch or specify an ASCII copy with the /A switch.

[PRINT] Cannot open (filename)
Either MS-DOS cannot find the specified file to print or the file does not exist. Check the command for a valid filename.

[CHKDSK] Cannot recover . entry, processing continued
The . entry (current directory) is defective.

[CHKDSK] Cannot recover .. entry
The .. entry (parent directory) is defective.

[CHKDSK] CHDIR .. failed, trying alternate method
In traveling the tree structure, CHKDSK was not able to return to a parent directory. It will try to return to that directory by starting over at the root and traveling down.



[COMMAND] Content of destination lost before copy
A file to be used as a source file to the COPY command has been overwritten prior to completion of the copy. Example:
COPY A + B B
which destroys B before it can be copied.

[CHKDSK] Convert lost chains to files (Y/N)?
If you respond Y to this prompt, CHKDSK will recover the lost blocks it found when checking the disk. CHKDSK will create a directory entry and a file for you with the filename FILEnnnn. If you respond N, CHKDSK frees the lost blocks so they can be reallocated.

[DISKCOPY] Copy another (Y/N)?
Respond Y if you wish to copy another disk. Respond N if you do not wish to copy another disk.

[DISKCOPY] Copy complete
DISKCOPY has completed processing.

[DISKCOPY] Copy not completed
DISKCOPY could not copy the entire disk.

[DISKCOPY] Copying...
This message indicates that DISKCOPY is copying a disk.

[MS-DOS] Copyright 1981,82 Microsoft Corp.
This message appears on most MS-DOS utility and command banners.

[COMMAND] Current date is (mm-dd-yy)
This message is displayed in response to the DATE command.

[COMMAND] Current time is (hh:mm:ss. hh)
This message is displayed in response to the TIME command.

[MS-DOS] Data error reading drive (x:)
Device error. See Appendix B.

[MS-DOS] Data error reading drive (x:)
Device error. See Appendix B.

[CHKDSK] Directory is totally empty, no . or ..
The specified directory does not contain references to current and parent directories. Delete the specified directory and recreate it.

[MS-DOS] Disk error reading drive (x:)
Device error. See Appendix B.

[CHKDSK] Disk error reading FAT (x)
One of your File Allocation Tables has a defective sector in it. MS-DOS will automatically use the other FAT. It is a good idea to copy all your files onto another disk.

[MS-DOS] Disk error writing drive (x:)
Device error. See Appendix B.

[CHKDSK] Disk error writing FAT (x:)
One of your File Allocation Tables has a defective sector in it. MS-DOS will automatically use the other FAT. It is a good idea to copy all your files onto another disk.

[DISKCOPY] Disks must be the same size
You cannot copy the contents of a disk with a different format using DISKCOPY. Use the COPY command to copy files onto the disk.

[MS-DOS] Divide overflow
The 8086 has set the divide overflow flag which is usually caused by division by zero.

[CHKDSK] (.) (..) Does not exist
This is an informational message from CHKDSK. This message indicates either the . or .. directory entry is invalid.

[COMMAND] Duplicate file name or File not found
You have tried to rename a file to a filename that already exists or the name you specified could not be found.

[COMMAND] ECHO is off (or on)
This message tells you the current status of ECHO.

[COMMAND] Enter new date:
You must respond to this prompt when you start MS-DOS. Enter the date in a <mm>/<dd>/<yy> format.

[COMMAND] Enter new time:
You must respond to this prompt when you start MS-DOS. Enter the time in the <hh>:<mm>:<ss> format.

[CHKDSK] Entry has a bad attribute (or link or size)
This message may be preceded by one or two periods which indicate which subdirectory is invalid. If you have specified the /F switch, CHKDSK will attempt to correct the error.

[COMMAND] Error in .EXE file
The .EXE file you have asked MS-DOS to load
has an invalid internal format.

[PRINT] (type of error) error reading file
Device error. See Appendix B.

[COMMAND] Error writing to device
You tried to send too much data to a device.
MS-DOS was unable to write the data to the
specified device.

[CHKDSK] Errors found, F parameter not specified
Corrections will not be written to disk
CHKDSK found errors on the disk. If you have
not specified the /F switch, CHKDSK will
continue printing messages but will not
correct the errors.

[PRINT] Errors on list device indicate that it may be
off-line. Please check it
Your printer is offline.

[COMMAND] EXEC failure
MS-DOS either found an error when reading a
command or the FILES statement in the
CONFIG.SYS file is set too low. Increase the
value and restart MS-DOS.

[COMMAND] File allocation table bad
The disk may be defective. Run CHKDSK to
check the disk.

[PRINT] File allocation table bad drive (x:) [CHKDSK]
The disk may be defective. Run CHKDSK to
check the disk.

[COMMAND] File cannot be copied onto itself
The source filename you specified is the same
as the destination filename. Example:
COPY A A.

[EXE2BIN] File cannot be converted
The input file is not in the correct format.

[COMMAND] File creation error
You tried to add a new filename or replace a file that already exists in the directory. If the file already exists, it is a read-only file and cannot be replaced. Run CHKDSK on the disk to determine the cause of the error.

[CHKDSK] (filename) contains non-contiguous blocks
The filename specified is not allocated contiguously on the disk. If you specify the /F switch, CHKDSK will fix this error.

[PRINT] (filename) file not found
You switched disks while a file was queued up, but before it started to print. Reissue the PRINT command for that filename.

[CHKDSK] (filename) is cross linked on cluster
Make a copy of the file you want to keep, and then delete both files that are cross linked.

[PRINT] (filename) is currently being printed
The filename specified is being printed.

[PRINT] (filename) is in queue
The filename specified is waiting to be printed.

[COMMAND] File not found [EDLIN, FC, FIND, RECOVER]
MS-DOS cannot find the file that you specified. Check to see that the pathname is accurate and that the file exists in the directory you specified.

[CHKDSK] First cluster number is invalid, entry truncated
The file directory entry contains an invalid pointer to the data area. If you specified the /F switch, the file is truncated to a zero-length file.

[EXE2BIN] Fixups needed - base segment (hex:)
The source (.EXE) file contained information indicating that a load segment is required for the file. Specify the absolute segment address at which the finished module is to be located.

[COMMAND] FOR cannot be nested
Nesting of FOR statements is not allowed in a batch file.

[FORMAT] Format another (Y/N)?
Type Y (for Yes) to format another disk. Type N (for No) if you do not want to format another disk. If you accidentally type Y, you can abort the format process by typing <CONTROL-C> in response to the "Strike any key to begin formatting" message.

[FORMAT] Format failure
MS-DOS could not format the disk. This message is always displayed in conjunction with an explanation as to why MS-DOS could not format the disk.

[CHKDSK] Incorrect DOS version [EDLIN, FC, FIND, FORMAT, MORE, PRINT, RECOVER, SORT, SYS]
Many version 2.00 utilities will not run on older versions of MS-DOS. The utilities CHKDSK, PRINT, and SYS will only run under the exact version of MS-DOS for which they were configured.

[MS-DOS] Insert diskette for drive (x:) and strike any key when ready
This message appears when MS-DOS is copying and formatting. You should insert a disk in the appropriate drive and press any alpha-numeric key to begin processing.

[COMMAND] Insert diskette with batch file and press any key when ready
You no longer have the disk containing the batch file you specified in the drive you originally specified. Reinsert the disk that contains the batch file in the appropriate drive.

[DISKCOPY] Insert formatted target diskette into drive (x:)
DISKCOPY is ready for a disk in the destination drive. DISKCOPY requires that the destination disk be already formatted.

[DISKCOPY] Insert source diskette into drive (x:)
Insert the disk to be copied into the specified drive.

[DISKCOPY] Insert target diskette into drive (x:)
You are running DISKCOPY and your source and destination drives are the same. Reinsert the destination disk into the specified drive.

[COMMAND] Insufficient disk space [SORT]
The disk is full. It does not contain enough room to perform the specified operation.

[CHKDSK] Insufficient memory [EDLIN, SORT]
There is not enough memory to perform the specified operation.

[CHKDSK] Insufficient room in root directory. Erase files in root and repeat CHKDSK
CHKDSK always recovers lost files into the root directory. In this case, your root directory is full. Delete some files in your root directory to make room for the lost files.

[COMMAND] Intermediate file error during pipe
The pipe operation makes use of temporary files on the disk which will automatically be deleted after the piping process is complete. An error has occurred in one of these files.

[FORMAT] Invalid characters in volume label
The volume label should contain only up to 11 alphanumeric characters.

[COMMAND] Invalid COMMAND.COM Insert COMMAND.COM disk in default drive and strike any key when ready
The application you have just run used up almost all of memory. It is necessary for MSDOS to reload the COMMAND.COM file from disk. However, MSDOS cannot find COMMAND.COM on the disk or the copy found is invalid. Insert a disk into the default drive which contains a copy of COMMAND.COM similar to the version on the disk with which you started MS-DOS.



- [COMMAND] Invalid COMMAND.COM Insert COMMAND.COM disk in drive (x:) and strike any key when ready
The application you have just run used up almost all of memory. It is necessary for MSDOS to reload the COMMAND.COM file from disk. However, MSDOS cannot find COMMAND.COM on the disk or the copy found is invalid. Insert a disk into the specified drive which contains a copy of COMMAND.COM similar to the version on the disk with which you started MS-DOS.
- [MS-DOS] Invalid country code
You have specified a country number in your CONFIG.SYS file which is not in the table of files configured in this implementation of MS-DOS. Country codes must be in the range 1-99. Consult the documentation on CONFIG.SYS for more information on supported countries.
- [CHKDSK] Invalid current directory
Your disk is bad. Replace the disk or make another copy from your backup system disk.
- [COMMAND] Invalid date
You specified an invalid date in response to the date prompt when starting MS-DOS.
- [COMMAND] Invalid device
The device specified was not CON, NUL, AUX, or PRN.
- [COMMAND] Invalid directory
The directory you specified either does not exist or is invalid. Check to see that you entered the directory name correctly.
- [COMMAND] Invalid drive in search path
The drive does not exist.
- [RECOVER] Invalid drive or file name
Specify a valid drive or a valid file name.
- [CHKDSK] Invalid drive specification [COMMAND, DISKCOPY, FORMAT]
Specify a valid drive.
- [COMMAND] Invalid number of parameters [FIND, RECOVER]
You have specified the wrong number of options in the command line.

[CHKDSK] Invalid parameter [COMMAND,
FIND, FORMAT, PRINT]
One of the switches that you have specified
is wrong.

[COMMAND] Invalid path or file name
Specify a valid pathname or filename to the
COPY command.

[COMMAND] Invalid path, not directory, or directory not
empty
You are unable to remove the directory
requested for one of the specified reasons.

[CHKSK] Invalid sub-directory entry
The subdirectory that you specified either
does not exist or is invalid. Check to see
that you entered the subdirectory name
correctly.

[COMMAND] Invalid time
You specified an invalid time in response to
the time prompt when starting MS-DOS.

[COMMAND] Label not found
There is a GOTO command to a nonexistent
label in a batch file.

[EDLIN] Line too long
During a Replace command, the string given as
the replacement caused the line to expand
beyond 253 characters. Divide the long line
into two lines and retry the Replace command.

[PRINT] List output is not assigned to a device
When you first run print, it asks you what
device you want to specify as a print
spooler. This message appears if PRINT is
set up for a nonexistent device.

[COMMAND] Memory allocation error. Cannot load COMMAND,
system halted
Restart MS-DOS. If this error persists, make
a new copy of the MS-DOS disk from your
backup copy of the system disk.

[MORE] --More--
 Press the space bar to view more of the file
 or directory.

[COMMAND] Must specify ON or OFF
 The command requires either an ON or an OFF
 argument.

[PRINT] Name of list device [PRN]:
 This prompt appears when PRINT is run the
 first time. Any valid device may be
 specified and that device then becomes the
 PRINT output device.

[PRINT] No files match d:xxxxxxx.xxx
 A filespec was given for files to add to the
 queue, but no files match the specification.

[COMMAND] No free file handles Cannot start COMMAND.COM,
 exiting
 Restart MS-DOS. If this message persists,
 increase the FILES parameter in the
 CONFIG.SYS file.

[MS-DOS] No paper error writing device (dev)
 Device error. See Appendix B.

[COMMAND] No path
 You have typed PATH<RETURN> to find out what
 your search path is. There is no current
 command search path.

directory but it is full. Subdirectories are not limited in size as is the root directory.

- [MS-DOS] Non-DOS disk error reading drive (x)
Device error. See Appendix B.
- [MS-DOS] Not ready error reading drive (x:)
Device error. See Appendix B.
- [MS-DOS] Not ready error writing drive (x:)
Device error. See Appendix B.
- [COMMAND] Out of environment space
There is not enough room in the program environment to accept more data.
- [FORMAT] Press any key to begin formatting (x:)
This prompt is issued before you format a disk. Press any alphanumeric key to begin the format process. If you wish to discontinue this operation, press <CONTROL-C>.
- [RECOVER] Press any key to begin recovery of the (xxx) file(s) on drive (x:)
This prompt is issued before you recover a disk or file. Press any alphanumeric key to begin the recover process. If you wish to discontinue this operation, press <CONTROL-C>.

[DISKCOPY] Press any key when ready
This prompt occurs when you are copying disks. When you have inserted the disks into the appropriate drives, press any alphanumeric key to begin the DISKCOPY process. If you wish to discontinue this operation, press <CONTROL-C>.

[PRINT] PRINT queue is empty
There are no files waiting to be printed.

[PRINT] PRINT queue is full
There is room for 10 files in the list of files waiting to be printed.

[CHKDSK] Probable non-DOS disk Continue (Y/N)?
The disk you are using is not recognized by this version of MS-DOS. The disk either was created by another system with a format that is not supported on this version of MS-DOS or is not an MS-DOS disk. Do not continue processing if CHKDSK has returned this message for a removable disk. If this message is returned for a hard disk, the information describing the characteristics of the disk to MS-DOS has been destroyed. In this case, you may continue CHKDSK processing.

[CHKDSK] Processing cannot continue
There is not enough memory in your machine to process CHKDSK for this disk. You must obtain more memory to run CHKDSK.

[COMMAND] Program too big to fit in memory
You must acquire more memory to run your application. It is possible that some applications you have run are still using some memory. You may try to restart MS-DOS; however, if you still receive this message, you must acquire more memory.

[MS-DOS] Read fault error reading drive (x:)
Device error. See Appendix B.

[PRINT] Resident part of PRINT installed
This is the first message that MS-DOS displays when you issue the print command. It means that available memory has been reduced by several thousand bytes to process the PRINT command concurrent with other processes.

[MS-DOS] Sector not found error reading drive (x:)
Device error. See Appendix B.

[MS-DOS] Sector not found error writing drive (x:)
Device error. See Appendix B.

[MS-DOS] Sector size too large in file (filename)
The specified device driver loaded by CONFIG.SYS uses a sector size larger than that of any other device driver on the system. You cannot run this device driver.

[MS-DOS] Seek error reading drive (x:)
Device error. See Appendix B.

[MS-DOS] Seek error writing drive (x:)
Device error. See Appendix B.

[DISKCOPY] Source and target diskettes are not the same format. Cannot do the copy
You must have the same size and kind of disks to run DISKCOPY. Example: you cannot copy from a single-sided disk to a double-sided disk. Reformat the target disk to be of the same type as the source disk.

[MS-DOS] Specified COMMAND search directory bad
The SHELL statement in the CONFIG.SYS file is incorrect. The place that you have told MS-DOS to find COMMAND.COM does not exist, or COMMAND.COM is not in that place.

[COMMAND] Strike a key when ready...
This prompt occurs during command processing and is always accompanied by another message. This message is also displayed if you have inserted a PAUSE statement in a batch file. Usually, you are asked to insert disks into appropriate drives before this prompt. Press any alphanumeric key to begin command processing.

[COMMAND] Syntax error [FIND]
Check to make sure that you have typed the command correctly.

[COMMAND] Terminate batch job (Y/N)?
If you press <CONTROL-C> while in batch mode, MS-DOS asks you whether or not you wish to end batch processing. Press Y to end processing. Press N to continue the batch job.

[COMMAND] Unable to create a directory
MS-DOS could not create the directory you specified. Check to see that there is not a name conflict (you may have a file by the same name) or the disk may be full.

[MS-DOS] Unrecognized command in CONFIG.SYS
There is an invalid statement in your CONFIG.SYS file. Refer to Appendix D for a list of valid statements.

[CHKDSK] Unrecoverable error in directory Convert directory to file (Y/N)?
If you respond Y to this prompt, CHKDSK will convert the bad directory into a file. You can then fix the directory yourself or delete it.

[COMMAND] VERIFY is off (or on)
This message tells you the current setting of VERIFY.

[COMMAND] Volume in drive (x:) has no label
This is an informational message displayed in response to the DIR command.

[COMMAND] Volume in drive (x:) is (filename)
This is an informational message displayed in response to the DIR command.



[FORMAT] Volume label (11 characters, ENTER for none)?
This message is displayed when you specify the /V switch in the FORMAT command. Specify a volume label or press <RETURN> to indicate that you do not want a volume label for this disk.

[RECOVER] Warning - directory full
The root directory is too full for RECOVER processing. Delete some files in the root directory to free space.

[EXE2BIN] Warning: Read error in EXE file

The amount read was less than the size of the header. This is a warning message only.

[MS-DOS] Write fault error writing drive (x:)
Device error. See Appendix B.

[MS-DOS] Write protect error writing drive (x:)
Device error. See Appendix B.

[RECOVER] (xxxx) of (xxxx) bytes recovered
This message tells you how many bytes MS-DOS was able to recover of the disk or file.

[PRINT] (filename) cancelled by operator
This message is printed on the printer when you specify the /T switch in the PRINT command.

The following messages are displayed when certain MS-DOS commands have completed processing. These are informational messages only.

```
[CHKDSK]      (xxxx) bytes available on disk [FORMAT]
[CHKDSK]      (xxxx) bytes disk space freed
[CHKDSK]      (xxxx) bytes disk space would be freed
[CHKDSK]      (xxxx) bytes free [COMMAND]
[CHKDSK]      (xxxx) bytes in (yyyy) directories
[CHKDSK]      (xxxx) bytes in (yyyy) hidden files
[CHKDSK]      (xxxx) bytes in (yyyy) recovered files
[CHKDSK]      (xxxx) bytes in (yyyy) user files
[CHKDSK]      (xxxx) bytes in bad sectors [FORMAT]
[CHKDSK]      (xxxx) bytes total disk space [FORMAT]
[CHKDSK]      (xxxx) bytes total memory
[FORMAT]      (xxxx) bytes used by system
[CHKDSK]      (xxxx) bytes would be in (yyyy) recovered files
[COMMAND]     (xxxx) file(s)
[COMMAND]     (xxxx) file(s) copied
[RECOVER]     (xxxx) file(s) recovered
[CHKDSK]      (xxxx) lost clusters found in (xxxx) chains
[CHKDSK]      (filename) contains (xxxx) non-contiguous blocks*
[CHKDSK]      (filename) has invalid cluster, file truncated
[CHKDSK]      Volume (filename) created (mmm dd, yyyy)
```


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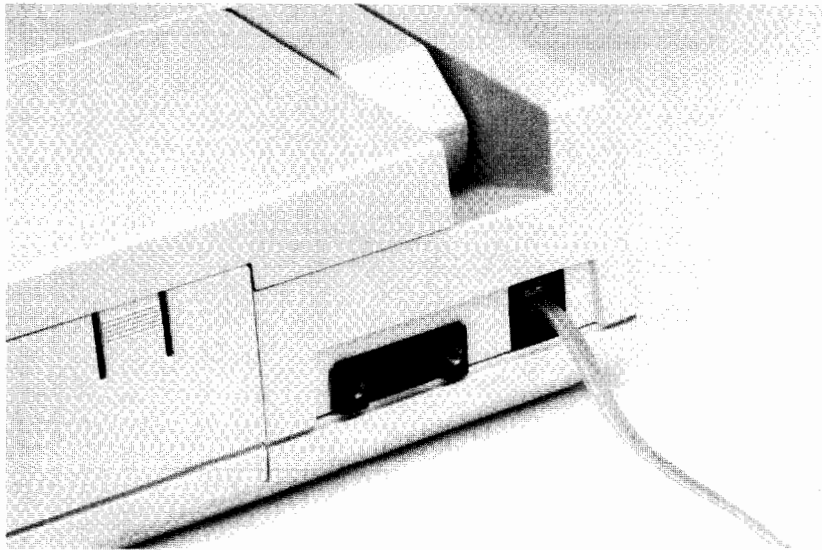
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TERMINAL EMULATOR USER'S MANUAL

Introduction

The Terminal Emulator enables your HP 110 to communicate with other computers using the built-in modem, the built-in serial interface, or the built-in HP-IL interface. (Refer to chapter 3 of the *HP 110 Owner's Manual* for more information about connecting the modem and the interfaces.) The Terminal Emulator supports a direct connection or a telephone connection to a computer. The computer to which you make a connection is usually referred to as the *host computer*. Before making a connection to a host computer you need to know the steps involved in establishing and ending communications. These steps are described in this manual.

For many purposes, the built-in, 300-baud modem can be used.



However, if you want to use a faster modem, such as a 1200-baud modem, you can connect it to the built-in serial interface and use it instead of the built-in modem.

Terminal

If the serial interface is already in use (for example, connected to a printer), you can connect a serial modem to an HP 82164A HP-IL/RS-232-C Interface connected to the built-in HP-IL interface instead. You can also use an acoustic coupler connected to the serial interface or to the HP-IL/RS-232-C Interface on those occasions when you don't have a direct connection available.

For two computers to communicate, they must observe a set of rules—a *protocol*—that dictates when and how two computers talk and listen to each other. For your computer to communicate properly with another computer, both computers must have matched settings that establish the communications protocol.

Before using the Terminal Emulator, you must either be directly connected to a host computer through a serial port or have one of the following connected to a telephone jack:

1. The built-in modem.
2. An external serial modem connected to:
 1. The built-in serial interface.
 2. The HP 82164A HP-IL/RS-232-C Interface which is connected to the built-in HP-IL interface.

The Terminal Emulator assumes you are using the built-in modem unless you specify otherwise in the Terminal Configuration menu.

Configuring the Terminal

The Terminal Configuration menu lists all the parameters that may need changing when you use your HP 110 as a terminal. This menu is used to select the settings appropriate for your host computer. When you press **Terminal Config** ((F5)) for the first time, the menu displays the default values for these parameters.

Terminal

Terminal Configuration

Comment:

Logon String:

Phone Number:

HandShake: None

Parity: Even

Baud Rate: 300

Xmit Pacing: None

Recv Pacing: None

Data Bits: 7

EOL Sequence: CR

Parity Check: On

Echo: Off

Device: Modem

Load File

Store File

Next Choice

Prev Choice

03 11

14:47

Default Values

Help

Exit Config

These default settings are appropriate for many applications such as logging on to Dow Jones News/Retrieval® or THE SOURCEsm. Other computers or information services may require a different configuration. If you use other computers or information services, you should obtain their specifications for remote terminals and select the appropriate device settings in the Terminal Configuration menu.



The following table shows the choices available for each of the device settings.

Terminal	Device Settings	
	Setting	Choices
	Device	MODEM, Serial, HP 82164A.
	Handshake	None, Enq/Ack.
	Parity	Even, None, Odd.
	Baud Rate	300, 110, 134, 600, 1200, 2400, 4800, 9600, 19200.
	Xmit Pacing	None, XON/XOFF.
	Recv Pacing	None, XON/XOFF.
	Data Bits	7, 8, 6.
	EOL Sequence	CR, LF, CR/LF
	Parity Check	On, Off.
	Echo	Off, On.

You can move around the menu using the cursor control keys. You can select one of the choices for any field by pressing **Next Choice** ((f3)) or **Prev Choice** ((f4)).

Most computer systems specify the required settings so you don't need to understand the settings in order to configure your terminal. For those who are interested, appendix A describes the settings in more detail.

Connecting to a Host Computer

To use the Terminal Emulator, select **Terminal** in the main P.A.M. screen. The HP 110 will display the Terminal Emulator program header and prompt you either to enter a terminal configuration file name and press **(Return)**, or to just press **(Return)**. After you press **(Return)**, the Terminal Emulator program starts. You start each terminal operation by pressing a labeled function key. You exit each Terminal Emulator menu by pressing **Exit** (**f8**). You make the function key labels appear and disappear by pressing **Menu**.

Terminal

Before you establish a connection to a host computer, you might need to set some values in the Terminal Configuration menu that define how your HP 110 and the host computer will communicate. The Terminal Configuration menu that the HP 110 first displays is the default Terminal Configuration menu. For many applications using a modem, the settings in the default Terminal Configuration menu are appropriate and do not need to be changed (except for the phone number). If you are using the built-in modem, you might need to simply add a phone number to the menu.

If you are using an external modem, the **Phone Number** field won't be used by the HP 110. For more information about external modems refer to "Using an External Modem," on page 1-19 in this manual.

To establish a connection to a host computer, the Terminal Emulator must be running and a Terminal Configuration menu that matches the settings of the host computer must be active. After the HP 110 confirms that a connection to the host computer has been established, you might need to give the host some account numbers and a password to be able to use it. The process of giving a host computer account numbers and a password is called *logging on*.

Suspending Operations

When you are performing operations on a host computer you might encounter situations in which you would like to stop some operation, such as listing a long file. Most computers enable you to do this at any time by pressing **(Break)**. This sends a break signal to the host, halting its current operation. In most cases this enables you to recover from an error or halt an operation that you no longer want to perform. When you send a break signal, the host computer usually returns you to a level at which you can give it instructions.*

Sometimes when receiving information from a host computer, you might want to temporarily halt the operation but not end it. For example, you might be receiving several pages of text, and would like to halt the transmission occasionally so that you can view some lines. After viewing some lines, you might want to resume receiving text until you're ready to view the next set of lines. In most cases, you can temporarily halt transmission of data by pressing **(Stop)**.† When you want to resume transmission, press **(Stop)** again.

The following table summarizes the operations described above:

Terminal Operation Keystrokes

Keystrokes	Action
(Break)	Sends a BREAK signal to the host computer. This usually halts an operation and sets the host computer to respond to instructions.
(Stop)	<p>Halts transmission of information from the host computer. It does not disconnect you from the host.</p> <p>If transmission is halted, pressing this key resumes transmission of information from the host computer.</p>

* Not all computers respond the same way to a break signal. Therefore, you should refer to the appropriate manual for the host computer or consult the manager of the host system to find out how the host responds to a break signal.

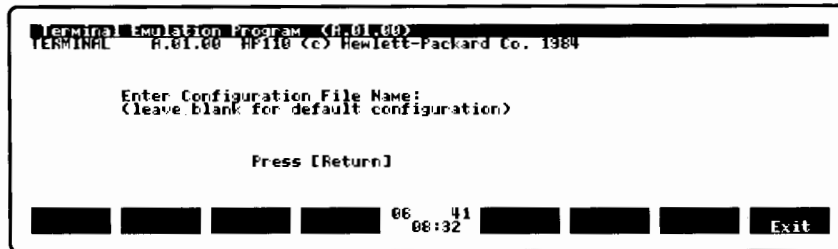
† The **(Stop)** key alternately sends the characters XOFF and XON to the host computer. Pressing **(Stop)** for the first time sends an XOFF. When you press this key again, it sends an XON character, and so on. If you set the Xmit Pacing field in the Terminal Configuration menu to None, the **(Stop)** key will not stop transmission.

