

HP 260 Computer Systems



OPERATING AND MANAGING YOUR HP 260

User's Manual



HERRENBERGER STRASSE 130, D-7030 BOEBLINGEN

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




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




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



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PRINTING HISTORY

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition or a new update is published. No information is incorporated into a reprinting unless it appears as a prior update; the edition does not change when an update is incorporated.

The software code printed alongside the date indicates the version level of the software product at the time the manual or update was issued. Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one to one correspondence between product updates and manual updates.

First Edition	Feb 1985.	B. 07.00
Second Edition	Sep 1986.	B. 08.00



LIST OF EFFECTIVE PAGES

The List of Effective Pages gives the date of the most recent version of each page in the manual. To verify that your manual contains the most current information, check the dates printed at the bottom of each page with those listed below. The date on the bottom of each page reflects the edition or subsequent update in which that page was printed.

Effective Pages	Date
all	Sep 1986



Welcome to the HP 260 Business Computer System. The HP 260 is an easy-to-operate computer that allows you to: enter information, process information, access information and create reports on a printer or on a display screen. The HP 260 can be used in a variety of environments, from a small single-user configuration to a larger system capable of processing many tasks.

Your HP 260 System has been designed as a series of components. Each system consists of four major components:

- the System Processing Unit (SPU) - this is the "brain" of your system.
- one or more workstations - your means of communicating with the SPU. Each workstation has a keyboard and a display. You talk to the computer via the keyboard, which resembles an office typewriter. The SPU talks to you via the display, a television-like screen. The display (also called the CRT - Cathode Ray Tube) is used for viewing input data (such as data being entered on a form) and output data.
- one or more mass storage devices - devices for storing and accessing information and programs.
- one or more printers - devices used to produce printed reports which contain the information you require in the day-to-day operation of your business.*

WHO SHOULD READ THIS MANUAL?

As its title implies, this manual contains information for operators (users) of the system as well as for the system's Principal Operator, the person who manages your HP 260 System.

An **operator** is any person who uses the system. For example, a person who enters data for an inventory control program or uses the HP 260 to print reports about cash flow is an operator. This manual teaches an operator how to start and stop the system, how to use a workstation, how to access the peripherals connected to the HP 260, and how to deal with the occasional errors that may occur.

The **Principal Operator** is a user who is responsible for ensuring that regular backups are performed. A **backup** is a copy of your system's programs and data. It is used to restore your system to its original state in case its data becomes corrupt. This manual's section titled "What Every Principal Operator Should Know" suggests several backup schemes and provides instructions for performing the backups.

The tasks for which the Principal Operator is responsible are small and should not interfere with the work normally performed by the person serving as Principal Operator.

*Operating instructions for each printer are located in the printer's Operating Manual.

WHAT DO I DO NEXT?

Now that you have an overview of your system, you must next become familiar with the operation of your system. The remaining sections of this manual teach you what you need to know to operate your computer system:

- Section 2 teaches you how to start and stop your computer system.
- Section 3 introduces you to the HP 45262D and the HP 45263D video workstations. It explains how to use the keys on the keyboards of these workstations to communicate with your computer system. It also explains how to control the information that is displayed on the workstation screen.
- Section 4 introduces you to the HP 2392A workstation. It explains how to use the keys on the keyboards of this workstation to communicate with your computer system. It also explains how to control the information that is displayed on the workstation screen.
- Section 5 introduces you to the HP 150 workstation/personal computer. It explains how to use the keys on the keyboards of this workstation to communicate with your computer system. It also explains how to control the information that is displayed on the workstation screen.
- Section 6 introduces you to the HP VECTRA workstation/personal computer. It explains how to use the keys on the keyboards of this workstation to communicate with your computer system. It also explains how to control the information that is displayed on the workstation screen.
- Section 7 introduces you to the HP Portable Plus workstation/personal computer. It explains how to use the keys on the keyboards of this workstation to communicate with your computer system. It also explains how to control the information that is displayed on the workstation screen.
- Section 8 introduces you to the HP 2622D workstation. It explains how to use the keys on the keyboards of this workstation to communicate with your computer system. It also explains how to control the information that is displayed on the workstation screen.
- Section 9 contains several simple exercises so that you can practice with your workstation's keyboard and become familiar with its operation.
- Section 10 describes the different peripherals that may be connected to your system. It also teaches you how to use the mass storage devices supported by the system and how to store and care for media used by these devices.
- Section 11 introduces several fundamental system commands used to access and run programs.
- Section 12 teaches the Principal Operator how to back up (make copies of) the files on the system. It suggests several schemes for quickly and easily restoring your system in case its data or programs become corrupt.
- Section 13 describes the procedures to follow if an error occurs. It shows you how to track down the error and how to interpret the error messages you may receive from the system.
- Appendix A lists the error numbers returned by your computer system when it encounters problems. A description of the meaning of each of these error numbers is also given.

- Appendix B contains diagrams of all the keyboards supported with the current edition of the Operating System.
- Appendix C discusses the concept of "volume specifiers", which are identifiers for the mass storage devices used with your computer system.
- Appendix D discusses the use of softkeys as typing aids.
- Appendix E describes how to configure each of the workstations supported on your computer system.
- Appendix F is a glossary of the terms used in this manual.

NOTE

This manual describes operation of the HP 250 and HP 260 Business Computer Systems with Operating System B.08.00.

Note that not all peripherals described in this manual are supported on both computer systems. Contact your third party representative or your Hewlett-Packard sales representative for a list of devices supported on your system.





After your system has been installed, it is ready to operate. You must then load the system software. This procedure is referred to as "starting up the system" or "loading the system".

Starting up your system can be compared to starting an automobile. Your car must have fuel in it before you can successfully start it. In the same way, your system must have a version of the system software available. This system software may be stored on a fixed disc or on a removable medium such as a tape cartridge or flexible disc. It is the "fuel" required to start your system.

While the system software is loading, several messages are displayed on the **principal workstation**. Which of your system's workstations is the principal workstation? The system uses the following set of rules to locate the principal workstation, when the SPU is switched on:

- If your system is an HP 250 with an integrated workstation, that workstation is the principal workstation.
- If your system is not equipped with an integrated workstation, the system checks to see if a Video MUX Interface is installed. If it is, the video workstation connected to channel 1 is the principal workstation.
- If your system is not equipped with an integrated workstation and if a Video MUX Interface is not installed on your system, then the system checks to see if the SPU is equipped with Integrated Serial Ports. If so, then the principal workstation is the workstation connected to port -1.
- If your system is not equipped with an integrated workstation, a Video MUX Interface or Integrated Serial Ports, the principal workstation is the workstation connected to the system's ASI port 1.

If for any reason your system cannot communicate with the principal workstation, messages sent to the principal workstation are lost. For example, if your system is equipped with a Video MUX Interface but does not have a video workstation attached to channel 1, messages sent to the principal workstation are lost.

You must have access to the principal workstation when loading the system.

SYSTEM START-UP

The components of your system must be started in the following order.

1. Switch on all mass storage devices. Wait 30 seconds for the discs to warm up.
2. Switch on the workstations.
3. Switch on the printers, plotters, terminals and data entry devices.
4. If an I/O Extender is fitted, press its On/Off switch until it locks in the recessed position labeled "I". The I/O Extender's On/Off switch is at the bottom left-hand corner of the front of the cabinet.
5. Locate the SPU's On/Off switch. On the most recent systems, it is a white button located at the lower left-hand corner on the front of the SPU cabinet. On older systems, the On/Off switch is a key located on the front of the SPU cabinet.

If the SPU On/Off is a white button, press the On/Off switch until it locks in the recessed position labeled "I". If the SPU On/Off switch is a key, insert the key and turn it clockwise to the position labeled "I".

6. The SPU automatically tests itself when its power is turned on. As the test is performed, a list of system components is shown on the principal workstation's display. The following is a sample self test message on the principal workstation:

```
ST 4
 1 P
 2 P
 3 P
 4 P
 5 P
 6 P
 7 P
 8 P
 9 P
 A P
 C P
 E P
```

NOTE

If the system fails a self-test, system loading will halt, and an "F" will appear in the second column, indicating which component failed. If this occurs, switch off the SPU. Wait a few seconds and then switch on the SPU again. If the error still occurs, record the information displayed on the

principal workstation's screen. Then refer to the section titled "In Case of Difficulty" for help in interpreting the error information.

7. The system next loads the operating system, performs some additional tests and, finally, loads the system DROMs. The system then displays the following message on the principal workstation:

The system is waiting for the disc to warm up

Wait for about 30 seconds to allow the system to search all connected mass storage devices for an operating system file (it might take about two minutes if a tape has to be searched). If no system file is found, the system displays the following message:

SYSTEM FILE NOT FOUND

If the above message is displayed, check that all mass storage devices are powered-on. If the system software still does not load, refer to the section titled "In Case of Difficulty".

The following is a sample of the information displayed on the principal workstation when the system software and DROMs are loaded.

```
The system is waiting for the disc to warm up
System loading from 7946 on address 5 unit# 1
SYSTEM I/O INITIALIZATION
ASYNCHRONOUS DATA COMM SELF TEST
LOADING DROMS
-
```

8. If your principal workstation is an HP 2622D, HP 45252D, or HP 45263D workstation, the cursor (a flashing underscore "_") is not displayed on the principal workstation's screen until loading successfully completes; when the cursor is displayed, your system is ready for use.

On HP 2392A, HP 150, HP VECTRA and HP Portable Plus workstations, the cursor is always displayed even while the SPU is not powered on. If your system's principal workstation is one of these types, press one of the workstation's alpha-numeric keys (such as "A"). If the character is then displayed on the screen, the system is ready for use. If the character is not displayed, the system has not yet finished loading the system software.

SYSTEM SHUT-DOWN

Before powering off the system, you should complete the current operation or terminate the program you are running. Powering off during program execution may result in the loss of data. Copying or transferring data from one disc to another should be completed before turning off the system. Make sure that all scheduled backups have been completed. It is important that none of the workstations or other peripherals connected to your system (including those at remote sites) are being used when you shut down the system. **Turning off the system shuts down every user's task, not just the task(s) of the person using the principal workstation.**



Execute the **SHOWTASK** command. If the **TOOLS DROM** or **SHOW** binary are loaded, executing this command shows you if any other programs are currently running on the system. If the **TOOLS DROM** or **SHOW** binary are not loaded, the message "IMPROPER EXPRESSION" is displayed; you must then manually check to see if any other programs are running.



Remove any flexible discs or tape cartridges that are in mass storage devices and store them properly. After making sure that no other users are accessing the system, turn the power switches of peripheral devices to their OFF positions. If your system SPU's On/Off switch is a white button located on the front of the SPU cabinet, press the On/Off switch and release it; the switch will lock in the extended position (labeled "O") and the system will shut down. If your system SPU's On/Off switch is a key, turn it counter-clockwise to the position labeled "O" to shut down the system.



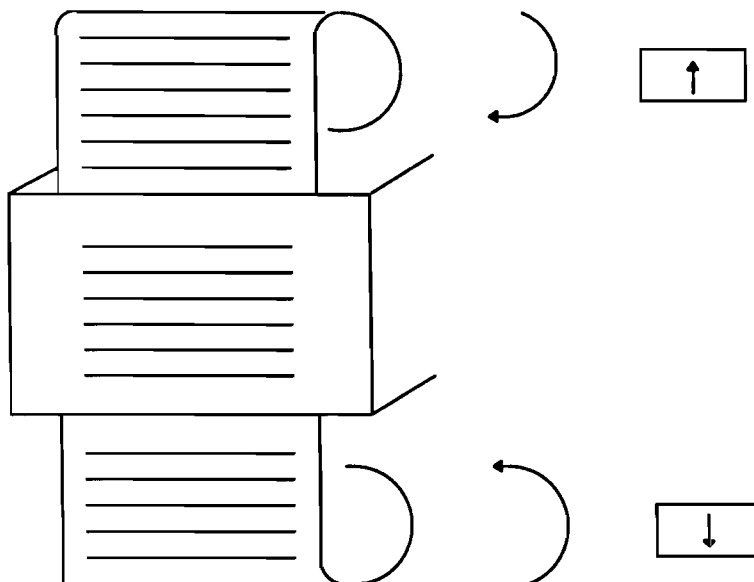
DISPLAY

The display is used to view program listings, program output, and information entered from the keyboard. The display information is maintained in a portion of each user's memory partition, which is referred to as display memory. More information can be stored in display memory than can be displayed at one time.

The screen can display the softkey labels, one line of status information and one page of characters. A page consists of 24 lines of characters (21 lines of characters if softkey labels are displayed); each line contains a maximum of 80 characters. As the display is filled, the top line rolls off the screen to make room for the next line of information to be displayed. When viewing display lines, you may access lines preceding or following those currently on the screen by pressing the display editing keys  and .

For example, to view a line of information that has already scrolled off the display, press  to position the cursor at the top of the display. Then, press  again to cause the line "above" it (in display memory) to be brought into view. Notice that this causes the line of information that was on the bottom of the display to scroll off the screen, since only a fixed number of lines can be displayed at one time.

The following illustration shows the scrolling process.



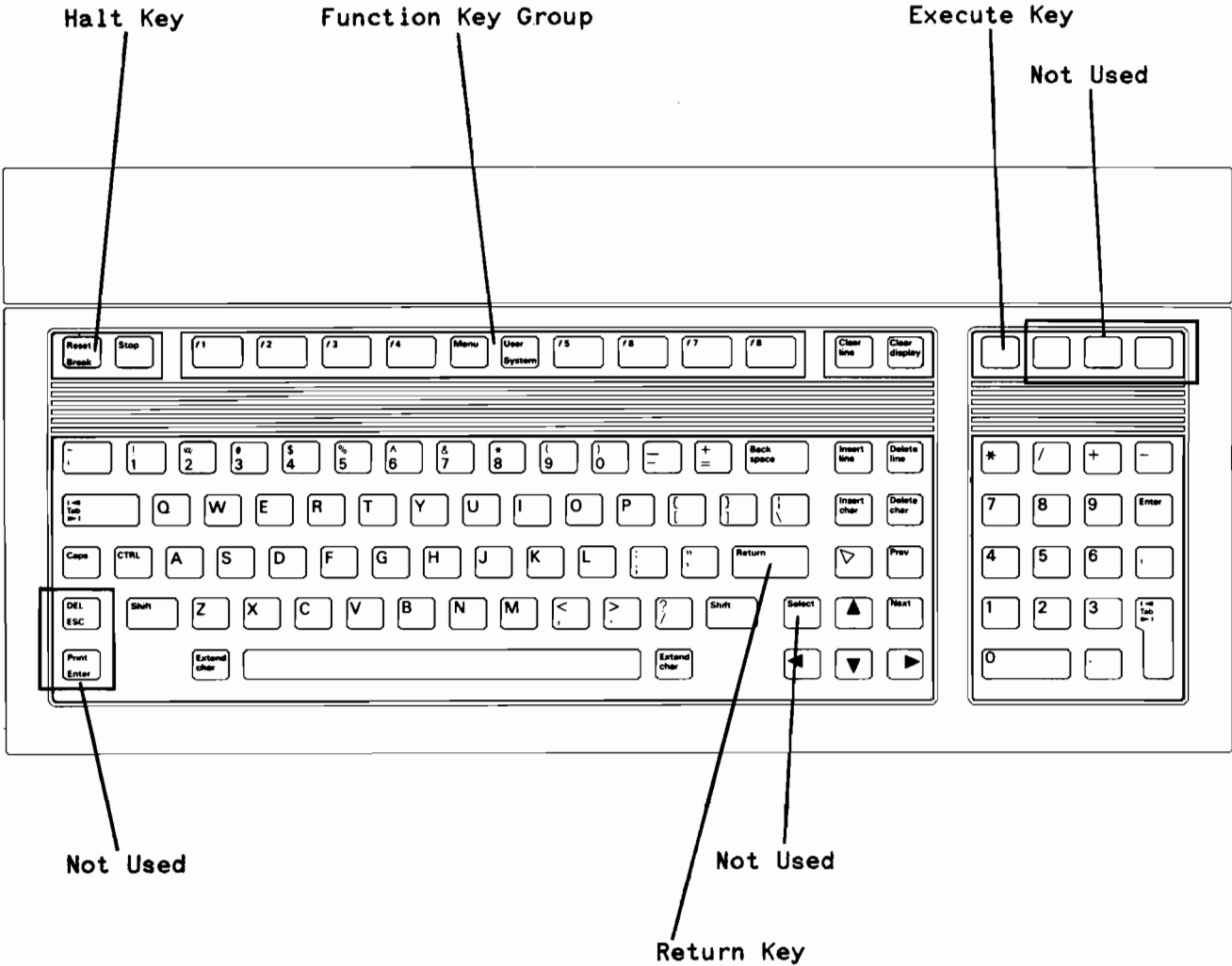
The HP 4526xD Workstation

When your computer system is ready for operation, the cursor (a blinking underscore character) is visible on the screen.

The capabilities of the display are numerous. For example, characters on the display may appear as: half-bright, underlined, blinking, or inverse video (or any combination). These features can be accessed either from the keyboard or programmatically. Methods for accessing the display enhancements from the keyboard are described in the paragraphs titled "Display Enhancement Keys", later in this section.

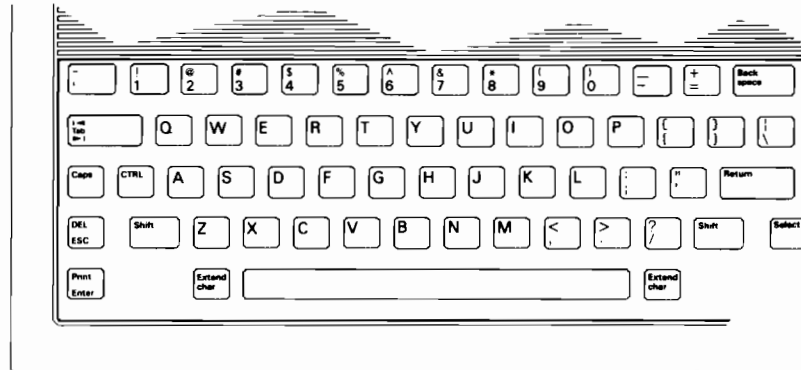
KEYBOARD

The keyboard resembles a typewriter keyboard and is used to communicate with the computer. The keyboard consists of a typewriter block, a data entry pad, display editing keys, an execute key, a HALT key, and special function keys (also called softkeys). Each group of keys is described in this section.



Typewriter Block

The typewriter block is used to input data or program lines. It consists of keys for uppercase and lowercase alphabetic characters, numbers, punctuation marks, and some commercial symbols. The standard or base character set is indicated on the keys. Several special keys are provided on the left and right sides of the keyboard block and are discussed in the following paragraphs.



Typewriter Block
(U.S. Keyboard)

The key labeled "Shift" (referred to as SHIFT or **SHIFT**) allows you to select uppercase alphabetic characters. For example, to enter an upper case "A", press and hold down **SHIFT** as you press the key labeled "A". The SHIFT key also allows you to access the "upper" of two characters shown on a key cap, such as the "?" character on the key cap labeled with the characters "/" and "?". For example, to enter the "?" character, press and hold **SHIFT** as you press the key labeled "/".

The key labeled "Caps" (referred to as CAPS throughout the manual set) locks only alphabetic keys to upper case characters. In order to access the shifted characters on non-alphabetic keys, you must still press **SHIFT**. For example, if you want to enter the "\$" character while the CAPS key is active, you must press **SHIFT** as you press the key labeled "4".

To access a lowercase alphabetic character while the CAPS key is active, press **SHIFT** and the alphabetic key.

The key labeled "CTRL" (referred to as CONTROL throughout the manual set) is used to access special characters and commands as shown in this section.

The key labeled "Back space" (referred to as **BACKSPACE**) is used to move the display cursor one space toward the left margin. If the cursor is located at the left margin, pressing **BACKSPACE** has no effect.

Pressing **SHIFT** with the BACK SPACE key moves the cursor to the beginning of the current line.

When the key labeled "Return" is pressed (referred to as RETURN or **RETURN**), the cursor is positioned at the beginning of the next line; the data on the current line is sent to the SPU for processing. The type of processing performed depends on several factors; thus the **RETURN** key has several functions. If a program is executing, **RETURN** can be used to enter data in response to a prompt from the program. If a program is not executing, **RETURN** can be used to execute a BASIC command or to assign a value to a variable. For example, to execute the CAT command you could enter: CAT **RETURN**. The value of a numeric expression can be assigned to a variable by entering: A=2+2 **RETURN**. Note that this key cannot be used to simply execute a numeric expression; this function is performed by the EXECUTE key (discussed later in this section).

When **CONTROL RETURN** is pressed, the cursor is moved to the beginning of the next line, but the data displayed on the current line is not processed.

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The key labeled "Tab" (referred to as TAB or **TAB**) moves the cursor to the first character position of the next input field or tabbed position. When you press **SHIFT** **TAB**, the cursor moves to the first character of the previous input field or to the previous tabbed position.

To set a tab at a particular location in a line, move the cursor to the desired location. Then press and hold **CONTROL** as you press **TAB**.

To clear a tab, move the cursor to the tab position. Then press and hold both **SHIFT** **CONTROL** as you press **TAB**.

The key labeled "Extend char" allows you to enter characters from the extended character set; this character set was determined when your Principal Operator executed the CONFIG utility. Consult your Principal Operator to find out which extended character set is defined for your system. To enter a character from the extended character set, press and hold down the key labeled "Extend char" as you press the desired key.

If you are entering many characters from the extended character set, you can use a system key (discussed later in this section) to change the keyboard's definition such that it continually accesses the extended or alternate character set.

The key labeled "Select" is pressed to display the labels for currently defined user softkeys. If one set of user softkey labels are already displayed, pressing the select key cycles through the three user softkey sets. For more information, refer to the paragraphs titled "System Key, Menu Key, Select Key and Softkeys".

The keys labeled "DEL/ESC" and "Print/Enter" do not function. Pressing one of these keys causes a beep to sound; each of these keys is ignored by the system.

If in any manual you are instructed to press your workstation's ENTER key, press **RETURN** instead.

Data Entry Pad

Use this block of keys, located on the far right side of the keyboard, to input numeric data rapidly.

Several math symbols are provided on the data entry pad: "*" (multiply), "/" (divide), "+" (add) and "-" (subtract). These keys can be used to perform quick calculations and to enter signed data values.

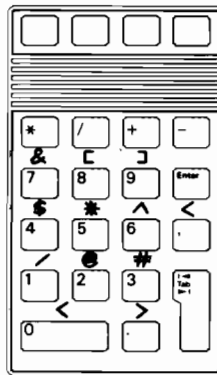
The keys labeled "." (decimal point) and "," (comma) are provided to allow you to enter decimal numbers and number sets quickly.

Another TAB key is provided on the data entry pad, allowing you to enter data rapidly on forms. The TAB key can be configured such that its function is identical to TAB key (located in the Typewriter Block) or such that its function is identical to the RETURN key; consult your system's principal operator to find out to which function the TAB key is configured.

The key labeled "Enter" does not function. Pressing **ENTER** causes a beep to sound; the key is ignored by the system.

However, the combination of **CONTROL** **ENTER** does function. This key combination is used during program development and aids in debugging programs. For more information, refer to the BASIC programming section titled "Program Debugging".

Many of the keys on the data entry pad can be used with the SHIFT key to enter a punctuation mark, a math symbol or a commercial symbol. For example, to enter a "\$" character, press **SHIFT** and the key labeled "4".



Data Entry Pad

There are four function keys located directly above the data entry pad. Of these four keys, the key on the left is the EXECUTE key and is labeled **EXECUTE**. The function of the EXECUTE key is explained later in this section. The other three keys have no function (they are ignored by the system).

Display Editing Keys

The display editing keys are used to modify input and position the cursor at specific locations on the screen. The function of each key is repeated rapidly by holding the key down.

Pressing the key labeled "Clear line" causes all characters from the present cursor position to the end of the line to be cleared from the display. Pressing and holding down **SHIFT** as you press the "Clear line" key moves the cursor to the left margin of line in which it is currently displayed and then clears from the display all characters from the cursor to the end of the line.

Pressing the key labeled "Clear display" clears all characters from the cursor's current position to the end of display memory (including all lines "below" those currently displayed). Pressing and holding down **SHIFT** as you press the "Clear display" key clears all characters from display memory and positions the cursor in the upper left corner of the display.

Pressing the key labeled "Delete char" deletes the character located at the cursor's current position. All characters following the cursor are shifted left one position to fill the gap.

Pressing the key labeled "Insert char" causes the workstation to enter the insert mode. The cursor appears within an inverse video box. Type in the characters you wish to insert. All characters to the right of the cursor are shifted to the right to make room for the new characters. To exit from the insert mode, either press the "Insert char" key again or move the cursor from its current line.



Pressing the key labeled "Delete line" deletes the entire line in which the cursor is located.


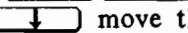
Pressing the key labeled "Insert line" inserts a blank line on the display. The new line is inserted immediately preceding the line containing the cursor; the cursor appears at the first position of the new line.

The keys **←** and **→** move the cursor one position to the left or right. Holding down one of these keys causes the cursor to move rapidly in the indicated direction. The cursor wraps around to the next line if a margin is encountered. For example, suppose that the cursor is located at column 30, line 10 of the display as you begin to press and hold down **→**. The cursor moves to the right until it encounters the right margin. Next, the cursor "wraps around" to the beginning of the next line (column 1 of line 11) and continues moving right.




Pressing **SHIFT ←** or **SHIFT →** moves the cursor five spaces in the indicated direction.

Pressing **CONTROL →** moves the cursor to the end of the current line.


The keys  and  move the cursor up or down one line from its current position on the display. When the cursor hits the top of the screen, the next line of display memory is brought into view, while the bottom line scrolls off the screen (refer to the illustration at the beginning of this section). Similarly, when the cursor hits the bottom of the screen, the line of display memory below the line containing the cursor is brought into view; the top line scrolls off the screen. This process is called "scrolling".


Pressing  moves the cursor to the top left corner of the previous display page; pressing  move the cursor to the top left corner of the next display page. Using one of these combinations of keys is equivalent to scrolling 24 lines (21 lines if softkey labels are displayed) back or ahead with a single keystroke.

Pressing the key labeled "Prev" or the key labeled "Next" moves the cursor to the top left corner of the previous and next display page, respectively. This is equivalent to scrolling 24 lines (21 lines if softkey labels are displayed) back or ahead with a single key stroke.

Pressing  (also referred to as the HOME key) moves the cursor to the first character of display memory. To position the cursor just after the last character in display memory, press . To position the cursor at the first character of the current screen, press .

Execute Key

There are four function keys located directly above the data entry pad. The EXECUTE key is the left key of the four function keys and is labeled . The EXECUTE key executes the line or expression on the display which currently contains the cursor. For example, the value of the equation $8+22-(7*11)$ is computed and displayed by typing the following:

$8 + 22 - (7 * 11)$ (then press )

The HALT Key

The key labeled "Reset/Break" is the workstation's HALT key. It is located in the top left corner of the keyboard.

Unless overridden by the program, pressing **HALT** stops a program at the end of its current operation; the next program line to be executed is displayed. Pressing **HALT** is not a normal way to stop a program and may require reloading the program to resume operation.

The HALT key also acts as a "single step" key when a BASIC program is loaded but is not running. A "single step" key executes a single line of a program each time the key is pressed.

You should note that if you are sending output to an HP printer, such as the HP 2932A printer, it may continue to print for a period of time even though you pressed **HALT**.

To stop the current program from executing and to abort all Input/Output operations, press **SHIFT** **HALT**.

To abort all operations and clear the user work area, press **CONTROL** **HALT**.

The key labeled "Stop" does not function. Pressing this key causes a beep to sound; the key is ignored by the system.

System Key, Menu Key, Select Key and Softkeys

The term **softkeys** specifies the eight function keys located at the top of the keyboard (labeled f1 through f8), and their corresponding labels located near the bottom of the screen (displayed only when the keys are defined). Pressing each key can run a program stored in the computer's memory or can display and enter a pre-defined string of characters. You will most likely use these keys with an application software program, with a utility program (such as initializing media), or as typing aids. In such instances, these keys are defined by you or the application program and are referred to as **user-defined softkeys**. Up to three sets of user-defined softkeys can be defined at any one time.

It is also possible for the softkeys to take on pre-defined system values, in which case they are referred to as **system defined keys**.

A softkey's definition is in effect (or "active") only when its label is displayed.

The key labeled "Menu" (referred to as MENU or CYCLE) is located at the top center of the keyboard. It allows you to cycle the current set of softkey definitions. If no user softkeys are defined, the MENU key's only effect is to turn off system key labels, if they are displayed.

The key labeled "Select" functions identically as the MENU key. Pressing the select key cycles through the current set of softkey definitions. If no user softkeys are defined, pressing the select key turns off the system key labels, if they are displayed.

The key labeled "System" (referred to as the SYSTEM key) is located at the top center of the keyboard. It allows you to activate the system key definitions. Press the SYSTEM key to activate the system keys (the softkey labels appear near the bottom of the screen). Pressing **SHIFT** with the SYSTEM key has the same effect as pressing the MENU key.

User-defined Keys

The function keys located at the top of the keyboard are numbered f1 through f8. These keys correspond to eight labels located near the bottom of the display.

Each of the eight keys can be defined three ways; it is possible to have 24 user-defined softkeys at one time. The corresponding softkey labels appear on the screen when the keys are defined. The MENU key allows you to cycle through the different softkey definitions. The status line, when displayed, identifies which set of softkeys are currently defined. Softkeys can be used to execute a program stored in the computer's memory or to aid in typing. For example, you can define a softkey such that when it is pressed, a character string is displayed and (optionally) entered or executed.

To learn about using softkeys as typing aids, read this manual's appendix titled "Using Softkeys as Typing Aids".

The HP 4526xD Workstation

System Defined Keys

System defined keys allow you to:

- switch between the main and alternate character sets,
- display workstation status information (such as which set of softkeys is currently defined and whether or not the "Caps" key is active),
- display control characters, and
- access display enhancements (such as inverse video and blinking characters).

To enable the system keys, press the key labeled "System". You can then activate one or more of the system display features by pressing the appropriate softkey. Alternately, you can access a display feature at any time (regardless of which set of softkey definitions are active) by pressing **CONTROL** with the desired system key.

To de-activate a system display feature, activate the system keys; then press **SHIFT** and the appropriate system key. Alternately, a system display feature can be de-activated at any time (regardless of which softkey definitions are displayed) by pressing **SHIFT CONTROL** and the appropriate system key.

The system display enhancements can be intermixed in display operations and can be included in string variables. However, the enhancements are not recognized by some external devices (including printers).

Alternate Character Set

When your Principal Operator ran the CONFIG utility, a standard character set and an alternate character set were specified for your workstation's keyboard. Each character set defines which character the computer "sees" when a key is pressed on the workstation keyboard. Characters from both sets, along with display enhancements, can be mixed together on the display.

To access the alternate character set, activate the system keys and then press **F1**. You can access the alternate character set at any time (regardless of which softkeys are currently defined) by pressing **CONTROL F1**.

To disable the alternate character set and use the main character set, activate the system keys and press **SHIFT F1**. You can disable the alternate character set at any time (regardless of which softkeys are currently defined) by pressing **SHIFT CONTROL F1**.

Status Line

The term "status line" refers to the bottom line of the display. This line is reserved for displaying the following status information: which softkey set is currently defined (user-defined softkey set 1-3, the system defined softkey set or none) and whether or not the "Caps" key is active.

To display the status information, activate the system defined keys; then press **F3**. Alternately, you can display the status line at any time (regardless of which softkeys are currently defined) by pressing **CONTROL F3**.

If you want to remove error messages relating to the HP 4526xD workstation, which might appear during system start-up, press **CONTROL F3**.

To remove the status information from the display, activate the system keys; then press **SHIFT F3**. You can remove the status information from the display (regardless of which softkeys are currently defined) by pressing **SHIFT CONTROL F3**.

Display Functions

Your workstation's keyboard is capable of generating many different characters, including a special type of character called a control character. A control character is a character that is normally not displayed. Rather, it is used to signal the system's software, communicate with an application program or send control signals to a device. For example, when you press the LEFT ARROW key on the keyboard, no character is displayed. Instead, the cursor moves one position to the left. Why? Because when you press the LEFT ARROW key, you cause a control character to be sent to the computer system software which in turn, sends the appropriate commands to the display to move the cursor one space to the left.

Control characters are generated whenever you press an arrow key, a function key, a HALT key, the "Extend char" key, the "Return" key, the "Execute" key or a display edit key. Control characters are also generated whenever you use **CONTROL** with other keys.

There are many instances when you want to prohibit a control character from being acted on immediately (such as using control characters when defining softkeys as typing aids; for more information, refer to this manual's appendix titled "Using Softkeys as Typing Aids").

The system key labeled "DISPLAY FUNCTIONS" allows you to prohibit the control keys from being acted on immediately. To do this, activate the system keys; then press **F4**. When the "DISPLAY FUNCTIONS" key is active, control characters are displayed, not interpreted. Alternately, you can enable the "DISPLAY FUNCTIONS" key (regardless of which softkeys are currently defined), by pressing **CONTROL F4**.

When you want to disable the "DISPLAY FUNCTIONS" key so that control characters once again take on their normal function, activate the system keys and then press **SHIFT F4**. Alternately, you can disable the "DISPLAY FUNCTIONS" key (regardless of which softkeys are currently defined) by pressing **SHIFT CONTROL F4**.

Display Enhancement Keys

There are four modes of display enhancement:

- inverse video - characters entered after the inverse video display enhancement has been selected are displayed as dark characters on a light background.
- blinking video - characters entered after the blinking video display enhancement has been selected blink off and on.
- underline video - characters entered after the underline video display enhancement has been selected are underlined on the display.
- half bright - characters entered after the half bright video enhancement has been selected are displayed with half the intensity or brightness of normal characters.

Any combination of these display enhancements can be used.

The display enhancements are accessed by first activating the system keys and then pressing the appropriate softkey. Alternately, a display enhancement can be activated (regardless of which softkeys are currently defined) by pressing **CONTROL** and the appropriate softkey.

To turn off a display enhancement, first activate the system keys. Then press **SHIFT** and the appropriate softkey. Alternately, you can turn off a display enhancement at any time (regardless of which softkeys are currently defined) by pressing **SHIFT CONTROL** and the appropriate softkey.

Bar Code Reader Connection

The HP 92916A bar code reader is supported for use with the HP 45263D workstation. The bar code reader should be connected to the HP-HIL port on the keyboard of the workstation. The bar code reader is supported only in Keyboard Emulation mode.

Here is an example of a valid switch setting for the configuration of the HP 92916A when it is connected to an HP 45263D workstation.

Switch No.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Setting	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0

This switch setting has the following characteristics:

- Auto recognition
- **RETURN** key configured as terminator
- Check digit off
- USACII keyboard mode

Refer to the installation manual for the HP 92916A for the details of the configuration of the bar code reader.



THE HP 2392A WORKSTATION

SECTION

4

The HP 2392A can be used as a workstation on an HP 260 computer system or as a terminal on other multi-user computer systems. The HP 2392A functions differently when operating as an HP 260 workstation (referred to as "workstation mode") than it does when operating as a terminal (referred to as "terminal mode"). This section of the manual describes how to use the HP 2392A as a workstation. For information on using the HP 2392A as a terminal, refer to the manuals supplied with the HP 2392A.

To place the HP 2392A in workstation mode, press and hold down the key labeled "Shift" as you press the key labeled "ESC/DEL".

NOTE



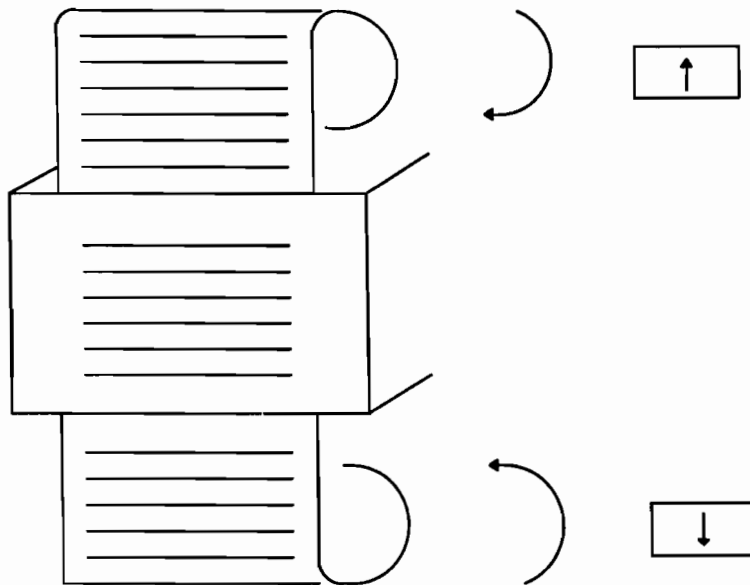
The HP 260 must be powered up and must be configured correctly before the HP 2392A can be used as a workstation. Ask your system's principal operator for assistance if the workstation is not operating.

Additionally, the HP 2392A itself must be correctly configured before it can be used as a workstation. Instructions for configuring the HP 2392A as a workstation are located in the appendix titled "Configuring Workstations".

Once in workstation mode, the HP 2392A can be placed in terminal mode by pressing and holding down **CONTROL** as you press the key labeled "L". Alternatively, you can press the system key labeled "LOCAL" as described in the paragraphs titled "Softkeys and the Select Key".

DISPLAY

The workstation's display is used to view program listings, program output, and information entered from the keyboard. The display memory can store more characters than shown on the screen at one time. The screen can display the softkey labels, one line of status information and one page of characters. A page consists of 24 lines of characters (21 lines of characters if softkey labels are displayed). Each line contains a maximum of 80 characters. If the display has been filled, the top line rolls off the screen. As you type a line, the display will roll up to make room for a new line. This up and down movement is called scrolling. The following illustration shows the scrolling process.



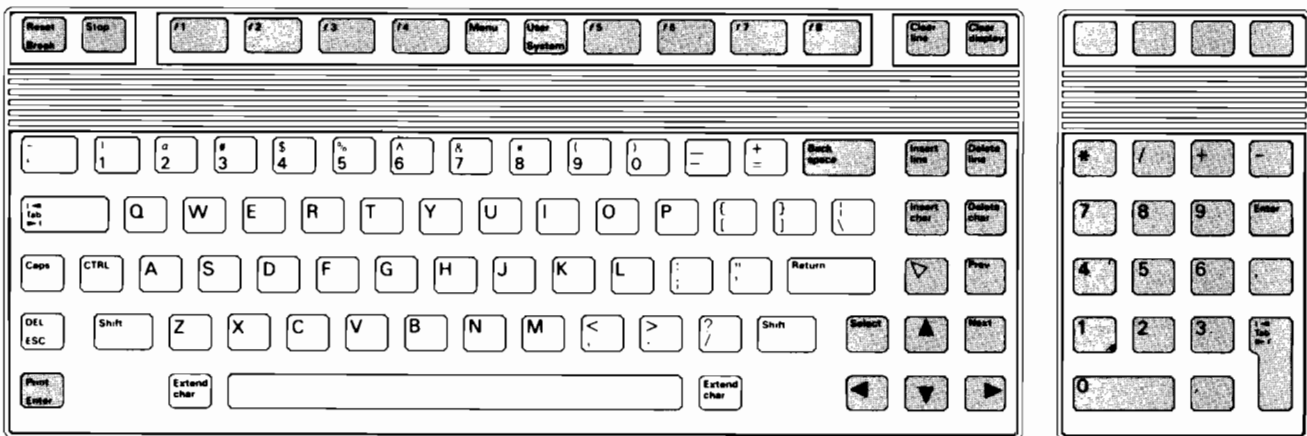
Characters on the display may appear as half-bright, underlined, blinking and inverse video (or any combination thereof). These display enhancements can be accessed by using softkeys, as described in this section's paragraphs titled "Softkeys and the Select Key".

KEYBOARD

The keyboard is your means of sending data and commands to the SPU. Physically it resembles a typewriter. The keyboard consists of different groups, each of which is described in detail in this section: the alphanumeric keys, the numeric keypad, the cursor control keys, the edit keys, the HALT key and the softkeys.

Alphanumeric Keys

The unshaded area in this illustration shows the location of the standard alphanumeric keys on your HP 2392A.



- | | | | |
|---------|----------|-----------|---------------|
| 1 SHIFT | 3 ESC | 5 TAB | 7 EXTEND CHAR |
| 2 CAPS | 4 RETURN | 6 CONTROL | |

Most alphanumeric keys function identically to the keys on an ordinary typewriter. Pressing an alphanumeric key causes the character printed on the key to be displayed on the workstation's display. Pressing and holding down an alphanumeric key displays a string of the characters printed on the key.

Some of the keys in the alphanumeric group have special functions. These keys are shown in the preceding illustration and are described in the following paragraphs.

NOTE

Do not press the key labeled "Enter" when your HP 2392A is being used as an HP 260 workstation. Pressing it produces unpredictable results and can cause data loss.

SHIFT

The two keys labeled "Shift" are your workstation's SHIFT keys. Pressing and holding down **SHIFT** as you press an alphabetic key causes the uppercase alphabetic character to be displayed. For example, to type an uppercase "A", press and hold down **SHIFT** as you press the key labeled "A". The SHIFT key also allows you to access the "upper" of two characters printed on a key, such as the "?" character on the key labeled with the characters "/" and "?". For example, to type "?" press and hold **SHIFT** as you press the key labeled "/".

Additionally, the SHIFT key is often used with other types of keys, such as cursor control keys and function keys. When directed to press **SHIFT** in combination with other keys, press and hold down the SHIFT key as you press the other keys.

CAPS

The key labeled "Caps" is your workstation's CAPS key. Pressing this key once sets the "caps mode". In this mode, each alphabetic key pressed is displayed as an uppercase alphabetic character. Only alphabetic keys (A through Z) are affected by the caps mode.

When the caps mode is active, you can type a lowercase alphabetic character by pressing **SHIFT** with the alphabetic key.

ESC and DEL

The key labeled "ESC" and "DEL" is both your workstation's escape key and its DEL key. Like the SHIFT key, the escape key is used only in combination with other keys. When instructed to press **ESCAPE** in combination with other keys, first press **ESCAPE**, release it and then press the other keys. For example, if instructed to press **ESCAPE****SHIFT****TAB**, press and release **ESCAPE**; then press and hold **SHIFT** as you press **TAB**.

Pressing **SHIFT****ESCAPE** sends a special, single character named "DEL" to the SPU. This tells the system that your workstation is ready for use. If the HP 2392A is in terminal mode, pressing **SHIFT****ESCAPE** switches it to workstation mode. If the HP 2392A is in workstation mode, pressing **SHIFT****ESCAPE** causes the system to erase and then re-display the information currently on the display.

RETURN

The key labeled "Return" is the workstation's RETURN key. Pressing **RETURN** sends the data on the current line to the SPU for processing and positions the cursor at the beginning of the next line. If a program is executing, **RETURN** can be used to enter data in response to a prompt from the program. If a program is not executing, **RETURN** can be used to execute a BASIC command or to assign a value to a variable. For example, to execute the CAT command you could type: **CAT RETURN**. The value of a numeric expression could be assigned, for example, by typing: **A=2+2 RETURN**. Note that this key cannot be used to simply execute a numeric expression; this function is performed with the EXECUTE system softkey (described in the paragraphs titled "Softkeys and the Select Key").

Pressing **ESCAPE RETURN** moves the cursor to the beginning of the next line without sending data to the SPU to be processed.

TAB

The key labeled "Tab" is the workstation's TAB key. Pressing **TAB** moves the cursor to the next input field or tabbed position. Pressing **SHIFT TAB** moves the cursor to the previous input field or tabbed position.

By using the "TAB = RETURN" system softkey (as described in the paragraphs titled "Softkeys and the Select Key"), you can specify that all TAB keys function as RETURN keys. In this case, the TAB key has the following functions:

Pressing **TAB** sends the data on the current line to the SPU to be processed and moves the cursor to the beginning of the next line.

Pressing **ESCAPE TAB** moves the cursor to the next input field or tabbed position.

Pressing **ESCAPE SHIFT TAB** moves the cursor to the previous input field or tabbed position.

CONTROL

The key labeled "CTRL" is the workstation's CONTROL key. Like the SHIFT key, the CONTROL key is only used in combination with other keys. When instructed to press **CONTROL** in combination with other keys, press and hold down **CONTROL** as you press the other keys.

For example, when printing a long list of information to the display (such as the output from a CAT statement), you can temporarily pause printing by pressing **CONTROL** and the key labeled "S". To resume printing, press **CONTROL** and the key labeled "Q".

EXTEND CHAR

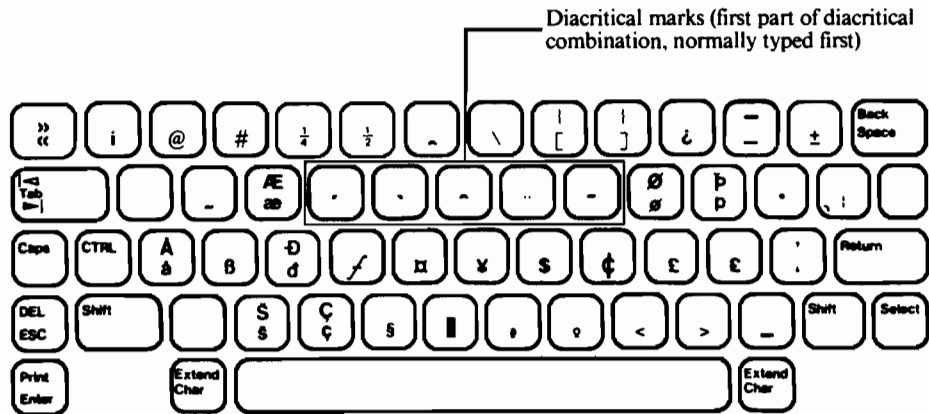
The "Extend char" key is used in combination with certain alphanumeric keys to allow access to a subset of the ROMAN 8 character set. For example, the German a-umlaut, o-umlaut, and u-umlaut characters, and the accented characters of the French language can be displayed on the screen of your workstation.

The keyboard diagram below shows the mapping between the normal key characters and the characters that are accessed using "Extend char". Characters that appear on the keys in the diagram below are accessed by pressing the relevant key together with the "Extend char" key.

The HP 2392A Workstation

If the character you want to display does not appear in the diagram but the accent you need to form the character does appear on one of the keys in the diagram, use the following procedure to display the character.

1. Press the "Extend char" key together with the key that corresponds to the accent you need (for example the key labeled "U" corresponds to the umlaut of the German language). The accent is displayed above the current position of the cursor.
2. Press the alphanumeric key of the character you want to display. The character is displayed together with its accent.



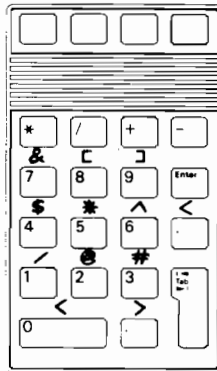
Numeric Keypad

Use this block of keys, located on the far right side of the keyboard, to input numeric data rapidly.

Several math symbols are provided on the numeric keypad: "*" (multiplication), "/" (division), "+" (addition) and "-" (subtraction). These keys can be used to perform quick calculations and to enter signed data values.

The keys labeled "." (decimal point) and "," (comma) allow you to enter decimal numbers and number sets quickly.

The numeric keypad's TAB key functions in exactly the same way as the TAB key in the alphanumeric keys.



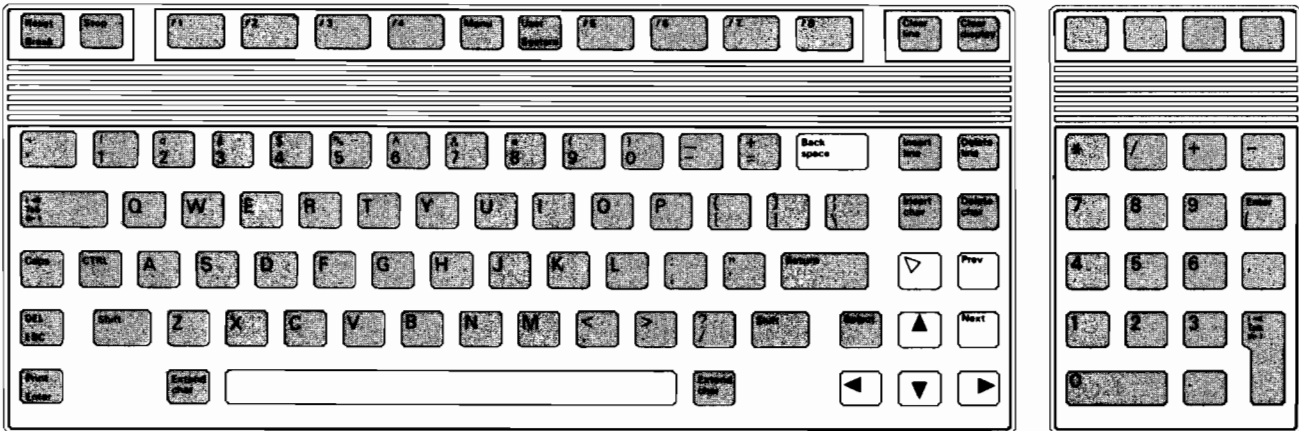
Numeric Keypad

NOTE

Do not press the ENTER key when your HP 2392A is being used as an HP 260 workstation. Pressing it produces unpredictable results and can cause data loss.





Cursor Control Keys


The unshaded area in this illustration shows the location of the cursor control keys. The cursor control keys are used to move the cursor on the screen and to select the part of the display memory you want to display.



Cursor Control Keys



Pressing  moves the cursor from its current position to the next line above it on the display. If you press and hold  down, the cursor moves rapidly toward the top of the display. If  is pressed when the cursor is at the top line of the display, the line in display memory above the current line is scrolled onto the display. Pressing  has no effect when the cursor is located in the top line of display memory.

Pressing the key sequence **SHIFT**  displays the next 24 lines (21 lines if softkey labels are displayed) of display memory. The cursor is positioned at the top left corner of the new page.



Pressing moves the cursor from its current position to the next line below it on the display. If you press and hold down, the cursor moves rapidly toward the bottom of the display. If is pressed when the cursor is at the bottom line of the display, the line in display memory below the current line is scrolled onto the display.

Pressing the key sequence **SHIFT** displays the previous 24 lines (21 lines if softkey labels are displayed) of the display memory. The cursor is positioned in the top left corner of the newly displayed page.



Pressing moves the cursor one space to the left of its current position on the display. Pressing and holding down causes the cursor to move rapidly to the left. If is pressed when the cursor is at the first column of a line, the cursor is moved to the last column of the previous line. If the cursor is located in column 1 of the top line of display memory, pressing has no effect.



Pressing moves the cursor one space to the right of its current position on the display. Pressing and holding down causes the cursor to move rapidly to the right. If is pressed when the cursor is at the last column of a line, the cursor moves to the first column of the next line.



The key is the workstation's HOME key. Pressing moves the cursor to column 1 of the first line of display memory.

Pressing **SHIFT** positions the cursor just after the last character in the last line of display memory.

Pressing **ESCAPE** moves the cursor to the upper left corner of the page currently displayed.

BACKSPACE

The key labeled "Back space" is the workstation's BACKSPACE key. Pressing **BACKSPACE** moves the cursor one space to the left. When the cursor is in column 1, pressing **BACKSPACE** has no effect.

