HP 260 Computer Systems

CE HANDBOOK FOR THE HP 260 SERIES 30 AND SERIES 40

CE Handbook

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PRODUCT OVERVIEW

SECTION 1

PRODUCT OVERVIEW

Product Range

There are two products covered in this handbook. These are:

- The HP 260 Series 30
- The HP 260 Series 40

The two computers are identical in appearance and connectability. When you look at them, side by side, the only ways to tell them apart are to read their nameplates or to read the part numbers on their respective processor boards.

Internally, the differences between them are:

- The HP 260 Series 40 has disc cache capability, and therefore higher system performance
- The HP 260 Series 30 has no disc cache capability
- The HP 260 Series 30 can use a maximum of 1.3 Mbytes of memory
- The HP 260 Series 40 can use a maximum of 2.0 Mbytes of memory
- The HP 260 Series 40 has the processor board with part number: 45072-66567
- The HP 260 Series 30 has the processor board with part number: 45070-66567

The only time that these differences between the two products is likely to concern you, as a CE, is when a customer wants to increase the performance of his system by upgrading his HP 260 Series 30 to an HP 260 Series 40. This upgrade is effected by replacing the processor board (PN 45070-66567) with the processor board (PN 45072-66567).

Minimum System

The minimum system consists of the following parts:

- Processor board with two integrated serial ports and 0.5 Mb integrated memory
- HP-IB Assembly board
- A minimum working system also needs a system disc and a principal workstation. The principal workstation on the minimum-system HP 260 must be an HP 2392A or a PC, and must be connected to integrated port -1.

Card Cage Configuration

There are two boxes associated with the HP 260; the main box and an optional extender box. The slots are numbered from the bottom up; that is, the lowest slot is slot #1 and the highest slot is slot #5.

Main Box

Slot	Function
5	Any I/O
4	Any I/O
3	Any I/O
2	Memory (0.5-1.5 Mb)
1	Processor board

Extender Box

The extender box has 5 slots, all of which can have any type of I/O board.

Limits on I/O Boards

Here is a table showing the maximum number of each type of board allowable with the HP 260.

Type	Per Box	Per System
HP-IB	1	1
ASI	2	2
VIDEO	2	2
INP	1	1
Memory	-	1 slot in main box

NOTE

The slot available for the addition of memory boards is slot 2 in the main box, it is not possible to add memory to the extender box. Each memory board has 0.5 Mb of capacity and up to three of the new, smaller boards can be added to slot 2 of the main box. The first add-on memory board plugs into the backplane of slot 2 of the main box. It is different from the second and third added-memory boards. The second and third boards are identical, and plug into the back of the first add-on memory board.

System Connectivity

Here is a table showing the number of I/O ports available and the maximum number of users supported on both types of HP 260.

Box	Max # of ports	Max # of users	Port Type
Main	12	12	All serial ports
Main	10	10	8 Video and 2 integrated serial ports
Main + Extender	20	15	8 Video and 12 serial ports

ASI Connectivity Details

The ASI board has two types of port:

- Ports 1,2 and 3 have modem, RS-232 and RS-422 capability with standard D-type, 25-pin connectors
- Ports 4 and 5 have RS-232 and RS-422 capability, but no modem capability. These ports need a coupling cable to connect to standard, 25-pin connectors.

Port/Channel Mapping for I/O Boards

If two I/O boards of the same type are installed in the system (that is two VIDEO boards, or two ASI boards), the board nearest to the bottom of the card cage has the lowest port/channel number. For example, if there are two VIDEO boards, the board nearest to the bottom has channels 1-4, and the other board has channels 5-8.

SAFETY OVERVIEW

SECTION 2

SAFETY OVERVIEW

The following general safety precautions must be observed during all phases of operation, service, and repair of this system. Failure to comply with the precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the system. Hewlett-Packard Company assumes no liability for failure to comply with these requirements.

Ground the System

The system has a three-conductor, AC power cable. The power cable must be plugged into an approved, three-contact, electrical outlet with a safety ground.

Do Not Operate In An Explosive Atmosphere

Do not operate the system in the presence of flammable gases or fumes. Operation of any electrical system in such an environment is a serious hazard.

Keep Away From Live Circuits

Operating personnel must not remove system covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components when the power cable is connected. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Service Or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DATE CODES

SECTION 3

PCB DATE CODES

The following table lists the minimum date code for all the boards that can be added to the HP 260 card cage. You might find that the boards in particular HP 260s have date codes that are greater than those listed in the following table.

When you check the date codes of the boards in a card cage, make sure that all boards are properly seated. Loose boards are likely to cause intermittent errors.

Board	Part Number	Date Code	Revision
Series 30 CPU	45070-66567	2639	A
Series 40 CPU	45072-66567	2639	A
Main Memory	45008-66501	2639	A
Add-on Memory	45009-66501	2643	A
HP-IB	45070-66507	2640	B
ASI	45127-66501	2640	B
HPHIL (VIDEO)	45128-66501	2629	A
INP	45129-66501	2643	A
Main Backplane	45070-66501	2629	A
Extender Backplane	45071-66501	2643	A

OPERATING SYSTEM DATE CODES

B.08 Date Code	Description
2704	Initial release
2709	B.08 with full-featured FVBACK utility (program revision "8.11")
2715	Current version of B.08 (including latest UPDATE DROM) at release of this manual

OS INSTALLATION AND UPGRADE

SECTION 4

OS INSTALLATION FOR A NEW SYSTEM

Use the following procedure to install an operating system on a new HP 260 system only. The procedures for upgrading an operating system that is already installed on the customer's system are described later in this section.

Installing the OS on a new HP 260 System

This procedure describes the installation of a new operating system from its distribution medium to the disc on which the operating system will normally be stored. Two sets of distribution media are used to install B.08 on new customer systems: tape cartridges and microfloppies. The procedures for this installation from each type of medium are given separately.

Installing the OS from microfloppies

1. Power-on the disc drive and wait for the device to complete its self-test. On 913X devices, both the "FAULT" LED and the "ON-LINE" LED are illuminated during self-test. When self-test is complete, both of the LEDs stop shining.

2. Insert the OPERATING SYSTEM microfloppy into the drive on the disc. Wait until the microfloppy is ready for use; the red LED on the drive stops shining when the microfloppy is ready.

3. Power on the SPU. Wait until the power-on sequence is complete, and the cursor appears on the screen of the principal workstation. The following message will also appear:

```
LOAD KEY "PRIMER"
```

4. Press the RETURN key to execute the LOAD KEY "PRIMER" command. The following softkey definitions will appear.

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

5. Remove the OPERATING SYSTEM microfloppy from the drive and insert the UTILITIES 1 microfloppy into the drive.

6. Wait until the microfloppy is ready for use; the red LED on the drive stops shining when the microfloppy is ready.

7. Press the RUN "INIT" softkey.

8. A menu appears on the screen. Select the INIT softkey.

9. The unit specifiers of each of the mass storage devices connected to the SPU will now appear on the main screen and as softkey options. Select the softkey that is displaying the unit specifier of the disc that you want to initialize. This is the customer's system disc, and not the microfloppy.

10. Another set of softkeys, which allow you to select the interleaving factor to be used and specify the directory size now appear. Use the displayed, default values unless you have a special reason for changing them.

11. Select the CONTINUE softkey to begin the initialization of the new disc. Wait for the initialization process to complete. An example of the time taken for a disc to be initialized is that the process lasts for about 30 minutes with a 9133H disc.

12. When the disc initialization is complete, the message "INITIALIZATION COMPLETE" is displayed on the screen of the principal workstation. The initial softkey menu re-appears on the screen as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

13. If the customer wants to give a label to the system disc, enter the command: `PRINT LABEL "NAME OF CUSTOMER'S CHOICE" ON ":X"` (where X is the unit specifier of the system disc).

14. Now that the disc is initialized, you can store the operating system and standard Hewlett-Packard software on the customer's disc.

15. Press the RUN "ROUTIL" softkey. A menu will now appear and you should select the COPY softkey. If you are unfamiliar with the ROUTIL program and would like more details about it than are given here, refer to the "HP 260 UTILITIES MANUAL". That manual contains illustrations of the program menu and a comprehensive description of the program's functions.

16. Select the source volume and the destination volume from the list of unit specifiers of connected devices which are supplied as softkey options. The source volume here is the microfloppy, which has a unit specifier beginning with :A2,. The destination volume is the disc that has just been initialized and you should select the same unit identifier that you selected for the initialization. The system disc also has the label that you gave to it earlier (if the customer wanted a label).

17. Select the COPY ALL softkey to copy the standard set of run-only programs to the customer's disc. As each program is copied, the screen display highlights its name in the list of programs.

NOTE

Notice that you have now copied the US-English version of the QUERY program to the destination volume. Use the RUN "QUERIN" softkey, as described later in this section, to replace the US-English version with the local-language version.

18. When the copying is complete, select the EXIT softkey to return to the main ROUTIL menu.

19. Remove the UTILITIES 1 microfloppy from the disc drive and insert the UTILITIES 2 microfloppy in the drive.

20. Select the COPY softkey from the main ROUTIL menu.

21. Select the COPY ALL softkey to copy the standard set of run-only programs to the customer's disc. As each program is copied, the screen display highlights its name in the list of programs.

22. When the copying is complete, select the EXIT softkey to return to the main menu of the ROUTIL program.

23. Remove the UTILITIES 2 microfloppy from the disc drive and insert the OPERATING SYSTEM microfloppy in the drive.

24. Select the SYSTEM & DROMS softkey, to begin the procedure of copying the Operating System and the standard set of DROMs to the customer's disc.

25. Select the COPY softkey, followed by the source volume and destination volume, which will appear as softkey options.

26. Now, select the COPY ALL softkey to copy all the standard DROMs in addition to the Operating System to the customer's disc. Again, you can watch the progress of the copying process on the workstation screen; the DROM being copied is highlighted.

27. When all of the DROMS and the Operating System have been copied, select the EXIT softkey to return to the main ROUTIL menu, and then select the EXIT ROUTIL softkey to leave the ROUTIL program.

28. The initial softkey menu re-appears on the screen as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

29. Remove the OPERATING SYSTEM microfloppy from the drive and insert the QUERY microfloppy.

30. Press the RUN "QUERIN" softkey to display the following screen:

CHOOSING THE LANGUAGE FOR YOUR QUERY PROGRAM

The QUERY program has been written in 6 languages.
Press the softkey labeled with the language that you prefer for your prompts and messages.

U.K. ENGLISH and U.S. ENGLISH differ in date and currency symbol representation

Please select the language for your QUERY program messages and prompts.

FRENCH	GERMAN	ITALIAN	KATAKANA	U.K. ENGLISH	U.S. ENGLISH		

31. Select the language that the customer wants for QUERY, by pressing the relevant softkey. The language options are shown below.

    FRENCH
    GERMAN
    ITALIAN
    KATAKANA
    U.K. ENGLISH
    U.S. ENGLISH

32. Confirm your choice of language by pressing the YES softkey of the new screen.

33. Select the source and destination volumes for the copying of the QUERY program. The possible volumes will appear as softkey options. The source volume is the microfloppy and the destination volume is the customer's system disc.

34. Confirm your choice of the source device and the destination device by pressing the YES softkey of the new screen.

35. When the QUERY program has been copied, the initial softkey menu will re-appear as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

36. Press the RUN "CONFIG" softkey.

NOTE

The ROUTIL program that is distributed on the microfloppy contains an instruction to set the MSI to the destination device of the copy of the Operating System that you have carried out already. Therefore, the MSI is currently the customer's system disc. The embedded MSI command is not copied to any destination device.

37. Use the `Keyboard Edit` option of "CONFIG" to configure the primary keyboard type to the language of the customer's choice.

38. Use the `Autostart` option of "CONFIG" to remove the message `LOAD KEY "PRIMER"` from the customer's configuration. This will avoid future confusion.

39. Use the "CONFIG" program to configure the rest of the the customer's system.

40. Power-off the SPU, then power it on again, to allow the system to recognize and implement the new configuration. Check that no error messages are displayed. If error messages appear, refer to the OS Diagnosis Section for information on how to proceed.

NOTE

If the customer needs the GPL1 and GPL2 software, copy the relevant microfloppy to the system disc using the ROUTIL program. Follow the same procedure as for copying the UTILITIES 1 and the UTILITIES 2 microfloppies.

NOTE

For Step 39. in the above procedure, refer to the following sections of this handbook: Configuring discs, Configuring terminals, Configuring printers, Configuring plotters, Configuring data capture terminals, Configuring bar code readers, and OS Configuration. These sections will help you to configure the customer's system. However, this handbook does not contain information on Auto Start or Miscellaneous Configuration (time slices and Default MSI device). These configurations are application dependent, and you should refer to the appropriate application manuals for details.

Installing the OS from a tape cartridge

1. Power-on the disc drive and wait for the device to complete its self-test. On 794X devices both the "FAULT" LED and the "ON-LINE" LED are illuminated during self-test. When self-test is complete, both of the LEDs stop shining.

2. Insert the "OPERATING SYSTEM" tape cartridge into the drive on the disc. Wait until the tape cartridge is ready for use; the BUSY light on the drive stops shining when the cartridge is ready.

3. Power-on the SPU. Wait until the power-on sequence is complete, and the cursor appears on the screen of the principal workstation. The following message will also appear:

   ```
   LOAD KEY "PRIMER"
   ```

4. Press the RETURN key to execute the LOAD KEY "PRIMER" command. The following softkey definitions will appear.

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

5. If you are installing the Operating System from an HP 9144A tape drive, proceed from Step 7.

6. If you are installing the Operating System from any other device (using a tape cartridge) **enter the command: DIRECT NOUPDATE**. This command allows the tape to bypass the tape buffer on the disc, which it normally uses to update itself.

7. Press the RUN "INIT" softkey.

8. A menu will then appear on the screen. Select the INIT softkey.

9. The unit specifiers of each of the mass storage devices connected to the SPU appear on the main screen and as softkey options. Select the softkey which displays the unit specifier of the disc that you want to initialize.

10. Another set of softkeys, which allow you to select the interleaving factor to be used and specify the directory size now appear. Use the displayed, default values unless you have special reasons for changing them.

11. Select the CONTINUE softkey to begin the initialization of the new disc. Wait for the initialization process to complete. An example of the time taken for a disc to be initialized is that the process lasts for about 40 minutes with a 7945A disc. Refer to the HP 260 UTILITIES MANUAL for details of the initialization times for each of the discs supported on the HP 260.

12. When the disc initialization is complete, the message "INITIALIZATION COMPLETE" is displayed on the screen of the principal workstation. The initial softkey menu re-appears on the screen as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

13. If you are installing the Operating System from an HP 9144A tape drive, proceed from Step 15.

14. If you are installing the Operating System from any other device (using a tape cartridge), **enter the command: INDIRECT** to allow the tape processing to go through the tape buffer on the disc. This is the normal mode of operation of the device.

15. If the customer wants to give a label to the system disc, enter the command: PRINT LABEL "NAME OF CUSTOMER'S CHOICE" ON ":X" (where X is the unit specifier of the system disc).

16. Now that the disc is initialized, you can store the operating system and standard Hewlett-Packard software on the customer's disc. Press the RUN "ROUTIL" softkey. A menu will now appear and you should select the COPY softkey. If you are unfamiliar with the ROUTIL program and would like more details about it than are given here, refer to the "HP 260 UTILITIES MANUAL". That manual contains illustrations of the program menu and a comprehensive description of the program's functions.

17. Select the source volume and the destination volume from the list of unit specifiers of connected devices, which are supplied as softkey options. The source volume here is the tape cartridge, which has a unit specifier beginning with :K2, . The destination volume is the disc that has just been initialized, and you should select the same unit identifier that you selected for the initialization.

18. Select the COPY ALL softkey to copy the standard set of run-only programs to the customer's disc. As each program is copied, the screen display highlights its name in the list of programs.

NOTE

Notice that you have now copied the US-English version of the QUERY program to the destination volume. Use the RUN "QUERIN" softkey, as described later in this section, to replace the US-English version with the local-language version.

19. When the copying is complete, select the EXIT softkey to return to the main ROUTIL menu.

20. Select the SYSTEM & DROMS softkey, to begin the procedure of copying the Operating System and the standard set of DROMs to the customer's disc.

21. Select the COPY softkey, followed by the source volume and destination volume, which will appear as softkey options.

22. Select the COPY ALL softkey to copy all the standard DROMs in addition to the Operating System to the customer's disc. Again, you can watch the progress of the copying process on the workstation screen; the DROM being copied is highlighted.

23. When all of the DROMS and the Operating System have been copied, select the EXIT softkey to return to the main ROUTIL menu and then select the EXIT ROUTIL softkey to leave the ROUTIL program.

24. The initial softkey menu re-appears on the screen as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

25. Press the RUN "QUERIN" softkey to display the following screen:

```
                 CHOOSING THE LANGUAGE FOR YOUR QUERY PROGRAM

The QUERY program has been written in 6 languages.
Press the softkey labeled with the language that you prefer for your
prompts and messages.

U.K. ENGLISH and U.S. ENGLISH differ in date and currency symbol representation
-------------------------------------------------------------------------------
Please select the language for your QUERY program messages and prompts.
```

FRENCH	GERMAN	ITALIAN	KATAKANA	U.K. ENGLISH	U.S. ENGLISH		

26. Select the language that the customer wants for QUERY, by pressing the relevant softkey. The language options are shown below.

    FRENCH
    GERMAN
    ITALIAN
    KATAKANA
    U.K. ENGLISH
    U.S. ENGLISH

27. Confirm your choice of language by pressing the YES softkey of the new screen.

28. Select the source and destination volumes for the copying of the QUERY program. The possible volumes will appear as softkey options. The source volume is the microfloppy and the destination volume is the customer's system disc.

29. Confirm your choice of the source device and the destination device by pressing the YES softkey of the new screen.

30. When the QUERY program has been copied, the initial softkey menu will re-appear as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"					RUN "INIT"	

31. Press the RUN "CONFIG" softkey.

NOTE

The ROUTIL program that is distributed on the tape cartridge contains an instruction to set the MSI to the destination device of the copy of the Operating System that you have carried out already. Therefore, the MSI is currently the customer's system disc. The embedded MSI command is not copied to any destination device.

32. Use the Keyboard Edit option of "CONFIG" to configure the primary keyboard type to the language of the customer's choice.

33. Use the Autostart option of "CONFIG" to remove the message LOAD KEY "PRIMER" from the customer's configuration. This will avoid future confusion.

34. Remove the OPERATING SYSTEM tape cartridge from the drive by pressing the UNLOAD key on the cartridge housing, waiting until the BUSY light stops shining, and pressing the eject key.

35. Use the "CONFIG" program to configure the rest of the customer's system.

36. Power-off the SPU, then power it on again, to allow the system to recognize and implement the new configuration. Check that no error messages are displayed. If error messages appear, refer to the OS Diagnosis Section for information on how to proceed.

NOTE

For Step 35. in the above procedure, refer to the following sections of this handbook: Configuring discs, Configuring terminals, Configuring printers, Configuring plotters, Configuring data capture terminals, Configuring bar code readers, and OS Configuration. These sections will help you to configure the customer's system. However, this handbook does not contain information on Auto Start or Miscellaneous Configuration (time slices and Default MSI device). These configurations are application dependent, and you should refer to the appropriate application manuals for details.

MINOR REVISION UPGRADE

A minor revision of the operating system is one where only the last two digits change, such as from B.06.00 to B.06.01. If the letter or first two digits change, it is a major revision of the operating system. The following procedure is for upgrading the operating system to incorporate a minor revision:

1. Power-up the system using the currently-installed version of the operating system from the system disc.

2. Back up all software using the DUPL utility, the FVBACK utility, or a combination of the BACKUP utility and the DBSTOR binary.

3. Enter the command `RUN "CONFIG"` to produce a printout of the entire system configuration. Select `SET PRINTER`. Do not select the CRT. Select `DUMP CONFIGURATION`.

4. Enter the command `RUN "ROUTIL"`. If you are unfamiliar with the ROUTIL program and would like more details about it than are given here, refer to the "HP 260 UTILITIES MANUAL". That manual contains illustrations of the program menu and a comprehensive description of the program's functions.

5. A menu will now appear on the screen. Select the SYSTEM & DROMS softkey.

6. Another menu will appear on the screen. Select the PURGE softkey and then the unit specifier of the device that contains the operating system and DROMs to be purged.

7. Select the PURGE ALL softkey from the next screen menu. Each DROM is highlighted on the workstation screen as it is purged. When all of the DROMs and the Operating System have been purged, a new softkey menu is displayed.

8. Select the PURGE softkey.

9. Select the volume from which you want to purge the UTILITIES.

10. Select the PURGE ALL softkey. Each file is displayed in inverse video as it is purged.

11. When all of the UTILITIES programs have been purged, a new menu appears on the screen. Select the EXIT softkey, followed by the EXIT ROUTIL softkey, to leave the ROUTIL program.

12. Make sure that the drive in which you want to insert the medium containing the new version of the operating system is empty before you power-off the SPU. This precaution could save you about ten minutes of frustration.

13. Power-off the SPU and insert the medium containing the new version of the operating system into the cartridge tape drive, microfloppy drive, or floppy drive (depending on the customer's system).

14. Power-on the SPU and wait until the power-on sequence is complete, and the following command is displayed: `LOAD KEY "PRIMER"`

15. Press the RETURN key to execute the LOAD KEY "PRIMER" command. The following softkey definitions will appear. Notice that if you are using a floppy disc to load the new operating system, the ROUTIL program is on the UTILITIES floppy, not the Operating System floppy.

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

16. Press the RUN "ROUTIL" softkey. Select the COPY softkey from the new softkey menu.

17. Select the source and destination volumes, which will be displayed as softkey options. The source volume is the OS distribution medium, and the destination volume is the customer's system disc.

18. Select the COPY ALL softkey to copy the standard set of UTILITIES programs to the customer's disc. As each program is copied, the screen display highlights its name in the list of programs.

19. When the copying is complete, select the EXIT softkey to return to the main ROUTIL menu.

20. If you are using microfloppies to copy the UTILITIES, remove the UTILITIES 1 microfloppy from the drive, and insert the UTILITIES 2 microfloppy. Follow the same procedure as for the UTILITIES 1 microfloppy.

21. If you are using a tape cartridge to load the new Operating System, simply select the SYSTEM & DROMS softkey. If you are using a microfloppy or a floppy to load the new Operating System, remove the UTILITIES microfloppy or floppy currently in the drive, and replace it with the OPERATING SYSTEM microfloppy or floppy. Then select the SYSTEM & DROMS softkey.