Manual Log On Using the Modem

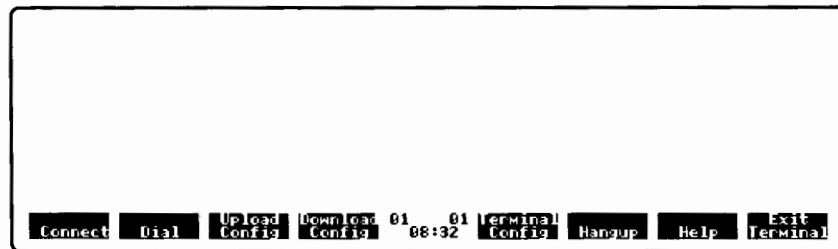
Before you can program the Terminal Emulator to log on to a host computer, you must understand each step in the dialing and log-on procedures for that host.

Example: The following procedure shows how to log on to an information service such as the Dow Jones News/Retrieval. Note that before you can log on to an information service, you must have an account with that service and a TELENET™ or TYMNET™ access telephone number. (The information service that you subscribe to typically provides you with the access numbers in your area.)

1. To begin this procedure, select **Terminal** in the main P.A.M. screen. This gives you the following screen telling you that the Terminal Emulator is running:



2. Press **(Return)** to see the Configurations screen:



3. Press **(f5)** to select the Terminal Configuration menu:

Terminal

Terminal Configuration

Comment:
Login String:
Phone Number:
HandShake: None Parity: Even Device: Modem Baud Rate: 300
Xmit Pacing: None Recv Pacing: None Data Bits: 7
EOL Sequence: CR Parity Check: On Echo: Off

Load File Store File Next Choice Prev Choice 03 11 Default Values Help Exit Config

4. With the tab or cursor keys, move the field selection cursor to the Phone Number field. Type in the phone number for Dow Jones News/Retrieval. The default values are the correct terminal settings in this example, so nothing else needs to be typed on this screen.
5. Press **Exit Config** (**(f8)**) to return to the Configurations.
6. Press **Dial** (**(f2)**) to dial Dow Jones News/Retrieval.

Once the number is dialed, the display

Waiting for carrier...

appears.

The HP 110 waits for a carrier signal for about a minute. If no carrier signal is detected, the system hangs up. To repeat the call, press **Dial** again. When the computer has established a telephone connection, it displays:

CONNECTED

This indicates that a communications link is established between your HP 110 and the telephone network.

7. Now establish a connection to the information service. Then follow the log-on procedures required by the host computer system. In this example, press **(Return)** twice and see:

```
TELNET 503 108L
TERMINAL=
```



Terminal

Now press **(Return)** once more. The display shows:

@

This is a prompt for the address of the host system on the telephone network. The network can connect you with any of several systems, but depending on your location and your log-on sequence, you must specify one system to obtain access to your information service. (The service you subscribe to should give you this information.) In this example you type: **X 99999** (you must enter a space after the **X**) and press **(Return)**. This specifies a system. When prompted to enter the name of the service you want, type: **DJNS** (for Dow Jones) and press **(Return)**. You will then be asked for your password. You must have an account to receive a password on this network. Contact the service you want to buy for information about obtaining an account.

8. After you type your individual password, you will be logged on to the Dow Jones News/Retrieval. You then can enter commands and receive information from the service.
9. When you have completed your operations, you need to log off. To log off (that is, to end the session with the host), follow the log-off procedure for the host computer (for many computer systems you simply type **EYE** or **OFF**).
10. Press **(Menu)** to display the Configurations menu, and press **Hangup** (**f6**) to hangup the phone line and disconnect from the host computer.

The procedure described above illustrates how to manually establish a modem connection and perform a log-on procedure. Other computer systems have different log-on requirements, but the general procedure is similar.

In the example above, we took the following steps in communicating with another computer:

1. Configured the Terminal Emulator. We displayed the Terminal Configuration menu and entered the phone number of the host computer. In this example, none of the settings on the menu needed to be changed.

2. Established the connection to the host computer. We exited the Terminal Configuration menu and pressed **Dial** ((f2)) to establish a telephone connection to the host.
3. Logged on to the host computer. We entered the account information and the password to log on to the computer.
4. Performed operations.
5. Logged off and disconnected from the host computer. We entered commands to log off then pressed **Hangup** ((f6)).

Manual Log On Using the Serial Interface

Some host computers enable direct connections to them through the built-in serial interface of the HP 110. Once you have the serial interface connected to the serial line from the host computer, you can run the Terminal Emulator and log on to the host.

Logging on to a computer through the serial interface is very similar to logging on through a modem. The major difference is that you press **Connect** ((f1)) instead of **Dial** ((f2)).* The following example demonstrates the general procedure for logging on to a computer using the serial interface.

Example: Suppose you want to log on to an HP 3000 computer using your HP 110 and the Terminal Emulator. The computer prompts you for log-on information, then indicates when you have successfully logged on.

1. To begin, ensure that the serial interface cable is connected to the serial port and to an HP 3000 serial line.
2. Select **Terminal** from the main P.A.M. screen. The Terminal Emulator program header is displayed.
3. Press **Return** to display the Configurations menu, then press **Terminal Config** ((f5)) to display the Terminal Configuration menu. Since you are using a direct line to the host computer and not a modem, don't enter a phone number.

* The **Connect** key simply opens the serial port to the device that is connected to the port. If you press **Connect** when using the built-in modem (rather than the serial interface), and a carrier tone is detected, you will be connected to the host; if no carrier tone is detected, you will get an error message.

4. The Terminal Configuration menu should have the following settings:

Terminal Configuration					
Comment:					
Logon String:					
Phone Number:					
HandShake:		Enq/Ack	Parity:	None	Device: Serial
				Baud Rate:	2400
Xmit Pacing:		XON/XOFF	Recv Pacing:	XON/XOFF	Data Bits: 7
EOL Sequence:		CR	Parity Check:	Off	Echo: Off
Load File	Store File	Next Choice	Prev Choice	03 14:43 11 Default Values	Help Exit Config

Terminal

5. Press **Exit Config** ((f8)).
6. Press **Connect** ((f1)) to establish contact with the HP 3000.
7. The HP 3000 may expect you to enter a log-on sequence. Your log-on sequence might contain the word HELLO and some account information.

:HELLO USER.ACCOUNT

Type in your log-on sequence and press **Return**.

8. The host computer prompts you for a password:

ENTER GROUP PASSWORD:

Enter your password and press **Return**.

9. The host computer displays some information to indicate that you successfully logged on. For example, it might display:

MPE IV C.A1.01. WED, DEC 14, 1983, 10:39 AM

:

You are now logged on to the HP 3000 and can begin your work.

Automatic Log On

Rather than performing the log-on procedure manually whenever you want to establish a connection to a computer, you can store a *log-on string* and an encoded telephone number in a Terminal Configuration file. The HP 110 then automatically performs the log-on operations for you after establishing a connection with a host computer. This feature is useful when you log on to the same systems frequently and don't want to key in configuration and log-on information each time.

The Log-on String. The log-on string is a series of instructions that tells the HP 110 what prompts to expect from the host computer and what information to send in response to those prompts.

To create a log-on string:

1. Press **Terminal Config** (**(f5)**) when the Configurations menu is displayed. This shows you the Terminal Configuration menu.
2. Use the tab or cursor keys to set the field selection cursor to the `Logon String` field. Enter the log-on string into this field.
3. If your log-on string is longer than the `Logon String` field, use MemoMaker to create a text file containing the log-on string, then enter the name of that file in the `Logon String` field.

The following table shows the characters allowed in a log-on string and their meanings.

Valid Log-on String Elements

Element	Description
E	Transmits the current End-of-Line sequence to the host computer.
Wx	Waits for x seconds before proceeding. No space is allowed between the W and the numeral. x can be a value from 0 through 9. If x is 0, the number of seconds is 10.
"string"	A string of characters such as an ID number or a password. Spaces can be used in the string. The string must be enclosed in quotes.
{string}	Specifies a prompt string that the Terminal Emulator is to wait for. The prompt string must be enclosed in a set of opening and closing braces ({ }). The braces tell the HP 110 that this is a prompt to wait for. If the Terminal Emulator searches through more than 250 characters received from the host before finding the specified string, an error occurs.
<file name>	Indicates the file in which to find the log-on sequence. A text file can contain a log-on sequence when it is too long to fit within the Logon String field of the Terminal Configuration menu. If used, it must be the only item in the Logon field. Also, it must begin with the character "<" and end with ">". Otherwise, an error results.

Terminal



In the example beginning on page 1-7, you logged on to Dow Jones News/Retrieval, pressed **(Return)** twice and waited for the prompt `TERMINAL=`. The first part of the log-on string includes `EE` and a prompt:

```
EE<TERMINAL=>
```

Your reply to this prompt was to press **(Return)**. So the string becomes

```
EE<TERMINAL=>E
```

The next prompt received from the host computer is `@`, to which you replied with `% 99999`. After several moments, the service prompted you for an ID number and a password. After sending the host address, the HP 110 should wait 3 seconds, send `DJNS`, wait 3 more seconds, then send the ID number. The full string now becomes:

```
EE<TERMINAL=>E<@>"% 99999"EW3"DJNS"EW3"ID xxxxxx"
```

In this string, `xxxxxx` represents the ID number. After the HP 110 executes the log-on string, you must enter the password.

When entering prompts into the log-on string, the entire prompt is not necessary. The prompt you enter is simply a string that the HP 110 searches for before sending out the next piece of information, so you can enter only the first few characters of the prompt. For some host systems, it is necessary to include a wait between the prompt and response.

The Phone Number Field. When you dial a phone number that contains a prefix, you sometimes must dial the prefix and wait for a second dial tone before you dial the rest of the phone number. You can specify pauses between dialed numbers by inserting special characters into the phone number. (Remember that the Terminal Emulator auto-dial feature works only with the built-in modem.)

The following table shows the characters that can be included in a phone number and the effects they have:

Valid Phone Number Elements	
Element	Description
0 through 9	Dials the number.
, (comma)	Specifies a pause of about 1 second.
K	Specifies a pause of about 5 seconds.
O	If it is the first character in the phone number, it sets the modem to Originate mode. If it is not the first character, it is ignored. (Default value)
A	If it is the first character in the phone number, it sets the modem to Answer mode. If it is not the first character, it is ignored.
P	Selects pulse dialing.
T	Selects tone dialing. (Default value)

All other characters in a phone number are ignored.

Originate and answer modes are distinguished by the tone sent and by when they initiate a carrier. In originate mode, the modem waits for a valid carrier on the line before sending its own signal.

In answer mode, the signal is raised immediately, and it waits for the returning signal.

In both cases, if there is no response after one minute, the computer will hang up.

By placing an A (for answer mode) followed by a phone number in the phone number field on the Terminal Configuration menu, the Terminal Emulator will dial the number and raise a carrier signal. In this way, you can call an originate-only modem.

Example. Suppose you want the Terminal Emulator to set the modem to Originate mode, dial 9 for an outside line, wait 5 seconds, dial a prefix, say 115, wait 3 seconds, and dial a 7-digit number, say 111-9990. Using the characters in the table above, the phone number would be:

09K115,,,111-9990*

By including a F or T in the phone number, you select either pulse dialing or tone dialing (default). Check with your local telephone company for information about the capabilities of your local access line.

Calling the Terminal Emulator From P.A.M. and MS-DOS. If you regularly use the Terminal Emulator to communicate with a computer system, you can create an application in the P.A.M. screen that, when selected, runs the Terminal Emulator and automatically establishes a connection to the host. To do this, follow the instructions under “Installing Application Programs in P.A.M.,” in chapter 2 of the *HP 110 Owner's Manual*.

Two lines are used for each application you want to add on the P.A.M. screen. In the first line enter a label for this program. In the second line type `TERMINAL /t file name /d file name /u file name`. The *file name* following `/t` is the name of a Terminal Configuration file. The *file name* following `/d` is the name of a Download Configuration file, and the *file name* following `/u` is the name of an Upload Configuration file. (Upload and Download Configuration files are described under “Transferring Files,” on page 1-20.) The Terminal Configuration file, Download Configuration file and Upload Configuration file are optional.

Example: Create a P.A.M. screen application that runs the Terminal Emulator and logs the HP 110 on to THE SOURCE. You must first create a Terminal Configuration file, save it (described below), and optionally create Upload and Download Configuration files. Name the Terminal Configuration file `TSOURCE.CNF`, name the Download Configuration file `DSOURCE.CNF`, and name the Upload Configuration file `USOURCE.CNF`. This gives us the following lines of a P.A.M. application:

```
#Call THE SOURCE.
CALL SOURCE
TERMINAL /T TSOURCE.CNF /D DSOURCE.CNF /U USOURCE.CNF
```

Now when the P.A.M. screen is displayed, you can move the pointer to **CALL SOURCE** and press **Select** to run the Terminal Emulator and call THE SOURCE.

* The O for originate is not required, because it is the default value.

The last line in the P.A.M. application above is an MS-DOS command. If you prefer, you can execute it from the keyboard as an MS-DOS command rather than using a P.A.M. application.

Saving the Configuration

After creating the proper configuration, building the log-on string and entering a phone number into the Terminal Configuration menu, you can save the information in the menu for future use. To do this, go to the Terminal Configuration menu and press **Store File** ((f2)). The function key labels are replaced by a prompt for a file name. The computer is

prompting you to name a file in which to store the terminal configuration

information. Type a valid file name and press **Return**. The information in the Terminal Configuration menu is now stored.

To call this file press **Load File** ((f1)). The HP 110 will prompt you to enter a file name. Key in the file name and press **Return**. The information in the specified configuration file is loaded into the Terminal Configuration menu. Using this method you can save several configuration files and call up the one for the system you want to use.

When naming configuration files, it's a good idea to give them extensions so that they can be easily identified in the directory. For example, a terminal configuration file name could be DJNS.CNF, where the extension CNF stands for "Configuration File."

If there is one system you use all the time, you can have the HP 110 begin the log-on sequence automatically for you. Name the terminal configuration file AUTOLOG.CNF. When you select the Terminal Emulator program from the main P.A.M. menu, it will find AUTOLOG.CNF and log on for you.

If the HP 110 can't complete the log-on procedure from the information given in the configuration file, it will notify you and instruct you to press a key to resume operations. If it does not receive a prompt for which it is waiting, you can return to the Terminal Emulator by pressing **Exit** ((f8)). The Terminal Emulator will not detect a loss of carrier while executing an automatic log-on procedure.



Hanging Up

After completing a session with a host computer, you should log off the host and, if you are using a modem, hang up. To hang up, have the Terminal screen showing, and press **Hangup** ((f6)).

It is possible to leave the Terminal Emulator program without breaking your connection to a host computer. You might want to leave the Terminal Emulator for a few moments when you need to do some calculations, examine a file, or perform some other operation, then return to the Terminal Emulator and continue operations with the host computer. To exit the Terminal Emulator without breaking a connection to a host, press **Exit Terminal** ((f8)).

When you want to return to the Terminal Emulator, select **Terminal** from the main P.A.M. screen (this runs the Terminal Emulator again) and from the Configurations menu press **Connect** ((f1)). You can then resume operations with the host computer.

Note: When you exit the Terminal Emulator without breaking the connection to the host computer, you are still logged on. In this case, you might use computer time unnecessarily if you take a long time to return to the Terminal Emulator. If you leave the Terminal Emulator without breaking the connection to the host, don't forget to run the Terminal Emulator again and log off.

Automatic Answering

The HP 110 not only has the ability to place calls to other computers, it can answer calls as well.

There are three ways the HP 110 can respond to a call. In all cases, you must be in P.A.M.:

1. When the phone rings, the HP 110 automatically looks for a file called `AUTOANSR.BAT` and follows the instructions in that file. This file, created by you, contains answering instructions for the HP 110.
2. When the phone rings, type the command `terminal /a` into the command line, telling the HP 110 to go into the Terminal Emulator and answer the phone.

3. When the phone rings, type `terminal /t file name`. The HP 110 will go into the Terminal Emulator and use the file specified to configure the terminal. The Phone Number field should contain only an `A`, so the system will answer the phone.

If the phone rings while the HP 110 modem is connected to a phone jack, you will hear a low beep for every ring of the phone.

If the HP 110 is off, the ringing phone turns the computer on.

If you are in the Terminal Emulator, the computer does not respond to the buzz. You will not hear the phone ring.

If you are in an application other than the Terminal Emulator, you will hear the phone buzz. If you wish to respond to the ringing phone, you must go out of the application and in to P.A.M. If the phone is still ringing, the computer will look for `AUTOANSR.BAT`, or if this file doesn't exist, you can use option 2 or 3 above.

`AUTOANSR.BAT` should have a minimum of the following lines:

1. `terminal /a`. Tells the HP 110 to go into the Terminal Emulator and answer the phone.
2. `CTTY AUX`. Allows the calling machine to take control of the HP 110.
3. `COMMAND`. Invokes the MS-DOS command interpreter. The last line sent by the caller must be `exit` which will cause an exit from MS-DOS and the next line in `AUTOANSR.BAT` to be executed.
4. `terminal /h`. Tells the HP 110 to go into the Terminal Emulator and hang up. Control returns to P.A.M.

Line 4 is important because it leaves the HP 110 in P.A.M. so that another phone call can be taken.

Using an External Modem

To use an external modem with the Terminal Emulator, press **Connect** (**f1**) from the Configurations menu. If the external modem is properly installed, the Terminal Emulator informs you when it has established a connection to the modem. You can then enter commands from the keyboard to operate the modem. The settings displayed in the Terminal Configuration menu have no effect on an external modem, *except* that information in the `Logon String` field is sent to the modem when you press **Connect** (**f1**) from the Configurations menu.

By entering modem commands in the `Logon String` field of the Terminal Configurations menu, you can use the automatic log-on features of the Terminal Emulator to operate an external modem. (Remember that the `Phone Number` field in the Terminal Configuration menu is used to dial a number using the built-in modem only.)

Example: You want to log on to Dow Jones News/Retrieval using an external modem that has auto-dial capabilities and is connected to the built-in serial interface. In the Terminal Configuration menu the `Device` field should be set to `Serial`.

For some external modems, the command `AT` sets the modem to respond to further commands, and `D` sends the instruction to dial a number.

Thus, in this example, the first characters in the `Logon` field of the Terminal Configuration menu should be: `AT D`. Then enter the phone number that you would normally put into the `Phone Number` field if you were using the internal modem. This information is added to the front of the log-on string you used when calling DJNS in the first example under “Automatic Log On,” on page 1-14. When the modem has established a connection, it responds with the message: `CONNECTED`. The log-on sequence should wait for this message. The log-on string becomes:

```
"AT Dnnnnnnnnnn"E( CONNECTED )EE( TERMINAL= )E( @ )
"X 99999"EW3"DJNS"EW3"ID xxxxxx"E
```

where `nnnnnnnnnnnn` represents the phone number of the service.

Transferring Files

When communicating with another system, you might want to transfer files either to or from the host using the Terminal Emulator. Downloading is the act of transferring information from a host computer to your local terminal. Uploading is the act of transferring information to the host from your local terminal.

Information can either be “captured” as it is sent to the terminal and stored in a file, or files can be transferred using the Modem7 protocol, which checks for transmission errors in files as they are received. Modem7 is a public domain program that enables two computers to transfer files and check for errors. The protocol used by this program is referred to as the *Modem7 protocol*. Refer to appendix B for information about the HP 110 implementation of Modem7 protocol.

Note: If you intend to use the Modem7 protocol for transferring files between the HP 110 and the host computer, ensure that the host computer can use this protocol. If the host computer doesn't use this protocol, check with the computer system manager to see if Modem7 can be obtained as a file transfer protocol (FTP) for the host system.

From the Terminal menu you can select the Upload or Download Configuration menu by pressing **Upload Config** ((f3)) or **Download Config** ((f4)).

Upload and Download Configuration Menus

Specifying From and To Files. Type into the `From file` field the name of the file to be sent. Type into the `To file` field the name of the file in which to store the information.

Specifying File Type. For most applications, set this field to `7-bit Text`. (This is the default setting.) For some applications, such as transmitting binary data using Modem7, this field should be set to `Binary`.

Remote Invocation. For many UNIX™ systems (or remote CP/M® systems) this field should be `umodem`. This tells the host system that you are using the Modem7 protocol.

If you are using another protocol, enter into this field the command that tells the host computer to use that protocol.

If you are using data capture (that is, using no protocol), enter into this field the commands that tell the host computer to send the file by the name specified in the `From Remote File` field. (An example of this is shown under "Downloading Files," on page 1-22.)

Command Options. If you are using the Modem7 protocol, enter the host's command options. If you are using some other protocol, the information in this field is transmitted to the host system after the remote invocation string.

Protocols. When set to `On`, protocols are enabled. When set to `Off`, protocols are disabled and data capture is enabled. Protocol off means that a file is being sent or received byte for byte. Thus, transfer of binary files will probably not succeed because a file also contains control characters. These characters will be sent to the host along with the rest of the file and the host may act on these characters. The keyboard is live, so keys that are pressed are transmitted to the host.

On the Upload menu, there is an additional option, `HP Prompt`. This option transfers the next character only after the previous character has been echoed. Use this option to upload text files to an HP3000. (On the HP3000, you should be in the Editor subsystem with append mode on.) The keyboard is not live in this protocol.

Overwrite Permission (on the Download Configuration menu only). When set to `On` this enables the HP 110 to overwrite an existing file. That is, if the local file you specify already exists, it enables the HP 110 to write over it with new information from the host computer.

Storing and Retrieving the Menus. You can save and retrieve Upload and Download Configuration menus in the same way that you store terminal configuration menus. For example, when you press `Store File` (`(f2)`), the HP 110 prompts you for a file name in which to store the configuration information. Enter a file name and press `(Return)`. You retrieve a file by pressing `Load File` (`(f1)`), entering a file name at the prompt, and pressing `(Return)`.

Downloading Files

Downloading. When you are communicating with a host computer (and the Terminal menu is active), you can download information to an HP 110 file by pressing `From Host` (`(f1)`). This displays a new function key menu and initiates the file transfer according to the active Download Configuration menu. When the file transfer is complete or you want to end the transfer early, press `Exit` (`(f8)`) to return to the Terminal menu.

Data Capture. If you log on to a news service and want to capture information as it is displayed, use the following settings on the Download Configuration menu: Leave the `From Remote File` field blank. Select a file in which to store the incoming information by typing its name in the `To Local File` field. Select any file type you want, leave the `Command Options` field blank, and set the `Protocols` field to `off`. In the `Remote Invocation` field you should type the command that the host system needs to begin transferring information.

Example: You are connected to THE SOURCE and you want to download the instructions for the mailgram program into a file named `mgram`.

1. Type `MGRAM` in the `To Local File` field.
2. The command for sending the instructions for the mailgram program is `MGRAM INSTRUCT`. Type `MGRAM INSTRUCT` in the `Remote Invocation` field.
3. Exit the Download Configuration menu and press `From Host` (`(f1)`). The Terminal Emulator sends the `MGRAM INSTRUCT` instruction to THE SOURCE. THE SOURCE then sends the file containing the mailgram instructions to your HP 110. As the file is displayed on the terminal, it is stored in the file `MGRAM` in your HP 110.
4. Press `Exit` (`(f8)`) to end the downloading session, and return to the Terminal menu. (This takes about 10 seconds to ensure that no more information is being transmitted.)

Terminal

Uploading Files

To transfer a local file to the host computer:

1. Be sure that the Upload Configuration menu is properly configured. If you are not using the Modem7 protocol when uploading a file, set `Protocols` to `Off`. If you are uploading to an HP3000, set `Protocols` to `HP Prompt`. In the `Remote Invocation` field, enter the commands that instruct the host computer to receive a file from the HP 110.
2. In Terminal mode, press `To Host` (`(f2)`). Information is transferred to the host computer.
3. When the transfer is complete, press `Exit` (`(f8)`) to return to the Terminal menu.

Using An Acoustic Coupler

Terminal

The built-in modem on the HP 110 is a *direct connect* modem in that it connects directly into a telephone outlet. Another type of modem you can use is an *acoustic coupler*. With an acoustic coupler, you manually dial the phone number of the host computer then insert the telephone handset into the *acoustic cups* of the coupler. Instructions for using an acoustic coupler are usually included with the coupler.

To use a serial acoustic coupler with the HP 110:

1. Connect the coupler to the built-in serial interface or to the HP-IL/RS-232-C Interface as described in chapter 3 of the *HP 110 Owner's Manual*.
2. Dial the number for the host computer and listen for the carrier signal. It is a high-pitched tone that the coupler recognizes.
3. Insert the telephone handset into the acoustic cups of the coupler.
4. With the Configurations Menu showing on the display, press **Connect** (**f1**).
5. When the serial port is open the HP 110 will display **Connected**. You can now log on to the host computer.

TERMINAL CONFIGURATION SETTING DESCRIPTIONS



This appendix describes the device settings on the Terminal Configuration menu. You do not need to know what these settings mean to properly adjust them for most host computers. However, sometimes you might not have all the specifications for the host computer. You might therefore need to experiment with the settings until you can communicate with your computer. Understanding what these settings mean can help you determine the right settings for the host when its specifications aren't known.

HandShake. The *handshake* is a communications protocol used by two computers. It establishes how and when one computer sends information and the other receives it. Your choices for handshake are *none* and ENQ/ACK.

Under the ENQ/ACK protocol, the computer that is sending information controls the timing and amount of data sent. When the sending computer transmits a section of information, it sends an ENQ (enquire) character. The receiving device sends back an ACK (acknowledge) character when it is ready for more information. Upon receiving the ACK, the sending computer can send more information.

- **Parity.** *Parity* is an *equivalence* that is set in every byte of data by a sending device and optionally checked by a receiving device. This helps to ensure that the data is received as sent.

In *even parity* the sending device sets the most significant bit of each byte if the number of remaining bits set is odd. This ensures that each byte sent has an even number of bits set. In respect to the number of bits set, all bytes are *equivalent*. The receiving device simply checks to ensure that an even number of bits are set. If an odd number of bits are set, then a *parity error* occurs. The receiving device can then respond to the parity error.

Odd parity works similarly. In this scheme, the most significant bit of a byte of data is set if there is an even number of bits set in the remainder of the byte. This ensures that an odd number of bits is always sent.

Baud Rate. This commonly refers to the number of bits per second that can be transmitted and received by a communications device. Two devices communicating with each other must use the same baud rate. Technically, a baud is a unit of signalling speed equal to the number of discrete conditions or signal events per second. This is not necessarily the same thing as bits per second (BPS). In common usage though, baud rate is used in a context that implies bits per second. (Refer to “Data Bits,” below.)