Pressing **ESCAPE** **BACKSPACE** moves the cursor to column 1 of the line currently containing the cursor.

NEXT

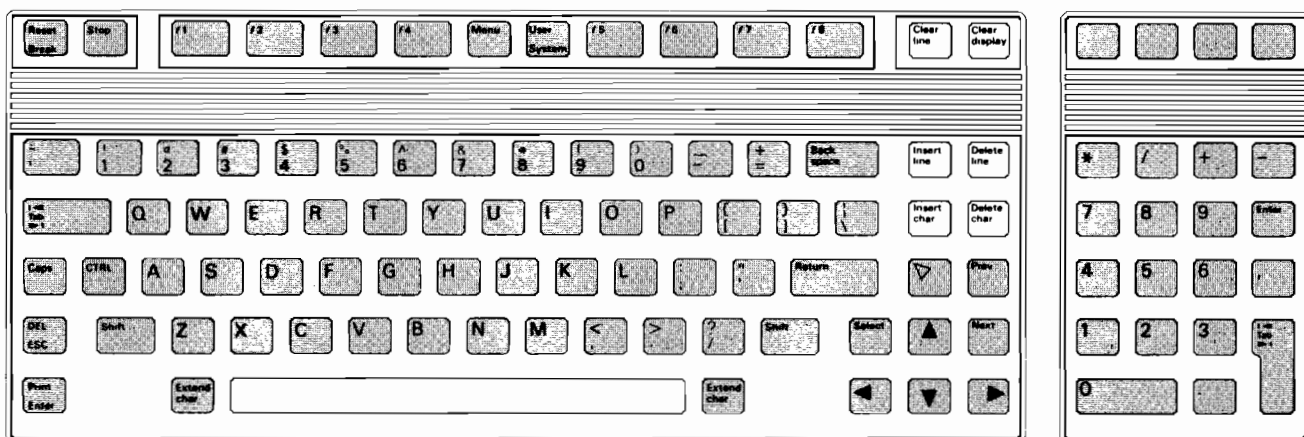
The key labeled "Next" is the workstation's NEXT page key. Pressing NEXT displays the next page of information in display memory and moves the cursor to the top left corner of the newly displayed page. This is equivalent to scrolling ahead 24 lines (21 lines if softkey labels are displayed) with a single keystroke.

PREV

The key labeled "Prev" is the workstation's previous page key. Pressing PREV displays the previous page of information in display memory and moves the cursor to the top left corner of the newly displayed page. This is equivalent to scrolling back 24 lines (21 lines if softkey labels are displayed) with a single keystroke.

Edit Keys

The unshaded area in this illustration shows the location of the edit keys. Editing keys are used for inserting and deleting lines and characters displayed on your screen.



Edit Keys

Clear line

To erase all characters from the present cursor position to the end of the current line, press the key labeled "Clear line".

To clear the current line or field, press **[ESCAPE]** and the key labeled "Clear line".

Clear display

To clear all input fields from the cursor's current position to the end of the display storage area press the key labeled "Clear display".

To delete the entire display storage area, press **[ESCAPE]** and the key labeled "Clear display".

Insert char

The key labeled "Insert char" allows you to insert characters on the display; characters are inserted to the left of the cursor. To insert characters, enter the insert mode by pressing the key labeled "Insert char". Then type in the characters you want to insert. Characters to the right of the cursor (including the character at the cursor's current position) are shifted to the right to make room for the inserted characters; characters shifted past the right margin of the display are displayed on the line below that containing the cursor.

To exit from insert mode, press the key labeled "Insert char" again or move the cursor from its current line.

Delete char

The key labeled "Delete char" allows you to delete characters from the display. To delete a character, position the cursor under the character and press "Delete char". Characters to the right of the deleted character are shifted left one space to close the gap.

Insert line

The key labeled "Insert line" allows you to insert a new blank line on the display. When you press the "Insert line" key, a line is inserted immediately above the line containing the cursor.

Delete line

The key labeled "Delete line" allows you to delete a line of information from the display. To delete a line, position the cursor in the line and then press the "Delete line" key.

The HALT Key

The key labeled "Break" is the workstation's HALT key. Pressing **BREAK** stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing **BREAK** again causes the displayed line to be executed; again, the next program line to be executed is printed on the display. Thus, the HALT key allows you to "single step" through a program, executing each program line individually.

If you press **BREAK** while a program is printing, printing may continue for a short period, even though the program has stopped.

The HALT key and the HALT/SGLE STEP system key function identically. Use whichever key is easier for you.

NOTE

Do not press the key labeled "Stop" or **SHIFT** with the key labeled "Break/Reset". Pressing either of these key combinations produces unpredictable results and can cause data loss.

Softkeys and the Select Key

The term **softkeys** specifies the eight function keys located at the top of the keyboard (labeled f1 through f8), and their corresponding labels located near the bottom of the screen. Pressing each key can run a program stored in the computer's memory or can display and enter a pre-defined string of characters. You will most likely use these keys with an application software program, with a utility program (such as initializing media), or as typing aids. In such instances, these keys are defined by you or the application program and are referred to as **user-defined softkeys**. Up to three sets of user-defined softkeys can be defined at any one time.

It is also possible for the softkeys to take on pre-defined system values, in which case they are referred to as **system defined keys**.

NOTE

A softkey's definition is in effect (or "active") only when its label is displayed.

The Select Key

Pressing the "Select" key allows you to cycle through the currently displayed sets of softkey labels.

Pressing **ESCAPE** and the key labeled "Select" switches between the system softkeys and user-defined softkeys. For example, if the system softkey labels are currently displayed, press **ESCAPE** and "Select" to display the user-defined softkeys; if the user-defined softkeys are currently displayed, press **ESCAPE** and "Select" to display the system softkey labels. (If no user softkeys are currently defined, pressing **ESCAPE** and "Select" simply turns on and off the display of the system softkey labels.)

Pressing **CONTROL** and the key labeled "N" has the same effect as pressing the "Select" key.

NOTE

The keys labeled "Menu" and "User/System" (located in the middle of the function keys f1 through f8) are disabled. Pressing either key causes a beep to sound; the keys are ignored by the system.

User-defined Keys

The function keys located at the top of the keyboard are numbered f1 through f8. These keys correspond to eight labels located near the bottom of the display.

Each of the eight keys can be defined three ways; it is possible to have twenty-four user-defined softkeys at one time. The corresponding softkey labels appear on the screen when the keys are defined. The "Select" key allows you to cycle through the different softkey definitions. Softkeys can be used to execute a program stored in the computer's memory or to aid in typing. For example, you can define a softkey such that when it is pressed, a character string is displayed and (optionally) executed.

To learn about using softkeys as typing aids, read this manual's appendix titled "Using Softkeys as Typing Aids".

System-defined Softkeys

Your system can also define the function keys at the top of the keyboard. These system-defined softkeys allow you to access many additional capabilities and functions. For example, using your workstation's system softkeys, you can access your workstation's alternate character set, access display enhancements, and set and delete tabs.

You can access the system softkeys by using the "Select" key, as described previously.

The three sets of system softkeys are shown below:

LINE DRAW CHAR SET		EXPAND	DISPLAY FUNCTIONS	INVERSE VIDEO	BLINKING VIDEO	UNDERLINE VIDEO	HALFBRT VIDEO
-----------------------	--	--------	----------------------	------------------	-------------------	--------------------	------------------

System Softkey Set 1

TAB +	TAB -	STATUS	DETACH	HALT/ SGLE STEP	HALT ALL		LOCAL
-------	-------	--------	--------	--------------------	----------	--	-------

System Softkey Set 2

SCRATCH ALL	TAB= RETURN	NETDISCON	NETDISCON +SCRATCH	ADVANCED STEP	EXECUTE		HANG UP
----------------	----------------	-----------	-----------------------	------------------	---------	--	---------

System Softkey Set 3

Each system softkey is described in the following paragraphs.

LINE DRAW CHAR SET

The line draw character set allows you to generate lines of varying thickness and angles with the help of your keyboard's alphanumeric characters. This character set may be used, for example, to draw tables and illustrations on the screen. The correspondence between the line draw character set and the alphanumeric keys on the keyboard is shown in the appendix titled "Keyboards".

When the alternate character set is active, an asterisk (*) is displayed in the softkey label. Pressing the softkey labeled "LINE DRAW CHAR SET" puts you back into normal character set mode; the asterisk (*) in the softkey label is removed.

EXPAND

The EXPAND system softkey allows you to see the "value" of a display control character. When the "DISPLAY FNCTNS" key is active and a cursor control key, edit key, HALT key, function key, or TAB key is pressed, only a dash "-" is displayed. To see which key generated the "-", position the cursor under the "-" and press the "EXPAND" system key. An abbreviated English language description of the key is displayed in the bottom line of the "EXPAND" system key label.

DISPLAY FNCTNS

A control character is a character that signals to the system's software to communicate with an application program or sends control signals to a device. These control characters are generated whenever you press an arrow key, a function key, the HALT key, the RETURN key, the system softkey EXECUTE or a display editing key. Pressing this softkey allows you to prohibit a control character from being acted on immediately; the character will not be interpreted by the system.

When "DISPLAY FNCTNS" is active, an asterisk (*) is displayed in the softkey label.

The HP 2392A Workstation

To disable "DISPLAY FNCTNS", press the softkey again; the asterisk (*) will be removed from the softkey label.

VIDEO ENHANCEMENTS

There are four display enhancements:

Inverse Video: characters are displayed as dark characters on a light background.

Blinking Video: characters blink on and off.

Underline Video: characters are underlined on the display.

Halfbrgt Video: characters are displayed with half the intensity or brightness as normal characters.

To enable a video enhancement, position the cursor at the desired location and press the enhancement's associated softkey. (An asterisk appears in the softkey label to remind you that the enhancement is active.) Then, type the characters that are to be displayed with that enhancement. To disable the video enhancement, press the enhancement's softkey again; the asterisk will be removed from the softkey label.

There is no restriction on the number of video enhancements that can be active at one time.

TAB +

Pressing this function key sets a tab at the cursor's current position.

TAB -

Pressing this key deletes any tabs at the cursor's current position.

DETACH

It is possible to request and attach a secondary task to your workstation by using the BASIC language REQUEST and ATTACH statements. Your system's principal operator must first configure a secondary task by using the CONFIG utility. Once the secondary task is attached to your workstation, you can exit or "detach" from this secondary task by pressing the "DETACH" system softkey. The workstation is once again "attached" to its primary task (the task available to it immediately after system power up).

Similarly, you can "detach" from the secondary task by pressing **CONTROL** with the "D" alphabetic key.

HALT/SGLE STEP

Pressing the system softkey labeled "HALT/SGLE STEP" stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing this softkey again causes the displayed line to be executed; again, the next program line to be executed is printed on the display. Thus, the softkey allows you to "single step" through a program, executing each program line individually.

If you press this system softkey while your program is printing, printing may continue for a short period, even though the program has stopped.

The HALT/SGLE STEP system key and the HALT key (labeled "Break") function identically. Use whichever key is easier for you.

HALT ALL

Pressing this softkey stops the current program from executing and stops all input/output operations.

You can also perform the "HALT ALL" function by pressing **CONTROL** and the key labeled "Y".

NOTE

Pressing this softkey is not a normal way of stopping your program and may result in a loss of data.

LOCAL

Pressing this function key places the HP 2392A back in terminal mode. The local screen is cleared and the local softkey labels are displayed. The HP 260 ignores all data entered.

To place the HP 2392A again into workstation mode, press **SHIFT ESCAPE**. This sends the "DEL" character to the HP 260, telling it that the workstation is ready for use. The workstation's display memory is restored.

You can also switch the HP 2392A from workstation mode to terminal mode by pressing **CONTROL** and the key labeled "L".

SCRATCH ALL

Pressing this softkey stops the current program from executing and stops all input and output operations. It erases the entire user memory, including programs and variables.

Pressing **ESCAPE CONTROL** and the key labeled "Y" is equivalent to pressing the "SCRATCH ALL" system softkey.

NOTE

Pressing this key results in a loss of data.

TAB = RETURN

Pressing this function key redefines all workstation TAB keys to function as RETURN keys. An asterisk is displayed in the softkey label to remind you of the TAB keys' new function. Refer to the description of the TAB key in the paragraphs titled "Alphanumeric Keys" for a description of the TAB keys' new functions.

To restore your workstation's TAB keys to their original function, press the "TAB = RETURN" softkey again. The asterisk in the softkey's label will be removed, indicating that TAB keys no longer function as RETURN keys.

NETDISCON

This key is used to exit remote access and leave the remote task as it is. This function key is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

NETDISCON SCRATCH

Pressing this key exits remote access and issues a SCRATCH ALL in the task on the remote system. This function is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

ADVANCED STEP

This key allows a fast stepping through the program. When this softkey is pressed, the program continues processing until the next sequential line is to be executed. You use this key to execute sub-structures such as loops and subroutines, as an entity when stepping through program execution. Refer to your system's BASIC Programming Manual for more information on use of advanced stepping.

EXECUTE

This key is used to execute the line or expression on the display which currently contains the cursor. For example, the value of the expression $8 + 22 - (7 * 11)$ is computed and displayed when the following is entered:

$8 + 22 - (7 * 11)$ Then press softkey f7 in set 3.

Pressing **CONTROL** and the key labeled "X" is equivalent to pressing this system softkey.

HANG UP

You use this key when your workstation is linked to the HP 260 system via a modem. Pressing this softkey causes a hang up signal to be sent to the modem, thus disconnecting it.

Pressing the keys labeled "CTRL" and "L" twice (that is, **CONTROL** "L" **CONTROL** "L") achieves the same result.

Bar Code Reader Connection

The HP 92915A bar code reader is supported for use with the HP 2392A workstation. The bar code reader should be connected between the HP 2392A workstation and the keyboard, that is the bar code reader is connected to both the workstation and the keyboard. The bar code reader is supported only in Keyboard Emulation mode. Refer to the installation manual for the HP 92915A bar code reader for the configuration of the bar code reader.

THE HP 150 WORKSTATION

SECTION

5

The HP 150 A/B and HP 150 II (HP TOUCHSCREEN II) can be used as independent, stand-alone personal computers or as workstations on an HP 260 computer system. The HP 150 functions differently when operating as an HP 260 workstation (referred to as "workstation mode") than it does when operating as a personal computer (referred to as "PC mode"). This section of the manual describes how to use the HP 150 as a workstation. For information on using the HP 150 as a PC, refer to the manuals supplied with the HP 150.

To place the HP 150 in workstation mode, press and hold down the key labeled "Shift" as you press the key labeled "ESC/DEL".

If you want to use AdvanceLink while your HP 150 is connected to your computer system in workstation mode, it is recommended that you use the logon file that is supplied with the operating system to connect your HP 150 to your computer system as a workstation. Refer to the "UTILITIES" manual for the details of using the logon file.

NOTE



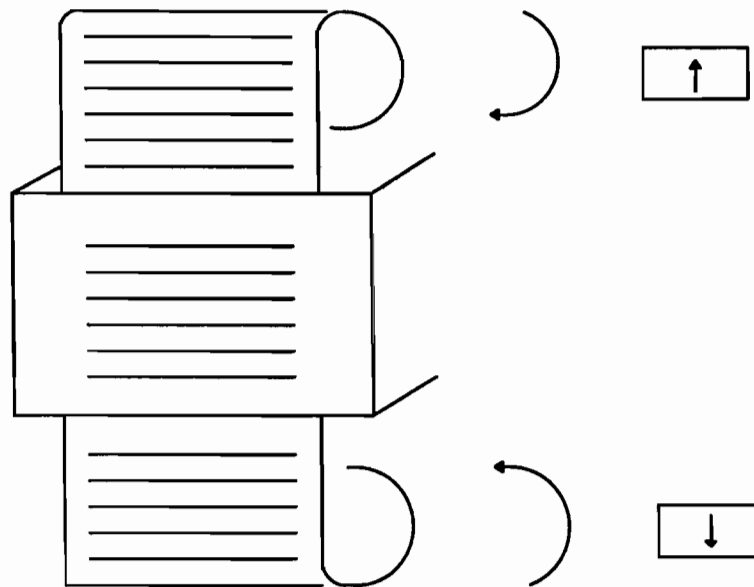
The HP 260 must be powered up and must be configured correctly before the HP 150 can be used as a workstation. Ask your system's principal operator for assistance if the workstation is not operating.

Additionally, the HP 150 itself must be correctly configured before it can be used as a workstation. Instructions for configuring the HP 150 as a workstation are located in the appendix titled "Configuring Workstations".

Once in workstation mode, the HP 150 can be placed in PC mode by pressing and holding down **CONTROL** as you press the key labeled "L". Alternatively, you can press the system key labeled "LOCAL" as described in the paragraphs titled "Softkeys and the Select Key".

DISPLAY

The workstation's display is used to view program listings, program output, and information entered from the keyboard. The display memory can store more characters than can be shown on the screen at one time. The screen can display the softkey labels, one line of status information and one page of characters. A page consists of 24 lines of characters (21 lines of characters if softkey labels are displayed). Each line contains a maximum of 80 characters. If the display has been filled, the top line rolls off the screen. As you type a line, the display will roll up to make room for a new line. This up and down movement is called scrolling. The following illustration shows the scrolling process.



NOTE

While using your HP 150 as a workstation, do not use its touchscreen facility. It is not a supported accessory when using the HP 150 as a workstation.

If your HP 150 is equipped with a built-in thermal printer, underlined characters will print without the underline. The underline enhancement is not supported with the HP 150's built-in printer.

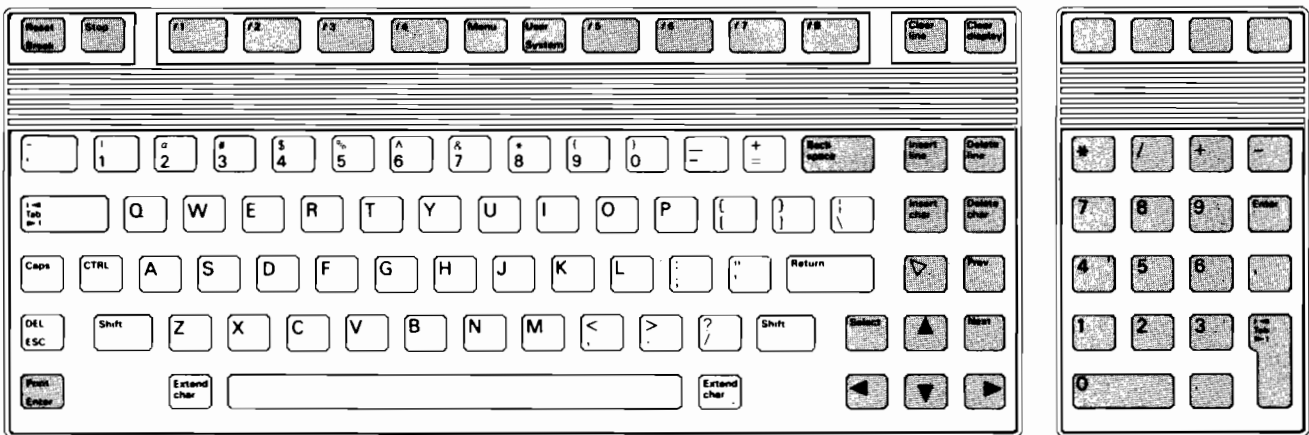
Characters on the display may appear as half-bright, underlined, blinking and inverse video (or any combination thereof). These display enhancements can be accessed by using softkeys, as described in this section's paragraphs titled "Softkeys and the Select Key".

KEYBOARD

The keyboard is your means of sending data and commands to the SPU. Physically it resembles a typewriter. The keyboard consists of different groups, each of which is described in detail in this section: the alphanumeric keys, the numeric keypad, the cursor control keys, the edit keys, a HALT key and the softkeys.

Alphanumeric Keys

The unshaded area in this illustration shows the location of the standard alphanumeric keys on your HP 150.



- | | | | |
|---------|----------|-----------|---------------|
| 1 SHIFT | 3 ESC | 5 TAB | 7 EXTEND CHAR |
| 2 CAPS | 4 RETURN | 6 CONTROL | |

Most alphanumeric keys function identically to the keys on an ordinary typewriter. Pressing an alphanumeric key causes the character printed on the key to be displayed on the workstation's display. Pressing and holding down an alphanumeric key displays a string of the characters printed on the key.

Some of the keys in the alphanumeric group have special functions. These keys are shown in the preceding illustration and are described in the following paragraphs.

NOTE

Do not press the key labeled "Enter" when your HP 150 is being used as an HP 260 workstation. Pressing it produces unpredictable results and can cause data loss.

SHIFT

The two keys labeled "Shift" are your workstation's SHIFT keys. Pressing and holding down **SHIFT** as you press an alphabetic key causes the uppercase alphabetic character to be displayed. For example, to type an uppercase "A", press and hold down **SHIFT** as you press the key labeled "A". The SHIFT key also allows you to access the "upper" of two characters printed on a key, such as the "?" character on the key labeled with the characters "/" and "?". For example, to type "?" press and hold **SHIFT** as you press the key labeled "/".

Additionally, the SHIFT key is often used with other types of keys, such as cursor control keys and function keys. When directed to press **SHIFT** in combination with other keys, press and hold down the SHIFT key as you press the other keys.

CAPS

The key labeled "Caps" is your workstation's CAPS key. Pressing this key once sets the "caps mode". In this mode, each alphabetic key pressed is displayed as an uppercase alphabetic character. Only alphabetic keys (A through Z) are affected by the caps mode.

When the caps mode is active, you can type a lowercase alphabetic character by pressing **SHIFT** with the alphabetic key.

ESC and DEL

The key labeled "ESC" and "DEL" is both your workstation's escape key and its DEL key. Like the SHIFT key, the escape key is used only in combination with other keys. When instructed to press **ESCAPE** in combination with other keys, first press **ESCAPE**, release it and then press the other keys. For example, if instructed to press **ESCAPE** **SHIFT** **TAB**, press and release **ESCAPE**; then press and hold **SHIFT** as you press **TAB**.

Press **SHIFT** **ESCAPE** sends a special, single character named "DEL" to the SPU. This tells the system that your workstation is ready for use. If the HP 150 is in PC mode, pressing **SHIFT** **ESCAPE** switches the it to workstation mode. If the HP 150 is in workstation mode, pressing **SHIFT** **ESCAPE** causes the system to erase and then re-display the information currently on the display.

RETURN

The key labeled "Return" is the workstation's RETURN key. Pressing **RETURN** sends the data on the current line to the SPU for processing and positions the cursor at the beginning of the next line. If a program is executing, **RETURN** can be used to enter data in response to a prompt from the program. If a program is not executing, **RETURN** can be used to execute a BASIC command or to assign a value to a variable. For example, to execute the CAT command you could type: **CAT RETURN**. The value of a numeric expression could be assigned, for example, by typing: **A=2+2 RETURN**. Note that this key cannot be used to simply execute a numeric expression; this function is performed with the EXECUTE system softkey (described in the paragraphs titled "Softkeys and the Select Key").

Pressing **ESCAPE RETURN** moves the cursor to the beginning of the next line without sending data to the SPU to be processed.

TAB

The key labeled "Tab" is the workstation's TAB key. Pressing **TAB** moves the cursor to the next input field or tabbed position. Pressing **SHIFT TAB** moves the cursor to the previous input field or tabbed position.

By using the "TAB = RETURN" system softkey (as described in the paragraphs titled "Softkeys and the Select Key"), you can specify that all TAB keys function as RETURN keys. In this case, the TAB key has the following functions:

Pressing **TAB** sends the data on the current line to the SPU to be processed and moves the cursor to the beginning of the next line.

Pressing **ESCAPE TAB** moves the cursor to the next input field or tabbed position.

Pressing **ESCAPE SHIFT TAB** moves the cursor to the previous input field or tabbed position.

CONTROL

The key labeled "CTRL" is the workstation's CONTROL key. Like the SHIFT key, the CONTROL key is only used in combination with other keys. When instructed to press **CONTROL** in combination with other keys, press and hold down **CONTROL** as you press the other keys.

For example, when printing a long list of information to the display (such as the output from a CAT statement), you can temporarily pause printing by pressing **CONTROL** and the key labeled "S". To resume printing, press **CONTROL** and the key labeled "Q".

EXTEND CHAR

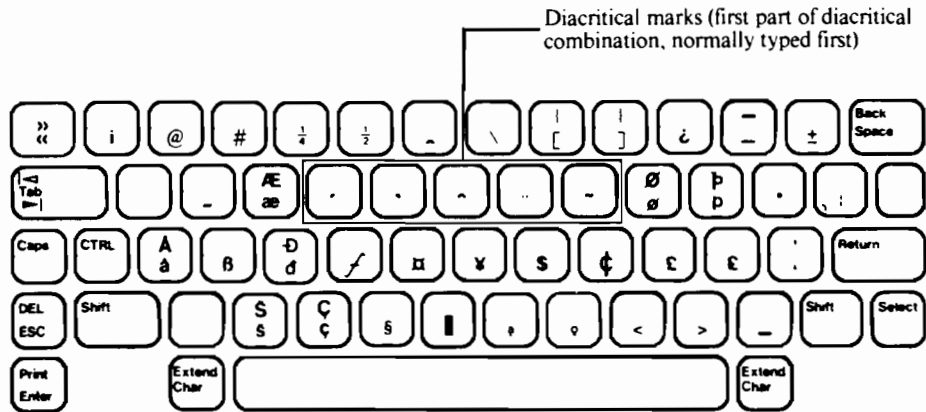
The "Extend char" key is used in combination with certain alphanumeric keys to allow access to a subset of the ROMAN 8 character set. For example, the German a-umlaut, o-umlaut, and u-umlaut characters, and the accented characters of the French language can be displayed on the screen of your workstation.

The keyboard diagram below shows the mapping between the normal key characters and the characters that are accessed using "Extend char". Characters that appear on the keys in the diagram below are accessed by pressing the relevant key together with the "Extend char" key.

The HP 150 Workstation

If the character you want to display does not appear in the diagram but the accent you need to form the character does appear on one of the keys in the diagram, use the following procedure to display the character.

1. Press the "Extend char" key together with the key that corresponds to the accent you need (for example the key labeled "U" corresponds to the umlaut of the German language). The accent is displayed above the current position of the cursor.
2. Press the alphanumeric key of the character you want to display. The character is displayed together with its accent.



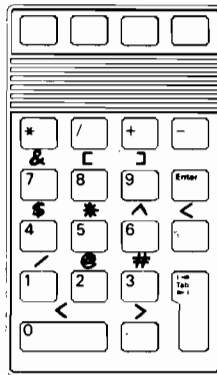
Numeric Keypad

Use this block of keys, located on the far right side of the keyboard, to input numeric data rapidly.

Several math symbols are provided on the numeric keypad: "*" (multiplication), "/" (division), "+" (addition) and "-" (subtraction). These keys can be used to perform quick calculations and to enter signed data values.

The keys labeled "." (decimal point) and "," (comma) allow you to enter decimal numbers and number sets quickly.

The numeric keypad's TAB key functions in the same way as the TAB key in the alphanumeric keys.



Numeric Keypad

NOTE

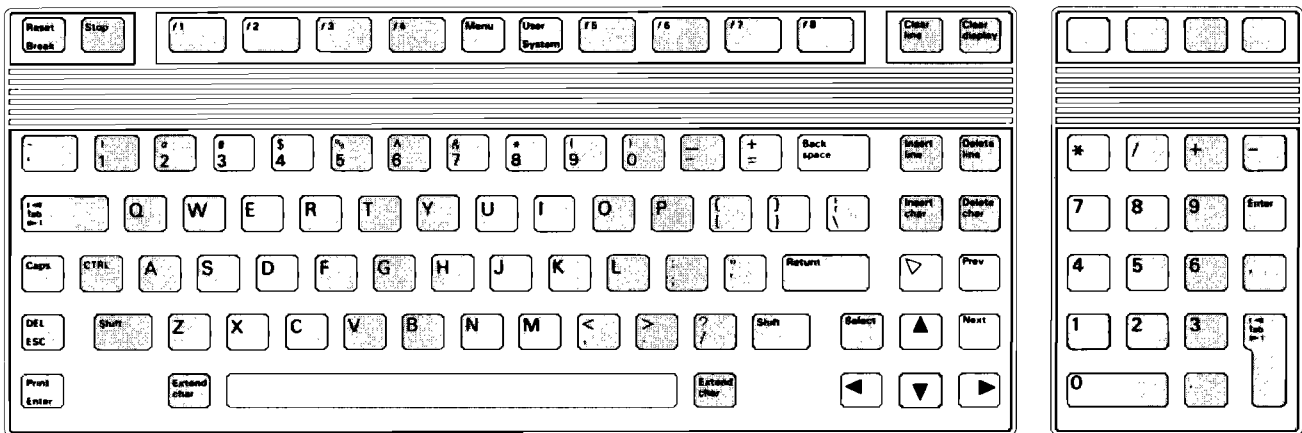
Do not press the ENTER key when your HP 150 is being used as an HP 260 workstation. Pressing it produces unpredictable results and can cause data loss.

The SHIFT key can be used with many of the keys in the numeric keypad. The following table shows the character displayed when SHIFT is pressed with a key from the numeric keypad.

SHIFT "Key"	,	*	/	+	-	^	{		}	[\]	#	`	@	~
"Key" Label	,	*	/	+	-	0	1	2	3	4	5	6	7	8	9	.





Cursor Control Keys



The unshaded area in this illustration shows the location of the cursor control keys. The cursor control keys are used to move the cursor on the screen and to select the part of the display memory you want to display.



Cursor Control Keys



Pressing  moves the cursor from its current position to the next line above it on the display. If you press and hold  down, the cursor moves rapidly toward the top of the display. If  is pressed when the cursor is at the top line of the display, the line in display memory above the current line is scrolled onto the display. Pressing  has no effect when the cursor is located in the top line of display memory.

Pressing the key sequence   displays the next 24 lines (21 lines if softkey labels are displayed) of display memory. The cursor is positioned at the top left corner of the new page.



Pressing moves the cursor from its current position to the next line below it on the display. If you press and hold down, the cursor moves rapidly toward the bottom of the display. If is pressed when the cursor is at the bottom line of the display, the line in display memory below the current line is scrolled onto the display.

Pressing the key sequence **SHIFT** displays the previous 24 lines (21 lines if softkey labels are displayed) of the display memory. The cursor is positioned in the top left corner of the newly displayed page.



Pressing moves the cursor one space to the left of its current position on the display. Pressing and holding down causes the cursor to move rapidly to the left. If is pressed when the cursor is at the first column of a line, the cursor is moved to the last column of the previous line. If the cursor is located in column 1 of the top line of display memory, pressing has no effect.



Pressing moves the cursor one space to the right of its current position on the display. Pressing and holding down causes the cursor to move rapidly to the right. If is pressed when the cursor is at the last column of a line, the cursor moves to the first column of the next line.



The key is the workstation's HOME key. Pressing moves the cursor to column 1 of the first line of display memory.

Pressing **SHIFT** positions the cursor just after the last character in the last line of display memory.

Pressing **ESCAPE** moves the cursor to the upper left corner of the page currently displayed.

BACKSPACE

The key labeled "Back space" is the workstation's BACKSPACE key. Pressing **BACKSPACE** moves the cursor one space to the left. When the cursor is in column 1, pressing **BACKSPACE** has no effect.

Pressing **ESCAPE** **BACKSPACE** moves the cursor to column 1 of the line currently containing the cursor.

NEXT

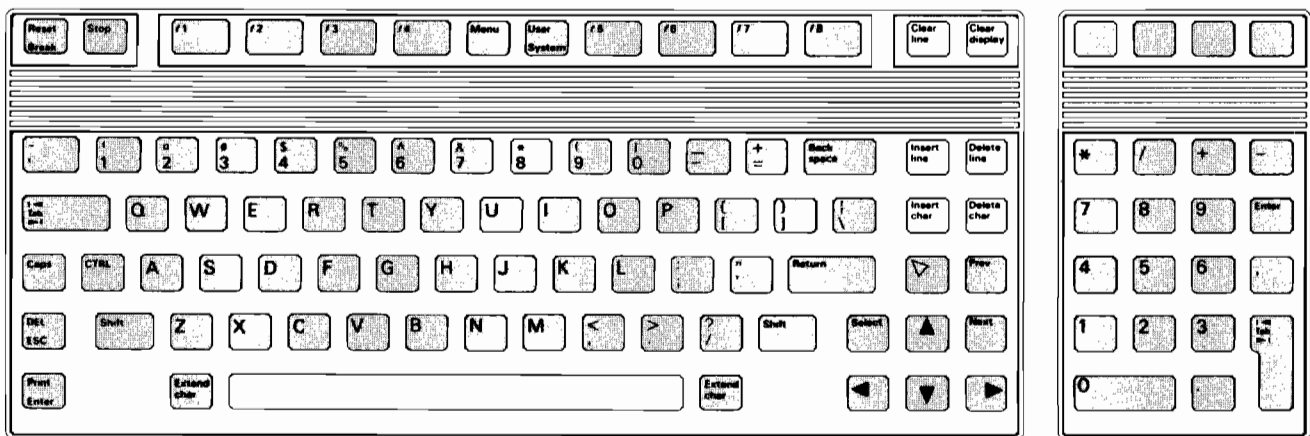
The key labeled "Next" is the workstation's NEXT page key. Pressing NEXT displays the next page of information in display memory and moves the cursor to the top left corner of the newly displayed page. This is equivalent to scrolling ahead 24 lines (21 lines if softkey labels are displayed) with a single keystroke.

PREV

The key labeled "Prev" is the workstation's previous page key. Pressing PREV displays the previous page of information in display memory and moves the cursor to the top left corner of the newly displayed page. This is equivalent to scrolling back 24 lines (21 lines if softkey labels are displayed) with a single keystroke.

Edit Keys

The unshaded area in this illustration shows the location of the edit keys. Editing keys are used for inserting and deleting lines and characters displayed on your screen.



Edit Keys

Clear line

To clear all characters from the present cursor position to the end of the current line, press the key labeled "Clear line".

To clear the entire current line, press **ESCAPE** and the key labeled "Clear line".

Clear display

To clear all characters from the cursor's current position to the end of the display storage area, press the key labeled "Clear display".

To delete the entire display storage area, press **ESCAPE** and the key labeled "Clear display".

Insert char

The key labeled "Insert char" allows you to insert characters on the display; characters are inserted to the left of the cursor. To insert characters, enter the insert mode by pressing the key labeled "Insert char". Then type in the characters you want to insert. Characters to the right of the cursor (including the character at the cursor's current position) are shifted to the right to make room for the inserted characters; characters shifted past the right margin of the display are displayed on the line below that containing the cursor.

To exit from insert mode, press the key labeled "Insert char" again or move the cursor from its current line.

Delete char

The key labeled "Delete char" allows you to delete characters from the display. To delete a character, position the cursor under the character and press "Delete char". Characters to the right of the deleted character are shifted left one space to close the gap.

Insert line

The key labeled "Insert line" allows you to insert a new blank line on the display. When you press the "Insert line" key, a line is inserted immediately above the line containing the cursor.

Delete line

The key labeled "Delete line" allows you to delete a line of information from the display. To delete a line, position the cursor in the line and then press the "Delete line" key.

The HALT Key

The key labeled "Break" is the workstation's HALT key. Pressing **BREAK** stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing **BREAK** again causes the displayed line to be executed; again, the next program line to be executed is printed on the display. Thus, the HALT key allows you to "single step" through a program, executing each program line individually.

If you press **BREAK** while a program is printing, printing may continue for a short period, even though the program has stopped.

The HALT key and the HALT/SGLE STEP system key function identically. Use whichever key is easier for you.

NOTE

Do not press the key labeled "Stop" or **SHIFT** with the key labeled "Break/Reset". Pressing either key combinations produces unpredictable results and can cause data loss.

Using the STOP Key to Leave AdvanceLink

If you are running AdvanceLink on your HP 150, and using the HP 150 as a workstation on your computer system at the same time, you can exit both AdvanceLink and workstation mode, and return to the HP 150's PAM, by pressing **SHIFT** and the key labeled "Stop", at the same time.

Do not press the "Stop" key if AdvanceLink is not running.

Softkeys and the Select Key

The term **softkeys** specifies the eight function keys located at the top of the keyboard (labeled f1 through f8), and their corresponding labels located near the bottom of the screen. Pressing each key can run a program stored in the computer's memory or can display and enter a pre-defined string of characters. You will most likely use these keys with an application software program, with a utility program (such as initializing media), or as typing aids. In such instances, these keys are defined by you or the application program and are referred to as **user-defined softkeys**. Up to three sets of user-defined softkeys can be defined at any one time.

It is also possible for the softkeys to take on pre-defined system values, in which case they are referred to as **system defined keys**.

NOTE

A softkey's definition is in effect (or "active") only when its label is displayed.

The Select Key

Pressing the "Select" key allows you to cycle through the currently displayed sets of softkey labels.

Pressing **ESCAPE** and the key labeled "Select" switches between the system softkeys and user-defined softkeys. For example, if the system softkey labels are currently displayed, press **ESCAPE** and "Select" to display the user-defined softkeys; if the user-defined softkeys are currently displayed, press **ESCAPE** and "Select" to display the system softkey labels. (If no user softkeys are currently defined, pressing **ESCAPE** and "Select" simply turns on and off the display of the system softkey labels.)

Pressing **CONTROL** and with the key labeled "N" has the same effect as pressing the "Select" key.

NOTE

The keys labeled "Menu" and "User/System" (located in the middle of the function keys f1 through f8) are disabled. Pressing either key causes a beep to sound; the keys are ignored by the system.

User-defined Keys

The function keys located at the top of the keyboard are numbered f1 through f8. These keys correspond to eight labels located near the bottom of the display.

Each of the eight keys can be defined three ways; it is possible to have twenty-four user-defined softkeys at one time. The corresponding softkey labels appear on the screen when the keys are defined. The "Select" key allows you to cycle through the different softkey definitions. Softkeys can be used to execute a program stored in the computer's memory or to aid in typing. For example, you can define a softkey such that when it is pressed, a character string is displayed and (optionally) executed.

To learn about using softkeys as typing aids, read this manual's appendix titled "Using Softkeys as Typing Aids".

System-defined Softkeys

Your system can also define the function keys at the top of the keyboard. These system-defined softkeys allow you to access many additional capabilities and functions. For example, using your workstation's system softkeys, you can access your workstation's alternate character set, access display enhancements, and set and delete tabs.

You can access the system softkeys by using the "Select" key, as described previously.

The three sets of system softkeys are shown below:

LINE DRAW CHAR SET		EXPAND	DISPLAY FUNCTIONS	INVERSE VIDEO	BLINKING VIDEO	UNDERLINE VIDEO	HALFBRGT VIDEO
-----------------------	--	--------	----------------------	------------------	-------------------	--------------------	-------------------

System Softkey Set 1

TAB +	TAB -	STATUS	DETACH	HALT/ SGLE STEP	HALT ALL		LOCAL
-------	-------	--------	--------	--------------------	----------	--	-------

System Softkey Set 2

SCRATCH ALL	TAB= RETURN	NETDISCON	NETDISCON +SCRATCH	ADVANCED STEP	EXECUTE		HANG UP
----------------	----------------	-----------	-----------------------	------------------	---------	--	---------

System Softkey Set 3

Each system softkey is described in the following paragraphs.

LINE DRAW CHAR SET

The line draw character set allows you to generate lines of varying thickness and angles with the help of your keyboard's alphanumeric characters. This character set may be used, for example, to draw tables and illustrations on the screen. The correspondence between the line draw character set and the alphanumeric keys on the keyboard is shown in the appendix titled "Keyboards".

When the alternate character set is active, an asterisk (*) is displayed in the softkey label. Pressing the softkey labeled "LINE DRAW CHAR SET" puts you back into normal character set mode; the asterisk (*) in the softkey label is removed.

EXPAND

The EXPAND system softkey allows you to see the "value" of a display control character. When the "DISPLAY FNCTNS" key is active and a cursor control key, edit key, HALT key, function key, or TAB key is pressed, only a dash "-" is displayed. To see which key generated the "-", position the cursor under the "-" and press the "EXPAND" system key. An abbreviated English language description of the key is displayed in the bottom line of the "EXPAND" system key label.

DISPLAY FNCTNS

A control character is a character that signals to the system's software to communicate with an application program; or it sends control signals to a device. These control characters are generated whenever you press an arrow key, a function key, a HALT key, the Return key, the system softkey EXECUTE or a display editing key. Pressing this softkey allows you to prohibit a control character from being acted on immediately; the character will not be interpreted by the system.

When "DISPLAY FNCTNS" is active, an asterisk (*) is displayed in the softkey label.

To disable "DISPLAY FNCTNS", press the softkey again; the asterisk (*) will be removed from the softkey label.

VIDEO ENHANCEMENTS

There are four display enhancements:

Inverse Video: characters are displayed as dark characters on a light background.

Blinking Video: characters blink on and off.

Underline Video: characters are underlined on the display.

Halfbrgt Video: characters are displayed with half the intensity or brightness as normal characters.

To enable a video enhancement, position the cursor at the desired location and press the enhancement's associated softkey. (An asterisk appears in the softkey label to remind you that the enhancement is active.) Then, type the characters that are to be displayed with that enhancement. To disable the video enhancement, press the enhancement's softkey again; the asterisk will be removed from the softkey label.

There is no restriction on the number of video enhancements that can be active at one time.

TAB +

Pressing this function key sets a tab at the cursor's current position.

TAB -

Pressing this key deletes any tabs at the cursor's current position.

DETACH

It is possible to request and attach a secondary task to your workstation by using the BASIC language REQUEST and ATTACH statements. Your system's principal operator must first configure a secondary task by using the CONFIG utility. Once the secondary task is attached to your workstation, you can exit or "detach" from this secondary task by pressing the "DETACH" system softkey. The workstation is once again "attached" to its primary task (the task available to it immediately after system power up).

Similarly, you can "detach" from the secondary task by pressing **CONTROL** with the "D" alphabetic key.

HALT/SGLE STEP

Pressing the system softkey labeled "HALT/SGL STEP" stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing this softkey again causes the displayed line to be executed; again, the next program line line to be executed is printed on the display. Thus, the softkey allows you to "single step" through a program, executing each program line individually.

If you press this system softkey while your program is printing, printing may continue for a short period, even though the program has stopped.

The HP 150 Workstation

The HALT/SGLE STEP system key and the HALT key (labeled "Break") function identically. Use whichever key is easier for you.

HALT ALL

Pressing this softkey stops the current program from executing and stops all input/output operations.

You can also perform the "HALT ALL" function by pressing **CONTROL** and the key labeled and "Y".

NOTE

Pressing this softkey is not a normal way of stopping your program and may result in a loss of data.

LOCAL

Pressing this function key places the HP 150 back in PC mode. The local screen is cleared and the local softkey labels are displayed. The HP 260 ignores all data entered.

To place the HP 150 again into workstation mode, press **SHIFT** and the key labeled "ESC/DEL". This sends the "DEL" character to the HP 260, telling it that the workstation is ready for use. The workstation's display memory is restored.

You can also switch the HP 150 from workstation mode to PC mode by pressing **CONTROL** and the key labeled "L".

SCRATCH ALL

Pressing this softkey stops the current program from executing and stops all input and output operations. It erases the entire user memory, including programs and variables.

Pressing **ESCAPE CONTROL** and the key labeled "Y" is equivalent to pressing the "SCRATCH ALL" system softkey.

NOTE

Pressing this key results in a loss of data.

TAB = RETURN

Pressing this function key redefines all workstation TAB keys to function as RETURN keys. An asterisk is displayed in the softkey label to remind you of the TAB keys' new function. Refer to the description of the TAB key in the paragraphs titled "Alphanumeric Keys" for a description of the TAB keys' new functions.

To restore your workstation's TAB keys to their original function, press the "TAB = RETURN" softkey again. The asterisk in the softkey's label will be removed, indicating that TAB keys no longer function as RETURN keys.

NETDISCON

This key is used to exit remote access and leave the remote task as it is. This function key is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

NETDISCON SCRATCH

Pressing this key exits remote access and issues a SCRATCH ALL in the task on on the remote system. This function is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

ADVANCED STEP

This key allows a fast stepping through the program. When this softkey is pressed, the program continues processing until the next sequential line is to be executed. You use this key to execute sub-structures such as loops and subroutines, as an entity when stepping through program execution. Refer to your system's BASIC Programming Manual for more information on use of advanced stepping.

EXECUTE

This key is used to execute the line or expression on the display which currently contains the cursor. For example, the value of the expression $8 + 22 - (7 * 11)$ is computed and displayed when the following is entered:

$8 + 22 - (7 * 11)$ Then press softkey f7 in set 3.

Pressing **CONTROL** and the key labeled "X" is equivalent to pressing this system softkey.

HANG UP

You use this key when your workstation is linked to the HP 260 system via a modem. Pressing this softkey causes a hang up signal to be sent to the modem, thus disconnecting it.

Pressing the keys labeled "CTRL" and "L" twice (that is, **CONTROL** "L" **CONTROL** "L") achieves the same result.

Bar Code Reader Connection

The HP 92916A bar code reader is supported for use with the HP 150II, when the HP 150II is in workstation mode. The bar code reader should be connected to the HP-HIL port on the keyboard of the HP 150II. The bar code reader is supported only in Keyboard Emulation mode. Refer to the installation manual for the HP 92916A for the configuration of the bar code reader.

The HP 92915A bar code reader is supported for use with the HP 150A/B, when the HP 150A/B is in workstation mode. The bar code reader should be connected between the HP 150A/B workstation and the keyboard, that is the bar code reader is connected to both the workstation and the keyboard. The bar code reader is supported only in Keyboard Emulation mode. Refer to the installation manual for the HP 92915A bar code reader for the configuration of the bar code reader.

THE HP VECTRA WORKSTATION

SECTION

6



The HP Vectra Personal Computer can be used as an independent, stand-alone personal computer or as a workstation on an HP 260 computer system. The HP Vectra functions differently when operating as an HP 260 workstation (referred to as "workstation mode") than it does when operating as a personal computer (referred to as "PC mode"). This section of the manual describes how to use the HP Vectra as a workstation. For information on using the HP Vectra as a PC, refer to the manuals supplied with the HP Vectra.

To place the HP Vectra in workstation mode, press and hold down the key labeled "CTRL" as you press the key labeled "←" (located above the large key labeled "Enter").

It is recommended that you use the logon file that is supplied with the operating system to connect your HP Vectra to your computer system as a workstation. Refer to the "UTILITIES" manual for the details of using the logon file.

NOTE

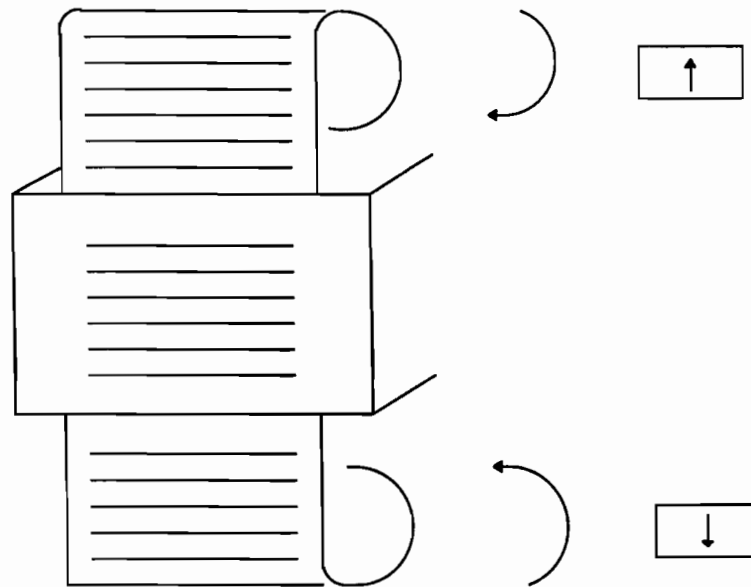
The HP 260 must be powered up and must be configured correctly before the HP Vectra can be used as a workstation. Ask your system's principal operator for assistance if the workstation is not operating.

Additionally, the HP Vectra must be running the AdvanceLink 2392 software (revision A.05.04 or more recent) and must itself be correctly configured before it can be used as a workstation. Instructions for configuring the HP Vectra as a workstation are located in the appendix titled "Configuring Workstations".

Once in workstation mode, the HP Vectra can be placed in PC mode by pressing and holding down **CONTROL** as you press the key labeled "L". Alternatively, you can press the system key labeled "LOCAL" as described in the paragraphs titled "Softkeys and the Select Key".

DISPLAY

The workstation's display is used to view program listings, program output, and information entered from the keyboard. The display memory can store more characters than can be shown on the screen at one time. The screen can display the softkey labels, one line of status information and one page of characters. A page consists of 24 lines of characters (21 lines of characters if softkey labels are displayed). Each line contains a maximum of 80 characters. If the display has been filled, the top line rolls off the screen. As you type a line, the display will roll up to make room for a new line. This up and down movement is called scrolling. The following illustration shows the scrolling process.



NOTE

While using your HP Vectra as a workstation, do not use the HP Touch accessory. It is not a supported accessory when using the HP Vectra as a workstation.

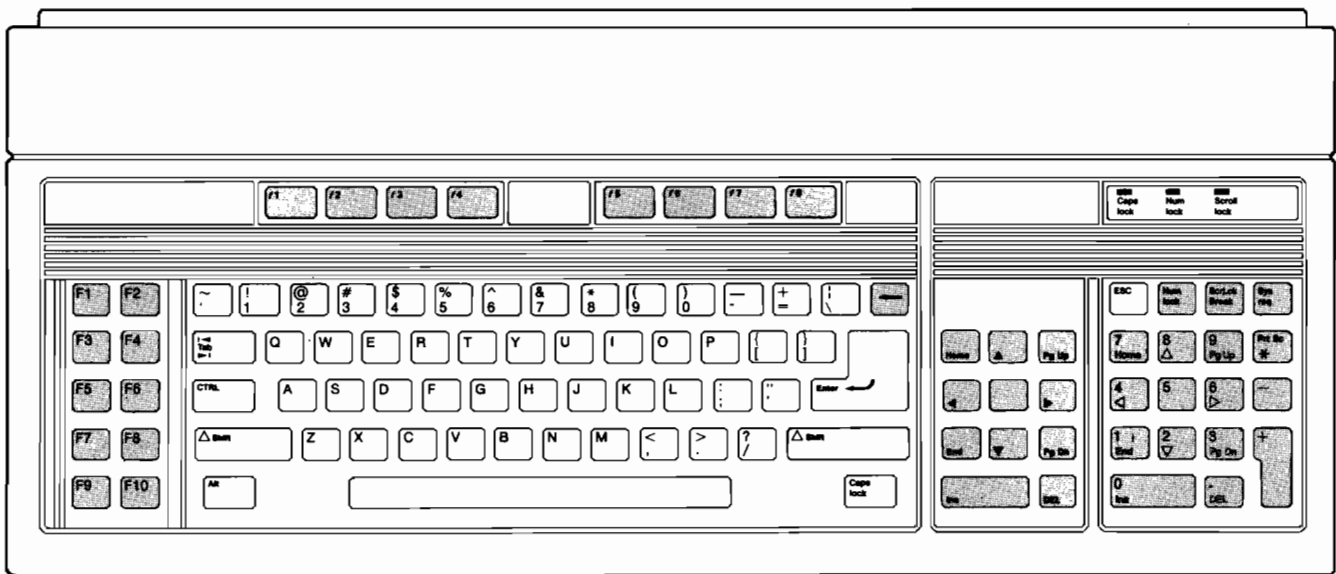
When your HP Vectra is in monochrome display mode, characters on the display may appear as half-bright, underlined, blinking and inverse video (or any combination thereof). When your HP Vectra is in color display mode, some of the display enhancements are mapped into color functionality. These display enhancements can be accessed by using softkeys, as described in this section's paragraphs titled "Softkeys and the Select Key".