22. Select the COPY softkey from the menu.

23. Now select the source and destination volumes, which will be displayed as softkey options. The source volume is the OS distribution medium and the destination volume is the customer's system disc (that is, the disc from which you have just purged the old operating system and DROMs).

24. Now, select the COPY ALL softkey to copy all the standard DROMs in addition to the Operating System to the customer's disc. Again, you can watch the progress of the copying process on the workstation screen; the DROM being copied is highlighted.

25. When all of the DROMS and the Operating System have been copied, select the EXIT softkey to return to the main ROUTIL menu and then select the EXIT ROUTIL softkey to leave the ROUTIL program.

26. Press the RUN "QUERIN" softkey to display the following screen:

```
                    CHOOSING THE LANGUAGE FOR YOUR QUERY PROGRAM

The QUERY program has been written in 6 languages.
Press the softkey labeled with the language that you prefer for your
prompts and messages.

U.K. ENGLISH and U.S. ENGLISH differ in date and currency symbol representation
--------------------------------------------------------------------------------
Please select the language for your QUERY program messages and prompts.
```

FRENCH	GERMAN	ITALIAN	KATAKANA	U.K. ENGLISH	U.S. ENGLISH		

27. Select the language that the customer wants for QUERY, by pressing the relevant softkey. The language options are shown below.

    FRENCH
    GERMAN
    ITALIAN
    KATAKANA
    U.K. ENGLISH
    U.S. ENGLISH

28. Confirm your choice of language by pressing the YES softkey of the new screen.

29. Select the source and destination volumes for the copying of the QUERY program. The possible volumes will appear as softkey options. The source volume is the microfloppy and the destination volume is the customer's system disc.

30. Confirm your choice of the source device and the destination device by pressing the YES softkey of the new screen.

31. When the QUERY program has been copied, the initial softkey menu will re-appear as follows:

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

32. Press the RUN "CONFIG" softkey.

33. Use the `Keyboard Edit` option of "CONFIG" to configure the primary keyboard type to the language of the customer's choice.

34. Use the Autostart option of "CONFIG" to remove the message LOAD KEY "PRIMER" from the customer's configuration. This will avoid future confusion.

35. Configure the customer's system in accordance with the printout you took in Step 3.

36. Power-off the SPU, then power it on again to allow the system to recognize the new configuration. Check that no error messages are displayed. If error messages appear, refer to the OS Diagnosis Section for information on how to proceed.

NOTE

Since this is a minor revision upgrade, all binaries that are part of programs will still work. Therefore, the application programs do not need to be up-graded. However, if there are any bug fixes in a binary used in a program, follow the Major Revision procedure. This will ensure that the binaries are upgraded.

MAJOR REVISION UPGRADE

A major revision of the operating system is one where the letter or first two digits change, such as from B.05.03 to B.06.00 or A.03.06 to B.04.00. If only the last two digits change, it is a minor revision of the operating system.

The following procedure is for upgrading the operating system to incorporate a major revision. Note that the first 36 steps are the same as for the upgrading of the operating system due to a minor revision.

Major Revision Upgrade Procedure

1. Power-up the system using the currently-installed version of the operating system from the system disc.

2. Back up all software using the DUPL utility, the FVBACK utility, or a combination of the BACKUP utility and the DBSTOR binary.

3. Run "CONFIG" in order to produce a printout of the entire system configuration. Select SET PRINTER. Specify a printer other than the CRT. Select DUMP CONFIGURATION.

4. Enter the command RUN "ROUTIL". If you are unfamiliar with the ROUTIL program and would like more details about it than are given here, refer to the "HP 260 UTILITIES MANUAL". That manual contains illustrations of the program menu and a comprehensive description of the program's functions.

5. A menu will now appear on the screen. Select the SYSTEM & DROMS softkey.

6. Another menu will appear on the screen. Select the PURGE softkey and then the unit specifier of the device that contains the operating system and DROMs to be purged.

7. Select the PURGE ALL softkey from the next screen menu. Each DROM is highlighted on the workstation screen as it is purged. When all of the DROMs and the Operating System have been purged, a new softkey menu is displayed.

8. Select the PURGE softkey.

9. Select the volume from which you want to purge the UTILITIES.

10. Select the PURGE ALL softkey. Each file is displayed in inverse video as it is purged.

11. When all of the UTILITIES programs have been purged, a new menu appears on the screen. Select the EXIT softkey, followed by the EXIT ROUTIL softkey, to leave the ROUTIL program.

12. Make sure that the drive in which you want to insert the medium containing the new version of the operating system is empty before you power-off the SPU. This precaution could save you about ten minutes of frustration.

13. Power-off the SPU and insert the medium containing the new version of the operating system into the cartridge tape drive, microfloppy drive, or floppy drive (depending on the customer's system).

14. Power-on the SPU and wait until the power-on sequence is complete, and the following command is displayed: `LOAD KEY "PRIMER"` .

15. Press the RETURN key to execute the LOAD KEY "PRIMER" command. The following softkey definitions will appear. Notice that if you are using a floppy disc to load the new operating system, the ROUTIL program is on the UTILITIES floppy, not the Operating System floppy.

RUN "ROUTIL"	RUN "CONFIG"	RUN "QUERIN"				RUN "INIT"	

16. Press the RUN "ROUTIL" softkey. Select the COPY softkey from the new softkey menu.

17. Select the source and destination volumes, which will be displayed as softkey options. The source volume is the OS distribution medium, and the destination volume is the customer's system disc.

18. Select the COPY ALL softkey to copy the standard set of UTILITIES programs to the customer's disc. As each program is copied, the screen display highlights its name in the list of programs.

19. When the copying is complete, select the EXIT softkey to return to the main ROUTIL menu.

20. If you are using microfloppies to copy the UTILITIES, remove the UTILITIES 1 microfloppy from the drive, and insert the UTILITIES 2 microfloppy. Follow the same procedure as for the UTILITIES 1 microfloppy.

21. If you are using a tape cartridge to load the new Operating System, simply select the SYSTEM & DROMS softkey. If you are using a microfloppy or a floppy to load the new Operating System, remove the UTILITIES microfloppy or floppy currently in the drive, and replace it with the OPERATING SYSTEM microfloppy or floppy. Then select the SYSTEM & DROMS softkey.

22. Select the COPY softkey from the menu.

23. Now select the source and destination volumes, which will be displayed as softkey options. The source volume is the OS distribution medium and the destination volume is the customer's system disc (that is, the disc from which you have just purged the old operating system and DROMs).

24. Now, select the COPY ALL softkey to copy all the standard DROMs in addition to the Operating System to the customer's disc. Again, you can watch the progress of the copying process on the workstation screen; the DROM being copied is highlighted.

25. When all of the DROMS and the Operating System have been copied, select the EXIT softkey to return to the main ROUTIL menu and then select the EXIT ROUTIL softkey to leave the ROUTIL program.

26. Press the RUN "QUERIN" softkey to display the following screen:

```
                 CHOOSING THE LANGUAGE FOR YOUR QUERY PROGRAM

The QUERY program has been written in 6 languages.
Press the softkey labeled with the language that you prefer for your
prompts and messages.

U.K. ENGLISH and U.S. ENGLISH differ in date and currency symbol representation
-------------------------------------------------------------------------------
Please select the language for your QUERY program messages and prompts.

-------------------------------------------------------------------------------
 FRENCH | GERMAN | ITALIAN |KATAKANA ||  U.K.   |  U.S.   |        |
        |        |         |         || ENGLISH | ENGLISH |        |
```

27. Select the language that the customer wants for QUERY, by pressing the relevant softkey. The language options are shown below.

    FRENCH
    GERMAN
    ITALIAN
    KATAKANA
    U.K. ENGLISH
    U.S. ENGLISH

28. Confirm your choice of language by pressing the YES softkey of the new screen.

29. Select the source and destination volumes for the copying of the QUERY program. The possible volumes will appear as softkey options. The source volume is the microfloppy and the destination volume is the customer's system disc.

30. Confirm your choice of the source device and the destination device by pressing the YES softkey of the new screen.

31. When the QUERY program has been copied, the initial softkey menu will re-appear as follows:

```
   RUN       RUN       RUN                                             RUN
"ROUTIL"  "CONFIG"  "QUERIN"                                         "INIT"
```

32. Press the RUN "CONFIG" softkey.

33. Use the `Keyboard Edit` option of "CONFIG" to configure the primary keyboard type to the language of the customer's choice.

34. Use the Autostart option of "CONFIG" to remove the message LOAD KEY "PRIMER" from the customer's configuration. This will avoid future confusion.

35. Configure the customer's system in accordance with the printout you took in Step 3.

36. Power-off the SPU, then power it on again to allow the system to recognize the new configuration. Check that no error messages are displayed. If error messages appear, refer to the OS Diagnosis Section for information on how to proceed.

Binary Replacement Procedure

For each program that uses binaries, use the procedure given in the following steps to change the binaries in each program to their new versions. There are two different sets of steps: one for operating systems where the TOOLS DROM is loaded, and the other for operating systems where the TOOLS DROM is not loaded.

NOTE

Remember that it is the customer's responsibility to change the binaries in all of the application programs to their new versions. It is not part of the Hewlett-Packard CE's responsibility to make the changes. The information is included here for the information of CEs. If a CE is asked by a customer how to make the binary changes, it might be useful to have this information readily accessible.

1. Power-up with the old OS revision (which you have just replaced on the system disc with the major updated version) from the OS distribution medium (floppy, tape cartridge or microfloppy) on which it is stored.

2. Enter the command LOAD "PROGRAM NAME" to load the program into the memory.

3. Enter the command SAVE "tprogname" to remove the old versions of the binaries.

4. Repeat the previous two steps for each program that uses binaries.

5. Power-off the SPU and remove the OS distribution medium.

6. Power-on the SPU with the new version of the operating system from the system disc. The next step depends on whether the customer has chosen to load the TOOLS DROM during the configuration of his system. The two possible procedures are given below.

If the TOOLS DROM is loaded

1. Enter the command `GET "tprogname"` where "tprogname" is the name you gave to the "saved" program in Step 39.
2. Enter the command `RE-STORE "PROGRAM NAME"` where "PROGRAM NAME" is the original name of the program. The program can now be run on the new version of the operating system.
3. Enter the command `PURGE "tprogname"` to purge the temporary file.
4. Repeat the previous three steps for each program that uses binaries.

If the TOOLS DROM is not loaded

1. Enter the command `LOADBIN "BINARY NAME"` for each of the binaries used in the program. This will load the new version of each binary from the new version of the OS.
2. Enter the command `GET "tprogname"` to combine the program with the new binaries.
3. Enter the command `RE-STORE "PROGRAM NAME"` to store the program including the new versions of the binaries it uses.
4. Enter the command `PURGE "tprogname"` to purge the temporary file.
5. Enter the command `SCRATCHP` to clear the user memory of binaries before repeating the above procedure for the next program.
6. Where possible, run the program to verify that the upgrade was successful.
7. Repeat the previous six steps for each program that uses binaries.

ENHANCEMENT OF THE OS USING THE UPDATE DROM

The UPDATE DROM provides a way to improve the quality of the current OS between OS releases. With the B.08 OS, you can obtain the latest version of the UPDATE DROM in two ways:

- use an HP 2622D, HP 2392A or a supported PC, and a MODEM connection
- use an HP 2392A, or a supported PC, and an X.25 connection

These two ways of obtaining the UPDATE DROM are explained in the following paragraphs.

File Information

The UPDATE DROM distribution package has three files:

UPINS1, UPINS, and UPINFO.

- UPINS1 contains the latest version of the UPDATE DROM.
- UPINS contains the program that is used to transfer the UPDATE DROM to the operating system, and to change the file type from "DATA" to "DROM".
- UPINFO contains information about the problems that have been fixed by the release of the latest version of the UPDATE DROM.

Transferring the UPDATE DROM Via a MODEM Connection

Each time you transfer the UPDATE DROM from our system in Boeblingen to your local system, you must copy the UPINS1 file and the UPINFO file. If you do not already have the UPINS file on your system, you must also copy it. However, if you do have the UPINS file on your system, you do not need to copy it each time you transfer the UPDATE DROM.

Equipment Needed

You need the following equipment to transfer the UPDATE DROM from our system in Boeblingen to your local system.

- an HP 2622D workstation, an HP 2392A workstation, or a supported PC connected to your local system
- a 1200-baud MODEM connected to an NT22-type port on your local system, if you are using an HP 2622D workstation, or a 1200-baud MODEM connected to a 2392-type port on your local system, if you are using any other type of workstation
- the NET260 software installed on your local system

- If you are using an HP 2622D workstation, the primary language on your local system must be configured to USACSII. This is not necessary if you are using a 2392-type workstation.

Obtaining the Telephone Number of the Boeblingen System

Contact the HP 260 Support Engineers in Boeblingen to obtain the telephone numbers for connecting to the Boeblingen system from an HP 2622 workstation, and from a 2392-type workstation. Note that these two numbers should not be confused, because you cannot use the 2622 number for the connection of a 2392-type workstation, or vice versa.

Transfer Procedure

To obtain the latest version of the UPDATE DROM, use the following procedure.

1. Dial the relevant telephone number for our system in Boeblingen, West Germany. Make sure that you use the correct number for your type of workstation.

2. Input RUN "NTCOPY"

3. The program requests the port ID for the port that is connected to the remote system. Input the port ID of the port to which your local MODEM is connected. This port ID is obtained by adding 10 to the actual ASI port number.

4. The program asks you to specify the device that contains the NTCOP program. Press RETURN.

5. Press the RECEIVE FILE softkey.

6. Press the SINGLE FILE softkey.

7. Input the name of the first file that you want to transfer, for example, UPINS1.

8. Input the name that you want to give to the UPINS1 file on your local system. You can call it UPINS1 if you want.

9. Input the name of the next file that you want to transfer, for example, UPINFO.

10. Input the name that you want to give to the UPINFO file on your local system. You can call it UPINFO if you want.

11. Input the name of the next file that you want to transfer, for example, UPINS. Note that if you already have the UPINS file on your local system, you do not need to transfer it again.

12. If you decided to transfer the UPINS file, input the name that you want to give to the UPINS file on your local system. You can call it UPINS if you want.

13. Press the EXIT RECEIVE softkey to return to the main menu of the NTCOPY program.

14. Press the EXIT softkey to exit from the NTCOPY program.

NOTE

If you decide to change the names of the UPINS1, UPINS or UPINFO files when you transfer them to your system for the first time, you must use the new names in later transfers. This ensures that you do not have more than one version of the UPDATE DROM in your system.

Transferring the UPDATE DROM Via an X.25 Connection

Each time you transfer the UPDATE DROM from our system in Boeblingen to your local system, you must copy the UPINS1 file and the UPINFO file. If you do not already have the UPINS file on your system, you must also copy it. However, if you do have the UPINS file on your system, you do not need to copy it each time you transfer the UPDATE DROM.

Equipment Needed

You need the following equipment to transfer the UPDATE DROM from our system in Boeblingen to your local system.

- an HP 2392A workstation, or a supported PC, connected to your local system
- an X.25 PAD connection, or a MODEM and an X.25 user-account, or an acoustic coupler and an X.25 user account
- the NET260 software installed on your local system
- the X25CPY program installed on your local system (X25CPY is a BASIC program that is distributed with the NET260 software)

NOTE

The X.25 PAD, MODEM or acoustic coupler must be connected to an ASI port of type 2392 on your local system.

Obtaining the X.25 Number of the Boeblingen System

Contact the HP 260 Support Engineers to obtain the X.25 number of our system in Boeblingen.

Connecting your System to Boeblingen via X.25

Use the following procedure to connect your system to our system via X.25.

1. Input RUN "X25CPY".
2. Press the softkey f4 to step through the port IDs until the port ID to which your PAD or MODEM is connected is displayed.
3. Press the softkey f1.
4. If you are connected to a PAD directly, input the X.25 number of our system in Boeblingen.

   If you are not connected to a PAD directly, dial the number of the nearest PAD, and log on to the PAD. When you have logged on to the PAD, input the X.25 number of our system in Boeblingen.

NOTE

If you are connected to a DATEX-P PAD, omit the (0262) code from the X.25 number. The (0262) is the international code for West Germany.

5. The system prompts you for your name. Input your user name.

6. Now you must configure your local PAD for transparent data-transmission. Ask your local PAD-supplier for information on how to configure your PAD. If you are using the HP 2334A PAD, you need to reconfigure the following parameters:

Parameter	Meaning	HP 2334A Setting
1	Escape from data transfer disabled	0
3	Data forwarding characters ALL	127
9	Padding after carriage return (no)	0
15	Editing (no)	0

To reconfigure the HP 2334A parameters so that they correspond with those in the above table, input the following commands.

Command	Comment
CONTROL P	! Puts you into CONFIG mode
PAR?RETURN	! Shows you the current values
SET 1:0,3:127,9:0,15:0RETURN	! Changes parameters 1,3,9 and 15
PAR?RETURN	! Shows you the new values
RETURN	! Exits CONFIG mode

When you have configured your PAD, leave the program by pressing the softkey f8.

7. Press the BREAK key. The X25CPY program returns control to your local system, and starts the NTCOPY program automatically.

8. The program asks you to specify the device that contains the NTCOP program. Press RETURN.

9. Press the RECEIVE FILE softkey.

10. Press the SINGLE FILE softkey.

11. Input the name of the first file that you want to transfer, for example, UPINS1.

12. Input the name that you want to give to the UPINS1 file on your local system. You can call it UPINS1 if you want.

13. Input the name of the next file that you want to transfer, for example, UPINFO.

14. Input the name that you want to give to the UPINFO file on your local system. You can call it UPINFO if you want.

15. Input the name of the next file that you want to transfer, for example, UPINS. Note that if you already have the UPINS file on your local system, you do not need to transfer it again.

16. If you decided to transfer the UPINS file, input the name that you want to give to the UPINS file on your local system. You can call it UPINS if you want.

17. Press the EXIT RECEIVE softkey to return to the main menu of the NTCOPY program.

18. Press the EXIT softkey to exit from the NTCOPY program.

NOTE

If you decide to change the names of the UPINS1, UPINS or UPINFO files when you transfer them to your system for the first time, you must use the new names in later transfers. This ensures that you do not have more than one version of the UPDATE DROM in your system.

Clearing Your X.25 Connection

When you exit from the NTCOPY program, the connection between our system in Boeblingen and the X.25 PAD to which you are connected is cleared. However, if your local system is connected to the PAD via a MODEM or an acoustic coupler, you must clear this connection yourself. Refer to your MODEM's documentation to find out how to do this.

Field Procedure

When you have successfully copied the UPINS, UPINS1 and UPINFO files to your system you can work independently to update your customers' systems during routine maintenance visits or problem solving assignments.

Installing the UPDATE DROM on an Operating System

First you need to have the files UPINS, UPINS1 and UPINFO (or the same files with their new names if you changed them earlier) stored on a distribution medium - a cartridge tape or a microfloppy. Then there are two slightly different procedures, depending on whether the customer's system disc contains an earlier UPDATE DROM or not.

If there is no UPDATE DROM on the system disc

1. Enter the command `RUN "UPINS"`
2. From the menu that appears, select the INSTALL softkey
3. Select the source volume from the volume names displayed as softkey options. This source volume will normally be your cartridge tape or microfloppy.
4. Select the destination volume from the volume names displayed as softkey options. This destination volume will normally be the customer's system disc.
5. Select the CONTINUE INSTALL softkey from the new menu
6. When the installation is complete, select the EXIT UPINS softkey. The customer's system disc now contains the UPDATE DROM with the latest improvements to the current Operating System.

If there is an UPDATE DROM on the system disc

1. If you want to find out which version of the UPDATE DROM is currently on the customer's system, run CONFIG, and select the DROM LIST option. The revision date of the UPDATE DROM tells you which version is currently on the system.

2. Enter the command `RUN "UPINS"`.

3. From the menu that appears, select the PURGE softkey.

4. Select the volume from which the UPDATE DROM is to be purged - the customer's system disc.

5. When the purge is complete and the main menu appears again, select the INSTALL softkey.

6. Select the source volume from the volume names displayed as softkey options. This source volume will normally be your cartridge tape or microfloppy.

7. Select the destination volume from the volume names displayed as softkey options. This destination volume will normally be the customer's system disc.

8. Select the CONTINUE INSTALL softkey from the new menu.

9. When the installation is complete, select the EXIT UPINS softkey. The customer's system disc now contains the UPDATE DROM with the latest improvements to the current Operating System.

With B.08 and later versions of the Operating System

The B.08 and later versions of the Operating System are shipped with the latest version of the UPDATE DROM included as part of the DROM set. Therefore, a customer who is running B.08 or a later version of the Operating System, should always have an UPDATE DROM on the system disc.

So, when you want to copy the newest UPDATE DROM to such a customer's system, you should use the second of the two procedures given above. This makes sure that you purge the old version of the UPDATE DROM before you install the new version.

NOTE

The UPINS program uses the file $$UPDA as a temporary file on the system file. Before you run the UPINS program, make sure that there is no file called $$UPDA on the customer's system disc. Such a file would be lost during the copying of the UPDATE DROM.

MAINFRAME INSTALLATION

SECTION 5

INSTALLING THE HP 260

The HP 260 is customer installable. Therefore it would be superfluous to document the relatively easy procedure in this handbook. If you are asked to install an HP 260, refer to the manual titled "Installing Your HP 260" for the details of how to proceed. Refer to the section of this handbook titled "Mainframe Configuration" for the details of the positioning of the PC boards in the card cage of the HP 260.

INSTALLING THE HP 45071A I/O EXTENDER BOX

The Extender box cannot be installed by a customer. When a customer purchases an extender box, HP installation is included in the price.

The following procedure shows you how to install the extender box.

Installation Procedure

WARNING

Disconnect all power cables from the SPU box and make sure that no power cables are connected to the I/O Extender Box.

1. Unpack the I/O Extender Box.
2. Place the I/O Extender Box on the styrofoam mat with which it was delivered.
3. Bring the customer's SPU to the work surface and place it next to the I/O Extender Box.
4. Loosen the hand screws that secure the power-supply cover to the SPU cover. Remove the power-supply cover.
5. Slide the cover of the SPU to the rear of the box and pull it clear of the box.
6. Loosen the two hand screws that hold the top PCB in the SPU box. Carefully pull the board out of the SPU and place it on the flat surface. Do not walk around while you are handling the board because this might cause electrostatic discharge (ESD).
7. Loosen the hand screws that secure the power-supply cover to the cover of the I/O Extender Box. Remove the power-supply cover.