Xmit Pacing. In data communications, most sending devices respond to a signal from a receiving device to halt transmissions. They also respond to a signal to resume transmissions. These two signals are actually the ASCII characters DC1 and DC3. These represent *transmission on* (XON) and *transmission off* (XOFF) respectively. You can enable the HP 110 to transmit these characters to a host computer by setting the `Xmit Pacing` field to `XON/XOFF`. You can disable the HP 110 ability to send these characters by setting the `Xmit Pacing` field to `none`.

Recv Pacing. Setting this field to `XON/XOFF` enables the ability of the HP 110 to respond to `XON` and `XOFF` characters sent by a host computer. With `XON/XOFF` set, when the HP 110 receives an `XOFF`, it stops transmitting data. When it receives an `XON`, it resumes transmission.

Data Bits. Each byte of data contains several binary digits called bits. Each unit of data sent is represented by a byte. Some computers send bytes that contain eight bits. Some use bytes that contain seven bits and some use six bits. The `Data Bits` setting should match the number of bits transmitted in each byte of data by the host computer.

EOL Sequence. A sequence of characters represents the end of a line of data or text. Typically, a carriage return (taken from the carriage on a typewriter or a printer, indicated by CR) or a linefeed (advance the paper up one line, indicated by LF) represent the end of a line. Most commonly, these two characters together represent the end of a line.

The *end-of-line* (EOL) sequence is sent by the HP 110 whenever you press `(Return)`. You might need to select an EOL sequence to match the host computer. You can select `CR/LF` (sends both a carriage return and linefeed), `CR` (sends a carriage return only), or `LF` (sends a linefeed only). The default is `CR`.

Parity Check. Setting the Parity Check to `On` enables the HP 110 to check incoming data bytes for parity errors. It checks bytes according to the parity setting. When `Parity Check` is set to `Off`, the HP 110 ignores the parity of incoming data bytes.

Echo. When you send information to a host computer, it can return that information, indicating that it received your transmission. For example, when you are logged on to a computer, the characters you see typed on the display are actually the characters the host computer echoes back to you (assuming that it has an echo capability). Some host systems don't have an echo capability. The HP 110 can provide its own echo when the host system doesn't have it. (Computer systems that don't have echo capability usually operate on a half-duplex line.)

For most applications, `Echo` should be set to `Off`. However, if the host computer doesn't have echo capability, you won't be able to see what you type when logged on unless `Echo` is set to `On`.

**HP 110 IMPLEMENTATION OF
MODEM7 PROTOCOL**

The protocol used by the HP 110 is a block protocol, and is designed to transfer files in 128 byte blocks. A block number and checksum are included along with the data to help guarantee that the data is received correctly.

The block protocol operates as either 8-bit or 7-bit protocol. The line format is set to 8-bit, no parity, with one stop bit prior to file transmission and is restored to its original state after completion of transmission or user termination of transmission.

Each block of data being transferred is in the following format:

`<soh> <blk#> <255-blk #> <--128 data bytes--> <cksum>`

where:

<code><soh></code>	= 01H.
<code><blk #></code>	= binary number, starting at 01, incrementing by 1. 0FFH wraps to 00H.
<code><255-blk #></code>	= 1's complement of the block number, for an 8-bit machine.
<code><cksum></code>	= 8 bit sum of all the data bytes only; toss any carry.

All transmission errors are retried 10 times before the file transfer is aborted.

The following outlines what the program on the receiving end of the file transfer does:

- The receiver has a 10-second timeout while waiting to receive a block. Each time the receiver times out, it sends a `<nak>` to the sender program, and increments its error counter. The first time the receiver times out and sends the `<nak>`, it acts as a signal to the sender program to start the transfer.

- Once the receiver begins receiving a block, the receiver goes into a one-second timeout for each character and the checksum. If the receiver wishes to <nak> a block for any reason, it must wait for the line to clear.
- If the block numbers get out of synchronization in such a way that recovery is impossible, or if a problem arises with the mass storage device, the receiver program will wait for the line to clear, then send a <can>, thus aborting the transfer.
- When a block is received correctly, the receiver sends an <ack> to the sender program. When an error occurs, the receiver sends a <nak>, requesting retransmission of the block.

The following outlines what the program on the sending end of the file transfer must do:

- While waiting for the signal from the receiver (a <nak>) to begin transmission, the sender waits in a one-minute timeout. If the sender is not told to start within the one-minute timeout, it aborts the file transfer.
- Once the sender receives the signal to start, it will transmit a block of data, then wait for the receiver to transmit back either an <ack>, a <nak> or a <can>. If an <ack> is received, the sender transmits the next block. If a <nak> is received, the previous block will be re-transmitted. If a <can> is received, the file transfer is aborted.
- If the sender program encounters a mass storage problem, it will cancel the file transfer by sending a <can> to the receiver.
- The last block of data should contain an end-of-file character (^Z). After the last block has been correctly transmitted, an <eot> is sent, signaling the end of transfer. The sender waits for the receiver to send an <ack> signaling that it is done also.

Special characters:

```
<soh> = 01H
<eot> = 04H
<ack> = 06H
<nak> = 15H
<can> = 18H
<^Z> = 1AH
```

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MemoMaker User's Manual

For the HP 110 Portable Computer

Reorder Number
00090-90019

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INTRODUCING MEMOMAKER

Make a Memo

Welcome to the HP 110 MemoMaker.

MemoMaker is a simple yet powerful word processor for people who need to write although their primary occupation is not writing. MemoMaker is intended especially for managers and professionals who need to write occasionally to do their jobs.

When you use MemoMaker, what you see is what you get. When you print what you have typed, the printed text looks exactly like the displayed text. This means that formatting is simply a matter of getting your document to “look right” in the display.

MemoMaker Requirements

- HP 110 Portable Computer
- Printer (Necessary *only* if you want to print a document.)
- External disc drive (Necessary *only* if you want to make an external disc copy of a file for archive or transfer to another computer.)

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HOW TO USE THIS MANUAL



Why does a product that takes such a short time to master have such a long manual? One reason is that most of the manual is designed to be used as a desktop or bookshelf reference, not to be read a page at a time. But the main reason is that the manual is written with a number of different readers in mind—as “all things to all people.”

Overview of the MemoMaker Manual

Like MemoMaker itself, this manual about MemoMaker is designed for easy use:

Chapter 1, “Getting Started,” teaches you how to use MemoMaker competently; that is, well enough for it to be useful to you and well enough so that you can begin to teach yourself how to use it expertly.

Chapter 2, “MemoMaker Procedures,” contains step-by-step descriptions of all the basic MemoMaker procedures. It serves as a review of the procedures you learned in chapter 1. It is an advanced tutorial that goes beyond chapter 1 to describe less common MemoMaker procedures, and serves as a how-to-do-it checklist for experienced MemoMaker users who need to refresh their memories.

Chapter 3, “For Your Reference,” describes the arrangement of the rest of the manual and defines some important terminology.

Chapter 4, “A Guide To Using the Display and Help Options,” discusses the MemoMaker display and Help information.

Chapter 5, “MemoMaker Key and Function Dictionary,” contains an alphabetical dictionary of information on the MemoMaker keyboard and function key selections.

Chapter 6, “MemoMaker Files,” contains information on drives, discs, directories, the file manager, special files, and file names.

Appendix A, “In Case of Difficulty,” explains the warnings MemoMaker may give you—by displaying messages or issuing a beep—when you may be about to do something the wrong way. The appendix also tells you how to respond to the warnings.

Appendix B, “MemoMaker and WordStar®,” shows you how to use MemoMaker with WordStar®.

Getting the Most Out of the MemoMaker Manual

If you have never used a word processor before, finish this introduction, then complete chapter 1, “Getting Started.” Then leaf through the rest of the manual to see what’s in it, paying particular attention to chapter 2, “MemoMaker Procedures.” If you need training wheels, keep chapter 2 open beside you. You should also read chapter 3, “For Your Reference.”

If you are new to MemoMaker but not to word processing, you may not need chapter 1, “Getting Started.” Leaf through the rest of the manual to see what’s in it, then leaf through chapter 1 to see whether it would be useful or interesting to you. If it is not, read through “Getting Lost and Getting Help” beginning on page 4-3. Then use the Help displays and chapter 2 to help you to put MemoMaker to work.

If you know how to use MemoMaker, but not how to perform a specific MemoMaker procedure, turn to the alphabetical directory of MemoMaker procedures on page 2-2 to get further guidance.

If you know how to use MemoMaker, but now need to get some other specific information about it, use the following resources to find your way around the manual:

- The table of contents.
- The subject index.
- The overview provided earlier (pages vii and viii).
- The colored tab printed on the edge of each page in chapters 1 through 6, and the appendices.

If you use WordStar®, but need to work with someone who is using MemoMaker, turn directly to appendix B, MemoMaker and WordStar®.

If you need to know how to print documents (make *hard copies*) with MemoMaker, but not how to compose with it, read “Print the Document; in the Workspace” (page 2-15). You may also want to read the descriptions of the printing function keys in chapter 5, “MemoMaker Key and Function Dictionary.”

GETTING STARTED

Lesson 1: Starting From Square One**How To Start MemoMaker**

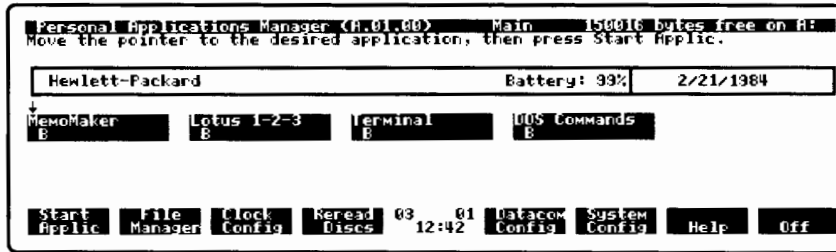
This lesson serves as a checklist of the things you need to have done, and the things that have to be just so, before you can begin learning how to use MemoMaker. The items on the list are ordered by number—you need to follow the order. And you need to be able to say “Yes, I have” or “Yes, it is” to each of the items before you can get off Square One, and proceed with MemoMaker.

1. If your HP 110 Portable Computer hasn’t been set up, set it up. Instructions are in your *HP 110 Owner’s Manual*.
2. If you have a printer to connect to your HP 110 computer and it isn’t now connected to it, connect it. (Refer to chapter 3, “Using the HP 110 With Peripherals” in your *HP 110 Owner’s Manual*, and to the owner’s manual you received with the printer.)

Note: When you plan to use a printer during a MemoMaker session, you should plug in and turn on the printer *before* starting MemoMaker.

3. Turn on the HP 110 display.

At this point, you should be looking at a display identical or similar to the following P.A.M. display:



The display you are looking at need not be identical, because, if you are using an external disc drive, your MemoMaker work disc can be on another drive besides drive A. (Also, there can be other applications listed on the display beside MemoMaker, Lotus®, and Terminal Emulation.)

4. Start MemoMaker. (If you need instructions on starting an application, refer to “What Does P.A.M. Do?” in section 2 of your *HP 110 Owner's Manual*.) After you have started MemoMaker, you should be looking at a display similar to the one below:



Pressing almost any key replaces the copyright information in the header with a label identifying the current function key menu; in this case, **MAIN Keys**.

With MemoMaker started, for the time being your HP 110 is a machine for running MemoMaker and no other application. You will have to exit MemoMaker before you can start any other application.

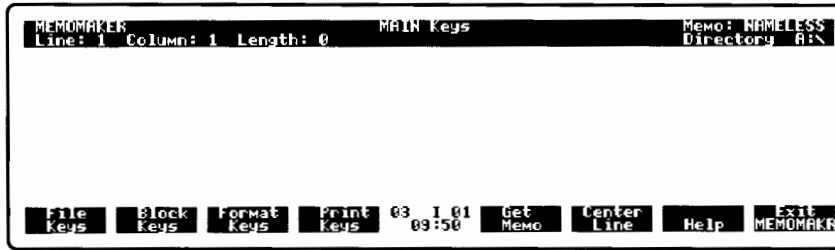
Note: When used to print documents, MemoMaker always uses the current “Printer Interface” device, as specified in the P.A.M. System Configuration Menu. (If you specify HP-IL as the Printer Interface device, the HP 110 uses the first printer it encounters in the interface loop and ignores any other printer in the loop.)

5. Read the following information on the MemoMaker keyboard.

The MemoMaker Keyboard

- **Q**, **6**, **,** and the other keys that type characters (letters, numbers, symbols) work like typewriter keys.
- **Shift** is like the typewriter Shift key—hold it down when you type a letter and you get a capital; hold it down when you press **8** (for example) and you get *.
- **Caps** is a switch. The space between the fourth and fifth menu labels in your display shows **C** when the switch is on. When it is off, the letter keys produce lowercase characters. When it is on, the letter keys produce uppercase letters. That is, typing a letter produces a capital letter and pressing **Shift** when typing it produces a lowercase letter. **Caps** affects only the alphabet keys.
- **Q**, **Return**, and the other keys that type characters or perform repeatable functions repeat themselves when you hold them down, as on an electric typewriter.
- The cursor shows you where the next character you type will go. Typing that character moves the cursor one space right.
- **Tab** is like the typewriter Tab key. The cursor moves so many spaces to the right. **Shift Tab** (that is, press **Tab** while you are pressing **Shift**) moves the cursor so many spaces to the left.
- **Return** works like the Return key on an electric typewriter or the carriage return on a manual typewriter, except that it moves the cursor rather than a carriage. You usually don’t need it, because when you type a word past the right margin, the word wraps—jumps to the left margin of the next line—instead.

- (Extend char) (+Char) is a switch. When the switch is on (that is, when your computer is in insert mode rather than writeover mode), an I appears as shown below in the MemoMaker function menu:



If the cursor is on the t in cæt and you are...

...in insert mode, typing r gives you cær t, and cær t pushes all the characters to the right of it one character right. (If the last character in the line is pushed past the right margin, the last word wraps.)

...in writeover mode, typing r gives you cær, and no characters are shifted.

- (Extend char) (-Char) deletes the character at the cursor position. The character that was just to its right moves to the cursor position to take its place, and all characters to *its* right move left one column.
- (Space) (the space bar) also moves the cursor. More than that, it leaves a blank space at the position the cursor is on when you press it, and that blank space is actually a character—the space character. This means that if the cursor is on the s in pæars and you press the space bar while you are in Insert mode, you end up with one pæar, one s, and a space between. All characters to the right of the s are pushed to the right, just as they would be if you typed an alphabet character.
- (f1) through (f8), the function keys at the top of the keyboard, correspond to the eight function key labels at the bottom of the display.
- (◀) and (▶) move the cursor to the left and right within a single line.
- (▲) and (▼) move the cursor up and down within the display. When the cursor reaches the top or bottom of the display, (▼) moves the cursor past the line at the bottom of the display by scrolling the display up; (▲) does the same thing in reverse.

- (Shift) (▲) scrolls the display up without moving the cursor; (Shift) (▼) scrolls the display down in the same way.
- (Extend char) (▶) returns the cursor to the beginning of the document; (Extend char) (▲) moves it to the end.
- (Extend char) (Next) or (Extend char) (Prev) replace the contents of the present display with those of the next or previous display (one display = 12 lines).
- (Extend char) (+Line) inserts a new line above the line containing the cursor.
- (Extend char) (-Line) erases the line containing the cursor and moves all succeeding lines up one line.
- (Extend char) (Clr line) with the cursor in column 27 erases from the cursor position to the end of the line.

Other MemoMaker key functions are described under “The MemoMaker Keyboard: Special Key Usage” on page 5-1.

Now that you have been through the preceding five steps, (pages 1-1 through 1-3), you are ready to move off Square One and proceed with MemoMaker itself. Thus, with MemoMaker still active, go on to lesson 2, below.

Lesson 2: The MemoMaker Display

MemoMaker uses the HP 110 display in its own unique way. In this lesson, you will explore the MemoMaker display as an overview of MemoMaker.

Before you continue, pause for a moment to consider this display. The main area of it is empty—or *was* empty, if you have been improvising. The cursor is at the top, toward the left. If you think of this area as a blank page of paper in a typewriter, then the cursor is in the first line you will be able to type, in the first space to the right of the left margin.



Note: Steps 27 through 30 in this lesson involve the use of a printer. If you plan to complete these steps, ensure that the link between your HP 110 and printer is active. That is, if your printer was not already plugged into your HP 110 and turned on *before* you turned on the HP 110, perform the following:

- A. Ensure that the printer is plugged into the HP 110 and turned on.
- B. Reset the HP 110 by pressing and holding **CTRL** **Shift** and pressing **Break**.

1. If you reset the HP 110 or have not started MemoMaker, do so now by using steps 3 and 4 on pages 1-1 and 1-2.

When you type a character, the character appears on the display at the cursor point and the cursor jumps one space to the right. This is like what happens when you type a character on a page of paper in a typewriter. At this point you could continue typing and fill the entire display with words, just as you might fill a page, but to save time, try the following:

2. Type MemoMaker.

Notice that the word starts where the cursor first appeared—as you expected.

3. Press **◀** until the cursor is on the first M in MemoMaker.
4. Press **Extend char** **+Char** a few times, noticing as you do that an I flashes on and off at the bottom of your display. End up with I off. Then press **Space** (the space bar) once.

With I off you are in Writeover mode rather than Insert mode, so pressing **Space** writes a space over the M—it leaves you with emMaker. (If you had pressed **D** instead of **Space** you would have produced DemoMaker.)

5. Replace the first M by moving the cursor to the space created in the last step (press **◀**) and typing an M. Now move the cursor back to the M you just typed, turn I on (by pressing **Extend char** **+Char**) and press **Space** once.

With I on you are in Insert mode, so pressing **Space** inserts a space where the M was and moves the M and every character to the right of it over to make room for it.

6. With the cursor on the first M, press (Extend char) (-Char).

You get emOMaker again, but notice that the cursor hasn't moved as it did when you pressed (Space) the first time. This time you are deleting the M, not writing a space over it, so the characters to the right of it have to shift left to fill up the gap it left.

7. Move the cursor to a blank space before emOMaker, then press (Extend char) (-Char).

Same principle as in the previous step. Though no visible character has been deleted, you have in fact deleted a space character, and accordingly, characters to the right have shifted left to fill up the gap.

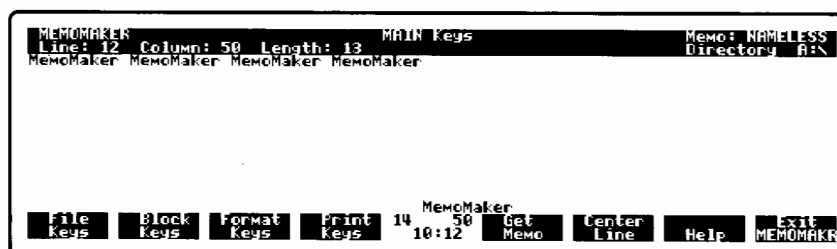
8. Move the cursor past the end of emOMaker, then type MamOMaker MemOMakr MemmoMaker.

Depending on the location of emOMaker, you may have experienced word wrap—you'll know it if you have.

9. Now change each of the misspelled words in the display to correct the spelling of MemOMaker. You're on your own, but...

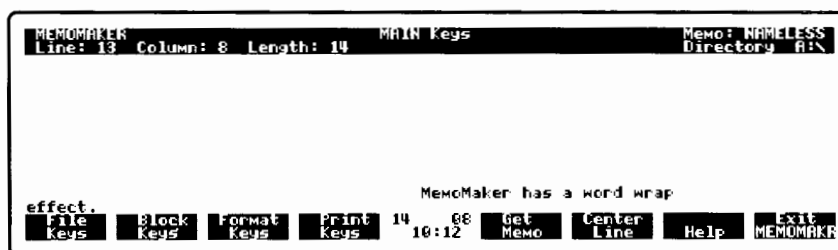
...here are some hints:

- I off with MamOMaker.
 - I on with emOMaker and MemOMakr.
 - (Extend char) (-Char), not (Space), with MemmoMaker.
10. Move the cursor to the bottom center of the display—the top of your display should read Line: 12—and type a word:



This is like what would happen on a typewriter if you roll the page all the way to the bottom, tab over to the middle of the page, and type a word.

11. Continue typing on the bottom line until you get the word wrap effect—until the word you are typing runs into the right margin and jumps to the left margin of the next line. Don't worry about typing errors, but remember to leave spaces between words:



Your HP 110 now displays lines 2 through 13—line 1 has disappeared—and you could go on doing this for well over a thousand lines. This *isn't* like a page of paper in a typewriter.

12. Now press (Extend char) (▼). Your HP 110 displays lines 1 through 12 again.

To sum up what you already know, your display is really a sort of scroll, one that only gets cut up into pages when you have finished composing on the electronic medium and begin to print your composition on paper.

It is useful to picture your display this way, as a window for viewing the temporarily exposed portion of a scroll. But in one way the picture is misleading. You will be working with an electronic scroll if you're writing a ten-page report, but you won't be if it's a ten-line memo. MemoMaker lets your imaginary sheet of paper grow up into a scroll only if the piece of writing you are working on requires it.

In the language that this manual uses, MemoMaker provides a *temporary workspace*, one in which you can create a memo or other document as short as a short page or as long as a long scroll. Accordingly, your display is your window on all or part of the document in the workspace while you write, revise, review, or print it.

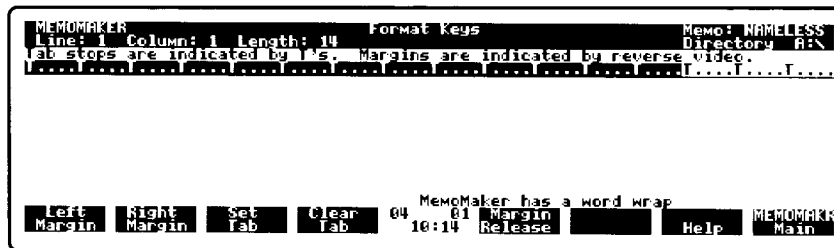
13. Now look at the top of your display, at the second line in the header. You read the line and column of MemoMaker in which the cursor is located, and the length of the document currently in the workspace. (If you have pressed no other key since you pressed (Extend char) (▼), the cursor is in line 1.)

Note: The line and column numbers appearing between the fourth and fifth labels in the menu at the bottom of the display indicate the cursor's *absolute* position in the HP 110 display.

In the far right of the header you read that the document in the workspace, the memo, is still nameless—it doesn't yet have a file name. You also read that the logged directory is A:\. This means that if you gave the document a file name and then went through the necessary steps to save it as a file without specifying the disc or the directory on the disc, it would be saved in A:\, the root directory of the HP 110 built-in electronic disc.

You also read that the eight function key labels at the bottom of your display label the main keys or, more precisely, the main function key group.

14. Look at the first four function keys—**File Keys**, **Block Keys**, **Format Keys**, and **Print Keys**. Including the main function key group, MemoMaker contains five function key groups, and these four labels stand for the other four. Pressing the function key that corresponds to a label displays the corresponding function key group.
15. Press **Format Keys**—the display should be as shown in the following illustration:



You can see that five of the format keys have to do with margins and tabs, and that a ruler line has appeared at the top of your display to show you the current margins and tab stops—margins in columns 1 and 65, tabs in columns 1, 6, 11, 16, and so on. Notice that there is a key that routes you back to the main keys (**MEMOMAKER Main**), but that the format keys provide no route to the other three function key groups.

16. Press **Margin Release**. An asterisk appears on the label to show that it is on. Now exit from the format mode by pressing **MEMOMAKR Main**.
17. Without pressing the **(Return)** key, move the cursor to column 1 of line 14 and type the long sentence displayed on the display bottom below—don't put a period after columns yet:

```
MEMOMAKER                               MAIN Keys                               Memo: NAMELESS
Line: 14 Column: 80 Length: 14          Directory: A:\

                                     MemoMaker has a word wrap
effect.
This sentence doesn't have much to say but it does manage to take up 80 columns
File Keys Block Keys Format Keys Print Keys 14 80 Get Memo Center Line Help Exit MEMOMAKER
10:23
```

Assuming that you typed accurately, notice that your sentence actually took up 79 columns—it needs a period to make it to 80.

18. Type the period:

```
MEMOMAKER                               MAIN Keys                               Memo: NAMELESS
Line: 15 Column: 9 Length: 15          Directory: A:\

                                     MemoMaker has a word wrap
effect.
This sentence doesn't have much to say but it does manage to take up 80
columns.
File Keys Block Keys Format Keys Print Keys 14 89 Get Memo Center Line Help Exit MEMOMAKER
10:24
```

The word **columns** and the period wrap, showing that MemoMaker's maximum line length is 79 columns. (**Margin Release*** is still on, even though the cursor is on the next line.)

19. Press **(Return)**. This reactivates the margin setting and clears the asterisk from the **Margin Release** key. (To check this for yourself, press **Format Keys**, inspect **Margin Release** in the display, then press **MEMOMAKR Main**.)

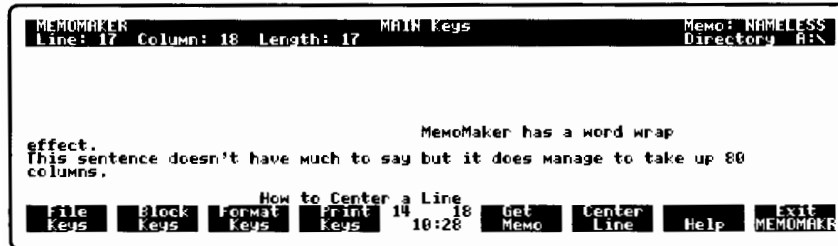
Pressing **Margin Release** again would have had the same effect, but moving the cursor back within the margins by some means other than actually pressing **(Return)** would not have.

Each of the four secondary function key groups has

MEMOMAKR Main as the route back to the main keys. The main keys are “main” because you have to pass through them on your way between any two other sets of keys. (You are in the position of a tree-climber—a human one, not a jumping squirrel!—who has to return to a main branch to pass from one secondary branch to another.)

20. Press **(Return)** (if you need to) to position the cursor at the left margin of an empty line, then...
21. Type your name or some phrase less than a line long; then...
22. Press **Center Line**:

1:Starting

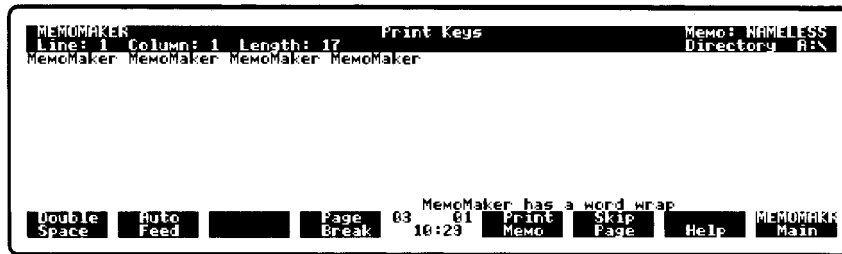


The name or phrase should jump toward the center of the display—strictly speaking, it should center itself *with respect to the left and right margins*, which are *not* centered on the display.

Another function of the MemoMaker function keys is to perform automatic operations like line centering. On a typewriter, line centering requires time-consuming calculations.