KEYBOARD

The keyboard is your means of sending data and commands to the SPU. Physically it resembles a typewriter. The keyboard consists of different groups, each of which is described in detail in this section: the alphanumeric keys, the numeric keypad, the cursor control keys, the edit keys, the function keys (labeled F1 through F10) and the softkeys (labeled f1 through f8).

Alphanumeric Keys

The unshaded area in this illustration shows the location of HP Vectra's standard alphanumeric keys as well as a few special keys used with HP Vectra's alphanumeric keys.



- | | | | |
|---------|---------|-----------|-------|
| 1 SHIFT | 3 ESC | 5 TAB | 7 ALT |
| 2 CAPS | 4 ENTER | 6 CONTROL | |

Most alphanumeric keys function identically to the keys on an ordinary typewriter. Pressing an alphanumeric key causes the character printed on the key to be displayed on the workstation's display. Pressing and holding down an alphanumeric key displays a string of the characters printed on the key.

Some of the keys in the alphanumeric group have special functions. These keys are shown in the preceding illustration and are described in the following paragraphs.

SHIFT

The two keys labeled "Shift" are your workstation's SHIFT keys. Pressing and holding down **SHIFT** as you press an alphabetic key causes the uppercase alphabetic character to be displayed. For example, to type an uppercase "A", press and hold down **SHIFT** as you press the key labeled "A". The SHIFT key also

The HP Vectra Workstation

allows you to access the "upper" of two characters printed on a key, such as the "?" character on the key labeled with the characters "/" and "?". For example, to type "?" press and hold **SHIFT** as you press the key labeled "/".

Additionally, the **SHIFT** key is often used with other types of keys, such as cursor control keys and function keys. When directed to press **SHIFT** in combination with other keys, press and hold down the **SHIFT** key as you press the other keys.

CAPS

The key labeled "Caps lock" is your workstation's CAPS key. Pressing this key once sets the "caps mode"; the "Caps lock" indicator light (located just above the numeric keypad) lights to indicate that the workstation is in the caps mode. In this mode, each alphabetic key pressed is displayed as an uppercase alphabetic character. Only alphabetic keys (A through Z) are affected by the caps mode.

When the caps mode is active, you can type a lowercase alphabetic character by pressing **SHIFT** with the alphabetic key.

ESC

The key labeled "ESC" is your workstation's escape key. Like the **SHIFT** key, the escape key is used only in combination with other keys. When instructed to press **ESCAPE** in combination with other keys, first press **ESCAPE**, release it and then press the other keys. For example, if instructed to press **ESCAPE****ENTER**, press and release **ESCAPE**; then press **ENTER**.

ENTER

The key labeled "Enter" is the workstation's **ENTER** key. Pressing **ENTER** sends the data on the current line to the SPU for processing and positions the cursor at the beginning of the next line. If a program is executing, **ENTER** can be used to enter data in response to a prompt from the program. If a program is not executing **ENTER** can be used to execute a BASIC command or to assign a value to a variable. For example, to execute the **CAT** command you could type: **CAT** **ENTER**. The value of a numeric expression could be assigned, for example, by typing: **A=2+2** **ENTER**. Note that this key cannot be used to simply execute a numeric expression; this function is performed with the **EXECUTE** system softkey (described in the paragraphs titled "Softkeys and the Select Key").

Pressing **ESCAPE****ENTER** moves the cursor to the beginning of the next line without sending data to the SPU to be processed.

NOTE

The key labeled "Enter" is equivalent to the **RETURN** key of other HP 260 workstations. If you are instructed to press your workstation's **RETURN** key, press **ENTER** on the HP Vectra keyboard instead.

TAB

The key labeled "Tab" is the workstation's TAB key. Pressing **TAB** moves the cursor to the next input field or tabbed position. Pressing **SHIFT** **TAB** moves the cursor to the previous input field or tabbed position.

By using the "TAB = RETURN" system softkey (as described in the paragraphs titled "Softkeys and the Select Key"), you can specify that all TAB keys function as RETURN keys. In this case, the TAB key has the following functions:

Pressing **TAB** sends the data on the current line to the SPU to be processed and moves the cursor to the beginning of the next line.

Pressing **ESCAPE** **TAB** moves the cursor to the next input field or tabbed position.

Pressing **ESCAPE** **SHIFT** **TAB** moves the cursor to the previous input field or tabbed position.

CONTROL

The key labeled "CTRL" is the workstation's CONTROL key. Like the SHIFT key, the CONTROL key is only used in combination with other keys. When instructed to press **CONTROL** in combination with other keys, press and hold down **CONTROL** as you press the other keys.

For example, when printing a long list of information to the display (such as the output from a CAT statement), you can temporarily pause printing by pressing **CONTROL** and the key labeled "S". To resume printing, press **CONTROL** and the key labeled "Q".

ALT

The key labeled "Alt" is used to access non-USASCII characters independently from the language configuration of your keyboard. For instance, you can use the "Alt" key together with certain other keys to display the accented characters of the French and German languages. For example, if you want to display the German "a umlaut" character, use the following procedure:

1. Press the "Alt" key together with the "U" key (the "U" key corresponds to the umlaut accent). Nothing is displayed on the screen.
2. Press the "A" key. The German "a umlaut" character is displayed on the screen.

Refer to the Vectra Technical Reference manual (Volume 1 - Hardware) for the details of the mapping between the keystrokes and the characters displayed.

Numeric Keypad

The group of keys located at the far right side of the keyboard function as both cursor control keys and as a numeric key pad. When the "Num lock" indicator light (located above the numeric keypad) is lit, the keys function as a numeric keypad. When the "Num lock" indicator light is not lit, the keys function as cursor control keys.

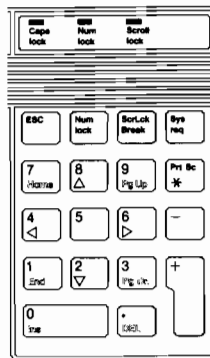
To switch the function of these keys between numeric keypad and cursor control keys, press the key labeled "Num lock".

When the "Num lock" indicator is lit, the numeric keypad allows you to enter the numbers 0-9 (as indicated on the top label of the key), the decimal point "." (as indicated on the top label of the key), as well as the math symbols "*", "-", and "+".

When the "Num lock" indicator is not lit, the numeric keypad operates identically to the cursor control pad located immediately to the left of the numeric keypad; the bottom label on each key indicates the key's cursor control function and is identical to the label of the corresponding key in the cursor control pad. (The function of the cursor control keys is described in the paragraphs titled "Cursor Control Keys".)

When the "Num lock" indicator is lit, the numeric keypad's cursor control functions can be accessed by pressing **SHIFT** and a numeric key. For example, when the "Num lock" indicator is lit, pressing **SHIFT** and the key labeled "4/ ←" causes the cursor to move one space to the left.

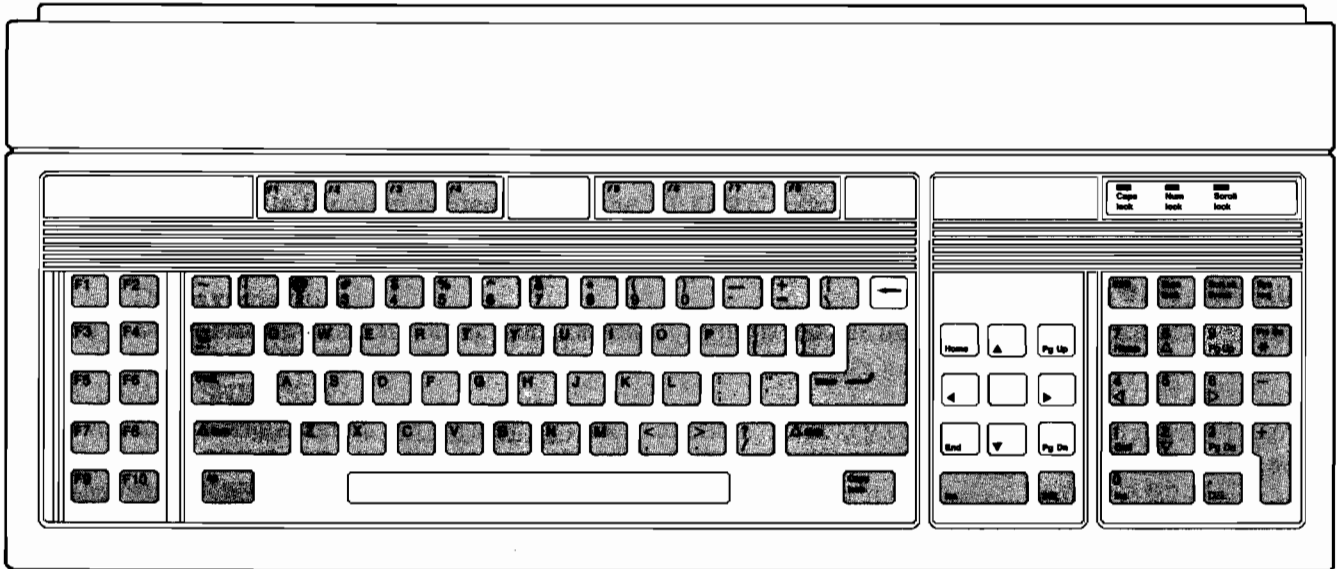
Similarly, when the "Num lock" indicator is not lit (and thus, the numeric keypad is functioning as a cursor control keypad), the number keys can be accessed by pressing **SHIFT** and a numeric keypad key. For example, when the "Num lock" indicator is not lit, pressing **SHIFT** and the key labeled "4/ ←" causes a "4" to be displayed. Use this block of keys, located on the far right side of the keyboard, to input numeric data rapidly. Pressing **SHIFT** and the numeric keypad key labeled "* /Prt Sc" causes the information currently displayed to be copied to the workstation's local printer. If no local printer is connected and this key is pressed, the workstation's keyboard will not respond for a short time as the workstation processes the keystroke.



Numeric Keypad





Cursor Control Keys

The unshaded area in this illustration shows the location of the cursor control keys. The cursor control keys are used to move the cursor on the screen and to select the part of the display memory you want to display.






Cursor Control Keys







Pressing  moves the cursor from its current position to the next line above it on the display. If you press and hold  down, the cursor moves rapidly toward the top of the display. If  is pressed when the cursor is at the top line of the display, the line in display memory above the current line is scrolled onto the display. Pressing  has no effect when the cursor is located in the top line of display memory.

The HP Vectra Workstation






Pressing  moves the cursor from its current position to the next line below it on the display. If you press and hold  down, the cursor moves rapidly toward the bottom of the display. If  is pressed when the cursor is at the bottom line of the display, the line in display memory below the current line is scrolled onto the display.



Pressing  moves the cursor one space to the left of its current position on the display. Pressing and holding down  causes the cursor to move rapidly to the left. If  is pressed when the cursor is at the first column of a line, the cursor is moved to the last column of the previous line. If the cursor is located in column 1 of the top line of display memory, pressing  has no effect.



Pressing  moves the cursor one space to the right of its current position on the display. Pressing and holding down  causes the cursor to move rapidly to the right. If  is pressed when the cursor is at the last column of a line, the cursor moves to the first column of the next line.

HOME

Pressing the HOME key moves the cursor to column 1 of the first line of display memory.

Pressing **ESCAPE** and HOME moves the cursor to the upper left corner of the page currently being displayed.

END

Pressing the END key positions the cursor just after the last character in the last line of display memory.

BACKSPACE

The key labeled "←" is the workstation's BACKSPACE key. Pressing "←" moves the cursor one space to the left. When the cursor is in column 1, pressing "←" has no effect.

Pressing **ESCAPE** and "←" moves the cursor to column 1 of the line currently containing the cursor.

PgDn

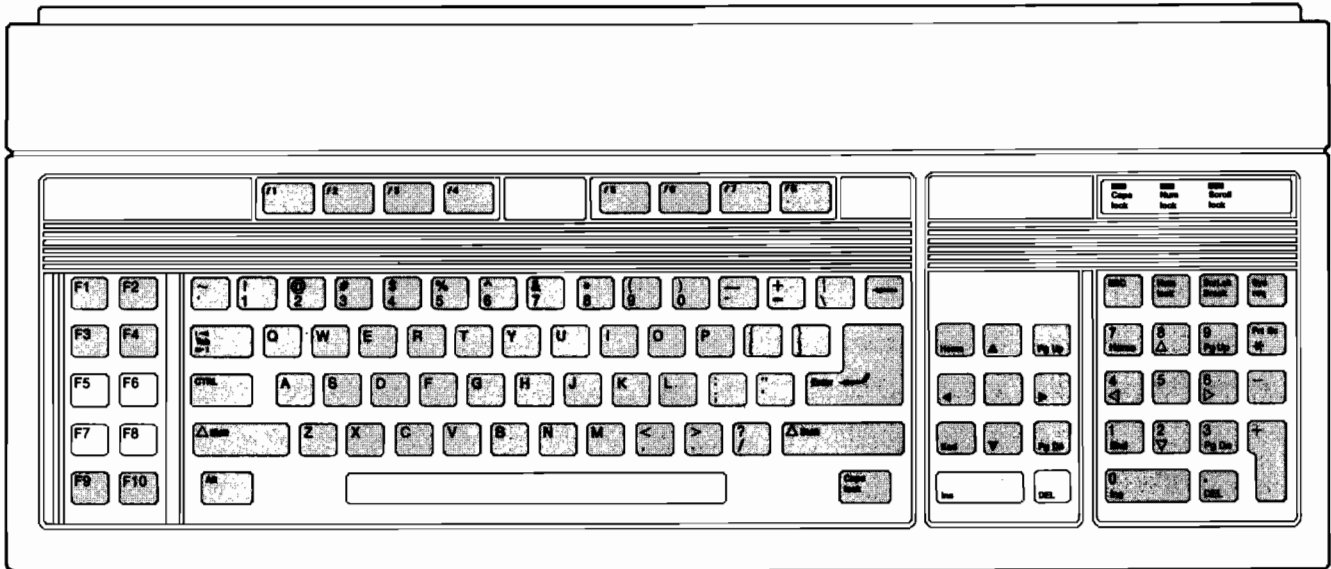
The key labeled "PgDn" is the workstation's NEXT page key. Pressing PgDn displays the next page of information in display memory and moves the cursor to the top left corner of the newly displayed page. This is equivalent to scrolling ahead 24 lines (21 lines if softkey labels are displayed) with a single keystroke.

PgUp

The key labeled "PgUp" is the workstation's previous page key. Pressing PgUp displays the previous page of information in display memory and moves the cursor to the top left corner of the newly displayed page. This is equivalent to scrolling back 24 lines (21 lines if softkey labels are displayed) with a single keystroke.

Edit Keys

The unshaded area in this illustration shows the location of the edit keys. Editing keys are used for inserting and deleting lines and characters displayed on your screen.



Edit Keys

Clear line

To clear the entire current line, press **(ESCAPE)** and the key labeled "Clear line".

To clear all characters from the present cursor position to the end of the current line, press the key labeled "Clear line".

Clear display

To clear all characters from the cursor's current position to the end of the display storage area, press the key labeled "Clear display".

To delete the entire display storage area, press **(ESCAPE)** and the key labeled "Clear display".

Ins

The key labeled "Ins" allows you to insert characters on the display; characters are inserted to the left of the cursor. To insert characters, enter the insert mode by pressing the key labeled "Ins". Then type in the characters you want to insert. Characters to the right of the cursor (including the character at the cursor's current position) are shifted to the right to make room for the inserted characters; characters shifted past the right margin of the display are displayed on the line below that containing the cursor.

To exit from insert mode, press the key labeled "Ins" again or move the cursor from its current line.

DEL

The key labeled "DEL" allows you to delete characters from the display. To delete a character, position the cursor under the character and press "DEL". Characters to the right of the deleted character are shifted left one space to close the gap.

Insert line

The key labeled "Insert line" allows you to insert a new blank line on the display. When you press the "Insert line" key, a line is inserted immediately above the line containing the cursor.

Delete line

The key labeled "Delete line" allows you to delete a line of information from the display. To delete a line, position the cursor in the line and then press the "Delete line" key.

The HALT Key

The key labeled "Host break" is the workstation's HALT key. Pressing "Host Break" stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing "Host Break" again causes the displayed line to be executed; again, the next program line to be executed is printed on the display. Thus, the "Host Break" key allows you to "single step" through a program, executing each program line individually.

If you press "Host Break" while a program is printing, printing may continue for a short period, even though the program has stopped.

The "Host Break" key and the HALT/SGLE STEP system key function identically. Use whichever key is easier for you.

NOTE

The Edit keys and the "Host break" key are part of the AdvanceLink 2392 package. A plastic "overlay" is provided with AdvanceLink 2392 to inform you of the special functions performed by the function keys F1-F10, on the extreme left of your keyboard. The names of the Edit keys in the preceding paragraphs are taken from this "overlay"

NOTE

Do not press the key labeled "Stop data" or **SHIFT** with the key labeled "Host Break". Pressing either of these key combinations produces unpredictable results and can cause data loss.

Using the Stop data Key to leave AdvanceLink 2392

If you want to exit from AdvanceLink 2392 and workstation mode, and return to the HP Vectra's PAM, press **SHIFT** and the key labeled "Stop data" at the same time.

Softkeys and the Select Key

The term **softkeys** specifies the eight function keys located at the top of the keyboard (labeled f1 through f8), and their corresponding labels located near the bottom of the screen. Pressing each key can run a program stored in the computer's memory or can display and enter a pre-defined string of characters. You will most likely use these keys with an application software program, with a utility program (such as initializing media), or as typing aids. In such instances, these keys are defined by you or the application program and are referred to as **user-defined softkeys**. Up to three sets of user-defined softkeys can be defined at any one time.

It is also possible for the softkeys to take on pre-defined system values, in which case they are referred to as **system defined keys**.

NOTE

A softkey's definition is in effect (or "active") only when its label is displayed.

The Select Key

Pressing the "Select" key allows you to cycle through the currently displayed sets of softkey labels.

Pressing **ESCAPE** and the key labeled "Select" switches between the system softkeys and user-defined softkeys. For example, if the system softkey labels are currently displayed, press **ESCAPE** and "Select" to display the user-defined softkeys; if the user-defined softkeys are currently displayed, press **ESCAPE** and "Select" to display the system softkey labels. (If no user softkeys are currently defined, pressing **ESCAPE** and "Select" simply turns on and off the display of the system softkey labels.)

Pressing **CONTROL** and with the key labeled "N" has the same effect as pressing the "Select" key.

User-defined Keys

The function keys located at the top of the keyboard are numbered f1 through f8. These keys correspond to eight labels located near the bottom of the display.

Each of the eight keys can be defined three ways; it is possible to have twenty-four user-defined softkeys at one time. The corresponding softkey labels appear on the screen when the keys are defined. The "Select" key allows you to cycle through the different softkey definitions. Softkeys can be used to execute a program stored in the computer's memory or to aid in typing. For example, you can define a softkey such that when it is pressed, a character string is displayed and (optionally) executed.

To learn about using softkeys as typing aids, read this manual's appendix titled "Using Softkeys as Typing Aids".

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System-defined Softkeys

Your system can also define the function keys at the top of the keyboard. These system-defined softkeys allow you to access many additional capabilities and functions. For example, using your workstation's system softkeys, you can access your workstation's alternate character set, access display enhancements, and set and delete tabs.

You can access the system softkeys by using the "Select" key, as described previously.

The three sets of system softkeys are shown below:

LINE DRAW CHAR SET		EXPAND	DISPLAY FUNCTIONS	INVERSE VIDEO	BLINKING VIDEO	UNDERLINE VIDEO	HALFBRGT VIDEO
-----------------------	--	--------	----------------------	------------------	-------------------	--------------------	-------------------

System Softkey Set 1

TAB +	TAB -	STATUS	DETACH	HALT/ SGLE STEP	HALT ALL		LOCAL
-------	-------	--------	--------	--------------------	----------	--	-------

System Softkey Set 2

SCRATCH ALL	TAB= RETURN	NETDISCON	NETDISCON +SCRATCH	ADVANCED STEP	EXECUTE		HANG UP
----------------	----------------	-----------	-----------------------	------------------	---------	--	---------

System Softkey Set 3

Each system softkey is described in the following paragraphs.

LINE DRAW CHAR SET

The line draw character set allows you to generate lines of varying thickness and angles with the help of your keyboard's alphanumeric characters. This character set may be used, for example, to draw tables and illustrations on the screen. The correspondence between the line draw character set and the alphanumeric keys on the keyboard is shown in the appendix titled "Keyboards".

When the alternate character set is active, an asterisk (*) is displayed in the softkey label. Pressing the Softkey labeled "LINE DRAW CHAR SET" puts you back into normal character set mode; the asterisk (*) in the softkey label is removed.

EXPAND

The EXPAND system softkey allows you to see the "value" of a display control character. When the "DISPLAY FNCTNS" key is active and a cursor control key, edit key, HALT key, function key, or TAB key is pressed, only a dash "-" is displayed. To see which key generated the "-", position the cursor under the "-" and press the "EXPAND" system key. An abbreviated English language description of the key is displayed in the bottom line of the "EXPAND" system key label.

DISPLAY FNCTNS

A control character is a character that signals to the system's software to communicate with an application program or sends control signals to a device. These control characters are generated whenever you press an arrow key, a function key, a HALT key, the Return key, the system softkey EXECUTE or a display editing key. Pressing this softkey allows you to prohibit a control character from being acted on immediately; the character will not be interpreted by the system.

When "DISPLAY FNCTNS" is active, an asterisk (*) is displayed in the softkey label.

To disable "DISPLAY FNCTNS", press the softkey again; the asterisk (*) will be removed from the softkey label.

VIDEO ENHANCEMENTS

There are four display enhancements:

Inverse Video: characters are displayed as dark characters on a light background.

Blinking Video: characters blink on and off.

Underline Video: characters are underlined on the display.

Halfbrgt Video: characters are displayed with half the intensity or brightness as normal characters.

To enable a video enhancement, position the cursor at the desired location and press the enhancement's associated softkey. (An asterisk appears in the softkey label to remind you that the enhancement is active.) Then, type the characters that are to be displayed with that enhancement. To disable the video enhancement, press the enhancement's softkey again; the asterisk will be removed from the softkey label.

There is no restriction on the number of video enhancements that can be active at one time.

NOTE

The four display enhancements referred to above are all available when the HP Vectra is operated in monochrome display mode. However, when the HP Vectra is operated in color mode, some of the display enhancements are mapped into color functionality.

The HP Vectra Workstation

TAB +

Pressing this function key sets a tab at the cursor's current position.

TAB -

Pressing this function key deletes any tabs at the cursor's current position.

DETACH

It is possible to request and attach a secondary task to your workstation by using the BASIC language REQUEST and ATTACH statements. Your system's principal operator must first configure a secondary task by using the CONFIG utility. Once the secondary task is attached to your workstation, you can exit or "detach" from this secondary task by pressing the "DETACH" system softkey. The workstation is once again "attached" to its primary task (the task available to it immediately after system power up).

Similarly, you can "detach" from the secondary task by pressing **CONTROL** with the "D" alphabetic key.

HALT/SGLE STEP

Pressing the system softkey labeled "HALT/SGL STEP" stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing this softkey again causes the displayed line to be executed; again, the next program line line to be executed is printed on the display. Thus, the softkey allows you to "single step" through a program, executing each program line individually.

If you press this system softkey while your program is printing, printing may continue for a short period, even though the program has stopped.

The HALT/SGLE STEP system key and the HALT key (labeled "Break") function identically. Use whichever key is easier for you.

HALT ALL

Pressing this softkey stops the current program from executing and stops all input/output operations.

You can also perform the "HALT ALL" function by pressing **CONTROL** and the key labeled "Y".

NOTE

Pressing this softkey is not a normal way of stopping your program and may result in a loss of data.

LOCAL

Pressing this function key places the HP Vectra back in PC mode. The local screen is cleared and the local softkey labels are displayed. The HP 260 ignores all data entered.

To place the HP Vectra again into workstation mode, press **(SHIFT)** and the key labeled "←" (located above the large key labeled "Enter"). This informs the HP 260 that the workstation is ready for use. The workstation's display memory is restored.

You can also switch the HP Vectra from workstation mode to PC mode by pressing **(CONTROL)** and the key labeled "L".

SCRATCH ALL

Pressing this softkey stops the current program from executing and stops all input and output operations. It erases the entire user memory, including programs and variables.

Pressing **(ESCAPE)(CONTROL)** and the key labeled "Y" is equivalent to pressing the "SCRATCH ALL" system softkey.

NOTE

Pressing this key results in a loss of data.

TAB = RETURN

Pressing this function key redefines all workstation TAB keys to function as RETURN keys. An asterisk is displayed in the softkey label to remind you of the TAB keys' new function. Refer to the description of the TAB key in the paragraphs titled "Alphanumeric Keys" for a description of the TAB keys' new functions.

To restore your workstation's TAB keys to their original function, press the "TAB = RETURN" softkey again. The asterisk in the softkey's label will be removed, indicating that TAB keys no longer function as RETURN keys.

NETDISCON

This key is used to exit remote access and leave the remote task as it is. This function key is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

NETDISCON SCRATCH

Pressing this key exits remote access and issues a SCRATCH ALL in the task on on the remote system. This function is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

ADVANCED STEP

This key allows a fast stepping through the program. When this softkey is pressed, the program continues processing until the next sequential line is to be executed. You use this key to execute sub-structures such as loops and subroutines, as an entity when stepping through program execution. Refer to your system's BASIC Programming Manual for more information on use of advanced stepping.

EXECUTE

This key is used to execute the line or expression on the display which currently contains the cursor. For example, the value of the expression $8 + 22 - (7 * 11)$ is computed and displayed when the following is entered:

$8 + 22 - (7 * 11)$ Then press softkey f7 in set 3.

Pressing **CONTROL** and the key labeled "X" is equivalent to pressing this system softkey.

HANG UP

You use this key when your workstation is linked to the HP 260 system via a modem. Pressing this softkey causes a hang up signal to be sent to the modem, thus disconnecting it.

Pressing the keys labeled "CTRL" and "L" twice (that is, **CONTROL** "L" **CONTROL** "L") achieves the same result.

Bar Code Reader Connection

The HP 92916A is supported for use with the HP Vectra, when the HP Vectra is in workstation mode. The bar code reader should be connected to the HP-HIL port on the keyboard of the HP Vectra. The bar code reader is supported only in Keyboard Emulation mode. Refer to the installation manual for the HP 92916A for the configuration of the bar code reader.

THE HP PORTABLE PLUS WORKSTATION

SECTION

7

The HP Portable Plus Personal Computer can be used as an independent, stand-alone personal computer or as a workstation on an HP 260 computer system. The HP Portable Plus functions differently when operating as an HP 260 workstation (referred to as "workstation mode") than it does when operating as a personal computer (referred to as "PC mode"). This section of the manual describes how to use the HP Portable Plus as a workstation. For information on using the HP Portable Plus as a PC, refer to the manuals supplied with the HP Portable Plus.

To place the HP Portable Plus in workstation mode, press and hold down the key labeled "Shift" as you press the key labeled "ESC DEL". It is recommended that you use the logon file that is supplied with the operating system to connect your HP Portable Plus to your computer system as a workstation. Refer to the "UTILITIES" manual for the details of using the logon file.

NOTE

The HP 260 must be powered up and must be configured correctly before the HP Portable Plus can be used as a workstation. Ask your system's principal operator for assistance if the workstation is not operating.

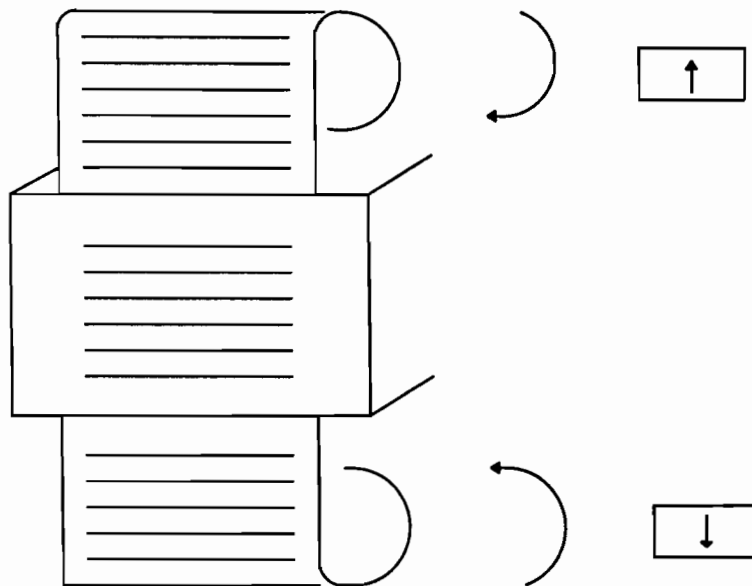
Additionally, the HP Portable Plus must be running the Reflection 1 software and must itself be correctly configured before it can be used as a workstation. Instructions for configuring the HP Portable Plus as a workstation are located in the appendix titled "Configuring Workstations".

Once in workstation mode, the HP Portable Plus can be placed in PC mode by pressing and holding down **CONTROL** as you press the key labeled "L". Alternatively, you can press the system key labeled "LOCAL" as described in the paragraphs titled "Softkeys and the Select Key".



DISPLAY

The workstation's display is used to view program listings, program output, and information entered from the keyboard. The display memory can store more characters than shown on the screen at one time. The screen can display the softkey labels, one line of status information and one page of characters. A page consists of 24 lines of characters (21 lines of characters if softkey labels are displayed). Each line contains a maximum of 80 characters. If the display has been filled, the top line rolls off the screen. As you type a line, the display will roll up to make room for a new line. This up and down movement is called scrolling. The following illustration shows the scrolling process.



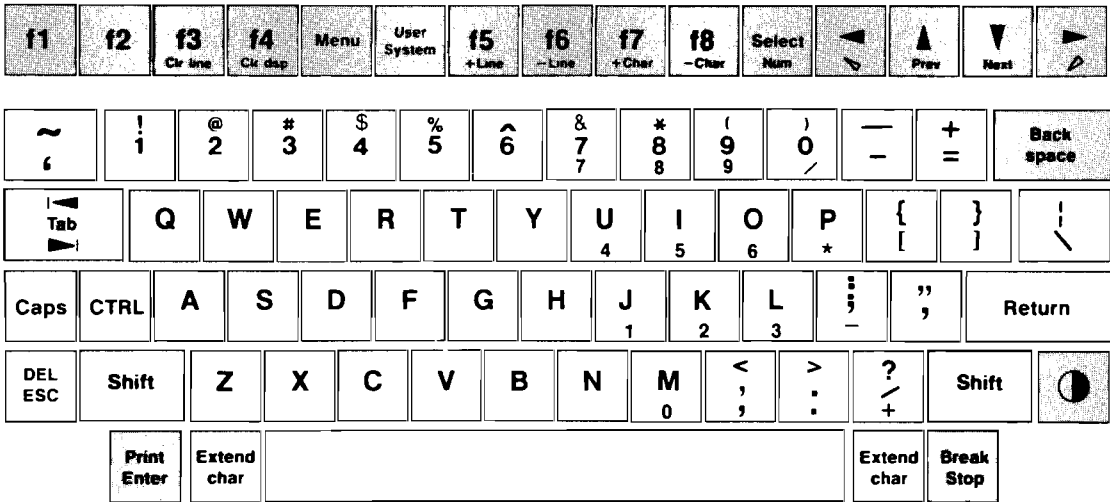
Characters on the display may appear as half-bright, underlined, blinking and inverse video (or any combination thereof). These display enhancements can be accessed by using softkeys, as described in this section's paragraphs titled "Softkeys and the Select Key".

KEYBOARD

The keyboard is your means of sending data and commands to the SPU. Physically it resembles a typewriter. The keyboard consists of different groups, each of which is described in detail in this section: the alphanumeric keys, the numeric keypad, the cursor control keys, the edit keys, the HALT key and the softkeys.

Alphanumeric Keys

The unshaded area in this illustration shows the location of the standard alphanumeric keys on your HP Portable Plus.



- 1 SHIFT
- 2 CAPS
- 3 ESC
- 4 RETURN
- 5 TAB
- 6 CONTROL
- 7 EXTEND CHAR

Most alphanumeric keys function identically to the keys on an ordinary typewriter. Pressing an alphanumeric key causes the character printed on the key to be displayed on the workstation's display. Pressing and holding down an alphanumeric key displays a string of the characters printed on the key.

Some of the keys in the alphanumeric group have special functions. These keys are shown in the preceding illustration and are described in the following paragraphs.

NOTE

Do not press the key labeled "Enter" when your HP Portable Plus is being used as an HP 260 workstation. Pressing it produces unpredictable results and can cause data loss.

SHIFT

The two keys labeled "Shift" are your workstation's SHIFT keys. Pressing and holding down **SHIFT** as you press an alphabetic key causes the uppercase alphabetic character to be displayed. For example, to type an uppercase "A", press and hold down **SHIFT** as you press the key labeled "A". The SHIFT key also allows you to access the "upper" of two characters printed on a key, such as the "?" character on the key labeled with the characters "/" and "?". For example, to type "?" press and hold **SHIFT** as you press the key labeled "/".

Additionally, the SHIFT key is often used with other types of keys, such as cursor control keys and function keys. When directed to press **SHIFT** in combination with other keys, press and hold down the SHIFT key as you press the other keys.

CAPS

The key labeled "Caps" is your workstation's CAPS key. Pressing this key once sets the "caps mode". In this mode, each alphabetic key pressed is displayed as an uppercase alphabetic character. Only alphabetic keys (A through Z) are affected by the caps mode.

When the caps mode is active, you can type a lowercase alphabetic character by pressing **SHIFT** with the alphabetic key.

ESC and DEL

The key labeled "ESC" and "DEL" is both your workstation's escape key and its DEL key. Like the SHIFT key, the escape key is used only in combination with other keys. When instructed to press **ESCAPE** in combination with other keys, first press **ESCAPE**, release it and then press the other keys. For example, if instructed to press **ESCAPE****SHIFT****TAB**, press and release **ESCAPE**; then press and hold **SHIFT** as you press **TAB**.

Pressing **SHIFT****ESCAPE** sends a special, single character named "DEL" to the SPU. This tells the system that your workstation is ready for use. If the HP Portable Plus is in terminal mode, pressing **SHIFT****ESCAPE** switches it to workstation mode. If the HP Portable Plus is in workstation mode, pressing **SHIFT****ESCAPE** causes the system to erase and then re-display the information currently on the display.

RETURN

The key labeled "Return" is the workstation's RETURN key. Pressing **RETURN** sends the data on the current line to the SPU for processing and positions the cursor at the beginning of the next line. If a program is executing, **RETURN** can be used to enter data in response to a prompt from the program. If a program is not executing, **RETURN** can be used to execute a BASIC command or to assign a value to a variable. For example, to execute the CAT command you could type: CAT **RETURN**. The value of a numeric expression could be assigned, for example, by typing: A=2+2 **RETURN**. Note that this key cannot be used to simply execute a numeric expression; this function is performed with the EXECUTE system softkey (described in the paragraphs titled "Softkeys and the Select Key").

Pressing **ESCAPE****RETURN** moves the cursor to the beginning of the next line without sending data to the SPU to be processed.

TAB

The key labeled "Tab" is the workstation's TAB key. Pressing **TAB** moves the cursor to the next input field or tabbed position. Pressing **SHIFT****TAB** moves the cursor to the previous input field or tabbed position.

By using the "TAB = RETURN" system softkey (as described in the paragraphs titled "Softkeys and the Select Key"), you can specify that all TAB keys function as RETURN keys. In this case, the TAB key has the following functions:

Pressing **TAB** sends the data on the current line to the SPU to be processed and moves the cursor to the beginning of the next line.

Pressing **ESCAPE****TAB** moves the cursor to the next input field or tabbed position.

Pressing **ESCAPE****SHIFT****TAB** moves the cursor to the previous input field or tabbed position.

CONTROL

The key labeled "CTRL" is the workstation's CONTROL key. Like the SHIFT key, the CONTROL key is only used in combination with other keys. When instructed to press **CONTROL** in combination with other keys, press and hold down **CONTROL** as you press the other keys.

For example, when printing a long list of information to the display (such as the output from a CAT statement), you can temporarily pause printing by pressing **CONTROL** and the key labeled "S". To resume printing, press **CONTROL** and the key labeled "Q".

EXTEND CHAR

The key labeled "Extend char" (also referred to as EXTEND CHAR), located on the right and on the left of your space bar, is used to access the function labeled on the front of each of the key caps on the top row of the Portable Plus keyboard. For example, pressing the key labeled "Extend char" and the function key **4** simultaneously, performs the "Clear Display" function. That is, it clears the display from the current cursor position to the end of the display storage area.

The "Extend char" key can also be used in combination with certain alphanumeric keys to allow access to a subset of the ROMAN 8 character set. For example, the German a umlaut, o umlaut, and u umlaut

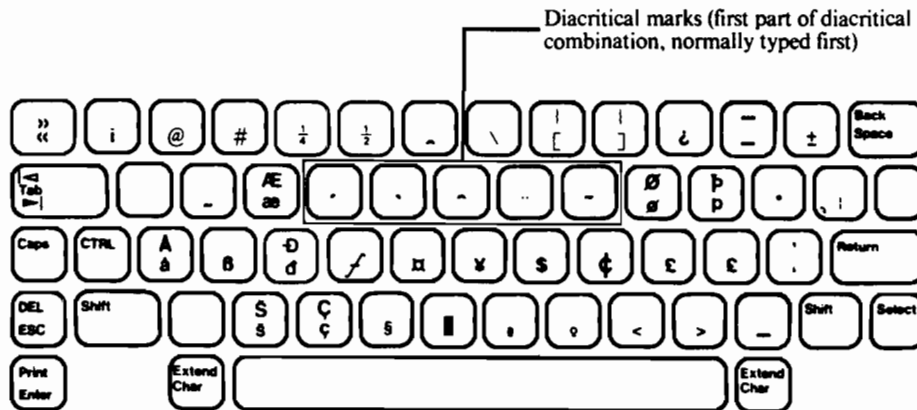
The HP Portable Plus Workstation

characters, and the accented characters of the French language can be displayed on the screen of your workstation.

The keyboard diagram below shows the mapping between the normal key characters and the characters that are accessed using "Extend char". Characters that appear on the keys in the diagram below are accessed by pressing the relevant key together with the "Extend char" key.

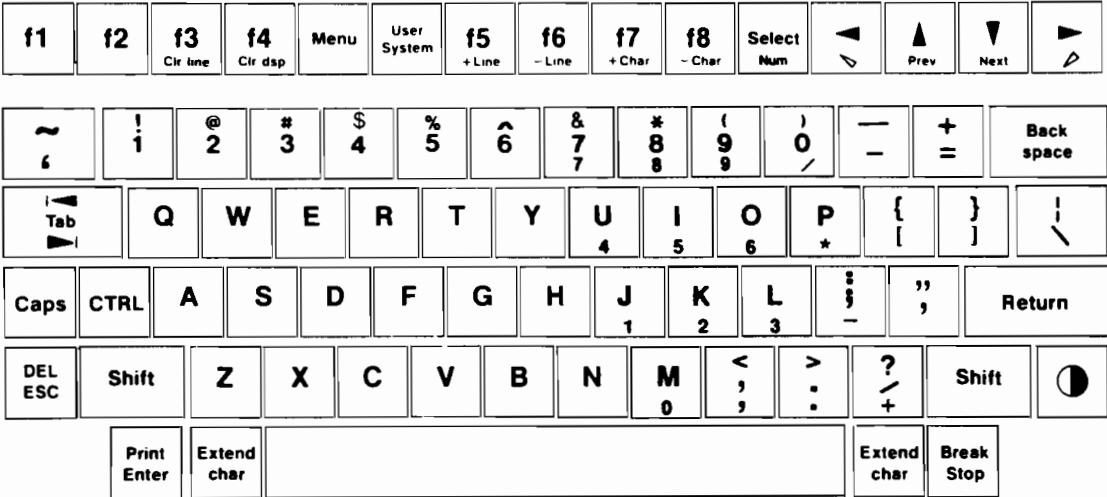
If the character you want to display does not appear in the diagram but the accent you need to form the character does appear on one of the keys in the diagram, use the following procedure to display the character.

1. Press the "Extend char" key together with the key that corresponds to the accent you need (for example the key labeled "U" corresponds to the umlaut of the German language). The accent is displayed above the current position of the cursor.
2. Press the alphanumeric key of the character you want to display. The character is displayed together with its accent.



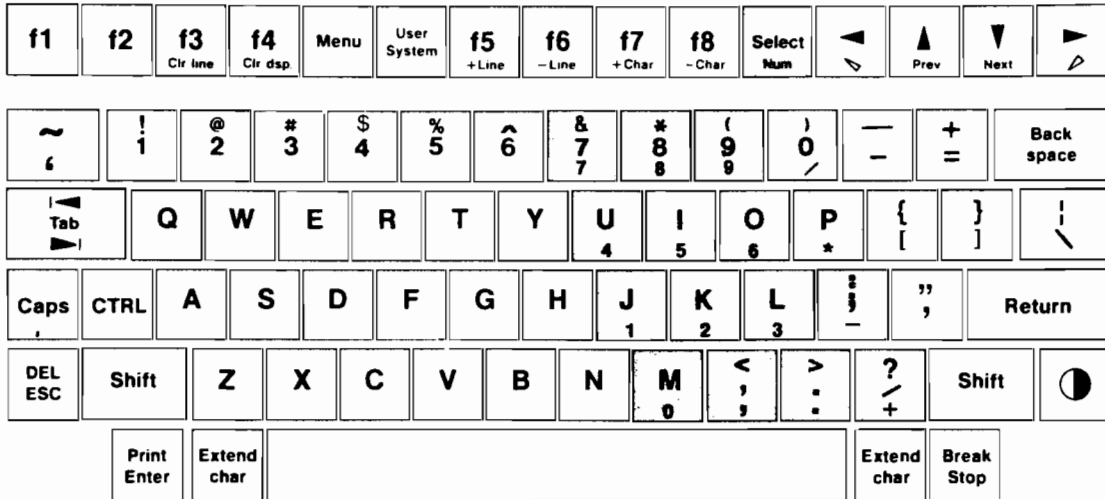
The Numeric Keypad

The numeric keypad is integrated into the typewriter keypad. To activate or deactivate it, press the keys labeled "Extend char" and "Num" (in the top row of the keyboard) simultaneously. To deactivate the numeric keypad, press the keys labeled "Extend Char" and "Num" simultaneously once more.




The numeric keypad provides a calculator-type arrangement of numeric characters that can be used for the rapid input of numeric data. It also includes the mathematical symbols for multiplication (*), subtraction (-), division (/) and addition (+). Furthermore, you will find a decimal point and comma.

Editing Keys



With the exception of BACKSPACE and TAB, all editing keys are located in the top row of keys. Editing keys are used for deleting and inserting lines and characters and for viewing other parts of your display memory not currently displayed on the screen.

Clearing part of a line.

Clearing a line is done by placing the cursor at the character position at which you want the deletion to begin and then pressing the keys labeled "Extend char" and .

The character at the cursor position and all the characters to the right on that line will be deleted, but the line itself will remain.

Clearing one or more lines.

To clear the entire current line, press the keys labeled "ESC", "Extend char" and **^3**.

To delete all text from some point to the end of the display memory place the cursor where you want the deletion to begin and then press the keys labeled "Extend char" and **^4**.

This deletes the character at the cursor's position and all the characters to the right of the cursor, and all lines below the cursor. This deletes the entire display memory, sometimes including text you cannot see.

Deleting a character.

To delete a character at the cursor's position, press the keys labeled "Extend char" and **^8**.

Any characters remaining to the right will be moved one space to the left as the gap is closed.

Inserting characters.

To insert characters to the left of the cursor's position, press the keys labeled "Extend char" and **^7**.

Your HP Portable Plus is then in insert mode and the cursor appears in a dark box. If you insert more characters than will fit into a given line, the text will wrap around the right margin and continue in a newly inserted blank line.

Pressing the keys labeled "Extend char" and **^7** again makes the workstation leave the insert mode.

Deleting a line.

To delete a line, place the cursor anywhere on the line you want delete and press the keys labeled "Extend char" and **^6**.

This deletes the line containing the cursor and moves all subsequent lines up one line.

Inserting a blank line.

Place the cursor anywhere on the line before which you want to insert a blank line. Then press the keys labeled "Extend char" and **^5**. This moves the line in which the cursor was located and all subsequent lines down one line and inserts a blank, new line before the current line.

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Moving the cursor to tab stops.

To move the cursor to the next tabbed position or next input field, press **TAB**.

To move the cursor to the previous tabbed position or input field, press **SHIFT** **TAB**. Refer to the description of softkey handling for details on deleting and setting tabs.

Moving the cursor up or down.

To move the cursor up or down one space at a time, press **↑** or **↓**. To move the cursor quickly upwards or downwards, hold one of these keys down. The cursor will keep moving until you release the key, or until the beginning of the display memory is reached.

Moving the cursor to the left or right.

To move the cursor right or left one space at a time, press **←** or **→**. To move the cursor quickly to the right or left, keep holding these keys down. The cursor movement will continue until you release the key or until the beginning of the display memory has been reached.

Moving the cursor to the next or previous page of text.

Press the keys labeled "Extend char" and "Next" to move the cursor to the next 24 lines of text. (21 lines if softkey labels are displayed.)

Press the keys labeled "Extend char" and "Prev" to move the cursor to the previous 24 lines of text. (21 lines if softkey labels are displayed.)

Moving the cursor to the beginning of display memory.

To move the cursor to the beginning of display memory, press the key labeled "Extend char" and **←**.

Moving the cursor to the last line of display memory.

To move the cursor to a position just after the last character in the last line of display memory, press the key labeled "Extend char" and **→**.

Moving the cursor to the top of the screen.

To move the cursor to the upper left corner of the screen currently displayed, press **ESCAPE**, the key labeled "Extend char", and **←**.

Softkeys and the Select Key

There are eight softkeys located on the top portion of your keyboard. The term **softkeys** specifies the eight function keys located at the top of the keyboard (labeled f1 through f8), and their corresponding labels located near the bottom of the screen. Pressing each key can run a program stored in the computer's memory or can display and enter a pre-defined string of characters. You will most likely use these keys with an application software program, with a utility program (such as initializing media), or as typing aids. In such instances, these keys are defined by you or the application program and are referred to as **user-defined softkeys**. Up to three sets of user-defined softkeys can be defined at any one time.

It is also possible for the softkeys to take on pre-defined system values, in which case they are referred to as **system defined keys**.

NOTE

A softkey's definition is in effect (or "active") only when its label is displayed.

The Select Key

Pressing the "Select" key allows you to cycle through the currently displayed sets of softkey labels.

Pressing **ESCAPE** and the key labeled "Select" switches between the system softkeys and user-defined softkeys. For example, if the system softkey labels are currently displayed, press **ESCAPE** and "Select" to display the user-defined softkeys; if the user-defined softkeys are currently displayed, press **ESCAPE** and "Select" to display the system softkey labels. (If no user softkeys are currently defined, pressing **ESCAPE** and "Select" simply turns on and off the display of the system softkey labels.)

Pressing **CONTROL** and the key labeled "N" has the same effect as pressing the "Select" key.

NOTE

The keys labeled "Menu" and "User/System" (located in the middle of the function keys f1 through f8) are disabled. Pressing either key causes a beep to sound; the keys are ignored by the system.

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User-defined Keys

The function keys located at the top of the keyboard are numbered f1 through f8. These keys correspond to eight labels located near the bottom of the display.

Each of the eight keys can be defined three ways; it is possible to have twenty-four user-defined softkeys at one time. The corresponding softkey labels appear on the screen when the keys are defined. The "Select" key allows you to cycle through the different softkey definitions. Softkeys can be used to execute a program stored in the computer's memory or to aid in typing. For example, you can define a softkey such that when it is pressed, a character string is displayed and (optionally) executed.

To learn about using softkeys as typing aids, read this manual's appendix titled "Using Softkeys as Typing Aids".

System-defined Softkeys

Your system can also define the function keys at the top of the keyboard. These system-defined softkeys allow you to access many additional capabilities and functions. For example, using your workstation's system softkeys, you can access your workstation's alternate character set, access display enhancements, and set and delete tabs.

You can access the system softkeys by using the "Select" key, as described previously.

The three sets of system softkeys are shown below:

LINE DRAW CHAR SET		EXPAND	DISPLAY FUNCTIONS	INVERSE VIDEO	BLINKING VIDEO	UNDERLINE VIDEO	HALF BRGT VIDEO
-----------------------	--	--------	----------------------	------------------	-------------------	--------------------	--------------------

System Softkey Set 1

TAB +	TAB -	STATUS	DETACH	HALT/ SGLE STEP	HALT ALL		LOCAL
-------	-------	--------	--------	--------------------	----------	--	-------

System Softkey Set 2

SCRATCH ALL	TAB= RETURN	NETDISCON	NETDISCON +SCRATCH	ADVANCED STEP	EXECUTE		HANG UP
----------------	----------------	-----------	-----------------------	------------------	---------	--	---------

System Softkey Set 3

Each system softkey is described in the following paragraphs.

LINE DRAW CHAR SET

The line draw character set allows you to generate lines of varying thickness and angles with the help of your keyboard's alphanumeric characters. This character set may be used, for example, to draw tables and illustrations on the screen. The correspondence between the line draw character set and the alphanumeric keys on the keyboard is shown in the appendix titled "Keyboards".

When the alternate character set is active, an asterisk (*) is displayed in the softkey label. Pressing the softkey labeled "LINE DRAW CHAR SET" puts you back into normal character set mode; the asterisk (*) in the softkey label is removed.

EXPAND

The EXPAND system softkey allows you to see the "value" of a display control character. When the "DISPLAY FNCTNS" key is active and a cursor control key, edit key, HALT key, function key, or TAB key is pressed, only a dash "-" is displayed. To see which key generated the "-", position the cursor under the "-" and press the "EXPAND" system key. An abbreviated English language description of the key is displayed in the bottom line of the "EXPAND" system key label.

DISPLAY FNCTNS

A control character is a character that signals to the system's software to communicate with an application program; or it sends control signals to a device. These control characters are generated whenever you press an arrow key, a function key, the HALT key, the Return key, the system softkey EXECUTE or a display editing key. Pressing this softkey allows you to prohibit a control character from being acted on immediately; the character will not be interpreted by the system.

When "DISPLAY FNCTNS" is active, an asterisk (*) is displayed in the softkey label.

To disable "DISPLAY FNCTNS", press the softkey again; the asterisk (*) will be removed from the softkey label.

VIDEO ENHANCEMENTS

There are four display enhancements:

Inverse Video: characters are displayed as dark characters on a light background.