8. Slide the cover of the I/O Extender Box to the rear of the box and pull it clear of the box.

9. Remove any PCB's from the Extender Box. Carefully place them on the flat surface.

10. Place the I/O Extender Box cover (the cover with the hole in its top) on the **SPU box**. Slide the cover on to the rear of the box and slide it towards the front.

11. Loosen the two sliding panel grips on the top of the cover and move them towards the center of the hole.

12. Carefully place the I/O Extender Box on top of the SPU box. Make sure that the data bus in the bottom of the I/O Extender Box is inserted properly into the data bus in the top of the SPU box. Two metal guides in the I/O Extender box fit into two holes in the SPU box to help to ensure that the boxes are aligned correctly.

13. Push the sliding panel grips in the bottom of the I/O Extender Box away from the center of the hole until they lock. This helps to make the new assembly secure.

14. Slide the cover without the hole on to the I/O Extender from the rear of the box.

15. Replace the power-supply covers on both the SPU Box and the I/O Extender Box.

16. Replace the top PCB in the SPU box. Tighten the hand screws to secure the PCB.

17. Install the PCB's that have been delivered with the I/O Extender Box. Start from the bottom slot and work upwards. Remember that any add-on memory boards that might be delivered with the I/O Extender Box must be added to slot #2 of the main SPU (and not to any slot in the I/O Extender Box).

OPERATING SYSTEM CONFIGURATION

SECTION 6

CONFIGURING PRIMARY TASKS

In general, refer to the "HP 260 UTILITIES Manual" for the details of how to configure tasks and workstations. However, here is a brief description of the most important points.

Use the following procedure to configure a primary task on an HP 260. A primary task is defined as a task that has a workstation attached to it when the system is powered on.

Primary Tasks

Use the following procedure:

1. Make a list of the primary tasks and their types. On the HP 260 a maximum of 15 primary tasks can be configured. These tasks can be divided between the three possible types of I/O (VIDEO, ASI, and Integrated Port ASI) as follows.

```
Maximum number of VIDEO I/O Primary Tasks       = 8

Maximum number of Integrated Port ASI Tasks     = 2

Maximum number of ASI Primary Tasks             = 10
```

2. To configure a Video Workstation, first make sure that the VIO DROM is configured. The PIO DROM must be configured if you want to configure a workstation on an asynchronous serial port. The procedure for configuring DROMs is given later in this section.

3. Select the "Task and Workstation Configuration" option of CONFIG. Select the class of the workstation for each task from the three softkey options offered (Video Workstations, Asynchronous Workstations, and Integrated Port Workstations).

4. Specify the time slice to be allocated to the task. The default setting is 1, giving each task equal priority. If a task is thought to be particularly important, it is possible to increase its share of CPU time by increasing its time slice.

5. Record the task configuration by using the RECORD CONFIG softkey.

6. For the tasks using ASI communication, set the desired baud rate for the communication between the SPU and the workstation. The default setting is 19200. Possible limitations of the desired baud rate include the limited capability of modems, which often have a maximum speed

of 1200 baud, or the inability of peripheral devices to operate at high speeds of data transmission.

NOTE

If the workstation connected to integrated port -1 is to be used as the principal workstation, then integrated port -1 must be configured to 19,200 baud.

7. To change the baud rate for a workstation, select the "Asynchronous Port Configuration" option of CONFIG. Use the ALTER FIELD, NEXT CHOICE and DONE softkeys to select the desired baud rate.

8. Power-off the system, then power it on again to allow the new configuration to be recognized by the system.

9. Check that no error messages are displayed during the power- up of the system.

CONFIGURING DROMS

The following instructions show how to configure the set of DROMS available on B.08.00. Configuring a DROM means changing its auto-load status.

1. Run CONFIG and select Option 2. Use the EDIT softkey to change the auto-load status for the DROMS of current interest. Record the new status information by pressing the RECORD CONFIG softkey, and exit from the CONFIG program.

2. Power-off the system, then power it on again, to allow the system to recognize the new configuration.

3. Check that no error messages of type `DROM LOADER FAILURES` are displayed during system power-up.

The most likely error message related to the configuration of DROMS is :

```
DROM LOADER FAILURE WITH "DROM NAME": INSUFFICIENT SPACE
```

To overcome this problem, select Option 8 of CONFIG and use the DROM OVERFLOW softkey to allocate memory space, from any user block or the common block to the storage of the DROMs that failed to load. Use the cursor to select the memory blocks to be allocated to DROM overflow.

NOTE

Configure only those DROMS that are required for the applications of the customer. The configuration of superfluous DROMs wastes memory space that could otherwise be available to users.

A DROM is available to all tasks on the system; its storage location makes no difference to its availability.

LOADING BINARIES

The fundamental difference between a binary and a DROM is that a binary is available *only* to the task that has loaded it. To load a binary, enter the following command:

LOADBIN "BINARY NAME" The binary is now stored in the task's memory partition and will remain there until:

- Another program is loaded/run
- SCRATCHA is entered
- SCRATCHP is entered
- CONTROL HALT, ESCAPE CONTROL Y or the SCRATCH ALL system softkey is pressed

A binary that is part of a program (that is, a binary that was in the task memory when the program was stored) will be loaded automatically whenever the program is loaded and whenever it is run with automatic load.

NOTE

It is possible to load multiple copies of a binary in a task's memory partition. This has no advantage and wastes memory space. Indeed, it could cause a memory overflow of the task's partition (indicated by ERROR 2 on the display).

THE PRINCIPAL WORKSTATION

The Principal Workstation on an HP 260 system can belong to one of two types:

- The Video Workstation on channel 1 of the Video board.
- The PC or 2932A connected to integrated port -1

NOTE

The PC or 2932A workstation on integrated port -1 can be the principal workstation only when there is no Video workstation in the system. If a PC or workstation is used as the principal workstation, both the PC or workstation and integrated port -1 must be configured to 19,200 baud. The connection between the PC or workstation and port -1 must be direct (that is, a modem connection is not allowed for the principal workstation).

Further, no workstation connected to a port on the ASI board can be the principal workstation on an HP 260 Series 30/40 system. This does not affect the position of ASI port 1 on older HP 260 systems; it remains possible to use this port for the connection of principal workstations under the B.08 Operating System.

Boot-up Problems Related to the Principal Workstation

If a system is booted and the principal workstation does not respond, check the following:

- If there is a Video board in the SPU, make sure that your principal workstation is a Video workstation connected to channel 1 of the lower Video board.
- Make sure that the principal workstation is not connected to the ASI board. On the HP 260 Series 30/40, a workstation can not be used as the principal workstation if it is connected to a port on the ASI board.
- If there is no Video board in the SPU, make sure that the principal workstation is connected to Integrated port -1 on the processor board. Integrated port -2 cannot be used to connect the principal workstation.
- If the principal workstation is connected to integrated port -1, check the configuration of the PC or workstation against the following list. If you find any differences, change the configuration of the PC or workstation to conform with the list.

Baud Rate	19,200
Data Length	8 bit
Parity	No Parity
Receive Pacing	XON/XOFF
Handshake	ENQ/ACK
Remote Mode	On

MAINFRAME CONFIGURATION

SECTION 7

PRODUCT OVERVIEW

Introduction

The HP 260 system is intended to be fully customer installable. The commitment to this ease of installation is shown in the absence of configuration switches from the system. Even the ASI board ports are configured through software.

Minimum System

The minimum system consists of the following parts:

- Processor board with two integrated serial ports and 0.5 Mb integrated memory
- HP-IB Assembly board
- For a **working** system, a system disc and a principal workstation are also needed. The principal workstation on a minimum HP 260 can be either a PC or a 2392A workstation (connected to integrated port -1).

Card Cage Configuration

There are two boxes associated with the HP 260; the main box and an optional extender box.

Main Box

Slot	**Function**
5	Any I/O
4	Any I/O
3	Any I/O
2	Any I/O or Memory (0.5-1.5 Mb)
1	Processor board

The extender box has 5 slots, all of which can have any type of I/O board.

Mainframe Configuration

Limits on I/O Boards

Here is a table showing the maximum number of each type of board allowable with the HP 260.

Type	**Per Box**	**Per System**
HP-IB	1	1
ASI	2	2
VIDEO	2	2
INP	1	1
Memory		1 slot

System Connectivity

Here is a table showing the number of I/O ports available and the maximum number of users supported on both types of HP 260.

Box	**Max # of ports**	**Max # of users**	**Port Type**
Main	12	12	All serial ports
Main	10	10	8 Video and 2 integrated ports
Main + Extender	20	15	8 Video and 12 serial ports

ASI Connectivity Details

On the ASI board there are 2 types of port:

- Ports 1,2 and 3 have modem, RS-232 and RS-422 capability with standard D-type, 25-pin connectors
- Ports 4 and 5 have RS-232 and RS-422 capability, but no modem capability. These ports need a coupling cable to connect to standard 25-pin connectors.

DATA COMM. CONFIGURATION

SECTION 8

ASYNCHRONOUS DATA COMMUNICATION CONFIGURATION

The HP 260 SPU supports serial asynchronous data communication through 25 pin D-type connectors. Three types of data communication are supported:

- RS-232 direct connection
- RS-422 direct connection
- RS-232 communication over a modem

There are three classes of serial port on the 260 SPU:

- Ports 1, 2 and 3 on the ASI board. These ports have RS-232, RS-422 and modem-communicative capabilities.
- Ports 4 and 5 on the ASI board. These ports have RS-232 and RS-422 communicative capabilities, but cannot be connected to any device over a modem. A coupling cable must be supplied in order to use these ports with a 25-pin, D-type connector.
- The 2 integrated serial ports on the HP 260 processor board. These ports have RS-232 and modem-communicative capabilities. These ports support all of the printers that are supported on the HP 260 and also the PC-type workstations. However, peripherals that require the TIO DROM, such as plotters and terminals, are not supported on these ports. The table below shows which devices can be connected to the integrated serial ports.

Workstations

HP VECTRA
HP 150
HP 2392A
IBM PC
HP Portable Plus

Printers

HP 2932A
HP 2934A
HP 2563A
HP 2686A
HP 2225D
HP 2603A

An HP 260 system can have three levels of ASI communication capacity:

- The minimum ASI capacity HP 260 has no ASI board. The only ASI communications on such a system are through the integrated ports on the CPU.
- The HP 260 with the next level of communication capability has one ASI board and the 2 integrated ports, giving a total of 7 asynchronous data communication ports.
- The HP 260 with maximum ASI capacity has 2 ASI boards and the 2 integrated ports, giving a total of 12 asynchronous data communication ports.

The Deletion of the PA Switch

The 260 ASI board has no PA selection switch because the selection is made automatically by the operating system. If there is only one ASI board in the system, that board is given PA 5. If there are two ASI boards in the system, the board in the slot nearer to the bottom of the card cage is given PA 5, and the other board is given PA 4.

Configuring the RS-232C board connectors

The first step in the configuration of the asynchronous data communication section of an HP 260 system is to determine what type of communication is required for each port. When this is known, each port must be configured to operate in the desired manner. For the ports on the ASI board and the integrated ports on the processor board, this is done using the CONFIG program, as described below.

The alternatives for communication over each of the ports on the HP 260 are now described.

Ports 1-3 on the ASI Board

- DIRECT RS-232C connection. A single cable with a maximum length of 15 meters is supported.
- RS-422 connection. A maximum length of 1000 meters is supported with an RS-422 connection.
- SWITCHED MODEM (USA). In this switched, asynchronous modem connection, the ASI monitors the Clear To Send (CTS) signal.
- SWITCHED MODEM (EUROPE). In this switched, asynchronous modem connection, the ASI interface monitors the Data Carrier Detect (DCD) signal.
- LEASED MODEM (EUROPE, DRS = +12V). In this private-line modem, the Data Rate Select (DRS) line requires +12V.
- LEASED MODEM (US, DRS = -12V). In this private-line modem, the Data Rate Select (DRS) line requires -12V.
- UNUSED PORT. This setting is used when a particular port is to be left without a connected device for a considerable period.

NOTE

The function of the UNUSED PORT setting is to ground the receiver line, reducing the risk of damage to the HP 260 mainframe and ASI board from electro-static discharge (ESD). The effective throughput of the ASI board is increased if ports that are not being used are configured as UNUSED PORTs. Ports that have class "None" in CONFIG are automatically configured as UNUSED by the operating system. This applies only to the HP 260 Series 30/40 computer, and not to the older HP 260s and HP 250s, on which the ports are configured manually.

Ports 4 and 5 on the ASI Board

- DIRECT RS-232C connection. A single cable with a maximum length of 15 meters is supported.
- RS-422 connection. A maximum length of 1000 meters is supported with an RS-422 connection.
- No modem connections are supported on ports 4 and 5.
- UNUSED PORT. This setting is used when a particular port is to be left without a connected device for a considerable period.

Integrated Serial Ports on the CPU

- DIRECT RS-232C connection. A single cable with a maximum length of 15 meters is supported.
- SWITCHED MODEM (USA). In this switched, asynchronous modem connection, the ASI monitors the Clear To Send (CTS) signal.
- SWITCHED MODEM (EUROPE). In this switched, asynchronous modem connection, the ASI interface monitors the Data Carrier Detect (DCD) signal.
- LEASED MODEM (EUROPE, DRS = +12V). In this private-line modem, the Data Rate Select (DRS) line requires +12V.
- LEASED MODEM (US, DRS = -12V). In this private-line modem, the Data Rate Select (DRS) line requires -12V.
- No RS-422 connection is supported on the integrated serial ports.
- UNUSED PORT. This setting is used when a particular port is to be left without a connected device for a considerable period.

Configuring the RS-232C board connections

This procedure is used to select the type of data communication for each of the ASI ports and the two integrated ports on the processor board.

1. Run the CONFIG program.
2. Select option 9 ("Asynchronous Port Configuration").
3. In the column headed "SwConf" the type of data communication currently selected for each of the ports is shown.
4. If you want to change the type of communication for any port, position the cursor in the field under SwConf, and in the row for the port you want to change.
5. Press the ALTER FIELD softkey, and then select the type of communication you want from the following list of alternatives:

Connection Type	Softkey Label
Direct connection	DIRECT
Switched European Modem	MSwEU
Leased European Modem	MoLeHi
Switched U.S. Modem	MSwUS
Leased U.S. Modem	MoLeLo

6. When you have selected the type of communication for each port, press the RECORD CONFIG softkey. The new configuration will then be saved to the system disc.

HP 260 RS-232C Connector Pin Definitions

Here are the definitions of the pins used in the connection of devices to the ASI board ports and the integrated serial ports of the HP 260.

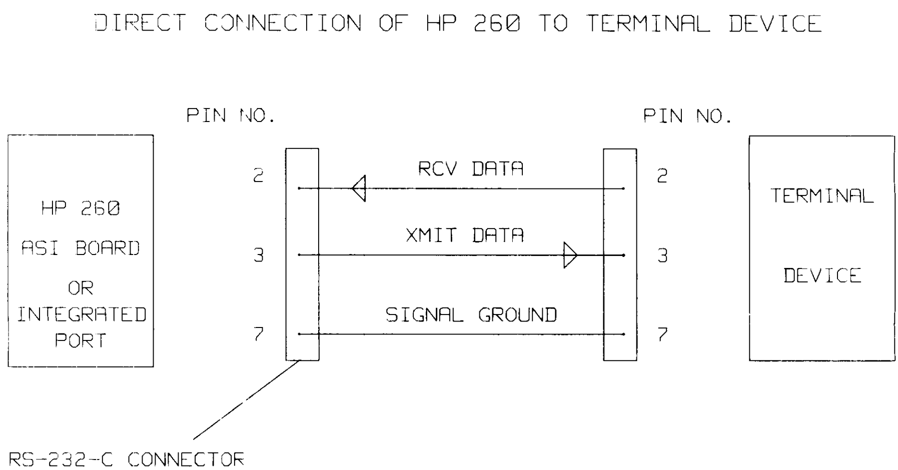
Connector Pin#	Port ID	Function	RS-232-C Characteristics	RS-422 Characteristics
1	AaI	Protective Ground	SHIELD GROUND	SHIELD GROUND
2	AaI	Received Data	INPUT	DIFFERENTIAL INPUT 1
3	AaI	Transmitted Data	OUTPUT	
4	A I	Request To Send	OUTPUT	
5	A I	Clear To Send	INPUT	
6	A I	Data Terminal Ready	OUTPUT	
7	AaI	Signal Ground	SIGNAL GROUND	SIGNAL GROUND
8	A I	Data Carrier Detected	INPUT	
9	Aa	Send Data		DIFFERENTIAL OUTPUT 1
10	Aa	Send Data		DIFFERENTIAL OUTPUT 2
18	Aa	Receive Data		DIFFERENTIAL INPUT 2
20	A I	Data Set Ready	INPUT	
23	A I	Data Rate Select	OUTPUT	

Notes on the above Table

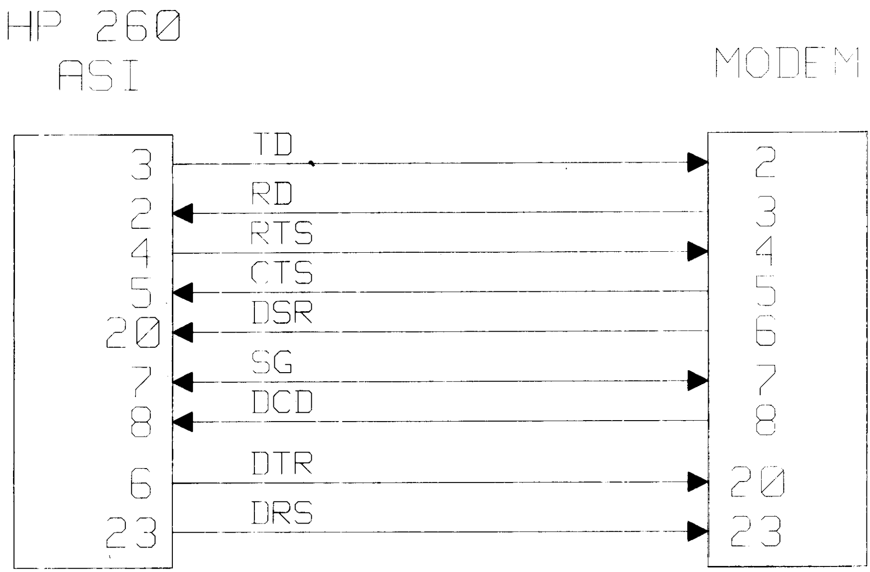
- All of the other pins on the standard, 25-pin connector are unused.
- The port ID A refers to ASI ports 1,2,3,6,7,8.
- The port ID a refers to ASI ports 4,5,9,10
- The port ID I refers to the integrated SPU ports -1,-2.
- RS-422 signals are not available on integrated ports.
- Communication via modem is not available on ASI ports 4,5,9,10.

NOTE

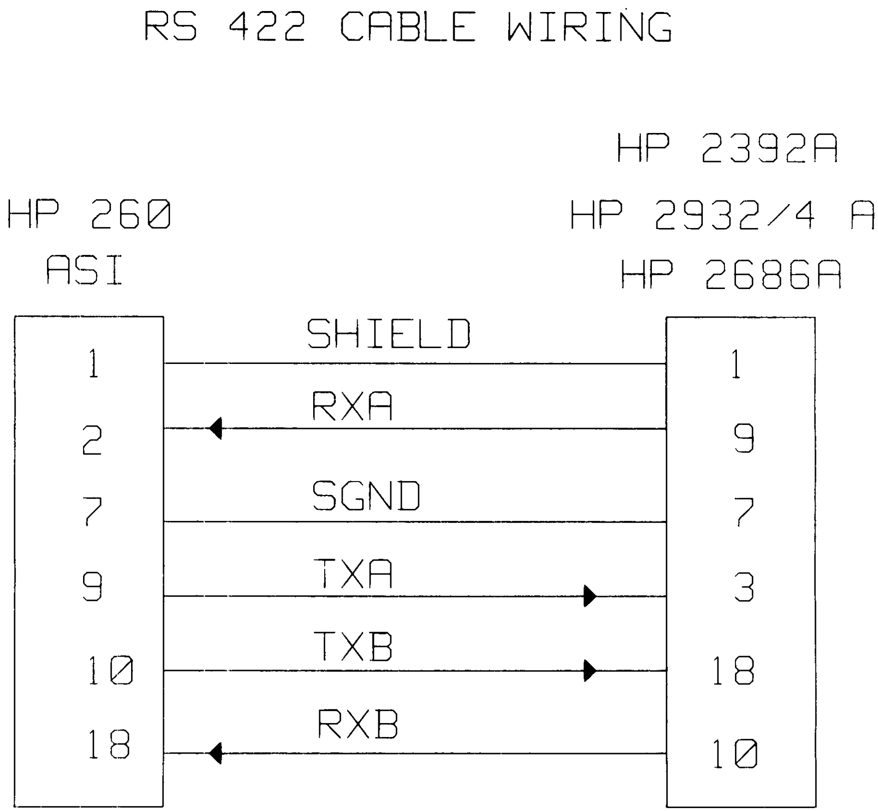
The Shield Ground wire, which is connected to pin 1 of each of the connectors of a cable, should be connected to the cable shield at one end of the cable only. If the Shield Ground wire is connected to the shield at both ends of the cable, interference might be produced.



Direct Connection of a Device over RS 232C



Connection of a MODEM with an HP 260 ASI Port



Connection of a Device over RS 422

NOTE

You cannot reverse the connectors of the RS 422 cable; the connector with pin 2 connected must be attached to an ASI port of the HP 260, and the connector with pin 3 connected must be attached to the peripheral device.