23. Press **(Extend char)** **(F1)** to return the cursor to the beginning of your memo—you are about to print it, and the cursor marks the point at which the printing will begin.
24. Now ensure that your printer is loaded with paper and is ready to print. (Refer to the **Note** on page 1-6.)

25. Press **Print Keys**—the display top and bottom should be as they appear below:



26. Press **Double Space** and **Auto Feed** a few times, then leave them as you found them—off, that is, with no asterisk displayed.

Off means single space and manual feed. Manual feed is another way of saying “Insert a page by hand if you haven’t already, print it, remove it by hand, insert another page by hand, print it, and so on”—just like a typewriter.

Auto Feed* is for the sort of computer paper that comes in fan-folds, with the sheets connected along perforated lines or in rolls. It means that the printer keeps on going when it comes to the end of a page.

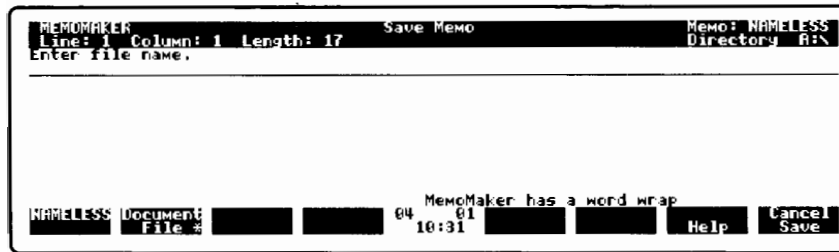
27. Press **Print Memo**.

If all goes well, this should have the effect of printing your first MemoMaker composition, or the first page of it if you have typed beyond line 55. (With manual feed, the printing starts at the cursor point and goes on for the length of your composition or for the standard page length of 55 lines, whichever is less.)

With MemoMaker, what you see on the display is what you get on paper, so you should recognize what the printer has produced.

If you don’t, or if it produces nothing, rest assured. There’s more on printing in lesson 5.

28. Press **MEMOMAKR Main**, then **File Keys**, then **Save Memo**; the display top and bottom should be as they appear below:



MEMOMAKER Line: 1 Column: 1 Length: 17 Save Memo Memo: NAMELESS Directory R:\
Enter file name.

NAMELESS Document File # 64 01 10:31 MemoMaker has a word wrap Help Cancel Save

1: Starting

You use **Save Memo** to give the document in the workspace a file name and to save it on the HP 110 electronic disc or on an external disc. (To use **Save Memo** with WordStar® files, refer to appendix B, “MemoMaker and WordStar®,” and to the description of the **Document File *** and **ASCII File *** function keys on page 5-13.)

When you selected **Save Memo** from the file keys, a number of things happened:

- **Save Memo** replaced **File Keys** at the top of your display.
- A message that prompts you to **Enter file name** was displayed.
- The cursor jumped to the input line, to the spot where you **Enter file name**.
- A new set of function keys was displayed.

Save Memo is displayed to tell you that these function keys are an extension of **Save Memo**—keys that are displayed only after you select **Save Memo** and used only to carry out the procedure that selecting **Save Memo** initiates.

One key on the **Save Memo** extension is labeled **NAMELESS**, the same word you see at the top of your display. This function key carries the name of the document in the workspace, and pressing it (don’t!) has the same effect as typing in the file name of the document on the line where the cursor is now located, and then pressing **(Return)**. In this case, if you press **NAMELESS**, your document will be saved on disc as a file named **NAMELESS**. To avoid this absurdity...



29. Type `1stmemo` on the input line and press `(Return)`.

This has the effect of saving your document on the indicated drive (in this case, `A:\`). The only *visible* change—

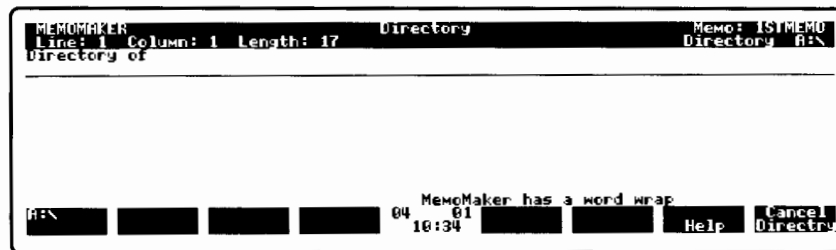
1:Starting



—is that the file keys are displayed again, and `1STMEMO` appears on the top line of the display—which means that the memo you have been writing now has a proper file name. Invisibly, however, a copy of the memo has been saved in the root directory on the disc in drive A under the name `1STMEMO`. (For a description of the HP 110 directory system, refer to “Using More Than One Directory” in chapter 2 of your *HP 110 Owner's Manual*.

To confirm that you have saved `1STMEMO`, you can look at a list of the files in your logged directory. To do so...

30. Press `Directory`—a display like the one below should appear:



Pressing `Directory` has the effect of putting MemoMaker on hold while you examine the contents of a directory.

31. To view the default directory (`A:\` in this case), just press `A:\` (the `(f1)` key). If, instead, you want to view the contents of another directory, type in that directory name and press `(Return)`. When you have finished examining the desired directory...

32. Press **Back To MEMOMAKR**.

This takes you back to the MemoMaker file keys.

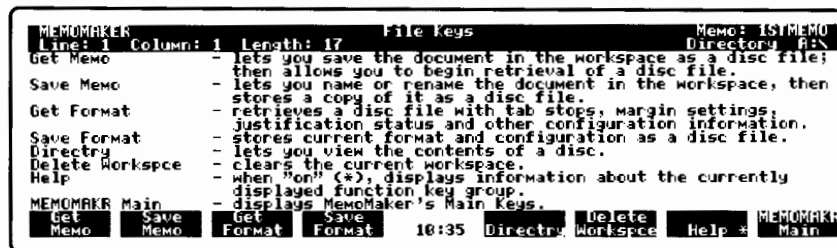
If this were a typical MemoMaker session, there are a number of things you might do next:

- Revise 1STMEMO; print the revision or update the file with it.
- Erase the contents of the workspace, that is, the copy of 1STMEMO you now see in the display, with the **Delete Workspce** key. Use the workspace to write another document.
- Use the **Get Memo** softkey to replace the contents of the workspace with the contents of another file retrieved from a disc. (To use **Get Memo** with WordStar® files, refer to appendix B, "MemoMaker and Wordstar®," and to the description of the **Document File *** and **ASCII File *** function keys on page 5-13.)
- Print the other file, or use the workspace to revise it and then print it.
- Update the revised file, and so on.

As it is, this is only the second MemoMaker lesson, and nearly the end of it at that. To review what you have learned, and to learn one last thing about MemoMaker...

33. Press the **Help** function key.

An asterisk appears on the **Help** key and 1STMEMO is replaced in the main display area by a listing of information about the file keys:



The asterisk in **Help *** means that you are in the Help mode.

34. Read the displayed summary of the file keys. To exit from Help mode, press **Help *** again. (All other keys except **Menu** and **Q** are disabled while Help mode is active.)

You will be reassured to know that lesson 3 describes the file keys you haven't used yet.

35. Press **MEMOMAKR Main** and **Help**, then read the summary of the main keys. When you are finished, press **Help *** again to exit from Help mode.

You should have been familiar with all the main keys except **Block Keys**, **Get Memo**, and **Exit MEMOMAKR**. You will use **Exit MEMOMAKR** to end this session. Lesson 3 begins with **Get Memo** and lesson 4 concerns the block keys.

36. Type something else in your display, as much as you want.

You are almost ready to end lesson 2.

Notice that you just revised 1STMEMO. Your workspace copy of it is an updated version of your disc copy. You will get a chance to update the disc copy before you go on to lesson 3.

37. ...If you are going to turn to lesson 3 immediately, press **File Keys**, then **Delete Workspace**.

...If you are going to exit MemoMaker and take up lesson 3 later, press **Exit MEMOMAKR**.

In either case, because you have changed 1STMEMO since you last saved it (steps 28 and 29), you are asked

Do you want to save the current memo as
1STMEMO?

and given two function keys to choose between: **Yes, Save** and **No, Discard**:

MEMOMAKER		Delete Workspace		Memo: 1STMEMO	
Line: 6	Column: 15	Length: 18	Directory: A:\		
Do you want to save the current memo as 1STMEMO?					
This is something else to be added as a revision to the file named 1STMEMO.					
		04 01 10:42		Yes, Save	No, Discard
				Help	Cancel Delete

38. Choose **Yes, Save**. It has the effect of updating the disc file named 1STMEMO by putting the more recent workspace version in its place.

By doing this, you have:

- Updated 1STMEMO
- Completely erased the contents of the workspace (though not the disc copy of those contents).
- Deactivated MemoMaker and restored the P.A.M. display (if you pressed `Exit MEMOMAKR`).
- Completed lesson 2.

Lesson 3: A Session With Files and Formats

In this lesson you get a chance to simulate a typical MemoMaker session. During the session, you will learn more about moving files from the temporary workspace to permanent disc storage and back. You will also learn how to set page formats—margins and tab stops—and save these settings for later use.

If MemoMaker is not currently active in your HP 110, start MemoMaker as you did in lesson 1 and at the start of lesson 2. The 1STMEMO file (refer to items 28 and 29 on pages 1-13 and 1-14) should be on disc A. Once the main keys are displayed, begin the lesson.

A Script For the Session

Suppose that this morning you commuted to work on a newly-opened public transit system, and that during the trip you used your HP 110 to compose the first draft of a letter to the system's director. Use the following instructions to type in and store your rough draft.

1. If you have just started MemoMaker (and not pressed any keys) the display top and bottom should be as they appear on the following page. (Remember that the copyright information is replaced when you press almost any key.) If you are continuing from the preceding lesson, press `MEMOMAKR Main` before continuing.

```

MEMOMAKER (R.01.00) (c) COPYRIGHT Hewlett-Packard Co. 1984
Line: 1 Column: 1 Length: 0
Directory A:\

File  Block  Format  Print  03  01  Get  Center  Exit
Keys  Keys  Keys  Keys  11:52 Memo Line Help MEMOMAKER

```

1:Starting

Now type the following memo:

Office of the Director
Horsepower Rail Lines
9999 Barn Street
Hayfield, New York

To Whom It May Concern:

As I write this letter I am riding on your new system for the very first time. Whoever would have thought that a horse-drawn trolley system would be the ideal way to commute in the nineteen-eighties? Obviously, the city planners, with excellent foresight, anticipated the need for additional mass transit and solved the problem quickly and economically.

I want you to know that I find the seating well-arranged and comfortable (which, by the way, allows me to make good use of the travel time by typing memos and letters into my portable, battery-powered computer). Also, the cleanliness of the coach and the courtesy of the steward reflect well upon your management methods. I am looking forward to many pleasant rides on your excellent system.

Sincerely,

2. Store the draft by performing the following:
 - A. Press **File keys** to call the file menu.
 - B. Press **Save Memo** to prepare to store the memo.
 - C. Type transit.let **(Return)** to specify the file name and execute the storing operation.
 - D. Press **Delete Workspce** to clear the letter from the display.

Working With Files and Formats

Having stored the first draft of the above letter, you are ready to proceed with the examples in the remainder of this lesson.

- ## 1: Starting

Now type `transit.let` on the input line (the line with the cursor) and press `(Return)`:

Your letter should now be displayed. Notice that `TRANSIT.LET` appears after `MEMO:` at the top of the display to identify the current file.

- 
- Computer
Museum

As some unexpected events happened between the time you wrote the first draft and the end of your commute, you see that some changes need to be made. You could insert them and thus revise your writing, but you don't have the time. You could clear the letter from the workspace, then use the workspace to write a memo to yourself about it, then save the memo as a new file, maybe as `transit.mem`—but then you could not look at both the letter and the memo at the same time without printing out one or the other of them. In the end, you decide to tack a note to the end of the letter, in the same file, so that both letter and note will be in the workspace at once. Later, when you have had time to incorporate the note into the letter, MemoMaker can easily erase the notes from the file containing the letter or—if it's worth keeping—make another file out of it.

The margins of the letter seem to be about 65 columns apart, a good width for standard business stationery 8½ inches wide but not as wide as your display allows. You decide to set your margins as wide as possible so that more of your note will appear in the display at once. (You like to see as large a chunk of your writing at one time as is possible, to make it easier to keep track of what you are saying.

3. Press `MEMOMAKR Main`, then `Format Keys`.

The ruler line tells you, or should tell you, that your left and right margins are in columns 1 and 65 and that your tab stops are in columns 1, 6, 11, and so on. This is the standard MemoMaker format, and if your ruler line tells you something different, someone has modified it.

You change margins and set or clear tab stops by:

- A. Placing the cursor in the column where you want the margin or tab stop, or want a tab stop cleared.
 - B. Selecting the appropriate function key.
4. Move the cursor to column 79.

5. Press **Right Margin**—a display like the one below should appear:

```
MEMOMAKER                      Format Keys                      Memo: TRANS 1.1.1
Line: 1 Column: 79 Length: 25  Directory: 88
Tab stops are indicated by T's. Margins are indicated by reverse video.
Hayfield, New York

To Whom It May Concern:

As I write this letter I am riding on your new system for the
very first time. Whoever would have thought that a horse-drawn
trolley system would be the ideal way to commute in the
Left Right Set Clear 64 79 Margin
Margin Margin Tab Tab 12:09 Release Help MEMOMAKER
Main
```

1: Starting

Note: You could move the cursor to column 80 and press **Right Margin**, but the margin will still be set to column 79.

The ruler line confirms that you have reset the right margin in column 79.

Notice that the tab stops correspond to the **T**-symbols in the ruler line. You set and clear tabs in the same way that you set margins, by locating the cursor in the appropriate column and pressing the appropriate function key.

6. Use **←** to move the cursor to column 3, then press **Set Tab** to place a tab stop there. While the format keys are displayed, you cannot move the cursor outside of the ruler line. Thus, to resume your memo operations...
7. Press **MEMOMAKER Main**.
8. Press **(Extend char) →** to move the cursor to the end of your letter, then press **(Return)** to move the cursor down one more line. This is the point at which you will begin your note, which is going to be like the note on the display below:

```
MEMOMAKER                      MAIN Keys                      Memo: TRANS 1.1.1
Line: 34 Column: 80 Length: 34  Directory: 88
excellent system.
Sincerely,
* The stop at 153th street to water the horse turned into a comedy of errors.
* The driver forgot to bring a water bucket and tried to use his hat instead.
* The horse ate the hat.
* The driver got angry and tried to punch the horse.
* The horse bolted, causing the trolley to move with a jerk, which spilled
  several passengers onto the floor. (Luckily, my rugged computer survived this
  ill treatment.)
* I suggest you hire drivers who have good memories and patience toward horses.
File Block Format Print 14 80 Get Center Help Exit
Keys Keys Keys Keys 12:30 Memo Line MEMOMAKER
```

9. Type the note. Take time to get it perfect, and if that involves correcting some mistakes, make a mental note of the techniques you used. If you want to add anything, to help write a better letter, go ahead!

After you typed your asterisks, did you move the cursor to column 3 with the **(Space)** or **(Tab)**? Either would have served the purpose.

Did the word `several` wrap? When it did, how did you indent it two spaces? Did you press **(Extend char)** **(+Char)** to put MemoMaker in insert mode, use **(←)** to move the cursor back to column 1, then use the space bar to move the entire word two spaces right?

If you made a typing error, did you correct it in Insert mode or Writeover mode? In Insert mode, you probably moved the cursor back to the point where you went wrong, typed it right (if there was anything to type), then used **(Extend char)** **(-Char)** to erase your mistakes. In Writeover mode, after you moved the cursor you probably typed the right word or spelling over the wrong, then used **(Extend char)** **(-Char)** to erase any mistakes left over. If your correction was longer than your mistake, you probably ended up in Insert mode, regardless of the mode in which you started.

Did you end up with text so different from what you were copying that you had to use **(Extend char)** **(-Line)** on it and start over? You will learn advanced editing techniques in lesson 4 that will make that sort of thing unnecessary.

You have finished your note to yourself. Now you need to save it so that you can call it back later when you have the time to incorporate it into your letter.

10. Press **File Keys**, then **Save Memo**—the display top and bottom should be as they appear below:

```
MEMOMAKER                               Save Memo                               Memo: TRANSIT.LET
Line: 34 Column: 80 Length: 34          Directory: A:\
Enter file name.

* The stop at 159th street to water the horse turned into a comedy of errors.
* The driver forgot to bring a water bucket and tried to use his hat instead.
* The horse ate the hat.
* The driver got angry and tried to punch the horse.
* The horse bolted, causing the trolley to move with a jerk, which spilled
several passengers onto the floor. (Luckily, my rugged computer survived this
ill treatment.)
* I suggest you hire drivers who have good memories and patience toward horses.
TRANSIT Document 04 61
.LET File * 12:30 Help Cancel Save
```

The function keys make up the same extension to `Save Memo` that you displayed in lesson 2, but now the key that was labeled `NAMELESS` is labeled `TRANSIT.LET`. Moreover, now you can use the key as a quick way to Enter file name—quicker than typing `TRANSIT.LET` on the input line and pressing `(Return)`.

11. Press `TRANSIT.LET`.

This has the effect of updating `TRANSIT.LET`—replacing the file on drive A that contains your letter with a file that contains both the letter and the note you added—and restoring the file keys to the display.

Except where this function key is labeled `NAMELESS`, it contains the file name of the document in the workspace exactly as you typed it. For lack of space, it does *not* contain any path name you typed, but it implies the path. This is the reason pressing `TRANSIT.LET` updated `TRANSIT.LET` in drive A instead of creating a new file.

For now, you're finished with the note. But it occurs to you that you often use the format you established, the one with the right margin out to column 79 and a tab stop in column 3, to write notes. If you could somehow save this format for later use, you wouldn't have to make these settings again. Accordingly...

12. Press `Save Format`.

Notice that the extension displayed is similar to the one you just displayed with `Save Memo`. The key that, with `Save Memo`, was labeled `TRANSIT.LET` now is labeled `STARTUP.FMT`.

Don't press it!

`STARTUP.FMT` stands for either of the following:

- The current startup format file if you have already created `STARTUP.FMT`.
- The name that will be given to the format file you are creating if you press `STARTUP.FMT`.

Notice that `STARTUP.FMT` is a file name just as `TRANSIT.LET` is. When you enter MemoMaker (start up MemoMaker), MemoMaker's default format is activated unless you have previously created a format file named `STARTUP.FMT`. (This lesson assumes you haven't.) If you want the startup format to match the current format (the differences are that the current format has the right margin in column 79 and a tab stop in column 3) you can create a format file named `STARTUP.FMT`.

Pressing **STARTUP.FMT** would achieve this. However, if you want to save the format version you are currently using without replacing the HP 110 default format, you simply give the current format a file name having a prefix *other than* **STARTUP**. Accordingly...

13. Type **wideline.fmt** on the input line and press **(Return)**.

This has the effect of saving your wideline format as a file on the logged disc—its full name will be **A:\WIDELINE.FMT**—leaving the HP 110 without a file named **STARTUP.FMT**.

Admittedly this is a somewhat artificial operation, since the format file **WIDELINE.FMT** is nearly identical to MemoMaker's default format—only one margin and one tab stop are different. In practice, you would be unlikely to create a new format file like **WIDELINE.FMT** unless it contained a good deal more new formatting information.

In fact, the MemoMaker default format and any format files you create contain a great deal of information beside margin settings and tab stops:

- Justification status: whether MemoMaker will justify a block of text, that is, make the right margin even. (The MemoMaker default format will not right-justify.)
- Insert Mode (I) setting: Insert or Writeover mode (MemoMaker default format is Off).
- **Double Space** and **Auto Feed** setting. (MemoMaker default format is Off.)
- Logged directory and drive. (MemoMaker default format uses **A:**.)

Notice that the file keys are displayed again. To activate a format file when another format is active, press **Get Format**, then type in the name of the desired format file and press **(Return)**. (When you press **Get Format** the leftmost function key is labeled with the name of the currently active format file. If the MemoMaker default format is currently active, this key is labeled with **STARTUP.FMT**.)

14. Press **MEMOMAKR Main**. (If **Cancel Get** is displayed, press it first.)

Lesson 3 is about to end, so...

15. Press **Exit MEMOMAKR**. Since you have already saved the current memo, (step 11 on the preceding page), MemoMaker exits to P.A.M. without prompting you to save the displayed memo.

Lesson 4: Cutting Out, Copying, and Pasting

To begin lesson 4, start MemoMaker as you did in the previous lessons. (This lesson assumes that you start with the default MemoMaker format instead of continuing the format you created using `WIDELINE.FMT` in the preceding lesson.)

Preparing For Lesson 4

To set up the HP 110 for a session using the features described in this lesson, do the following:

1. Type in the following text (allowing only *one* space between each period and the beginning of the following word):

This is an example of straight text that you can use to gain experience with several MemoMaker block features plus the align and justify features. (The remainder of this lesson has been written with the assumption that you are using the text shown here.) Later in this lesson you will delete this line. When you finish typing in this text you will be ready to proceed to the next part of this lesson. Because MemoMaker is so flexible you can type in a solid block of information in a hurry, then take care of the formatting work at a later time. This might be very helpful if you want to take notes in a seminar, class, or other presentation, then later print the notes in a form that you or others can easily use for reference. Being able to move blocks of text around in your workspace or to copy a block at another location in the workspace can be a time-saving advantage and certainly gives you a great deal of versatility; especially when you don't have the luxury of editing something on a piece of paper before you edit the actual file.

2. Press **File Keys**, then **Save Memo** to prepare to store the text.
3. Type `sample.txt` **(Return)** to specify the file name and execute the storing operation.
4. Press **Delete Workspce**. Because you have already stored a copy of the file in step A, MemoMaker clears the workspace without prompting you to save the file.

Having stored `SAMPLE.TXT`, you are ready to proceed with the examples in the remainder of this lesson.

Proceeding With Lesson 4

If you have completed the preceding steps under “Preparing For Lesson 4” you are ready to begin the lesson.

1. Press **Get Memo**.
2. Type `sample.txt` on the input line and press **Return**—a display like the one below should appear—

1: Starting

```
MEMOMAKER                               File Keys                               Memo: SAMPLE.TXT
Line: 1 Column: 1 Length: 17             Directory: A:\
This is an example of straight text that you can use to gain
experience with several MemMaker block features plus the align
and justify features. (The remainder of this lesson has been
written with the assumption that you are using the text shown
here.) Later in this lesson you will delete this line. When you
finish typing in this text you will be ready to proceed to the
next part of this lesson. Because MemMaker is so flexible you
can type in a solid block of information in a hurry; then take
care of the formatting work at a later time. This might be very
helpful if you want to take notes in a seminar, class, or other
presentation, then later print the notes in a form that you or
others can easily use for reference. Being able to move blocks of
Get      Save      Get      Save      63      61      Delete
Memo     Memo     Format    Format    13:17  Directory Workspace Help Main
```

—containing the text that you entered before beginning this lesson (page 1-25).

3. Use **Extend char** **Next** to help you read through to the end of it, then **Extend char** **␣** to return to the beginning of the text.

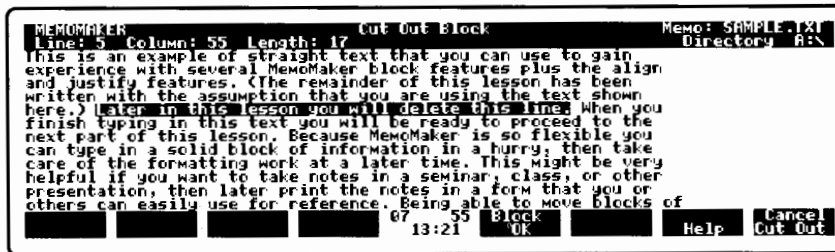
In this lesson, you will use MemMaker’s basic editing capacities to revise the text.

4. Press **MEMOMAKR Main**, then **Block Keys**.

The block keys contain the keys you use to cut out, copy, and paste the basic revising operations and some others you will find out about as you go along.

5. Move the cursor to the first letter in the third sentence (L—located near the beginning of line 5 if you used the default margins when you typed your original copy of the file).
6. Press **Cut Out Block**. The extension containing **Block OK**—a new one—appears.

7. Move the cursor to the space following the period at the end of the sentence (near the end of the same line). A display like the one below should appear:



1: Starting

As you can see, the block you have marked out is highlighted. Notice that it begins in the column where you marked it and ends one column to the left of the cursor.

8. Press **Block OK**—a display like the one below should appear:

This is an example of straight text that you can use to gain experience with several MemoMaker block features plus the align and justify features. (The remainder of this lesson has been written with the assumption that you are using the text shown here.) When you finish typing in your text you will be ready to proceed to the next part of this lesson. Because MemoMaker is so flexible, you can type in a solid block of information in a hurry, then take care of the formatting work at a later time. This might be very helpful if you want to take notes in a seminar, class, or other presentation, then later print the notes in a form that you or others can easily use for reference. Being able to move blocks of

9. Press **(Extend char)** **(Next)** and **(▲)** to display the last six lines of the text. Then move the cursor to the first letter in the last sentence (the B in Being). Press **Cut Out Block** and move the cursor to the first blank line after the last line of the text and press **Block OK**. Even though you cut this block of text from the display, the HP 110 remembers it. Now press **(Return)** twice to move the cursor down two lines and over to column 1, and press **Paste Block**. The text you just cut reappears as a separate (but misaligned) paragraph.



At this point the paragraph has been separated from the rest of the text, but is in the wrong shape:

This is an example of straight text that you can use to gain experience with several MemoMaker block features plus the align and justify features. (The remainder of this lesson has been written with the assumption that you are using the text shown here.) When you finish typing in your text you will be ready to proceed to the next part of this lesson. Because MemoMaker is so flexible, you can type in a solid block of information in a hurry, then take care of the formatting work at a later time. This might be very helpful if you want to take notes in a seminar, class, or other presentation, then later print the notes in a form that you or others can easily use for reference.

Being able to move blocks of text around in your workspace or to copy a block at another location in the workspace can be a time-saving advantage and certainly gives you a great deal of versatility; especially when you don't have the luxury of editing something on a piece of paper before you edit the actual file.

10. If the cursor is not already at the first *column* in the line containing the word **Being**, move it to that position and press **Align Block**. Then move the cursor *past* the line containing "...the actual file" and press **Block OK**—a display like the one below should appear:

Being able to move blocks of text around in your workspace or to copy a block at another location in the workspace can be a time-saving advantage and certainly gives you a great deal of versatility; especially when you don't have the luxury of editing something on a piece of paper before you edit the actual file.

Everything falls into place, words from the second line moving up to fill the blank space in the first line, words from the third line filling in on the second, and so on.

The **Align Block** function does not close up text separated by blank lines. To demonstrate:

- A. Move the cursor two lines below the last line of the paragraph and type **This is a separate line.**
- B. Move the cursor back to the first letter (B) in the preceding paragraph and press **Align Block**.
- C. Move the cursor to the first line after the sentence you just typed and press **Block OK**. Your new sentence should have remained as a separate paragraph.