Blinking Video: characters blink on and off.

Underline Video: characters are underlined on the display.

Halfbrgt Video: characters are displayed with half the intensity or brightness as normal characters.

To enable a video enhancement, position the cursor at the desired location and press the enhancement's associated softkey. (An asterisk appears in the softkey label to remind you that the enhancement is active.) Then, type the characters that are to be displayed with that enhancement. To disable the video enhancement, press the enhancement's softkey again; the asterisk will be removed from the softkey label.

There is no restriction on the number of video enhancements that can be active at one time.

TAB +

Pressing this function key sets a tab at the cursor's current position.

TAB -

Pressing this key deletes any tabs at the cursor's current position.

DETACH

It is possible to request and attach a secondary task to your workstation by using the BASIC language REQUEST and ATTACH statements. Your system's principal operator must first configure a secondary task by using the CONFIG utility. Once the secondary task is attached to your workstation, you can exit or "detach" from this secondary task by pressing the "DETACH" system softkey. The workstation is once again "attached" to its primary task (the task available to it immediately after system power up).

Similarly, you can "detach" from the secondary task by pressing **CONTROL** with the "D" alphabetic key.

HALT/SGLE STEP

Pressing the system softkey labeled "HALT/SGLE STEP" stops the currently executing program and halts that program's input and output operations; the next program line to be executed is printed on the display. Pressing this softkey again causes the displayed line to be executed; again, the next program line to be executed is printed on the display. Thus, the softkey allows you to "single step" through a program, executing each program line individually.

If you press this system softkey while your program is printing, printing may continue for a short period, even though the program has stopped.

The HALT/SGLE STEP system key and the HALT key (labeled "Break") function identically. Use whichever key is easier for you.

HALT ALL

Pressing this softkey stops the current program from executing and stops all input/output operations.

You can also perform the "HALT ALL" function by pressing **CONTROL** and the key labeled "Y".

NOTE

Pressing this softkey is not a normal way of stopping your program and may result in a loss of data.

LOCAL

Pressing this function key places the HP Portable Plus back in terminal mode. The local screen is cleared and the local softkey labels are displayed. The HP 260 ignores all data entered.

To place the HP Portable Plus again into workstation mode, press **SHIFT****ESCAPE**. This sends the "DEL" character to the HP 260, telling it that the workstation is ready for use. The workstation's display memory is restored.

You can also switch the HP Portable Plus from workstation mode to terminal mode by pressing **CONTROL** and the key labeled "L".

SCRATCH ALL

Pressing this softkey stops the current program from executing and stops all input and output operations. It erases the entire user memory, including programs and variables.

Pressing **ESCAPE****CONTROL** and the key labeled "Y" is equivalent to pressing the "SCRATCH ALL" system softkey.

NOTE

Pressing this key results in a loss of data.

TAB = RETURN

Pressing this function key redefines all workstation TAB keys to function as RETURN keys. An asterisk is displayed in the softkey label to remind you of the TAB keys' new function. Refer to the description of the TAB key in the paragraphs titled "Alphanumeric Keys" for a description of the TAB keys' new functions.

To restore your workstation's TAB keys to their original function, press the "TAB = RETURN" softkey again. The asterisk in the softkey's label will be removed, indicating that TAB keys no longer function as RETURN keys.

NETDISCON

This key is used to exit remote access and leave the remote task as it is. This function key is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

NETDISCON SCRATCH

Pressing this key exits remote access and issues a SCRATCH ALL in the task on the remote system. This function is displayed only when NETWORK/260 software is currently running and the workstation is connected to a remote system.

ADVANCED STEP

This key allows a fast stepping through the program. When this softkey is pressed, the program continues processing until the next sequential line is to be executed. You use this key to execute sub-structures such as loops and subroutines, as an entity when stepping through program execution. Refer to your system's BASIC Programming Manual for more information on use of advanced stepping.

EXECUTE

This key is used to execute the line or expression on the display which currently contains the cursor. For example, the value of the expression $8 + 22 - (7 * 11)$ is computed and displayed when the following is entered:

$8 + 22 - (7 * 11)$ Then press softkey f7 in set 3.

Pressing **CONTROL** and the key labeled "X" is equivalent to pressing this system softkey.

HANG UP

You use this key when your workstation is linked to the HP 260 system via a modem. Pressing this softkey causes a hang up signal to be sent to the modem, thus disconnecting it.

Pressing the keys labeled "CTRL" and "L" twice (that is, **CONTROL** "L" **CONTROL** "L") achieves the same result.

Function Control Keys

The two function control keys **MENU** and **USER/SYSTEM** are disabled, since all terminal functions are fully controlled by your HP 260.

Terminal Control Keys



The key **BREAK** has the same function as the softkey **HALT/SGLE STEP**.

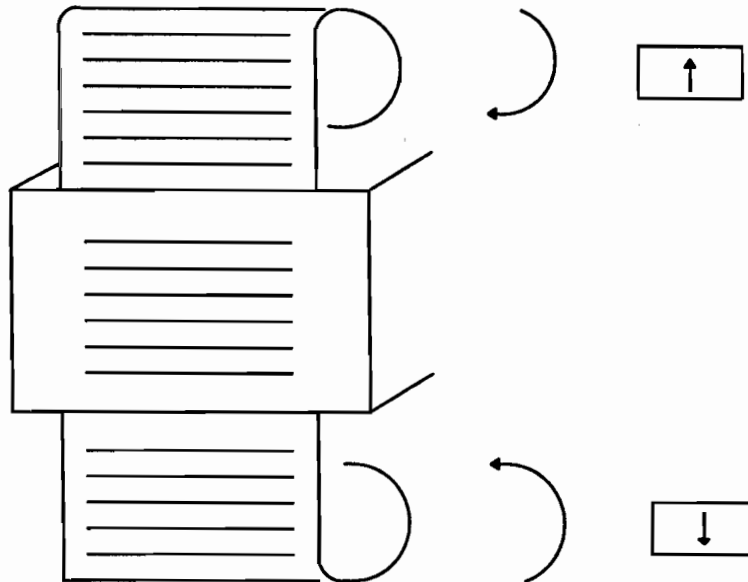
NOTE

Do not press the key labeled "Stop" or the key labeled "Print/Enter". Pressing either of these keys produces unpredictable results and can cause data loss.



DISPLAY

The display is used to view program listings, program output, and information entered from the keyboard. The display memory can store more characters than shown on the screen at one time. The screen can display the softkey labels, one line of status information and one page of characters. A page consists of 24 lines of characters (21 lines of characters if softkey labels are displayed); each line contains a maximum of 80 characters. If the display has been filled, the top line rolls off the screen. As you type a line, the display will roll up to make room for a new line. When viewing display lines, you may access lines preceding or following those currently on the screen by pressing the display editing keys  and . The illustration shows the scrolling process.



When your HP 260 is ready for operation, the cursor (a blinking underscore character) is visible on the display.

The capabilities of the display are numerous. For example, characters on the display may appear as half-bright, underlined, blinking, or inverse video (or any combination). These features can be accessed either from the keyboard or programmatically. Methods for accessing the display enhancements are described later in this section.

THERMAL PRINTER (OPTIONAL)

Your HP 2622D workstation may be equipped with an integral thermal printer, allowing you to produce a hard copy of displayed information. The thermal printer offers two main printing capabilities:

- **Printing the screen contents** - the printer can print the entire contents of the display. Consult the paragraphs titled "Printing a Screen Image on the Thermal Printer", later in this section for further information.
- **Printing all interactions with the system** - the printer can record any or all interaction with the system (such as file catalogs, transactions, and even program results). Read the paragraphs titled "Output Commands" in this manual's section titled "System Commands" for further information.

Loading Thermal Printer Paper

The optional thermal printer uses specially manufactured paper. It is recommended that you always use HP Thermal Paper in your printer. Use of non-HP paper can shorten the life of the print head and also affect print quality. Additionally, if you have an HP Warranty Service Contract, you must use HP Thermal Paper to maintain a valid contract.

To load a roll of thermal paper, perform the following steps:

1. **Lift the top cover of the printer mechanism. An illustration of the correct paper position and flow is embossed on the underside of the cover.**
2. **Press the latch toward the front of the unit to release the latching frame. Lift the hinged latching frame to its forward position.**
3. **Remove any paper remaining in the printer.**
4. **The center paper core is held in place by a metal rod inserted through the center of the core. Grasp the core and lift forward and upward along the guide slots to remove the core and rod.**
5. **Remove the old core from the rod and insert the rod through the core of a new roll of paper.**
6. **HP Thermal Paper is coated with print material on only one side; it must be inserted correctly into the printer to produce a print image. The paper must feed toward the front of the unit from the underside of the paper roll.**
7. **Place the ends of the metal rod into the guide slots and press downward and then toward the back of the unit until the rod snaps into place.**
8. **Feed the leading edge of the paper through the latching frame and the clear plastic guide window.**

CAUTION

The print head is relatively fragile and susceptible to damage; be careful not to strike it while loading paper.

9. Lower the latching frame without locking it into place.
10. Align the sides of the paper with the guide lines embossed on each side of the guide window.
11. Each new roll of HP thermal paper has a glue spot near the leading edge of the roll that holds the paper roll intact during shipment. Do not allow the print head to come in contact with the glue spot. Feed approximately 12 inches of paper through the latching frame so that the glue spot is beyond the print head and guide window.
12. Press the latch down until it clicks into place. If the latch is not locked, a printer error will be printed at the bottom of the screen whenever you attempt a print operation.
13. Close the top cover securely, making sure that the excess paper extends through the slot at the top of the workstation.
14. Tear off the excess paper using the guide window as the cutting edge.

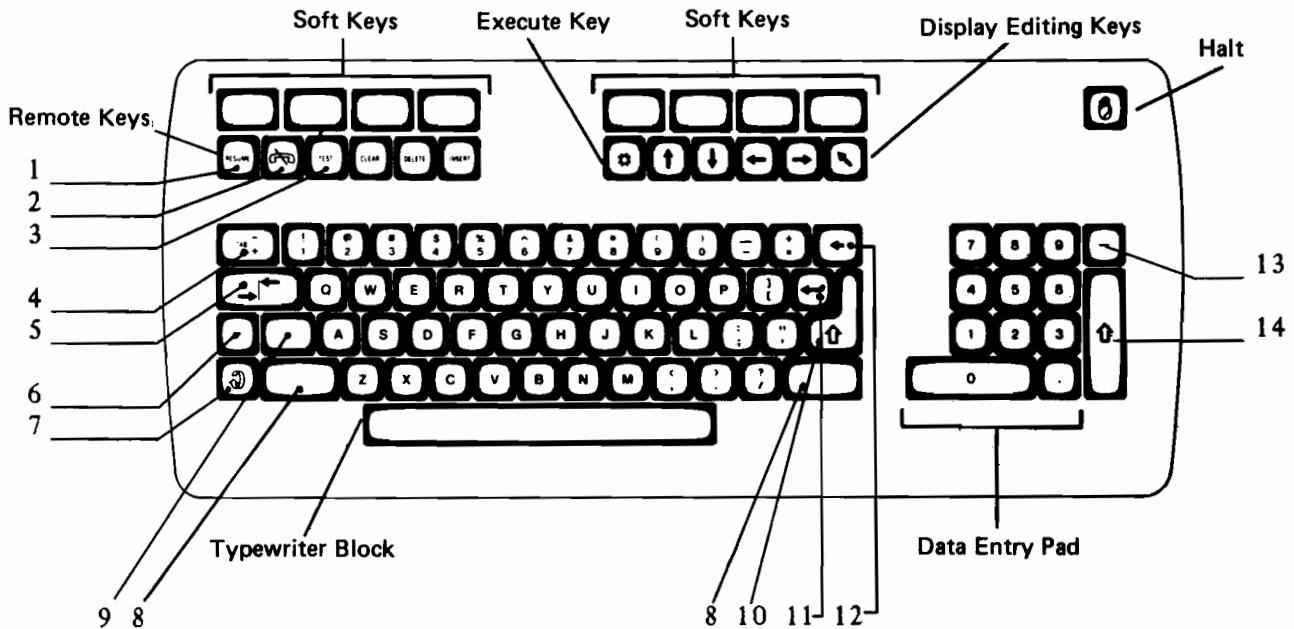
NOTE

If subsequent printer operations produce no image on the paper, you may have installed it with the wrong side facing the print head.

KEYBOARD

The keyboard is used to communicate with the computer. Physically, it resembles the keyboard of a typewriter.

The keyboard is organized into several logical groups of keys (refer to the following illustration): a typewriter block, a data entry pad, display editing keys, an execute key, a halt key, three remote keys, and eight function keys. Each group of keys is discussed in this section. Note that several individual keys (such as the EXECUTE key and the ENTER Key) are identified in the illustration. Refer to the drawing to help you locate the keys when reading about them later in this section. Each of these keys is described in this section.



1 RESUME Key

2 MODEM Key

3 TEST Key

4 SET TAB Key

5 TAB Key

6 CONTROL Key

7 CYCLE Key

8 SHIFT Key

9 CAPS-LOCK Key

10 ENTER Key

11 CARRIAGE RETURN Key

12 BACKSPACE Key

13 MINUS Key

14 ENTER Key

HP 2622D Keyboard (U.S. Keyboard)

Typewriter Block

The typewriter block is used to input data or program lines. It consists of uppercase and lowercase alphabetic characters, numbers, punctuation marks, and some commercial symbols. The standard or base character set is indicated on the keys. (When two characters are shown on the key cap, the "lower" of the two characters is the base character.) To access an uppercase alphabetic character or to access the "upper" character of a key whose cap shows two characters you must use a special control key (called the SHIFT key). The SHIFT key and the other special control keys provided in the typewriter block are described in the following paragraphs.

The SHIFT key (also referred to as **SHIFT**) allows you to select uppercase alphabetic characters. For example, to enter an upper case "A", press and hold down **SHIFT** as you press the key labeled "A". **SHIFT** also allows you to access the "upper" of two characters shown on a key cap. For example, to enter the "?" character, press **SHIFT** and the key labeled "/".

The CAPS-LOCK key locks only alphabetic keys to upper case characters. In order to access the shifted characters on non-alphabetic keys, press the **SHIFT** key. For example, to enter the \$ sign while the CAPS-LOCK key is active, press **SHIFT** as you press the key labeled "4" (located on the typewriter block).

The BACKSPACE key (also referred to as **BACKSPACE**) moves the display cursor one space toward the left margin.

The CARRIAGE RETURN key moves the cursor to the beginning of the next line. When **SHIFT** is pressed with the CARRIAGE RETURN key, the cursor is moved to the beginning of the present line of input. The CARRIAGE RETURN key only changes the location of the cursor; data is not entered when this key is pressed.

The ENTER key (also referred to as **ENTER**) enters data into memory. It also executes the current command.

The SET TAB key (also referred to as **TAB ↵**) allows you to set and clear tabs. To set a tab, move the cursor to the desired position on the line; then press **TAB ↵**. To delete an existing tab, move the cursor to the tab position; then press **SHIFT** **TAB ↵**.

The TAB key (also referred to as **TAB**) moves the cursor to the first character position of the next input field or tabbed position. If you press **SHIFT** with the TAB key, the cursor is moved to the first character of the previous input field or to the previous tabbed position.

The CONTROL key (also referred to as **CONTROL**) is used to access special features and functions as shown throughout this section.

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The CYCLE key is used to access all 24 user-defined softkeys. This key is discussed further in the paragraphs about softkeys, which appear later in this section.

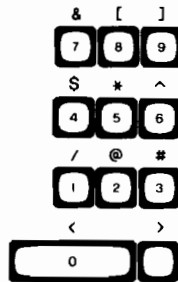
Data Entry Pad

Use this block of keys, located on the far right side of the keyboard, to rapidly input numeric data.

Another ENTER key is conveniently placed on the side of the data entry pad. Its function is identical to that of the ENTER key located in the typewriter block.

Above the ENTER key on the data entry pad is the MINUS key. The MINUS key can be used to enter a subtraction math symbol (-) or to enter a negative number, such as "-5". Alternatively, the MINUS key can be configured to serve as an additional TAB key; refer to the paragraphs titled "Setting the HP 2622D Configuration" for further information.

Many of the keys on the data entry pad can be used with the SHIFT key to enter a punctuation mark, a math symbol or a commercial symbol. For example, to enter a "\$" character, press **SHIFT** and the key labeled "4".



Data Entry Pad Showing Shifted Key Values

Display Editing Keys

The Display Editing Keys are used to modify input and to position the cursor at specific locations on the screen. The function of a Display Editing Key is rapidly repeated by holding the key down.

The CLEAR key (also referred to as **CLEAR**) clears the current line or field. When you press **CONTROL CLEAR**, only the characters from the present cursor position to the end of the current line are cleared from the display. When you press **SHIFT CLEAR**, all input fields are cleared from the cursor's present position to the end of the display storage area (which includes all lines below that are not currently displayed). When you press **CONTROL SHIFT CLEAR**, the entire display storage area is cleared (including all lines not currently displayed on the screen).

The DELETE key (also referred to as **DELETE**) is used to delete the character displayed at the cursor's current position. When you press **SHIFT DELETE**, the entire current line is deleted from the display. Note that the current line can take up more than one row of the display screen.


The INSERT key (also referred to as **INSERT**) allows you to insert characters to the left of the cursor. Press **INSERT** to enter the insert mode; then type in the characters you wish to insert. To exit from the insert mode, either press the INSERT key again or move the cursor from its current line. (For example, pressing the ENTER key cancels the insert mode as this moves the cursor to the beginning of the next line.) The Status Display allows you to quickly see if the insert mode is active; the Status Display is described later in this section. When you press **SHIFT INSERT**, a blank line is inserted preceding the line currently containing the cursor; the cursor then appears at the first position of the new line.

The keys **→** and **←** move the cursor one space to the right or left. If you hold one down, the cursor moves rapidly in the indicated direction. The cursor wraps around to the next line if a margin is encountered. Pressing **SHIFT ←** or **SHIFT →** moves the cursor five spaces in the indicated direction.

The keys **↑** and **↓** move the cursor up or down one line from the current position on the display. Pressing **SHIFT ↑** and **SHIFT ↓** moves the cursor to the previous and next display page respectively. The illustration at the beginning of this section shows this movement up or down, called scrolling.




The HOME key (also referred to as **↶**) moves the cursor to the first character of the display storage area. Pressing **SHIFT ↶** positions the cursor just after the last character in the display storage area. Pressing **CONTROL ↶** moves the cursor to top left corner of the page currently displayed.

Execute Key


The EXECUTE key (also referred to as ) executes the line or expression on the display which currently contains the cursor. For example, if you enter the following, the value of the line is computed and displayed:



8+22-7*11 (then press )



Halt Key

The HALT key (also referred to as ) halts a program at the end of the current operation. Unless overridden by the program, pressing  stops the program, and the next program line to be executed is displayed. Pressing  is not a normal way to stop a program, and may require reloading the program to resume operation.

The HALT key may have other functions, depending on the state of the system or the application program that is running. For example, the HALT key acts as a "single step" key when a BASIC program is loaded but is not running (a "single step" key executes a single line of a program each time the key is pressed).

You should note that if you are sending output to a printer, it may continue to print for a period of time even though you pressed .

Press   to stop the current program from executing and to stop all Input/Output operations.

Press   to abort all operations; this clears the user work area in memory and clears the workstation display.

Remote Keys

The remote keys (RESUME, MODEM and TEST) are located in the upper left hand corner of the keyboard.

The RESUME key allows you to request a total update of display information in the event of a data communication error or other error that would cause the workstation to display incorrect data. When you press this key, the display storage area is erased and the remote workstation display is rewritten under the control of the HP 260 system.

NOTE

Pressing RESUME while data is being sent to a remote printer results in a loss of the data.

Pressing the TEST key initiates several diagnostic tests that verify the workstation's operation. The self-test is performed on a local basis; in other words, the test is performed even if the remote workstation is not connected to the HP 260. If any part of the test fails, a message identifying the failing part is displayed. Copy the message and report it to your HP Customer Engineer when calling for service.

When you press **SHIFT** TEST, the terminal continually loops through its self test. To cancel the continuous self test, press the RESUME key.

The MODEM key is a local key that is used when your terminal is linked to the HP 260 system via a modem. It can be set as either active or inactive in the terminal configuration. (For more information, refer to the information titled "Setting the HP 2622D Configuration", later in this section.) When configured as active, pressing this key disconnects the modem; pressing it again connects the modem. You can see the status of this key by accessing the Status Display. (For more information, refer to the information titled "Modem Status", later in this section.)

Softkeys

There are eight softkeys located on the top portion of the keyboard.

You will most likely use these keys in conjunction with an application software program, a utility program (such as initializing media), or as typing aids; when these keys are used in this way, they are referred to as **user-defined softkeys**. The HP 260 system also has its own defined softkeys which can be used to set the terminal configuration, display status information, display all softkey labels, and access alternate character sets (line drawing, display mode, and display enhancements); when the softkeys are used in this way, they are referred to as **system defined-keys**.

User-defined Keys

Each of the eight keys can be defined three ways. Therefore, it is possible to have 24 user-defined softkeys at any one time. These softkeys are numbered 1 through 24. The corresponding softkey labels appear on the screen when the keys are defined. Pressing a key activates a program that is stored in the computer's memory or executes a typing aid definition.

If you are running a program which has 24 softkeys defined, only eight of the keys are available at any given time. To activate the next set of softkeys and display the corresponding labels, press the **CYCLE** key located on the lower left hand side of the typewriter block.

To learn more about using softkeys as typing aids, read this manual's appendix titled "Using Softkeys as Typing Aids".

System-defined Keys

You can access several special functions defined by the system by pressing softkeys simultaneously with either **(SHIFT)** or **(CONTROL)**. These are known as the Control Function Key Set and the Shift Function Key Set.

Shift Function Key Set. The shift function key set contains system-defined keys which you can use to configure your workstation, display the screen contents to the optional thermal printer, show a status display, and display all softkey labels. The following paragraphs describe how to use the shift function key set to access these functions.

The HP 2622D Workstation

Setting the HP 2622D Configuration. You configure the 2622D workstation by pressing **SHIFT** **F1** and then selecting the options by using softkeys. The following screen appears:

WORKSTATION CONFIGURATION							
Baud Rate		Frame Rate					
Minus Key		Modem Key					
Chars/Line							
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES				

To change the option for any setting, use the TAB key to position the cursor within the field you wish to change. Then use the softkeys labeled NEXT CHOICE and PREVIOUS CHOICE to select the proper values. The DEFAULT VALUES softkey sets the options to pre-defined values. When you have all values exactly as you want them, press the SAVE CONFIG softkey to record your new configuration and exit.

The workstation attributes that can be configured are discussed in the following paragraphs:

- **Baud Rate** is a value representing the rate at which characters are transmitted between the CPU and the workstation. The Baud Rate you specify while configuring the terminal must match the value the Principal Operator entered when executing the CONFIG Utility.

If your workstation is connected to the CPU via an ASI interface and a cable (a modem is not used), the Baud Rate is usually 9600. If your workstation is connected to the CPU via an ASI interface and a modem, the Baud Rate is usually either 300 or 1200. Consult your system's Principal Operator for the appropriate Baud Rate for your workstation.

- **Frame Rate** specifies the rate at which the display is refreshed. In almost all instances, the Frame Rate should be set to "60 Hz". However, operating the workstation near heavy machinery that is powered by a 50 Hertz source can cause the displayed characters to waver and jump. Changing the workstation's Frame Rate to "50 Hz" can eliminate this problem.
- **Minus Key** specifies the function of the "-" key, located in the upper right corner of the numeric keypad. Configuring the Minus Key to be "MINUS" causes the "-" character to be displayed when the key is pressed. Configuring it to be "TAB" causes the Minus Key to function exactly as **TAB**. Changing this configuration does not affect the function of the "-" key located in the typewriter block.
- **Modem Key** specifies whether or not the Modem Key functions when the workstation is connected to the computer via a modem. If the Modem Key is configured as "ACTIVE", the key functions as described earlier in this section. If the Modem Key is configured as "IGNORE", the Modem Key is ignored by the workstation. Note that if the workstation is not connected to the computer via a modem, the Modem Key is ignored.
- **Chars/Line** specifies the number of characters per line that are printed on the workstation's optional, built-in printer. If this value is configured as "80", printed characters are the same size as those that appear on the display. If "Chars/Line" is configured as "132", a compressed character set is used when printing. The compressed character set allows 132 characters to be printed on a single line.

Printing a Screen Image to the Thermal Printer. If your workstation has a thermal printer, you can print the contents of the display screen on the thermal printer by pressing **SHIFT** **F4**.

The HP 2622D Workstation

The Status Display. By pressing **SHIFT** **F5**, you can display the following information:

- Softkey Set Status
- Modem Status
- Insert Character Status

The last line of the screen is reserved for the status display. Regardless of the setting of the status display, you have 24 lines of the screen available when softkey labels are off; when softkey labels are on, you have 21 lines available.

To remove the status display from the screen, press **SHIFT** **F5** again.

Softkey Set Status. Allows you to see which set of user-defined softkeys is currently active. The sets are defined as Set 1 (Keys 1-8), Set 2 (9-16), and Set 3 (17-24). When the CYCLE key is pressed, the status information automatically changes to reflect the new set of active keys.

Modem Status. The modem status is only meaningful when your workstation is connected via a modem. The status is defined as either "MODEM ON" or "MODEM OFF" depending on your use of the MODEM key (the MODEM key is defined in the section on Remote Keys).

Insert Character Status. You can tell whether or not you are in insert mode by looking at the information displayed in the lower right hand corner of the Status Display. When you press the INSERT key, the information on the display changes from OFF to ON or vice versa.

Displaying All Softkey Labels. To display all user-defined and system-defined softkeys at one time, press **SHIFT** **F8**. The following screen appears on the display (to turn off the softkey display mode, press **SHIFT** **F8** again):

CONTROL FUNCTION KEYS							
ALTERNATE CHAR SET			DISPLAY FUNCTIONS	INVERSE VIDEO	BLINKING	UNDERLINE	HALF BRIGHT

SHIFT FUNCTION KEYS							
TERMINAL CONFIG			PRINT DISPLAY	STATUS DISPLAY			LABELS DISPLAY

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

SOFTKEY SET 3				INSERT CHARACTER OFF			
---------------	--	--	--	----------------------	--	--	--

Control Function Key Set. You can access several alternate character sets by pressing the **CONTROL** key in conjunction with a softkey. These character sets include a line drawing set, a display character control set, and display enhancement sets (half-bright, blinking, inverse video, and underlining).

CONTROL FUNCTION KEYS							
ALTERNATE CHAR SET			DISPLAY FUNCTIONS	INVERSE VIDEO	BLINKING	UNDERLINE	HALF BRIGHT

Characters from these alternate sets may be intermixed in display operations, included in string variables, and, in general, handled like the standard Roman alphanumeric character set. However, these alternate characters may not be recognized by some external devices (including printers).

Each alternate character set is accessed by a unique **CONTROL**-key sequence with the softkeys.

Auxiliary Character Set. When your Principal Operator ran the **CONFIG** utility, a standard character set and an auxiliary character set were specified for your workstation's keyboard. Each character set defines which character the computer "sees" when a key is pressed on the workstation keyboard.

For example, your workstation may be configured such that its standard (or primary) character set is "U.S. ASCII" while its auxiliary character set is "GERMAN". In many cases, the auxiliary character set is configured to be the line drawing character set.

You can access your workstation's auxiliary character set by pressing **CONTROL** **F1** .

To disable the auxiliary character set and use the main character set, press **SHIFT** **CONTROL** **F1** .

Display Control Character Set. To access the display control character set, press **CONTROL** **F4** .

To exit the display control character set, press **SHIFT** **CONTROL** **F4** .

One typical use of these display control characters involves the definition of softkeys as typing aids. For a more detailed discussion, see the section in this book titled "Using Softkeys as Typing Aids".

SOLVING ARITHMETIC PROBLEMS

The data entry pad can be used to solve arithmetic problems. The range of numbers that your HP 260 can manipulate and print is approximately -10×10^{99} through $+10 \times 10^{99}$.

While the system is calculating, the cursor is not shown on the display. You cannot input any information from the keyboard during this time. The HP 2392A workstation will beep if you attempt to input any information during the calculation time.

Numerical results appear in one of three forms: integer, decimal, and scientific notation. Example computations illustrate the three output forms:

Integer Result

8 + 22

30



Decimal Result

4.7 + 5.7

10.4

Scientific Notation Result

1.93E55*10

1.930000000000E+56

NOTE

The key on the HP 4526xD and HP 2622D workstations corresponds to the EXECUTE system softkey, or the key combination: **CONTROL** X, on the HP 2392A, HP Vectra, HP 150, and HP Portable Plus.

Keyboard Operations

The most frequently used operators are + (addition), - (subtraction), / (division), * (multiplication), ^ (exponentiation), and ** (exponentiation).

For example, to compute the sum of 8 and 22, enter the following:

8 + 22 (then press)

The result 30 is calculated and displayed.

More complicated problems can be solved as well. For example, to evaluate the expression $9*8+(7-2)+10$, enter:

9 * 8 + (7 - 2) + 10 (then press)

The result 87 is calculated and displayed.

You must use the operator * when multiplying numbers. The expression AB, which indicates "A times B" in algebra, is not interpreted as multiplication by the computer. You must enter A*B.

The computer performs operations in a preset order called a mathematical hierarchy. For keyboard operations, you need to remember that exponentiation has higher priority than multiplication and division. Multiplication and division have higher priorities than addition and subtraction. Below is an abbreviated list of the mathematical hierarchy, with parentheses having the highest priority.

Mathematical Hierarchy

Symbol	Description
()	parentheses
^ or **	exponentiation
*, /	multiplication, division
+, -	addition, subtraction

Examples

In the next paragraphs, several examples are provided which illustrate the hierarchy of mathematical operators.

To evaluate the expression $3+(2*5)$, enter the following:

$3 + (2 * 5)$ (then press)

The hierarchy of mathematical operators specifies that an operation occurring in parentheses should be done first. Therefore $(2 * 5)$ is evaluated first, and the result **10** is added to **3**. In this example the parentheses are not needed, since the multiplication operation would be performed before the addition operation anyway (the multiplication operator $*$ has a higher priority than the addition operator $+$). Thus, entering $3 + (2 * 5)$ is equivalent to entering $3 + 2 * 5$, even though no parentheses are used in the second expression.

If two operators have equal priority in an expression (such as $*$ and $/$), then the operations are performed from "left to right", as is shown in the next example.

To evaluate the expression $(10-3)*(8/4)$, enter the following:

$(10 - 3) * 8 / 4$ (then press)

Applying the rules of the mathematical hierarchy, operations in parentheses are done first. Therefore, **3** is subtracted from **10** leaving **7**. This reduces the math problem to $7 * 8 / 4$. Since multiplication and division have the same priority, the remaining operations are done "left to right". First, **7** is multiplied by **8** and then, the result **56** is divided by **4**, yielding **14**.

Now solve the expression $10-3*8/4$ by entering:

$10 - 3 * 8 / 4$ (then press)

Multiplication and division are highest priority operations in the expression and are evaluated first. Since multiplication and division have the same priority, they are evaluated "left to right". Therefore, **3** is multiplied by **8** and then the result **24** is divided by **4**, yielding **6**. This reduces the expression to $10-6$ which results in **4**.

CORRECTING TYPOGRAPHICAL ERRORS

The most frequent errors are typographical errors. To correct a typographical error, use the display editing keys described in the "Workstation" section of this manual. For example, suppose that you wanted to enter "Washington D.C.", but actually typed the following:

Washington D.E.

To correct the error, press **BACKSPACE** or **←** to position the cursor under the character "E". Next type an uppercase "C" and press **RETURN** to enter the correct data. Notice that you do not have to move the cursor to the end of the line before entering the corrected data.

Now suppose that you want to enter the name "John Doe", but accidentally type:

John Dooe

To correct the mistake, press the **←** or **BACKSPACE** to position the cursor under either "o" character. Next, delete the extra character using your workstation's delete character key (for example, the key labeled "Delete char" on the HP 4526xD); press **RETURN** to enter the corrected data.

UNDERSTANDING ERROR MESSAGES

Typographical errors made when entering a command are detected by the computer after you press the RETURN key. This type of error causes an error message to be displayed on the screen (directly below the line containing the error). Error messages can be generated by an application program or by the HP 260's operating system. Examples of these types of errors are provided in the following paragraphs.

Suppose that you are running an application program which requires you to enter the current date in the form "MM/DD/YY". However, you enter:

10/11/8

An error message like the following might be shown:

10/11/8

INVALID DATE - DATE RANGE IS 01/01/72 TO 12/31/99

The cursor indicates the specific character in error. In this case, a two-digit number must be entered for the year.

When the appropriate number is entered, the cursor indicates the next line is ready for entry.

You may at some time misspell a command. For example, the RUN command executes the program currently loaded into the SPU's memory. If you typed RUIN, instead of RUN, the system would interpret RUIN as an illegal expression and display the following:

RUIN

IMPROPER EXPRESSION

This is an example of a syntax error, which is an error in the structure of a statement or command. Syntax errors are most often caused by improper spelling or misplaced punctuation.

Programming or software errors generally have the form "ERROR XXX IN LINE YYY". For example, the following error message (Error 31) indicates that division by zero was attempted in line 90 of the program:

ERROR 31 IN LINE 90

Error codes and their explanations are listed in the back of this manual. Procedures to follow if you encounter difficulties are described in this manual's section titled "In Case of Difficulty".



MASS STORAGE DEVICES AND THEIR MEDIA

SECTION

10

Your computer system is equipped with several peripheral devices. These devices can be disc drives, tape drives, workstations, printers, plotters and bar code readers. Each of these peripherals is supplied with a manual that describes the operation and care of that peripheral. For example, the manual for an HP printer describes how to load printer paper and how to change the printer ribbon.

Your system's disc drive(s) and other mass storage devices hold the system software, application programs and valuable data. This section of the manual gives you tips to help you use the device and media in the most productive and efficient manner. It also describes how to load, unload, store and protect the various removable mass storage media supported by your computer system.



OPERATOR TIPS

This section of the manual describes how mass storage media should be used and stored. It describes effects of the environment on the media and the drive mechanisms.

Additionally, this section of the manual suggests several file naming conventions that make it easier to use and manage the mass storage media.

Choosing Media: Fixed Disc or Removable Media

A fixed disc is a rigid platter used to magnetically store data and programs. The platter spins at a fixed rate as one or more read/write disc heads, (suspended just above or below the storage medium,) read and write data on the medium. The read/write heads never touch the storage medium; thus the medium does not wear out. Additionally, the drive mechanism of Winchester-type fixed disc drives (the fixed disc devices currently supported by your computer system) is sealed to prevent dust, smoke and other contaminants from reaching the medium or the read/write heads; this further extends the "life" of the storage medium. Media failure can occur only if a mechanical failure in the drive occurs or if the drive is jarred (causing the heads to come in contact with the storage medium).

Removable media devices store data and read data from their storage media by moving the media past the device's read/write heads. Because the medium touches the heads, it eventually wears out; thus the life of a removable medium depends on the number of times it is accessed. Additionally, the storage medium is not sealed against contaminants (such as smoke, dust and skin oil) which can further shorten the medium's life.

For applications such as file sorts and data base management which involve heavy use of files stored on a mass storage medium, Hewlett-Packard recommends that you use fixed disc media to obtain optimum performance and reliability.

Storing Mass Storage Media

Provide storage for your media in or near the area where it is used. This way your media are not only easily accessible, but also stored in a clean, dust-free area. Magnetic media have the same requirements as the computer for avoiding extreme heat, cold, and humidity. Moving a tape from storage in one environment to a tape drive in a very different environment may cause the magnetic oxide coating on the tape to flake off. Moving a flexible disc from storage in one environment to a device in a very different environment can cause the disc to warp.

Using damaged media can cause further problems ranging from read errors to damaged read-write heads in the drive.

If working and storage areas cannot be kept at the same relative humidity and temperature, move mass storage media to the system at least one hour before use. This allows the media to achieve a moisture and temperature balance with the system environment.

Effect of Magnetic Fields on Media

Data on discs and tapes are stored by means of electric charges. Placing the media near a magnetic field can cause the information on the disc or tape to be altered. Magnetic fields are generated by power generating equipment, alternators, transformers, electrical equipment with motors (such as floor polishing equipment).

Even data processing equipment creates a magnetic field. Do not place discs or tape cartridges on top of disc drives, for example.

For more detailed information see your computer's Site Preparation Manual.

Naming Files

You and the other users of the system may want to adopt a file naming convention. Conventions make it easier to distinguish your files from those of other users. They also allow you to easily see how much disc space is used to store your files. This is especially important if disc space is in short supply. Finally, file naming conventions are useful because they help to inform all of the people working with a set of files of the contents of the files.

File names can consist of one to six characters; any character can be used except space, quote mark, comma, colon, NULL or CHR\$(255).

One file naming convention that you may wish to use consists of naming all files in the following form:

XXNNNN

where **XX** represent the initials of the main user of the file; **NNNN** are characters referring to the file's contents. For example, a file named **MLPAYR** might contain a payroll roster maintained by Marvin Langren.

Another convention is to name files based solely on the file's content. For example, a simple name for payroll file #12 might be **PAY012**. By naming payroll files in this fashion you could maintain 999 payroll records (in files **PAY001** through **PAY999**).

If you write your own programs, you could use an upper case name for a program, and the same name in lower case for the data file. For example, your program name could be **CHECKS** and its associated data file could be named **checks**.

USING FIXED DISC DRIVES

Each of the disc drives listed in the following table is supported by the B.08 version of your computer's operating system. However, not all of the disc drives are supported by each of the models of the HP 250 and the HP 260. For the current information about which disc drives are supported, contact your local Hewlett-Packard sales office, or your computer supplier.

Disc Drives Supported By The B.08 Operating System

HP 7906H/M/S
HP 7910K
HP 9895K
5/10/15 MB discs
HP 7908P
HP 7911P
HP 7912P
HP 7941A
HP 7942A
HP 7945A
HP 7946A
HP 7957A
HP 7958A
HP 9133D
HP 9133H
HP 9133L
HP 9134D
HP 9134H
HP 9134L
HP 9153B
HP 9154B

Operating a Fixed Disc

Each of these disc drives contains a fixed disc. The HP 7908P, 7911P, 7912P, 7942A, and 7946A disc drives also contain an integrated cartridge tape drive. A single controller manages the operations of both the fixed disc and the tape drive. The HP 9133D, 9133H, 9133L and 9153B disc drives also contain an integrated 3.5 inch flexible disc. A single controller manages the operations of both the fixed disc and the flexible disc drive. Operating a fixed disc consists solely of turning on and off power to the device.

To power on the disc drive, move the switch to the on position (labeled "ON" or "I"). The power switch for the HP 7941A, 7942A, 7945A, 7946A, 7957A, 7958A, 9133D, 9133H, 9133L, 9134D, 9134H, 9134L, 9153B, and 9154B disc drives is located near the lower left corner of the panel on the front of each drive. The power switch for the HP 7908P, 7911P, and 7912P drives is located at the bottom of the rear panel of the drive cabinet. To power off a drive, move the same switch to the off position (labeled "OFF" or "O").

NOTE

You should never power off any mass storage device unless you do so as part of a normal system shutdown. The computer must be powered off before you power off a mass storage device.



USING STAND-ALONE CARTRIDGE TAPE DRIVES

HP 9144 Cartridge Tape Drive

The operation of the HP 9144A cartridge tape drive consists of powering the drive on and off, and loading and unloading cartridge tapes, which are the only storage media available to the HP 9144A drive.

The power switch for the HP 9144A drive is located near the lower left corner of the front panel of the drive. To power on the drive, move the switch to the position labeled "1". To power off the drive, move the switch to the position labeled "0".

Refer to the sub-section titled "CARTRIDGE TAPES" for the details of how to load and unload cartridge tapes.

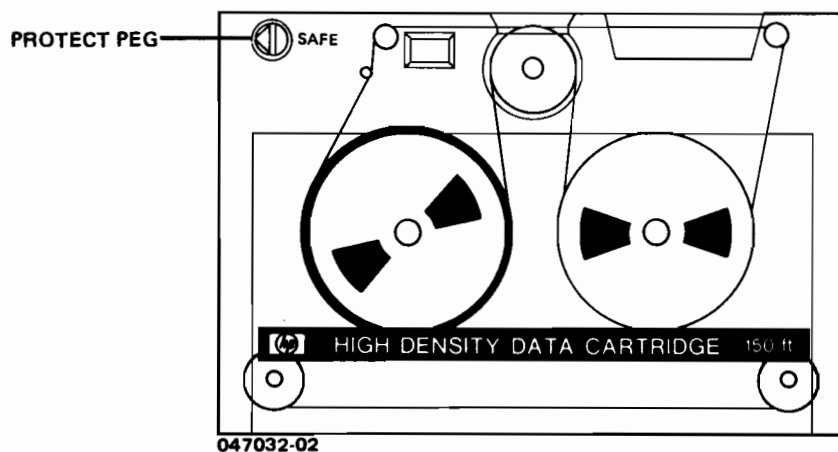
CARTRIDGE TAPES

Cartridge tapes are used as backup media on your computer system, if you have an HP 9144A stand-alone tape drive, or one or more HP 7908P, 7911P, 7912P, 7942A, or 7946A disc drives. Each of the disc drives has an integrated cartridge tape drive.

Tape cartridges come in two sizes. The short cartridge is 150 ft long, and the long cartridge is 600 ft long. The long cartridge has about four times the capacity of the short cartridge.

Protecting the Tape Cartridge from Alteration

The peg in the upper left hand corner of the tape cartridge is used to prevent alteration of data stored on the tape.



To protect a tape cartridge from accidental alteration, turn the protect peg on the tape cartridge so that it points to the word "SAFE". When the peg is in this position, initialization and write operations (STORE, SAVE, PRINT#, etc.) are not allowed. Trying to do a write operation displays the message: **Error 83** (the medium is write protected).

If you want to write data to the tape, turn the protect peg until the arrow faces away from the word "SAFE".

Mass Storage Devices

Although you can protect the cartridge tape from accidental modification, the best way to ensure that your valuable files will not be lost or damaged is to duplicate the files and keep the duplicates in a safe place (such as in fireproof storage). Refer to the section "What Every Principal Operator Should Know" to learn how to create a backup of your files.

Handling Tape Cartridges

Follow these guidelines to ensure that your tape cartridges remain error-free for as long as possible.

- Do not touch the surface of the exposed tape.
- Do not attempt to clean the tape or tape guides within the cartridge.
- When not in use, the tape cartridges should be removed from their drive and stored in the protective plastic case.
- Do not store tape cartridges in: direct sunlight, excessively warm, dry, dirty, or humid areas or near magnetic fields (for example, near motors or transformers).

NOTE

Although all of your system's commands work with cartridge tape drives, use the drive only as a backup device. Any use other than copying files in a sequential manner results in poor drive performance and early failure of the tape drive or the tape medium.

Inserting a Tape Cartridge

Slide the tape cartridge label-side up into the drive until you hear it click into its proper position.

The tape drive needs between 30 seconds and two minutes to prepare the tape for operation. During this preparation, the drive's "BUSY" light shines. When the tape is ready for use, the "BUSY" light stops shining.

Using the Tape Cartridge

Once you have inserted the tape cartridge and waited for the tape to rewind, it is ready for use.

Until the tape drive's UNLOAD button is pressed the drive's tape eject mechanism is locked; the tape cartridge cannot be removed. The tape BUSY indicator lights during any tape operation, including the loading and unloading processes. The PROTECT indicator lights when you insert a tape cartridge that is protected against write operations (its protection peg points to the word "SAFE" on the cartridge).

Normally, access to data on a cartridge tape is made indirectly, through a buffer on the disc. However, if the disc is not functioning properly, you can use the integrated tape drive independently of the buffer, by using the command DIRECT NOUPDATE. This allows you to continue to use your integrated tape drive for backup, until the fixed disc has been repaired. Please notice that it is possible that you could lose some data if you use your cartridge tape drive in this way.

NOTE

The HP 9144A stand-alone tape drive has no relationship with any disc buffer. Therefore, the DIRECT NOUPDATE command (and its complement, the DIRECT command) command has no have no meaning when you are using the HP 9144A.

Removing a Tape Cartridge

To remove a tape cartridge from the drive, push the UNLOAD button on the front panel of the drive. The tape drive needs between 30 seconds and two minutes to prepare the tape for removal (it records any operational errors that have occurred). During this preparation, the drive's "BUSY" light shines. When the tape is ready to remove, the "BUSY" light stops shining, and the drive buzzes. You can then remove the tape.

When the UNLOAD button is pressed, the responsibility for the operation is assigned to the task which has been configured as TASKID 1 (your principal operator knows who this is). As a result, a program running under TASKID 1 will pause and the cursor will disappear from the workstation for up to two minutes while the tape is rewinding.

NOTE

Do not use excessive force on the tape eject lever or button. It will not operate when power is off or when the BUSY light is lit.

An error occurs: if a tape is removed from a drive under abnormal circumstances (for example, during a temporary power failure) and if a tape (other than the one abnormally removed) is inserted in the drive. Similarly, an error occurs if the tape that was removed under abnormal circumstances is inserted into a different tape drive. To recover from either error, you must re-insert the tape that was abnormally removed into the drive from which it was removed; then remove the cartridge tape from the drive with the procedure described earlier. If you cannot locate the correct tape cartridge, you must run the TAPFIX utility program, which is described in your system's Utilities Manual.

3.5 INCH FLEXIBLE DISCS

3.5 inch flexible discs can be used as backup media on your computer system, if you have an HP 9133D, 9133H, 9133L, or 9153B disc drive. Flexible discs are removable from their drives.

CAUTION

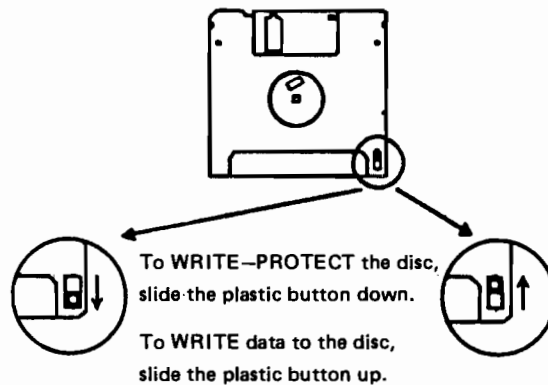
The HP 9133D, 9133H, 9133L and 9153B Disc Drives are shipped with a cardboard disc inserted in the drive. The cardboard disc prevents damage to the drive's read-write heads during shipment.

To prevent damage to the disc drive, make sure that the cardboard disc has been removed before powering on the drive.

Protecting the Disc from Alteration

It is possible to protect a flexible disc such that data can no longer be written to it. This ensures that the disc drive cannot write over or delete information from the flexible disc. The protection can be removed at any time, enabling the drive to again write information on the flexible disc.

To protect a flexible disc, find its write-protect tab; it is located on the back side of the disc jacket, on the edge opposite the shutter. Place the tip of a pen in the small hole at the top of the write-protect tab. Slide the tab downward until it locks into place (as shown in the following illustration).



**To write-protect the disc,
slide the plastic button down.**

**To write data to the disc,
slide the plastic button up.**

To remove the protection from a flexible disc, place the tip of a pen in the small hole at the top of the write-protect tab. Slide the tab up, away from the near edge, until it locks into place (as shown in the preceding illustration). Once this is done, data and programs can be written on the flexible disc.

The best way to ensure that valuable files are not damaged or lost is to duplicate the files and keep the duplicates in a safe place. Refer to the section "What Every Principal Operator Should Know" for more information on creating backups.

Disc Drive Self Test

When you turn on the disc drive (by pressing the power switch on the front panel until it locks), a self-test is performed on the flexible and fixed disc drives. The self-test takes about 40 seconds, and, during the test, the yellow fault light on the front panel of the drive is lit. Because the flexible and fixed disc drives are tested during the self-test, the flexible and fixed disc access indicators light periodically during the test. After about 40 seconds, the yellow fault light should go out, indicating that the device has passed the self-test. If the fault light remains on, turn off the disc drive. Turn the disc drive on again to repeat the self-test. If the fault light is still lit after this repetition of the self-test, contact your dealer or the nearest Hewlett-Packard Sales and Service Office.

The Flexible Disc

The flexible disc is made from a flexible mylar sheet coated with a thin layer of magnetic oxide. This mylar sheet is enclosed in a protective plastic jacket designed to keep the recording surface clean.

The disc drive reads data from and writes data to the flexible disc in the space under a "window" in the jacket. The window is covered by a metal shutter. The shutter helps protect the surface of the medium from dust particles and accidental fingerprints.

The flexible disc is equipped with an auto shutter. This means that when the flexible disc is placed in the drive, the shutter automatically opens to expose the surface of the medium. You do not need to manually open the shutter before inserting the flexible disc in the drive.

Media Monitor

Because the flexible disc drive's read/write heads touch the surface of the magnetic medium, the flexible discs eventually wear out. Through a feature called "Media Monitor", your disc drive automatically monitors the cumulative use of each individual flexible disc. When, due to normal wear, the flexible disc becomes worn and a risk of data loss arises, the drive's access light blinks and a "clicking" sound is heard when the computer is not accessing the disc. The disc drive still accepts and performs commands from the computer. However, after a command has been performed, the disc drive immediately resumes the warning indication.

When the Media Monitor warning occurs, copy the flexible disc that causes the warning at your earliest convenience. Begin using the copy, and discard the original. If you continue to use the original flexible disc, the disc drive (eventually) prohibits writing to it. After that time, you will only be able to read data from the flexible disc or copy the flexible disc.

Handling and Storing a Flexible Disc

Because of the plastic case, metal shutter and Media Monitor, Hewlett-Packard's 3.5 inch flexible disc is very reliable. However, your flexible discs contain valuable data and programs, so you want to treat them with care. The following guidelines help you prolong the life of both your flexible discs and your disc drive:

- Make sure the shutter is closed when the flexible disc is not in use. This protects its magnetic medium from dust, fingerprints and scratches which can cause data loss.
- Use the flexible disc in a clean environment. This minimizes the risk of dust or dirt particles scratching its magnetic medium and causing data loss.
- Keep flexible discs stored in a cool, dry place. This prevents damage caused by heat and moisture.
- Avoid magnetic fields, such as appliances with motors. Magnetic fields can alter or erase data on a flexible disc.
- Do not touch the surface of the flexible disc's magnetic medium. Particle contamination can scratch the flexible disc or cause the disc to wear out prematurely, and will probably result in loss of data.
- Do not try to clean the flexible disc. The plastic jacket contains a mechanism for cleaning the flexible disc surface. Other cleaning methods may damage the flexible disc.

Inserting and Removing a Flexible Disc

To insert a flexible disc, hold it with the label on the top and the shutter pointing at the slot in the disc drive. Slide the flexible disc into the drive until you feel it drop into the slot. Do not force the flexible disc into the drive.

To remove a flexible disc from the disc drive, press the disc eject button. Pull the flexible disc straight out.

NOTE

The flexible disc is not locked into the disc drive. To avoid loss of data, do not remove a flexible disc from the drive unless you are certain that the disc is not being used by any task.



HP 9895A Flexible Disc Drive

Your computer system might be equipped with an HP 9895A Flexible Disc Drive. The drive is a device which rotates a flexible disc, and then transfers information from the flexible disc to memory (known as a read operation) or from memory to flexible disc (a write operation).