CONFIGURATION OF THE INP BOARD

Four dip switches and a momentary push button (P.B.) switch are located on the INP board. The P. B. switch is located on the front edge of the board, and is used to initiate the self test. The dip switches are located on the back edge of the board, and determine the board channel address and online/offline mode. Switches 1, 2, and 3 determine the channel address: Switch 4 determines the mode:

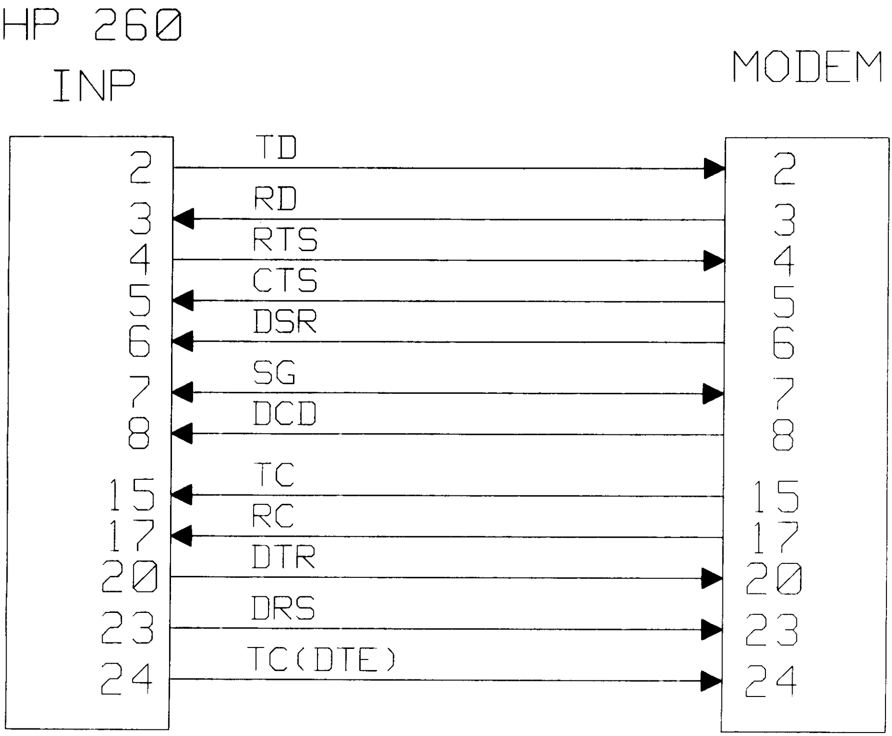
Switch 4 OFF: Normal Online Mode
Switch 4 ON: Offline Mode

Offline mode disconnects the INP from the I/O bus, and is used when continuously self testing the INP. During normal operation, dip switch settings are as follows:

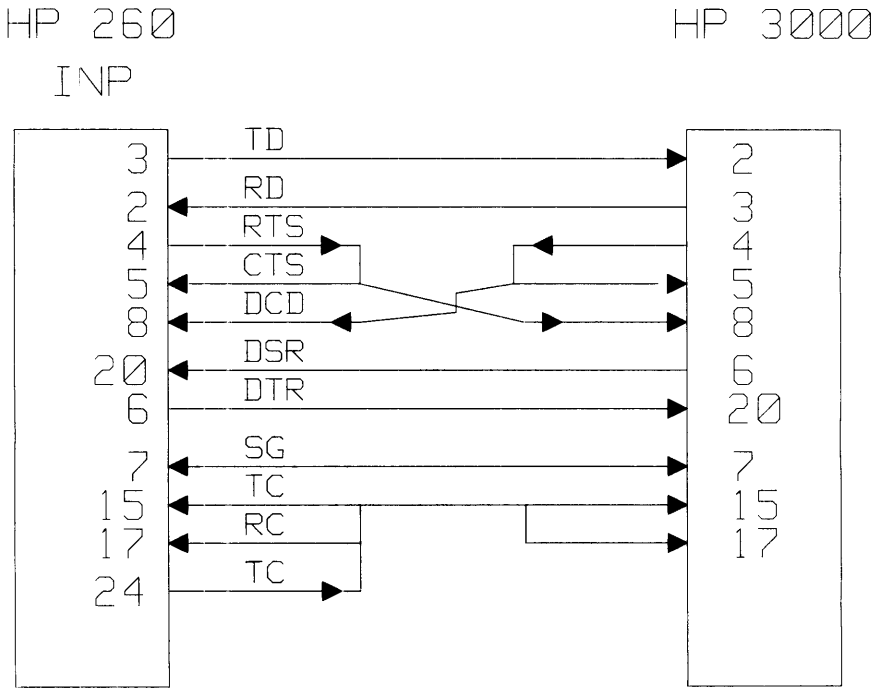
SWITCH	SETTING
1	ON
2	ON
3	ON
4	OFF

The synchronous port is an RS-232-C interface for either modem connection over a switched/leased line or for direct connection to an HP3000 INP via a direct connect cable.

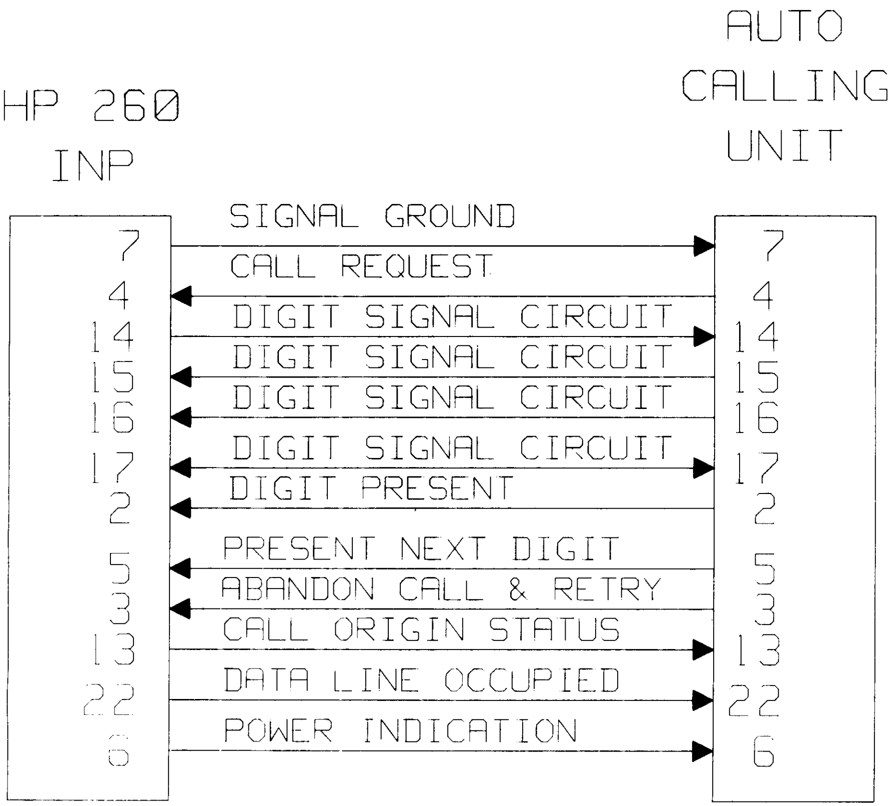
The interface for the synchronous port (modem connection -- leased, private, or switched lines) is shown in the following figure.



The interface for the synchronous port (direct connection) is shown in the following figure.



The auto-calling interface is RS-366 and is under software control, including response time-outs and telephone numbers. The interface for the RS-366 auto calling port is shown in the following figure.



The Auto-Calling Loop-Back Connector (45122-62101) consists of an RS-232 connector and hood, and fits onto the ACU port during the Connector Loop-Back test in IDU260. When not in use, the connector is stored on one of the two securing positions provided on the bottom half of the Connector Panel Board. The wiring diagram for the Auto-Calling Loop-Back Connector is shown in the following figure.

```
RS-366    Pin

DPR        2 >---------
               |
DLO       22 <---------

ACR        3 <---------
               |
NB2       15 >---------

CRQ        4 >---------
               |
(TEST)    25 <---------

PND        5 <---------
               |
NB1       14 >---------

PWI        6 <---------
               |
NB4       16 >---------

COS       13 <---------
               |
NB8       17 >---------
```

WIRING DIAGRAM FOR AUTO-CALLING LOOP-BACK CONNECTOR

The Synchronous Modem Diagnostic Loop-Back Connector (45122-62102) consists of an RS-232 connector and hood, and fits onto the synchronous port during the Connector Loop-Back test of the IDU260. When not in use, the connector is stored on one of the two securing positions provided on the bottom half of the connector panel board.

The wiring diagram for the Synchronous Modem Diagnostic Loop-Back Connector is shown in the following figure.

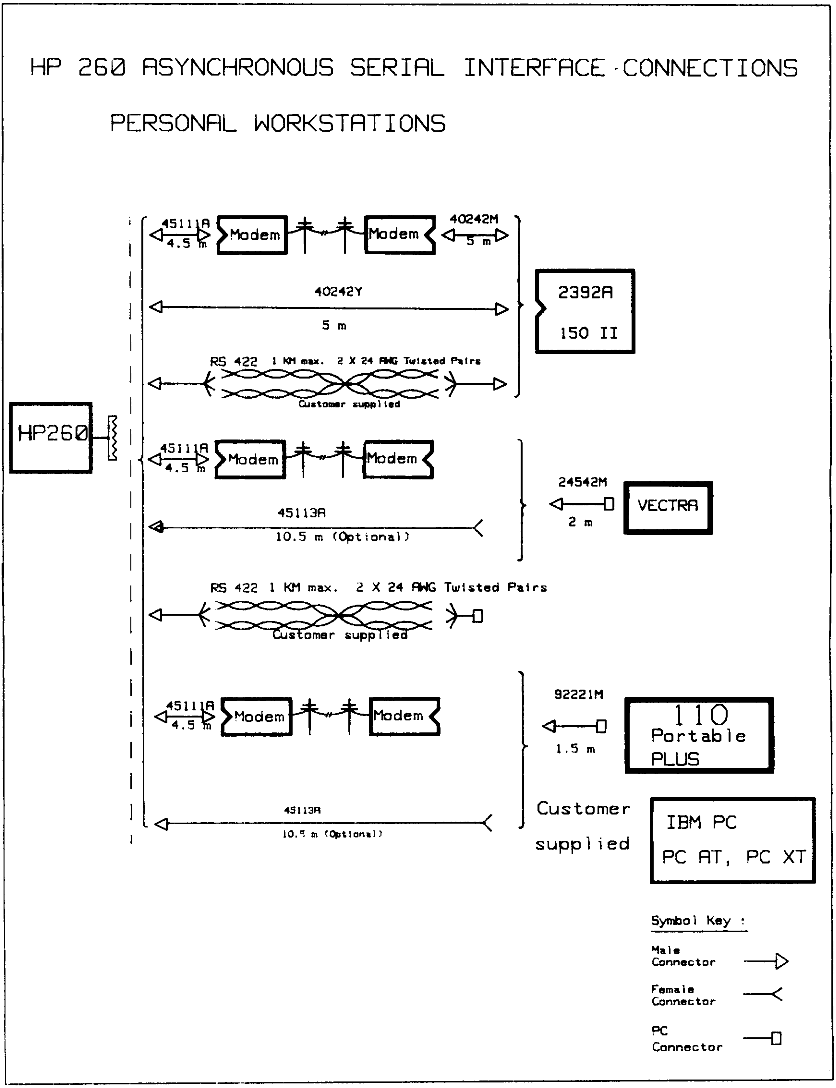
```
 RS-232     Pin

  BA         2 >---------
                  |
  BB         3 <---------

  CA         4 >---------
                  |
  CB         5 <---------

  CC         6 <---------
                  |
  CD        20 >---------

  DB        15 <---------
                  |
  DD        17 <--------|
                  |
  DA        24 >---------

  CF         8 <---------
                  |
  CE        22 <--------|
                  |
  CH        23 >---------

  AB         7 ----------
                  |
 (TEST)     25 ----------
```

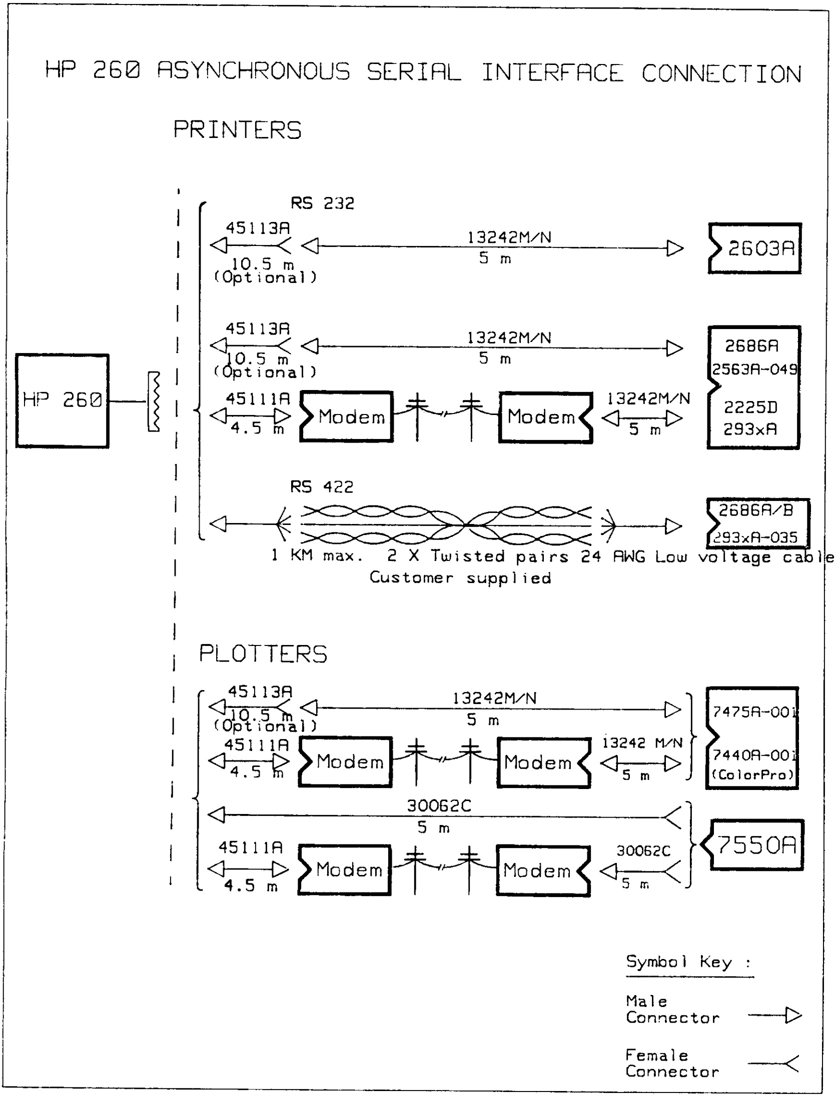
WIRING DIAGRAM FOR SYNCHRONOUS MODEM
DIAGNOSTIC LOOP-BACK CONNECTOR

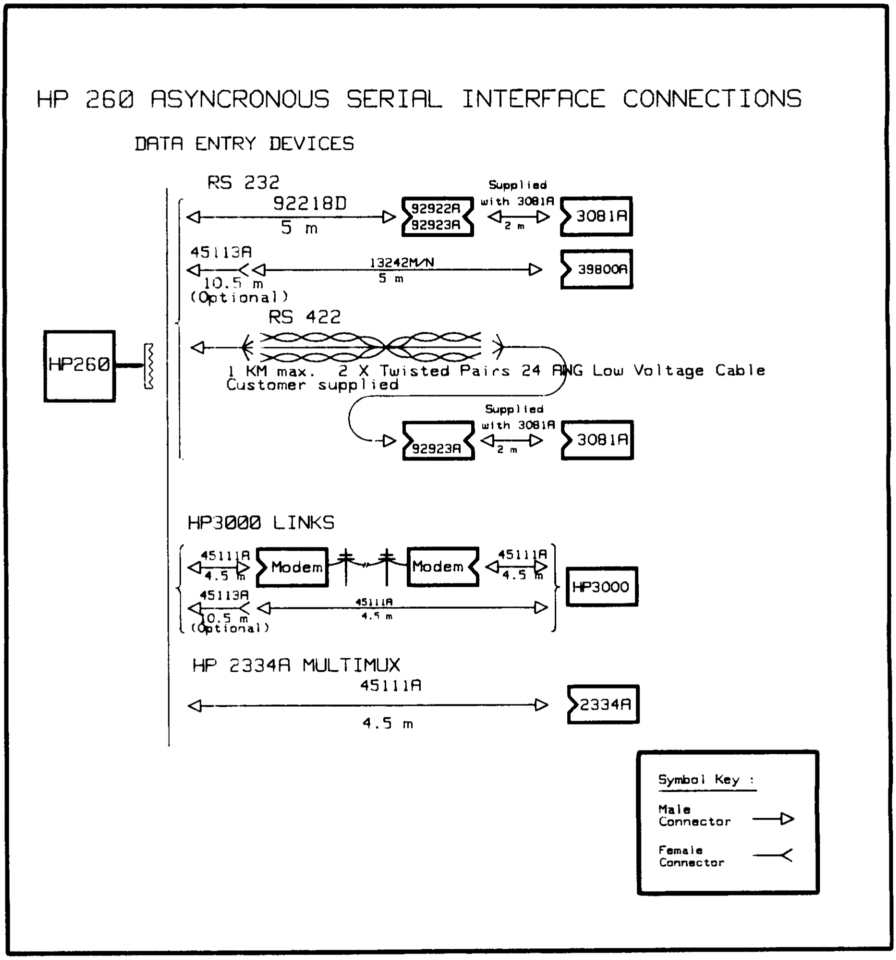
NOTE:

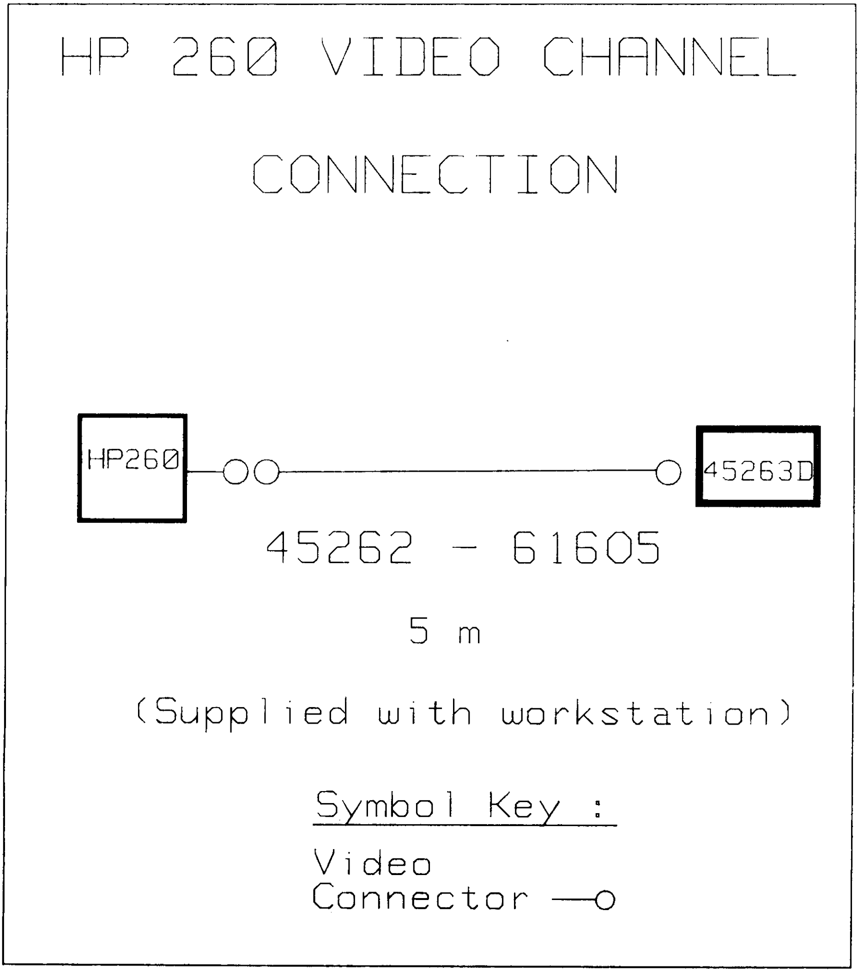
The INP uses pin 25 to determine whether or not the connector is in place, and whether or not the correct loop-back connector is on the port. Pin 25 of the Auto-Calling Loop-Back Connector is wired to pin 4, while pin 25 of the Synchronous Modem Diagnostic Loop-Back Connector is wired to pin 7. Note that this method of using pin 25 to determine whether or not the correct loop-back connector is in place makes it impossible to use the loop-back connectors and the IDU to verify the integrity of either the modem cable or auto-call cable. These cables do not connect pin 25, as required by most modems.