11. Another purpose of **Align Block** is to realign text within a new set of margins. Accordingly, you can reset your right margin to 79 by retrieving the **WIDELINE.FMT** format file (which you created in the last lesson—pages 1-20, 1-21, and 1-24).
12. Press **MEMOMAKR Main**, then **File Keys**, then **Get Format**.
13. Type **wideline.fmt** on the input line and press **(Return)**. Your right margin is now set to column 79.
14. Press **MEMOMAKR Main** and **Block Keys**.
15. Use **(Extend char)** **(V)** to move the cursor to the beginning of the text, to the T in **This**. Press **Align Block**. Then use **(Extend char)** **(A)** to move the cursor to the end of the text, past the last line. Press **Block OK**—a display like the one below should appear:

```

MEMOMAKER                               Block Keys                               Memo: SAMPLE.TXT
Line: 1 Column: 1 Length: 17              Directory: A:\
This is an example of straight text that you can use to gain experience with
several MemMaker block features plus the align and justify features. (The
remainder of this lesson has been written with the assumption that you are
using the text shown here.) When you finish typing in this text you will be
ready to proceed to the next part of this lesson. Because MemMaker is so
flexible you can type in a solid block of information in a hurry, then take
care of the formatting work at a later time. This might be very helpful if you
want to take notes in a seminar, class, or other presentation, then later print
the notes in a form that you or others can easily use for reference.

Being able to move blocks of text around in your workspace or to copy a block
at another location in the workspace can be a time-saving advantage and
Cut Out Copy Paste Align 03 01 Enhance Help MEMOMAKER
Block Block Block Block 13:38 Block Main

```

You have marked the entire text as a block and realigned it within a 79-space format.

16. Now, with the cursor on the first letter of the phrase **This is an example**, press **Copy Block**. Move the cursor to the space after the period in that same sentence (in the last part of line 2). Then press **Block OK**.
17. Use **(Extend char)** **(Next)** to move the cursor to the next display, then press **(V)** as many times as you need to move the cursor to the second line after the line that reads **This is a separate line**.
18. Type **This line lengthens the text**.
19. Move the cursor to column 31, which is one space beyond the period following text, and press **Paste Block**.

This is copying, not cutting. Using **Copy Block** with **Paste Block** is like making a photocopy of a page, cutting a block out of the copy, and pasting it in somewhere else.

20. Now use (Extend char) (▼) to display the beginning of the memo again, then move the cursor to the letter n in the word an in the first sentence.
21. Press (Extend char) (-Char) to delete the n. Then press (Extend char) (+Char) to turn on Insert (I) mode, press the space bar once, and type the word brief. Turn off Insert mode by pressing (Extend char) (+Char) again.

22. Now move the cursor to the letter s in the word straight in line 1 and press Enhance: Block.

This time still another extension appears. Notice the two keys to the left. The enhancement you are going to give straight text is underlining.

23. Press Enhance: Underlin. Move the cursor to the first space after the last t in text and press Enhance: Underlin again. The text should appear as follows:

This is a brief example of Ustraight textU that you can use

The pair of U symbols are a signal to a printer to underline the specified text. Assuming that your printer is capable of underlining characters, it will print Ustraight textU as straight text.

(To remove the underlining at any time, move the cursor back to the U preceding straight and press (Extend char) (-Char). Then move the cursor to the U following text and press (Extend char) (-Char) again.)

24. Move the cursor to the first letter in the word MemoMaker in the first sentence, then press Enhance: Bold. Now move the cursor to the space after the r in MemoMaker and press Enhance: Bold again. The resulting B symbols are a signal to a printer to print the specified text in bold. The text should appear as shown below:

with several BMemoMakerB block features plus the align and

The word MemoMaker should appear in boldface characters on a printout unless the printer is not capable of producing boldface type.

(To remove the bold enhancement at any time, move the cursor back to the B preceding MemoMaker and press (Extend char) (-Char). Then move the cursor to the B following MemoMaker and press (Extend char) (-Char) again.) Exit from the enhancement menu by pressing Back To Block.

25. Now let's justify the text. Move the cursor to the T in This and press **Align Block**, then press **Justify** before you move the cursor to the end of the letter text.

An asterisk should appear on **Justify*** to show you that justification is active. As you will see, this doesn't affect how words appear on the display as you type them, but it does affect what happens to them when you use **Align Block**. Incidentally, justification stays on until you press **Justify** again or exit from MemoMaker.

26. Move the cursor to the first line after the end of the memo.
27. Now press **Block OK**—a display like the one below should appear:



The entire text is realigned in justified form; all the spaces that were formerly at the end of a given line are now distributed evenly between the words in it.

28. Now press **MEMOMAKER Main**, **File Keys**, and **Save Memo**.
29. Type `findraft.txt` and press **(Return)**.
The effect of this is to save your revision of the text in the logged directory of the logged disc—in the root of A. The original (`SAMPLE.TXT`) stays in the root of A.
30. Press **MEMOMAKER Main**.
Lesson 4 is about to end, so...
31. ...If you plan to turn immediately to lesson 5, press **(Extend char)** **(Clr Dsp)**.
...If you plan to exit MemoMaker, press **Exit MEMOMAKER**. Since you have already saved the current memo (Steps 28 and 29, above) MemoMaker exits to P.A.M. without prompting you to save the displayed memo.

Lesson 5: Printing Memos; Some Questions and Answers About MemoMaker

Printing a Memo

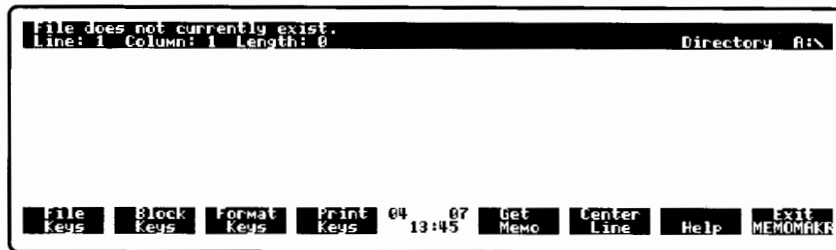
Connect a printer to your HP 110, then:

1. Turn on the printer.
2. Hold down the (Shift) and (CTRL) keys and press (Break).
3. Start MemoMaker as you did in the previous lessons.

1:Starting

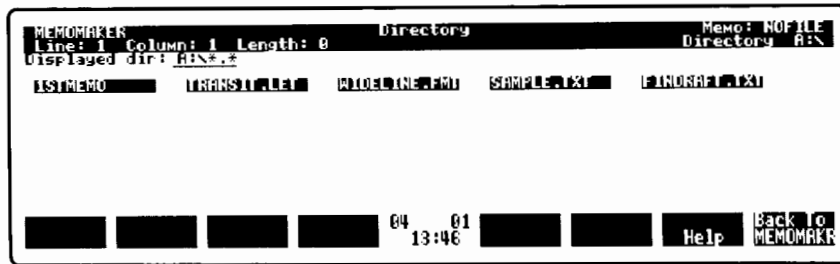
You will need the files you created earlier in this section (1stmemo, widelinefmt, and findraft.txt). Once the MemoMaker main keys are displayed, begin...

1. Press **Get Memo**, then—assuming that there is no file named nofile in the logged directory, type nofile and press (Return). This results in the flashing error message illustrated below.



Most error messages are self-evident. However, you may wish to refer to appendix A, "In Case of Difficulty" for the complete list of MemoMaker error messages, descriptions of the conditions they describe, and suggested remedies.

2. Press **File Keys** and **Directory** to prepare for displaying the directory. Now list the default directory by pressing **(ft)** (**A:**). A display similar to the following should appear:



1: Starting

This is like what you did in lesson 2 when you displayed the logged directory to confirm that you had indeed saved 1STMEMO. Notice the familiar names of the other files in the logged directory.

3. Exit from the directory by pressing **Back To MEMOMAKER**. Then press **Get Memo** and type **findraft.txt** (**Return**).

Now you are going to print (or at least read about printing!) your revision of the memo you wrote in lesson 3.

4. Press **MEMOMAKER Main**, then **Print Keys**.

The cursor should be at the beginning of the text, where the printer will start printing.

5. Press **Skip Page**.

The cursor skips to the last line or to line 56, whichever occurs first. You can use the **Skip Page** key to page through a document, looking for a page you want to print.

6. Press **(Extend char)** (**▼**), then **Double Space**, then **Skip Page** again.

When the printer is set for double spacing, a page is 28 lines long rather than 55. Accordingly, the cursor jumps to line 29, or the last line, whichever occurs first.

7. Press **Double Space *** to restore single spacing, then move the cursor to the blank line between the first and second paragraphs and press **Page Break**.

The symbol **.PA** means *Printer, end the page here*—it isn't actually printed. With **Page Break**, you can override MemoMaker standard page length settings. If your printer has automatic feed, press **Auto Feed**.



8. Now press **(Extend char)** **(▶)**, turn your printer on, insert a sheet of paper, and press **Print Memo**.

If all goes well, your printer should produce the first paragraph on one page and the remainder of the text on the next page. (If your printer does not have automatic feed, you have to manually feed in a new page and press **Print Memo** again to print the rest of the text.)

This is as far as chapter 1, “Getting Started,” will be taking you with your hands on MemoMaker—the rest of lesson 5 is booklearning. Accordingly...

9. Turn off your printer.
10. Press **MEMOMAKR Main** and **Exit MEMOMAKR**.
11. Press **Yes, Save** or **No, Discard** if the prompt line asks you to do so.
12. Turn off your HP 110 display.
13. Keep reading!

The rest of lesson 5 consists of eight questions and their answers. The questions are of the kind that you are likely to be asking after four-and-a-half lessons. The answers are meant to help you make the transition from beginning student of MemoMaker to everyday user of it. Sometimes this involves suggesting ways you can use the rest of this manual.

Some Questions and Answers About MemoMaker

1. I can't see the forest for the trees. Is there a map of all the MemoMaker function key groups and extensions to give me a graphic picture of how they are interrelated?
There is a fold-out menu map just inside the back cover to help you locate the function keys.
2. When I used the Help mode to explore MemoMaker in lesson 2, I didn't get into the function key extensions; only the function key groups. There was no way to find out about such extension keys as **Block OK** and **Yes, Save**. How can I get Help on the extension keys?

To get Help for an extension key, display the menu containing that key and press **Help**. When you are finished with the Help information, press the **Help *** key again.

3. I notice that the MemoMaker keyboard behaves in a slightly different way from the way the keyboard behaves when I have no application loaded on my HP 110 computer. The description of the MemoMaker keyboard in chapter 1 is useful, but I'd like to see a comparison of the two keyboards. Does the MemoMaker manual have one?

Yes, refer to "The MemoMaker Keyboard: Special Key Usage" on page 5-1. This information provides a detailed description of the MemoMaker keyboard. Incidentally, the two keyboards are *nearly* identical in the way they behave. When there is a difference it is a commonsense one. For example, the keyboard with MemoMaker wraps one word at a time because MemoMaker is a *word processor*, while the keyboard with no application loaded wraps a character at a time—because it isn't a word processor.

4. I use special narrow stationery, so I always need a right margin set in column 50 (instead of the standard column 65). Can I change the setting with which MemoMaker is loaded so that I don't have to go to the trouble of changing it every time I use MemoMaker?

Yes, you can change the margins with which MemoMaker is loaded, and also any other setting included in the default format by creating a `STARTUP.FMT` file such as the one mentioned in lesson 3. Refer to "The `STARTUP.FMT` File" on page 6-2 and also the procedure for making changes in the file, described under "Change the format with which MemoMaker is loaded" on page 2-5.

5. Can I cut out or copy a section from one document (as in lesson 4) but then paste it into another document?

Yes, by marking the section in the first document with **Clear Line** or **-Line**, or with **Cut Out Block** or **Copy Block** and **Block OK**. Then use **Get Memo** to bring a second document into the workspace in place of the first one; then use **Paste Block** as you would have if you hadn't switched documents. You can insert a whole document into another document this way by making a block out of it (as long as you move the inserted document in blocks of 60 lines or less). Refer to "Move a block or a copy of a block from the document in the workspace to another document" (page 2-14), "Insert a document or a copy..." (page 2-12), and "Append a document or a copy..." (page 2-4). You can also use a similar procedure to make a separate document out of a block or a copy of a block.

6. Chapter 1, “Getting Started,” provided me with file names to type, but didn’t give me any help in inventing them. What sort of file names can I give MemoMaker documents? What sort of file names *should* I give MemoMaker documents?

Basically, you can give a MemoMaker document any name that the directory will recognize. Your two questions are the titles of two topics in chapter 6.

7. Now that I’ve almost completed this chapter, I’d like some more precise information about how to use the rest of the manual. How can I make the rest of the manual useful to me without reading it—which I don’t plan to do!

The first part of the MemoMaker manual is designed to be read a page at a time, as you would read a story. As of the end of this lesson, however, the story is over. You will probably read the rest of the manual only when you have a particular question, and you will probably approach the part of it you need to read by way of the contents listing or the index, not by simply turning the pages. Some of the answers provided in this lesson may encourage you to turn to particular sections of the manual, and an error message at the top of your display should stimulate your interest in appendix A, “In Case of Difficulty.”

Beyond that, you will use chapter 2, “MemoMaker Procedures,” when you want to make sure how to perform a particular MemoMaker procedure—the procedures are listed alphabetically in the directory at the beginning of the section. If you are puzzled by a particular function key, or suspect that it has more functions than you realize, you can look up the key in chapter 5, “MemoMaker Key and Function Dictionary.” Most of that chapter is an alphabetical listing of function keys. Most of the rest of the manual, in fact, is comprised of lists of procedures and of function keys.

MEMOMAKER PROCEDURES

This chapter tells you what you can do with MemoMaker and how to do it; it contains step-by-step descriptions of basic MemoMaker procedures. A *procedure* can be anything from releasing the margins, which requires one step that is always the same, to drafting a memo, which requires many steps that are seldom the same from one memo to the next. Some of the procedures described in this section are only one step long, and all are short enough so that you will find yourself performing them the same way over and over again.

This chapter does *not* contain information about a number of activities that you may justifiably think of as MemoMaker procedures. Thus, if you are in search of information about any of the four topics listed below, turn to the chapter in this manual listed with the particular topic.

- Moving from function key group to function key group in MemoMaker—page 4-1.
- Using the **Help** function key—page 4-3.
- Using the keyboard—pages 5-1 through 5-4.
- Naming files—page 6-3.

A Directory To MemoMaker Procedures Listed In This Chapter

For easy reference, you will find an alphabetical directory of MemoMaker procedures on the next two pages. The procedures are listed by title, for example, “Change a margin setting.” The way to use this section is to scan the following directory to find the title of the procedure you want to look up, then turn to the body of the section, where you will find the procedure listed in alphabetical order.

Align a block of text. (Refer to "Realign a block of text," **page 2-16.**)

Append a document or a copy of a document to another document (**page 2-4.**)

Boldface a block of text; that is, put a block of text in boldface type. (Refer to "Enhance a block of text," **page 2-11.**)

Center a line (**page 2-5.**)

Change a margin setting (**page 2-5.**)

Change the format with which MemoMaker is loaded, that is, create `STARTUP.FMT` (**page 2-5.**)

Change the logged drive, logged directory, or both (**page 2-7.**)

Change the MemoMaker paper setting to automatic feed or manual feed (**page 2-7.**)

Change the MemoMaker printer setting to single or double space (**page 2-7.**)

Change the name of the document in the workspace and store the document (**page 2-8.**)

Clear a tab stop (**page 2-9.**)

Concatenate files. (Refer to "Append a document or a copy of a document to another document," **page 2-4.**)

Copy a block of text. (Refer to "Cut out or copy a block of text," **page 2-10.**)

Cut out a block of text. (Refer to "Cut out or copy a block of text," **page 2-10.**)

Cut out or copy a block of text (**page 2-10.**)

Delete (erase) a block of text. (Refer to "Cut out or copy a block of text," **page 2-10.**)

Delete (erase) the contents of the workspace (**page 2-10.**)

Enhance a block of text (**page 2-11.**)

Exit from MemoMaker (**page 2-12.**)

Insert a document or a copy of a document into another document (**page 2-12.**)

Justify a block of text. (Refer to "Turn justification on or off," **page 2-23.**)

A DIRECTORY OF MEMOMAKER PROCEDURES (Cont.)

- List the logged drive, logged directory, or both (**page 2-12**).
- Make a separate document out of a block or a copy of a block (**page 2-13**).
- Move a block or a copy of a block from the document in the workspace to another document (**page 2-14**).
- Move a block or a copy of a block to another place in the document (**page 2-15**).
- Name or rename a document. (Refer to "Change the name of the document in the workspace...", **page 2-8**, "Store the nameless document currently in the workspace...", **page 2-22**, and "Update a document stored on disc...", **page 2-23**.)
- Paste a block. (Refer to the two "Move a block or a copy of a block..." procedures, **pages 2-14 and 2-15**.)
- Print the document in the workspace (**page 2-15**).
- Realign a block of text (**page 2-16**).
- Release the margins (**page 2-16**).
- Retrieve a file from disc storage whose file name, directory, or disc location you do not know (**page 2-17**).
- Retrieve a file from disc storage whose file name, directory, and disc location you know (**page 2-18**).
- Retrieve a format on file in disc storage (**page 2-19**).
- Retrieve and print a MemoMaker file in disc storage. (**page 2-20**).
- Set a tab stop (**page 2-20**).
- Show the printer where to end a page (**page 2-20**).
- Store the current MemoMaker format in a file in the logged directory (**page 2-20**).
- Store the nameless document currently in the workspace as a file in the logged directory (**page 2-22**).
- Turn justification on or off (**page 2-23**).
- Underline a block of text. (Refer to "Enhance a block of text," **page 2-11**.)
- Undo an enhancement. (Refer to "Enhance a block of text," **page 2-11**.)
- Update a document stored on disc with the revised version of it in the workspace. Retain the revised version in the workspace for further work (**page 2-23**).



The MemoMaker Procedures

With each procedure, what you do is on the left. For example, item 1, below, means “Step 1: select the **File Keys** function key.”

1. **File
Keys**

*Each procedure begins as if the main keys were displayed, so in the example above the first step involves **File Keys**, which is one of the main keys. If the file keys are displayed when you begin a procedure whose first step is to select **File Keys**, start with step 2.*

If a particular step involves one of the MemoMaker function keys and you need more information about the key, consult “MemoMaker Function Keys” on page 5-4, which contains an alphabetical listing of the MemoMaker function keys.

If you need information about using any of the other keys on the HP 110 keyboard with MemoMaker, consult the first section of chapter 5.

Append a document or a copy of a document to another document (concatenate files).

1. **Block
Keys**

2. Follow the procedure for moving a block or copy of a block to another document (refer to “Move a block or a copy of a block from the document in the workspace to another document”) *except—*

A. Mark the *entire document to be moved* as a block with


Cut Out Block or **Copy Block**.

Note: The size of a block you move cannot exceed 60 lines. Attempting to move a larger block results in the **Block too large for block storage error** message.


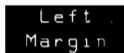
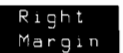
- B. Place the cursor at the *end* of the destination document before you select **Paste Block**.

Comments: You can repeat this procedure any number of times, and by so doing make a single large file out of a number of smaller files. With a number of files, the procedure goes more quickly if you start by making a block out of the file that will go *last*, insert that block at the end of the file that will precede it, mark that newly enlarged file as a block, and so on.

Center a line.

1. Move the cursor to the line you wish to center.
2. 

Change a margin setting.

1. 
2. Find your current margin settings on the ruler line displayed above the main text area.
3. Move the cursor to the column where you want your margin.
4.  or 

Change the format with which MemoMaker is loaded, that is, create `STARTUP.FMT`.

`STARTUP.FMT` always specifies the drive and directory that were the current logged drive and directory when you created (or changed) `STARTUP.FMT`. Thus, if you want `STARTUP.FMT` to specify a logged drive and/or logged directory other than the current default drive or directory, change the current default drive and/or directory while still in P.A.M. (that is *before* you start MemoMaker). Refer to “Change the logged drive, logged directory, or both” on page 2-7.

Note: You cannot change the logged drive or logged directory while in MemoMaker.

After you start MemoMaker, but before you retrieve another format:

1. Perform one or more of the following procedures:
 - Change a margin setting.
 - Insert or delete an enhancement marker (boldface or underline).

- Change the MemoMaker paper setting to automatic feed or manual feed.
 - Change the MemoMaker printer setting to single or double space.
 - Change the Insert mode setting, that is, turn I on or off by pressing `(Extend char)` `(+Char)`.
 - Clear a tab stop.
 - Set a tab stop.
 - Turn justification on or off.
2. If neither the main nor file keys are displayed, select `MEMOMAKR Main`.
 3. If the file keys are not displayed, select `File Keys`.
 4. `Save Format`
A function key displays the file name `STARTUP.FMT`; on the prompt line, you are told:
Enter file name.
 5. `STARTUP.FMT`

Comments: Unless you create `STARTUP.FMT` each time you start MemoMaker it will be loaded with the following format:

Item	Default Setting
Margins	Columns 1 and 65
Feed (Manual or Automatic)	Manual
Printer Spacing (Single or Double)	Single
Insert (I) Status (On or Off)	Off (Writeover)
Logged Drive and Directory	A:\ (Root of A)
Tab Stops	Columns 1, 6, 11, etc.
Justification Status (On or Off)	Off (Ragged Right)

For more information about `STARTUP.FMT`, refer to “The `STARTUP.FMT` File” on page 6-2.

This feature is particularly useful if most of the documents you create with MemoMaker have a different format than the standard one described above.

If you change a number of format settings, remember that each procedure is described as if it began with the main keys displayed. You may have to return to the main keys with **MEMOMAKR Main** after you carry out one procedure before you can begin the next.

Change the logged drive, logged directory, or both.

Exit from MemoMaker and use the Personal Applications Manager (P.A.M.) to specify the new logged drive and/or logged directory, then restart MemoMaker. (Refer to chapter 2, “The Personal Applications Manager—P.A.M.,” in your *HP 110 Owner's Manual*.)

Change the MemoMaker paper setting to automatic feed or manual feed.

1. **Print Keys**
2. **Auto Feed *** or **Auto Feed**

Comments: If automatic feed is “on”, an asterisk appears in the menu label. **Auto Feed *** means automatic feed is on; **Auto Feed** means it is off. “Off” means that the printer stops after it prints a page. It is the setting with which MemoMaker is loaded unless auto feed is active when you create a **STARTUP.FMT** file. When using a printer with a tractor feed and fanfold paper, you would probably want to keep auto feed on. When using single sheets of paper in your printer, you would probably want to keep auto feed off.

Change the MemoMaker printer setting to single or double space.

1. **Print Keys**
2. **Double Space *** or **Double Space**

Comments: If double spacing is active, an asterisk appears in the menu label. **Double Space *** means double spacing is on; **Double Space** means it is off. “On” means that text appearing in single-space format on your display appears in double-space format on the printed page; “off” is the setting with which MemoMaker is loaded unless double spacing is active when you create a **STARTUP.FMT** file.

Change the name of the document in the workspace and store the document.

1.

File
Keys

Select **Directory** if you don't know whether the logged directory contains a file with the name you are going to give the document in the workspace. For example, if you want to use the file name DRAFT2.MEM, select **Directory**, type in the name of the current directory, such as a :, and press **Return**. If the file name does not appear in the directory listing, you can use it. Otherwise you cannot use it (unless you want the file whose name you are changing to *replace* the existing file of that name).

Note: Because the last directory accessed will appear on the menu label for **(f1)** after you press **Directory**, you may or may not be able to press **(f1)** instead of typing in the name of the current directory.

To exit from the directory, press **Back To MEMOMAKR**. (If you do not press **Return** as described above, you need to press **Cancel Directory** *first*, then press **Back To MEMOMAKR**).

2.

Save
Memo

If the document in the workspace is now named DRAFT1.MEM...

MEMOMAKER

Save Memo

Memo: DRAFT1.MEM

Line: 1 Column: 39 Length: 1

Directory: a:\

Enter file name.

DRAFT1

Document:

File *

64 81

14:24

Help

Cancel

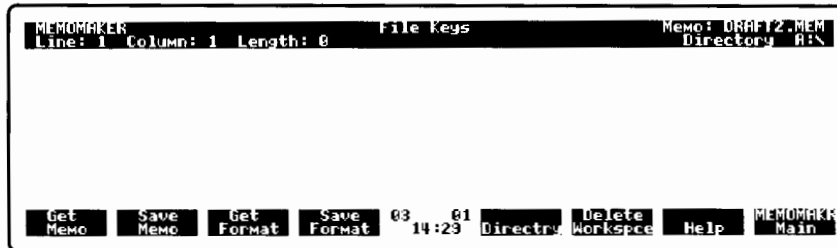
Save

...then the **(f1)** function key displays DRAFT1.MEM. On the prompt line, you are told:

Enter file name.

The cursor moves to the input line at the top of your display.

4. On the input line, type draft2.mem.
5. **(Return)**. (Notice that the Memo: label in the file keys header has changed from DRAFT1.MEM to DRAFT2.MEM.)



2:Procedures

The document displayed is saved under the file name DRAFT2.MEM. Its original still exists on disc as DRAFT1.MEM.

Comments: Until you press **(Return)**, you can undo the effect of the procedure by selecting **Cancel Save** or pressing **(DEL ESC)**.

If you select the function key labeled with the file name of the current document, for example, DRAFT1.MEM instead of typing a new file name, you will *update* DRAFT1.MEM; that is, you will save the contents of the workspace as DRAFT1.MEM and erase the original DRAFT1.MEM on disc.

Clear a tab stop.

1. **Format Keys**
2. Find the current tab stops on the ruler line displayed above the main text area.
3. Move the cursor to a column in which there is a tab stop.
4. **Clear Tab**



Cut out or copy a block of text.

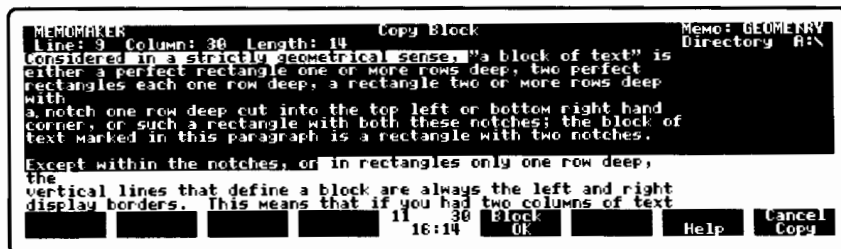
1. **Block**
Keys
2. Move the cursor to the first character in the section of text you wish to cut out, copy, or enhance (in this case, the first " symbol in the first line):

Considered in a strictly geometrical sense, "a block of text" is either a perfect rectangle one or more rows deep, two perfect rectangles each one row deep, a rectangle two or more rows deep with a notch one row deep cut into the top left or bottom right hand corner, or such a rectangle with both these notches; the block of text marked in this paragraph is a rectangle with two notches.

Except within the notches, or in rectangles only one row deep, the vertical lines that define a block are always the left and right display borders. This means that if you had two columns of text on the display, you couldn't mark one as a block and not the other.

2:Procedures

3. **Cut Out** or **Copy**
Block **Block**
4. Use the cursor to define a block that you wish to cut out or copy. (The block ends with the character or space one column before the cursor.)