The storage medium associated with this type of drive is an 8 inch flexible disc (also called a floppy disc or, simply, a floppy). It is a magnetic medium used to store data and programs. Additionally, it is used for backups and software data exchange.

Handling Flexible Discs

Follow these guidelines to ensure that your flexible discs remain error free for as long as possible.

- Always return flexible discs to their storage envelopes after removing them from the drive.
- Since fingerprints on the medium can cause loss of data, handle the floppy only by its label area.
- Never touch the surface of the flexible disc showing through the protective sealed jacket.
- Never write on the protective jacket with a lead pencil or ballpoint pen. Use a soft felt-tip pen and write on the label only. Do not erase titles; apply a new label instead.
- Although the floppy is flexible, do not bend or fold it since this can cause damage to the floppy.
- Never subject flexible discs to temperature or humidity extremes.
- Contamination from dust, smoke and ashes can damage flexible discs. Always close disc drive doors when not in use.
- Avoid placing flexible discs in strong magnetic fields that may exist around transformers or magnets, since this can cause loss of data.
- Never remove flexible discs from their sealed protective jackets.
- The inside surface of the sealed jacket is coated with a material that cleans the medium as it rotates. Any other method of cleaning may scratch the medium and cause loss of data.
- Use only HP approved flexible discs - others may impair data integrity or damage the disc drive.
- Always remove flexible discs from drives when the discs are not needed for a substantial period.

Inserting and Removing a Flexible Disc

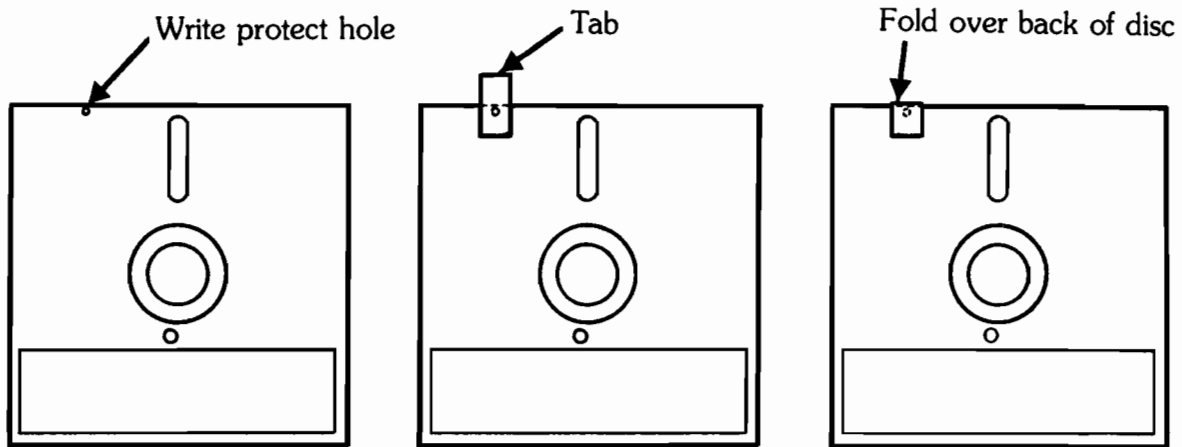
To insert a flexible disc into the HP 9895A Disc Drive, press the bar on the drive door to open the door. If necessary, remove the floppy already in the drive and store it in its envelope.

Insert the new flexible disc, label side up, into the drive such that the notched end of the flexible disc is inserted first. Slide the disc into the drive until you hear it click into its proper position. Close disc drive door until it latches. Now that the floppy is in place, it is ready for use.

To remove a flexible disc from the HP 9895A Disc Drive, press the bar below the drive door to unlock the door. You can open the door only when the in use light is not on. Slide the flexible disc out and place it in its storage envelope. Be sure to close the disc drive door before resuming program operation. This will help keep the area free from dust and dirt.

Protecting a Flexible Disc from Alteration

To protect a flexible disc from accidental alteration, remove its write tab (the piece of black tape labeled "WRITE"). When the tab is removed, initialization and write operations (such as **STORE**, **SAVE** and **PRINT#**) are not allowed; they result in the message: **ERROR 83 Medium is Write Protected**. If you decide later that you want to make changes to files on the flexible disc, cover the write protect hole with a new write tab. Write tabs are supplied with each package of flexible discs.



Restoring Write Capability to a Flexible Disc

You should protect flexible discs by taking proper care of them. Return flexible discs to their envelopes when they are not being used, and follow the guidelines shown on the back of the flexible disc envelope.

The best way to ensure that valuable files are not damaged or lost is to duplicate the files and keep the duplicates in a safe place (such as a fireproof vault). Refer to this manual's section titled "What Every Principal Operator Should Know" for information about creating backups.

SYSTEM COMMANDS



SECTION

11

You use system commands to execute programs, clear memory, output information, store files, retrieve files, delete files and copy files.

All mass storage operations deal with files, which are the basic components of a storage medium.

When you turn your system on, the device used to load the operating system is automatically specified as the **default mass storage device**, unless another device is specified in the CONFIG program. This is the device to which all file operations are directed if no other device has been specified.

NOTE

Although all commands can be used with a cartridge tape drive, it is not intended to be used as a disc. Any use other than copying files in a sequential fashion can result in poor tape drive performance and early drive failure.

ACCESSING FILES ON STORAGE DEVICES

When accessing a file on a mass storage device, you must supply at least the name of the file. If only the name of a file is supplied, the system assumes that the file is located on the default mass storage device. To tell the system that the specified file is located on a device other than the default mass storage device, you use either a unit specifier or a volume name. Wherever a file name is used in a system command, a unit specifier or a volume name can be included.

A **unit specifier** identifies the physical location of a file. For example, a unit specifier tells whether the named file is on a cartridge tape, on an HP 7946A fixed disc or on an HP 9133H's 3.5 inch flexible disc. A **volume name** is a name that you assign to a storage medium with the **PRINT LABEL** command. It allows you to address a particular mass storage medium by name. For example, you can specify that you want a listing of all files on the flexible disc labeled "MYDISC". Consider the following analogy:

Suppose you asked a friend to come to your home on Main Street. Once your friend arrives at Main Street, he must decide which house is yours. If you have given him your address, he can easily find your home. If your friend knows only your name and not your address, he must look for your name on the mailbox of each house. When he finds the mailbox with your name, he has located your house.

The HP 260 can either use an address (a unit specifier) or a name (a volume label) to locate the mass storage device containing a file.

Assigning Volume Labels (PRINT LABEL)

Volume names are assigned to storage media with the **PRINT LABEL** command. For example, to assign the label **SAMPLE** to the volume in the default mass storage device, execute the following command:

```
PRINT LABEL "SAMPLE"
```

The label you give to a volume cannot exceed eight alphanumeric characters.

If you want to display the label of the default mass storage device, execute the following commands:

```
READ LABEL A$  
A$
```

The first command copies the volume label into the string variable **A\$**. The second command displays the value of the string variable **A\$**.

Using Unit Specifiers

Each mass storage device is assigned an address by which you can access the files stored on its mass storage medium. The address is referred to as the unit specifier and consists minimally of the colon character ":" and a single letter specifying the type of mass storage device, all enclosed in double-quote marks. A complete list of device identifiers is supplied in this manual's appendix titled "Volume Specifiers", along with a more detailed description of unit specifiers.

Suppose that you want to print the label **SAMPLE** on a cartridge tape. Checking the appendix titled "Volume Specifiers" you find that **":K"** is a unit specifier for the cartridge tape drive. Therefore, you would execute the following command:

```
PRINT LABEL "SAMPLE" ON ":K"
```

Notice that this does not change the default mass storage device. It tells the system to use the specified device for this mass storage operation, not the default mass storage device.

To verify that the label was written properly on the cartridge tape, you would execute the following commands:

```
READ LABEL A$ ON ":K"
A$
```

The first command copies the volume label of the cartridge tape into the string variable **A\$**. The second command causes the value of the string variable **A\$** to be displayed.

Changing the Default Mass Storage Device (MSI)

As described earlier, the default mass storage device is usually the mass storage device from which the operating system was loaded. However, you can specify which device is the default mass storage device by executing the **MASS STORAGE IS** command.

For example, to declare that the system's cartridge tape drive is the default mass storage device, execute the following command:

```
MASS STORAGE IS ":K"
```

You can abbreviate the **MASS STORAGE IS** command as **MSI**. Therefore the command declaring that the cartridge tape drive is the default mass storage device is:

```
MSI ":K"
```

Similarly, to declare that the volume whose label is **SAMPLE** is the default mass storage device, execute the following:

```
MSI ",SAMPLE"
```

EXECUTING PROGRAMS (RUN)

The **RUN** command executes the program currently in the computer's memory or loads a program from a specified file into memory and executes it.

For example, the following command executes the program currently in the computer's memory:

RUN

If no program is currently in memory, an error message is issued.

If you want to execute a program that is not currently in memory, enter the name of the file containing the program with the **RUN** command. For example, if the program you wish to run is stored in the file named "TAX" on the default mass storage device, execute the following command:

RUN "TAX"

The system will then copy the program from the file named "TAX" into the computer's memory and execute it.

ERASING THE CONTENTS OF MEMORY (SCRATCH)

All or part of your user work area can be erased by using the **SCRATCH** command .

COMMAND	FUNCTION
SCRATCH	Erases programs and variables.
SCRATCH A	Erases the entire user area.
SCRATCH C	Erases all variables, including those in memory reserved in "common" (via the COM statement).
SCRATCH P	Erases programs, variables, and binary routines.
SCRATCH V	Erases all variables except those in memory reserved in "common" (via the COM statement).
SCRATCH KEY#	Erases softkey typing-aid definitions.
SCRATCH <input type="text" value="F1"/>	Erases the softkey typing-aid definition for softkey #1.

NOTE

The **SCRATCH A** command has the same effect as pressing **CONTROL HALT** on the HP 4526xD and HP 2622D workstations, or pressing the system softkey **SCRATCH ALL**, or **ESCAPE CONTROL Y** on the HP 2392A, HP 150, HP Vectra, and HP Portable Plus workstations.

FILE OPERATIONS

You can store data and programs in files on various mass storage media for later use.

Names for files stored on any single mass storage medium must be unique to that medium. For example, a flexible disc and a fixed disc can each contain a file named "TAX". But neither can contain more than one file named "TAX".

Any attempt to create two files of the same name on a mass storage medium results in an error (ERROR 54 - file already exists).

Storing Programs (STORE)

The STORE command copies a program from the computer's memory into a file on a mass storage device, so that it can be retrieved later. Any binary routines in memory are stored in the file with the program.

For example, the following command creates a file named "TAX" on the default mass storage device, and copies the program currently in memory (including any binary routines resident in memory) into that file:

```
STORE "TAX"
```

A file created by the STORE command is a file of type PROG. Files of this type can be accessed only with the LOAD, RUN and COPY commands.

If you want to store a program on a device other than the default mass storage device, you must specify the location of the volume on which it is to be stored. For example, suppose you want to store a program on an HP 7946A Disc. Since a unit specifier for the HP 7946A is ":U", you would execute the following command:

```
STORE "TAX:U"
```

When developing programs, you often have the need to store a program back into its original file. For example, suppose that you are developing a program to prepare tax returns. The program is stored in a file named "TAX". You retrieve the file and make a few changes to the program. Now you want to store the modified program back into the file "TAX". However, you receive an error (ERROR 54 - file already exists) when you execute:

```
STORE "TAX"
```

The HP 260's operating system does this to prevent you from accidentally writing over an existing file. If you want to replace the old contents of the file "TAX" with the program currently in memory, you must use the RE-STORE command:

```
RE-STORE "TAX"
```

This command removes the file named "TAX" from the default mass storage media, creates a new file named "TAX" on the default mass storage media, and copies the program currently in memory into the new file.

Copying a Program from File to Memory (LOAD)

The **LOAD** command copies a program from a file into the computer's memory. The file must have been created by the **STORE** command (in other words, it must be a file of type **PROG**). For example, the following command copies a program into memory from the file named "TAX" on the default mass storage device:

```
LOAD "TAX"
```

If a file has been specially marked as run-only (see the **CATALOG** command section), it begins to execute immediately after it has been copied into memory.

Saving Programs In Data Files (SAVE)

The **SAVE** command creates a file of type **DATA** and copies the program currently in the computer's memory into that file; unlike the **STORE** command, binary routines in memory are not saved in the file with the program; thus any binary routines used by the program must be loaded separately when retrieving and running the program. Programs created with the **SAVE** command can be copied into memory with the **GET** command, described later in this section.

For example, the following command creates a **DATA** file named "TAX" on the default mass storage device, and copies the program currently in memory into that file:

```
SAVE "tax"
```

Copying DATA Files Into Memory (GET)

To copy a program into the computer's memory from a file of type **DATA** (created by the **SAVE** command), use the **GET** command. For example, the following command copies a program from the file "TAX" (a file of type **DATA** on the default mass storage device) into the computer's memory:

```
GET "tax"
```

Copying a File (COPY)

The COPY command duplicates a file, either on the same medium or on another medium. When copying files, you specify the following information:

- the name of the file to be copied,
- the location of the file to be copied (assumed to be the default mass storage device, unless a unit specifier or a volume name is supplied),
- the name of the new file to be created,
- the location of the new file (assumed to be the default mass storage device, unless a unit specifier or a volume name is supplied).

For example, suppose that you want to create a copy of the file named "TAX" (located on the default mass storage device). Execute the following:

```
COPY "TAX" TO "INCTAX"
```

This creates a new file named "INCTAX" on the default mass storage device, and copies the contents of the file named "TAX" into the new file.

Now suppose that you want a copy of the file named "TAX", but you want the copy to be made on a cartridge tape. Since a unit specifier for the cartridge tape drive is "K", you execute the following command:

```
COPY "TAX" TO "TAX:K"
```

This creates a new file named "TAX" on the cartridge tape; it then copies the contents of the file named "TAX" (located on the default mass storage device) into the new file.

Finally, suppose that you want to create a copy of the file named "TAX", which resides on a cartridge tape. You want the copy to reside on a flexible disc whose label is "VOL1". Execute the following:

```
COPY "TAX:K" TO "NEWTAX,VOL1"
```

This creates a file named "NEWTAX" on the mass storage volume labeled "VOL1". The contents of "TAX" are copied into the new file "NEWTAX".

Cataloging Files (CATALOG)

The **CATALOG** command creates a listing (catalog) of the files stored on a mass storage device. This listing indicates whether or not those files are accessible, and provides information relating to that file. For example, to obtain a list of all files residing on the default mass storage device, execute either of the following commands (both execute identically):

CAT

or

CATALOG

This displays a table of information. In all cases, the catalog is listed on the current system printer. This is usually the display. To obtain a hard-copy listing of a catalog, refer to the subsection "Output Commands" later in the text.

The first column of the table designates the file name. The **PRO** column indicates whether a file has any special protection, and, for image files, indicates the data set number (01-50). There are two protect codes: **RO** and *****. The protect code ***** specifies that a special access code must be entered to access the file. If you know the access code, you can edit, purge, or run the file (and treat it like any other file). If you do not know the access code, you cannot access the file at all. The protect code **RO** specifies that the program contained in the file is "run-only". This means that once the file is loaded, it runs automatically. The program is automatically removed from memory when it completes; it cannot be printed or listed. The **TYPE** label refers to one of the several file types, such as type **PROG** (created with the **STORE** command).

The column headed "REC/FILE" shows the number of logical records in the file.

The column headed "BYTES/REC" shows the number of bytes per logical record. For program files (type **PROG**) the logical record size is 256 bytes.

The column headed "ADDRESS" indicates the physical sector address of the first logical record in the file.

System Commands

NAME	PRO	TYPE	REC/FILE	BYTES/REC	ADDRESS
SYSTEM: F2,6,0					
SYSTEM	*	SYST	600	256	60
EUROPE		DROM	4	256	660
PACK		DROM	7	256	664
IMAGE		DROM	73	256	671
AFIG	RO	PROG	46	256	1181
MFIG	RO	PROG	54	256	1227
RFIG	RO	PROG	76	256	1281
TFIG	RO	PROG	54	256	1357
XFIG	RO	PROG	52	256	1411
CONFIG	RO	PROG	100	256	1463
MTEST	RO	PROG	40	256	1563
GPL276	*	DATA	97	96	1603
GPL274	*	DATA	97	140	1640
GPL272	*	DATA	97	96	1694
GPL257	*	PROG	84	256	1731
GPL254	*	PROG	133	256	1815

Example of CAT Listing

To obtain a catalog from a medium other than the default mass storage device, you can include either a unit specifier or a volume label with the CAT command. For example, to obtain a catalog of the flexible disc currently in the HP 9133H Disc Drive, you could execute the following command:

```
CAT ":A"
```

This causes the system to display a table, listing all files present on the flexible disc.

To obtain a catalog of a volume labeled "HP250", execute the following command:

```
CAT ",HP250"
```

Selective Catalogs

Sometimes you want just a listing of all files on a volume that begin with certain letters or a listing of all files on a volume that are of a specific type. You can do this by adding some information to the CAT command.

For example, to obtain a list of all files beginning with the letters HP that reside on the default mass storage device, execute the following command:

```
CAT "HP"
```

To obtain a list of all files that are of the type DATA on a 3.5 inch flexible disc located in an HP 9133H Disc Drive, execute the following command:

```
CAT ":A",DATA
```

As a final example, suppose you want a list of all files that: begin with the letters HP, are of type PROG, and reside on an HP 7908P fixed disc. Execute the following command:

```
CAT "HP:Q",PROG
```

Deleting Files from a Mass Storage Device (PURGE)

The PURGE command deletes a file from a mass storage device. Use the PURGE command with caution. If you delete a file by mistake and you have no back-up copy of that file, the data it contained is lost.

To delete a file named "TAX" from an HP 7946A Disc, execute the following command:

```
PURGE "TAX:U"
```

As soon as PURGE has completed execution, the cursor reappears on the display. If you try to purge a file that is not present on the specified mass storage device, an error is generated (ERROR 56 - file name is undefined).

To verify that a file has been purged from the mass storage medium, execute the CAT command.

OUTPUT COMMANDS

Many kinds of output are generated by your system. For example, the **CAT** command causes information about the files stored on a mass storage medium to be output. An improperly entered command causes an error message to be output. An application program may execute a **PRINT** statement causing information to be output.

By default, all of these outputs are directed to your display. However, you can change the device to which output is sent by executing the following commands:

- **PRINTER IS** - this command specifies the output device for the **PRINT** command and for the **PRINT USING** command.
- **SYSTEM PRINTER IS** - this command specifies the output device for the **LIST**, **CAT** and **TRACE** commands. It also controls output generated by the single-step function.
- **PRINT ALL IS** - this command specifies a device to which a copy of all displayed information is sent. This includes all information entered from the keyboard and all error messages displayed.

For example, if an error occurs, the error message is sent to both the display and the device specified by **PRINT ALL IS**.

With each command, you specify the output device by supplying the address of the peripheral.

Peripheral Addresses

Each peripheral device connected to your HP 260 responds to a unique **peripheral address**. A peripheral address is a number between -2 and 20 identifying the location of that device. An address is determined by several factors, including the type of interface connecting the peripheral to the computer. In general, peripheral addresses for devices connected to your systems are:

- -1, -2 - workstations or printers connected to integrated ports -1 and -2 on the HP 260 Series30 and Series40 computers.
- 0 through 7 - disc drives or printers connected to the HP 260 via the HP-IB Interface. The address of these devices is determined by a set of address switches located on the device; on some printers it is set using keys on the printer's control panel (depending on the model of printer).
- 8 - your workstation's display.
- 9 - the system's "bit bucket" or "wastebasket". Any output sent to this address is discarded by the system.

- 10 - the workstation's local printer. For example, if you are using a local printer attached to a PC or HP 2392A workstation, use this address to access it.
- 11 through 20 - devices connected to your system via an ASI Interface. The address of these devices is determined by adding 10 to the port number of the ASI Interface connecting the device to the HP 260.

For example, the peripheral address of a device connected to the HP 260 via ASI port 3 is 13. The peripheral address of a device connected to the HP 260 via ASI port 6 is 16.

Directing Program Output (PRINTER IS)

The **PRINTER IS** command assigns the output device for all **PRINT** and **PRINT USING** operations, which are normally issued within a program. Each new **PRINTER IS** statement cancels the previous one. Therefore, if the application program you run contains a **PRINTER IS** statement, that program's printer assignment overrides any assignment you made from the keyboard. In this instance, you can only change the program's output device by editing the application program and modifying its **PRINTER IS** statement (or deleting the statement completely).

Assuming that an application program does not include a **PRINTER IS** statement, you can direct its output to a device other than your workstation's display. For example, to direct the output of an application program to a printer connected to ASI port 2, execute the following command before running the program:

```
PRINTER IS 12
```

To cause output from an application program to appear on your workstation's display, execute the following command:

```
PRINTER IS 8
```

System Commands

Setting a Printer to Top of Form

To set a printer to top of the form, you can use the **PRINTER IS** statement followed by a **PRINT PAGE** statement.

For example, if you wanted to set a printer at address 0 to the top of form without walking to the printer, you would execute the following sequence:

```
PRINTER IS 0
```

```
PRINT PAGE
```

If your workstation has a built-in thermal printer, you can set the thermal printer to the top of form by executing the following:

```
PRINTER IS 10
```

```
PRINT PAGE
```

If you look carefully at the thermal printer paper, you will notice a small tick mark. This tick mark is the bottom of form.

Outputting Listings and Catalogs (SYSTEM PRINTER IS)

The **SYSTEM PRINTER IS** statement allows you to specify which peripheral is the output device for the **LIST**, **CAT** and **TRACE** commands, as well as for the single step function.

For example, suppose that you want a printed catalog of the files on an HP 9146A Disc Drive. The printer you want to use is connected to the system via ASI port 3. Execute the following sequence commands:

```
SYSTEM PRINTER IS 13
```

```
CAT ":U"
```

```
SYSTEM PRINTER IS 8
```

The third command specifies that the output from future commands will be directed to the display.

Printing All Displayed Information (PRINT ALL IS)

To obtain a permanent copy of your interactions with the system, use the **PRINT ALL IS** command. For example, suppose you want to use the printer located at HP-IB address 0 to record all of your interactions. Execute the following command:

```
PRINT ALL IS 0
```

A copy of all information sent to the display is now also sent to the printer at address 0. When you no longer wish to record all of your interactions with the system, execute the following command:

```
PRINT ALL IS 8
```

If your workstation has an optional thermal printer, you can record all of your interactions with the system by executing:

```
PRINT ALL IS 10
```



WHAT EVERY PRINCIPAL OPERATOR SHOULD KNOW

SECTION

12

The principal operator is a user who is responsible for:

- insuring that the system's files are periodically backed up (copied). These copies insure that your system's valuable data and programs are not lost in the event that one or more files are accidentally destroyed. The principal operator may back up the system or may delegate this task to another user. However, he is responsible for making sure that regular backups are created.
- configuring the system at installation time (if you have elected to install the system yourself). Similarly, the principal operator configures the system when new peripherals or new users are added to the system.
- serving as the "designated caller" to HP Response Centers. If you purchase support services from HP, you may receive access to HP's Response Centers. Support plans providing this service specify that one "designated caller" can phone an HP Response Center and receive assistance with programming and operating problems from an HP Application Engineer.
- arranging any preventive maintenance required for system peripherals.
- assisting other users when they need information about the system configuration or help.

This section of the manual describes procedures that allow you to quickly and easily complete the tasks associated with these responsibilities. The tasks are quite small and should not interfere with the normal daily work of the person serving as principal operator.



PREVENTIVE MAINTENANCE

Find out from the company that sold you your computer if any of your peripherals require preventive maintenance. The system SPU does not require preventive maintenance, but some printers, plotters and disc drives do require periodic attention.

If you have a hardware service contract, peripherals that require preventive maintenance must receive it to insure that repairs to them are covered by the contract. If you have a hardware contract, you have already paid for this service.

You and your AE (Application Engineer) should plan any preventive maintenance for your system. The time of day when the maintenance is performed should not conflict with heavy system usage. Some preventive maintenance requires that the system be devoted to the AE for running diagnostics; certain peripheral devices may not be available for use during maintenance visits. Plan your workload to have all high priority jobs completed before preventive maintenance begins.

INSTALLING NEW SOFTWARE AND HARDWARE PRODUCTS

To expand the capabilities of your system, you may decide to obtain new software or hardware from Hewlett-Packard or from a third party. When the time comes to install the new products, plan your workload accordingly. Create a full backup just before the installation begins to insure against loss of any data. Make sure that all critical jobs have been completed prior to starting the upgrade, and do not schedule any critical jobs to start immediately after the upgrade is complete. An upgrade may take longer than anticipated.

The following are some issues that you need to consider before upgrading the system's software.

- Are your users trained to use the new product?
- Do you know how to configure the system with the new product installed?
- Do you have an adequate supply of manuals for the system users?
- Do you require Application Engineering consultation before implementing the new product?

The following are some issues that you need to consider before upgrading the system's hardware.

- Is the equipment room suitable for the new product? For example, is the site equipped with sufficient space and power for the new hardware? The guide titled "Preparing For Your HP 260" describes the electrical and environmental requirements for the HP 260 and its peripherals.
- Do you need to order additional supplies for the new product (such as paper, printer ribbons, tapes or discs)?

SUPPORT SERVICES

Hewlett-Packard offers a comprehensive set of hardware and software support services to assure optimum performance of your system. Hardware support is your computer's "health insurance".

When you purchase hardware support services, you pay a fixed monthly fee which insures that should a problem occur, your system is repaired at no additional charge. HP hardware support services allow you to choose the level of support required for your system. For example, one HP hardware support service specifies that a Hewlett-Packard Application Engineer arrives at the computer site and begins repairing your system within four hours of receiving a service call, if at all possible. Another HP support service specifies that a Hewlett-Packard Application Engineer will arrive at your computer site and begin repairing your system within eight working hours of receiving a service call. For less essential hardware, you may elect to purchase "bench support". Equipment covered by this service is returned to Hewlett-Packard for repair.

Software support services provide:

- regular updates for your system's operating system and software. This means that your system will receive new versions of the operating system that include new software enhancements, new features and bug fixes. Additionally, this insures that you can take advantage of new feature software products for the computer that are released after you take delivery of your system.
- updates to the manual set. These updates reflect changes to the operating system, and changes to the feature software products.
- access to HP Response Centers. This service is provided with some levels of software support. HP Response Centers place a trained HP Support Engineer as close as your phone, should you have problems programming the system or using its feature software products.
- periodic newsletters. These newsletters provide information about new products and features, as well as tips for operating and programming the system.

For more information about hardware and software support service, contact your local HP Sales and Service Office.

INCORPORATING DOCUMENTATION UPDATES

Your local HP Sales Office can help you obtain support services that provide regular updates for your manuals. One person should be assigned to monitor the distribution of all of the manuals at the installation. This person would then be responsible for knowing which users have manuals in their possession, and ensuring that all documents are kept current. You may want to keep the manuals and media in the same place, and have the same person responsible for both.

Documentation Updates

An update modifies an existing manual by providing replacement pages that contain new or changed information. Each new update contains all changes made to a manual since the last printing of that manual. You receive manual updates when you: purchase a manual that has been updated, order an update for a specific manual from Hewlett-Packard, or purchase manual or software support services from Hewlett-Packard. Manual updates are generally issued in conjunction with software updates. Depending on the support service(s) you have purchased, manual updates may be sent directly to the principal operator at your site.

Update packages have no part number. They are numbered sequentially from the time the last edition of the manual was issued. These updates consist of a cover letter and replacement pages for the manual. Always incorporate an update as soon as it arrives and throw old pages away to prevent confusion.

The update cover letter identifies the title and the part number of the manual to be updated, as well as the date when the manual was printed. It also identifies the update number and date the update was printed.

The most recently changed material on each replacement page is indicated by a black, vertical "change bar" placed in the outer margin of the page, next to the material that changed. The date the material was changed is shown at the bottom of the page.

When a manual is reprinted, all prior updates to that manual are incorporated into the new manual. However, subsequent updates to the reprinted manual are still sequentially numbered beginning with the earliest update.

When you purchase a manual and that manual has been updated, a copy of the most recent update package is shipped with the manual. If you need to purchase additional update packages for your manuals, contact your local HP Sales Office for assistance in placing your order.

New Editions

When major changes are made to a manual, issuing an update package is no longer appropriate or practical. In this case, a new edition is printed. This new edition obsoletes all previous versions and updates. Look at the printing history in the front of each manual to learn about previous editions and updates. The date on the title page and back cover reflect the most recent edition; the manual part number remains the same.

WHAT IS A BACKUP?

The HP 260 system software, application software and data represent a large investment of time and money. Unforeseen circumstances (such as spilled coffee, smoke contamination, dust or fire) can cause the destruction of the mass storage device, its media, and/or the data it contains.

The principal operator is responsible for making a backup - a copy of the system software, application software and data. Typically, at least one backup is performed daily. However, the frequency of your system backups should be based on the answer to the question "How much data can I afford to lose?"

In the event that the software and data on your system are destroyed, you can quickly recover them by restoring the latest version of your system backup. If a user accidentally removes a needed file, the file (or a previous version of the file) can be recovered by copying it back into the system from the backup.

A common mistake is to underestimate the value of backup. When a system is first delivered, the contents of the new storage media are negligible. Gradually, as software such as financial, manufacturing and text processing programs are installed, discs begin to fill up with essential, hard-to-replace data. Absorbed in using the new, productive tool, nobody may think of backing up the files located on disc or tape. Unfortunately, some people never give serious thought to creating a backup until a system failure occurs. At that time, it becomes apparent that many hours have gone into the creation of these files; someone may have to replace some or all of them.

You cannot prevent an incident such as a power failure. You can, however, anticipate and minimize such problems by incorporating a backup plan into your operations the very first day that the system is put into use. This section of the manual provides some general information about backups and then shows you how to use the "software tools" provided with your system to create backups regularly.

If you have purchased software support services from Hewlett-Packard, the contract you signed specifies that:

"The customer is responsible for maintaining a procedure external to the products for reconstruction of lost or altered files, data or programs to the extent deemed necessary by the customer, and for actually constructing any lost or altered files, data, or programs."

CONSIDERATIONS FOR BACKUP PROCEDURES

There are several factors to consider when implementing your backup strategy: selecting a time of the day to create backups, determining the level of assurance you need against loss of data (that is, how often to back up), and evaluating how much data you need to back up.

Creating a backup monopolizes your discs; no disc activity may take place on a volume during its backup or recovery. When creating a backup, select a time when most users do not need the system. The beginning and end of the day are popular times for creating backups. Many users take advantage of the program scheduling capabilities provided with the PERFORM DRUM and create backups late at night when no one is using the system.

There are no fixed rules which determine the level of protection you need against loss of data. You have to determine the level of assurance which best suits your needs based on the difficulty in replacing existing data. For example, backups may be created twice daily (once at noon and once at the end of the day) on systems where data is extremely valuable and changes rapidly. Systems where data does not change frequently may elect to create backups once a day (at the start or at the end of the day) or even once a week (each Friday evening).

You should consider saving crucial backups (such as backups created right before month-end posting or clearing) until there is no chance of needing the data again. The last Friday of each month might be a good consideration for selecting a backup to be archived in this fashion.

If you decide to have only one tape or set of discs for backup, you run the risk of having a system failure during a backup, losing all information on that media. It is a good policy to use alternating discs or tapes to provide a "safety net" for accidents. It is possible, on the other hand, to do multiple backups to a single tape or disc, utilizing all of the space on the media. You must decide whether your data is reasonably protected.

To minimize the chance of loss, store the backups in a location away from the system. Data safes are specially designed to be air tight, water-proof containers for mass storage media. They are available from many computer accessory manufacturers.

Security

Another major consideration is the security of the backup tapes and flexible discs - where should they be kept and for how long? Some system users store their backup media in a bank. Such security measures prevent the loss of the data on these media by fire, theft or negligence. Additionally, they prevent unauthorized access to the data on the media.

CREATING A BACKUP: DISC TO TAPE

With the tape backup utility **FVBACK**, the entire contents of a fixed disc can be backed up to a cartridge tape in minutes.

This portion of the manual describes how **FVBACK** can be used to back up a disc. For detailed information on running **FVBACK** (such as a description of its syntax), refer to your system's Utilities Manual.

The **FVBACK** Utility

The **FVBACK** (Full Volume BACKup) program is a utility that allows you to rapidly copy the entire contents of a disc to a special file on a cartridge tape. Backup files are restored from the tape to the disc using the same program.

The **FVBACK** program copies entire volumes only, making it useful for complete backups. Because of the speed of **FVBACK**, you may choose to do a full backup daily, even if you only need certain files backed up. For example, up to two megabytes of information are backed up per minute using an HP 7908P disc. If you decide to back up only selected files, use the **BACKUP** utility (for backing up non-**IMAGE** files) and the **DBSTORE** command (for backing up **IMAGE** files). The **BACKUP** utility and the **DBSTORE** command are discussed later in this section.

What Every Principal Operator Should Know

Sample Procedure Using FVBACK

FVBACK always performs full volume backups; all files on a volume are copied. Therefore, a good backup strategy might use three cartridge tapes: two tapes labeled "daily" and one tape labeled "weekly". The steps listed below form a sample procedure you might use to back up a fixed disc to a cartridge tape. In this example procedure, the blank label on each tape is used to record the date of the backup.

- On Monday, create the first backup using the tape "daily#1". After backing up to the tape with FVBACK, record the date on the tape's label and store it in a safe place.
- On Tuesday, create a second backup using the tape labeled "daily#2". Again, record the date on the tape's label and store it in a safe place.
- On Wednesday, create a third backup using the tape labeled "daily#1". This erases the backup created on Monday. However, since the system is backed up on "daily#2", Monday's backup can safely be erased. Again, record the date of the new backup on the tape's label and store it in a safe place.
- On Thursday, create a fourth backup using the tape labeled "daily#2". This erases the backup created on Tuesday. Record the date on the label and store the tape in a safe place.
- On Friday, create a fifth backup using the tape labeled "weekly". Record the date on the tape's label and store it in a safe place.

To help insure the integrity of the system, keep the weekly tape for one month. Each month, place the month-end weekly backup in a permanent archive. This insures that the data it contains can be recovered in the future (for example, when balancing books at the end of the year).

CREATING A BACKUP: FLEXIBLE DISC TO FLEXIBLE DISC

The HP 260 is supplied with a utility program (DUPL) that copies the contents of one mass storage medium to another medium of the same type. This makes it ideal for backing up one flexible disc to another. Backups created with DUPL can be accessed directly; you need not use a recover utility to access a backup created with DUPL.

This portion of the manual describes how DUPL can be used to back up a disc. For detailed information (such as a description of its syntax), refer to your system's Utilities Manual.

The DUPL Utility

The utility program DUPL copies the entire contents of one mass storage medium to another medium of the same type. It can optionally record a label on the new disc, making that disc easy to identify later.

If your system is equipped with two flexible disc drives, you can copy directly from the flexible disc in one drive to the flexible disc in the other. If your system has only one flexible disc drive, you can use an option with DUPL that copies the flexible disc to a temporary file on another disc; after you place a fresh flexible disc in the drive, DUPL moves the temporary file to the new flexible disc.

DUPL has two modes of operation: duplication with checkread and duplication without checkread. Checkread is a procedure by which the system insures that each data value written to the new medium is identical to the data value read from the original medium.

Duplication with checkread is no more complicated to use than duplication without checkread. However, it is more time consuming than duplication without checkread since each byte of data written to the duplicate medium must be read and compared with the data read from the original medium.

Duplication without checkread is the least time consuming mode of operation. Because the reliability of HP disc drives and their media is very high, backups produced without checkread rarely differ from those created with checkread. However, an occasional error can occur. Should this happen, the file(s) affected by the error must be recovered from a previous backup.

The mode of operation you choose must balance the time required to produce the backup with the value of the data being copied. You may decide that your best choice is a mix of duplication strategies. For example, you may create daily backups without checkread and weekly backups with checkread.

What Every Principal Operator Should Know

Example

Suppose that your system is equipped with an HP 9133H Disc Drive. Each day you make few, but important changes to the data stored on the flexible disc labeled "TAXES1". Because of the importance of the data and the frequency with which the data is modified, you decide that the flexible disc should be backed up daily.

Since DUPL always copies the entire contents of one medium to another, you decide on a backup strategy that uses three flexible discs: two discs labeled "daily" and one disc labeled "weekly". You also decide to create backups using DUPL with checkread. Because the amount of data is relatively small, the additional time used in performing the checkread will be negligible.

- On Monday, create the first backup. Using DUPL, you copy the contents of TAXES1 to a temporary file on the HP 9133H fixed disc and then onto the flexible disc labeled "daily#1". The date is recorded on the disc's label and the disc is stored in a safe place.
- On Tuesday, create a second backup using the disc labeled "daily#2". Again, the date is recorded on the disc's label and the disc is stored in a safe place.
- On Wednesday, create a third backup using the disc labeled "daily#1". This erases the backup created on Monday. However, since the system is backed up on "daily#2", Monday's backup can safely be overwritten. Again, the date is recorded on the disc's label and the disc is stored in a safe place.
- On Thursday, create a fourth backup using the disc labeled "daily#2". This erases the backup created on Tuesday. The date is recorded on the disc's label and the disc is stored in a safe place.
- On Friday, create a fifth backup using the disc labeled "weekly". The date is recorded on the disc's label and the disc is stored in a safe place.

To help insure the integrity of the system, each weekly disc (a backup created with checkread) is kept for one month. Each month, the month-end weekly backup is placed in a permanent archive. This insures that you can recover this data if it is needed in the future.

CREATING A BACKUP: FIXED DISC TO FLEXIBLE DISC

This part of the manual describes the use of the backup utilities **BACKUP** and **RECOVR**, which are used to back up and recover non-**IMAGE** files. (An **IMAGE** file is a data base file created with **IMAGE** Data Base Software; **IMAGE** files are of file type **DSET** and **ROOT**.) This section also describes the use of the **DBSTORE** and **DBRESTORE** commands, which are used to back up and recover **IMAGE** files. With these utilities and commands, you can backup the entire contents of a mass storage medium or backup only selected files from a medium. If you need more detailed information about the use of the commands and utilities, refer to your system's Utilities Manual.

The programs and procedures described here can be used to back up non-**IMAGE** files from any mass storage medium to another; the backup medium and the source medium need not be of the same type. For example, with the **BACKUP** utility and the **DBSTORE** command, you can backup a flexible disc to a cartridge tape or backup a flexible disc to another flexible disc.

The **BACKUP** and **RECOVR** Utilities

The **BACKUP** program is a utility which backs up several non-**IMAGE** files. The backup can be created on mass storage media that are different from those on which the original file is stored.

When using **BACKUP**, you can specify that any of the following types of backups be created: a weekly backup, a daily backup, or a backup of selected files. A weekly backup is a full volume backup; all files stored on the original medium are copied. A daily backup contains only copies of files that have been accessed since the last weekly or daily backup was created. A backup of selected files contains copies of one or more individual files; you specify the names of the files to be backed up when you run the **BACKUP** utility.

To retrieve one or more files from a backup created with the **BACKUP** utility, use the **RECOVR** utility. This utility extracts files from the backup and copies them to a mass storage medium; the "destination" mass storage medium can be different from those on which the backup is stored.

The DBSTORE and DBRESTORE Commands

The **DBSTORE** command complements the **BACKUP** utility. **BACKUP** is used only to back up non-**IMAGE** files, while the **DBSTORE** command is used only to back up **IMAGE** data base files. The backup can be created on mass storage media that are different from those on which the original data base files are stored.

When using the **DBSTORE** command, you can specify which data sets are backed up: an individual data set, a sub-set of all data sets or the entire data base (including the root file).

To restore data to a data base from a backup, use the **DBRESTORE** command. This command restores all data sets from a backup created with **DBSTORE**; you cannot restore a portion of a backup with **DBRESTORE**. Thus, if a backup contains only two data sets, then both data sets are restored when **DBRESTORE** is executed. Similarly, if a backup contains the entire data base, **DBRESTORE** restores the entire data base when executed; you cannot restore a portion of a backup with **DBRESTORE**.

The **DBSTORE** and **DBRESTORE** commands can only be used if you have loaded the **DBSTOR** binary or if the **TOOLS DROM** has been configured for the system.

NOTE

DBUNLD and **DBLOAD** are not backup programs. Do not use them as such. Use **DBUNLD** and **DBLOAD** only if your data base becomes corrupt or if you wish to restructure your data base. Always execute **DBSTORE** to back up the data base before using **DBUNLD**; this insures data is not lost.

Example

Suppose that your system's only mass storage device is an HP 9133H Disc Drive. Therefore you must use its flexible disc drive to backup its fixed disc. You decide to create one full volume backup each week and daily backups on the remaining days of the week. You also decide to use a different flexible disc (or set of flexible discs) for each daily backup. To prepare for the backups, obtain a quantity of flexible discs and, using the **PRINT LABEL** command, record a label on each disc. For the weekly backups, you choose the volume labels "WEEK01", "WEEK02", "WEEK03", ... As you finish recording each volume label, you write the label on the flexible disc's paper label. For the daily backups, you choose the volume labels "MON01", "MON02", ..., "FRI01", "FRI02", ...

Since your **IMAGE** data base files must be backed up with a separate utility on separate discs, you also record volume labels on flexible discs for the data base backup. Again using the **PRINT LABEL** command, you record a label on each disc. For the weekly data base backup, you choose the volume labels "DBWK01", "DBWK02", ... For the daily backups, you choose the volume labels "DBMO01", "DBMO02", ..., "DBFR01", "DBFR02", ... Again, as each disc is removed from the drive, you write its volume label on the disc's paper label.

Once the preparation is complete, you are ready to start creating backups. The following is a description of a backup procedure you might follow:

- On Friday, perform a full volume backup. After inserting the volume labeled "WEEK01" into the flexible disc drive, run the BACKUP utility. Enter the appropriate responses to the program's prompts, and specify that a "weekly" backup is to be created. Once the first flexible disc is full, insert the volume labeled "WEEK02" and continue with the program. Continue this process with volumes "WEEK03", "WEEK04", ..., using as many discs as necessary to complete the backup.

At this point, only non-IMAGE files are backed up. To complete the system backup, repeat the previous procedure using the DBSTORE command with the volumes labeled "DBWK01", "DBWK02", "DBWK03", ...

After recording the date of the backup on each disc's label, the backup is stored in a safe location.

- On Monday, create the first daily backup. After inserting the disc labeled "MON01" into the flexible disc drive, run the BACKUP utility and select the "daily" backup option. After responding to the prompts and inserting additional discs as required, all non-IMAGE files that have been accessed since the last backup was performed are now backed up.

Next, using the DBSTORE command create a backup of all IMAGE files that have changed since the last backup was performed; use the flexible discs labeled "DBMO01", "DBMO02", ...

Once the backup is complete, write the date of the backup on each disc's label and then store the discs in a safe location.

- On Tuesday, repeat the procedures used to create Monday's daily backup; use the discs labeled "TUE01", "TUE02", ... and "DBTU01", "DBTU02", ... These backups contain all of the files that have been accessed since the backups were performed on Monday.

Once the backup is complete, write the date of the backup on each disc's label and then store the discs in a safe location.

- On Wednesday, repeat the procedures used to create Tuesday's daily backup; use the discs labeled "WED01", "WED02", ... and "DBWE01", "DBWE02", ... These backups contain all of the files that have been accessed since the backups were performed on Tuesday.

- On Thursday, repeat the procedures used to create Wednesday's daily backup; use the discs labeled "THU01", "THU02", ... and "DBTH01", "DBTH02", ... These backups contain all of the files that have been accessed since the backups were performed on Wednesday.

Once the backup is complete, write the date of the backup on each disc's label and then store the discs in a safe location.

To help insure the integrity of the system, keep the set of discs containing the weekly backup for one month. Each month, place the month-end weekly backup in a permanent archive. This insures that the data contained on the backup can be recovered in the future.

SUMMARY OF BACKUP TOOLS

Hewlett-Packard provides several different tools for backing up the files on your system's mass storage devices. The tool(s) you select for backing up your system depend on many different factors, such as the types of removable media mass storage devices connected to your system and the amount of time you have to create backups.

The following table is a summary of the advantages and limitations of each of the backup tools supplied by Hewlett-Packard.

TOOL	ADVANTAGES	LIMITATIONS
FVBACK	Fast; both IMAGE and non-IMAGE files backed up. Selected files or all files can be recovered.	Full backup only; to tape cartridge only
BACKUP	Can create full or partial backup to tape or disc	Time consuming; IMAGE database files not backed up
DBSTORE	Fast; to disc or tape.	Only IMAGE database files backed up
DUPL	Fast; both IMAGE and non-IMAGE files backed up	Must back up to identical type medium; full backup only

Note that each backup tool only enables you to restore files to their state at backup time. No automatic recovery is provided to recover changes made between the time the backup copy is created and the time that the failure takes place. If many applications modify certain data, you may want to back it up more frequently than you do the rest of your files.

Once you decide which backup procedure is right for your installation, arrange a backup schedule. Choose an alternate person to back up the system when the principal operator is not available. Then, publish the backup procedure to let all users know: who will backup the system, when the system will be backed up, and which files will be backed up. This allows all system users to arrange their schedules to avoid using the computer during backup.

Problems arise during the life of any computer system. Knowing how to handle these situations keeps your operation functioning smoothly.

In the event that an error occurs or the system becomes inoperable, you should take action to pinpoint the problem. By checking the system yourself, you may be able to avoid calling for service. In any case, you can minimize the time needed to get your system back into operation.

Ask your Principal Operator for help if you have problems with the procedures described in this section.

When an error occurs:

Stop what you are doing.

Look up all error messages; refer to the procedures described in this section of the manual.

Observe what is on the screen.

Write down this very important information.



Generally, any difficulty you encounter falls into one of the following categories:

- **Start-up Errors** - errors that occur during system power-up and during system software loading. This type of error can be caused by software or by hardware.
- **Operator Errors** - errors that occur when an operator attempts an incorrect procedure, enters an inappropriate command or enters an improperly formed command.
- **Software Errors** - errors that occur while a program is running; software errors are the result of an error in programming.
- **System Errors** - errors that occur because of a hardware failure or because of an error in the system software. When a system error occurs, an error message is displayed and all processing stops.
- **System Malfunctions** - malfunctions in the system that cause: system errors, software to abort, or performance that does not comply with published specifications.
- **Hardware Errors** - errors that occur when part of the system hardware fails.

Each of these types of errors and the procedures for dealing with them are described in this section. It may not always be obvious which kind of error has caused your problem and you may have to consult different subsections before you know which applies to your problem.

START-UP ERRORS

System start-up begins when you switch on your computer. First, the system performs a series of tests on its hardware. If the components pass the system self-test, the system next searches for the system software and loads it. Start-up errors can occur during system self-test or while the system software is loading.

Self-Test Failure

If any component of the SPU fails self-test, a message is displayed on the principal workstation. Should this happen, re-execute the system self-test by first turning the SPU off and then turning it on again. If the same component fails self-test again, your system requires service. Record the error message displayed in the last line of the display on the principal workstation; the information will be needed by the HP Application Engineer to help diagnose the problem. Then call your local HP Sales and Service Office.

If a component fails self-test only occasionally, you need to make a record of each failure. Note the time and date of the failure, the exact message displayed on the system console, and all circumstances that could be associated with the error. For example, if the error occurs while a large machine is operating near the system, the error could be caused by magnetic interference. Lights flickering or dimming when an error occurs could indicate power line problems.

System Loading

Once all components have passed self-test, the system begins searching for the system software. If it cannot find the SYSTEM file (the file containing the system software) on any mass storage device, the following message is displayed on the principal workstation:

"The system file was not found."

This means that the mass storage device containing the SYSTEM file could not be accessed or that the file no longer exists on the system's mass storage devices. Make sure that the mass storage device containing the system software is connected to the system and powered up. If you are attempting to load from a removable media mass storage device, make sure that the correct medium has been inserted in the device and that it has been inserted properly. Then start the system again. If the SPU still can't find the system software, try loading from a backup copy of the SYSTEM file. If this procedure is unsuccessful, record the resulting error message(s) and contact your local HP Sales and Service Office for service.

When a mass storage device is powered up, it requires a short amount of time to complete its self-test and to "warm up". The amount of time required varies with the device but is generally proportional to the storage capacity of the device. Allow a minimum of 20 seconds for discs. When a cartridge tape is inserted into a tape drive, time is needed for the tape to rewind. This process can take between 30 seconds and two minutes, depending on the length of the tape. While the HP 260 is searching for a SYSTEM file, the following message is displayed on the principal workstation:

"The system is waiting for the disc to warm up."

The system waits for up to eight minutes for a SYSTEM file to be found. Then, if no SYSTEM file has been found, the following message is displayed:

"The system file was not found."

This message indicates that the 'SYSTEM' file is not present on the mass storage medium or that a hardware failure has occurred.

Loader Errors

Loader errors indicate that the system was unable to load the system software. If you encounter a loader error, refer to this manual's appendix titled "Error Messages". For example, suppose the following message appears on the principal workstation:

LOADER ERROR B

By checking the appendix in this manual, you find that the SPU encountered a disc read error when trying to load the system software.

Loader errors A through C may indicate that the medium holding the operating system is worn or damaged. Should one of these loader errors occur, try loading the system from a backup copy of the operating system software.

When loading the system software from a cartridge tape, you must wait until the tape begins to rewind before powering on the SPU. Failure to do this can cause the load to fail and the following message to be displayed:

LOADER ERROR F

If this error occurs when trying to load from tape, wait until the tape has finished rewinding; then power on the SPU. If the message still appears on the principal workstation, a hardware problem exists with the disc or tape drive. Record the error message(s) and call your local HP Sales and Service Office for service.

If any loader error persists after repeated tries and the medium is not worn, record the error message and call HP for service.

In Case of Difficulty

Configuration Errors

Configuration messages indicate an inconsistency in hardware/operating system configuration. Although your system can operate with these inconsistencies, they should be corrected as soon as possible to avoid problems.

For example, if the operating system was told (via the CONFIG Utility Program) to expect more memory than is actually available or if a memory block has failed, a message of the following form appears on the principal workstation:

MEMORY FAILURE - BLOCK XX...

If the problem is simply that the system was told to expect more memory than is available, the Principal Operator can run the CONFIG utility and correct the problem. If the problem was caused by the failure of a memory block, you can continue using the system; however, you should call your local HP Sales and Service Office for service so that your system can be returned to full capacity.

Configuration error messages are described in this manual's appendix titled "Error Messages".

OPERATOR ERRORS

Operator errors occur when an operator attempts an incorrect procedure, executes an inappropriate or improperly formed command. Such errors are usually the result of a typographical error. For example, an operator error would occur if, when trying to execute the equation "2 + 2", you type in the incomplete computation "2 +", the system displays the following:

```
2 +  
IMPROPER EXPRESSION
```

When an operator error occurs, the system displays an error message and then positions the cursor on the display to indicate where the system encountered difficulty. In the previous example, the error message was **IMPROPER EXPRESSION** and the cursor was positioned immediately after the "+". This indicates that not enough information was entered to form a proper expression.