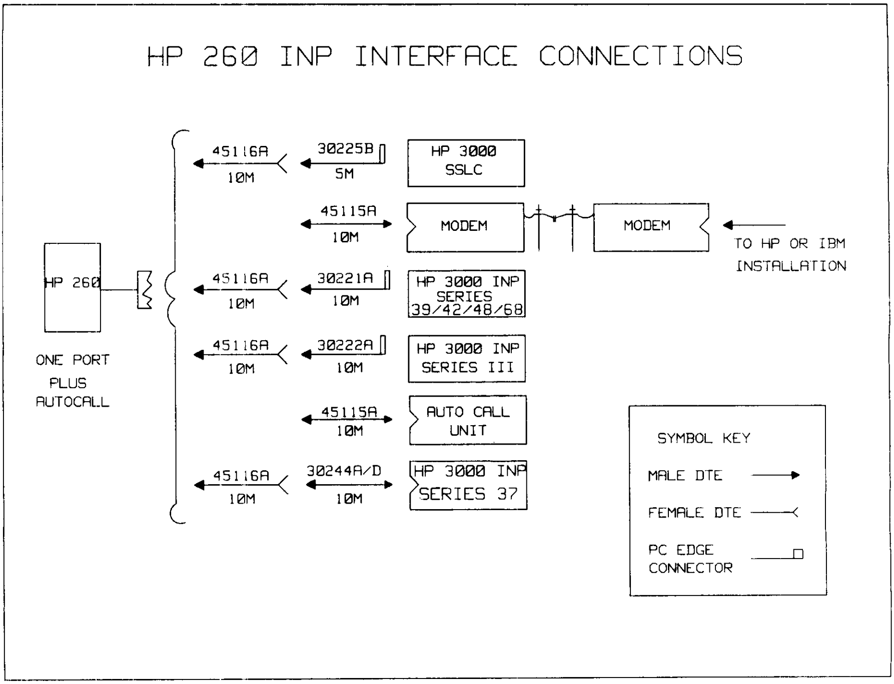
Connection Diagrams for ASI, Video, and INP Devices




HP 260 ASYNCHRONOUS SERIAL INTERFACE CONNECTION
PRINTERS
RS 232
45113A
10.5 m
(Optional)
13242M/N
5 m
2603A
45113A
10.5 m
(Optional)
13242M/N
5 m
2686A
2563A-049
2225D
293xA
HP 260
45111A
4.5 m
Modem
Modem
13242M/N
5 m
RS 422
2686A/B
293xA-035
1 KM max. 2 X Twisted pairs 24 AWG Low voltage cable
Customer supplied
PLOTTERS
45113A
10.5 m
(Optional)
13242M/N
5 m
7475A-001
7440A-001
(ColorPro)
45111A
4.5 m
Modem
Modem
13242 M/N
5 m
30062C
5 m
7550A
45111A
4.5 m
Modem
Modem
30062C
5 m
Symbol Key :
Male Connector
Female Connector


HP 260 ASYNCRONOUS SERIAL INTERFACE CONNECTIONS
DATA ENTRY DEVICES
RS 232
92218D
5 m
92922A
92923A
Supplied with 3081A
2 m
3081A
45113A
10.5 m
(Optional)
13242M/N
5 m
39800A
RS 422
1 KM max. 2 X Twisted Pairs 24 AWG Low Voltage Cable
Customer supplied
Supplied with 3081A
92923A
2 m
3081A
HP260
HP3000 LINKS
45111A
4.5 m
Modem
Modem
45111A
4.5 m
HP3000
45113A
10.5 m
(Optional)
45111A
4.5 m
HP 2334A MULTIMUX
45111A
4.5 m
2334A
Symbol Key :
Male Connector
Female Connector


HP 260 VIDEO CHANNEL
CONNECTION
HP260
45263D
45262 - 61605
5 m
(Supplied with workstation)
Symbol Key :
Video
Connector


HP 260 INP INTERFACE CONNECTIONS
HP 260
ONE PORT
PLUS
AUTOCALL
45116A
10M
30225B
5M
HP 3000
SSLC
45115A
10M
MODEM
MODEM
TO HP OR IBM
INSTALLATION
45116A
10M
30221A
10M
HP 3000 INP
SERIES
39/42/48/68
45116A
10M
30222A
10M
HP 3000 INP
SERIES III
45115A
10M
AUTO CALL
UNIT
45116A
10M
30244A/D
10M
HP 3000 INP
SERIES 37
SYMBOL KEY
MALE DTE
FEMALE DTE
PC EDGE
CONNECTOR

HP-IB CONFIGURATION

SECTION 9

CONFIGURING DEVICES ON THE HP-IB

When you connect devices on the HP-IB, consider the following factors:

- Daisy-chain Connection
- Device-type Limitations
- Cable Lengths

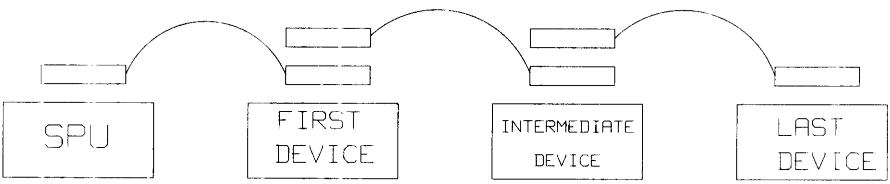
These factors are now explained.

Daisy-chain Connection

When you connect devices on the HP-IB of the HP 260, you must connect them in a chain. The following characteristics define a chain connection.

- Only one HP-IB cable is connected to the HP 260 SPU
- Each HP-IB device has either one or two HP-IB cables connected to it

The diagram below shows a schematic of a correct HP-IB connection (that is, a chain connection).



HP-IB Chain

Device Type Limitations

There are limits to the number of mass storage devices, and to the number of printers that can be connected on the HP-IB.

- A maximum of 4 mass storage devices can be connected
- A maximum of 2 printers can be connected

Cable Lengths

There are also limits to the length of the HP-IB cables that can be used to connect different types of devices.

For connections involving mass storage devices, the maximum cable length is 1 meter. This limit applies to the following types of connection:

- Mass storage device to mass storage device connections
- Mass storage device to SPU connections

For connections involving printers, the maximum cable length is 2 meters. This limit applies to the following types of connection:

- Printer to mass storage device connections
- Printer to printer connections

NOTE

All HP-IB cables must be directly connected from one device to another. If two or more cables are joined together to make a longer cable, this could cause intermittent failures.

The printer(s) in an HP-IB chain must be last in the chain (that is farthest from the HP 260 SPU).

Recommended HP-IB Cables

The following HP-IB cables are recommended for use with the HP 260:

Part No.	Cable Description
HP 10833A	1-meter HP-IB cable (male/male)
HP 10833B	2-meter HP-IB cable (male/male)
HP 10833D	0. 5 meter HP-IB cable (male/male)

LOGICAL DISC LAYOUT

SECTION 10

The logical layouts of each of the three disc formats supported on the HP 260 are illustrated and described in this section. The three layouts are:

- HP 260 Format
- HP Interchange format
- IBM 3740 0.25 Mb format

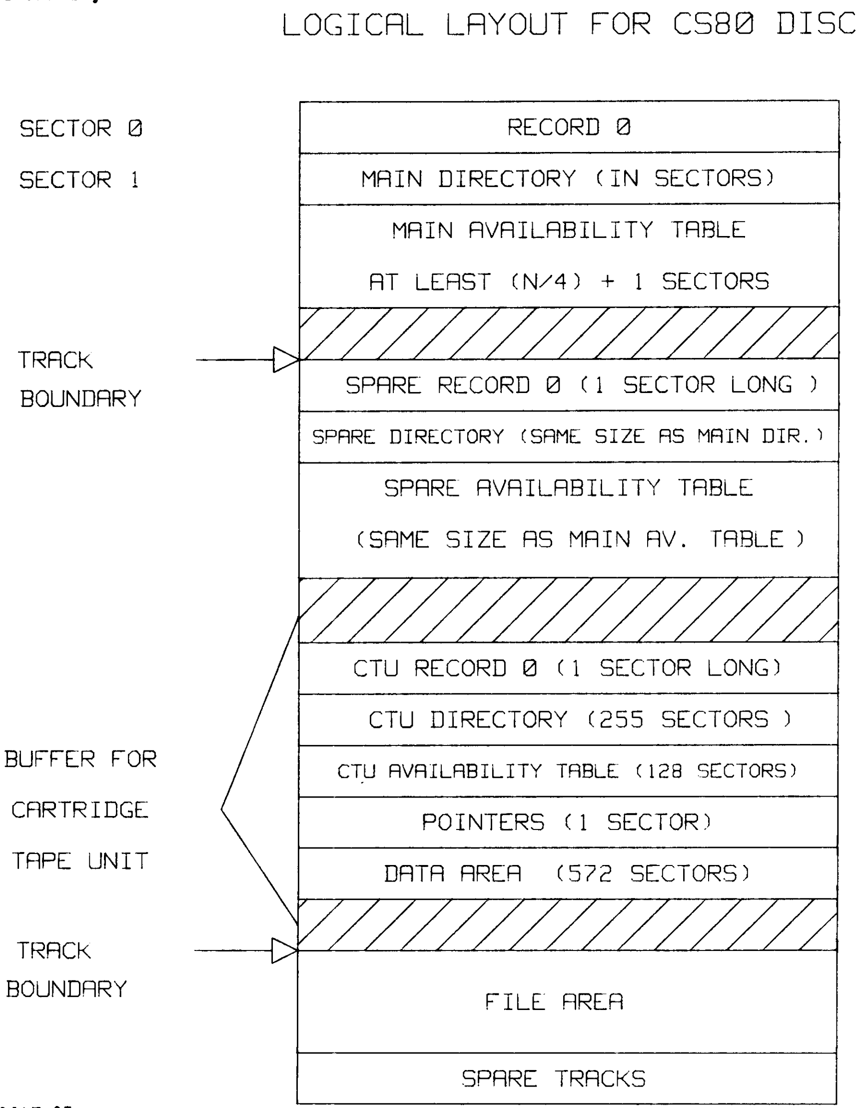
HP 260 FORMAT

The information given here is in 4 parts:

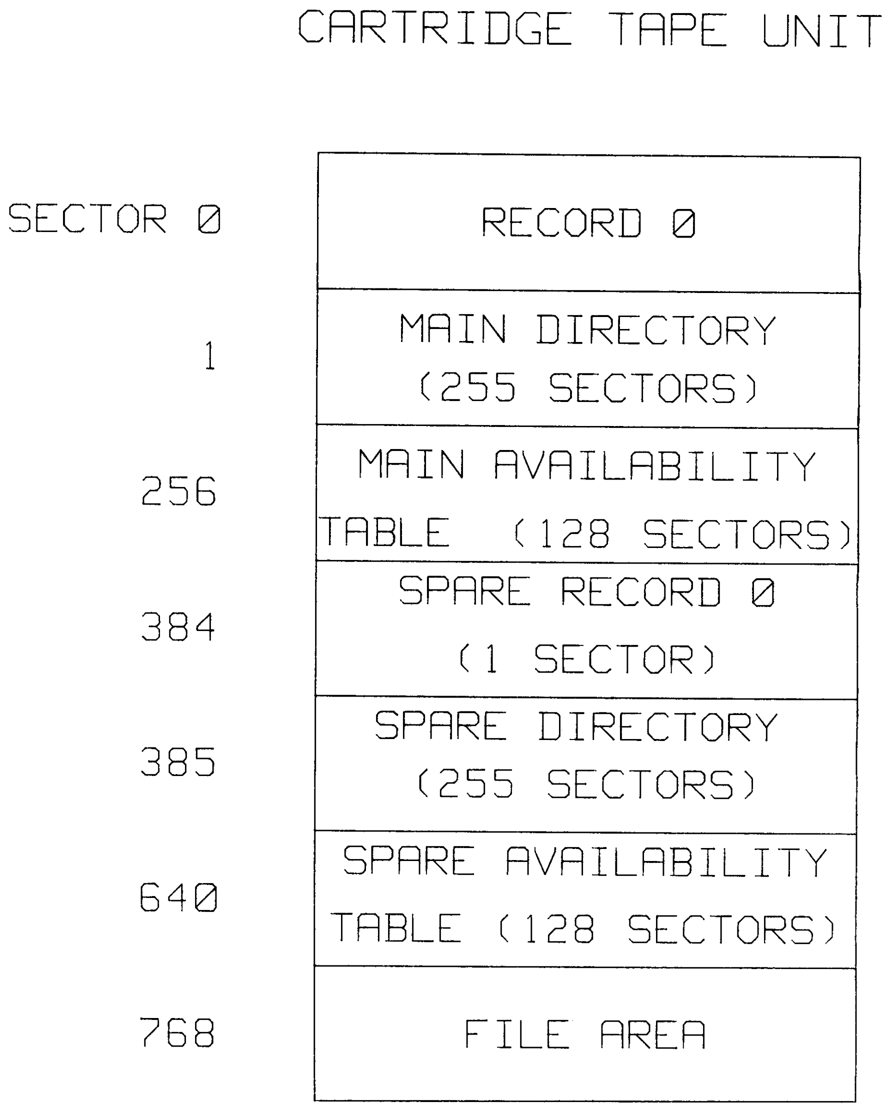
- Overall disc layout
- Record 0 layout
- File directory layout
- Availability table description

Overall Layout

Overall Layout of a CS 80 Disc



Overall Layout of a Cartridge Tape Unit



Record 0 Layout

RECORD 0 DETAILS

BIT 15 14 … 2 1 0

WORD	
0	SYSTEM ID CODE (SEE NOTES)
1	NUMBER OF RECORDS PER TRACK
2	TOTAL NUMBER OF GOOD TRACKS
3	TRACK NUMBER OF SPARE DIRECTORY
4	FIRST RECORD NUMBER OF MAIN DIRECTORY
5	FIRST RECORD NUMBER OF AVAILABILITY TABLE
6	FIRST RECORD NUMBER AFTER AVAILABILITY TABLE
7	FIRST USER TRACK NUMBER
8	NUMBER OF USER TRACKS
9	INTERLEAVE FACTOR (177777) IF NOT IMPORTANT
10	SY NOT USED PR HD
11	SEE NOTES
12	SEE NOTES
13	NOT USED
14	STRING IDCODE FOR THE VOLUME LABEL (SEE NOTES)
15	VOLUME LABEL CHARACTER COUNT (SEE NOTES)
16	VOLUME LABEL (2 CHARACTERS PER WORD)
17	VOLUME LABEL (2 CHARACTERS PER WORD)
18	VOLUME LABEL (2 CHARACTERS PER WORD)
19	VOLUME LABEL (2 CHARACTERS PER WORD)

Notes on Record 0

Word 0 contains the system ID code for the HP 260. This code is 003000.

Word 10 is the HP 260 flag word. Bits 0, 1 and 15 of Word 10 are used as flags. The meaning of these flags is:

SY bit (bit 15) set - HP 260 system file is present on disc

PR bit (bit 1) set - Privileged DROM permit flag

HD bit (bit 0) is set - Hardware diagnostic present on disc

Words 11 and 12 contain the address of the start of a hardware diagnostic program. These words are used only when bit 0 of Word 10 is set.

Word 13 contains information about the length of the Availability Table. When the DA bit (bit 0) is clear, a 2-word Availability Table is used. When the DA bit is set, a 4-word Availability Table is used. CS 80 discs use the 4-word Availability Table.

Word 14 contains the ID code for the volume label. For the HP 260, this ID code is 000074.

Word 15 shows the number of characters used in the volume label of the disc. For HP 260 systems, the maximum value of Word 15 is 000010 (octal).

Default Record 0 Values

These record 0 values are set when a disc is initialised using the default settings for interleaving and directory size. The following tables show the default values for each of the discs and tapes supported on the HP 260.

Word	**7912** **disc (:S)**	**7945/6** **disc (:U)**	**7941/2** **disc (:T)**	**9133L/9134L** **disc(:M)**
0	003000	003000	003000	003000
1	000100	000040	000040	000040
2	007644	015170	005530	011401
3	000005	000011	000006	000007
4	000001	000001	000001	000001
5	000325	000300	000200	000225
6	000500	000440	000300	000340
7	000031	000060	000052	000016
8	007613	015110	005456	011363
9	000001	000001	000001	000003

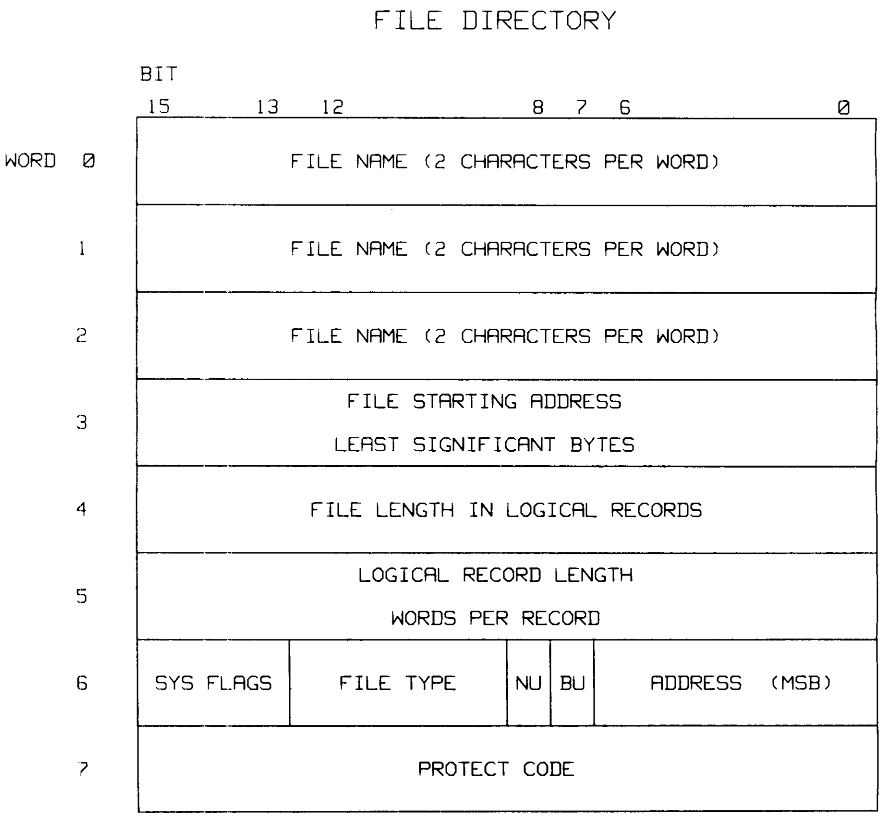
Default Record 0 Values (continued)

Word	**9133D/9134D disc (:M)**	**9133H/9134H disc (:M)**	**Microfloppy (:A)**	**Cartridge Tape (:K) 600 ft**
0	003000	003000	003000	003000
1	000040	000040	000020	000100
2	003424	004600	000232	007770
3	000007	000007	000001	000006
4	000001	000001	000001	000001
5	000225	000225	000025	000400
6	000340	000340	000040	000600
7	000016	000016	000002	000014
8	003414	004570	000230	007754
9	000003	000003	000002	000001

Default Record 0 Values (continued)

Word	**7957A disc (:V)**	**7958A disc (:V)**	**9153B/9154B disc (:N)**	**Cartridge Tape (:K) 150 ft**
0	003000	003000	003000	003000
1	000077	000077	000034	000100
2	011711	017650	005370	001776
3	000013	000013	000004	000006
4	000001	000001	000001	000001
5	000716	000716	000112	000400
6	001265	001265	000160	000600
7	000026	000026	000010	000014
8	011663	017622	005360	001762
9	000001	000001	000001	000001

Logical Layout of File Directory



Each directory entry consists of the 8 words shown in the figure above. There are 16 entries per sector in the file directory.

The logical end of the directory is shown by:

Word 0 = 000000
Word 1 = 177777

Any directory entries that have no file information are set to 0.

File Directory Notes

Here is how to interpret word 6 of a directory entry:

Bits 15 -13 contain the system flag information, which tells you which device was used to initialize the disc or tape. Here are the alternative flags:

B15	B14	B13	Initialising Device
0	0	0	Not Used
0	0	1	HP 9835
0	1	0	HP 9831
0	1	1	HP 260
1	0	0	HP 9845
1	0	1	Not Used
1	1	0	HP 9825
1	1	1	Not Used

Bits 12 - 9 contain the file type information, as follows:

B12	B11	B10	B9	File Type
0	0	0	0	BKUP
0	0	0	1	CHAR
0	0	1	0	DATA
0	0	1	1	Reserved
0	1	0	0	PROG
0	1	0	1	Unused
0	1	1	0	KEYS
0	1	1	1	COMM
1	0	0	0	Unused
1	0	0	1	SYST
1	0	1	0	Unused
1	0	1	1	DROM
1	1	0	0	BPRG
1	1	0	1	FORM
1	1	1	0	DSET
1	1	1	1	ROOT

Bit 8 of Word 6 is not used (NU in diagram).

Bit 7 of Word 6 is the back-up bit. If bit 7 is set, the file has been backed-up (BU in diagram).

Bits 6 - 0 of Word 6 contain the most significant bits of the address of the start of the file. The least significant bits of this address are contained in Word 3 of the File Directory.

Logical Layout of Availability Table

The logical layout of the Availability Table depends on whether the disc is a CS 80 device or not. The 2 layouts are now described.

CS 80 Devices

- Each entry in the table has 4 words
- Words 0 and 1 contain the starting address of the available space
- Words 2 and 3 contain the size of the available space (in sectors)
- The logical end of the Availability Table is shown by Word 0 = 177777
- Any entries that are not used are set to 0

Non-CS 80 Devices

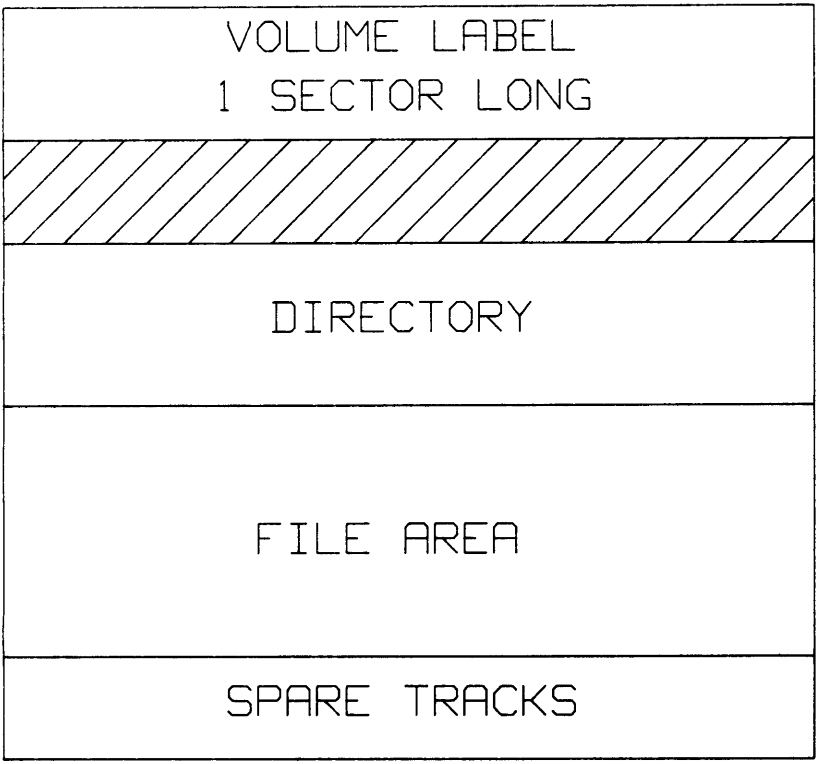
- Each entry in the table has 2 words
- Word 0 contains the starting address of the available space
- Word 1 contains the size of the available space (in sectors)
- The logical end of the Availability Table is shown by Word 0 = 177777
- Any entries that are not used are set to 0

HP INTERCHANGE FORMAT

The HP Interchange format can be used with tape drives and 8-inch floppy controllers. The information given here is in three parts.

- Overall Layout
- Volume Label
- File Directory

Overall Layout



Volume Label

VOLUME LABEL

BIT	15 — 0
WORD 0	10000 OCTAL LIF ID
1 2 3	VOLUME LABEL (2 CHARACTERS PER WORD)
4 5	DIRECTORY START ADDRESS (SECTOR NUMBER)
6	01000 OCTAL NEEDED BY HP 3000
7	DUMMY (SET TO ZERO)
8 9	LENGTH OF DIRECTORY FIXED AT INITIALISATION
WORDS 10-126	NOT DEFINED (SET TO ZERO)
127	RESERVED BY SYSTEM MEDIA MAINTENANCE WORD

Volume Label Notes

The volume label is located on: Track 0, Sector 0, Surface 0

All words on Track 0, Sector 1, Surface 1 are initialized to 0 so that the device is compatible with the HP 3000.