5. **Block**
OK

Delete (erase) the contents of the workspace.

1. **File**
Keys

2. **Delete
Workspce**

Unless the workspace contains a document that you have retrieved from disc storage or already saved, and then left exactly as is, you are asked on the prompt line whether you want to save the document in the workspace, for example, MEMO.TXT:

```
Do you want to save the current memo as
MEMO.TXT?
```

3. Select **Yes, Save** if you wish to save the document in the workspace; otherwise select **No, Discard**.

Comments: You can use the **(Extend char)** **(Clr dsp)** key in place of **Delete Workspce**.

Until you select **Yes, Save** or **No, Discard**, you can undo the effect of the procedure by selecting **Cancel Delete**.

Enhance a block of text.

1. **Block
Keys**2. **Enhance
Block**

3. Place the cursor on the first character in the block you want to enhance and press either **Enhance: Underlin** or **Enhance Bold**. A **U** or a **B** is inserted (imbedded) in the text.
4. Move the cursor to the first space after the last character you want to enhance and press the same key that you pressed in step 3. A second character (**U** or **B**) is imbedded in the text. The imbedded **U**'s or **B**'s *delimit* the block to be enhanced.
5. **Back To
Block**

Exit from MemoMaker.

1. **Exit**
MEMOMAKR

Unless the workspace is empty, contains a document that you have retrieved from disc storage and then left exactly as is, or you have already saved the document, you are asked on the prompt line whether you want to save the document in the workspace, for example, MEMO.TXT:

Do you want to save the current memo as
MEMO.TXT?

2. Select **Yes, Save** if you wish to save the document in the workspace; otherwise select **No, Discard**.

2:Procedures

Comments: If MEMO.TXT is a file that was retrieved from disc storage and then revised, **Yes, Save** updates it, that is, stores the revised version in place of the original.

Insert a document or a copy of a document into another document.

1. **Block**
Keys
2. Follow the procedure for moving a block or copy of a block to another document. (Refer to "Move a block or a copy of a block from the document in the workspace to another document.") *except—*
 - A. Mark the *entire document to be moved* as a block with **Cut Out Block** or **Copy Block**. (No more than 60 lines can be included in any block you move.)

Comments: You can use this procedure to append one file to another file. Refer to "Append a document..." on page 2-4.

List the logged drive, logged directory, or both.

1. **File**
Keys
2. **Directry**
3. Directory of *drive or directory name* (**Return**). For the default directory, just press (**f1**). (The menu label for (**f1**) will show the current logged drive.)

Comments: If the logged drive is A: and the logged directory root is \ then MEMO.TXT is stored as A:\MEMO.TXT.

When you start MemoMaker, it will use the currently logged directory as the logged drive and \ (root) as the logged directory *unless* your HP 110 contains a STARTUP.FMT file that specifies a different directory and root.

Make a separate document out of a block or a copy of a block.

1. **Block**
Keys
2. Mark a block with **Cut Out Block** or **Copy Block**. Refer to "Cut out or copy a block of text", or where a single line is involved, save the line in block storage by using **(Extend char) (-Line)**.

3. **MEMOMAKR**
Main

4. **File**
Keys

5. **Delete**
Workspace

Unless the workspace contains a document that you have saved without subsequent editing, or retrieved from disc storage or already saved, and then left exactly as is, you are asked on the prompt line whether you want to save the document in the workspace, for example, MEMO.TXT:

```
Do you want to save the current memo as
MEMO.TXT?
```

6. Select **Yes, Save** if you wish to save the document in the workspace; otherwise select **No, Discard**.








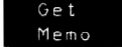
7. **MEMOMAKR**
Main

8. **Block**
Keys

9. **Paste**
Block

Comments: If MEMO.TXT is a file that was retrieved from disc storage and then revised, **Yes, Save** updates it (that is, stores the revised version on disc in place of the original).

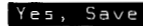

Move a block or a copy of a block from the document in the workspace to another document.

1. 
2. Mark a block with  or  (refer to “Cut out or copy a block of text”), or, where a single line is involved, save the line in block storage by using  .
3. 
4. 
5. 

2:Procedures



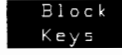
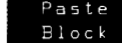
Unless the workspace contains a document that you have retrieved from disc storage and then left exactly as is, you are asked on the prompt line whether you want to save the document in the workspace, for example, MEMO.TXT:

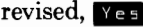
```
Do you want to save the current memo as
MEMO.TXT?
```

6. Select  if you wish to save the document in the workspace, otherwise select . On the prompt line you are told:

```
Enter file name.
```

The cursor moves to the input line at the top of your display.

7. On the input line, either type the name of a file in the logged directory, or designate the drive and path to the file you want to retrieve and then type its name.
8. .
9. Move the cursor to the point in the new document at which you want the block inserted.
10. 
11. 
12. 

Comments: If MEMO.TXT is a file that was retrieved from disc storage and then revised,  updates it, that is, stores the revised version on disc in place of the original.




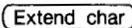


If you need help in responding to

Enter file name:

refer to the two "Retrieve a file from disc storage ..." procedures.

For information about logging, refer to "The logged drive and the logged directory" on page 6-1.

Move a block or a copy of a block to another place in the document.

1. 
2. Mark a block with  or  (refer to "Cut out or copy a block of text" on page 2-10), or, where a single line is involved, save the line in block storage by using  .
3. Move the cursor to the point at which you want the block inserted.
4. 





2:Procedures



Print the document in the workspace.


Note: The printer should be plugged in and turned on before you start MemoMaker. Otherwise, the printer may not respond to MemoMaker commands.

The default line setting is 55 lines per page. When you specify double spacing, the line setting is 28 lines per page.

1. 
The printer begins at column 1 of the line in which the cursor is positioned. Thus, if you want to print from the beginning of the document, and the cursor is not in column 1 of line 1, press  .
2. 

If auto feed is on and you are using fanfold or roller paper, printing will go on to the end of the document; ignore steps 3-5.

If auto feed is off, a page will be printed, the cursor will move to the beginning of the next page (if there is one), and the printer will pause.

3. If you are using single sheets of paper, remove the printed sheet and insert a new one.
4. 
5. Repeat steps 3-4 until you have printed the entire file.



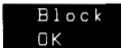
Comments: You can print whatever pages in the workspace document you want by leaving auto feed off, selecting **Print Memo**, and using **Skip Page** to page through the document. Select **Print Memo** whenever you get to a page you want to print.

2:Procedures

Selecting **Print Memo** will print according to the current settings of the **Double Space** and **Auto Feed** function keys. (You can change these settings at any time until you select **Print Memo**.)



If the document you are printing is a file that you have retrieved from disc storage and then revised, you will print the revised version of it, not the version on disc.

Realign a block of text.

1. 
2. Move the cursor to the first character in the section of text you wish to align.
3. 
4. Use the cursor to define a block that you wish to align (the block ends with the character or space one column before the cursor).
5. 

Comments: Until you select **Block OK**, you can undo the effect of the procedure by selecting **Cancel Align**.

Release the margins.

1. 
2. 

Comments: Margins stay released until you select **Margin Release*** again or (when the format keys are *not* displayed) you press **(Return)**.

Retrieve a file from disc storage whose file name, directory, or disc location you do not know.

1. **File
Keys**
2. **Directory**

You are prompted with:

Directory of

Either enter the name of the desired directory (for example, a:\) and press **(Return)** or, to list the default directory, just press **(f1)**.

3. Locate the name of the desired file in the listed directory, then exit from the directory by pressing **Back To MEMOMAKR** (which returns you to the main MemoMaker keys). If you need to search through more than one directory, repeat steps 1 through 3. To terminate the directory without typing in a directory name and/or pressing **(Return)**, just press **Cancel Directory**, then **Back To MEMOMAKR**.
4. When you have the needed file name, press **Get Memo**.

Unless the workspace is empty, or contains a document that you retrieved from disc storage or already saved, and then left exactly as is, you are asked on the prompt line whether you want to save the document in the workspace; for example, MEMO.TXT:

Do you want to save the current memo as
MEMO.TXT?

5. Select **Yes, Save** if you wish to save the document in the workspace; otherwise select **No, Discard**.

Your HP 110 then prompts you with

Enter file name.

Type in the file name and press **(Return)**.

Comments: Following the procedure in order to pass the file UNKNOWN.MEM back to MemoMaker is equivalent to selecting **Directory**, discovering that the file you want to retrieve is UNKNOWN.MEM, returning to MemoMaker, selecting **Get Memo**, then responding to

Enter file name.

by typing unknown.mem.

If MEMO.TXT is a file that was retrieved from disc storage and then revised, **Yes, Save** updates it, that is, stores the revised version on disc in place of the original.

Retrieve a file from disc storage whose file name, directory, and disc location you know.

1. **Get Memo**

Unless the workspace is empty, or contains a document that you have retrieved from disc storage or already saved, and then left exactly as is, you are asked on the prompt line whether you want to save the document in the workspace; for example, MEMO.TXT:

```
Do you want to save the current memo as
MEMO.TXT?
```

(To use **Get Memo** with WordStar® files, refer to appendix B, MemoMaker and WordStar®, and to the description of the **Document File *** and **ASCII File *** function keys on page 5-13.)

2. Select **Yes, Save** if you wish to save the document in the workspace; otherwise select **No, Discard**. On the prompt line, you are told:

```
Enter file name.
```

The cursor moves to the input line at the top of your display.

3. On the input line, type either the name of a file in the logged directory, or the drive, path, and name of the file you want to retrieve.
4. **(Return)**

Comments: You can also begin this procedure with the file keys displayed, since **Get Memo** is one of them as well as one of the main keys.

If MEMO.TXT is a file that was retrieved from disc storage and then revised, **Yes, Save** updates it, that is, stores the revised version on disc in place of the original.

If you select **No, Discard**, then select the function key labeled with the name of the current document (for example, MEMO.TXT), you will put the original disc version of MEMO.TXT in the workspace in place of the revised version of MEMO.TXT.

For information about logging, refer to “The Logged Drive and the Logged Directory” on page 6-1.

Retrieve a format on file in disc storage.

1. **File**
Keys
2. If necessary, use **Directory** to find the correct file name and path name of the file.
3. **Get**
Format

A function key displays the file name of the current format, for example, PICA.FMT; on the prompt line, you are told:

Enter file name.

The cursor moves to the input line at the top of your display.

4. On the input line, either type the name of a format file in the logged directory, or designate the drive and path to the format file you want to retrieve and then type its name.
5. **Return**

Comments: Until you press **Return** you can undo the effect of the procedure by selecting **Cancel Get** or pressing the **DEL ESC** key.

For information about logging, refer to “The Logged Drive and the Logged Directory” on page 6-1.

If you select the function key labeled with the file name of the current format, for example, PICA.FMT, you will replace PICA.FMT with itself. If you have made changes in PICA.FMT since you last retrieved it, these changes will be erased.

You can use the format retrieval procedure more than once while working on a single document. For example, you might use the default format for the opening paragraphs of a memo, a format you named TABLE.FMT for a table included next, and the default format again for the text that comprises the rest of the memo. (The easiest way to re-establish the default format is by creating a format file—at the beginning of a MemoMaker session—containing the default format, then using this procedure to retrieve that file.)

Retrieve and print a MemoMaker file in disc storage.

1. Retrieve a file from disc storage. (Refer to the two "Retrieve a file from disc storage..." procedures if you don't know how.)
2. If the main keys are not displayed, select **MEMOMAKR Main**.
3. Print the document in the workspace (Refer to "Print the document in the workspace," page 2-15.)

Set a tab stop.

1. **Format Keys**
2. Find the current tab stops on the ruler line displayed above the main text area.
3. Move the cursor to a column in which there is no tab stop.
4. **Set Tab**

Show the printer where to end a page.

1. **Print Keys**
2. Place the cursor in column 1 of the line *after* the line on which the page will end.
3. **Page Break**

The HP 110 displays the page break symbol .PA in columns 1 through 3 of the cursor line and signals the printer to end a page after the preceding line. The cursor and any text on the cursor line moves to the next line, where the subsequent printed page begins. The .PA symbol does not appear in print on either page.

Comments: Since the line count includes the .PA line, adding a .PA increases the length of the document by a line. **Skip Page** disregards .PA lines. That is, if the cursor is in line 1 and line 56 contains .PA, **Skip Page** moves the cursor to line 57 instead of line 56.

Store the current MemoMaker format in a file in the logged directory.

1. **File Keys**

2. Select **Directory** if you don't know whether the logged directory contains a file with the same name as the one you are going to give the current format.
3. **Save Format**
 A function key displays the file name of the format you loaded or retrieved and then changed. On the prompt line you are told:
 Enter file name.
 The cursor moves to the input line at the top of your display.
4. Type a file name that is not the name of a file in the logged directory.
5. **Return**

Comments: If you select the function key labeled with the file name of a format file you retrieved from the logged directory and then changed, (for example, **TABLE.FMT**), you will update **TABLE.FMT** in the logged directory; that is, **TABLE.FMT** will contain the new format and the old one will be erased. If you have previously created a startup format file (named **STARTUP.FMT**) and now select the function key labeled with **STARTUP.FMT**, you will update the existing **STARTUP.FMT**. When there is no file named **STARTUP.FMT**, MemoMaker uses a default set containing values for the following parameter types:

- Left and right margin settings.
- Tab stops.
- Justification status (whether **Justify** is on).
- Insertion status (whether **I** is on).
- Logged disc drive and directory.
- Printer feed setting (whether **Auto Feed** is on).
- Printer line setting (whether **Double Space** is on).



Use this procedure in conjunction with “Retrieve a format on file in disc storage” (page 2-19) to provide you with other automatically set page formats. This may be useful:

- When your memo blanks and letterhead stationery have different widths.

- When you need special tab settings for entries on column-ruled forms.
- When you use MemoMaker to create tables as well as ordinary text.
- When your printer alternates its type size between 10- and 12-characters per inch.

Until you press **(Return)**, you can undo the effect of the procedure by selecting **Cancel Save** or pressing **(DEL ESC)**.

Store the nameless document currently in the workspace as a file in the logged directory.

1. **File Keys**
2. **Save Memo**

On the prompt line, you are told:

Enter file name.

The cursor moves to the input line at the top of your display. (To use **Save Memo** with WordStar® files, refer to appendix B, “MemoMaker and Word Star®,” and to the description of the **Document File *** and **ASCII File *** function keys on page 5-13.)

3. On the input line, type a file name that is not the name of a file in the logged directory.
4. **(Return)**

Comments: Until you press **(Return)**, you can undo the effect of the procedure by selecting **Cancel Save** or pressing **(DEL ESC)**.

After you select **Save Memo**, the function key labeled with the name of the document in the workspace will be labeled **NAMELESS**. If you press **NAMELESS**, the document in the workspace will be stored in the logged directory as a file named NAMELESS. For more information about nameless files, refer to “Who Shall Remain NAMELESS?” on page 6-4.

Turn justification on or off.

1. `Block
Keys`
2. `Align
Block`
3. `Justify*` or `Justify`

Comments: `Justify *` means justification is on; `Justify` means it is off. `Justify` is the setting with which MemoMaker is loaded unless you specify `Justify *` in a `STARTUP.FMT` file.

Update a document stored on disc with the revised version of it in the workspace. Retain the revised version in the workspace for further work.

1. `File
Keys`
2. `Save
Memo`

On the prompt line you are told:

Enter file name.

The name of the displayed file appears in the menu label corresponding to function `(f1)`. Press `(f1)`.

3. For example, if the file in the workspace is named `MEMO.TXT`, select `MEMO.TXT`.

Comments: You can also perform the procedure with the sequence

`Get Memo`, `Yes`, `Save`, `Cancel Get`.

`Yes, Save` also appears after you select `Exit MEMOMAKR` or `Delete Workspce`, but in either case the document is not retained in the workspace if you update it.

FOR YOUR REFERENCE

Introduction

This section exists primarily to remind you of what you have already learned about MemoMaker, and secondarily to give you a general picture of its design and acquaint you with a few fine points concerning its use. It is not designed to introduce you to MemoMaker or to spell out basic MemoMaker procedures in a step-by-step fashion.

If you are a word processing beginner, chapter 1, "Getting Started," is your best introduction to MemoMaker. If you are an experienced user of some other word processor, the Help displays and the preceeding section, "MemoMaker Procedures," (chapter 2), are your best introduction to MemoMaker. If you have completed the lessons in chapter 1, the best step-by-step guide to MemoMaker procedures is in chapter 2.

Arrangement of Chapters 3 Through 6

Chapter 3: How to use the remaining chapters; other sources of information; special terms used in the manual.

Chapter 4: The MemoMaker display and Help keys.

Chapter 5: The MemoMaker keyboard; function key selections (alphabetical by label).

Chapter 6: Drives, discs, directories; the P.A.M. file manager; special files; file names.

Use the following resources to find your way around chapters 3 through 6:

- The Table of Contents.
- The Index.
- The tabs that mark each chapter.

Other Places to Turn for Information

Information about error messages and MemoMaker-WordStar compatibility is contained in appendices to this manual.

The *HP 110 Owner's Manual* contains much information relevant to MemoMaker:

- On the HP 110.
- On the Personal Application Manager (P.A.M.).
- On disc and file management.
- On starting MemoMaker.
- On (optional) printer and external disc drive installation.

Terminology

Files and Documents

This manual uses the word *document* to stand for any piece of writing that you create with MemoMaker—for a memo, a letter, a report, a set of notes, a procedure, whatever. The documents that you create and print with MemoMaker are stored on discs as files, and it is as files that they are retrieved from disc storage when you wish to review or revise them. Ordinarily, this manual refers to a document that you are writing, reviewing, revising, or printing as a *document*, and to the same document when stored on disc as a *file*.

It is possible to combine a number of MemoMaker files so that they become a single file with a single file name. In that case, the single file might be said to contain a number of documents. In this manual, however, a single MemoMaker file containing written text is always spoken of as consisting of a single document:

one text file = one document

Note: A document can have a file name without qualifying as a file. This is because a document that is now being composed, that has been given no file name, and that has never been filed on disc, is automatically labeled as *nameless*—and NAMELESS is a legitimate file name.

Function Keys

You can execute a function by pressing the corresponding numbered key (**f1** through **f8**) at the top of your keyboard. As you know, these keys correspond to the display labels and are called *function keys*. When this manual tells you to press the function key **Margin Release**, you should press the function key corresponding to the function key label **Margin Release**.

All the keys on the keyboard except the eight numbered function keys are *hard keys*. (Keys whose functions do not change.)

I Can't See It, But I Know It's There

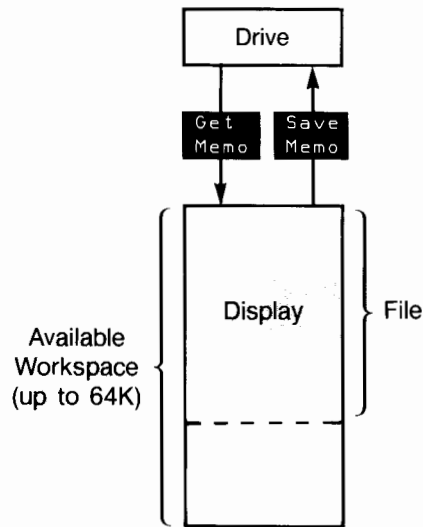
You don't need to know what's under the hood to be able to drive a car—though the knowledge may come in handy. Because this manual is meant to help you drive MemoMaker, not soup it up, it usually steers clear of what's under MemoMaker's hood. Two exceptions are the *workspace* and *block storage*, terms that you need to understand in order to stay on the road.

The Workspace. When you are writing or revising a MemoMaker file, you see up to 12 lines of the file in your display at a time. If your file is longer than what you can see, you can think of the entire file as a scroll, and what you can see as the open and visible part of the scroll.

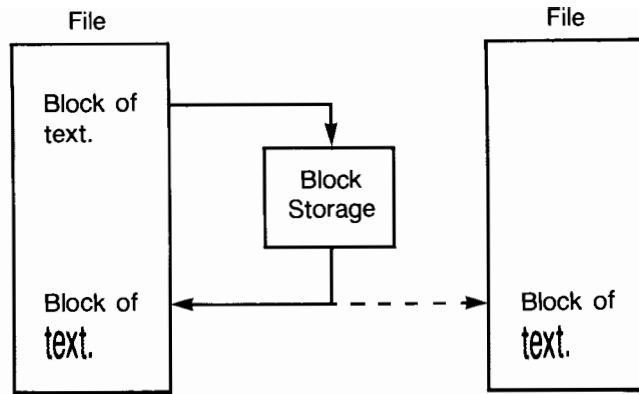
3:Reference



The invisible area in which your HP 110 holds the entire scroll while part of it is on display is the *workspace*. All of the workspace is located in system memory. The size of your workspace is up to 64K bytes, depending on the current memory configuration.



Block Storage. You can move blocks of up to 60 lines at a time. When you want to move a block of text from one place to another—to a new location in the document currently in the workspace or to another document—you first use the **Copy Block** or **Cut Out Block** function key, or the (Extend char) (Clr line) or (Extend char) (-Line) hard keys. Whichever key(s) you use, the effect is to place the block, or a copy of the block, in *block storage*. When you next move the cursor to the block's new location and select the function key **Paste Block**, the effect is to “paste” a copy of the block in block storage at the cursor position. (To place a block of text in a document other than the one currently in the workspace, you must (1) place the desired block of text in block storage, (2) store the current document, (3) get the other document into the workspace, and (4) position the cursor and press **Paste Block**.) You might also hear someone use the term *buffer* to refer to block storage. Block storage can contain only one block of text at a time.



Copy Block, **Cut Out Block**, (Extend char) (-Line), and (Extend char) (Clr line) replace the current contents of block storage with the specified block or line. **Paste Block** inserts the current contents of block storage at the current cursor position (or the line immediately following).

A GUIDE TO USING THE DISPLAY AND HELP OPTIONS



The fold-out menu map at the end of this manual shows how MemoMaker's function key groups and extensions are interconnected. As soon as you load MemoMaker you are shown the *main keys* group. You access each of the other function key groups from the main keys, and vice-versa. The main keys are "main" because of their relation to the other function key groups, which are like lesser branches attached to a main branch. To get from one to another you need to return to the main branch.

To exit from MemoMaker, you need to return to the main keys, then select **Exit MEMOMAKR**.

The function key *extensions* (on the right side of the menu map foldout) look like the function key groups, but are actually auxiliaries to particular keys. For example, when you select **Enhance Block**, all keys from the block keys group disappear, and an extension to **Enhance Block** (consisting of four keys) takes their place. You need to select **Back To Block** to exit from the extension.

The MemoMaker Display

Whatever function key group is displayed, your MemoMaker display contains a main area that is blank until you write on it or retrieve a document to display on it. Whatever group is displayed, you can write, revise, or review your documents in this area.

What Function Key Group Should I Normally Display?

You use the print keys to print documents; the block keys to move, copy, or modify blocks of text; the file keys to move files in and out of disc storage; and the format keys to change the page format to which your documents will conform. For ordinary writing and revising, you are best off displaying the block keys, since this allows you to perform MemoMaker's powerful block operations as you go along. The print keys may be more appropriate when you are writing or revising a number of simple documents and printing them immediately; the file keys when you are storing a document on disc for printing elsewhere or later. Whichever of the five groups you display, you have easy access to the other four.

Display Layout

The MemoMaker display template contains three areas: the header lines, the main display area beneath them, and the function key menu under the main display.

The Header Lines. There are two header lines that are always displayed in the template. When you start MemoMaker, line 1 identifies the current application, version, and copyright information. After you begin MemoMaker operations, line 1 identifies the application, the name of the function key or group extension currently displayed, and the name of the memo currently in the workspace. Also, when MemoMaker detects an error, the corresponding error message flashes in line 1 until you press almost any key. (For further information about error messages, refer to appendix A, "In Case of Difficulty...") Line 2 identifies the current line and column position of the cursor, the length of the current file, and the name of the current directory.

The Main Display Lines. Lines 3 through 14 of the template form a 12-line by 80-character window into the document currently in the workspace. This window displays your text, except that lines 3, 4, and 5 are temporarily used for header information when you press a function key that causes MemoMaker to prompt you for an input. When this occurs, lines 3 and 4 are used for the prompt and your response; line 5 is blank to help you easily distinguish the prompt from your text. After you key in your response and press **Return**, or press **Cancel** to terminate the operation, lines 3 through 5 again display your text. The display lines are 80 columns wide, but your text can occupy only the first 79 columns.

The Function Key Menu. This part of the display template contains the labels for the eight function keys. Between the fourth and fifth labels, the HP 110 displays status indicators and the current time. For an example of a status indicator, press (Extend char) (+Char). The I indicator appears, indicating that you can insert characters anywhere in the text. Press (Extend char) (+Char) again to deactivate the insert option and clear I from the display.

Getting Lost and Getting Help

All of the function key groups and most of the extensions contain a **Help** key. When you select **Help** from any group or extension, you are shown a display of useful information about the function keys that make up that group or extension. For example, pressing **Help** when the main function keys are displayed produces the following:

```
MEMOMAKER                               MAIN Keys                               Memo: NAMELESS
Line: 1 Column: 1 Length: 8             Directory R:\N
File Keys - displays the File Keys.
Block Keys - displays the Block Keys.
Format Keys - displays the Format Keys.
Print Keys - displays the Print Keys.
Get Memo - lets you save the document in the workspace as a disc file;
Center Line - then allows you to begin retrieval of a disc file.
Help - centers text on the cursor line between the margins.
Exit MEMOMAKER - when "on" (*), displays information about the currently
                  displayed function key group.
                  - lets you save the document in the workspace as a disc
                    file; then ends the MemoMaker session, returns to F.R.M.

File Keys Block Keys Format Keys Print Keys 16:16 Get Memo Center Line Help * Exit MEMOMAKER
```

Help automatically puts MemoMaker in the Help mode, (and displays an asterisk on the Help key—**Help ***—to indicate that Help is active). MemoMaker remains in Help mode until you press **Help *** again. In the Help mode, only the **Help *** key is active. Pressing any other of the remaining seven MemoMaker function keys has no effect.

4:Options

Getting Out of Help and Back on Track

Pressing **Help *** restores the display at which you were looking when you pressed **Help**. The same text—if any—is displayed, and the cursor returns to the position it occupied before you pressed **Help**.

All Things Being Equal, When Should I Seek Help?

Help is one of five sources of useful information about MemoMaker. The others are chapter 1, “Getting Started;” chapter 2, “MemoMaker Procedures;” chapter 3, “For Your Reference;” and chapter 4, which you are currently reading.

Help is particularly useful when:

- You have already completed chapter 1, “Getting Started.” (**Help** itself is an on-display reference manual, not a tutorial.)
- Your question is a simple one about a particular key. (Use chapters 3 through 6 if you need detailed information or have more general questions. Use chapter 2, “MemoMaker Procedures,” for reminders about particular procedures.)
- You are afraid that you are about to press the wrong key. (Use appendix A: “In Case of Difficulty...” if you have already done so and elicited an error message.)
- You don’t need to display a document while you are getting the information you need. (**Help** temporarily replaces text on display with its own messages.)