SOFTWARE ERRORS

Software or programming errors are caused by an error in a program being run on your system. Given the identical set of operating conditions, a software error occurs repeatedly. Software errors are shown on your workstation's display and have the form: **ERROR XX IN LINE YYYY**. A description of each error message is provided in this manual's appendix entitled "Error Messages".

If a software error occurs, note all events and conditions preceding the error, including: the key sequence you pressed, any error message displayed (and the line number, if indicated), all incorrect program output, and the number of the form or report being used when the error occurred. This information helps the program's author diagnose the problem when you report it.

If your workstation's keyboard does not respond after a software error occurs, press **HALT** or **BREAK** to stop the program. If that is not effective, press **SHIFT HALT** or **CONTROL Y**. If the keyboard still does not respond, press **CONTROL HALT** or **ESCAPE CONTROL Y** (this resets memory, erasing programs and data from this user's partition).

In Case of Difficulty

- If you want to use a local printer connected to a PC workstation on integrated serial port -1 or -2 (HP 260 Series30/Series40 only) to receive the memory printout, use the following procedure.

Set "LOCK BOTTOM" on your PC. Then press P to print the contents of memory.

Keep this printout with the copy of the workstation display you made. This information helps your Hewlett-Packard Service Representative to find out what caused the error, and how to stop it from happening again.

NOTE

There are several conditions that can prevent the system from generating an error report. If you find it impossible to make a printout of the contents of the memory, continue with Step 3.

3. Re-start the system.
4. Notify your Hewlett-Packard Customer Engineer about the system error. Have the information you recorded in steps 1 and 2 ready when he arrives to service the system.
5. If the HP Customer Engineer determines that the error was not caused by a hardware failure, the error is caused by a malfunction in the system software. Follow the procedures for reporting the system malfunction, described later in this section.

SYSTEM MALFUNCTIONS

A system malfunction is a flaw in either the system hardware or the operating system. It leads to aborts of application software programs, to system errors or to performances that do not comply with published specifications. If you have purchased software support services, you can report a system malfunction directly to Hewlett-Packard, using the procedures outlined in the following paragraphs. If you have not purchased software support, gather the information as described in the following paragraphs and call your local HP Application Engineer or your software supplier.

If you find a system malfunction, fill out an SR (Service Request, a form for reporting system malfunctions); these are supplied to customers purchasing software support. Send the completed SR with the following documentation to the SR monitor at your local HP office:

- Listings of any short programs that demonstrate the failure. If possible, include copies of these programs on magnetic tape or flexible disc.
- A copy of the the principal workstation display, if a system error was generated by the failure. Also, if you were able to print a report on the system printer when the system error occurred (as described earlier in this section, in the paragraphs titled "System Errors"), include that report.
- A list of all commands and input that produce the problem.
- Any printed outputs produced by the program(s) in which the error occurs.
- A configuration report from the system (refer to the HP 260 Utilities Manual for a description of the CONFIG Utility).

Once the SR has been submitted with the accompanying documentation, your field support team reviews and verifies the problem. Your HP AE (Application Engineer) attempts to reproduce the problem, if possible, and checks to see if this is a "known problem". If it is, a solution or at least a temporary workaround for the problem may already exist. If the problem is new, the AE completes a verification form and forwards it to Hewlett-Packard development engineers for resolution. While waiting for a final resolution to come from the development engineers, your AE will work with you to provide a temporary solution.

After your SR has been received at the factory, it is assigned a reference number. Hewlett-Packard then sends a letter to you and your AE to acknowledge receipt of the SR.

Your AE will notify you of the classification and solution of the problem. The speed with which a problem can be solved depends directly on how well it is isolated, on whether it is reproducible, on the accuracy of the SR, and on the quality of the accompanying documents.

HARDWARE ERRORS

Sometimes it is difficult to determine whether it is the hardware or the software that is causing a particular problem. If your error sounds similar to one of the following, it may be due to a hardware malfunction:

- A single workstation is not operating - no cursor is displayed and the system does not respond to the workstation's keyboard.
- Several workstations or the entire system is not operating - no cursors are displayed on the workstations and the system does not respond to workstation keyboards.
- A peripheral is reacting strangely. For example, a disc drive is making an unusual noise, a workstation is producing unusual characters or a printer is adding extra characters or lines to a printout.

NOTE

If you have a power failure, you might find that you have lost some data. This can happen with any computer, and is in no sense a hardware malfunction.

Workstation Does Not Operate

On occasion, a workstation may not display a cursor or the system may not respond to the workstation's keyboard.

If the cursor is displayed, but the system does not respond to the workstation's keyboard, make sure that the workstation's keyboard is securely connected to the workstation. Also make sure that the cables connecting the workstation to the system are securely attached. Next make sure that the rest of the system is still operating; the workstation not functioning could indicate a larger problem (refer to "Multiple Workstations Do Not Operate" later in this section). Finally, ask the Principal Operator to run the CONFIG Utility to ensure that the operating system is configured to use the workstation.

If the system still does not respond to the workstation's keyboard or the workstation's cursor is not displayed, try the procedures listed below to correct the problem.

If the problem occurs with an HP 2392A workstation, or with an HP 150, HP Vectra or HP Portable Plus personal computer:

1. Press the **(SHIFT)** and **(ESCAPE)** keys at the same time (on an HP Vectra press the **(CONTROL)** key and the key labeled ← at the same time).
2. Press the workstation's **(BREAK)** key. If this does not solve the problem, press the **(CONTROL)** key and the key labeled "Y" at the same time. Then press the **(SHIFT)** and **(ESCAPE)** keys at the same time (on an HP Vectra press the **(CONTROL)** key and the key labeled ← at the same time). If the cursor still is not displayed, press the **(ESCAPE)** key. Then press the **(CONTROL)** key and the key labeled "Y" at the same time. Then press the **(SHIFT)** and **(ESCAPE)** keys at the same time (on an HP Vectra press the **(CONTROL)** key and the key labeled ← at the same time).
3. Check the configuration of the workstation and the cabling, if the problem persists.
4. If the problem still isn't solved, turn the workstation off and then on again. Then press the **(SHIFT)** and **(ESCAPE)** keys at the same time (← on the HP Vectra).
5. If the workstation still does not operate, call your Hewlett-Packard Application Engineer to repair the workstation.

If the problem occurs with an HP 2622D workstation:

1. First, press the workstation's HALT key. If that does not cause the cursor to re-appear on the display, press **(SHIFT)** **(HALT)**. If the cursor still does not appear on the display, press **(CONTROL)** **(HALT)**.
2. If the cursor is still not displayed, turn the workstation off. Make sure that the power cable is plugged firmly into the workstation and into a power outlet. Check all cables on the back of the workstation to be sure they are securely connected. Turn the workstation back on. Listen for a "beep" shortly after the power is switched on; if the terminal does not beep, there is a hardware problem with the terminal or electrical power is not reaching the terminal.
3. Press the workstation's TEST key.
4. Press the workstation's RESUME key.
5. If the workstation still does not operate, call your Hewlett-Packard Application Engineer to repair the workstation.

In Case of Difficulty

If the problem occurs with an HP 4526xD workstation:

1. First, press the workstation's **(BREAK)** key. If that does not cause the cursor to re-appear on the display, press **(SHIFT)(BREAK)**. If the cursor still does not appear on the display, press **(CONTROL)(BREAK)**.
2. If the cursor is still not displayed, turn the workstation off. Make sure that the power cable is plugged firmly into the workstation and into a power outlet. Check all cables on the back of the workstation to make sure that they are securely connected. Turn the workstation back on.
3. If the workstation still does not operate, call your Hewlett-Packard Application Engineer to repair the workstation.

Multiple Workstations Do Not Operate

If several of the system's workstations do not operate, the interface for the workstations may not be functioning. Alternatively, this can indicate that the workstations are not configured. This can happen if you load the system software from a different source than usual. For example, suppose that you normally load the system software from the HP 7946A fixed disc. However, a new system tape was received and the software was loaded from that tape. The new system software does not "know" how many workstations are connected to the system. The Principal Operator can run the CONFIG Utility to correct this problem.

If multiple workstations do not operate and you are not loading the software from a different location than normal, turn the system off. Check plugs and cables to be sure they are securely connected. Turn the system back on. A boot-up message on the principal workstation may also indicate an error. If this does not solve the problem, contact your Hewlett-Packard Application Engineer for service.

Peripheral Malfunction

If you have not changed the way you use a peripheral and it begins operating in an unexpected way, it is likely that the peripheral has a hardware problem. Make sure your peripherals are "on-line" and configured correctly. You might be booting from a different system source medium than you expect. If this check did not solve the problem, turn the peripheral off; then check cable and plug connections. Using the peripheral's manual, perform the peripheral self-test and observe the results. Additionally, run the system tests described later in this section to verify the peripheral's operation. If the peripheral fails either its self-test or the system test, call your Hewlett-Packard Application Engineer for service. Further use of a peripheral with a problem could cause damage to that device and/or to the system software and data.

Power Failure

A power failure or change in power can have a wide range of effects. It can have no effect or it can cause considerable loss of data. If a power failure occurs, re-start the system after power returns. Check the files on the system's mass storage devices to determine if anything has been lost. If needed, restore any lost files or data using the most recent backup of the lost files.

SYSTEM TESTS

The HP 260 SPU performs a series of self-tests immediately after power is switched on. You can perform additional tests to verify system operation by running the TEST program, which is included with the system software. Tests are available for checking the keyboard, display, printer, and mass storage media.

Except for the keyboard test, all tests described here can be run from any workstation.

To run the TEST program, execute the following command:

RUN "TEST"

Then select the test from the initial test menu:

SYSTEM TESTS							
DISPLAY TEST	- Provides utilities for CRT re-adjustment and testing.						
PRINTER TEST	- Allows system printers to be tested.						
MEDIA TEST	- Allows HP format media to be tested, and provides a limited class of error recovery facilities.						
IBM MEDIA TEST	- Allows IBM format media to be tested.						
PLOTTER TEST	- Checks plotter configuration and exercises GPL.						
MISC. TESTS	- Provides tests for various other parts of the 260 hardware.						
Please select a function							
DISPLAY TEST	PRINTER TEST	MEDIA TEST	IBM MEDIA TEST	PLOTTER TEST	MISC. TESTS		EXIT PROGRAM

The softkey labeled "MISC. TESTS" allows you to access the keyboard test (described later in this section).

Display Tests

Press the softkey labeled "DISPLAY TEST" to list the available display tests, as shown below:

SYSTEM TESTS DISPLAY TEST							
DISPLAY CHECK - Tests basic CRT functions such as video enhancements and character generation ROMs.							
DISPLAY RAM - Puts various bit patterns in the display RAM. A visual inspection must be made that the patterns are correct.							
FOCUS & ALIGN - Displays a pattern on the CRT to aid in alignment.							
CYCLE MODE - Toggles the cycle mode. If the cycle mode is ON, the DISPLAY CHECK or the DISPLAY RAM test will repeat forever.							
							CYCLE MODE: OFF
Please select a function.							
DISPLAY CHECK	DISPLAY RAM	FOCUS & ALIGN				CYCLE MODE	EXIT

The "DISPLAY RAM" and "FOCUS & ALIGN" tests are to be used by HP Customer Engineers only.

Pressing the softkey labeled "DISPLAY CHECK" causes a series of inverse-video fields to be displayed initially. This allows you to check the screen for blank areas or stray dots. Next, the entire character set is displayed. The optional European and Katakana character sets are not displayed unless the system configuration specifies that they are to be loaded with the operating system.

After examining the final display, press the softkey labeled "EXIT" to return to the menu for display tests. Then press the softkey labeled "EXIT" to return to the main menu for the system tests.

Printer Test

Press the softkey labeled "PRINTER TEST" to test one or more printers connected to your system. This causes the following menu to be displayed:

SYSTEM TESTS PRINTER TEST							
PRINTER TEST - Tests the currently selected printer. Various options are available when testing each kind of printer.							
SELECT PRINTER - Allows the printer to be tested to be specified.							
CYCLE MODE - Toggles the cycle mode. If the cycle mode is ON, the PRINTER TEST will repeat forever.							
Printer is currently CRT. CYCLE MODE: OFF							
Please select a function.							
PRINTER TEST				SELECT PRINTER		CYCLE MODE	EXIT

The printer currently selected for testing is shown on the right side of the display (labeled "Printer is currently ... "). To select a different printer for testing, press the softkey labeled "SELECT PRINTER". This causes the device addresses of all printer(s) currently on-line to be displayed. Specify the device address of the printer to be tested by pressing the appropriate softkey. Next, press the softkey labeled "PRINTER TEST". This displays the following menu, allowing you to choose the printer test to be run:

SYSTEM TESTS PRINTER TEST							
PROCEED	- Runs standard printer test.						
RIPPLE PRINT	- Runs a ripple print test. This test runs until the EXIT key is pressed.						
CYCLE MODE	- Toggles the cycle mode. If the cycle mode is ON, the PRINTER TEST will repeat forever.						
							Printer is currently 0. CYCLE MODE: OFF
Please select a function.							
PROCEED					RIPPLE PRINT		EXIT

The "RIPPLE PRINT" test prints a full page of ASCII characters. Each successive line, the ASCII characters are shifted one space to the left, causing the characters to "ripple" down the page:

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL ...
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM ...
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN ...
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO ...
```

The "RIPPLE PRINT" test allows you to check that all characters are printing clearly in all positions on a page. If characters are missing or misformed, contact HP for service. Note that lightly printed characters could be caused either by a worn or defective ribbon, or by a dirty print head. Refer to the printer's operating manual for details on changing the ribbon or cleaning the print head.

The "PROCEED" printer test invokes the printer's standard test, including the printer's self-test. Check the printout of this test with printouts from previous tests to make sure that all character sets within the printer are functioning properly.

Press the softkey labeled "EXIT" to return to the main menu for the system tests.

Media Test

To test the storage medium of one or more of the system's mass storage devices, press the softkey labeled "MEDIA TEST". This causes a menu similar to the following to be displayed:

SYSTEM TESTS MEDIA TEST							
VERIFY	- Verifies a media using tight margin read. Will optionally attempt to recover certain classes of errors.						
CHECK AVT	- Rebuilds the availability table from the directory. Will report any overlapping files which occur.						
RECORD 0 RECOVERY	- Will attempt to recover a media which is giving error 85's because of a trashed sector 0.						
SELECT DEVICE	- Allows the device to be tested to be specified.						
Currently selected device is :C2,5,0							
Please select a function							
VERIFY	CHECK AVT	RECORD 0 RECOVERY		SELECT DEVICE			EXIT

The mass storage device currently selected for testing is listed near the lower right corner of the display (labeled "Currently Selected Device is ..."). If you want to test the medium of a different mass storage device, press the softkey labeled "SELECT DEVICE". This causes the model number and device address of all mass storage devices currently on line to be displayed. Each softkey is re-labeled with the name and address of one of the mass storage devices. Specify the medium to be tested by pressing the appropriate softkey; the menu for the media tests is again displayed.

The media test verifies a medium by reading each file stored on it. After pressing the softkey labeled "VERIFY", you must tell the test program what to do if it encounters an error while reading a file; press either the softkey labeled "W/O RECOVERY" or the softkey labeled "WITH RECOVERY".

If you press the softkey labeled "W/O RECOVERY", any error encountered is reported to your workstation's display; the test continues automatically. Errors are reported in the following form:

head#:track#:sector# error-type

For example, if an error was detected when reading from track 67, sector 11 with disc head 1, the following error message would be sent to the display:

1:67:11 (POSS.)

The error type "(POSS.*)" indicates that this read error may be recoverable by re-running the media test while using the "WITH RECOVERY" option.

An asterisk (*) appears in place of the sector number when successive sectors of a track cause errors. For example, the following error messages indicate that read errors occurred in sectors 11, 12, and 13 of track 9:

**1:9:11 (POSS.)
1:9:* (POSS.)
1:9:* (POSS.)**

NOTE

Select "WITH RECOVERY" only if you are sure that the problem is not hardware related. If a disc drive has been bumped or jarred, the drive's read-write heads may be moved out of alignment causing the disc to be unable to read disc files. Additionally, with long ownership read-write heads may "drift" out of alignment; recently recorded files will be readable, but files created months before may no longer be readable.

Before selecting "WITH RECOVERY", try accessing files from several older floppies as well as from newer floppies, if the problem occurs with a flexible disc. If the problem occurs with a fixed disc, try accessing several older files as well as several newer files on the disc. If there are problems with reading these files, consult your HP Customer Engineer before attempting to recover the files.

Files recovered while the disc heads are out of alignment may not be readable when the heads are re-aligned later.

When "WITH RECOVERY" is selected, the test stops to display the location and type of each error from which there is a chance to recover. When this occurs, the system displays an error message and prompt of the following form:

Possibly recoverable error in file 'name file_type' at XX:YY:ZZ

Attempt recovery?

In Case of Difficulty

In this sample message, XX represents the disc head number, YY represents the track number and ZZ represents the sector number where the error occurred. Before proceeding, write the name of the file on a piece of paper (in case you need to manually recover the file). If you want the test program to attempt to recover the file containing the error, press the softkey labeled "YES"; otherwise press the softkey labeled "NO". If the test program fails to recover a file containing an error, you can attempt to manually recover the file yourself.

If the test program fails to recover a file of type "PROG", you can try to recover the file by loading it into memory. **Before** you attempt this recovery, shut down all other tasks on your computer system (after making sure that all users have completed their work). This precaution is essential because, in most cases, the attempt to load a defective PROG file causes a system error.

Try to load the defective PROG file, using the LOAD command. If the attempted load causes a system error or a workstation hang, power off your computer system. Then power it on again, and purge the defective PROG file.

If the load is successful, and error messages listing the defective lines of the PROG file are displayed, correct these defective lines, and re-store the file to the original mass storage device (from which it was loaded). Before you tell other users that they can start to work again, try to load the corrected PROG file again. If it is successfully loaded without error messages, you have recovered it.

To manually recover a file of type "DATA", first try to copy the file into memory with the GET command (if the file contains a program). Then copy the program to a different medium using the SAVE command. If the "DATA" file does not contain a program, try reading its contents into memory with the READ\$ statement. Then write the data to a different medium using the PRINT\$ statement.

To recover a file of type "DSET" or "ROOT", attempt to serially unload the data using the DBUNLD Utility and then to recreate the file as described in your system's Utilities Manual.

Files that are not of type "PROG", "DATA", "DSET" or "ROOT" can only be recovered via the "VERIFY" option (and the "WITH RECOVERY" option) of the media test.

NOTE

The detection of any errors on a medium indicates either that the medium is worn or defective or that the drive requires service. After using the media test (with the "WITH RECOVERY" option), the medium should be backed up to another medium.

If the message "Error in Main Directory" appears when running the media test (with the "WITH RECOVERY" option), press the softkey labeled "EXIT". Then press the softkey labeled "CHECK AVT". This rebuilds the medium's availability table. If the test fails to rebuild the availability table, press the softkey labeled "RECORD 0 RECOVERY". This copies the medium's spare directory to its main directory. Then press the softkey labeled "CHECK AVT" again. Once the main directory and the availability table are fixed, press the softkey labeled "VERIFY" to verify the medium on which the files are stored.

IBM Media Test

To test an 8" IBM format 1/4 Mbyte flexible disc, press the softkey labeled "IBM MEDIA TEST". A menu similar to the following is displayed:

SYSTEM TESTS MEDIA TEST							
VERIFY	- Verifies an IBM 1/4 mbyte media using tight margin read.						
SELECT	- Allows the device to be tested to be specified.						
Currently selected device is none.							
Please select a function							
VERIFY				SELECT DEVICE			EXIT

The mass storage device currently selected for testing is listed near the lower right corner of the display (labeled "Currently selected device is ... "). If you want to test the medium of a mass storage device that is different than the one displayed, press the softkey labeled "SELECT DEVICE". This causes the model number and device address of all mass storage devices currently on line to be displayed. Each softkey is re-labeled with the name and address of one of the mass storage devices. Specify the medium to be tested by pressing the appropriate softkey; the menu for the IBM media test is again displayed.

The media test verifies a medium by reading each file stored on it. Press the softkey labeled "VERIFY" to start the test. Displayed messages indicate the test's progress, total errors encountered and the location of each error.

Keyboard Test

If you have an HP 4526xD workstation or an HP 2622D workstation, you can test its keyboard. The other workstations supported on your computer system cannot be tested in this way. To start the test, on an appropriate workstation, press the softkey labeled "MISC. TESTS". The following screen will be displayed.

SYSTEM TESTS MISCELLANEOUS TESTS							
ROM TEST	- Verifies that the checksum in the loader and parse table ROMs are correct.						
7 SEGMENT LED	- Tests the 7 segment LED display on the processor board.						
THUMB SW. TEST	- Tests the switch positions of the thumb wheel on the processor board.						
KEYBOARD TEST	- Tests keyboard of main console.						
CYCLE MODE	- Toggles the cycle mode. If cycle mode is ON, the ROM TEST will repeat forever.						
							CYCLE MODE: OFF
Please select a function							
ROM TEST	7 SEGMENT LED TEST	THUMB SW. TEST	KEYBOARD TEST			CYCLE MODE	EXIT

This menu allows access to several tests; tests other than the keyboard test should be used only by HP Customer Engineers (they are used as a tool to help the CE repair the system).

Pressing the softkey labeled "KEYBOARD TEST" causes a representation of your workstation's keyboard to be displayed. Each key is represented by an "arrow" character.

As a key on the workstation's keyboard is pressed, the arrow character representing that key on the display is replaced with an asterisk (*); an arrow appears at the lower left corner of the display to indicate if **CONTROL**, **SHIFT**, CAPS or CAPS-LOCK key is pressed with that key. The "key press indicator" changes position as each key is pressed.

If a "the key press indicator" does not change position when a key is pressed, that key is defective. Call your local HP Sales and Service Office for assistance.

Press the space bar to return to the menu for "MISC. TESTS".

Plotter Test

Press the softkey labeled "PLOTTER TEST" to test one or more plotters connected to your system. This causes the following menu to be displayed:

HP 260 PLOTTER SYSTEM/CONFIDENCE TEST Introduction							
Objectives of this test:							
1. Verify that a graphics plotter is properly connected and configured to your HP 260 Computer System.							
2. Verify that required plotter functions are working.							
You should:							
1. Turn on your plotter and load clean paper.							
2. Follow the rest of the instructions in this program.							
3. Examine the plot and compare with the picture in the manual OPERATING AND MANAGING YOUR HP 260. Please be sure that no picture detail is missing.							
4. If the picture is incorrect, see OPERATING AND MANAGING YOUR HP 260 for further instructions.							
Press CONTINUE when your plotter is ready.							
CONTINUE							EXIT PROGRAM

After reading the displayed instructions, press the softkey labeled "CONTINUE". The system displays the model number and device address of each plotter the program can currently test. If the model number and address of the plotter you want to test is displayed, follow the procedures described in this section's paragraphs titled "Running the Confidence Test". If the plotter you want to test is not shown on the display or if you want to alter the choice of plotters shown in the display, you must change the plotter test's configuration; follow the procedures described in this section's paragraphs titled "Adding, Changing and Deleting Plotters".

In Case of Difficulty

Adding, Changing, or Deleting Plotters

The plotter test program keeps a list of the plotters that it can test in a file named "GPL%CF"; each plotter in the list is identified by a model number, a model type and a device address. If you want to add a plotter to this list, to delete a plotter from the list or to change the address of a plotter in the list, press the softkey labeled "EDIT GPL%CF". This causes the system to display the model number, model type and device address of each plotter that it can test. At the same time, the softkeys are re-labeled "ADD PLOTTER", "CHANGE PLOTTER" and "DELETE PLOTTER". Press the appropriate softkey for the change you want to make; then respond to the prompts from the system by pressing a softkey.

Running the Confidence Test

When you are ready to test the plotter, press the softkey that is labeled with the correct model number, model type and device address. The plotter selected is then displayed in the center of the screen. After selecting the device to be tested, you are prompted to enter the size of paper used in the plotter. Additionally, you are given the option of running a "SIMPLE" test or a "COMPLETE" test; sample plots showing the plots produced by each type of test are supplied at the end of this section.

When running the "COMPLETE" test, you are prompted to enter the current date and a "run number". This information appears in the final test plot, making it easy to keep an archive of the different tests performed on the plotter.

After all information about the plotter address and the size of the paper have been entered, a new menu is displayed and the softkeys are re-labeled "START PLOTTING" and "ABORT PLOT". Press the key labeled "START PLOTTING" to begin the test. You can halt the test by pressing the softkey labeled "ABORT PLOT" at any time during the test.

Compare the plot drawn for the confidence test with the samples shown on the following pages. If the result of the test is a partial plot or no plot at all, the plotter may not be properly connected to the system or the plotter may need servicing.

NOTE

Certain values and figures, such as the number of pens, which are displayed in the confidence plot depend on the model of the plotter.

TEST
COMPLETED

SIMPLE Test Result

GPLCFT - GRAPHICS DEVICE/SYSTEM CONFIDENCE TEST

Slowest velocity test.

Run# 1

NINE LIFESTYLES

EIGHT PENS

Device address=
Buffer size=928 bytes

0 _____
 1
 2
 3
 4
 5
 6
 7
 8
 9

1 _____
 2 _____
 3 _____
 4 _____
 5 _____
 6 _____
 7 _____
 8 _____

TEXT ROTATION-9

TEXT ROTATION-1

TEST
COMPLETED

TEXT ROTATION-2

! " # \$ % & ' () * + , - . / £
 0 1 2 3 4 5 6 7 8 9 : ; < = > ? - ' " ç Ñ Ñ ÿ z ð £ ¥ S
 @ A B C D E F G H I J K L M N O ã è ð Ó á é ó ú à è ò ù ã è ð Ó
 P Q R S T U V W X Y Z [\] ^ _ Å î ð Æ á í ø æ Å î Õ Ü É ß
 ` a b c d e f g h i j k l m n o
 p q r s t u v w x y z { | } ~

COMPLETE Test Result

TESTING DISC DRIVES

Many HP disc drives have the ability to perform self-tests in which the disc executes a pre-defined, hardwired test to verify its operation. Similarly, many HP disc drives automatically log any failure or problem that occurs during normal operation; the information is stored in a special maintenance area of the disc (called the "disc log") and is usually accessible only to HP Customer Engineers.

MSTEST is a utility which allows you to initiate a disc's self-test and to read the contents of its disc log. The results of the self-test and the contents of the disc log are stored in a normal ASCII DATA file. With MSTEST, you can obtain a printed copy of the test results.

When Should MSTEST Be Run?

HP disc drives are highly reliable mass storage devices that fail only rarely. If you suspect that there are problems with one or more of your system's mass storage devices, run MSTEST. If a device fails its self-test or if there are a large number of log entries for the device, print a copy of the test results for use when calling your HP Customer Engineer for service.

MSTEST also provides usage information for cartridge tapes. It reports the number of times the tape has been loaded and the number of blocks accessed. If the number of tape loads exceeds 2000, the tape should be copied and then discarded. Similarly, if the total number of blocks accessed exceeds the value listed below, the tape should be copied and then discarded:

16.7 Mbyte Cartridge Tape (HP 88140SC): 2,186,700

67 Mbyte Cartridge Tape (HP 88140LC): 8,777,000

Running MSTEST

To test your system's disc drives, do the following:

1. Make sure that no other users or tasks are operating on the system. All files must be closed and disc activity must be halted before running MSTEST.
2. Set the default mass storage volume to be the volume containing MSTEST by executing the following:

`MASS STORAGE IS volume specifier`

3. Run MSTEST by executing the following command:

`RUN "MSTEST"`

In Case of Difficulty

4. MSTEST next displays a screen similar to the following, identifying the file on the default mass storage volume in which test results will be stored. MSTEST accumulates all test results in this file until the test program is terminated (by pressing the softkey labelled "EXIT PROGRAM").

The name of the file that MSTEST creates is of the form: Mstfxx (where xx is a two digit number). MSTEST examines the default mass storage device for existing result files, calculates a unique file name, and displays the file name beside the label "New result file is : ".

MASS STORAGE DEVICES TESTING PROGRAM							
Please make sure that nobody is working with the system !							
.... someone is still working with DBSYS:T2,5,0 !!!							
New result file is : Mstf04							
System busy installing table of HPIB-devices .							
							EXIT PROGRAM

NOTE

If any files on the system are still in use, MSTEST displays a message in inverse video (as in the preceding example screen). The message lists the volume label (if any) and unit specifier of the volume containing files that are still being accessed. Should this occur, you must wait until the files are no longer "open" before proceeding with the disc test. Alternatively, you can press the softkey labelled "EXIT PROGRAM" to terminate MSTEST; then re-start MSTEST when all other system activity has stopped.

5. MSTEST next identifies all devices connected to the system via HP-IB and lists these devices on the display. This information and the choices offered by the softkeys are collectively referred to as MSTEST's MAIN screen. For example:

MASS STORAGE DEVICES TESTING PROGRAM						
Actual result file is : Mstf04						
HPIB	DEVICES	UNIT 0	UNIT 1			
0	2934 printer					
1						
2	9133 : disk + 3.5"floppy	SOURCE1	empty	no logs		
3	7942 : disk + tape drive	DBSYS	UTILS04			
4	7908 : disk + tape drive	SALES	empty			
5	5 MB disk drive	no label		no logs		
6	8" floppy disk	empty		no logs		
7						
Waiting for commands.						
SELECT ONE		SELECT ALL	PREVIOUS RESULTS			EXIT PROGRAM



The column headings identify the following information:

HPIB - this is the device's HP-IB address.

DEVICES - this provides a short description of the device.

UNIT 0 - this is the volume label of the volume in unit 0 of the device at the specified HP-IB address. The message "empty" is displayed if no volume is present in unit 0. If the message "no label" is displayed, the volume is not labelled.

UNIT 1 - this is the volume label of the volume in unit 1 of the device at the specified HP-IB address. The message "empty" is displayed if no volume is present in unit 1. If the message "no label" is displayed, the volume is not labelled.

Devices that can be tested with MSTEST are displayed in full-bright video (**bold font** in the example displays); devices that cannot be tested with MSTEST are displayed in half-bright video (normal font in the example displays).

If the message "no logs" is displayed beside a device, MSTEST cannot access the device's disc maintenance area or the device does not log errors.

In Case of Difficulty

To test a single disc drive, press the softkey labelled "SELECT ONE". Refer to the paragraphs titled "Testing a Single Disc Drive" for further instructions.

To test all disc drives connected to the system, press the softkey labelled "SELECT ALL". Refer to the paragraphs titled "Testing All Disc Drives" for further instructions.

To print the results of a previous test, or to purge a file containing the results of a previous test, press the softkey labelled "PREVIOUS RESULTS". Refer to the paragraphs titled "Printing/Purging Test Results" for further instructions.

To exit the test program, press the softkey labelled "EXIT PROGRAM". If any errors have been detected during testing, MTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

Testing a Single Disc Drive

If you press the softkey labelled "SELECT ONE" when running MSTEST, a screen is displayed allowing you to select the disc drive to be tested. For example:

MASS STORAGE DEVICES TESTING PROGRAM							
Actual result file is : Mstf04							
HPIB	DEVICES	UNIT 0	UNIT 1				
0	2934 printer						
1							
2	9133 : disk + 3.5"floppy	SOURCE1	empty			no logs	
3	7942 : disk + tape drive	DBSYS	UTILS04				
4	7908 : disk + tape drive	SALES	empty				
5	5 MB disk drive	no label				no logs	
6	8" floppy disk	empty				no logs	
7							
Waiting for commands.							
BAR UP			BAR DOWN	SELECT THIS			EXIT

The disc to be tested is highlighted by an inverse video "bar". Press the softkeys labelled "BAR UP" and "BAR DOWN" until the disc you want to test is highlighted by the bar; then press the softkey labelled "SELECT THIS".

In Case of Difficulty

MSTEST next displays a screen similar to the following, allowing you to specify the type of test to be performed.

MASS STORAGE DEVICES TESTING PROGRAM						
Actual result file is : Mstf04						
HPIB	DEVICES	UNIT 0	UNIT 1			
0	2934	printer				
1						
2	9133	: disk + 3.5" floppy	SOURCE1	empty		no logs
3	7942	: disk + tape drive	DBSYS	UTILS04		
4	7908	: disk + tape drive	SALES	empty		
5	5 MB	disk drive	no label			no logs
6	8"	floppy disk	empty			no logs
7						
Waiting for commands.						
INITIATE SELFTEST			READ LOGS		CHANGE SELECTION	EXIT PROGRAM

NOTE

Once a test begins, MSTEST re-defines the softkeys; you can then cancel the test by pressing the softkey labelled "EXIT". If you cancel the test, either MSTEST waits for the device to complete its self-test or MSTEST finishes reading the current log entry, depending on the type of test being performed; MSTEST then re-displays the MAIN screen.

To initiate a disc's self-test, press the softkey labelled "INITIATE SELFTEST". After completing the self-test, MSTEST re-defines the softkeys, allowing you to:

- print the current contents of the result file. The file will contain information only if an error occurred during the test or if a cartridge tape was tested.

To print the contents of the result file, press the softkey labelled "OUTPUT: PRINTER". MSTEST then re-labels the softkeys with the names of the printers connected to the system; press the softkey identifying the printer to which the result file should be printed.

- select another device and the type of test to be performed (by pressing the softkey labelled "RE-START PROGRAM").
- exit the test program (by pressing the softkey labelled "EXIT PROGRAM"). If any errors have been detected during testing, MSTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

To read the error information stored in the disc's maintenance area, press the softkey labelled "READ LOGS". After reading the disc log, MSTEST re-defines the softkeys, allowing you to:

- print the current contents of the result file. The result file contains information only if an error occurred during the test, if the disc maintenance area is non-empty, or if a cartridge tape was tested.

To print the contents of the result file press the softkey labelled "OUTPUT: PRINTER". MSTEST then re-labels the softkeys with the names of the printers connected to the system; press the softkey identifying the printer to which the result file should be printed.

- select another device and the type of test to be performed (by pressing the softkey labelled "RE-START PROGRAM").
- exit the test program (by pressing the softkey labelled "EXIT PROGRAM"). If any errors have been detected during testing, MSTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

To select a different disc drive to test, press the softkey labelled "CHANGE SELECTION".

To exit the test program, press the softkey labelled "EXIT PROGRAM". If any errors have been detected during testing, MSTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

NOTE

While the actual test is performed, MSTEST modifies the display to provide an initial indication of test results. For example, when running a self-test, a column titled "DIAGNOSTIC RESULTS" is added to the display; depending on the results of the test, the message "Selftest passed" or "Selftest failed" is displayed in the column.

Similarly, when reading a disc log, a column titled "LOG ENTRIES" is added to the display; as each volume of the disc is read, the number of log entries (errors) found on the volume is displayed in the column. Each log entry represents one error or failure that occurred during normal disc operation.

In Case of Difficulty

A more detailed description of test results can be obtained by printing the result file.

Testing All Disc Drives

If you press the softkey labelled "SELECT ALL" when running MSTEST, a screen similar to the following is displayed; this allows you to specify the type of test to be performed.

MASS STORAGE DEVICES TESTING PROGRAM						
Actual result file is : Mstf04						
HPIB	DEVICES	UNIT 0	UNIT 1			
0	2934 printer					
1						
2	9133 : disk + 3.5" floppy	SOURCE1	empty		no logs	
3	7942 : disk + tape drive	DBSYS	UTILS04			
4	7908 : disk + tape drive	SALES	empty			
5	5 MB disk drive	no label			no logs	
6	8" floppy disk	empty			no logs	
7						
Waiting for commands.			All devices selected.			
INITIATE SELFTEST		READ LOGS		CHANGE SELECTION		EXIT

NOTE

Once a test begins, MSTEST re-defines the softkeys; you can then cancel the test by pressing the softkey labelled "EXIT". If you cancel the test, MSTEST either waits for the device to complete its self-test or MSTEST finishes reading the current log entry, depending on the type of test being performed; MSTEST then re-displays the MAIN screen.

To initiate self-test for all disc drives, press the softkey labelled "INITIATE SELFTEST". After completing the self-tests, MSTEST re-defines the softkeys, allowing you to:

- print the current contents of the result file. The result file contains information only if an error

occurred during the test or if a cartridge tape was tested.

To print the contents of the result file press the softkey labelled "OUTPUT: PRINTER". MSTEST then re-labels the softkeys with the names of the printers connected to the system; press the softkey identifying the printer to which the result file should be printed.

- select a different type of test to be performed (by pressing the softkey labelled "RE-START PROGRAM").
- exit the test program (by pressing the softkey labelled "EXIT PROGRAM"). If any errors have been detected during testing, MSTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

To read error log information stored in the discs' maintenance area, press the softkey labelled "READ LOGS". After reading all disc logs, MSTEST re-defines the softkeys, allowing you to:

- print the current contents of the result file. The result file contains information only if an error occurred during the test, if the disc maintenance area is non-empty, or if a cartridge tape was tested.

To print the contents of the result file press the softkey labelled "OUTPUT: PRINTER". MSTEST then re-labels the softkeys with the names of the printers connected to the system; press the softkey identifying the printer to which the result file should be printed.

- select a different type of test to be performed (by pressing the softkey labelled "RE-START PROGRAM").
- exit the test program (by pressing the softkey labelled "EXIT PROGRAM"). If any errors have been detected during testing, MSTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

To select a single disc drive to test (instead of all disc drives), press the softkey labelled "CHANGE SELECTION".

To exit the test program, press the softkey labelled "EXIT PROGRAM". If any errors have been detected during testing, MSTEST re-defines the softkeys and asks you if the results of the test should be recorded in the result file. To store the test results in the result file, press the softkey labelled "STORE RESULTS"; to discard the test results, press the softkey labelled "PURGE RESULTS".

NOTE

While the actual test is performed, MSTEST modifies the display to provide an initial indication of test results. For example, when running a self-test, a column titled "DIAGNOSTIC RESULTS" is added to the display; depending on the results of the test, the message "Selftest passed" or "Selftest failed" is displayed in the column adjacent to the disc being tested.

Similarly, when reading a disc log, a column titled "LOG ENTRIES" is added to the display; as each volume of the disc is read, the number of log entries (errors) found on the volume is displayed in the column adjacent to the disc being tested.

A more detailed description of test results can be obtained by printing the result file.

Printing/Purging Test Results

If you press the softkey labelled "PREVIOUS RESULTS" when running MSTEST, a screen is displayed which identifies all result files stored on the disc with MSTEST. For example:

MASS STORAGE DEVICES TESTING PROGRAM							
File		recorded on :					
Mstf00	11.07.86						
Mstf01	14.07.86						
Mstf02	03.06.86						
Mstf03	no date						
Mstf07	02.07.86						
Mstf10	03.07.86						
Mstf05	11.07.86						

Waiting for commands.

BAR UP			BAR DOWN	SELECT THIS			EXIT
--------	--	--	----------	-------------	--	--	------

Press the softkeys "BAR UP" and "BAR DOWN" until the name of the result file that you want to print/purge is highlighted by the inverse video bar; then press the sofkey labelled "SELECT THIS".

Once you have specified which result file to use, MSTEST re-defines the softkeys as indicated in the following sample display:

MASS STORAGE DEVICES TESTING PROGRAM							
File		recorded on :					
Mstf00							
Mstf01							
Mstf02							
Mstf03							
Mstf07							
Mstf10							
Mstf05							

Waiting for commands.

PRINT FILE			PURGE FILE		CHANGE SELECTION		EXIT
---------------	--	--	---------------	--	---------------------	--	------

To print the contents of the highlighted result file, press the softkey labelled "PRINT FILE". MSTEST then re-labels the softkeys with the names of the printers connected to the system; press the softkey identifying the printer to which the result file should be printed. Once MSTEST finishes printing the result file, it re-displays its MAIN screen allowing you to choose a different device or to start another test.

To purge the highlighted result file, press the softkey labelled "PURGE FILE". Once the result file is purged, MSTEST examines the disc to verify that the file has been deleted. Then it redisplayes the list of result files, allowing you to print or purge another file.

To print/purge a different result file, press the softkey labelled "CHANGE SELECTION".

To display MSTEST's MAIN screen, press the softkey labelled "EXIT".



Operator errors often result from incorrect procedures, inappropriate commands, or commands with incorrect parameters. Software errors are caused by an error in a program being executed. There may be logical errors or inappropriate commands, or commands with incorrect parameters. Hardware errors result from hardware failures, absence, or malfunction. The error message numbers of the operating system and an appropriate description of each are listed below.

1. **Software (DROM) configuration error:** The necessary system software is not loaded into memory.
2. **Memory overflow:** Lack of available memory for the task at hand.
3. **Line not found or not in current program segment:** Specified line may have been deleted.
4. **Improper RETURN:** A RETURN statement is encountered and it has no prior GOSUB.
5. **Abnormal program termination:** Missing a STOP or END statement in a program. Or a FNEND statement is encountered before the RETURN.
6. **Improper FOR-NEXT matching:** A NEXT statement is encountered without a corresponding FOR. Also improper FOR-NEXT nesting.
7. **Undefined function or subprogram:** Misspelling the function or subprogram name. Calling a function or subprogram that is not part of your program.
8. **Improper parameter matching:** Specifying inconsistent parameter lists in a CALL statement or user-defined function.
9. **Improper number of parameters:** Specifying the wrong number of parameters in a CALL statement or a user-defined function.
10. **String value required:** Returning wrong type of information from a function (when a string was expected, a number was sent).
11. **Numeric value required:** Returning wrong type of information from a function (when a number was expected, a string was sent).
12. **Attempt to re-declare a variable or file:** Dimensioning or typing the same variable more than once or using the same file number twice.
13. **Array dimensions not specified:** Attempting to access an array variable which has never been dimensioned or referenced.
14. **Incorrect OPTION BASE usage:** More than one OPTION BASE statement in a program, or may have a dimension or declarative statement preceding OPTION BASE.
15. **Invalid variable bounds:** Dimensioning an array in a subprogram where the lower bound is >32767 or <-32767.

Error Messages

16. Dimensions are improper or inconsistent: Using an array variable with the wrong subscripts. Example: If A is a 5 x 7 array, you cannot use A(4). Also, dimensioning an array of more than 32768 elements.
17. Subscript out of range: Using an array element too large dimension-wise to be an element of the desired array.
18. Substring out of range or substring too long: The maximum length of the receiving string is not dimensioned long enough or the subscripts of the string are incompatible with respect to the maximum or current length.
19. Improper value: A parameter is out of range for a particular statement being used.
20. Integer-precision overflow: The number specified as integer is out of the range -32768 through 32767.*
21. Short-precision overflow: The number specified as short precision is out of the range -9.99999E63 through +9.99999E63.*
22. Real-precision overflow: The number specified as real precision is out of the range -9.9999999999E99 through 9.9999999999E99.*
23. Intermediate-result overflow: The intermediate result was out of the range -9.9999999999E511 through 9.9999999999E511.*
24. TAN (N*PI/2), when N is odd: the result is undefined.*
25. Argument of ASN or ACS is >1 in absolute value: Passing an argument to ASN or ACS which is >1 or <-1.
26. 0 to a negative power: Taking the value 0 to a negative power, which is the same as dividing by 0.*
27. Negative number to non-integral power: Taking a negative number to a fractional power. Example: (-16)**.5 would give a complex number.
28. Argument of LOG or LGT is negative: The result would give a complex number.
29. Argument of LOG or LGT is 0: Value is undefined.**
30. Argument of SQR is negative. The square root of a negative expression would give a complex value.
31. Division by 0, or modulus 0: Division by 0 is not allowed.

* These error messages indicate that DEFAULT mode is not on. If DEFAULT is on, then the error messages will not appear and alternate default values will be assigned to the expressions although the result was out of range. The alternate or default values are either a maximum or minimum of the specified range, or +xxxx, as in error 24 or 26.

** DEFAULT is not on if this error occurred. When DEFAULT is on then this expression is assigned a value of -xxxx.

32. Improper string usage: Reading a numeric value in a **READ** statement, but a non-numeric string is being accessed in the data statement. For example:

```
10 READ X,Y
50 DATA "ABC",7
```

33. Argument of **NUM**, **CHR\$**, or **RPT\$** is improper: The **NUM** parameter may be the null string or if the product of the number of characters to be repeated and the number of it is to be repeated exceeds 32767, the argument of **RPT\$** is invalid.
34. Reference line is not an **IMAGE** statement: The **PRINT USING** or **DISP USING** statement references a line which is not an **IMAGE** statement.
35. Improper image: The characters in the string expression of a **PRINT USING** or **DISP USING** statement are not acceptable as an image.
36. Out of data: Reading data using a **READ** statement when data has run out or does not exist.
37. Edit string too long: Attempting to work with a string longer than 160 characters with **EDIT**.
38. Syntax error in **LENTER** or **ENTER**: An invalid numeric or string expression has been accessed by an **ENTER** or **LENTER** statement, or a protected line has been accessed by **LENTER**.
39. Function subprogram not allowed: A **DIM** statement in a subprogram contains a user-definable function as a parameter.
40. Improper replace or delete: The last line exceeds 9999 in the **REN** or **LOADSUB** command, or a **LOADSUB** statement was replaced with a statement other than a **SUB**.
41. First line number > second line number: For example, in a **DELETE**, **SAVE**, **LIST** or **SECURE** statement, the first line number is larger than the second.
42. Attempt to replace or delete a busy line or subprogram: Attempting to modify a line that currently is required to continue program execution.
43. Matrix not square.
44. Illegal operand in matrix transposition or matrix multiplication.
45. Nested keyboard entry statements: When asked to input a value, another **INPUT** statement has been executed via a subprogram or **ON KEY#** routine.
46. **(RE-)STORE**, **(RE-)SAVE** **(RE-)STORE KEYS**, or **(RE-)STORE BIN** error: Attempting to store information that is not currently in memory.
47. Subprogram **COM** declaration is not consistent with main program: The initial common statement is not consistent with the variable list of the **COM** statement in the subprogram.
48. Recursion in single-line function: Single lined function has been defined in terms of itself.
Example:

```
90 DEF FNA (X)=FNA(X)*8
```


Error Messages

49. Line specified in **ON** declaration not found: Transferring to a specific line through a statement, such as **ON KEY**, **ON END**, **ON ERROR**, or **ON HALT**, and the line does not exist in the current operating environment.
50. File number out of range: Referencing a file number outside the range of 1 through 10.
51. File not currently assigned: Attempting to access a file that is not currently **ASSIGNED**.
52. Improper volume label or mass storage unit specifier: Improper syntax for device specifier or volume label longer than eight characters.
53. Improper file name: A file name contains invalid characters, is the null string, or is greater than six characters.
54. Duplicate file name: Attempting to use the same name for two files on same medium.
55. Directory overflow: There is not enough room in the directory to incorporate additional files, or the availability table is full when purging a file.
56. File name is undefined: The specified file name does not exist on the specified device.
57. Attempt to use device of unknown type for mass storage: Have not loaded the necessary system software (**DROM**) or binary program to be used by the system to control a special device.
58. Improper file type: Attempting to **LOAD** a file that is not a program type, or **GET** a file that is not a data type, or **ASSIGN** a nondata file. Must use **LINK** or **GET** in order to load data files as programs.
59. End of file found: Attempting to retrieve or record information beyond the end of the file in, for example, a **PRINT#** or **READ#** statement.
60. End of record found in random mode: Attempting to retrieve or record information beyond the end of the record using direct data access.
61. Defined record size too small: Attempting to store data in a record which is too small.
62. File is protected, or wrong protect code specified: Attempting to modify or purge a protected file with the wrong protect code, or attempting to **PROTECT** a file that is already protected.
63. Number of records, bytes/record, or physical sectors too large: Cannot exceed 65534.
64. Medium overflow: There is not enough contiguous space on the medium to store desired information.
65. Incorrect data type: Attempting to read a string value into a numeric or vice versa.
66. Unused.
67. Parameter is ≤ 0 (when rounded): The parameter is in **ASSIGN** statement, for example, is less than 1.
68. Invalid line number encountered in mass storage operation: The program line access by **MERGE**, **GET**, or **LINK** exceeds 9999 after executing any renumbering parameter.

69. - 76. Unused.
77. Specified label not found: Medium having the specified label not found.
78. Possible volume-label conflict: Operation performed, however, the drive door was opened between when volume label was identified with drive, and this operation.
79. **LOAD SUB** error: A requested subprogram segment is not present or binaries are present in the program file.
80. Mass storage device door open or medium has been removed: Data transfer cannot occur if medium is not inserted correctly with door closed.
81. Mass storage device failure.
82. Mass storage device not present: The device address has been specified for a storage medium that is not hooked up to the system or not present at all.
83. Mass storage device is write-protected: Attempting to store data on a device from which data can only be retrieved.
84. Record not found: Addressed (requested) a record not available on that volume.
85. Mass storage medium is not initialized: Blank discs, fixed or flexible, must be initialized before use.
86. Special media: Cannot be accessed via standard mass storage operations.
87. Record address error: The disc medium has been damaged. The medium should be discarded or re-initialized after attempting to recover data.
88. Read data error: May indicate a medium failure due to defective disc or controller.
89. Check read error. Inconsistency between the data written on a medium and the version in memory. Attempt to repeat the operation.
90. Mass storage system error: A mass storage failure - call HP for service.
91. Attempt to access a busy file: **I/O** operations are nested on duplicate file numbers.
92. Cannot get exclusive access to a specified file: Attempting to get exclusive access to a file, for example, through **PURGE**, that is currently being accessed by yourself or someone else.
93. Attempt to access an exclusive file: Attempting to access a file when someone else has exclusive access.
94. Specified file cannot currently be locked: A file is already locked by another user.
95. String not intact on file: There is an improper character count encountered during **READ#** into a string variable.
96. Program is run-only: Cannot be **RENAMED**, **COPYed**, etc.

Error Messages

97. Unexpected Disc Interrupt - data files closed: Normally, the door was opened while files were opened.
98. Unexpected Disc Interrupt - Data lost: The door was opened and some data on at least one file is lost.
99. Unexpected Disc Interrupt - Opening a door on a mass storage device which has been locked via the program (does not apply to flexible disc drives).
100. **IMAGE** specification expects a numeric item: The expression to be output in **PRINT USING** or **DISP USING** is a string, but the corresponding **IMAGE** specification is numeric.
101. **IMAGE** specification expects a string item: The expression to be output in **PRINT USING** or **DISP USING** is numeric, but the corresponding **IMAGE** specification is string.
102. Numeric field specification is larger than internal buffer size: An output field larger than the available buffer space of the system is specified.
103. Not enough **IMAGE** specifications: An item in the **PRINT USING** or **DISP USING** statement has no corresponding **IMAGE** specification.
104. - 119. Unused.
120. Output field overflow: A string or a numerical expression is too large to fit into an output field.
121. Improper value in **CURSOR** parameter.
122. - 129. Unused.
130. Parameter for **REQUEST OR RELEASE** out of range: The parameter is not an integer from 0 through 20.
131. Specified device not available: The device is already being used by another user.
132. Referenced device missing or wrong type: A device is being requested which is not present, or the requested device is not a printer.
133. Printer is down: Printer is either turned off or no longer connected to the system. Turn on or re-connect.
134. Printer is offline: The cover is off the printer or the printer is offline and not available for printing.
135. - 139. Unused.
140. Spool file record length must be 256 bytes: An existing data file has been spooled to, but its record length is less than 256 bytes.
141. Incorrect data type found in spool file: Attempting to spool using a file that contains non-string data.
142. Door open - spool operation aborted: The disc drive door was opened during a spool operation. The current file is intact, but the last segment of data may be lost.

- 143. Expansion of spool file would cause medium overflow: There is not enough contiguous space on the medium being accessed to expand the spool file. Spool operation is aborted; file is left intact.
- 144. Spool file size too small: The file being spooled to has less than five records.
- 145. - 149. Unused.
- 150. Type of expression in **CASE** does not match type of expression in **SELECT**.
- 151. Parameter out of range on **INDENT**.
- 152. Improper matching of structured construct.
- 153. No structured construct active.
- 155. Invalid statement specified in **COMMAND**.
- 156. More than one level of recursion not allowed in **COMMAND**.
- 157. - 159. Unused.
- 160. Tape Operation Pending: The referenced tape was removed from the drive before the proper updating could take place. Insert the tape into the drive it was removed from and allow it to update properly before removal.
- 161. Disc Buffer Pending: The buffer required for this operation holds data for a tape that was prematurely removed. Locate the proper tape, insert it into the drive, and let the normal procedure complete before its removal.
- 162. Buffer Disc Not Ready: The disc holding the buffer for this tape is not ready for use.
- 163. Tape door locked.
- 164. Writing to tape not allowed until tape is initialized.
- 165. Self-test failure on Disc.
- 166. **TAPES DROM** not loaded.
- 167. - 199. Unused.

Error Messages

PACK/260 Errors

- 200. Referenced line not a **PACKFMT**.
- 201. Unused.
- 202. Insufficient dimension length in **PACK** statement, or insufficient current length in an **UNPACK**.
- 203. List item >32K in **PACK** or **UNPACK**.
- 204. Conversion error.
- 205. **UNPACK** requires a source string of greater current length.

IMAGE/260 Errors

- 210. Bad status array.
- 211. No **DBASE IS** statement active; improper data base specified or data base is not open.
- 212. Specified data set not found.
- 213. Too many variables in list.
- 214. **IN DATA SET** already active for data set.
- 215. Number of elements does not match.
- 216. Variable type does not match with associated field in set.
- 217. String length in list insufficient, or length of list array >255 bytes.
- 218. Variable not in common.
- 219. Line referenced is not an **IN DATA SET LIST** statement.
- 220. Improper or illegal use of maintenance word.
- 221. Data set not created.
- 222. Needed volume lost during dismount.
- 223. Improper backup file.
- 224. Incomplete backup file.
- 225. Improper utility version number in root file.
- 226. Corrupt data base - must recreate it.

- 227. Corrupt data base - must erase it in its entirety.
- 228. Data Sets cannot be restored without a root file.
- 229. No volume name on data base or backup volume.
- 320. Set or item specifier is out of range or is an invalid set or item name.
- 321. Relational operator is invalid.
- 322. The predicate specifier is not a valid form.

SORT/260 Errors

- 230. Improper nesting of **SORT** statements, including **DATA BASE IS** and **IN DATA SET**.
- 231. Cannot reactivate workfile.
- 232. Data base mode improper for sort.
- 233. Required data set or root file not mounted.
- 234. Missing or improper set linkage.
- 235. No **WORKFILE IS #** statement active.
- 236. Improper data item or data item not found.
- 237. Sum of sort field lengths plus overhead exceeds 256 bytes in **SORT BY**.
- 238. Improper synthetic linkage.
- 239. Insufficient space in workfile.
- 240. Program lost due to disc failure.
- 241. Improper operation attempted on workfile.
- 242. Improper **READ#** or **PRINT#** on workfile.
- 243. Workfile contains invalid information.
- 244. Data Base Corrupt.

Error Messages

REPORT WRITER/260 Errors

250. **BEGIN REPORT** does not reference a **REPORT HEADER** statement.
251. Report Writer is already active.
252. An **END REPORT DESCRIPTION** statement is missing as terminator to the Report Description section.
253. Duplicate Report Writer Description section.
254. Blank lines in **PAGE LENGTH** statement is greater than page size, or is negative.
255. Expression in a Report Writer statement evaluates to an unacceptable value.
256. A **TOTALS ON** or **GRAND TOTALS ON** statement is improperly positioned in the Report Description section.
257. A Report Writer operation was requested while outside the program scope of an active Report Writer, or an **END REPORT** was not executed for an active Report Writer before subprogram termination.
258. Effective page size is less than three lines.
259. Illegal execution of a Report Description section statement.
260. Insufficient space for printed output within the current page.
261. Left margin specified is less than 1 or greater than current printer width.
262. Control variable in **BREAK WHEN** statement has a length greater than was initially allocated.
263. A **DETAIL LINE** statement may not appear within the Report Description section.
264. Level parameter is out of range of from 0 through 9.
265. **(GRAND) TOTALS ON** statement is not active for the level requested.
266. Sequence parameter is out of range for **(GRAND) TOTALS ON** statement at the level requested.
267. **WITH number LINES** parameter in a header, trailer, or detail line is greater than the effective page size or is negative.
268. **OLDCV(\$)** function references a level which does not have a break defined.
269. **OLDCV(\$)** function does not match the data type for the control variable in the **BREAK WHEN** statement at the level requested.
270. **PRINTER IS** statement may not be executed while Report Writer is active.
271. A Report Writer statement may not be used recursively.
280. Language cannot be changed during **SORT BY**.

FORMS/260 Errors

- 290. Not allowed when form is active.
- 291. Not allowed within form image.
- 292. Attempt to input after last field of form.
- 293. Attempt to output after last field of form.
- 294. Not allowed unless form is active.

TIMER/260 Errors

- 300. Date not in acceptable format or incorrect.
- 301. Time not in acceptable format or incorrect.
- 302. Date or time has already been set. It may be set only once per system boot-up.
- 303. **ON DELAY** value incorrect.
- 304. Incorrect password given.

TIO/260 Errors

- 310. Port ordinal out of range (that is it is not -1, -2 or in the range 11-20).
- 311. Priority value out of range from 1 through 15.
- 312. Invalid address in **ON...**interrupt statement.
- 314. Ownership error: must do **REQUEST** before **ON INPUT**.
- 315. No input available: cannot do **AREAD\$** from specified port.
- 316. Invalid **SEND** or **SEND BREAK** statement: specified device is not a computer.

Error Messages

APD/260 Errors

- 751. Workstation is not of the type "2392"
- 752. The timeout limit is reached
- 753. The retries limit is reached
- 754. Remote device transmits a CAN character
- 755. Data is not in the form expected by the XMODEM protocol
- 756. Abnormal Transfer Termination - program stops before control parameter = 0
- 757. Buffer\$ parameter dimensioned to less than 128 bytes

MEDIA/260 Errors

General MEDIA Errors

- 340. Operation only allowed on IBM media.
- 341. Improper operation on CHAR file.
- 342. Operation not allowed on this media.
- 343. Invalid IBM data set record length.
- 344. File on IBM media must be type CHAR.
- 345. Invalid IBM file start address in CREATE command.

IBMDUMP and IBMWREC Errors

- 370. Record number out of range for IBM media.
- 371. Device does not contain IBM format media.
- 372. Invalid display or conversion parameter.
- 373. Deleted record read.

TASK/260 Errors

The error codes have different meanings for the **REQUEST** command and the **ATTACH** command. The error numbers in the table are execution errors caused by unsuccessful commands with no optional result parameter. The result in the table is the returned status indicating the outcome of the command.

REQUEST# Command

Error Number	Result	Description
none	0	Ownership granted
401	1	Specified TASKID not a task.
402	2	Specified TASKID not a secondary task or already owned by another user.
403	3	Executing task not the home user of a workstation.

ATTACH Command

Error Number	Result	Description
none	0	Attach initiated.
401	1	Specified TASKID not a task.
402	2	Specified TASKID not owned by executing task.
403	3	Executing task not the home user of a workstation or executing task currently not attached to a workstation, or workstation busy transferring files.

Error Messages

Binary Program Errors

- 800. Source and destination must not be the same device.
- 801. Devices not compatible.
- 802. Destination device is too small.
- 803. Cannot duplicate media.
- 810. Protect code parameter must be 2 characters long.
- 850. Bad file-type specifier.
- 851. Files not similar.
- 860. Old password does not match.
- 861. Improper number of array elements.
- 999. Binary program not compatible with current operating system revision.

System Errors

- 1000. System Files table full: There are too many active files in the system.
- 1001. Too many accesses to specified file: There are more than 15 concurrent addresses to the same file. Must de-assign some mass memory files.
- 1002. Request would result in deadlock: You are requesting a resource that, if granted, would deadlock the system.
- 1003. Cannot get exclusive access to specified device.
- 1004. Keyword not recognized by this operating system revision.
- 1005. Memory overflow in common block.
- 1010. Memory parity error: Hardware failure in memory. May be a temporary condition. If error reoccurs, record the numbers following the error number on the display, and contact HP for assistance.

Some system malfunctions are denoted by an error-like message on the display. These messages will appear as the words "SYSTEM ERROR". In addition, a table of numbers is listed. If a condition of this type occurs, you should record the system error letter and the message and table shown on the display. You must power off the system and then power it up after these errors.

Loader Errors

LOADER ERROR messages indicate that the operating system cannot be loaded successfully:

- A Checksum error.
- B Disc read error.
- C Checksum error.
- D Insufficient memory.
- E Interface error.

Loader errors A through C may indicate that the operating system disc or tape is worn or damaged. Try loading the system with the backup (spare) copy of the operating system disc or tape. If any loader error persists after repeated tries, record the error message and call HP for Service.

Configuration Messages

These messages indicate an inconsistency in hardware/operating system configuration. Although the system can operate with inconsistencies, each should be corrected as soon as possible. Contact your software supplier for assistance.

MEMORY FAILURE - BLOCK nn, ...

Either the operating system expected more memory than available or a memory block has failed.

UNEXPECTED MEMORY PRESENT - BLOCK nn, ... USER GIVEN EXTRA MEMORY

More memory is available than expected by the operating system.

ASYNC DATA COMM BOARD ON PA n IS DOWN

The self-test for the data communications interface has failed. Call HP for service.

Quick Guide to Error Messages

The table on this page gives you all the error messages in one place. You might want to copy this page, and display it in an easily accessible spot.

Error Codes

- 1 Software (DRGM) configuration error
- 2 Memory overflow
- 3 Line not open on current program segment
- 4 Invalid file found
- 5 Abnormal program termination
- 6 Improperly matched
- 7 Undefined function or subprogram
- 8 Improper parameter matching
- 9 Improper number of parameters
- 10 String value required
- 11 Numeric value required
- 12 Attempt to re-declare a variable
- 13 Array dimensions not specified
- 14 Incorrect OPTION BASE statement usage
- 15 Invalid bounds on array dimension, or string length in
- 16 Dimensional error
- 17 Dimensional error
- 18 Subscript out of range or subtracting too long
- 19 Improper value
- 20 Integer precision overflow
- 21 Short precision overflow
- 22 Real precision overflow
- 23 Intermediate-result overflow
- 24 TAN (N/PI/2), when N is odd
- 25 Argument of ASN or ACS is > 1 in absolute value
- 26 0 to a negative power
- 27 Negative number to non-integer power
- 28 Argument of LOG or LGT is negative
- 29 Argument of LOG or LGT is 0
- 30 Argument of SQR is negative
- 31 Division by 0, or modulo 0
- 32 String does not represent valid number, or string re-
- 33 Argument of NUM, CHR\$, or BP15 is improper
- 34 Retrieved line is not an IMAGE statement
- 35 Improper image
- 36 Out of data
- 37 Edit string too long
- 38 Syntax error in LINTER or LENTER. Also attempting to
- 39 Function subprogram not allowed
- 40 Improper REPLACE or DELETE
- 41 First line number > second line number
- 42 Matrix not square
- 43 Matrix not square or detects a busy line or subprogram.
- 44 Illegal operation in matrix transposition or matrix multi-
- 45 Needed keyboard entry statements
- 46 No busy in (RE)STORE, BK or no program in
- 47 Subprogram COM declaration is not consistent with
- 48 Recursion in single line function
- 49 Line specified in ON declaration not found
- 50 File number out of range from 1 thru 10
- 51 File not currently assigned
- 52 Improper volume label or mass storage unit specifier.
- 53 Improper file name
- 54 Duplicate file name

LOAD/250 Errors

- 230 Improper nesting of SORT statements, including DATA
- 231 Cannot reexecute workfile
- 232 Data base mode improper for sort
- 233 Required data set or root file not mounted
- 234 Missing or improper set linkage
- 235 WORMHOLE IS # statement active
- 236 File not found
- 237 Size of root field, origin plus overhead exceeds 256
- 238 Invalid data set or data item not found
- 239 Improper syntactic linkage
- 240 Program lost due to disk failure.
- 241 Improper operation attempted on workfile
- 242 Improper READ # or PRINT # on workfile
- 243 Workfile contains invalid information
- 244 Data Base Corrupt

FORMS / 250 Errors

- 290 Not allowed when form is active
- 291 Not allowed within form image
- 292 Attempt to input after last field of form
- 293 Attempt to output after last field of form
- 294 Not allowed unless form is active

TIMER / 250 Errors

- 300 Date not in acceptable format or incorrect
- 301 Time not in acceptable format or incorrect
- 302 Date or time has already been set. It may be set only once
- 303 ON DELAY value is incorrect

PERFORM Errors

- 440 Door opened on volume containing perform file;
- 441 PERFORM mode terminated.
- 442 Attempt to 'press' an undefined key using KEY #
- 443 Attempted display operation during WAIT state.
- 444 Loop nesting not allowed.
- 445 No loop currently active.
- 446 PARM array is undefined.
- 447 Invalid PARM index given.
- 448 Illegal PARM dimension given in :DIM PARM command
- 449 No matching :END LOOP statement.
- 450 No matching :END IF statement.

TIO / 250 Errors

- 310 Port address out of range of from 11 thru 15
- 311 Priority value out of range of from 1 thru 15.
- 312 Invalid address on ON statement
- 313 Ownership error. MUST REQUEST before ON INPUT
- 314 Ownership error. MUST REQUEST before ON INPUT
- 315 No input available. cannot do AREADS from specified
- 316 Invalid SEND or SEND BREAK statement specified de-
- 317 Invalid operator
- 320 - 322 IMAGE Errors

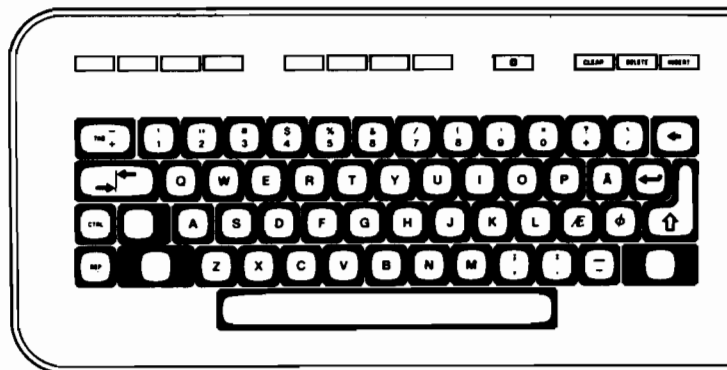
Loader Errors

- LOAD/PERFORM messages indicate that the operating system
- cannot be loaded successfully -
- A. Check status error
- B. Check status error
- C. Check status error
- D. Insufficient memory
- E. Invalid system error
- F. Invalid system error

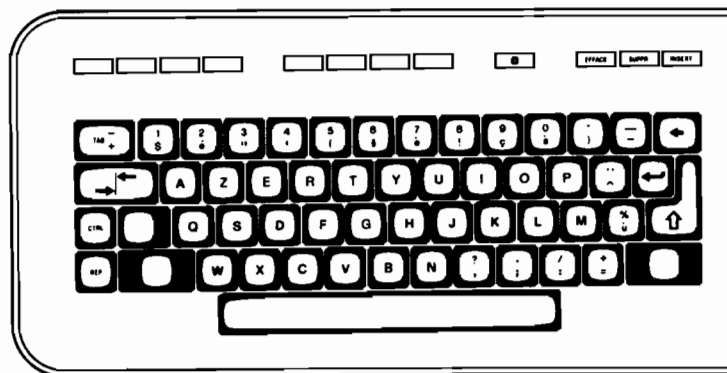
IMAGE Status Errors

- The following list describes the condition word values for
- IMAGE programming statements
- Condition
- Word
- 0 - Born every execution - no error
- 1 - No such data base
- 2 - Data base is currently opened in an incompatible mode
- 3 - Data base is currently opened exclusively
- 4 - Data base lock request was already made in current exe-
- 5 - Data base lock request was already made in current exe-
- 6 - Data base lock request was already made in current exe-
- 7 - Data base lock request was already made in current exe-
- 8 - Data base lock request was already made in current exe-
- 9 - Data base lock request was already made in current exe-
- 10 - User may not open additional data bases, flow are al-
- 11 - Bad data base name or preceding blanks missing
- 12 - DBPUT, DBDELETE, or DBUPDATE called with data
- 13 - Bad data base name or preceding blanks missing
- 14 - Bad data base name or preceding blanks missing
- 15 - Bad data base name or preceding blanks missing
- 16 - Bad data base name or preceding blanks missing
- 17 - Bad data base name or preceding blanks missing
- 18 - DBPUT, DBDELETE, and DBUPDATE not allowed in ac-
- 19 - Bad password - grants access to nothing
- 20 - Data item non-existent or inaccessible
- 21 - Data set volume non-existent
- 22 - User lacks write access to data set
- 23 - User lacks write access to data set
- 24 - DBPUT, DBDELETE, DBUPDATE not allowed on ac-
- 25 - User lacks write access to data set
- 26 - User lacks write access to data set
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- 135 - User lacks write access to data set
- 136 - User lacks write access to data set
- 137 - User lacks write access to data set

HP 2622D WORKSTATION



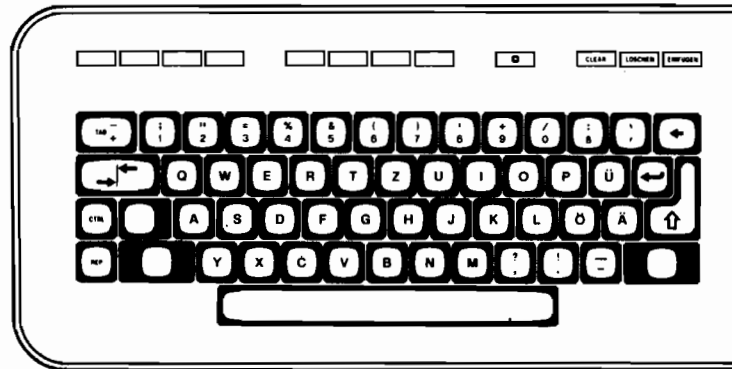
Danish Keyboard



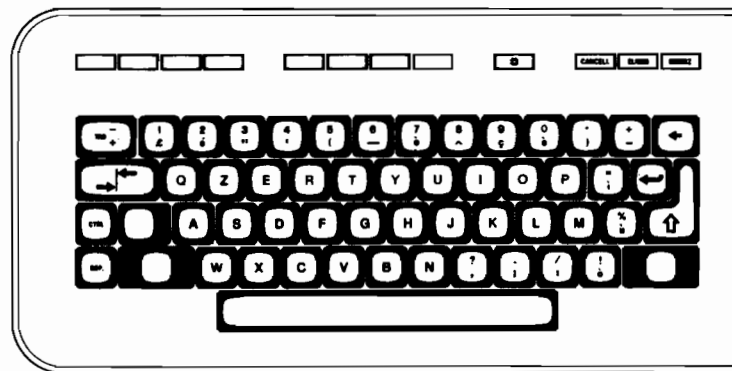
French Keyboard

(Note: the French Canadian Keyboard is not shown.)

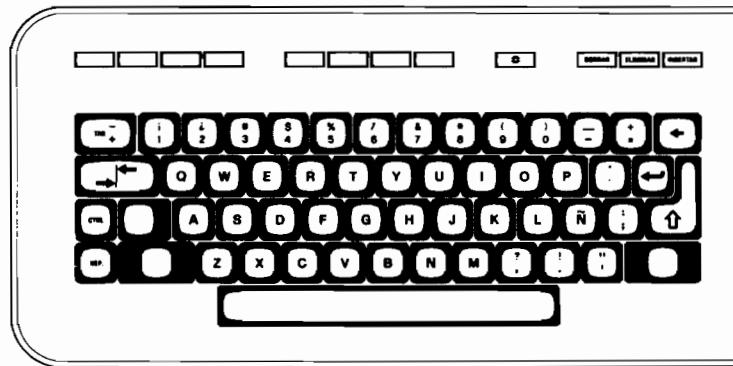
Keyboards



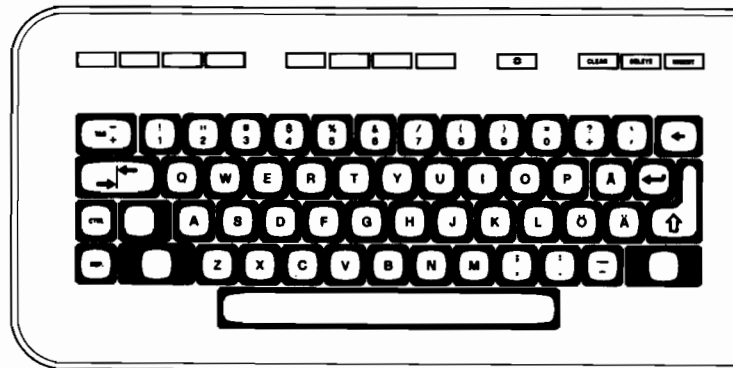
German Keyboard



Italian Keyboard

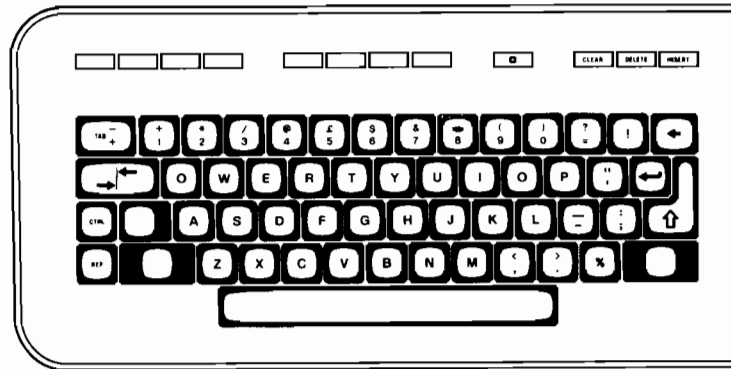


Spanish Keyboard

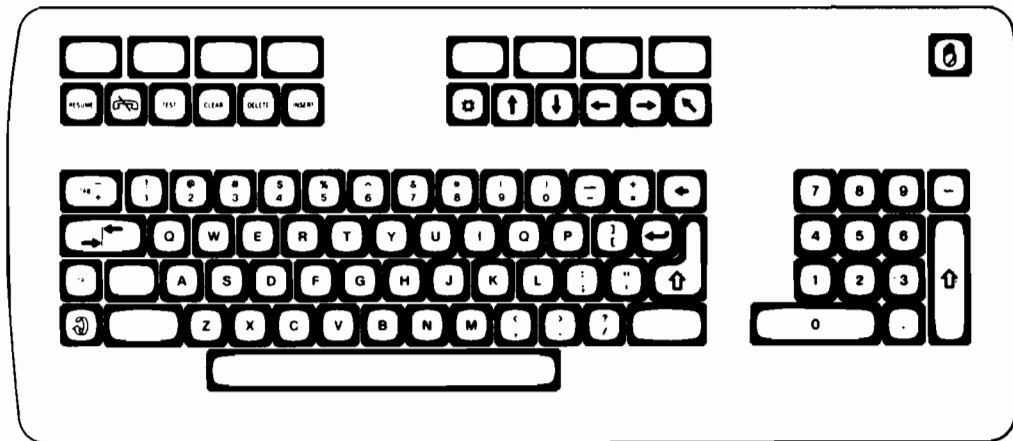


Swedish Keyboard

Keyboards

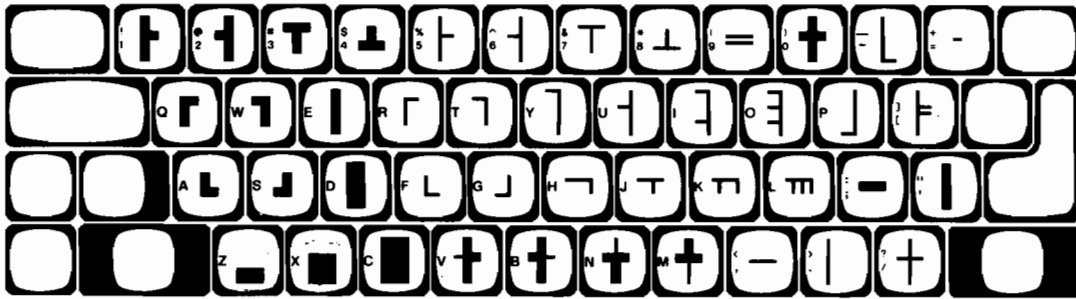


United Kingdom Keyboard

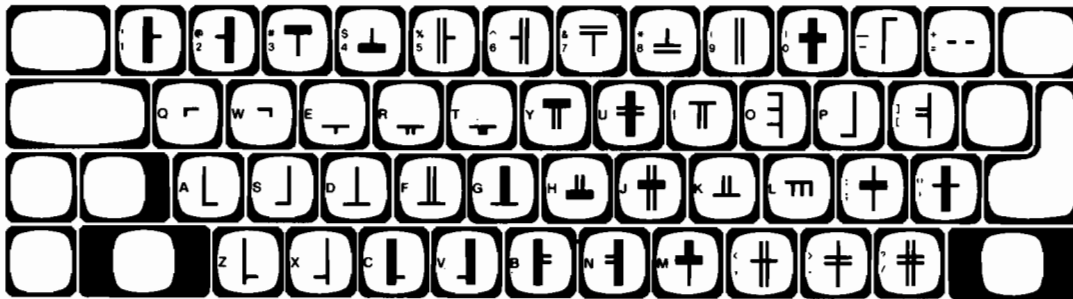


United States Keyboard

Keyboard Definitions for the Line Drawing Character Set



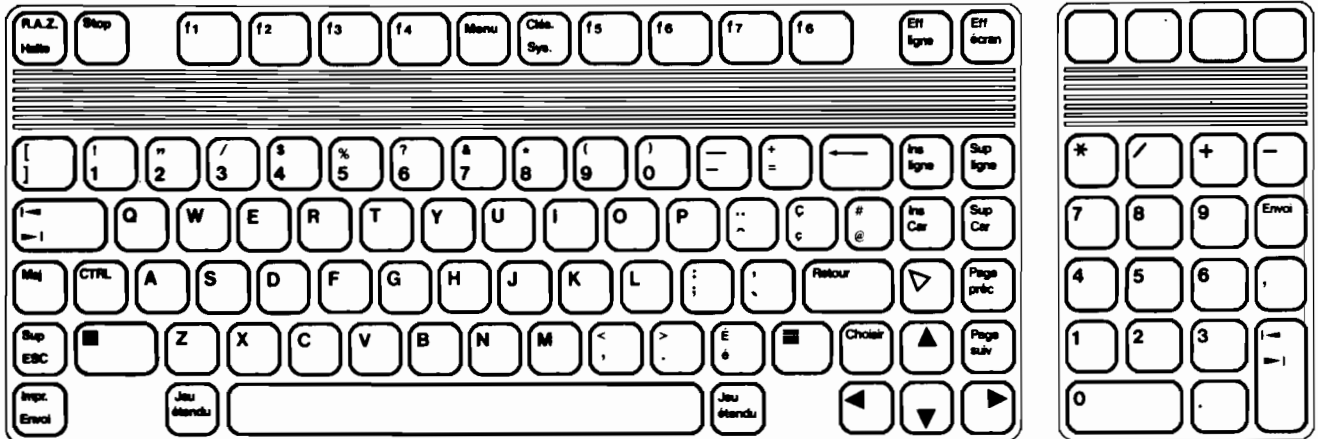
Unshifted Line-Drawing Keyboard



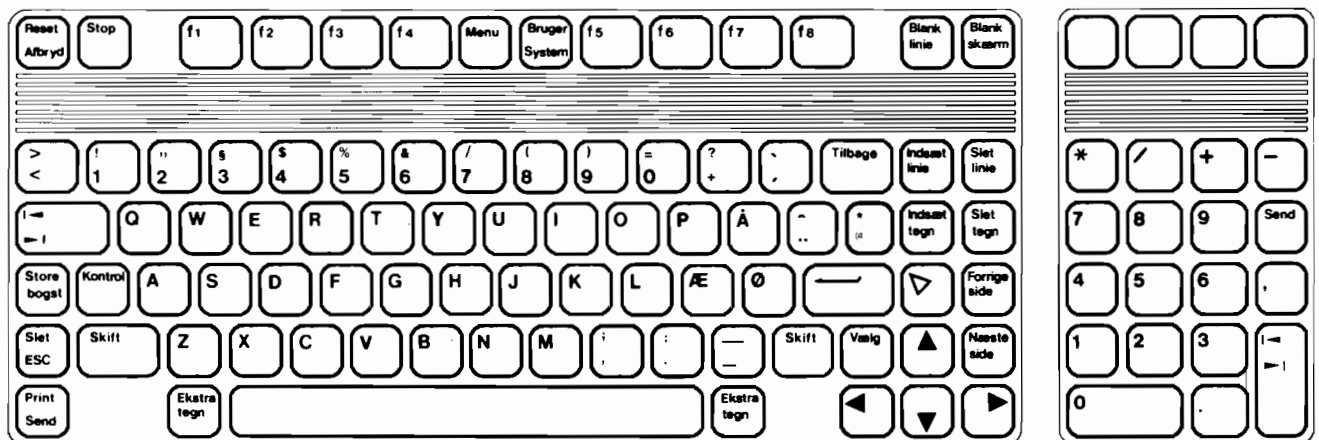
Shifted Line-Drawing Keyboard

Keyboards

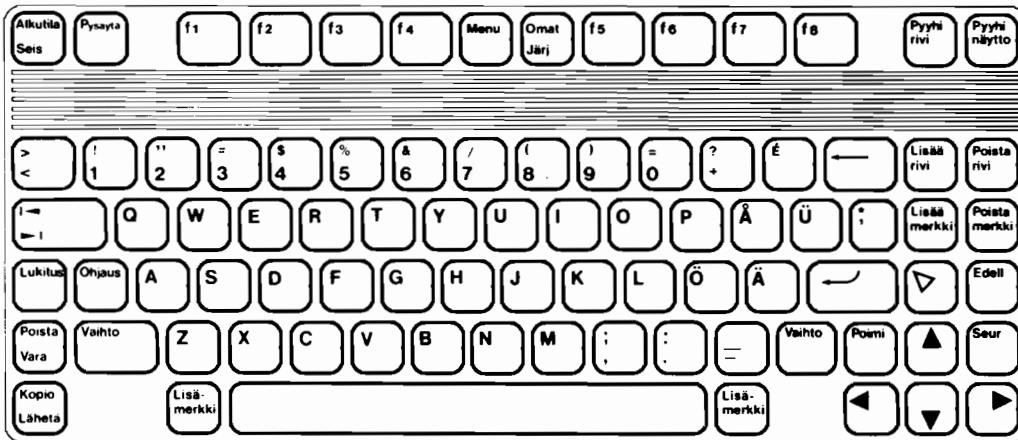
HP 4526xD, HP 150, HP 2392A WORKSTATIONS



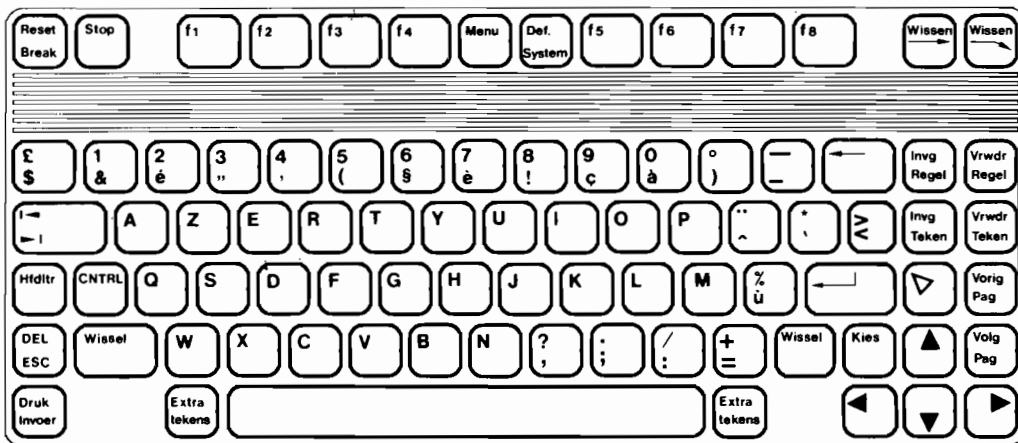
French Canadian Keyboard



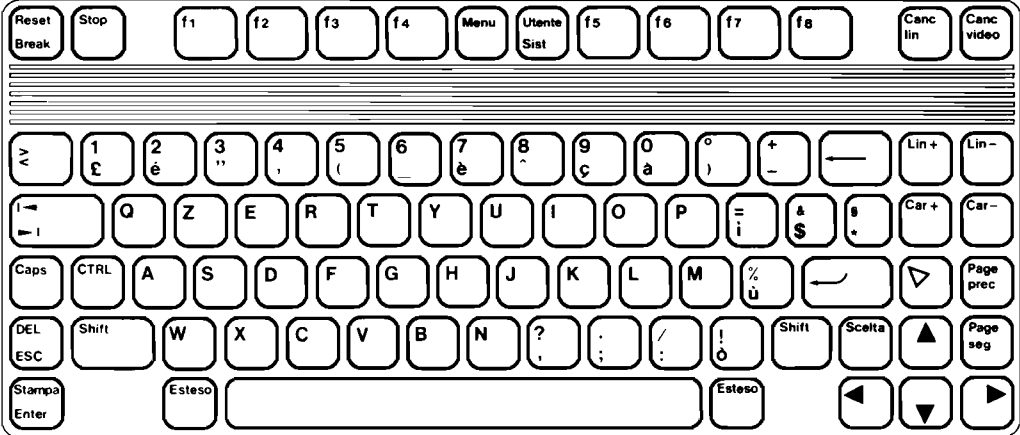
Danish Keyboard



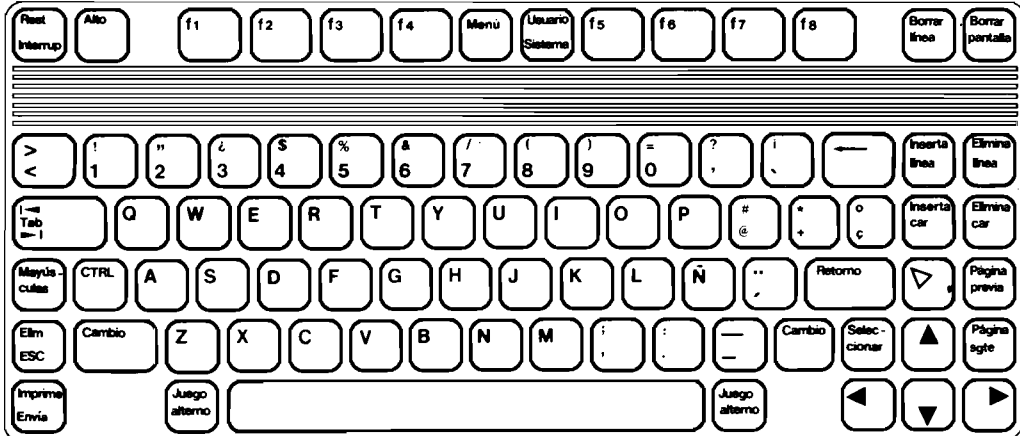
Finnish Keyboard



Flemish Keyboard

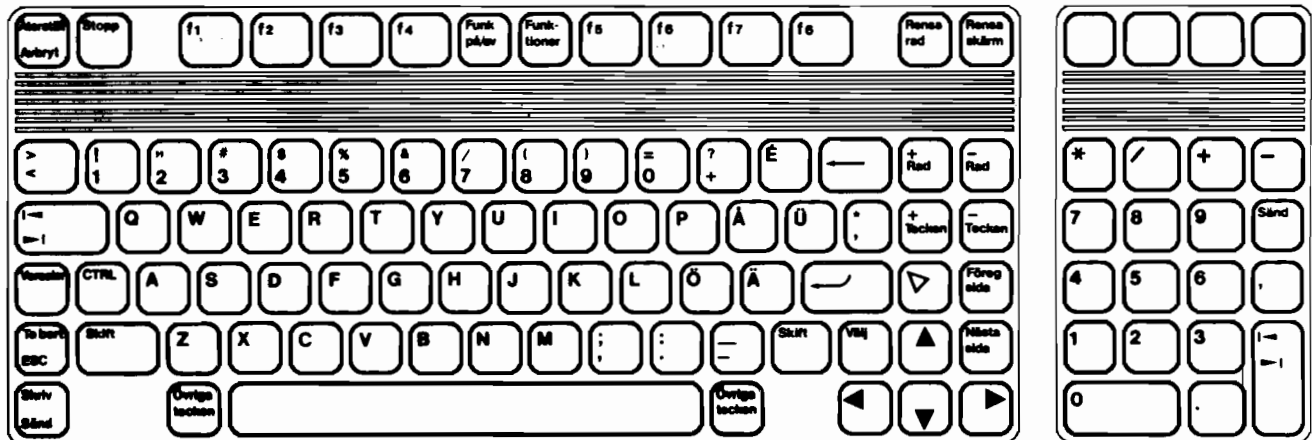


Italian Keyboard

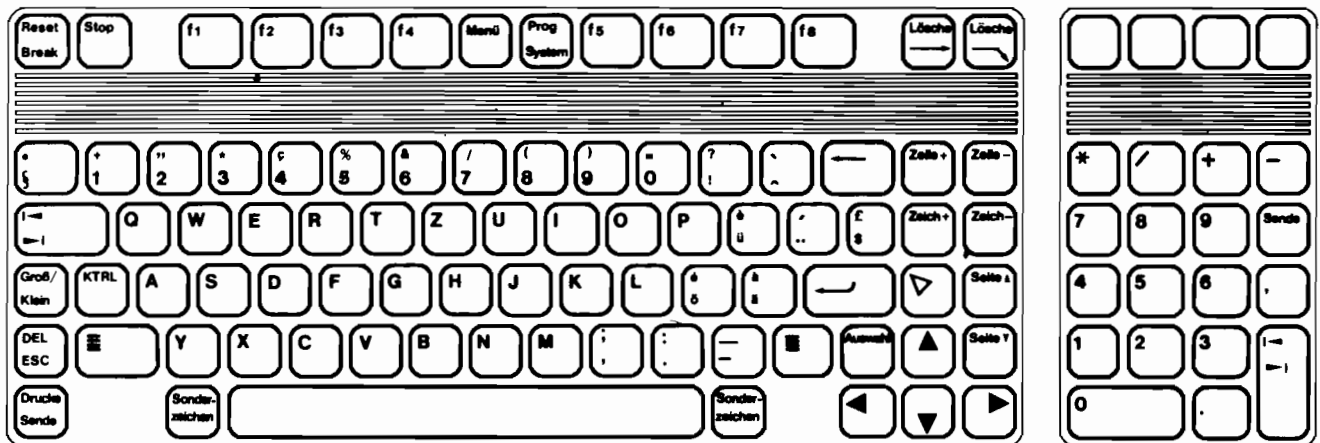


Spanish Keyboard (Europe)

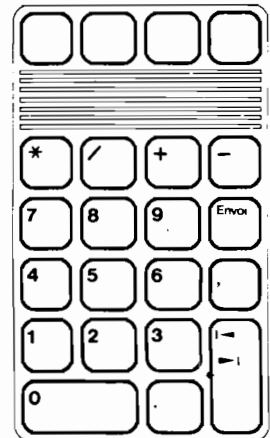
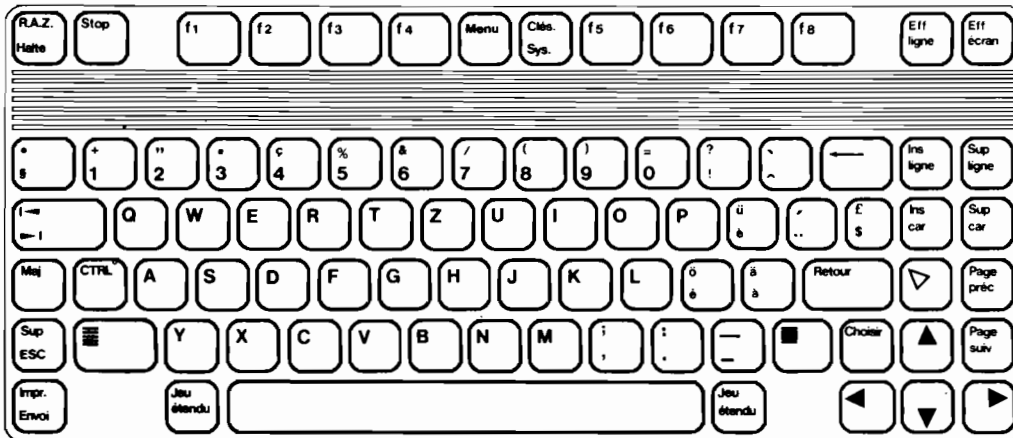
Keyboards



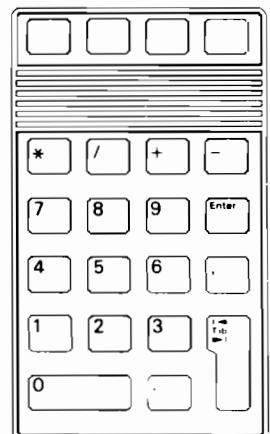
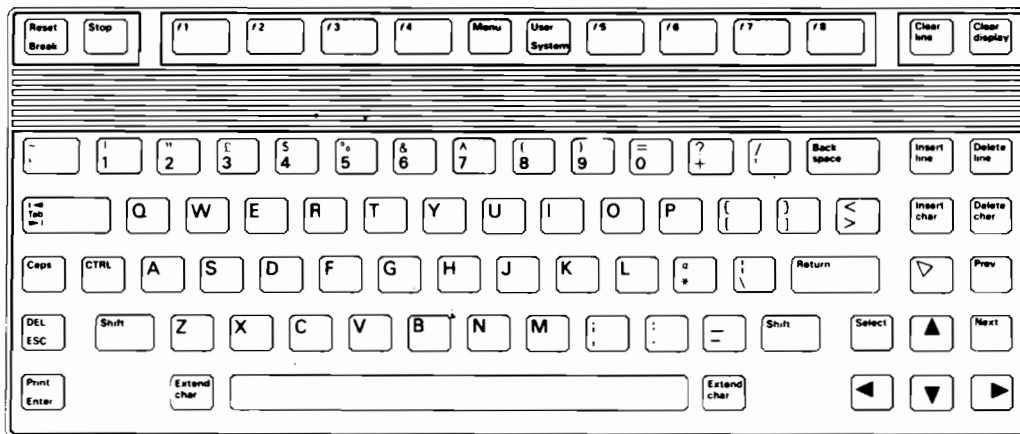
Swedish Keyboard



Swiss German Keyboard

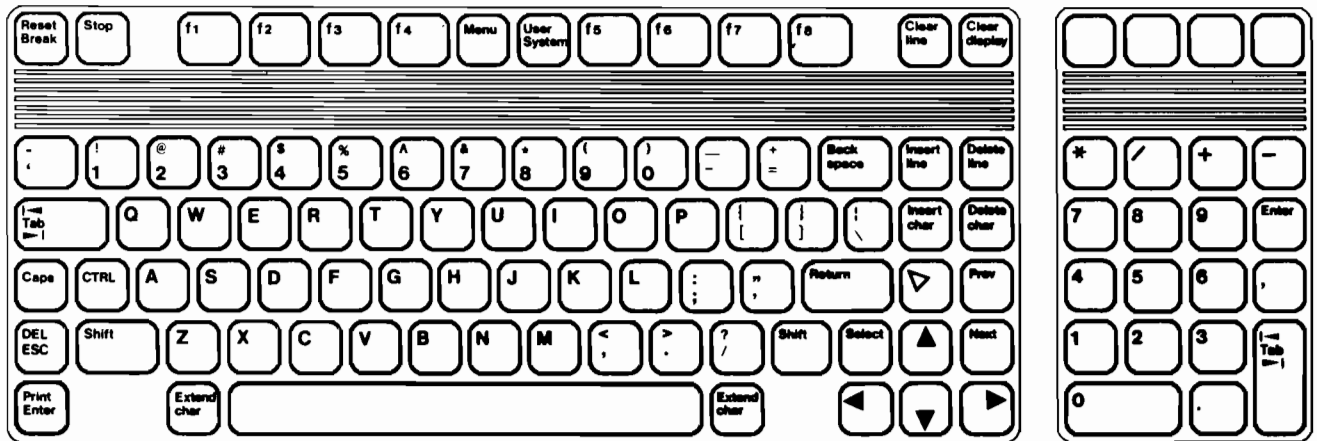


Swiss Roman Keyboard



United Kingdom Keyboard

Keyboards

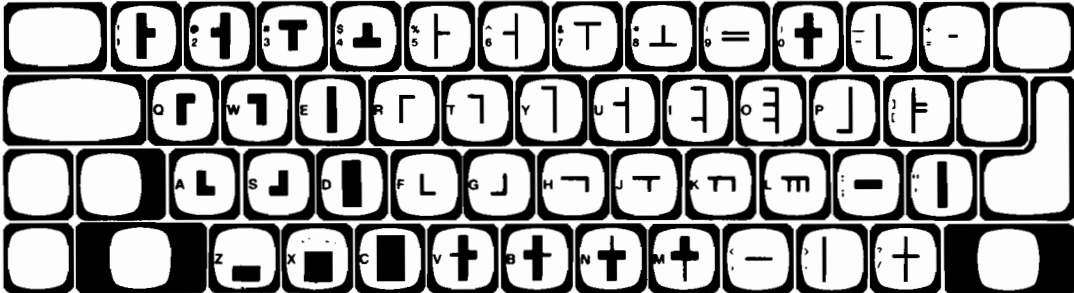


United States Keyboard

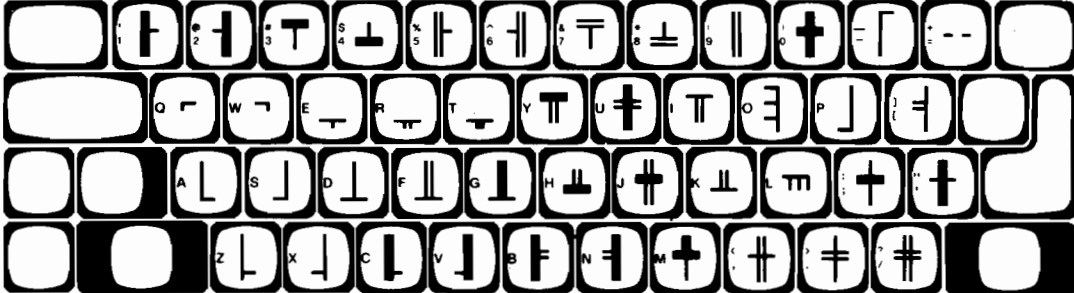
NOTE

The Katakana keyboard is not shown.

Keyboard Definitions for the Line Drawing Character Set

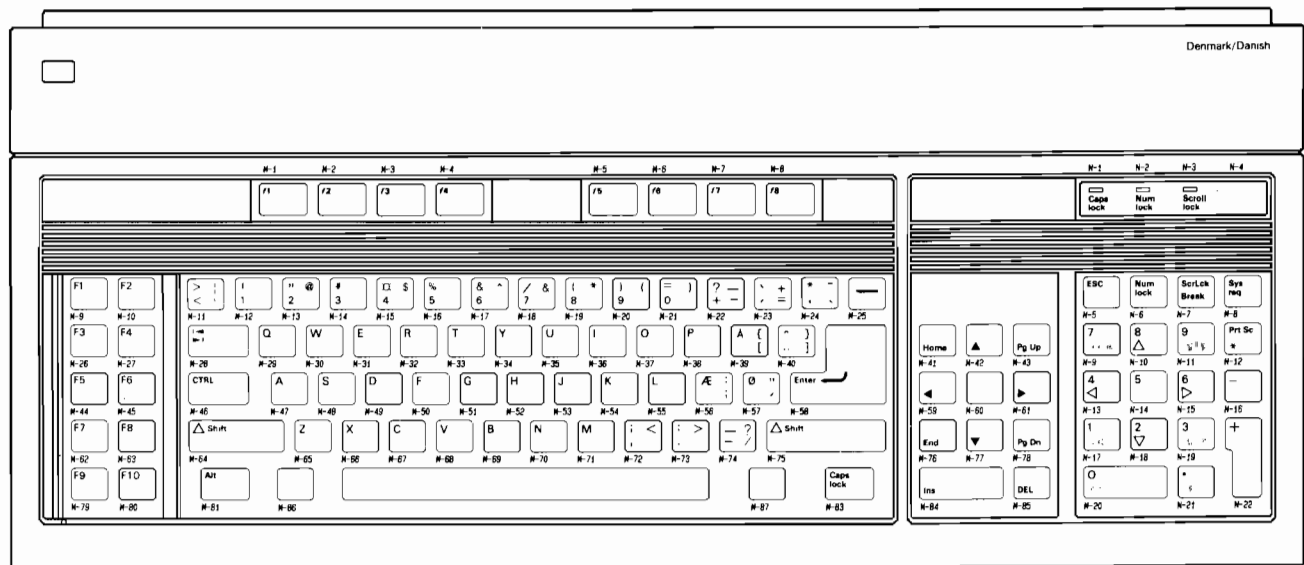


Unshifted Line-Drawing Keyboard

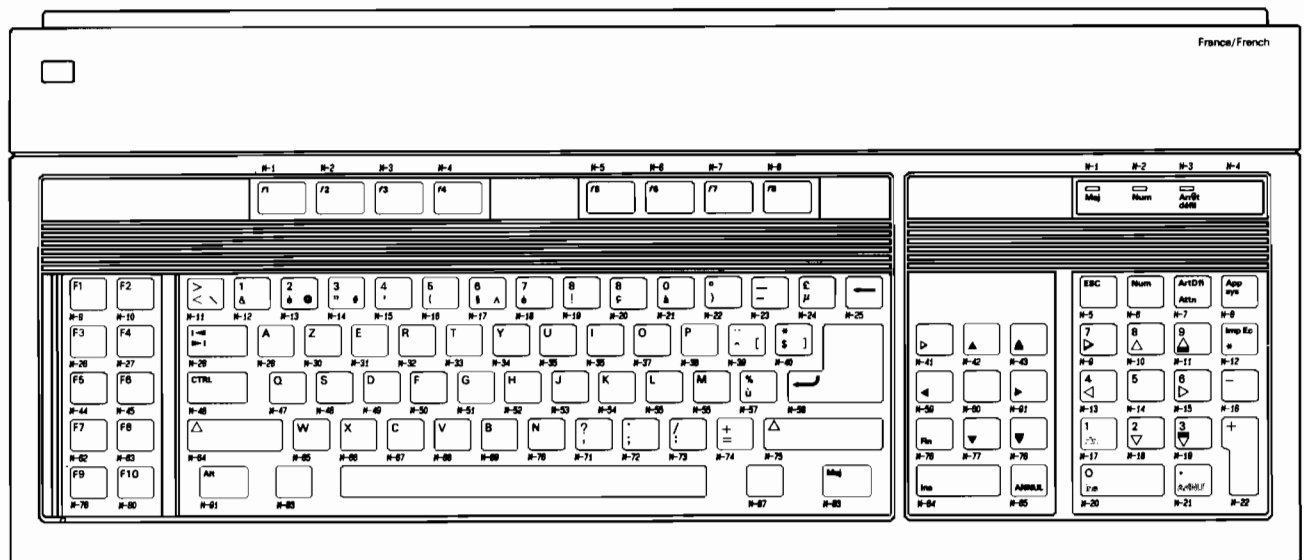


Shifted Line-Drawing Keyboard

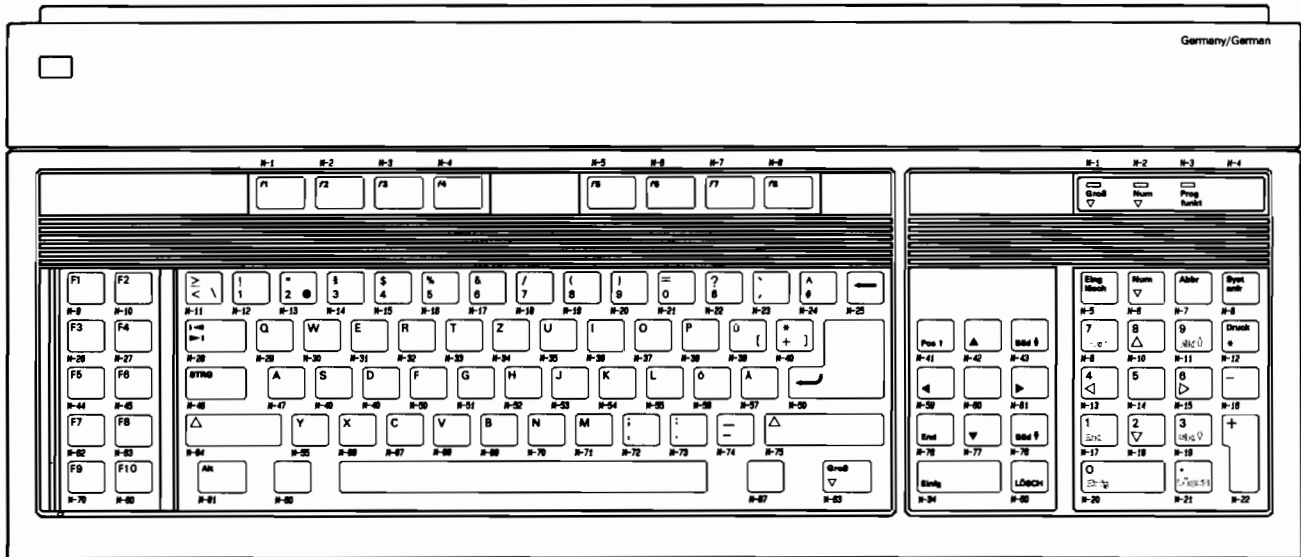
HP VECTRA



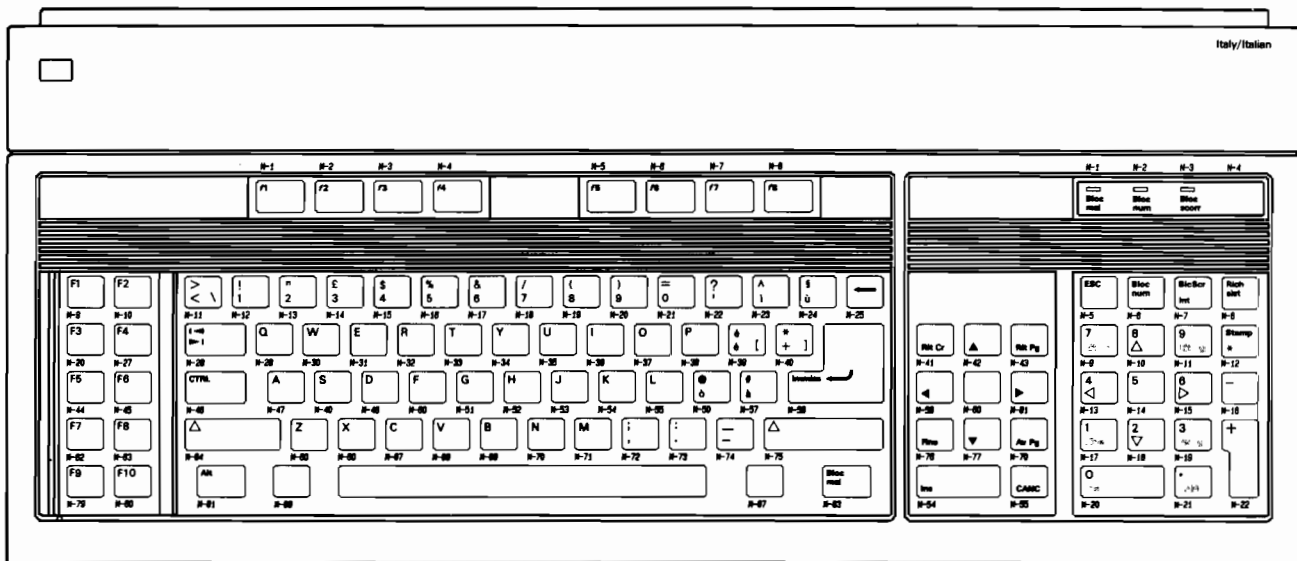
Danish Keyboard



French Keyboard

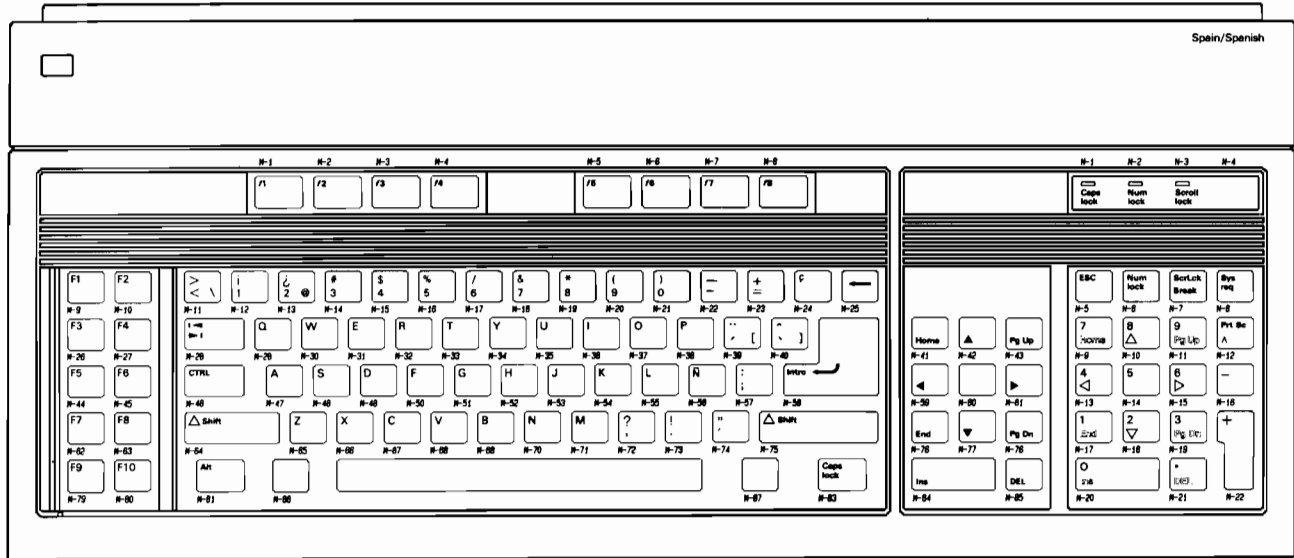


German Keyboard

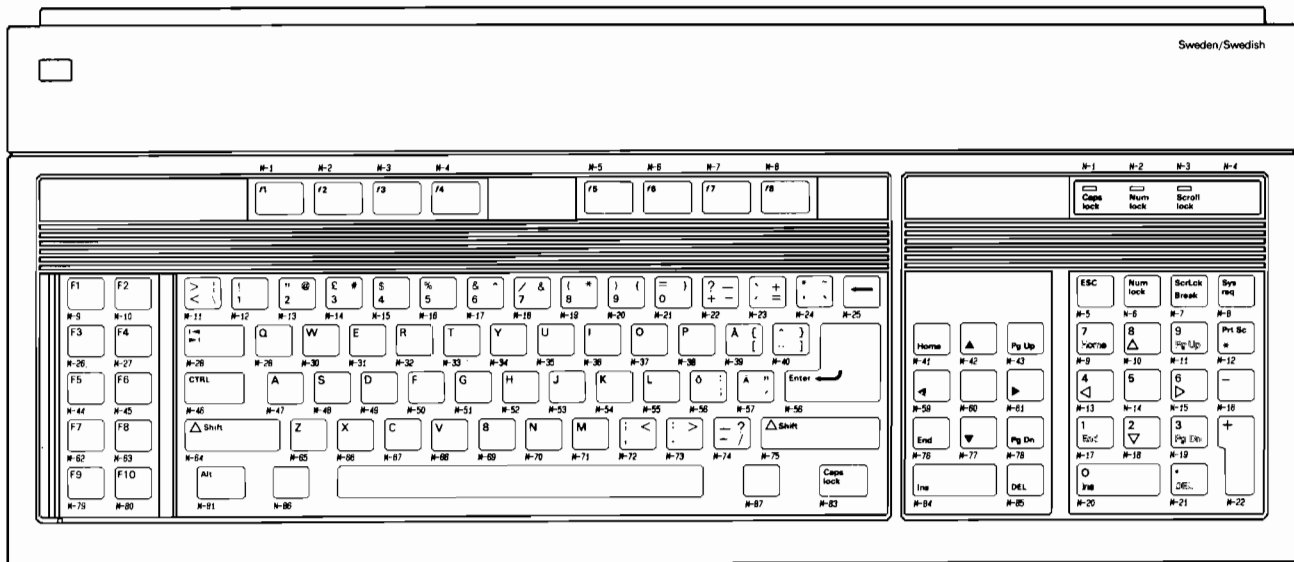


Italian Keyboard

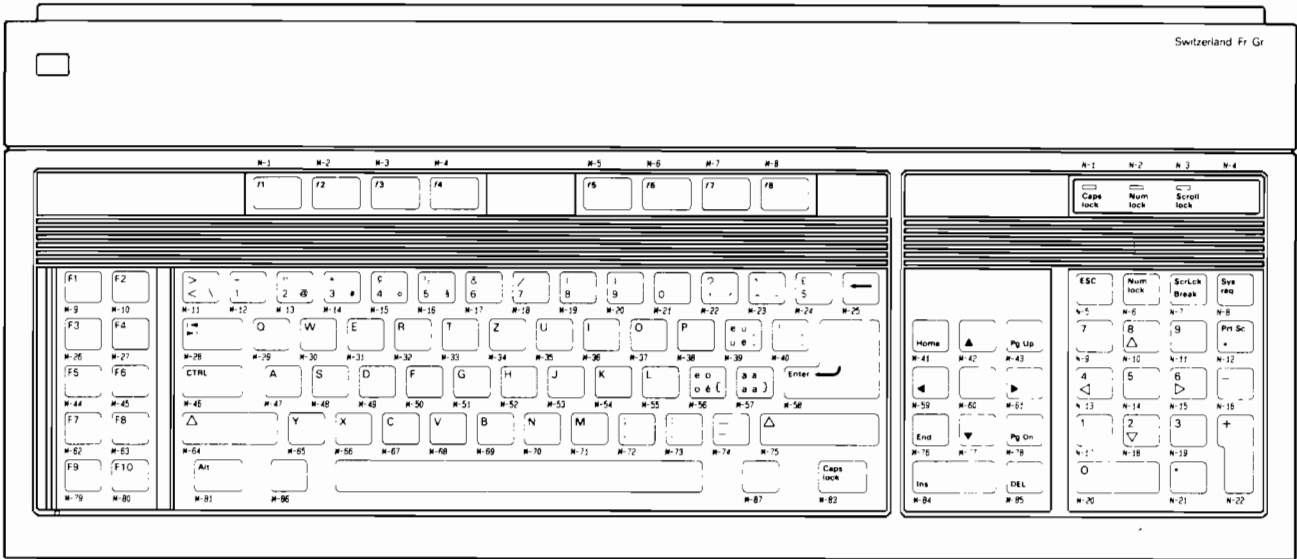
Keyboards



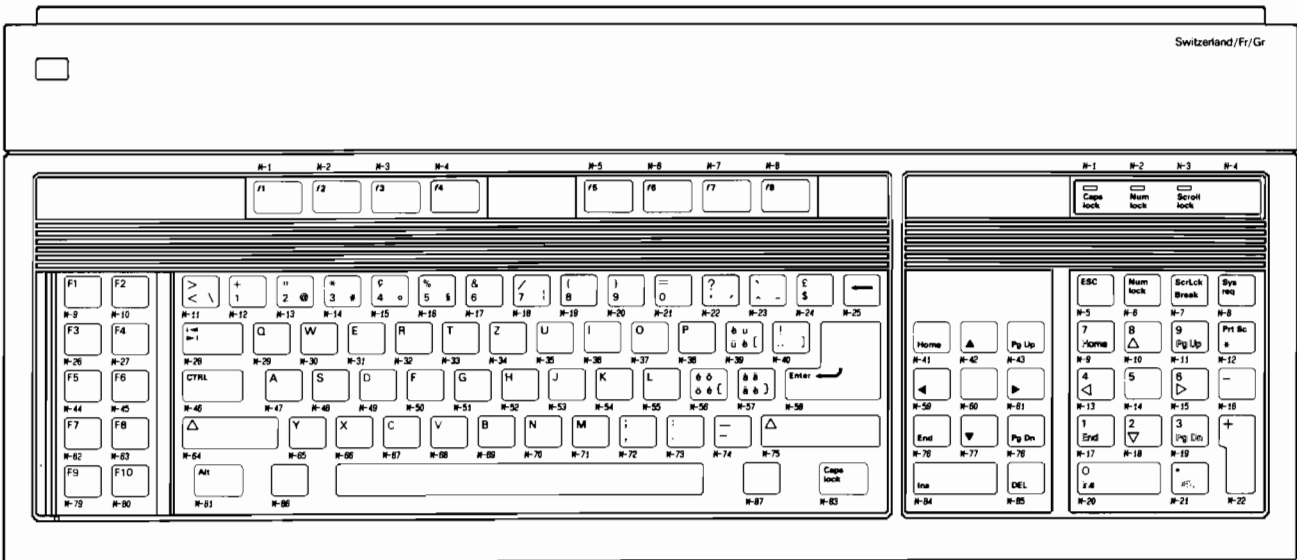
Spanish Keyboard (Europe)



Swedish Keyboard

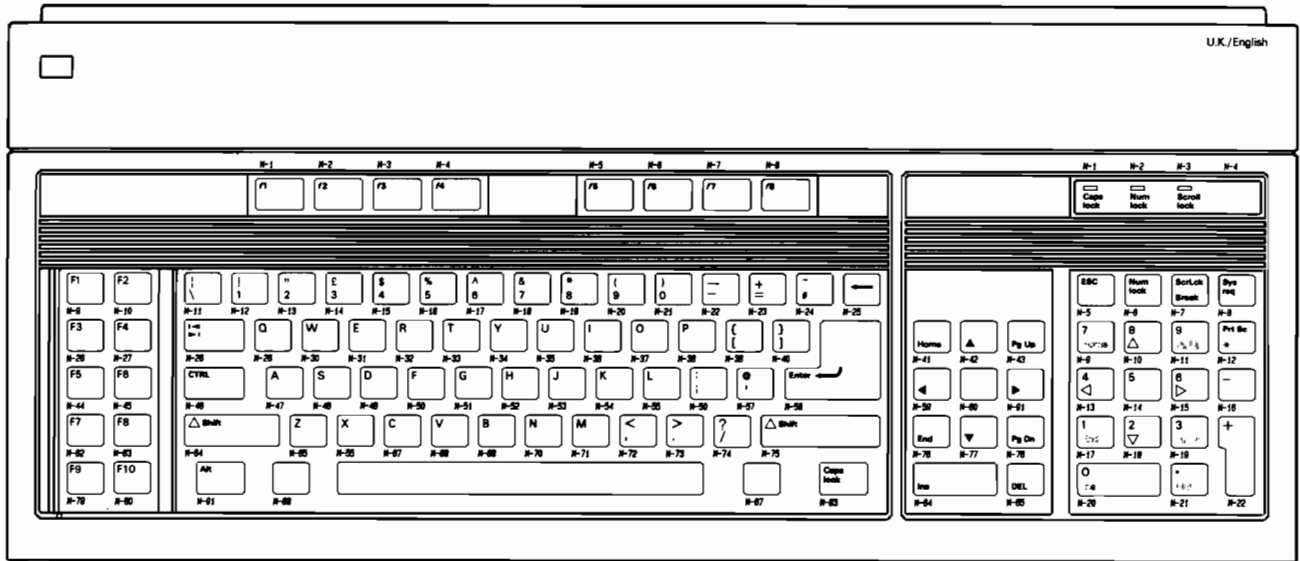


Swiss German Keyboard

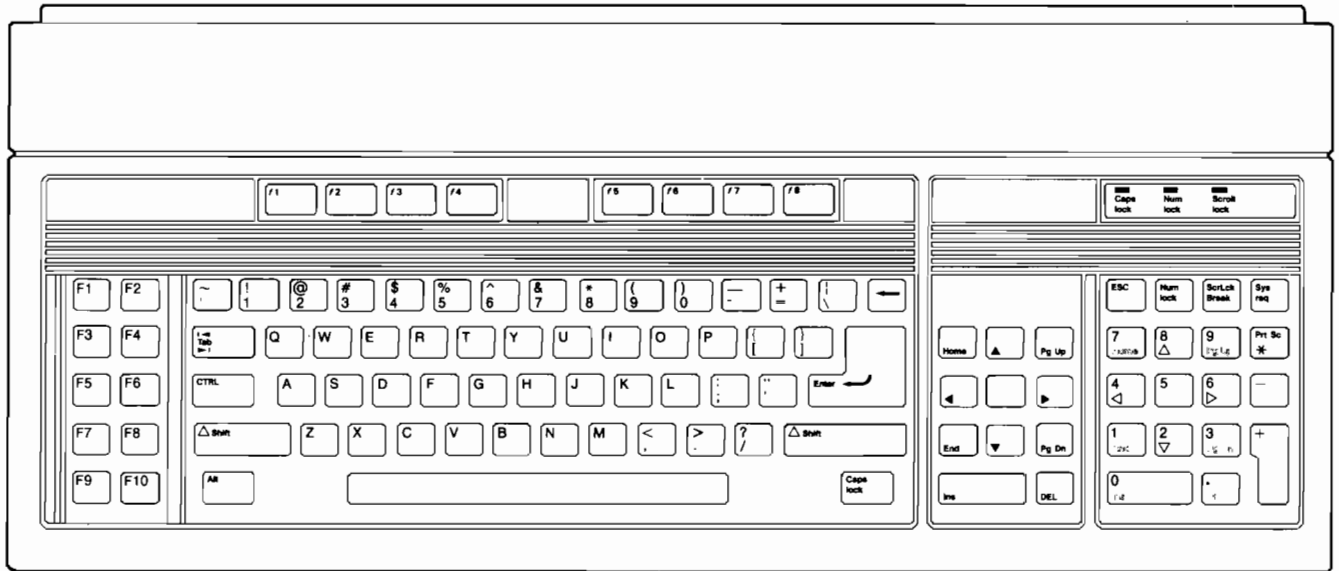


Swiss Roman Keyboard

Keyboards



United Kingdom Keyboard

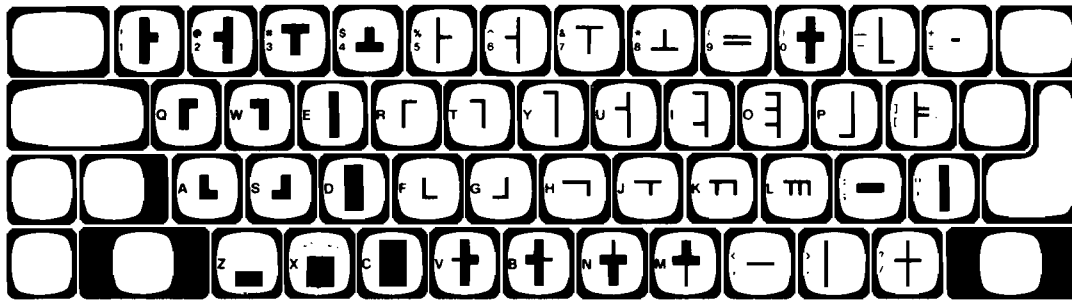


United States Keyboard

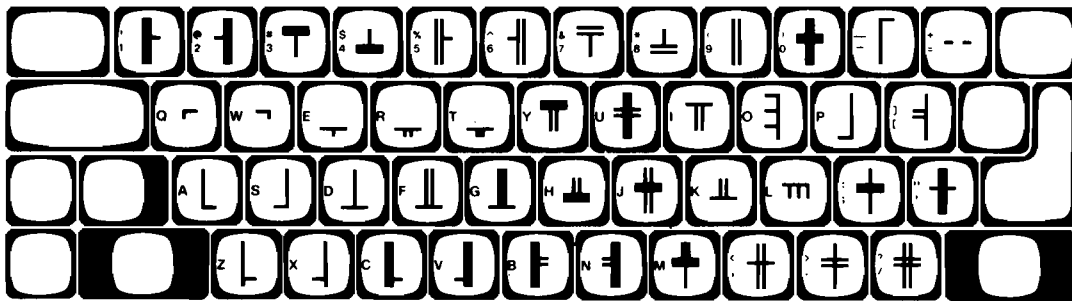
NOTE

The Finnish, Flemish, and Katakana keyboards are not shown.

Keyboard Definitions for the Line Drawing Character Set



Unshifted Line-Drawing Keyboard



Shifted Line-Drawing Keyboard



HP PORTABLE PLUS

No keyboards are shown for the HP Portable Plus.



Whenever you use a program, subprogram, or other file you must specify the name of the file and (in most cases) identify the volume where it is located. You identify the volume by supplying a volume specifier with the file name. A volume specifier is either a volume label or a unit specifier.

Volume Label

A volume label is a one to eight character string assigned to a storage medium via the PRINT LABEL statement. The characters ";" or ":" cannot be used because these characters are used in commands to delimit a volume label or file specifier from other parameters.

Unit Specifier

A unit specifier consists of several parameters in the following format (optional parameters are enclosed in brackets):

`device type [2 [device address [unit code]]]`

device type a single character which specifies the type of mass storage device. The currently supported values for *device type* are shown below:

Device Description	<i>device type</i>
HP 250's built-in 5 Mbyte Disc Drive	G
HP 250's built-in 10 Mbyte Disc Drive	H
HP 250's built-in 15 Mbyte Disc Drive	I
HP 7902 Flexible Disc Drive	F
HP 7906H/M/S Removable Disc Cartridge	C
HP 7906H/M/S Fixed Disc	D
HP 7908P Disc Drive (fixed disc)	Q
HP 7910 Disc Drive.	L
HP 7911P Disc Drive (fixed disc)	R
HP 7912P Disc Drive (fixed disc)	S
HP 7941A/7942A Disc Drive (fixed disc).	T
HP 7945A/7946A Disc Drive (fixed disc).	U
HP 7957/7958 Disc Drive	V
HP 9895 Flexible Disc Drive	F
HP 9133 Disc Drive (built-in 3.5" flexible disc drive)	A
HP 9133/9134 Disc Drive (fixed disc)	M
HP 9153 Disc Drive (built-in 3.5" flexible disc drive)	A
HP 9153/9154 Disc Drive (fixed disc)	N
Cartridge Tape Drive (built-in on the HP 7908P, HP 9144A, HP 7911P, HP 7912P, HP 7942A and HP 7946A)	K

Volume Specifiers

- Q** select code of the HP-IB Interface card.
- device address* the physical address of the device; this can be an integer expression with a value 0 through 7. If the device address is not specified, the system uses the highest address of all devices of type *device type* currently connected to the system.
- For example, suppose that two HP 7908P disc drives are connected to a system (addresses 0 and 4). Then if the unit specifier ":Q" is entered, the system "assumes" that the device specified is the device at address 4 (the higher address of the two type "Q" devices).
- unit code* a single digit used to distinguish between two or more HP-IB devices having the same device address. (For example, the HP 7908P contains a disc drive and a tape drive which are located at the same device address.) The unit code can be an integer expression with value 0 through 7. For an the HP 7908P, HP 7911P, HP 7912P, HP 7942A and HP 7946A Disc Drives (with cartridge tape drive), the disc unit code is always 0 and the tape unit code 1. For the HP 9895A Disc Drive, the unit code of the left drive is 0 while the unit code of the right drive is 1 (if the drive is equipped with two drives).
- The default unit code for disc devices is "0"; the default unit code for tape devices is "1".

Example

Suppose that you are using a system equipped with the following mass storage devices:

- HP 7946A Disc Drive (device address is set to 5).
- HP 7945A Disc Drive (device address is set to 4),
- HP 9895A Dual Drive Flexible Disc Drive (device address is set to 6).

The unit specifier for the HP 7946A disc drive is ":U2,5,0". Because the device type tells your system that the device is a fixed disc drive, the unit code can be omitted. Thus, the device specifier is ":U2,5". And since the HP 7946A has the highest device address of all type "U" devices connected to the system, the device address can also be omitted. Thus the device specifier is ":U2". However, since "2" is no longer needed, the device specifier for the HP 7946A can be further shortened to ":U".

The unit specifier for the HP 7945A disc drive is ":U2,4,0". Because the device type tells your system that the device is a fixed disc drive, the unit code can be omitted. Thus, the device specifier is ":U2,4". Note that this specifier cannot be shortened any further. If the device address was omitted, the system would assume the address to be the highest of all type "U" devices connected to the system and would select the address of the HP 7946A by default.

The unit specifiers for the HP 9895A disc drive are ":F2,6,0" (left drive of the dual drives) and ":F2,6,1" (right drive of the dual drives). The unit specifier ":F" specifies the left hand drive since the default unit code for disc devices is "0".

Each softkey can be defined for use as a keyboard typing aid to reduce a series of up to 160 keystrokes to one touch of a key. You can store and load typing aid definitions from mass storage devices as a file, so that the keys do not have to be continually redefined.

A softkey can be defined in two ways:

1. The **ON KEY** statement is used to define a softkey within a program; pressing a softkey with an active **ON KEY** definition causes an interrupt which can be detected by the program.
2. You can assign a typing aid definition to a softkey directly from the keyboard (via the **EDIT** command).

When a softkey is defined in both ways at the same time (via the **ON KEY** statement and via the keyboard), the definition assigned with the **ON KEY** statement always has priority. After the **ON KEY** definition has been deleted, the typing aid definition can be accessed.

What follows is a discussion on how you can use softkeys as typing aids.



DEFINING SOFTKEYS AS TYPING AIDS

To define or edit a softkey as a typing aid, you perform the following 3 basic steps:

1. Execute the following statement:

```
EDIT KEY# key number
```

or type the word **EDIT** and press the softkey you wish to define. Doing this places the keyboard in edit mode.

2. Type in the character sequence that you wish to store in the softkey.
3. Store the typing aid definition in the softkey by pressing the softkey. This causes the system to exit the edit mode. If you wish to exit the edit mode without storing the definition, press the **HALT** key; in this case, any previous typing aid definition is retained. This definition exists as long as the system is running. To permanently store a softkey definition, see the section headed "Storing Typing Aid Definitions".

ERASING TYPING AID DEFINITIONS

For a single key: To erase a typing aid definition for a single key, type in **SCRATCH** and then press the softkey you want to erase.

For all keys: To erase all typing aid definitions, execute the following command:

```
SCRATCH KEY#
```

LISTING CURRENT TYPING AID DEFINITIONS

To list all current typing aid definitions, execute the following command:

```
LIST KEY#
```

STORING TYPING AID DEFINITIONS

You might find, after operating your HP 260 for a period of time, that there are several commands which you use repetitively throughout the course of a day. If this is the case, you can define typing aid softkeys to execute the commands and then save your definitions in a special type of HP 260 file, known as a KEY file.

To save your softkey definitions, use the **STORE KEY** command; this saves all softkeys that are currently defined. The **STORE KEY** command is very similar to the **STORE** command described in Chapter 10; you specify the volume that you want to store the KEY file on.

For example, to store your softkey definitions onto a 7908 disc in a KEY file named **STEVES**, execute the following command:

```
STORE KEY "STEVES:Q"
```

After doing this, you can execute the **CATALOG** command to see the file named **STEVES**.

NOTE

If you attempt to **STORE** a KEY file under the same name, you will get an **ERROR 54**. Use the **RE-STORE** command to correct this error.

LOADING TYPING AID KEY FILES

Any KEY file created by the STORE command can be loaded into memory by executing the LOAD KEY command. This command is very similar to the LOAD command described in the chapter titled "System Commands".

For example, if you wanted to load the softkey definitions that you just stored onto the 7908 in the example above, execute:

```
LOAD KEY "STEVES:Q"
```

Now that you understand all aspects of using softkeys as typing aids, read further to see some examples of how you can use them.

Examples

The following examples are presented to give you ideas on how to use softkeys as typing aids. There is an inexhaustible number of ways in which you can use softkeys as typing aids. What is shown here is, by no means, intended to cover all possible uses of softkeys as typing aids; rather, they are intended to give you specific examples while also encouraging you to think of ways in which you can use these keys to perform repetitive tasks.

Example 1

Suppose that your daily responsibilities require you to type something repeatedly. One such thing might be the date. You might have to type memos that repeatedly use this date. Rather than having to type the date over and over again, you can enter the date into a softkey, and then just press the softkey whenever you need the date.

Here is a way to do this:

EDIT		1) TYPE "EDIT" and PRESS SOFTKEY #1					
KEY 1 - UNDEFINED		2) TYPE IN THE DATE AND PRESS SOFTKEY #1					
September 30,1981							
September							
30,1981							

Example 2

Suppose someone hands you a disc and says to you, "I want you to purge all of the data files on the mass storage device". If there is a large number of data files, you can save time and effort by defining a softkey as a typing aid to execute the **PURGE** command for you.

Here is how you would do it:

<pre> EDIT KEY 1 - UNDEFINED ⌘PURGE"+++++"⌘⌘ </pre>	<ol style="list-style-type: none"> 1) Type EDIT and press Softkey #1 2) Access the display control character set by pressing CNTL and Softkey #12 3) Type in the sequence as shown <ol style="list-style-type: none"> a) Press INSERT b) Type PURGE" c) Press the right arrow key six times so that you space over the file name d) Type a " e) Press CONTROL CLEAR to clear the rest of the line f) Press EXECUTE 4) Press Softkey #1 to define the typing-aid key
<pre> ⌘PURGE"→ →++++"⌘ </pre>	



CONFIGURING WORKSTATIONS

APPENDIX

E

This appendix describes how to configure terminals and PCs (personal computers) for use as HP 260 workstations.



CONFIGURING THE HP 2392A

The HP 260 must be powered up and must be configured correctly before the HP 2392A can be used as a workstation. Similarly, the HP 2392A must be properly configured before it can be used as a workstation. To configure the HP 2392A for use as an HP 260 workstation:

1. Power on the HP 2392A; the device is automatically in terminal mode.
2. Press the key labeled **USER SYSTEM**. The following softkey labels will be displayed.

device control	margins/ tabs/col	service keys	modes				config keys
----------------	----------------------	--------------	-------	--	--	--	-------------

3. Press , labeled **config keys**. The following softkey labels will be displayed.

		datacomm config	ext dev config	terminal config			
--	--	-----------------	----------------	-----------------	--	--	--

Configuring Workstations

4. Press **F3**, labeled **datacomm config**. The following screen will be displayed.

DATACOMM CONFIGURATION							
BAUD RATE	2400	Parity/DataBits		None/8		EnqAck YES	
ASTERISK	OFF	Chk Parity	NO	SR(CH)	LO		
RecvPace	None					CS(CB)	Xmit NO
XmitPace	None						
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES			DISPLAY FUNCTIONS	config keys

5. Press **F4**, labeled **DEFAULT VALUES**.

6. If your computer is an HP 260 Series30 or an HP 260 Series40, press **F2**, labeled **NEXT CHOICE**, until the baud rate changes to **19200**. If your computer is any other model of the HP 250 or HP 260, press **F2**, labeled **NEXT CHOICE**, until the baud rate changes to **9600**.

NOTE

19200 baud is the maximum rate for direct serial communication with the HP 260 Series30 or the HP 260 Series40. 9600 baud is the maximum rate for communication with any other model of the HP 250 or HP 260. If you wish to connect an HP 2392A using a modem, configure the baud rate to the speed specified by the modem.

7. Use the **TAB** key to move through the fields until the **RecvPace** field is highlighted.
8. Press **F2**, labeled **NEXT CHOICE**, until the **RecvPace** field displays **Xon/Xoff**. (All the other configuration values are as the default.) The terminal configuration screen should resemble the following illustration.

DATACOMM CONFIGURATION							
BAUD RATE	19200	Parity/DataBits	None/8				
ASTERISK	OFF	Chk Parity	NO	SR(CH)	LO	EnqAck	YES
RecvPace	XonXoff					CS(CB)	Xmit NO
XmitPace	None						
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES			DISPLAY FUNCTIONS	config keys






9. Press **F1**, labeled **SAVE CONFIG**.

CONFIGURING THE HP VECTRA

The HP 260 must be powered up and must be configured correctly before the HP Vectra can be used as a workstation. Similarly, the HP Vectra must be properly configured before it can be used as a workstation. To configure the HP Vectra for use as an HP 260 workstation:

1. Switch on the HP Vectra. The Personal Application screen appears. The ADVANCELINK 2392 application must be installed. Other applications can vary depending upon your system.

(P.A.M.)		MAIN MENU					
Select application to run and press Start Applic, or type a DOS command							
Hewlett-Packard		10-14-86		9:10:33			
DOS COMMANDS		FILE MANAGER		SETUP		Exec Card Manager	
ADVANCELINK 2392							
Start Applic		Set Date And Time		Manage Applics	Show .EXE .COM .BAT	Help	

2. Use the keys labeled , , , and  to select **ADVANCELINK 2392**; then press , labeled **Start Applic**. The following screen will be displayed.

Advancelink		MAIN					
HP68333F (c) Copyright Hewlett-Packard Co. 1982, 1983, 1984, 1985							
File Transfer		Command	Logging Options	File Manager	Terminal	Help	Exit AdvLink

3. Press **F6**, labeled **Terminal**. The following softkeys will be displayed.

device control	margins/ tabs/col		modes		advlink keys		config keys
----------------	----------------------	--	-------	--	-----------------	--	----------------

4. Press **F8**, labeled **config keys**. The following softkeys will be displayed.

serial1 config	serial2 config	advnet config	ext dev config	terminal config		global config	
-------------------	-------------------	------------------	-------------------	--------------------	--	------------------	--

5. Press **F1**, labeled **serial1 config**. The following screen will be displayed.

POINT TO POINT DATACOMM CONFIGURATION (SERIAL1)							
BAUD RATE	2400	Parity/DataBits		None/8		EnqAck YES	
ASTERISK	OFF	Chk Parity	NO	SR(CH)	LO		
RecvPace	None			CS(CB)	Xmit	NO	
XmitPace	None						
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES			DISPLAY FUNCTIONS	config keys

6. Press **F4**, labeled **DEFAULT VALUES**.

7. If your computer is an HP 260 Series30 or HP 260 Series40, press **F2**, labeled **NEXT CHOICE**, until the baud rate changes to **19200**. If your computer is any other model of the HP 250 or HP 260, press **F2**, labeled **NEXT CHOICE**, until the baud rate changes to **9600**.

NOTE

19200 baud is the maximum rate for direct serial communication with the HP 260 Series30 or the HP 260 Series40. 9600 baud is the maximum rate for direct serial communication with any other model of the HP 250 or HP 260. If you wish to connect an HP Vectra using a modem, configure the baud rate to the speed specified by the modem.

Configuring Workstations

8. Use the **TAB** key to move through the fields until the **RecvPace** field is highlighted.
9. Press **F2**, labeled **Next Choice**, until the **RecvPace** field displays **Xon/Xoff**. (All the other configuration values are as the default.) The terminal configuration screen should resemble the following illustration.

POINT TO POINT DATACOMM CONFIGURATION (SERIAL1)							
BAUD RATE 19200		Parity/DataBits None/8			EnqAck YES		
ASTERISK OFF		Chk Parity NO		SR(CH) LO			
RecvPace XonXoff					CS(CB) Xmit NO		
XmitPace None							
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES			DISPLAY FUNCTIONS	config keys

10. Press **F1**, labeled **SAVE CONFIG**.
11. Press **F8**, labeled **config keys**. Then press **F7**, labeled **global config**. The following screen will be displayed.

GLOBAL CONFIGURATION							
Keyboard USASCII					Personality HP		
Remote To Serial1					Printer I/F None		
Memory Size 32K							
Video Type Unspecified							
Vectra Mode YES					Screen Size 23 lines		
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES			DISPLAY FUNCTIONS	config keys

12. Press **F4**, labeled **DEFAULT VALUES**.

13. Use the cursor control keys to position the cursor in the field labeled "Screen Size".

Press , labeled **NEXT CHOICE**, until the value **24** appears in the field. Then press , labeled **SAVE CONFIG**.

If no field labeled "Screen Size" appears on the screen, press , labeled **SAVE CONFIG**.

CONFIGURING THE HP 150

The HP 260 must be powered up and must be configured correctly before the HP 150 can be used as a workstation. Similarly, the HP 150 must be properly configured before it can be used as a workstation. To configure the HP 150 for use as an HP 260 workstation:

1. Switch on the HP 150; the Personal Application Manager Screen appears. The display can vary depending upon the applications installed on your HP 150.

Personal Application Manager (P.A.M.)							Main
Select an application to run and press Start Applic							
Hewlett-Packard				15-10-86			
MSDOS COMMANDS	INSTALL						
A	A						
Start Applic		Set Date And Time	Reread Discs	File Manager	Terminal	Help	Exit P.A.M.

2. Select F6, labeled **Terminal**.
3. Press the key labeled **USER SYSTEM**. The following softkey labels will be displayed.

device control	margins/tabs/col	service keys	modes				config keys
----------------	------------------	--------------	-------	--	--	--	-------------

4. Press **F8**, labeled **config keys**. The following softkey labels will be displayed.

global config		port1 config	port2 config	terminal config	accessory config		
------------------	--	-----------------	-----------------	--------------------	---------------------	--	--

5. If you connected the serial cable to the HP 150 port labeled PORT 1 press **F3**, labeled **port1 config**. If you connected the serial cable to the HP 150 port labeled PORT 2, then press **F4**, labeled **port2 config**. In this example **Port1 config** is chosen.

FULL DUPLEX HARDWIRED (PORT1)							
BAUD RATE	2400	Parity/DataBits	None/8	Clock	INT	EnqAck	YES
ASTERISK	OFF	Chk Parity	NO	SR(CH)	LO		
RecvPace	None			CS(CB)	Xmit	NO	
XmitPace	None						
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	system defaults		config menus	DISPLAY FUNCTNS	config keys

6. Press **F4**, labeled **system defaults**. The label for **F4** will change to **DEFAULT VALUES**.

7. Press **F4**, now labeled **DEFAULT VALUES**.

8. If your computer is an HP 260 Series30 or HP 260 Series40, press **F2**, labeled **NEXT CHOICE**, until the baud rate changes to **19200**. If your computer is any other model of the HP 250 or HP 260, press **F2**, labeled **NEXT CHOICE**, until the baud rate changes to **9600**.

NOTE

19200 baud is the maximum rate for direct serial communication with the HP 260 Series30 or the HP 260 Series40. 9600 baud is the maximum rate for direct serial communication with any other model of the HP 250 or HP 260. If you wish to connect an HP 150 using a modem, configure the baud rate to the speed specified by the modem.

9. Use the **TAB** key to move through the fields until the **RecvPace** field is highlighted.

Configuring Workstations

10. Press , labeled **Next Choice**, until the **RecvPace** field displays **Xon/Xoff**. (All the other configuration values are as the default.) The terminal configuration screen should resemble the following illustration.

FULL DUPLEX HARDWIRED (PORT1)							
BAUD RATE 19200	Parity/DataBits None/8	Clock INT		EnqAck YES			
ASTERISK OFF	Chk Parity NO	SR(CH) LO		CS(CB) Xmit NO			
RecvPace XonXoff	XmitPace None						
SAVE CONFIG	NEXT CHOICE	PREVIOUS CHOICE	system defaults		config menus	DISPLAY FUNCTNS	config keys

11. Press , labeled **SAVE CONFIG**.

CONFIGURING THE HP Portable PLUS

The HP 260 must be powered up and must be configured correctly before the HP Portable PLUS can be used as a workstation. Similarly, the HP Portable PLUS must be properly configured before it can be used as a workstation. To configure the HP Portable PLUS for use as an HP 260 workstation:





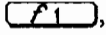
1. Switch on the HP Portable PLUS. When the HP Portable PLUS has warmed up, the Personal Application Manager screen appears. The REFLECTION 1 application must be installed. The other applications can vary depending upon your system.

```

Personal Application Manager (P.A.M.)      Main      nnnn Bytes free on A:
Move the pointer to the desired application, then press START APPLIC
Hewlett-Packard                          Battery 100%   15-10-86
DOS COMMANDS                          HP REFLECTION      VT REFLECTION
B                                       B

```

START APPLIC	FILE MANAGER	TIME & DATE	REREAD DISCS	DATACOMM CONFIG	SERIAL CONFIG		Off
-----------------	-----------------	----------------	-----------------	--------------------	------------------	--	-----

2. Use the keys labeled , , , and  to select the highlighted box marked **HP REFLECTION**. Press , labeled **START APPLIC**. The following softkeys will be displayed.

device control	margins/ tabs/col	config keys	modes keys	COMMAND LINE	file transfer	HELP	EXIT
-------------------	----------------------	----------------	---------------	-----------------	------------------	------	------

Configuring Workstations

3. Press **[F3]**, labeled **config** keys. The following softkeys will be displayed.

com1 config	com2 config	terminal page 1	terminal page 2	printer config	enhancmt config		System Keys
----------------	----------------	--------------------	--------------------	-------------------	--------------------	--	----------------

4. Press **[F1]**, labeled **Com1 config**. The following information is displayed.

COM1 CONFIGURATION							
Baud rate	9600			Xmit Indicator (*)	OFF		
Parity	NO			DCD Required	NO		
Check Parity	NO			CTS Required	NO		
Receive Pacing	NONE			DSR Required	NO		
Transmit Pacing	NONE			Stop Bits	1		
Enq/Ack Pacing	YES						
NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES	ACTIVE VALUES	ACTIVATE CONFIG	SAVE TO DISK		config keys

5. Press **[F3]**, labeled **DEFAULT VALUES**.

6. If your computer is an HP 260 Series30 or an HP 260 Series40, press **[F2]**, labeled **NEXT CHOICE**, until the baud rate changes to **19200**. If your computer is any other model of HP 250 or HP 260, press **[F2]**, labeled **NEXT CHOICE**, until the baud rate changes to **9600**.

NOTE

19200 baud is the maximum rate for direct serial communication with the HP 260 Series30 or the HP 260 Series40. 9600 baud is the maximum rate for direct serial communication with any other model of the HP 250 or HP 260. If you wish to connect an HP Portable PLUS using a modem, configure the baud rate to the speed specified by the modem.

7. Use the **[TAB]** key to move through the fields until the **Receive Pacing** field is highlighted.

8. Press **[F2]**, labeled **NEXT CHOICE**, until the **Receive Pacing** field displays **Xon/Xoff**. (All the other configuration values are as the default.) The terminal configuration screen should resemble the following illustration.

COM1 CONFIGURATION							
Baud rate	19200				Xmit Indicator (*)	OFF	
Parity	NO				DCD Required	NO	
Check Parity	NO				CTS Required	NO	
Receive Pacing	XonXoff				DSR Required	NO	
Transmit Pacing	NONE				Stop Bits	1	
Enq/Ack Pacing	YES						
NEXT CHOICE	PREVIOUS CHOICE	DEFAULT VALUES	ACTIVE VALUES	ACTIVATE CONFIG	SAVE TO DISK		config keys

9. Press **[F5]**, labeled **ACTIVATE CONFIG**, to save the configuration.

CONNECTING A 2392-TYPE WORKSTATION OVER X.25

If you have connected an HP 2392A, HP 150, HP VECTRA, or HP Portable Plus to an HP 2334A Packet Assembly/Disassembly Facility (PAD), you must input the following commands to establish a data transfer connection.

```

[CONTROL] P
@set 1:0, 3:127, 15:0 [RETURN]
[SHIFT] [ESCAPE] (or [CONTROL] ← on an HP Vectra)
    
```

NOTE

These commands should be input after you have typed in your X.25 network number.

If you want to use any PAD other than the HP 2334A, please contact your PAD supplier to find out how to establish an 8-bit transparent data path.



Alphanumeric characters - Letters, numbers, and punctuation marks.

Applications software modules - Computer programs to solve business related problems such as inventory, accounts receivable, order entry, etc.

Backups - Duplicating programs and data kept on removable media.

BASIC - An acronym for Beginner's All-purpose Symbolic Instruction Code; a popular, easy-to-learn programming language used on your computer system.

Binary program - An extension of the operating system, invoked by the user, that provides BASIC language enhancements.

Bit - An abbreviation for binary digit, or a unit of information that can be either 0 or 1.

Byte - A sequence of eight bits operated on as a unit, which is the smallest accessible amount of information in the computer.

Command - An operation which can be executed only from the computer keyboard; it cannot be used in a program.

Console - The part of a computer used for communication between the operator and the computer. See workstation.

CPU - Central Processor Unit: this performs the system's computational functions. It also referred to as SPU - System Processor Unit.

CRT - (Cathode Ray Tube): a synonym for the display or screen.

Cursor - The flashing underscore which appears on the display that points out the current character position.

Data base - A collection of related data sets (files).

Data integrity - The validity of data or information.

Data set - A data base file that contains data entries (records).

Defective tracks - A track on a storage medium where reading and writing of data is not possible, usually because of scratches, dirt, or lack of magnetic oxide on the surface of the disc. If any defective tracks exist, they are identified during the media initialization process (the INIT utility program).

Disc - A storage device on which information is recorded magnetically.

Display - A television-like screen used for outputting data, messages, and other information to the operator.

Display editing keys - A set of keys used to position the cursor at specific locations on the display to modify data.

Glossary

Directory - A "table of contents" showing the name, type, and number of files recorded on a disc.

Disc drive - The device used to transfer data between disc media and computer memory.

Disc drive code - The number of the disc drive unit.

Diagnostic - A test that the system performs on itself.

DROM - (Discrete Relocatable Optional Module): DROMs are optional additions to the operating system held in mass storage. They can be loaded with the operating system at power-on to extend the functionality of the operating system.

Exponentiation - Raising a number to a power. For example: $2^{**}3 = 2*2*2 = 8$

Editing - Correcting errors, whether typographical or non-typographical, and modifying program lines and data.

Error message - An English phrase or number describing an error that has occurred during execution. An error number refers to a detailed description of the problem (see the appendix titled "Error Messages").

Expression - One or more variables, numbers, functions, etc., grouped together with operators (+, -, *, /, etc.) and mathematically or logically evaluated to a single value.

File - A file is one or more logical records written on a storage medium. It consists of contiguous sectors which hold information such as programs or user-defined data.

Flexible disc - One of the storage media for your system. Data is written on a thin magnetic oxide film coated on plastic. The disc is enclosed in a sealed plastic jacket for protection.

Floppy disc - Another name for a flexible disc.

Form feed - The ability of the printer to automatically advance to the next form or page of paper for printing.

Field - A "window" or section of the display line where input or output is allowed.

Fixed disc - A disc that cannot be removed from its disc drive. Fixed discs are faster and more capacious than removable discs.

Function - A BASIC language operation which returns a number or value, and can be executed either from the keyboard or programmatically.

Hardware - The physical equipment making up your computer system.

Hardware error - An error associated with a mechanical failure of a component of your system.

Hierarchy - A list of priorities or procedures regarding relational operators, functions, and punctuation.

Initialization - A process that writes addresses on a storage medium, tests the writing and reading patterns from the disc, and sets up the directory to keep track of files.

Keyboard - A set of keys used to input information and program lines. It typically consists of a typewriter block, data entry pad, halt and execute keys, special function keys, and display editing keys.

Mass storage device - A mass storage device can be either a fixed disc drive, flexible disc drive, or tape or cartridge drive.

Medium - The material on which data is recorded.

Null string - A string variable containing no characters; it is often designated as "".

Numerical range - The range of limits on the value of numbers output by your computer.

Numerical value - The value of an expression represented as a decimal, an integer, or in scientific notation.

Operand - The expression that is being operated upon by a function, or a relational or arithmetic operator. For example: $2 + 8$.

Operator error - An error caused by attempting an improper key sequence, command, or procedure.

Operating system - The software that controls the operation of your computer.

Output - To yield the results of processed data; often refers to the result itself.

Parameters - Variables in a command or statement whose values are defined by the user.

Password - A unique code, usually a number or a name. Used to access an applications software module or data base information.

Peripherals - Devices used for Input/Output operations which are supported - for example, mass storage devices and printers.

Precision - The number of digits allowed per data element. Real (full) precision allows 12 digits, short precision allows 6 digits, and integer precision allows numbers from -32767 through 32767.

Principal workstation - It is the workstation where loading and system error information is displayed.

Program - A sequence of instructions or statements that a computer interprets and executes.

Record - A block of 256 bytes of data written on the disc.

Scientific notation - A form of writing a number as a decimal times a power of 10. Example: $1.0E6 = 1,000,000$

Scrolling - Refers to the up and down movement of the display. Scrolling occurs when you enter a new line at the bottom of the display or when you use the and keys at the top or bottom of the screen.

Softkeys - Special function keys that are defined to execute special instructions or any defined series of keystrokes.

Software - Programs or other instructions.

Software error - A logical or syntactical error encountered in software.

Special function keys (SFK) - User-definable keys. Each key can be dynamically defined as a typing or programming aid. Also known as softkeys.

Glossary

Spooling - Temporary storage of data or programs on mass storage files, allowing the system to continue processing while an output device is used.

Statement - A numbered line stored in computer memory. A collection of statements is known as a program.

Storage device - A mechanism that holds a medium for recording information for later retrieval.

String variable - A variable which represents a series of alphanumeric characters.

Syntax - The formal required structure of a program statement.

System software - The operating system, DROMs, run-only programs and utilities supplied by Hewlett-Packard.

Task - The actual or potential activity of program execution. Primary tasks have a workstation and user interaction; secondary tasks can operate in the background. All tasks require a 64 Kbyte memory partition.

Terminal - A device capable of entering or displaying information when requested by a program.

Variable name - A name representing a location in memory where data such as numbers, alphanumeric strings, and numeric arrays are stored. The value of this data can be modified.

Volume - The physical medium on which data and programs are stored.

Workstation - A device capable of running and editing programs and executing commands.