Words 1, 2 and 3 contain the Volume Label, and the following points are important:

- Characters are packed with the first character of a pair in the high-order byte
- Trailing characters are spaces
- Characters must be upper-case letters (A-Z) or digits (0-9)
- The first character in the Volume Label must be a letter
- The default Volume Label is six spaces

Words 4 and 5 contain a 2-word integer that shows the sector number of the start of the directory. The first word contains the high-order bits and the second word contains the low-order bits.

Word 6 is used to eliminate console messages on the HP 3000. To do this you must use octal 010000.

Words 8 and 9 contain information on directory length:

- A 2-word integer shows the size of the directory and prevents the directory from writing in user memory.
- The directory size is fixed when the device is initialized
- The maximum allowable size of the directory is given in sectors

File Directory

FILE DIRECTORY

WORD	BIT 15	14 … 0
0–4	FILE NAME (2 CHARACTERS PER WORD	
5	FILE TYPE	
6–7	STARTING SECTOR NUMBER	
8–9	LENGTH OF FILE (IN SECTORS)	
10–12	TIME OF CREATION (12 BCD DIGITS)	
13	L	VOLUME NUMBER
14–15	NOT USED	

General Information

- The logical end of the directory is shown by a file type of 177777 (in word 5)
- A purged file is indicated by the file type 000000. Purging a file has no effect on its directory name
- An ASCII data file is indicated by the file type 000001. This is the interchange file type. The associated file consists of 8-bit ASCII data records.

Words 0 - 4

These words contain the file name, and the following rules apply:

- Characters are packed with the first byte of a pair in the most significant byte of the word
- Characters must be upper-case letters (A-Z) or digits (0-9)
- The first character in a file name must be a letter
- Each non-purged file must have at least one letter in its file name

Word 5

Word 5 can contain **negative** file types. These are reserved for system-dependent applications. They are divided into the following groups:

File Type Range	Application
100000 - 155777	Not defined
156000 - 157777	CSD
160000 - 161777	CVD
162000 - 163777	DTD
164000 - 165777	9845/9835
166000 - 167777	HP 250/260
170000 - 171777	HP 1000
172000 - 173777	HP 3000
174000 - 175777	HP 300
176000 - 177776	Special interdivisional file types commonly used for interchange

Three general, negative-file types are currently defined:

- -177776 is a binary data file
- -177775 is a keyed data file
- -177774 is an interchange numeric format

Words 6 and 7

Words 6 and 7 contain the starting sector number for a file. The most significant bits of this address are in Word 6. The least significant bits are in Word 7.

Words 8 and 9

Words 8 and 9 contain a 2-word integer that shows the allocated space for the file on this volume. The current length of the file is not shown here. The following rules apply:

- The most significant bits are in Word 8
- The least significant bits are in Word 9
- Lengths less than 0 are not allowed
- The length and start address fields of a purged file are not guaranteed to be accurate
- The amount of free space is calculated from the start address and length fields of the 2 valid files nearest to the free space

Words 10, 11 and 12

Words 10, 11 and 12 contain 12 BCD digits of the form YYMMDDHHMMSS which define the time of creation of a file. The following rules apply:

- The first digit is in the most significant bits of Word 10
- The last digit is in the least significant bits of Word 12
- The field can also be used for file version numbers (on systems with no real time clock)
- If the year and month appear as 0, the rest of the field contains the version number
- If a file occupies several volumes, directory entries must have the same creation time or version number

Word 13

Word 13 contains the Volume Flag and the Volume Number. Here are some points on their use:

- In the diagram, L = last volume flag
- If L = 0, this volume is not the last volume of the file
- If L = 1, this volume is the last volume of the file
- The Volume Number is a 14-bit unsigned integer that contains the volume number of the current file
- Volume Number = 0 is not valid
- Volume Numbers begin with one and increase by one for each subsequent volume

IBM 3740 0.25 MB FORMAT

The information given here is in 4 parts:

- Overall Layout
- Error Map Sector
- Volume Identification Sector
- Data Set Headers

Overall Layout

OVERALL DISC LAYOUT

sectors 1 to 7	volume identification information
8 to 26	directory records
27 to 1924	data area
1925 to 1976	spare tracks
1977 to 2002	not used

Overall Disc Layout Notes

IBM media are single-sided flexible discs with 77 accessible tracks. These tracks are divided up in the following manner:

- 73 data tracks
- 1 index track
- 2 spare tracks
- 1 unused track
- Each track contains 26 128-byte sectors

Error Map Sector

SECTOR 5 (ERROR MAP SECTOR)

BYTE	
0	ERMAP
5	BLANK
6	TRACK NUMBER OF FIRST BAD TRACK
8	BINARY ZERO
9	BLANK
10	TRACK NUMBER OF SECOND BAD TRACK
12	BINARY ZERO
13	BLANK
80	BINARY ZEROS (48 BYTES LONG)

Volume Identification Sector

SECTOR 7

START BYTE	
0	VOLUME LABEL IDENTIFIER (ALWAYS VOL)
3	VOLUME NUMBER
4	VOLUME LABEL
10	ACCESSIBILITY INDICATOR (BLANK MEANS FREELY ACCESSIBLE)
11	RESERVED
37	OWNER IDENTIFICATION FIELD
51	RESERVED
75	PHYSICAL LENGTH INDICATOR BLANK MEANS 128 BYTE SECTOR
76	PHYSICAL SECTOR SEQUENCE CODE (INTERLEAVE) BLANK OR 01 - 13
78	RESERVED
79	LABEL STANDARD VERSION (MUST BE W)
80	PADDING (BINARY ZEROS) 48 BYTES LONG

Data Set Headers

DATA SET HEADERS

START BYTE	
0	LABEL IDENTIFIER - HDR (DDR FOR DELETED DATA SET
3	LABEL NUMBER ALWAYS 1
4	NOT USED BY MEDIA DROM
5	DATA SET NAME
13	NOT USED BY MEDIA DROM
22	RECORD LENGTH
27	NOT USED BY MEDIA DROM
28	BEGINNING OF EXTENT (CCHSS)
33	NOT USED BY MEDIA DROM
34	END OF EXTENT (CCHSS)
39	NOT USED BY MEDIA DROM
74	END OF DATA (CCHSS)
79	NOT USED BY MEDIA DROM (49 BYTES LONG)

SYSTEM DIAGNOSIS

SECTION 11

Isolating the Problem to Sub-system Level

This section contains a general procedure to help you to isolate an unknown problem with an HP 260 system.

Of course, this section will not itself contain the answers to the variety of problems which can occur. Instead, it attempts to direct you to the appropriate section of this handbook, or to the more specific manual where an answer is likely to be found.

When an Error Message is Displayed

- If the error message is a System Error, that is, if the "tombstone" set of numbers is displayed on the right side of the screen of the principal workstation, refer to the System Error section of this handbook.
- If the error message has a number, refer to the OS Diagnosis section of this handbook. If the particular error is not among those covered there, refer to the BASIC manual, the Syntax Reference guide or "Operating and Managing your HP 260" to obtain an explanation of the error message.
- If it is a Self-Test error for the mainframe, refer to the Self-Test Description section for details on the test being performed and the Mainframe Diagnosis section for diagnosis procedures.
- If it is an error related to data communications, refer to the Data Comm Diagnosis section.
- If it is a Loader Error or any other message that occurs during power-up, refer to the OS Diagnosis section.
- If it is an error issued by an application, refer to the relevant application manual.

If no Cursor Appeared on any Workstation

The absence of a cursor from all workstations could mean that power-up did not complete. The following procedure may help you to trace the cause of a failed power-up.

- First, look for an error message on each of the workstations on the system. If you find any, go through the "When an Error Message is Displayed" procedure immediately before this one, to help you to find out what has gone wrong.
- If no segment is lit on the LED on the Processor Board, refer to the Power Distribution part of the Mainframe Diagnosis section.
- Check the entire configuration of the principal workstation and the ASI board. Verify that the principal workstation passes self-test; refer to the Workstation Diagnosis section.

- If the LED on the Processor Board has a value from 0 through 9, or the letter A, C, or E is displayed steadily, or the LED has gone out completely, refer to the Mainframe Diagnosis section for details on interpreting the LED value.

- If the LED on the Processor Board is displaying the letter "L", this means that power-up stopped during the loading of the operating system. Some causes of this stopping of the power-up procedure are:

  - The power-up sequence of the load device might not have been complete when the SPU was powered on.

  - The load device might have failed self-test.

  - A LOADER ERROR might have occurred. If so, it is displayed on the screen of the principal workstation. The display of these errors is independent of the failure of the load process, so, if no messages are displayed on any workstation, a separate problem in the ASI or principal workstation might have occurred.

- If the LED on the Processor Board is displaying only the bottom segment, the Loader was unable to pass control to the Power-Up module of the Operating System. This is probably due to a problem with the Processor Board. Refer to the Mainframe Diagnosis section.

- If the LED on the Processor Board is flashing the letter "A", the ASI board has failed self-test. Refer to the Data Comm Diagnosis section.

- Check that the letter "P" is displayed on the LED on the Processor Board. Also check that the LED on the ASI Board is not lit. If it is lit, the ASI board has failed. The following alternative instructions assume that the letter "P" is displayed on the processor board and that the LED on the ASI board is not lit.

  - If no messages have been displayed throughout the power-up sequence, refer to the Workstation Diagnosis section and Data Comm Diagnosis section.

  - If the last message displayed on the principal workstation was `LOADING DROMS` and the system appears to stop at that point, then the problem is probably related to the load device or the HP-IB. Make sure that all printers on the HP-IB are on-line. Check that all devices on the HP-IB are on different addresses. Refer to the Disc Diagnosis section of this handbook.

  - Try to load the system from another device. If no messages are being displayed, try using a different principal workstation. The principal workstation is either the Video workstation on Video-channel 1, or the PC or HP 2392A workstation on integrated serial port -1.

  If the problem persists, contact your TSE.

If one or more Workstations Appear to be Hung

First, look at the principal workstation and check whether a system error is being displayed. If so, refer to the System Error section of this handbook.

If no system error is being displayed, make sure that the reported (or apparent) hang is not caused by one of the following "illusory hangs":

- The first access to the tape cartridge will "hang" the workstation for Task 1 for about 15 seconds.
- The unloading of a tape cartridge using the UNLOAD button on the drive will "hang" the workstation for USRID 1 for between 30 seconds (short tape) to 120 seconds (long tape).
- If output is sent to a printer which is off-line the workstation will be "hung" until the printer is brought back on-line. Note that SHIFT HALT will stop the attempted print.

Hangs and Video Workstations

If the system has a video workstation, there is a very simple test that you can make to find out whether or not there is a real hang. Press the CAPS key, and observe the screen to see whether the message "CAPS" toggles on and off. (The "CAPS" message is displayed on the bottom line of the screen.) If the CAPS key does not toggle the "CAPS" message on and off, there is a real hang on the system.

When you think the Hang is Real

If none of these "illusory hangs" is responsible for the standstill, try to bring the system back to life by pressing HALT. If this has no effect, press SHIFT HALT and then CONTROL HALT. If the hang persists try the following "instant diagnosis":

Press keys on the keyboard of a workstation (including function keys). Note which keys produce a beep response. Ignore keys such as the RESUME key. The beep responses are interpreted as follows:

- If only some, non-alphanumeric keys produce a beep, the operating system is recognizing each key as it is pressed.
- If all keys produce the beep response, the operating system may have the keyboard in the "disable keyboard" state. In this case the firmware for the keyboard is producing the beep, and the operating system is unaware that keys are being pressed.
- If only the function keys produce the beep, the current application may have disabled the function keys.
- Try the three tests given above on the other workstations in the system.

- If the dot on the processor-board LED is displayed with full brightness, or if it is not displayed at all, then it is very likely that the system is hung. You may require some familiarity with the LED to recognize when the dot is not being displayed.

  However, if the dot is flashing on and off, the system is not really hung.

Perhaps one of the discs in the system caused the hang. To find out, you need to use an HP 80 computer and the CS80 Exerciser software. Do not power-off the HP 260 SPU yet, because this clears the disc RAM where the possible cause of the hang is reported. Disconnect all of the discs in the system from the SPU. Then run the CS80 Exerciser on each of the discs, one-by-one.

If you find any TERRORs or DERRORs, take the necessary action to remove the cause of these errors. Then reconnect the discs to the HP 260 SPU, and reboot the system.

If you have reached this point without finding the cause of the hang, you have to reboot the system anyway, so that the customer can use the HP 260 again.

NOTE

> Before you switch off the system (to clear the hang), check each workstation to ensure that it is hung, and record the screen display and the intention of the operator(s) at the time of the hang. It is important that you inform your TSE when you encounter mysterious hangs, and seek his assistance in determining their causes.
>
> Make sure that you have tried all the tests and checks described in the previous paragraphs **before** you power-off the system. Powering-off the system can cause data bases to become corrupted, and this would cause a great deal of trouble for everyone concerned.

OS DIAGNOSIS

SECTION 12

This section of the handbook deals with the interpretation of errors related to the Operating System and how to solve the problems that have caused the errors.

Error Categorisation

There are two categories of errors related to the Operating System:

- Errors with error messages or error numbers displayed on the workstation of the task affected. The Error Code Interpretation part of this section of the handbook or the System Error section (which is the next section) should contain the relevant information on how to proceed.

- Errors with no error messages or error numbers displayed. If there is a system hang or a workstation hang, refer to the System Diagnosis section of this handbook. If the error is due to improper processing, isolate the source as far as possible and try to duplicate it (it is possible to repeat a software error if the circumstances are identical) on the same system and on another system. This will ensure that the error is not due to a hardware problem that is not currently known. Make sure that you back up all the files on the customer's system before trying to duplicate the error.

NOTE

When you find an unfamiliar Operating System bug, refer to the latest copy of the Software Status Bulletin (SSB) to check whether the error has already been reported. There may also be a workaround for the error in the same bulletin. If you find no report of the error, complete a Service Request form to report it and ensure that it is added to the STARS system.

Interpreting Error Codes

Although this section is about Operating System errors, many of the errors included can be caused by hardware problems. Only the more common errors are included here.

The information on each error is divided into three parts:

- The "detection" section describes how the operating system detects the particular error in relation to the appropriate subsystem(s).
- The "discussion" section expands upon how the error is detected and suggests some possible causes of the error.
- The "action" section suggests possible ways to obtain more information or solve the problem.

The following special terms are used in this section:

Record 0 - the first sector on a disc. It contains information that identifies the volume, including the volume label and pointers to the directory.

Device Table - a table kept in read/write memory that identifies the discs that are currently attached to the SPU. The table is used by the disc driver during I/O and is updated from the data contained in Record 0 of the volume in each drive.

Handler ROM table - a table of constants in read/write memory containing the characteristics of a disc, such as the number of sectors per track.

When trying to determine the specific cause of an error using information in this section, please remember the following:

- Refer to the appropriate diagnosis sections in the handbook before making hardware changes.
- Before changing boards, date codes should be checked on all boards to make sure that the boards currently installed are valid for the current configuration.
- For disc-related errors, check for worn media. Although "media" is not listed as a cause for many of the disc-related errors (not a primary cause for that error), it could still contribute to or cause the error condition.

Numbered Errors

Error 2 Memory overflow

Detection:

- Not enough memory is available for the current task.
- The program requires more than 64K bytes of memory.

Discussion:

- The program might begin execution before the error occurs.
- The available memory might be exceeded while trying to load additional routines from disc that are needed at that point during execution.

Action:

- Run "CONFIG" to check memory configuration.
- If the error occurs in an application, make sure that multiple LOADBINs of the same binary are not being done in the application. Issue a SCRATCHA command before loading the application.

Error 18 Substring out of range or substring too long

Detection:

- A substring is being referenced that is outside of the currently defined range for the string.
- The length of the receiving string is less than the length of the string being assigned to it.

Discussion:

- It is a software problem if the subscripts on the string are incompatible with respect to the maximum or current length of the string.
- On an assignment to a string from a data file, the string length in the file could be incorrect (data transfer problem when the string was stored or there could be a media problem).
- A data transfer problem could have occurred when reading the string length from the data file.
- This can be a software problem if the receiving string variable is too small (and the string length in the data file is correct).

- If too many bad tracks are reported during "INIT" or "FORMAT", this error can also occur (the number of bad tracks exceeds the string length).

Action:

- Check the dimensions on the string variable in the program.
- If the assignment to the string is from a data file, check the definition of the data record.
- If the data file is intact, increase the length of the string in the program.

Error 52 Improper volume label or mass storage unit specifier

Detection:

The volume label or mass storage unit specifier is not in a valid format.

Action:

- Issue a "CAT" command to check the volume label.
- Check the format of the mass storage unit specifier.

Error 53 Improper file name

Detection:

The file name specified is not in a valid format.

Action:

Check that the file name is not longer than six characters.

Error 54 Duplicate file name

Detection:

The file name specified already exists on the current mass storage device.

Action:

Check the current MSI device or specify a volume name or unit specifier in the file name reference.

Error 55 Directory overflow

Detection:

- The main directory is full and the system is trying to make an additional entry (when creating a file).
- The availability table (part of the directory) is full and the system is trying to make an additional entry (when purging a file).

Discussion:

- The directory could be full
- The "physical end of directory" entry in Record 0 could be incorrect.
- The availability table could be full.
- The "physical end of availability table" entry in Record 0 could be incorrect.

Action:

- Issue a "CAT" command to look at the directory contents.
- Run RECORD 0 RECOVERY in MEDIA TEST to see if the values in Record 0 are incorrect.
- The RECOVER DIRECTORY option should not be selected since this error is related to the physical end of directory, not an invalid logical end of directory.
- Similarly, the CHECK AVT option in MEDIA TEST should not be selected since the error is related to the physical end of the availability table, not the logical end of the availability table.

Error 56 File name is undefined

Detection:

The file name specified is not in the directory of the current mass storage device.

Action:

- Check that the file name specified is correct and is not present on the current mass storage device. Use a "CAT" command.
- Make sure that the correct volume is inserted.
- Check to see if the file has been purged by accident.

Error 57 Attempt to use device of unknown type for mass storage

Detection:

The current mass storage device cannot be recognized.

Action:

- Make sure that the mass storage unit specifier is correct.
- Make sure that the correct OS revision is being used with the device.
- Check that the device is powered-on and connected to the system.
- To isolate a drive or cable causing the error, remove all devices. Then add them one at a time, checking that each drive added can be accessed. The error can be caused by some other device interfering on the HP-IB.

Error 65 Incorrect data type

Detection:

The data type identifier (which is stored automatically as part of the data in a data file) does not match the data type of the receiving variable.

Discussion:

- The data type identifer could be incorrect in the file. A data transfer problem or a media problem could have occurred when the data was stored.
- A data transfer problem could have occurred when reading the data type identifier from the file.
- This can be a software problem if the receiving data type is incorrect and the type identifier in the file is correct.

Action:

Check the definition of the data record and the variables in the program.

Error 77 Volume Label not found

Detection:

The mass storage device with the specified volume label was not found.

Action:

Insert the mass storage device, if it is removable. Power it on, and check the cabling, if it is a fixed disc.

Error 78 Possible volume label conflict (unexpected interrupt)

Detection:

An unexpected interrupt from the disc was received and the disc operation was completed, the disc had previously been MSIed to by the use of a volume label. The error will also occur if the above MSI was performed and the door of the drive was opened, closed and later accessed.

Discussion:

Refer to the discussion for error 97.

Action:

Use the disc status command to determine the error condition being reported.

Error 80 Mass storage device door open or medium has been removed

For CS 80 devices:

- The tape is not ready (STAT11 = 20).
- Status bit 35 is set (STAT4 bit 12 = 1) indicating that the drive is not ready.
- No fault errors are indicated (STAT3 = 0) but an access error is indicated (STAT4 <>0) and it is not an error 81, 83, 85, or 88 condition.

For SS 80 devices:

- The device is not ready (STAT11 = 20).
- Status bit 35 is set (STAT4 bit 12 = 1) indicating that the drive is not ready.
- No fault errors are indicated (STAT3 = 0) but an access error is indicated (STAT4 <>0) and it is not an error 81, 83, 85, or 88 condition.

On a cartridge tape drive, the tape might not have been completely rewound before trying to access it.

On an SS 80 device, the microfloppy has been removed, and then the system has attempted to access it.

Action:

Use the DISC STATUS command to see the specific error condition being reported.

Error 81 Mass storage device failure

Detection:

- A timeout has occurred (no response within a certain period of time) during a parallel poll (STAT11 = 4).
- A timeout has occurred while trying to read data from PHI register 2 (STAT11 = 2).
- A timeout has occurred while trying to write data to PHI register 2 (STAT11 = 3).

For CS 80 devices,

- An invalid QSTAT was received (STAT11 = 7).
- Status word bit 19 is set, indicating a controller fault (STAT3 bit 12).
- Status word bit 22 is set, indicating a unit fault (STAT3 bit 9).
- Status word bit 30 is set, indicating a power failure (STAT3 bit 1).
- Status word bit 34 is set, indicating that no spares are available (STAT4 bit 13).

Discussion:

The error can be caused by:

- HP-IB cable length problems
- Disc controller problems
- PHI chip problems

Action:

- Use the DISC STATUS command to see the specific error condition being reported.
- Make sure that all printers are on-line. Reset all printers on the HP-IB and try the access again.
- Make sure that the disc drive is READY.
- Disconnect the drive causing the error and try accessing another disc. If this results in an error 81, replace the HP-IB board in the HP 260. If no errors occur, the problem is probably in the original drive.
- On a new installation, check cable lengths and try moving cables around to see if the problem moves with a cable. The error can be caused by ANY device on the HP-IB.

Error 82 Mass storage device not present

Detection:

The drive was present at power-up of the HP 260 (an entry was made in the device table), but the device is not present now.

Discussion:

This can be caused by bad HP-IB cables or poor controller/drive connections.

Action:

Make sure the HP-IB cables are attached to the drive and that the drive is powered on. Then power up the system again.

Error 83 Mass storage device is write-protected

Detection:

For CS 80 devices, status word bit 36 is set indicating a write protect error (STAT4 bit 11).

Discussion:

- On a floppy, the write tab is not on the diskette.
- On a cartridge tape drive, the protect peg is in the SAFE position.
- On a microfloppy, the write-protect tab is in the safe position.
- On a 9153B or a 9154B, the configuration wheel is set to 8.

Action:

Unprotect the device before attempting to write to it.

Error 84 Record not found

Detection:

Desired record not on the medium (overflow).

Discussion:

In IMAGE, if the data base becomes corrupt but is not flagged as corrupt, record pointers could be invalid, resulting in addressing the disc beyond the end of the medium.