**MEMOMAKER KEY AND
FUNCTION DICTIONARY**

**Overview**

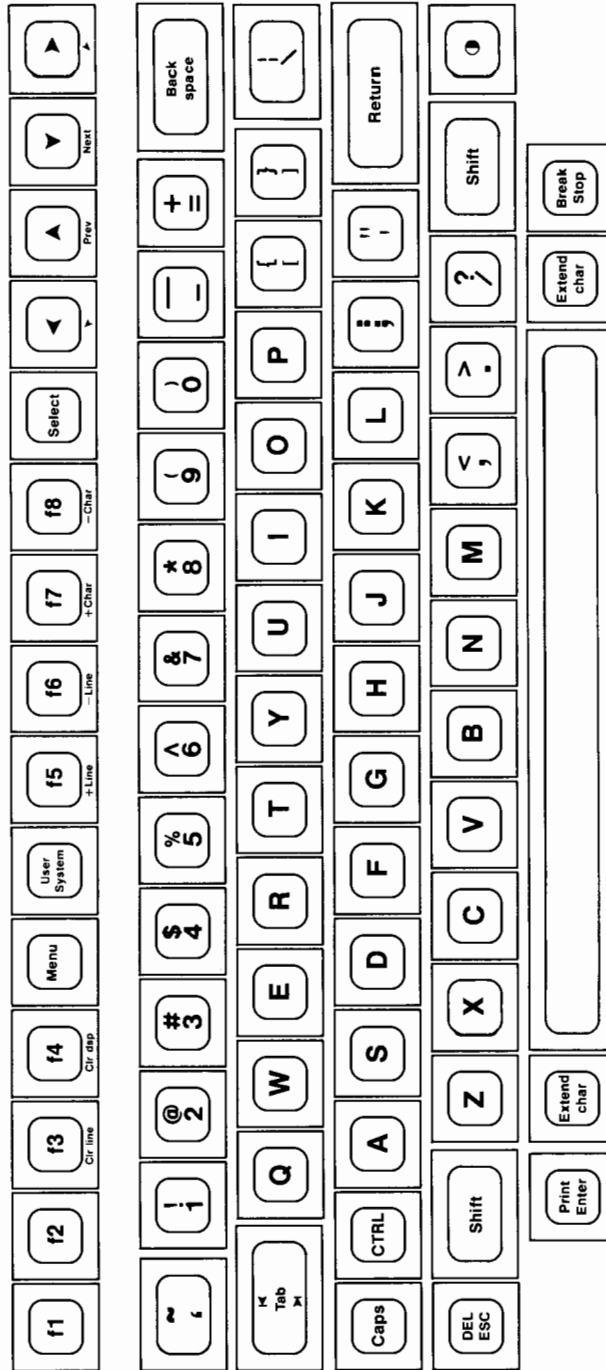
This chapter contains two sections. The first is organized as an alphabetical list of special MemoMaker keyboard functions—keys and key combinations that work in a different way when you are using MemoMaker on your HP 110 computer than when no application is loaded on it.

The second is organized as an alphabetical list of the MemoMaker function keys, by label.

The MemoMaker Keyboard: Special Key Usage

MemoMaker uses most of the keys on the HP 110 keyboard (which is illustrated on the following page).

5:Dictionary



5-2 MemoMaker Key and Function Dictionary

Except for the keys and key combinations listed alphabetically below, it uses them as they are used when you first turn on your HP 110's display, before you load any application. If you are unfamiliar with this ordinary HP 110 keyboard usage, consult your *HP 110 Owner's Manual* for a detailed introduction to it. The keys below are different from the ordinary only when you are creating or revising a document displayed on the main display area, not when you are using the keyboard to enter a file name on the input line above it. With all keys, including the following keys, holding a key down does the same thing, but faster, as pressing it repeatedly.

In the following key descriptions, special MemoMaker usage is in boldface type. One key directly above or before another—

(Extend char)

(Clr Line) or (Extend char) (Clr line)

—means to press the top or first key, then press the bottom or second key before you release the top or first.

(Extend char)

(Clr dsp)

Displays the file-saving menu extension and lets you save the document in the workspace. Then the entire contents of the workspace are erased. (Equivalent to `Delete Workspce`.)

(Extend char)

(-Char)

Deletes the character at the cursor position; moves all characters to the right of it one column to the left.

(Extend char)

(-Line)

Deletes the line containing the cursor, moves the next line up to replace it. **In MemoMaker, stores the deleted line in block storage—it can be moved to a new cursor position by `Paste Block`.**

Extend char
+Char

When on, typing a character moves all characters from the one at the cursor position to the end of the line one column to the right, then inserts the character you typed at the cursor position. **In MemoMaker, when the last character in a word is moved into column 80 as a result of being pushed to the right, the word wraps to the next line.**

Extend char
+Line

Moves all characters from the character at the cursor position to the end of the line down to the left margin of the next line, that is, splits the line; moves succeeding lines down one line to make room; cursor remains where it was when you pressed (Insert Line).

Return

Moves the cursor to the left margin of the following line. **In MemoMaker, turns margin release off if it is on.**

Tab

Moves the cursor right to the next tab stop. **In MemoMaker, tabs as far as the right margin.**

▲ ▼

Moves the cursor up or down **and scrolls the display when you use them to move the cursor past the upper or lower display borders.**

◀ ▶


Moves the cursor left or right. **In MemoMaker, moves the cursor as far as the left or right borders. If the cursor is beyond the left or right margin and `Margin Release` is off, you cannot type a character at the cursor position. If you try, the character you type will jump to the left margin of the next line.**


MemoMaker Function Keys

The MemoMaker function keys are contained in the 5 MemoMaker function key groups and the 17 function key extensions. A menu map illustrating these 22 interconnected arrays appears at the end of this manual.




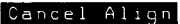
How To Use the Function Dictionary

The MemoMaker function keys are described on the following pages, in alphabetical order. Each entry begins with an image of the key described, followed by the menu map array name and line number in which the entry occurs. For example—


 (Block Keys/6)

—means that  is one of the block keys, and is in the sixth row of keys on the map.



In each function key entry, **boldface text describes the key's basic function.**

Notice that several of the labels of the far right function keys () in the function key extensions on the map at the end of this manual begin with : you can find information about any function key whose label begins with  under  (page 5-9).

The MemoMaker Function Dictionary

 (Block Keys/6)

Marks the beginning of the block to be rearranged so that it conforms to the current margin settings and justification status; displays

 extension so that you can mark the end with .

This involves the following operations, in the order given:

1. Removes all spaces at the beginning and end of the marked block.
2. Removes all spaces at the beginning and end of each line in the marked block.

3. Condenses all multiple spaces (two or more spaces in a row) within lines to a single space with the following exceptions, where more than two spaces are condensed to two:
 - After a period (.), a question mark (?), or an exclamation point (!).
 - After any of these followed by a quotation mark (single or double).
 - After a colon.
4. Brings up words from successive lines to fill in earlier lines, ordinarily leaving one space between the last word of a line and the word or words brought up. Where an earlier line ends with a period, a question mark, an exclamation point, any of these followed by a quotation mark, or a colon, leaves two spaces.
5. If justification is on, evenly distributes the spaces now at the ends of lines between words within the lines.

Align Block does not disturb completely blank lines. Refer to “Realign a block of text” on page 2-16.

Comments. Because **Align Block** automatically removes spaces at the beginnings of lines (step 2 above), you cannot align a block beginning with a conventionally indented paragraph (one whose first line is indented) and ending with another in a single alignment operation. Align a document containing such paragraphs one paragraph at a time.

When aligning a conventionally indented paragraph, mark the first letter in the first word of the paragraph, not the first column in its first line.

To create a paragraph with hanging indentation, that is, one with each line in the paragraph after the first one indented, set the left margin 6 columns in from column 1 (more or less), then use **Margin Release *** to begin the first line of the paragraph in column 1. (Be sure to cancel **Margin Release *** at the end of the first line by pressing **(Return)**.) To align the paragraph, mark it as a block beginning at the left margin of the first line.

Since **Align Block** does not disturb completely blank lines, you can align a series of block-style paragraphs separated by blank lines in a single alignment operation. You can align an entire document composed in block style this way.

When **Align Block** repositions a word divided and hyphenated at the end of a line, it does not delete the hyphen. However, with MemoMaker's automatic word-wrapping, it should not normally be necessary to split words between lines. (WordStar® users: refer to appendix B, "MemoMaker and WordStar®.")

You usually need to use **Align Block** after you have:

- Used **Cut Out Block** or **(Extend char) (-Line)** to cut out a block or line of text.
- Used **Paste Block** to insert a block or line of text in a new location.

- Used text insertions to revise a line.
- Changed the format in which you wish your document to be stored or printed.

ASCII File * (Alternative to **Document File *** Save or Get Extension/19, 21)

Refer to **Document File ***, page 5-13.

Auto Feed (Print Keys/3)

When on (*), instructs the printer to use automatic page feed.

Your printer uses automatic page feed with roller or perforated fan-fold paper. At the end of each page it automatically advances the paper to the line on the next page designated as the first print line.

When you load MemoMaker, **Auto Feed** is off unless you have reset it in the file **STARTUP.FMT**. In practice, this means that your printer will stop at the end of each page so that you can insert another sheet of paper. Refer to "Change the MemoMaker paper setting...." on page 2-7.

Comments. MemoMaker assumes that your printer and paper are coordinated in such a way that each sheet can contain 66 lines. If your printer gives you 6 lines to the inch, it is coordinated with paper 11

inches long, the standard office stationery length. With single-space text, MemoMaker accomodates these 66 lines by printing 55 lines of text per page and leaving 11 lines blank between 55-line blocks of text. (With double-space text, although there are only 28 lines of text per page, the block containing the text is also 55 lines long.) This means that if your printer and paper are coordinated according to MemoMaker's assumption, and if auto feed is on (**Auto Feed***), the print on each page after the first will start at the same line it started on the first page.

When you use **Page Break** to reduce the number of lines of text on a page while auto feed is on, MemoMaker increases the number of blank lines between blocks of text so that the next page begins on the proper line.

Back To Block (**Enhance Block** extension/7)

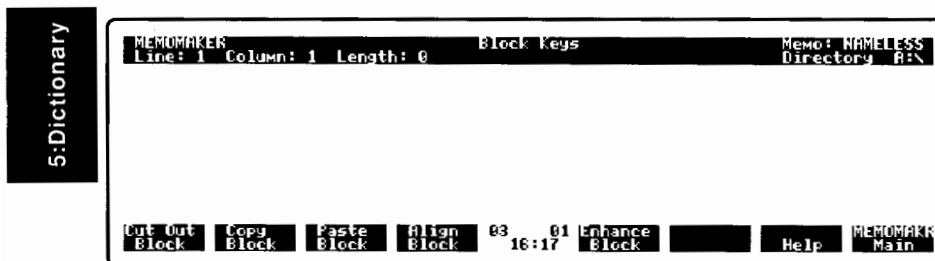
Returns to block keys menu.

Back To MEMOMAKR (**Directry** Extension/14, 15)

Returns to main keys menu.

Block Keys (Main Keys/1)

Displays the Block Keys.



**Block
OK**

(Block Keys Extensions/8, 9, and 10)

Cuts out, copies, or aligns a block after you have selected

Cut Out Block, **Copy Block**, or **Align Block**, and defined the block with the cursor; redisplay the block keys.

Refer to "Cut out or copy a block of text" on page 2-10 and "Realign a block of text on page 2-16.

**Cancel
Align**

(**Align Block** Extension/8)

**Cancel
Copy**

(**Copy Block** Extension/9)

**Cancel
Cut Out**

(**Cut Out Block** Extension/10)

**Cancel
Delete**

(**Delete Workspce**/12)

**Cancel
Directry**

(**Directry** Extension/13)

**Cancel
Exit**

(**Exit MEMOMAKR**/2)

**Cancel
Get**

(File Keys Extensions/17, 20, 21, 22)

**Cancel
Print**

(**Print Memo** Extension/4)

**Cancel
Save**

(File Naming Extension/16, 18, 19)

Wholly or partially undoes the effect of having selected a function key. For example, **Align Block: Pressing **Cancel Align** redisplay the function key group where the function key selected is located, for example, the block keys.**

The following keys undo only partially the effect of having selected a function key:

Cancel Align preserves any change you made in the setting of **Justify** after you selected **Align Block**.



Cancel Get: if you select **Yes, Save** after selecting **Get Memo**, preserves the effect of the action.

Cancel Print stops transmission to the printer, but does not necessarily stop printing immediately. Unless you stop the printer itself, printing continues until the contents of the buffer in the printer are all printed.

Comments. You can use the **(DEL ESC)** key in place of any of the **Cancel** function keys.

**Center
Line**

(Main Keys/1)

Places the text on the line containing the cursor midway between the left and right margins.

Refer to “Center a line” on page 2-5.

Comments. If a line of text cannot be centered exactly, it is positioned left of center; that is, if it would need to start halfway between columns 10 and 11 to be exactly centered, it starts at column 10.

If the line of text to be centered is too long to fit the margins and the left margin is to the right of column 1, **Center Line** centers the line with reference to the left and right margins. If this is impossible, it moves the line as close to this centered position as it can.

If **Margin Release*** is on, the line will be centered between columns 1 and 79.

**Clear
Tab**

(Format Keys/5)

Clears a tab stop in the column where the cursor is located.

When you load MemoMaker, the tab stops are set at columns 1, 6, 11, 16, and so on unless you have reset them in the file **STARTUP.FMT**.

You can identify the current tab stops by examining the ruler line displayed when you select **Format Keys**.

Refer to “Clear a tab stop” on page 2-9.

Copy
Block

(Block Keys/6)

Marks the beginning of a block of text to be copied from the document in the workspace and placed in block storage; displays the Copy Block extension so that you can mark the end of the block and store it.

Use Copy Block in conjunction with Paste Block, which moves a block of text from block storage to another point in the same document or another document.

Refer to “Cut out or copy a block of text” on page 2-10.

Comments. If you need to insert a copy of a block at a second location without removing it from its original location, use Copy Block. If you need to remove a block from one location and insert it at a second, use Cut Out Block instead of Copy Block.

You can place only one block at a time in block storage. A second block removes the first. If you need to move more than one block, alternate between Copy Block or Cut Out Block and Paste Block.

You can use Copy Block or Cut Out Block to put a block from one document in block storage, use Get Memo to bring a second document into the workspace, and then use Paste Block to insert the block in the second document.

To insert a copy of an entire file in another file, mark the beginning and end of the first file with Copy Block or Cut Out Block, then use the technique outlined above to insert this block in the second file. You can also use this technique to append a file to another file. Refer to “Insert a document or a copy of a document into another document” (page 2-12) and “Append a document or a copy of a document to another document” (page 2-4).

Cut Out
Block

(Block Keys/6)

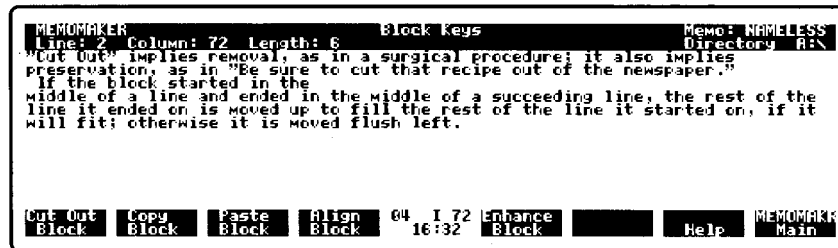
Marks the beginning of a block of text to be cut out of the document in the workspace and placed in block storage. Displays the Cut Out Block extension so that you can mark the end of the block and store it.

From block storage the block can be moved to another location in the same document, or in another document, with **Paste Block**. If it is not moved, it is erased when you place another block in block storage or when you exit MemoMaker.

In the following display, **Cut Out Block** deletes the highlighted block:



so that this is left:



Refer to “Cut out or copy a block of text” on page 2-10.

Comments. (This information applies to **Copy Block** as well as to **Cut Out Block**.)

After you delete a block, you will usually need to use **Align Block** to realign the section of text from which you deleted it. Refer to “Realign a block of text” on page 2-16.

Delete
Workspace (File Keys/11)

If the document in the workspace has not already been saved, displays the file-saving extension and lets you save the document; then erases the entire contents of the workspace.

If you retrieved the document in the workspace from disc storage, revised it, and then chose to save it, **Delete Workspce** also deletes the original disc file, that is, updates the file. If you retrieved the document and then left it exactly as is, **Delete Workspce** does not display the file-saving extension.

Refer to "Delete (erase) the contents of the workspace" on page 2-10.

Comments. You can use the **(Extend char)** **(Clr dsp)** key in place of **Delete Workspce**.

Directory (File Keys/11)

Prompts you for directory name. Lists directory when you press (f1) (for default directory) or type in directory name and press (Return). If there are more directory entries that can be displayed, the menu label corresponding to **(f1)** displays **More**. When this occurs, pressing **(f1)** lists the additional entries.

Document File * or **ASCII File *** (**Get Memo** and **Save Memo** Extensions/18, 19, 20, 21)

Document File */ASCII File * is a toggle in which the **Document File *** setting is the default selection. (The current setting applies to both the **Get Memo** and **Save Memo** extensions, regardless of which extension was displayed when you specified a new setting.)

Using Document File*. This option should be displayed when you save or get a MemoMaker or WordStar® file. With **Document File *** displayed, if you save a file containing international characters (characters having an ASCII code greater than 127), MemoMaker preserves these characters as text by adding WordStar® escape sequences to them. "Hard" spaces and carriage returns are preserved as such. (You cannot save "soft" spaces and carriage returns.)

This allows you to create a WordStar®-compatible file on the HP 110, then later transfer the file to a system that uses WordStar®. Refer to appendix B, "MemoMaker and WordStar®."



If you get a file containing international characters, MemoMaker performs the following:

- If an international character (c) is not enclosed by escape sequences (ASCII 27 c ASCII 28), the character is converted either to a “normal” (non-international) character or to a “hard” carriage return or space.
- If the character (c) is enclosed by escape sequences (ASCII 27 c ASCII 28), the escape sequences are removed and c is displayed as an international character.

Using ASCII File *. This option should be displayed when you want to save or get a “pure” text file. That is, when you save a file, **ASCII File *** causes your HP 110 to save all characters in that file in the same form as you see them, *except* characters intended as WordStar® escape sequences and character enhancements. (The escape sequences and enhancements are stripped from the file.) When you get a file, **ASCII File*** causes your HP 110 to preserve all characters as text. (All ASCII escape sequences including those for underlining and boldface are stripped from the file.)

**Double
Space** (Print Keys/3)

When on (*), causes the printer to print every other line, that is, to print with double spacing.

Single-space pages are 55 lines long unless you cut them short with **Page Break**. Double-space pages are 28 lines long unless you cut them short.

When you load MemoMaker, double spacing is off (**Double Space**) unless you have reset it in the file `STARTUP.FMT`.

5:Dictionary

Refer to “Change the MemoMaker printer setting to single or double space” on page 2-7.

**Enhance
Block** (Block Keys/6)

Displays the **Enhance Block extension so that you can mark the beginning and end of the block you want printed with underlining or boldface.**

The keys on the **Enhance Block** extension are labeled **Enhance: Underlin** (underline) and **Enhance: Bold** (boldface).

Refer to “**Enhance: Bold** or **Enhance: Underlin**.” Refer also to “Enhance a block of text” on page 2-11.

Enhance: Bold or **Enhance: Underlin** (**Enhance Block** Extension/7)

Determines the kind of enhancement to use when printing the specified block of text.

To use:

1. Move the cursor to the first character in a series you want printed with underlining or boldface.
2. Press **Enhance: Underlin** or **Enhance: Bold**. This marks the beginning of the block with a **U** or a **B**.
3. Move the cursor to the first space *after* the last character in the series you are underlining and press the same key that you pressed in step 3. This marks the end of the block with a **U** or a **B**.

Refer to “Enhance a Block of Text” on page 2-11.

Comments. Your printer must be able to print underlining and **boldface** for these enhancements to show up on paper. If you don’t know whether your printer will execute these enhancements, consult your printer owner’s manual.

Exit MEMOMAKR (Main Keys/1)

If the document in the workspace has not already been saved, displays the file-saving extension and lets you save the document; then ends the MemoMaker session, returns control to P.A.M.

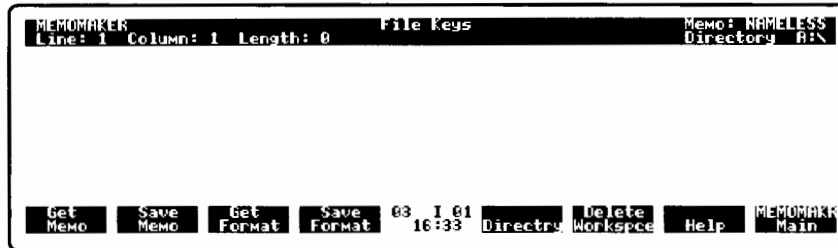
If you retrieved the document in the workspace from disc storage, revised it, and then chose to save it, **Exit MEMOMAKR** also deletes the original disc file, that is, updates the file. If you retrieved the document and then left it exactly as is, or if the workspace is empty, **Exit MEMOMAKR** does not display the file saving extension.

Refer to “Exit from MemoMaker” on page 2-12.

Comments. If you wish to preserve both the original (disc) version of the document currently in the workspace and the workspace version on disc, use **Save Memo** to rename and save the workspace version. The original, with its original file name, will remain on the disc.

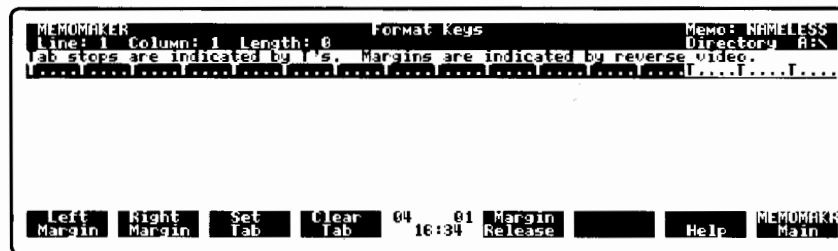
**File
Keys** (Main Keys/1)

Displays the File Keys.



**Format
Keys** (Main Keys/1)

Displays the format keys below the main display area, along with a ruler line that indicates the current margin and tab stop settings above it.



**Get
Format** (File Keys/11)

Begins replacement of the current format with a format stored in a file on disc.

The MemoMaker format includes:

- Margin settings.
- Tab stops.
- Justification status.
- I (Insert mode) setting
- Logged drive and directory settings.
- Printer feed setting.
- Printer line setting (single- or double-space).

Get Format works with **Save Format**. **Save Format** records in a file the format that exists when you select it. When you select **Get Format** at a subsequent time and specify that file, the recorded format replaces the current one.

Refer to “Retrieve a format on file in disc storage” on page 2-19.

Get (Main Keys/1)
Memo (File Keys/11)

If the document in the workspace has not already been saved, displays the file-saving extension and lets you save the document; then displays the file-naming extension to begin retrieval of another file to put in the workspace.

If the workspace contains a document, **Get Memo** erases it as it retrieves another one. The workspace can contain only one document at a time.

If you retrieved the document in the workspace from storage, revised it, and then chose to save it in the same drive location, **Get Memo** also deletes the original disc file, that is, updates the file. If you retrieved the document and then left it exactly as is, or if the workspace is empty, **Get Memo** does not display the file saving extension.

Refer to the two “Retrieve a file from disc storage...” procedures on pages 2-17 and 2-18.



Comments. If you wish to preserve both the original (disc) version of the document currently in the workspace and the workspace version, use **Save Memo** to rename and save the workspace version; the original, with its original file name, will remain on the disc. If you wish to use **Get Memo** with WordStar® files, refer to the “**Document File***” or “**ASCII File***” functions (page 5-13) and to appendix B, “MemoMaker and WordStar®.”

Help

(Almost all Function Key Groups and Extensions)

Provides information about the function keys currently displayed. Blocks functioning of other keys.

To return from a Help display to standard function key operation, press **Help *** again.

Refer to Chapter 4, “Getting Lost and Getting Help,” for more about **Help ***.

Justify*

(**Align Block** Extension/8)

When on (*), causes **Align Block to justify the text (even the right margin) in a marked block.**

When justification is on (**Justify***), the lines in any block of text that you use **Align Block** to align will be extended to the right margin to make the margin smooth. Extra spaces will be inserted within the lines as evenly as possible to fill them out. If you then turn justification off and realign the same block, these extra spaces will be moved to the ends of the lines.

5:Dictionary

When justification is off (**Justify**) and you use **Align Block** to align an unaligned block, MemoMaker fills in the lines of the block as well as possible without adding extra spaces within any of them; it allows spaces, but as few as possible, at the ends of the lines.

When you start MemoMaker, justification is off (**Justify**) unless you have reset it in the file **STARTUP.FMT**.

Example:

1. Text before alignment (the phrase “although it gives you a neater looking page” has been inserted)

People who don't like justification argue that although it gives
you a neater looking page
it makes the words a bit more difficult to read.

2. realigned (**Justify***)

People who don't like justification argue that although it gives
you a neater looking page it makes the words a bit more difficult
to read.

3. realigned (**Justify**)

People who don't like justification argue that although it gives
you a neater looking page it makes the words a bit more difficult
to read.

Refer to “Turn justification on or off” on page 2-23.

**Left
Margin** (Format Keys/5)

Resets the left margin to the column where the cursor is located.

When you load MemoMaker, the left margin is set at column 1 unless you have reset it in a `STARTUP.FMT` file. You can identify the current left margin by examining the ruler line displayed when you select

Format Keys.

Refer to “Change a margin setting” on page 2-5.

Comments. The left margin cannot be set to the left of column 1. If the left margin is set to the right of column 1 and the margins are released, the cursor can be moved left as far as column 1 and no further.

Margin Release* (Format Keys/5)

Releases the left and right margins, that is, lets you type in columns 1 through 79.

Margin Release switches between released and unreleased—an asterisk (*) means released. Characters outside the margins are printed in the usual fashion. Once you have released the margins, you can unrelease (reestablish) them by pressing **(Return)** as well as by selecting **Margin Release** again. Moving the cursor back within the margins by any means other than pressing **(Return)** leaves the margins released.

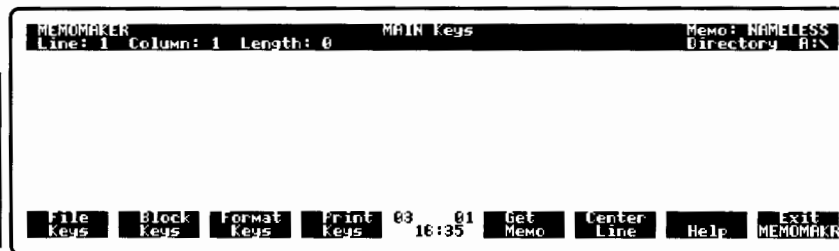
Comments. When you type a character in column 79, the cursor moves to column 80. If you then type a character, the word it is in wraps to column 1 of the next line.