Action:

- If the IMAGE situation above is encountered, perform a DBUNLD followed by a DBLOAD. (Note: if the number of entries in the root file is less than the actual number of entries, the remaining entries are lost by DBUNLD.) BE SURE to do a DBSTORE before attempting the DBUNLD.
- This error is usually NOT due to a problem in the disc drive.

Error 85 Mass storage medium not initialized

Detection:

- For CS 80 devices, status word bit 33 is set indicating that the media is uninitialized (STAT4 bit 14 = 1).
- Any disc error while trying to read Record 0 while updating a device table entry.
- Initializer code (word 0) in Record 0 not recognized while updating a device table entry.
- Volume label length (word 15) in Record 0 is less than 0 while updating a device table entry.
- The "number of records per track" in handler ROM table does not match the value (word 1) in Record 0 while updating a device table entry.
- The "first sector of directory" = 0 in the device table entry while preparing to read the directory or availability table from disc.

Action:

- If the medium is thought to have already been initialized, run the RECORD 0 RECOVERY option of MEDIA TEST in program CE (do not select the RECOVERY DIRECTORY option).
- Make sure that the MEDIA DROM is configured in the system if HP Interchange format or IBM format is being used. Make sure that the tape is in "DIRECT" mode.
- Backup the software on the media causing the error, then run EXRSIZ or EX794X to diagnose the medium.

Error 86 Access not allowed to specified device

Detection:

Device needed by the currently active task is dedicated to some other task.

Action:

If INIT or FORMAT is being used, be sure that no one else is trying to access the drive.

Error 88 Read data error

Detection:

For CS 80 devices, status word bit 40 was set indicating an unrecoverable data overflow (STAT4 bit 7) or status word bit 41 was set indicating an unrecoverable data error (STAT4 bit 6).

Discussion:

- The CRC computed when the data was written does not match the CRC computed when the data was read.
- The CRC check is performed during all read operations and, if CHECKREAD is ON, during all write operations (as the data is read back in before the buffer comparison).
- Causes of this error include worn media and faulty drive analog electronics.

Action:

Use the DISC STATUS command to determine the error condition being reported by the disc.

Error 89 Checkread error

Detection:

During a write operation with CHECKREAD or during the STORE or RESTORE of a program (with automatic checkread), the data read back into the second buffer does not match the data in the original buffer.

Discussion:

- During a CHECKREAD operation, if the disc cannot read the data back in, the appropriate error is issued (for example, error 87 or error 88).
- On a 1.2 megabyte floppy, if a data read error occurs on the first read with reduced margins, the message "WARNING: POSSIBLE DATA RECOVERY ERROR" is displayed. If the error occurs again on the second read using normal margins, either error 87 or error 88 is issued.

- The causes of this error include data transfer problems, bad HP-IB controller, bad HP-IB cables, disc interface problems, CPU problems, and memory problems.
- The data might have been changed before the CRC was computed, so no error would have been reported on the initial write. However, the differences between the new data and the original data will be identified when CHECKREAD is on.

Action:

- Try to find out whether the problem affects a single disc or a number of discs. If it affects a number of discs, it is a mainframe problem.
- STORE a program on a drive for a quick check.
- For more extensive checking, run the program listed below.

```
  5 ! Program to exercise two discs for Error 89
 10 ON ERROR GOSUB 300
 20 DIM A(511),C$[12]
 30 P = 0
 35 CHECKREAD
 40 FOR I=0 TO 511
 50   A(I)=I
 60 NEXT I
 65 ! in the next few lines, ?2,?,? is the device
 66 ! specifier of the drive(s) under test
 70 FCREATE "E89:?2,?,?",1,4098  ! first drive
 80 FCREATE "E89:?2,?,?",1,4098  ! second drive
 90 MSI ":?2,?,?"  ! first drive
 95 C$="First drive"
100 ASSIGN #1 TO "E89"
110 PRINT #1;A(*)
120 ASSIGN #1 TO *
130 MSI ":?2,?,?"  ! second drive
140 C$="Second drive"
150 ASSIGN #1 TO "E89"
160 PRINT #1;A(*)
170 ASSIGN #1 TO *
175 P=P+1
180 PRINT "Pass = ",P
190 GOTO 90
300 DISP ERRM$,C$
310 RETURN
320 END
```

Error 90 Mass storage system error

Detection:

- Unexpected EOI in READ BYTES routine (STAT11 = 5)
- The routine is to read in "x" bytes of data from the addressed talker on the HP-IB, but an EOI is received before the "x" bytes are read.
- DMA transfer did not complete (STAT11 = 6) (the interrupt for DMA completion was received, but an incorrect word count was in register DMAC).

Discussion:

For CS 80 Devices:

- STAT2 bit 0 is set
- A fault error has occurred (STAT3 <> 0) that is not an error 81 or error 165
- An error occurred, but it is not a fault error (STAT3 = 0) and it is not an access error (STAT4 = 0).

The causes of this error include:

- The HP-IB cables are too long
- The HP-IB controller is faulty
- The medium is worn
- Assorted drive problems

Action:

Use the DISC STATUS command to determine the specific error condition being reported.

Error 97 Door opened (unexpected interrupt) - data files closed

Detection:

An unexpected interrupt from the disc closed a data file which was open before the interrupt. No data is lost due to this interrupt.

Discussion:

- The operating system was not expecting an interrupt from the disc at that time.
- After receiving the interrupt, the operating system branches to invalidate the device table entry and sets a flag indicating that the door might have been opened.
- All tasks are notified that the door might have been opened.
- If the interrupt from the disc was not due to the door being opened, the message is meaningless but some condition existed where the disc needed to request processing.
- This error differs from error 98 in that there is no data currently in the buffer in memory that needs to be written out to disc (the data on the disc is current).

Action:

Use the DISC STATUS command to determine the error condition being reported by the disc.

Error 98 Door opened (unexpected interrupt) - data lost

Detection:

An unexpected interrupt from the disc closed a file that was open before the interrupt. The interrupt caused some data loss.

Discussion:

- Refer to the discussion above for error 97.
- This error differs from error 97 in that there is data in the buffer in memory that has not yet been written out to disc so the data is now lost and the disc file is not current.

Action:

Use the DISC STATUS command to determine the error condition that the disc is reporting.

Error 99 Locked door opened

Detection:

An unexpected interrupt from the disc was received and a DOOR LOCK command had previously been issued for that disc.

Discussion:

- Refer to the discussion above for error 97.
- This error differs from error 97 and error 98 in that the door has been locked on the disc.

Action:

Use the DISC STATUS command to determine the error condition that the disc is reporting.

Error 142 Door open - spool operation aborted

Detection:

An unexpected interrupt from the disc closed the spool file, which was open before the interrupt.

Discussion:

Refer to the discussion above for error 97.

Action:

Use the DISC STATUS command to determine the error condition that the disc is reporting.

Error 160 Tape operation pending

Detection:

An attempt to access the tape cartridge is made and it is detected that the tape has not been updated from the last operation performed on another drive (STAT11 = 26).

Discussion:

The tape cartridge was removed prematurely from the drive that it was in, or during the unload of the tape the disc detected a tape subsystem error, so the HP 260 did not reset the tape's Loaded Bit.

Action:

- Put the tape cartridge back in the drive it was previously in so that it can be updated, then it can be unloaded and placed in the new drive.
- If you suspect that the error was caused by a disc error, use the DISC STATUS command to determine the cause of the error. If the disc status is no longer valid, use the CS80 Exerciser to read the fault log.
- Refer to the Disc Diagnosis section for information on how to clear this error condition if the tape cannot be located.

Error 161 Disc buffer pending

Detection:

An attempt is made to use the buffer on the disc when it contains data for a different tape cartridge (STAT11 = 30).

Discussion:

The tape cartridge was removed prematurely from the drive or during the unload of the tape the disc detected a disc error so the HP 260 did not clear the Loaded Bit.

Action:

- Locate the tape cartridge that was previously in this drive so that it can be updated and the buffer cleared.
- If you suspect that the error was caused by a disc error, use the DISC STATUS command to determine the cause of the error. If the disc status is no longer valid, use the CS80 Exerciser to read the fault log.
- Refer to the Disc Diagnosis section for information how to clear this error condition if the tape cannot be located.

Error 162 Buffer disc not ready

Detection:

Any error condition for the disc (STAT11 22).

Discussion:

The disc holding the buffer for this tape is not ready for use.

Action:

Use the DISC STATUS command to find the specific error condition being reported.

Error 163 Tape door locked

Detection:

The cartridge tape door has been locked and a DIRECT, DIRECT NOUPDATE, or INDIRECT command has been issued (STAT11 = 163).

Discussion:

The cartridge tape door must be unlocked before these commands can be issued.

Action:

Unlock the cartridge tape door.

Error 164 Writing not allowed to tape until it is initialized

Detection:

An attempt is made to write to a tape that has not been initialized (STAT11 = 164).

Discussion:

Tapes from the factory containing software can only be read on the HP 260 (i.e. the tape has not been certified). The tape must be initialized (which includes certification) before any writing is allowed.

Action:

Copy all files on the tape to another tape or to a disc, then initialize the tape. Note that initializing the tape will erase all files on the tape.

Error 165 Self-test failure on disc

Detection:

Status word bit 24 is set indicating that self-test has failed on the CS 80 device while it was idle (STAT3 bit 7).

Discussion:

Self-test is continually performed on the disc whenever it is not doing processing. If there is any failure, the status bit is set.

Action:

Interpret the disc LEDs to determine the error condition being reported.

Error 166 TAPES DROM not loaded

Detection:

An attempt has been made to access a tape drive on a system where the TAPES DROM is not loaded.

Discussion:

- If a tape drive is used as the load device and the TAPES DROM is not loaded, the DROM is force-loaded. The user will receive an appropriate power-up message.
- On a system where the TAPES DROM is not configured but where there are tape drives connected and configured, a message is displayed informing the user of this situation.

Action:

Configure the TAPES DROM by running "CONFIG" and using the "DROM EDIT" Option. Save the new configuration to the customer's system disc. Then power off the SPU and power it on again to allow the system to recognize the new configuration.

Error 226 Corrupt data base - must recreate it (IMAGE)

Detection:

IMAGE found the data base marked as corrupt while trying to process it.

Discussion:

Some disc-related error had occurred earlier, causing the data base to become corrupt.

Action:

After this error occurs, do a DBPURGE followed by a DBRESTORE (from a previous DBSTORE copy). Transactions entered since the previous DBSTORE are lost.

Error 227 Corrupt data base - must erase it in its entirety (IMAGE)

Detection:

IMAGE found the data base marked as corrupt while trying to process it.

Dicussion:

Some disc-related error had occurred earlier which caused the data base to become corrupt, but the corruption is more severe than for an error 226.

Action:

After this error occurs, do a DBPURGE followed by a DBRESTORE (from a previous DBSTORE copy). Transactions entered since the previous DBSTORE are lost.

Error 240 Program lost due to disc failure (SORT)

Detection:

A disc-related error occurred while trying to re-load user memory from the workfile after completing a SORT BY.

Discussion:

SORT executes a SCRATCHA when this occurs, thereby clearing the program from memory.

Error 1003 Cannot get exclusive access to device

Detection:

The current disc operation requires exclusive access to the device and the system tables indicate that some other task currently has access to the device.

Action:

Make sure that no other tasks are trying to access the devices selected for use in the DUPL utility or DUP binary, and that there are no open data bases on either device.

Error 1004 Keyword not recognized by this operating system revision

Detection:

A keyword in a BASIC line in the program in memory is not available in the operating system that was used to power-up the system.

Action:

Check the OS revision (REVISION command) and verify that the program is intended for use under that revision (binaries updated, for example).

Error 1005 Memory overflow in common block

Detection:

Not enough room is available in common block for the shared data base control blocks that need to be currently active.

Action:

Determine from the bottom of the SCHEMA listing for each data base how much room is needed for the shared data base control blocks for ALL data bases open at the same time. Make sure that this much space has been allocated for common block through CONFIG.

Error 1010 Memory parity error

Detection:

The parity generated for a byte read from memory does not match the parity calculated when the byte was written into memory.

Action:

Refer to the Mainframe Diagnosis section for details on interpreting the two parity words displayed with the error message.

Power–on Messages

CONFIGURED DEFAULT MASS STORAGE DEVICE IS NOT PRESENT

Detection:

The device specified for the default MSI was not found during power-up.

Action:

- Run CONFIG and check Miscellaneous Configuration to determine what device is specified for the default MSI.
- Check that the specified device is present, powered-on, passed self-test, and is ready.

DROM LOADER FAILURE WITH drom name; reason

Detection:

The system was unable to load a DROM for the reason given.

Action:

- If the failure was due to another DROM not loaded, correct the loading of the other DROM (the other DROM might not be configured).
- If the failure was due to insufficient space, either too many DROMs were configured for available memory or a memory board that would contain DROMs failed. Correct a configuration problem through CONFIG, and a memory failure as described under the MEMORY FAILURE errors.

HPIB HANDSHAKE ABORT - LOAD FAILURE

Detection:

A handshake abort (timeout) occurred on the HP-IB during system load.

I nn

Detection:

An invalid interrupt was received from an undefined peripheral address (PA) or from a PA that should not be interrupting during self-test or load.

Discussion:

This message is displayed in the lower left corner of the display, where "nn" is the offending PA.

Action:

Try powering up again. If the error occurs again and it is from a valid PA, refer to the appropriate diagnosis section in this handbook. If the error is not from a valid PA, refer to the section titled "Mainframe Diagnosis". Use the information given there to isolate the cause of the problem.

IMAGE DROM NOT LOADED TO MAKE ROOM FOR PRINCIPAL WSTN (RIO/VIO/PIO)

Detection:

Not enough room was found to load the RIO DROM, the VIO DROM, or the PIO DROM, which was required for the configuration, so the IMAGE DROM was removed to make room.

Action:

- If the error was due to too many DROMs configured, correct the situation through CONFIG.
- The error could be caused by a failure in a memory board that was to be used for DROMs. Correct the failure by following the procedure listed under the MEMORY FAILURE error.

INP CHANNEL #1 -- FAILED INTERNAL SELF-TEST

Detection:

Self-test failed on the INP board on PA 0.

Action:

Refer to the Data Comm Diagnosis section of this handbook for the details of how to interpret the LED on the INP board.

NO INP CONTROLLERS INSTALLED

Detection:

The CS260 DROM is configured and loaded, but there was no response on PA 0 from the INP controller board.

Discussion:

The CS260 DROM is configured and loaded, it is assumed that an INP controller is present.

Action:

- If the INP controller is not present (and not supposed to be present), run CONFIG and remove the CS260 DROM from the system configuration.
- If the INP controller is not present and it is supposed to be, install the controller.
- If the INP controller is present, refer to the Data Comm Diagnosis section.

VIDEO I/O NOT PRESENT
CONFIGURED VIDEO CHANNEL 1 REMOVED
PORT -1 HAS BEEN CONFIGURED AS WORKSTATION

Detection:

The system has not found a Video board

Discussion:

The Video workstation that was configured as the principal workstation cannot be used, so the system allocates TASK ID #1 to the ASI workstation on integrated port -1. This makes the workstation on integrated port -1 the principal workstation.

Action:

- Check the seating of the Video board in the SPU. Replace the Video board with a new board and reboot the system.

VIDEO I/O NOT PRESENT, TASKS CONVERTED TO SECONDARIES

Detection:

The system has not found a Video board.

Discussion:

The tasks that were configured as Video workstations cannot be used as primary tasks, so the system converts them to secondary tasks. Therefore, the memory associated with the tasks is not wasted.

Action:

Check the seating of the Video board in the SPU. Replace the Video board with a new board and reboot the system.

SECONDARY TASK n DOWN; NO MEMORY AVAILABLE

Detection:

Not enough upper-memory blocks were found in the memory-presence table built during self-test to allow bringing up the secondary task.

Action:

- Correct any MEMORY FAILURE errors first.
- Add additional memory

SYSTEM LOAD FAILURE

Detection:

The system is unable to bring up any workstation, or the system is unable to set up the Common Block.

Action:

Correct all other error messages displayed during power-up. You might have to boot the system from the customer's original distribution medium.

THE "SYSTEM" FILE WAS NOT FOUND

Detection:

The loader searched all load devices and was unable to find the SYSTEM file.

Action:

- Make sure that the appropriate load device is connected and powered on. Note that the device must be fully powered up (including passing self-test) before the device will be recognized by the loader, and that the loader will not wait for the device.
- Make sure that the correct tape cartridge or microfloppy is inserted in the drive if it is the load medium.
- Use another load device or another copy of the operating system for loading. After powering up, do a CATalog of the media thought to contain the SYSTEM file.
- You might have to re-install the Operating System from the customer's original distribution medium, using the ROUTIL utility program.

WORKSTATION ON PORT n DOWN; NO MEMORY AVAILABLE

Detection:

Not enough upper-memory blocks were found in the memory-presence table built during self-test to allow bringing up the workstation.

Action:

- Correct any MEMORY FAILURE errors first.
- Add another memory board.

WORKSTATION ON PORT n GIVEN EXTRA MEMORY

Detection:

After assigning all memory to configured tasks, extra memory was found in the memory presence table built during self-test so it was given to this workstation.

Action:

- Correct any failures to bring up any workstation.
- Run CONFIG and specify that the additional memory is for the workstation.

WORKSTATIONS DOWN; RIO OR PIO DROM NOT LOADED

Detection:

The system is unable to communicate with the configured, ASI workstations because the RIO DROM and/or the PIO DROM is not loaded.

Action:

Run CONFIG and configure the RIO and/or PIO DROM to auto-load.

HP-HIL ERROR ON CHANNEL #

Detection:

There is a failure in communication between the keyboard and the Video workstation.

Discussion:

The keyboard/beeper is either faulty or improperly connected to the workstation.

Action:

- Check the connection of the keyboard to the workstation
- Replace the keyboard/beeper/cables
- Remove the Video board and reboot the system with the workstation on integrated port -1 as the principal workstation

SYSTEM LOAD FAILURE - UNABLE TO LOAD TAPES DROM

Detection:

The system file is stored on a cartridge tape, and there is not enough memory available to allow the TAPES DROM to be force-loaded. Therefore the loading of the system could not be successfully completed.

Action:

Run CONFIG and select the Memory Configuration Option. Configure part of the common block or part of a user block to DROM OVERFLOW. Save the new configuration and reboot the system.

NO RESPONSE TO SYSTEM SELF TEST FROM WORKSTATION ON PORT #

Detection:

The system cannot find a workstation on port # of the ASI that corresponds to the type of workstation configured on port # (in the CONFIG program).

Discussion:

- The workstation on port # might be powered-off
- There might be no workstation on port #
- The workstation on port # might be wrongly configured locally
- The workstation on port # might be wrongly configured in the HP 260 CONFIG program

Action:

- Check that there is a workstation on port #, and that it is powered-on
- Check the local configuration of the workstation
- Check the configuration of the workstation on the HP 260

PORTS DOWN; TIO DROM NOT LOADED

Detection:

The system is unable to communicate with devices connected to the ASI because the TIO DROM is not loaded.

Action:

Run CONFIG and configure the TIO DROM to auto-load.

SYSTEM LOAD FAILURE - UNABLE TO LOAD VIO DROM

Detection:

The principal workstation is the Video workstation on Video port 1. The system is unable to communicate with this workstation because the VIO DROM is not present on the load mass storage device, or because the VIO DROM is corrupt.

Action:

Remove the Video board(s) from the SPU and reboot the system, using a PC or workstation connected to integrated port -1 as the principal workstation. Run the CONFIG program and select the DROM EDIT option. Check whether the VIO DROM is present on the load mass storage device. If it is not present, use the ROUTIL program to copy the VIO DROM from your CE tape to the customer's storage device. If the VIO DROM is present, it is likely to be corrupt. Use the ROUTIL program to purge the VIO DROM, and then copy the DROM from your CE tape to the customer's storage device.

LESS MEMORY FOUND THAN CONFIGURED

Detection:

The system found that more memory had been configured than is physically present.

Discussion:

This error is due to either:

- The failure of a memory board
- The incorrect configuration of memory in the CONFIG program

Action:

- Check that the configuration of memory in CONFIG is correct. Alter this configuration if necessary.
- Check the seating of the memory boards in the SPU.
- Replace any board that appears to be faulty. Continue to replace memory boards, one by one, until the faulty board is located.

Loader Errors

LOADER ERROR A Checksum error

Detection:

The checksum computed when loading part of the operating system does not match the checksum stored as part of the operating system.

Action:

Install a new copy of the OS from the relevant distribution medium. The OS on the system disc is corrupt.

LOADER ERROR B Disc read error

Detection:

A disc error occurred while trying to read in the operating system or bootload file.

Discussion:

For the "new" ROMs (1818-2913 and 1818-2914), 12 octal numbers are also displayed after the message. These numbers are, (in order):

- The device address
- The unit number
- For CS 80 devices: status words STAT1 through STAT10

Action - refer to the Disc Diagnosis section for details on the status words.

LOADER ERROR C Checkread error

Detection:

A checkread error occurred while reading a directory record, Record 0, or the first record of the system file.

Action:

Connect another disc to the system. Reboot the system from this new disc, and then run the disc exerciser program (EXRSIZ or EX794X) to diagnose the problem on the first disc.

LOADER ERROR E Interface error

Detection:

Any problem related to the HP-IB.

Action:

- Change the HP-IB board and reboot the system.
- If LOADER ERROR F returns, try altering the physical connection path of the HP-IB devices. Then try altering the logical address configuration of the HP-IB devices.
- Refer to the "HP-IB Configuration" Section of this handbook for details of the recommended HP-IB configurational modes.

LOADER ERROR F Disc or system error

Detection:

- Various internal error conditions
- PHI chip timeout
- Attempt to perform an opcode that should not be used during a load (eg. Write).

Discussion:

For all ROMs (starting with ROM numbers 1818-2913 and 1818-2914), an octal number appears on the line following the message giving the specific error.

Action:

- For error 000005, the CS 80 device did not respond to a request status command with a parallel poll within two seconds. Refer to the Disc Diagnosis section .
- For error 000006, the CS 80 device did not return 20 status bytes in response to a request status command. Refer to the Disc Diagnosis section .
- For error 000007, the device did not respond to a DSJ (Device-Specified Jump) request.
- For error 000010, an invalid interrupt was received from the PHI chip on the HP-IB Board. Refer to the HP-IB Diagnosis section.
- For error 000011, the head/track/sector calculation for a disc resulted in a value out of range. This could be due to a bad directory entry for the system file or a bad address for the bootstrap file. Refer to the Logical Disc Layout section.