With typewriters and with most other word processors, you can release the margins only a line at a time. With MemoMaker, **Margin Release** stays on as long as you don't press it again or use **(Return)** to move the cursor back within the margins. The easiest way to achieve the same effect as **(Return)** without reestablishing the margins is to keep typing, that is, to let word wrap move the cursor to the first column of the next line.

MEMOMAKR Main (Print Keys/3), (Format Keys/5), (Block Keys/6), (File Keys/11)

Displays MemoMaker's main keys.

5:Dictionary



More

(Directory Extension/14)

If there are more directory entries than can be displayed at one time, **More** appears as the **(f1)** key label. Pressing **More** displays such entries.

**No,
Discard**

(File Saving Extension/12, 22)

After you have selected **Get Memo, **Exit MEMOMAKR**, or **Delete Workspce**, abandons the memo or other document in the workspace.**

With **Get Memo, displays the file-naming extension; executes **Exit MEMOMAKR** and **Delete Workspce**.**

Comments. If the document in the workspace was retrieved from disc storage, **No, Discard** abandons the workspace copy but leaves the original on disc intact.

Abandons is not equivalent to *erases*. If you select **Get Memo**, then **No, Discard**, then **Cancel Get**, the document in the workspace remains in the workspace. (When you use **No, Discard** after you use **Exit MEMOMAKR** or **Delete Workspce**, strictly speaking it is **Exit MEMOMAKR** or **Delete Workspce** that erases the document in the workspace.)

You can type **n (Return)** or **no (Return)** instead of selecting **No, Discard**.

**Page
Break**

(Print Keys/3)

With the cursor in line n , ends a printed page at line $n - 1$. The next page begins on line $n + 1$.

Selecting **Page Break** causes the page break symbol .PA to be displayed in column 1 of the cursor line, and signals the printer to end a page after the preceding line. Any text that was on the cursor line, and the cursor, move to the next line, where the subsequent printed page will begin. The .PA symbols do not appear in print on either page.

Refer to "Show the printer where to end a page" on page 2-20.

S:Dictionary

Comments. Since the line count includes the .PA line, adding a .PA increases the length of the document by one line. **Skip Page** disregards .PA lines for counting purposes; that is, if the cursor is in line 1 and line 56 contains .PA, **Skip Page** moves the cursor to line 57 instead of line 56.

**Paste
Block**

(Block Keys/6)

Performs either of the following:

With **Cut Out Block, **Copy Block**, or **Clr line**, inserts a stored block at the current cursor position.**

With a stored block such as the following...

```
This block of text has been stored with "Copy  
Block."
```

...and the cursor positioned as below:

```
This example shows the section of "Paste  
Block."
```

Paste Block produces the following:

```
This example shows the section of "Paste  
BThis block of text has been stored with "Copy Block."  
lock."
```

The cursor line is split, with the section beginning at the cursor pushed to the end of the last line of the stored block. If the space required for the stored block exceeds the space available on the cursor line, the stored block still splits the cursor line, but begins on the line following the cursor line.

5:Dictionary

Or:

With **Extend char **-Line**, pushes the cursor line down, inserts the stored line.**

With a stored line such as the following...

```
This line is stored with "Delete Line."
```

...and the cursor positioned as below:

```
This example shows the section of "Paste  
Block."
```

Paste Block produces the following:



```
This example shows the section of "Paste
This line is stored with "Delete Line."
Block."
```

The line containing the cursor is pushed down, and the stored line inserted in its place.

Comments. You can treat a line as a block, that is, store it with **Cut Out Block**, **Copy Block**, or **(Extend char) (-Line)**. You need to place the cursor on the first character in the line to store the line with **(Extend char) (-Line)**.

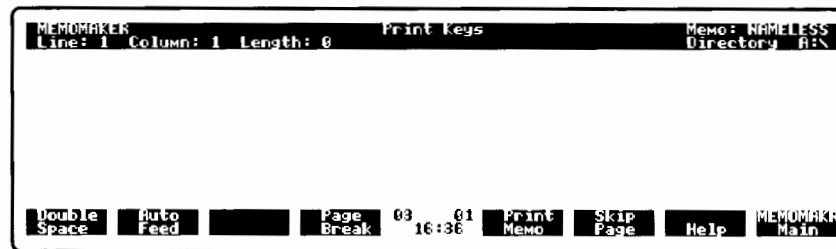
After you copy stored blocks or lines you will usually need to use **Align Block** to realign your text. For more information, refer to "Re-align a block of text" on page 2-16.

You can put a block from one document into block storage, use **Get Memo** to bring a second document into the workspace, and then use **Paste Block** to insert the stored block in the second document.

To insert a file of 60 lines or less into another file, mark the beginning and end of the first file with **Cut Out Block** or **Copy Block**, then use the technique outlined above to insert this block in the second file. (If the file you wish to insert is greater than 60 lines, you will have to move it in pieces that do not exceed 60 lines each.) You can use this technique to append a file to another file. Refer to "Insert a document or a copy of a document into another document" (page 2-12) and "Append a document or a copy of a document to another document" (page 2-4).

**Print
Keys** (Main Keys/1)

Displays the Print Keys below the main display area.



5:Dictionary

Print
Memo

(Print Keys/3)

With auto feed on, prints the entire document in the workspace starting at the cursor position; with auto feed off, prints a page of the document in the workspace, starting at the cursor position, every time you select it. With either, displays the **Print Memo extension.**

After you select **Print Memo** with auto feed off, the printer prints a page, then pauses. The cursor is at the beginning of the next page and the print keys are displayed. Insert another sheet of paper if you are using single sheets, then select **Print Memo** again, and so on.

Refer to “Print the document in the workspace” (page 2-15).

Comments. You are ready to print when:

- The document you wish to print is in the workspace.
- The cursor is at the point in the document where you wish to start printing.
- Your printer is prepared for printing.
- The following settings are correct:

Double
Space *

Auto
Feed *

You can also print whatever pages in the workspace document you want by leaving **Auto Feed** off, selecting **Print Memo**, and using **Skip Page** to page through the document. You select **Print Memo** whenever you get to a page you want to print.

You can page through the document with any key that moves the cursor, not just with **Skip Page**, and you can start a page anywhere that you place the cursor; only by using **Skip Page**, however, can you maintain regular pagination while you are doing this.

Right
Margin

(Format Keys/5)

Resets the right margin in the column where the cursor is located.

When you load MemoMaker, the right margin is set at column 65 unless you have reset it in a `STARTUP.FMT` file. You can identify the current right margin by examining the ruler line displayed when you select `Format Keys`.

Refer to “Change a margin setting” on page 2-5.

Comments. The right margin cannot be set to the right of column 79. If it is in column 79, or if the margins are released, you can type as far as column 79 and no further. (The cursor moves to column 80, but when you type another character, the word containing that character wraps to the left margin of the next line.)

The right margin cannot be set to the left of the left margin. Attempting to do so sets both margins to the position of the most recent margin setting.

`Save
Format` (File Keys/11)

Begins storage of the current format as a disc file; displays the file naming extension so that you can name or rename the file.

`Save Format` records in a file the format currently set for MemoMaker. This includes:

- Margin settings.
- Tab stops.
- Justification status.
- I (Insert mode) setting.
- Logged drive and directory settings.
- Printer feed setting (manual or automatic).
- Printer line setting (single- or double-space).

When you select `Get Format` at a subsequent time and specify that file, the format in the file supersedes whatever format is then set for MemoMaker.

Refer to “Store the current MemoMaker format in a file in the logged directory” on page 2-20.

Comments. You can use any file name recognized by the P.A.M. file manager for format files. The extension .FMT will help you to identify format files, for example, TABLE.FMT, PICA.FMT, LETTER.FMT, OUTLINE.FMT.

Save
Memo

(File Keys/11)

Lets you rename the document in the workspace or name a nameless document, then stores a copy of the document; displays the file saving extension in case you need to rename or name the document.

Save Memo leaves the document you have saved in the workspace. You can continue writing, revising, or reviewing it.

Refer to “Store the nameless document currently in the workspace...” (page 2-22) and “Update a document stored on disc...” (page 2-23).

Comments. When you are working on a single document for an extended period of time, use **Save Memo** periodically—perhaps once every half hour—to update the copy of it in storage. This way no accident can easily obliterate more than a small portion of your work.

Use **Save Memo** to rename a file that you have revised if you wish to save both the original and revised versions of it on disc. If you have finished revising and only need to update the file—that is, save the revised version but dispose of the original—you can also use **Delete Workspce**, **Exit MEMOMAKR**, or **Get Memo**. All permit updating. If you wish to use **Save Memo** with WordStar® files, refer to the “**Document File*** or **ASCII File***” function (page 5-13) and to appendix B, “MemoMaker and WordStar®.”

Set
Tab

(Format Keys/5)

Sets a tab stop in the column where the cursor is located.

When you load MemoMaker, the tab stops are set at columns 1, 6, 11, 16, and so on unless you have reset them in the STARTUP.FMT file.

You can identify the current tab stops by examining the ruler line displayed when you select **Format Keys**.

Refer to “Set a tab stop” on page 2-20.

Skip
Page

(Print Keys/3)

When auto feed is off, prevents the next page in the document in the workspace from being printed; moves the cursor to the first column of the first line of the page following the next page so that `Print Memo` can resume printing.

You can print whatever pages in the workspace document you want by leaving auto feed off, selecting `Print Memo`, and using `Skip Page` to page through the document; you select `Print Memo` whenever you get to a page you want to print.

Comments. You can page through the document with any key that moves the cursor, not just with `Skip Page`, and you can start a page at the beginning of any line in which you place the cursor; only by using `Skip Page`, however, can you maintain regular pagination while you are doing this.

When auto feed and double space are off, MemoMaker defines a page as one of the following:

- Any 55 lines starting with the line the cursor is on.
- Any group of 55 lines or less, starting with the cursor line and ending with the line before the page break symbol .P# appears (or the last line in the document).

When auto feed and double space are on, MemoMaker defines a page as one of the following:

- Any 28 lines starting with the line the cursor is on.
- Any group of less than 28 lines starting with the cursor line and ending with the line before the page break symbol .P# appears (or the last line in the document).

Startup
.FMT

(Get Format and Save Format Extensions/16, 17)

Refer to `XXXXXXXX.XXX`, which is the next entry.

5:Dictionary

XXXXXXXXX
.XXX

(File-Naming Extension/16 through 21)

When prompted by Enter file name, is equivalent in effect to typing a file name and pressing the **(Return) key; redisplay the main keys or file keys.**

With **Get Memo** and **Save Memo**, this function key is labeled with the file name of the document in the workspace instead of XXXXXXXXX.XXX.

With **Get Format** and **Save Format**, the key is labeled with the file name of the current format.

Comments. XXXXXXXXX.XXX is a sample file name; the function key referred to as XXXXXXXXX.XXX in this manual will appear on your display labeled as MEMO.TPL or STARTUP.FMT or some other file name, and is unlikely to appear as XXXXXXXXX.XXX.

The main uses of this function key are with **Save Memo** and **Save Format**, where it is used to save the document in the workspace or the current format as a disc file. With **Save Format**, when XXXXXXXXX.XXX is STARTUP.FMT, selecting it has the effect of updating the format with which MemoMaker is loaded. Refer to "The STARTUP.FMT File" on page 6-2.

If you select **Yes, Save** after **Get Memo**, selecting XXXXXXXXX.XXX next merely replaces the document in the workspace with itself.

If you select **No, Discard** and then XXXXXXXXX.XXX, the effect is to retrieve the original disc version of the document whose workspace version you just abandoned. You may wish to do this if you are dissatisfied with a revision and want to start over with it.

When XXXXXXXXX.XXX is not in the logged directory on the logged drive, selecting XXXXXXXXX.XXX is equivalent to typing the full drive and directory designation: XXXXXXXXX.XXX might be equivalent to A:\john\memos\vacation\XXXXXXXXXX.XXX (The reason for such abbreviation is that the full designation is too large to fit onto the label.)

When there is a document in the workspace that you have not named, the top line on your display reads Memo: NAMELESS. Strictly speaking, however, such a document actually has a name: NAMELESS. For this reason, when you select **Save Memo** or **Get Memo** with a nameless document in the workspace, the **XXXXXXXX.XXX** key will be labeled **NAMELESS**, and selecting it stores the document in the workspace with the file name NAMELESS or attempts to retrieve a file named NAMELESS from disc storage. For more information on the file name NAMELESS, refer to “Who shall remain NAMELESS...” on page 6-4.

Yes, Save (File-Saving Extension/12, 22)

After you have selected **Get Memo**, **Exit MEMOMAKR**, or **Delete Workspce**, stores the memo or other document in the workspace as a disc file; if the document in the workspace was retrieved from disc storage and then revised, deletes the original disc file, that is, updates the document.

You update when you store the new version of a document in place of the old.

Executing **Yes, Save** after **Get Memo** displays the file-naming extension. Executing **Yes, Save** after **Exit MEMOMAKR** or **Delete Workspce** executes **Exit MEMOMAKR** or **Delete Workspce**.

Comments. If you have not named the document in the workspace, the top line on your display reads Memo: NAMELESS. Strictly speaking, however, such a document actually has a name: NAMELESS. For this reason, when you select **Yes, Save** with a nameless document in the workspace, it will be stored with the file name NAMELESS. You should use **Save Memo** to name the document in the workspace before you save it. Once you have given it an appropriate name, you can use **Get Memo**, **Exit MEMOMAKR**, or **Delete Workspce** as well as **Save Memo** to save it. For more information on the file name NAMELESS, refer to “Who Shall Remain NAMELESS...” on page 6-4.

You can type **Y** (Return) or **yes** (Return) instead of selecting **Yes, Save**.



MEMOMAKER FILES

Drives, Discs, Directories

Introduction

When a disc drive is not plugged into the HP 110, you can access only drive A. (Drive B is in ROM—Read-Only Memory—and is not user-accessible.) However, if your system uses a flexible disc drive that holds two discs, MemoMaker addresses the left-hand drive as `C:\` and the right-hand drive as `D:\`.

The Logged Drive and the Logged Directory

When you select the function key `Save Memo` to store a file in a directory on disc, or when you select `Get Memo` to retrieve a file from a directory on disc, you ordinarily don't have to specify the disc or name the directory. Unless you specify the disc or name the directory, MemoMaker assumes that you mean the current logged drive and logged directory. For example, if the logged drive is `A:` and the logged directory is `\`, MemoMaker assumes that `MEMO.TXT` is really `A:\MEMO.TXT`.

If the full path name of `MEMO.TXT` is actually `C:\JOHN\MEMO.TXT`, you can type it in and avoid the logged drive and directory. But if it would be more convenient for you to make drive C, or some other drive, the logged drive, and `\JOHN`, or some other path name, the logged directory, then you can change the logged drive and logged directory. To do so, enter the P.A.M. file manager *before* you start MemoMaker, select a drive other than A and a directory other than the root directory, and then start MemoMaker—these will be the logged drive and directory until you exit MemoMaker, reenter the P.A.M. file manager, and change them again.

Files

The STARTUP.FMT File

When the `STARTUP.FMT` file does *not* exist, MemoMaker maintains a set of default format parameters. When you create a `STARTUP.FMT` file (*and, there can be no more than one file with this name at any time*), you can change one or more of the following format specifications:

- Left and right margins: columns 1 and 65.
- Tab stops: columns 1, 6, 11, 16, 21, and so on.
- Justification status: off (`Justify`).
- Insert (I) mode status: off (writeover mode).
- Logged disc drive and directory: “root of A” (`A:\`).
- Printer feed setting: manual, that is, “single sheet” (`Auto Feed`).
- Printer line setting: single space, that is, *not* double space (`Double Space`).

You can change any of these specifications after you start MemoMaker. But unless you create `STARTUP.FMT`, the next time you start MemoMaker it will revert to default format parameters.

Remember, you need `STARTUP.FMT` only if you want MemoMaker to start up with nondefault settings. The file `STARTUP.FMT` must remain in the logged drive to function automatically when you start MemoMaker. (For example, if `STARTUP.FMT` is in drive A, but the logged drive is C, `STARTUP.FMT` is not used when you start MemoMaker.)

To create `STARTUP.FMT`, refer to “Change the format with which MemoMaker is loaded, that is, create `STARTUP.FMT`” on page 2-5.

The P.A.M. File Manager

You use MemoMaker to store a file on disc or retrieve it when:

- You know or are making up the name of the file.
- The file goes to or comes from the logged directory on a disc in the logged drive, or to a drive and directory you know how to designate.

For any other disc procedure involving MemoMaker files, you need to exit from MemoMaker and use the P.A.M. file manager. With the file manager you can carry out a number of procedures that MemoMaker cannot do. You can:

- Change the drive or directory or both that MemoMaker recognizes as logged..
- Copy a MemoMaker file from one disc to another disc or duplicate it on the same disc.
- Erase a MemoMaker file from a disc.
- Rename a MemoMaker file.

File Names

What sort of file names can I give MemoMaker documents? From MemoMaker's point of view, any file name formed according to the rules for naming files observed by the P.A.M. file manager will do. That is, a MemoMaker file name:

- Must be from 1 to 8 characters long, for example, `filename`.
- Can have an extension 1 to 3 characters long that is preceded by a period (`.`), for example, `filename.ext`.
- Must be preceded by a drive designation and path name if the disc containing the file is not in the logged drive, or if the file is on a disc in the logged drive but not part of the logged directory on the disc; for example, `c:\john\filename.ext`.
- Can have an extension such as `.com` or `.prn` or `.lnk` reserved by MS™-DOS or another application (but to avoid confusion probably shouldn't have!).

What Sort of File Names Should I Give MemoMaker

Documents? If you keep both MemoMaker files and other sorts of files in the same directories, you need to give the MemoMaker files names that set them off from the others. You can give them all the same file name extension, such as `.mem`, or begin the file names themselves with `mem` or some identifying characters.

In the latter case, or if you keep special discs for MemoMaker files and have no need to identify them, you can use file name extensions to distinguish between different kinds of MemoMaker files, or between related files created on different dates.

Here are some examples of file name extensions that you can use to distinguish between different kinds of MemoMaker files:

.bak	A backup file.
.fmt	A format saved with Save Format .
.let	A letter.
.mem	A memo.
.nts	Notes.
.out	An outline.
.rep	A report.
.rev	A revised document.
.tpl	A template.

The following three file names might refer to a series of letters written to the IRS in January, April, and November 1984:

```
irslet.014
irslet.044
irslet.114
```

By using extensions to distinguish between document types or dates, you leave yourself free to use the file names themselves to identify document topics or—with letters—recipients.

Who Shall Remain NAMELESS...

When there is no document in the workspace, or when there is a document in the workspace that you have not named, the top line on your display reads **MEMO: NAMELESS**. Strictly speaking, however, the empty workspace or not-yet-named document actually has a file name—no less than **NAMELESS** itself. This means that if you select **Get Memo** with a nameless document in the workspace and then select **Yes, Save**, the document in the workspace will be stored on disc as a file named **NAMELESS**. It also means that when you use **Save Memo** to save such a document, a function key labeled **NAMELESS** will be displayed, and selection of that key will bring about the same result.

Clearly the best way to save a nameless document is to select **Save Memo**, then respond to

Enter file name.

by giving it an appropriate file name, such as `backpay.mem`. However, if you inadvertently save a document as `NAMELESS`, no harm is done. Simply exit from MemoMaker, enter the P.A.M. file manager, and give the file another name. Alternatively, use **Get Memo** to retrieve it, then use **Save Memo** to rename it while it is still in the workspace.

CAUTION

If you don't change the name of a document that you have stored on disc as `NAMELESS` before you store a second document on disc as `NAMELESS`, the second `NAMELESS` will replace—and obliterate—the first. (MemoMaker assumes that there is a single file named `NAMELESS`, and that you are performing a routine update of it.)



IN CASE OF DIFFICULTY...

Occasionally MemoMaker warns you that something it isn't equipped to handle has happened or is about to happen. Such warnings take the form of messages flashing on the top line of your display, or of beeps. None of them are cause for great alarm, but all of them are worth heeding and understanding.

Error Messages

Block too large for block storage.

Condition: You attempted to place more than 60 lines in block storage.

Remedy: Specify no more than 60 lines for each storage operation.

Can't create file.

Condition: Occurs in either of the following cases:

- When you are using an external disc drive and the drive on which you are saving `XXX\XXXXXXXX.XXX` does not contain a disc.
- The logged drive does not contain the directory `XXX\`.

Remedy: Type the name of a path that exists on the disc in the drive, insert a disc in the drive that contains the directory `\XXX` and then type `XXX\XXXXXXXX.XXX`, or exit from MemoMaker and use the P.A.M. file manager to create the directory `\XXX` in the current drive and then type `XXX\XXXXXXXX.XXX` again.

Designated or logged drive empty.

Condition: The external drive you designated, or the logged drive if you did not specifically designate one, is not turned on or is empty.

Remedy: Put a disc in the drive or turn it on, or designate another drive.

Disc write-protected.

Condition: The disc in the logged drive or the drive you designated can be read but not written on; that is, you can retrieve a file from it but you cannot store a file on it.

Remedy: Remove the write-protection from the disc or replace the disc.

Document too large for workspace.

Condition: The document you are creating has filled the entire workspace and can be made no larger. You need to split it into two documents of more manageable length.

Remedy: Update or save the document, then retrieve the file containing it. Use the procedure for making a separate document out of a block with **Cut Out Block** to create a file out of the part of the document you cut out. Then update the file you retrieved—that file will contain the rest of the original document.

File does not currently exist.

Condition: You tried to retrieve `XXXXXXXX.XXX` from a drive that doesn't contain it.

Remedy: Use the directory to determine what files are on the disc.

File too large for disc.

Condition: There isn't enough space on the disc for the document you are attempting to update or save.

Remedy: If you are using an external disc drive, use another disc that has enough room on it. If you are not using an external disc drive, try to reduce the document to a size that fits within the available space on the internal drive. If you do not reduce the document to a size that fits the available space, the document cannot be saved.

Input error while reading file.

Condition: File XXXXXXXX.XXX resides on an external disc, and before you finished retrieving XXXXXXXX.XXX, you removed the disc on which it was stored.

Remedy: Retrieve XXXXXXXX.XXX, this time without removing the disc.

Lines in the input file were split because they were too long.

Condition: You retrieved a file—probably a WordStar® file—containing lines longer than MemoMaker's maximum line length of 80 columns. The lines have been split at column 80.

Remedy: This is a message indicating how MemoMaker has handled a line length that is wider than MemoMaker allows. You can proceed with your file operations, but you may have to perform some format editing to achieve the desired layout for your text. To avoid this situation, ensure that the lines in your source file do not exceed 79 characters.

Output error while writing file.

Condition: File XXXXXXXX.XXX resides on an external disc, and before you finished saving the current document as XXXXXXXX.XXX, you removed the disc on which you were saving it or filled the disc.

Remedy: Save XXXXXXXX.XXX, this time without removing the disc or this time on a disc with room for it.

Beeps

1. The key you pressed is not used by MemoMaker.
2. That key cannot be used during the procedure you are now carrying out.

MEMOMAKER AND WORDSTAR®



MemoMaker is a simple word processor, ideal for producing brief documents. WordStar® is a sophisticated word processor, ideal for producing large, complicated documents. Both are adapted to the HP 110. In a typical office, WordStar might be used by word processing professionals; MemoMaker by managers who routinely compose memos, letters, procedures, or short reports, but otherwise have no need for a word processor.

MemoMaker and WordStar files are compatible. Thus you can use MemoMaker to write a memo, then use WordStar to revise it and/or print it. Alternatively, you can use WordStar to write, MemoMaker to revise or print. To use MemoMaker with WordStar files, you should learn how to use the `Document File *` / `ASCII File *` toggle described on page 5-13.

Some MemoMaker/WordStar® Alternatives

If both MemoMaker and WordStar are used on your HP 110, how can you put this compatibility to use? Here are four scenarios:

1. The only printer in your office is connected to the HP 110 on which your assistant uses WordStar. You compose a memo with MemoMaker, save it on a flexible disc, and hand the disc to your assistant, who uses WordStar to print it.
2. You want to revise a short section of a long report that was prepared with WordStar. You are unfamiliar with WordStar, but because MemoMaker can read WordStar files you can use it for the job.
3. Your assistant needs to use the WordStar-compatible program MailMerge™ to send out a form letter to your customers, but you use MemoMaker to draft the actual letter.

4. You use MemoMaker to compose a memo, but you let your assistant review it for spelling errors with the WordStar-compatible program SpellStar™.

MemoMaker users can also benefit from a number of products beside MemoMaker that are “WordStar compatible”—electronic style guides and thesauruses; software that generates tables of contents, footnotes, bibliographies, and indexes automatically; software that allows WordStar files to be typeset; and electronic mail and messaging systems. By being WordStar compatible, MemoMaker files are compatible with these products. Consult individual product specifications and manuals for more information about WordStar compatibility.

Transferring a File From WordStar® to MemoMaker

WordStar and MemoMaker have compatible files and perform many identical functions, but different function keys initiate these functions and different procedures carry them out. For this reason, *WordStar users who want to use MemoMaker will have to approach it as a completely different word processor, not as a smaller and simpler version of WordStar.*

File Compatibility

MemoMaker observes the same file name conventions as WordStar does.

MemoMaker files are compatible with WordStar *document* files to a limited degree. For example, MemoMaker does not distinguish between “hard” and “soft” carriage returns for word wrap, and between “hard” and “soft” spaces for justification, which are meaningful in WordStar.

MemoMaker files also display and print boldface and underlined text from WordStar files. Enhancement markers act as switches (^PS turns underlining “on” when you use it the first time, “off” when you use it again). The same markers in MemoMaker work only as special characters (**B** and **U**).

```
This file was written with WordStar.
This sentence contains BboldfaceB type.
This sentence contains an UunderlinedU word.
BThis boldface sentence contains an BUunderlinedU word.
```

All other WordStar features, such as “soft” hyphens, microjustification, and overprinting are not preserved by MemoMaker. This means, for example, that you can edit a WordStar file with MemoMaker and then return it to WordStar for printing without losing important printer control information. All in-text WordStar control characters except ^S and ^B (for underlining and boldface) are discarded when the file is loaded into MemoMaker. WordStar “soft” hyphens are displayed by MemoMaker as ordinary, that is, “hard,” hyphens.

When you use MemoMaker to print a WordStar file that contains dot commands that MemoMaker cannot act on, you will find that they appear on the printed page instead—whether you want them to or not. If you do not want them to appear, you will need to strip them from the file before you use MemoMaker to print it.

“To Compare Great Things With Small...”

Here is a list of several important WordStar functions and features that MemoMaker does *not* contain:

- Automatic file backup.
- Text entry and revision:
 - Hyphen help.
 - Block column operations.
 - Search-and-replace.
 - Global operations.
- Display:
 - Flag character display.
 - Automatic multiple spacing on display.
- Ability to run other programs, for example, MailMerge™.
- Functions performed with printer control (dot) commands.
- Differentiation between “hard” and “soft” spaces and carriage returns.

WordStar users should consider this list when they are deciding whether to use the much simpler MemoMaker for a given task. In some cases, it may be practical to divide the work of document creation between MemoMaker and WordStar, with MemoMaker used to create the basic document and WordStar to polish it, print it, or prepare it for specialized uses.

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