- For error 000012, division by zero was attempted in the head/track/sector calculation. Refer to the action above for error 000011.
- For error 000013, numeric overflow occurred in the head/track/sector calculation. Refer to the action above for error 000011.

Dumping the Contents of the Memory to a Tape

The ROMs on the processor board allow the capability to load in a MEMORY file instead of the operating system. This MEMORY file can be used to dump all of RAM memory to the mass storage device containing the MEMORY file.

The dump program can be initiated in two ways:

- through the SYSRR DROM when a system error has occurred
- by pressing the diagnostic switch on the HP 260

The dump program will be loaded in and will perform the memory dump. This dump can then be analyzed.

Refer to the section titled "System Error" for the details of making a memory dump after a system error has occurred.

Using the Diagnostic Switch to make a Memory Dump

Use the following procedure

1. **Do not power the system off**, as this will cause the loss of all the data in the memory.
2. Insert the cartridge tape containing the MEMORY file into the desired drive.
3. Press the Diagnostic Switch on the HP 260.
4. The system searches for the MEMORY file, starting with **HP-IB** address 7 and continuing to HP-IB address 0, until the MEMORY file is found. The contents of the memory are copied to the first MEMORY file that is found. Notice that unit 1 on each address is used before unit 0, so that a removable device is used in preference to a fixed disc.

When the dump is finished, the message "MEMORY DUMP COMPLETED" is displayed.

The following error messages can occur:

ATTEMPT TO WRITE PAST END OF FILE - system trying to dump more
than 640KB
DISC ERROR DURING WRITE - disc status indicates an error on a
write operation
FATAL ERROR 1 - no response to a seek command
FATAL ERROR 2 - seek error reported after a status check
FATAL ERROR 3 - no response to a read command
FATAL ERROR 4 - no response from non-CS 80 device
FATAL ERROR 5 - no response from CS 80 device
FATAL ERROR 6 - CS 80 status failed to return 20 bytes
FATAL ERROR 7 - an error occurred when requesting a DSJ
or QSTAT FATAL ERROR 8 - an error occurred during HP-IB

interrupt servicing FATAL ERROR 9 - the absolute sector number exceeded 65535 in FREC1 FATAL ERROR 10 - quotient was greater than 16 bits during a Head-Track-Sector calculation
FATAL ERROR 11 - divisor = 0 during an integer divide
FATAL ERROR 12 - overflow during an integer divide
FATAL ERROR 13 - no response to a write command
NO DEVICE FOUND - unable to find the load device in the system identifier table

When the dump finishes:

1. Power off the system to make sure that no more disc processing can take place.

2. Remove the disc or tape cartridge containing the MEMORY file.

3. Power up the system.

Factory policy on memory dumps:

Please check with the on-line support group before sending in a memory dump on disc or tape cartridge. The utility was developed as an aid when other diagnostic procedures do not supply enough information. The support group and the lab do not have the necessary resources to examine every dump that could be taken at every customer's site, nor is it necessary to perform the dump for every operating system-related problem. The support group will be able to make a recommendation as to when a dump is needed, and can also be sure the appropriate people will be available to examine the dump.

To copy the dump file:

A utility called SADUTL (file type PROG) is on the CE System Support Disc. This file allows copying the MEMORY (file type SYST) file by itself to another disc. Therefore, if you need to send a memory dump to the factory, run this utility and copy the MEMORY file from the CE System Support Disc that you used onto a floppy. When making copies of the MEMORY file, be sure to use SADUTL to set the bit in Record 0 on the disc indicating the presence of the file.

To copy the MEMORY file:

A utility called SADUTL is on the Stand-alone CE Diagnostic. This utility allows you to copy the MEMORY file to another mass storage device.

Details of Loading the MEMORY File

When the diagnostic switch is pressed, the ROMs on the processor board read the RAM block number that is stored in address 177777 (octal) of the RTC chip. This block of RAM is then checked to see if it is good. If it is good, the MEMORY file is loaded into this block. If it is bad, the ROMs on the processor board look for a good block with the highest possible block number. The MEMORY file is then loaded in that good block.

SYSTEM ERROR/HANG

SECTION 13

OVERVIEW

A system error is a non-recoverable general error that prevents any further processing. System errors can be caused by both software and hardware. A system error is detected by the Operating System as one of the following:

- An inconsistent data structure (for example, tables)
- Some hardware errors (for example, parity)
- Illegal interrupts
- Timeouts on the HP-IB
- An attempt to write to a protected memory block

DEALING WITH A SYSTEM ERROR

When you are asked to help a customer who has had a system error, the priorities are to obtain a copy of the HP 260's memory, and to re-start the customer's system as soon as possible. Use the following procedure to achieve these aims.

1. Copy the messages and the numbers from the principal workstation (the numbers are the well-known "tombstone" which characterizes a system error).

2. Find out the locations of the customer's printers, and decide whether you want to print out the contents of the HP 260's memory on an HP-IB printer or an ASI printer.

   Check that the printer you want to use is connected, powered-on, and that it has paper. The following printers are available for memory print-out.

   - The printer on HP-IB address 0
   - The printer on integrated serial port -1 or -2
   - The local workstation printer connected to the principal workstation (the workstation must be connected to integrated port -1)
   - The printer on ASI port 5 (applies to all HP 250s and to the HP 260 P/N 45261D)

3. If you want to use the HP-IB printer on HP-IB address 0, press CONTROL P.

If you want to use the printer on integrated port -1 or -2, or ASI port 5, press P.

If you want to use the local workstation printer, first set "LOCK BOTTOM" on the workstation, and then press P.

4. Now you have one print-out of the contents of the memory. If you want to print more copies, repeat the previous step.

5. When you have finished making paper copies of the contents of memory, consider whether you want to copy the memory from the HP 260's RAM to a file on a cartridge tape. To make this copy, you need the following:

   - A tape drive connected to the system, and currently powered-on

   - A cartridge tape with the file "MEMORY" installed. This "MEMORY" file must have been installed using the SADUTL utility program.

6. Press CONTROL D on the principal workstation's keyboard to start the copy of memory to the cartridge tape. The system searches for the file "MEMORY", starting with HP-IB address 7, and continuing down to HP-IB address 0, until "MEMORY" is found. Note that the system uses unit 1 on each address in preference to unit 0.

NOTE

Make sure that you finish making print-outs of the memory before you copy the memory to the cartridge tape. After you make this copy, it is not possible to produce any more print-outs.

7. Re-boot the customer's system.

8. Run the CONFIG program, and select option 1. Note the revision date of the UPDATE DROM that is currently loaded. It is vital that you obtain this date because it could explain the cause of the system error. If you contact the factory later, you will be asked to supply the revision date.

9. Take the printout and/or cartridge tape back to your office for analysis.

NOTE

The SYSRR DROM must have been loaded in the memory of the HP 260 before the system error occurred. Otherwise, it is not possible for you to make printouts of the contents of the memory, after the system error has occurred. Therefore, you should make it clear to all customers that they should always keep the SYSRR DROM "auto-loaded".

Using the Diagnostic Switch to make Copies of the Memory

If a system error occurs on a system where the SYSRR DROM is not loaded, you can still copy the contents of the system's memory to a cartridge tape. If the SYSRR DROM is not loaded, you can not use the CONTROL D keys to make the copy. Instead, press the diagnostic switch on the processor board of the HP 260 SPU.

You can also use the diagnostic switch to make copies of the memory of a system when there is a system hang (without the system error tombstone).

DEALING WITH A SYSTEM HANG

A system hang is a situation where the system will not respond to input from any workstation. Even a CONTROL HALT will not make the system respond. Refer to the section titled "System Diagnosis" to find out whether you have a system hang or something less serious.

The system is in an "error state" but does not know it. Once you are sure that you have a system hang, the only thing to do is to make a memory dump by pressing the diagnostic switch on the processor board of the HP 260 SPU. Refer to the section titled "OS Diagnosis" for the details of how to make a memory dump.

DECODING THE SYSTEM ERROR MESSAGE

The System Error Message (also known as the "tombstone") appears on the principal workstation whenever a system error occurs. If there is no System Error Message on the principal workstation's screen, no system error has occurred.

The screen below is an example of a System Error Message

```
SYSTEM ERROR  027110
              177776
              177366
              000040
              140002
              000003
              176553
              000041
              000076
              000077
              000000
              177777

              027110
              023703
              035106
              000052
              127750
              003500
              130465
              047233
              000000
```

The following table gives the meaning of each of the numbers in the System Error Message.

SYSTEM ERROR	XXXXXX	Contents of Register A
	XXXXXX	Contents of Register B
	XXXXXX	Contents of Register C
	XXXXXX	Contents of Register D
	XXXXXX	Contents of Register DMAPA
	XXXXXX	Contents of Register PA
	XXXXXX	Contents of Register R32 (upper data)
	XXXXXX	Contents of Register R34 (upper instructions)
	XXXXXX	Contents of Register R35 (lower data)
	XXXXXX	Current BASIC program line number (SYSLN)
	XXXXXX	Current Task In Control (TIC)
	XXXXXX	Parity Error memory location
	XXXXXX	Execution address where parity error occurred
	XXXXXX	Top of Return Stack value (pointed to by register R)
	XXXXXX	2nd Return Stack value
	XXXXXX	3rd Return Stack value
	XXXXXX	4th Return Stack value
	XXXXXX	5th Return Stack value
	XXXXXX	6th Return Stack value
	XXXXXX	7th Return Stack value
	XXXXXX	8th Return Stack value
	XXXXXX	9th Return Stack value

In the above table, XXXXXX represents an octal number.

NOTE

The octal numbers representing the Parity Error Memory Loccation and the Execution address where the parity error occurred are only displayed if a parity error has in fact occurred.

DECODING THE SYSRR PRINTOUT

The SYSRR printout has the following features:

- 1 page showing the status of each 2 active users; for example, if there are 4 active users, there are 2 pages of user-status printout - each showing the status of 2 users

- 1 page showing the status of the system

- 1 page listing the current BASIC line and user number of all users who were executing a program when the system error occurred

The diagrams below show the format of the User Status Printout, and the System Status Printout. The sub-sections which follow show you how to interpret the User Status and System Status Printouts, and show you how to trace the cause of a system error to a certain part of the operating system.

The final sub-section, titled "System Error Flowcharts", uses eight flowcharts to show you how to interpret a system error printout. You might prefer the flowcharts to the written explanation of the printout that is given in this section. The flowcharts are easier to read, and are better as a quick source of reference.

```
                                TASK XX STATUS

    MASS MEM               DB TABLES                      STACK           REGISTERS

EUSP      XXXXXX      DB02                         TOS    XXXXXX      A          XXXXXX
FREC1     XXXXXX         MODE     XXXXXX                  XXXXXX      B          XXXXXX
FREC2     XXXXXX         FREC2    XXXXXX                  XXXXXX      C          XXXXXX
MMBFR     XXXXXX         EUSP     XXXXXX                  XXXXXX      D          XXXXXX
DMAC1     XXXXXX         SHARED   XXXXXX                  XXXXXX      DMAC       XXXXXX
                         LOCAL    XXXXXX                  XXXXXX      DMAMA      XXXXXX
OPCODE    XXXXXX                                          XXXXXX      DMAPA      XXXXXX
OPCD      XXXXXX      DB03                                XXXXXX      PA         XXXXXX
                         MODE     XXXXXX                  XXXXXX      R          XXXXXX
                         FREC2    XXXXXX                  XXXXXX      R32        XXXXXX
    DB TABLES            EUSP     XXXXXX                              R34        XXXXXX
                         SHARED   XXXXXX                              R35        XXXXXX
DB00                     LOCAL    XXXXXX                              R37        XXXXXX
   MODE   XXXXXX
   FREC2  XXXXXX      DB04
   EUSP   XXXXXX         MODE     XXXXXX
   SHARED XXXXXX         FREC2    XXXXXX                                    MISC
   LOCAL  XXXXXX         EUSP     XXXXXX
                         SHARED   XXXXXX                              DBB        XXXXXX
DB01                     LOCAL    XXXXXX
   MODE   XXXXXX
   FREC2  XXXXXX
   EUSP   XXXXXX
   SHARED XXXXXX
   LOCAL  XXXXXX
```

User Status Printout

NOTE

The User Status Printout is also known as the Task Status Printout.

```
                              SYSTEM STATUS <REV B.8>

TASK #    BLOCK #    STATUS      STACK  < 03 >

  1       XXXXXX     XXXXXX        TOS  XXXXXX    # OFFSET  BLK    # OFFSET  BLK
  2       XXXXXX     XXXXXX             XXXXXX    0 XXXXXX  XX    16 XXXXXX  XX
  3       XXXXXX     XXXXXX             XXXXXX    1 XXXXXX  XX    17 XXXXXX  XX
  4       XXXXXX     XXXXXX             XXXXXX    2 XXXXXX  XX    18 XXXXXX  XX
  5       XXXXXX     XXXXXX             XXXXXX    3 XXXXXX  XX    19 XXXXXX  XX
  6       XXXXXX     XXXXXX             XXXXXX    4 XXXXXX  XX    20 XXXXXX  XX
  7       XXXXXX     XXXXXX                       5 XXXXXX  XX    21 XXXXXX  XX
  8       XXXXXX     XXXXXX                       6 XXXXXX  XX    22 XXXXXX  XX
  9       XXXXXX     XXXXXX                       7 XXXXXX  XX    23 XXXXXX  XX
 10       XXXXXX     XXXXXX                       8 XXXXXX  XX    24 XXXXXX  XX
 11       XXXXXX     XXXXXX                       9 XXXXXX  XX    25 XXXXXX  XX
                                                 10 XXXXXX  XX    26 XXXXXX  XX
NTASK         XX     SYSBK   XXXXXX              11 XXXXXX  XX    27 XXXXXX  XX
TIC       XXXXXX     COMBK   XXXXXX              12 XXXXXX  XX    28 XXXXXX  XX
                                                 13 XXXXXX  XX    29 XXXXXX  XX
PARITY ERROR: LOCATION  XXXXXX                   14 XXXXXX  XX    30 XXXXXX  XX
              ADDRESS   XXXXXX                   15 XXXXXX  XX    31 XXXXXX  XX

                          DISC STATUS SET 01

EUSP      XXXXXX          STAT1   XXXXXX              STAT6    XXXXXX
OPCD      XXXXXX          STAT2   XXXXXX              STAT7    XXXXXX
FREC1     XXXXXX          STAT3   XXXXXX              STAT8    XXXXXX
FREC2     XXXXXX          STAT4   XXXXXX              STAT9    XXXXXX
STAT11    XXXXXX          STAT5   XXXXXX              STAT10   XXXXXX


                          DISC STATUS SET 02

EUSP      XXXXXX          STAT1   XXXXXX              STAT6    XXXXXX
OPCD      XXXXXX          STAT2   XXXXXX              STAT7    XXXXXX
FREC1     XXXXXX          STAT3   XXXXXX              STAT8    XXXXXX
FREC2     XXXXXX          STAT4   XXXXXX              STAT9    XXXXXX
STAT11    XXXXXX          STAT5   XXXXXX              STAT10   XXXXXX
```

System Status Printout

Interpreting The User Status Printout

MASS MEM Table

EUSP, FREC1, FREC2 and OPCD are Disc Driver Status Words. Refer to the section titled "Disc Diagnosis" for the details of the information contained in these status words.

MMBFR is a pointer to the mass-memory data buffer in the user memory.

DMAC1 is the number of 16-bit words in the DMA transfer.

OPCODE is the disc driver operation code that was most recently requested by the HP 260. The least significant five bits of the OPCODE have the following meanings:

OCTAL NUMBER	MEANING
00	request unit status
01	seek only
02	read a single sector
03	write a single sector
04	verify
05	initialize the medium
06	read multiple sectors
07	write multiple sectors
10	add new file name to directory
11	delete file name from directory
12	write main and spare directory
13	checkread operation
14	directory record read
15	diagnostic switch pressed
16	record 0 read into checkread buffer
17	determine available space on media
20	lock/unlock door

DB TABLES

These tables refer to data bases that are open. DB04 refers to the first data base that is currently open. DB00 refers to the fifth data base that is currently open.

MODE is the mode in which the data base is open.

FREC2 contains the lower 16 bits of the disc address of the root file of the data base.

EUSP is the encoded unit specifier for the root file of the data base (that is, the EUSP tells you which disc contains the root file). Refer to the section titled "Disc Diagnosis" for the details of how to read the EUSP.

SHARED is the offset from the beginning of the shared data base dynamic buffer to the beginning of the shared data base control block.

LOCAL is the offset from the beginning of the local data base dynamic buffer to the beginning of the local data base control block.

STACK

The STACK refers to the return stack pointed to by register R. The table printed in the User Status Printout contains ten addresses, starting with the top of stack address (TOS), and proceeding backwards. If the stack contained fewer than ten entries at the time of the system error, the lower values in the STACK table might not be relevant. If this is the case, the value 000000 appears in the STACK table. This value indicates the bottom of the stack.

Interpreting The System Status Printout

Information about each task

In the upper-left corner of the printout, under the headings TASK#, BLOCK# and STATUS, information is given about each of the tasks that were active when the system error occurred.

TASK# gives the number of each of the active tasks.

BLOCK# contains the memory block number assigned to each task.

STATUS gives the status of each task when the system error occurred. For OS revision B.08.xx,

000000 = task was active
177777 = task was not active

Information about the system

The rest of the System Status Printout contains information about the whole system.

NTASK gives the number of tasks that are configured in the system.

TIC gives the number of the Task In Control when the system error occurred. Normally the TIC will be between 1 and NTASK. If the TIC value is 177777, the system was switching between tasks when the system error occurred.

SYSBK contains the memory block number assigned to the upper part of the OS.

COMBK contains the memory block number assigned to the common block.

PARITY ERROR

The 2 parity words appear on the printout only if a parity error has occurred. The first word gives the memory location of the parity error in a coded format. The second word gives the address in the operating system in which the parity interrupt occurred.

STACK

The STACK table here refers to the return stack that is used by the system when no task is in control.

DROM TABLE

The DROM TABLE lists the offset values between the beginning of the memory block and the start of each loaded DROM.

The DROM number (#) is the internal DROM number. The internal DROM numbers run from 0 to 31. Note that the internal number of a DROM might be different from the number of that DROM in the CONFIG list. Refer to the DROM reference number table later in this section.

OFFSET contains the offset values for each DROM. A value of 000000 indicates that a DROM is not loaded.

BLK contains the memory block in which each DROM is loaded. These values are needed because there are several DROM-overflow blocks.

Tracing The Cause Of The System Error

Perform the following, short procedure before beginning to look for specific causes of the system error:

1. Identify the Task In Control (TIC) from the SYSTEM STATUS printout. Look at the USER STATUS printout for the Task In Control. Write down the values of the STACK table, and use these STACK values in the rest of this sub-section. If the TIC = 177777, then the system was switching between tasks when the error occurred. In this case you must examine all tasks and the system stack in the rest of the steps below.

2. Identify the operating system revision from the SYSTEM STATUS printout.

3. Identify the BASIC line (if any) for the Task In Control.

Now you can begin to look for the specific cause of the system error. Use the following categories:

Parity Errors

A parity error has occurred if the parity words are present in the System Error Message displayed on the principal workstation, or are present in the SYSTEM STATUS printout. Refer to the sub-section titled "Finding the location of a parity error" for details of how to proceed.

NOTE

> If the parity words are present, ignore all the other information in the System Printout because the parity error caused the System Error.

Attempt to Write into Protected Memory

An attempt to violate protected memory has been made if the value of the top of the user or system return stack is 51702. If the top of stack value is 51702, write down the second value in the stack. Use this new value in the procedure titled "Uncertain Cause of the System Error".

Illegal Interrupt

An illegal interrupt has occurred if the value of the top of the user stack or the system stack is 51700.

If there is a Task In Control, read the value of the PA register in the USER STATUS printout for the Task In Control. This value is the peripheral address where the interrupt was being generated.

If there is no Task In Control, read the value of the PA register from the sytem error "tombstone". This value is the peripheral address where the interrupt was being generated.

The operating system was not expecting to receive interrupts from this address. Contact your TSE or the factory for more information.

Timeout on the HP-IB

A timeout (handshake abort) has occurred if the value of the top of the user stack or the system stack is 56710. If a timeout on the HP-IB has caused the system error, check all the devices in the HP-IB chain. Make sure that they are all powered on, and that no 2 devices have the same HP-IB address. Check the cables between the devices, and make sure that the recommendations given in the section of this handbook titled "HP-IB Configuration" are complied with.

If you find nothing wrong with the devices or the configuration, call your TSE or the factory.

Uncertain Cause of the System Error

If none of the 4 specific failures has caused the error, it has been caused by an inconsistency in pointers or addresses, or by unexpected values. The final cause of these could be either hardware or software based. However, it cannot be an error in application code. Follow the procedure below to determine where the error occurred, then call your TSE or the factory for assistance.

1. Use the value on the top of the return stack for the Task In Control (TIC). Call this the stack value. However, if there has been an attempt to write into protected memory, you must use the second value in the stack as the "stack value".

2. If the leading digit in the stack value is 0, the error occurred in the lower part of the operating system. Determine which OS module it occurred in by using the Operating System layout in the section of this handbook titled "Memory Organization". Call your TSE or the factory.

3. If you have reached this point, the leading digit in the stack value must be a 1. There are several possible interpretations of the system error printout. These alternatives are now listed and explained.

   - If the value for register R34 in the user status printout is the same as the value for SYSBK in the system status printout, and the stack value is greater than 130626, then the system error occurred in the upper part of the Operating System.

     Find out which OS module the error occurred in by using the Operating System layout in the section of this handbook titled "Memory Organization". Call your TSE or the factory and pass on this information.

   - If the value for register R34 in the user status printout is the same as the value for the memory block assigned to the Task In Control in the system status printout, and this value is different from the block number for any DROM (also found in the system status printout), then the error occurred in a binary.

     Find out from the application code or VAR which binaries were being used by the Task In Control, and call your TSE or the factory. The current BASIC line of the TIC, when the system error occurred, might also help you here.

   - If the value for register R34 in the user status printout is the same as the value for the memory block assigned to the Task In Control in the system status printout, and this value is the same as the block number for any DROM, then the error might have occurred in a DROM or in a binary. Contact your TSE for assistance.

- If the value for register R34 in the user status printout is the same as the block number for a DROM (but not the same as the value of the SYSBK or TIC memory block), then carry out the following procedure:

    1. Note the entries in the DROM table (in the system status printout) where the block number is the same as the value in the register R34. Ignore entries of 000000. The valid entries are known as the DROM Table entries.

    2. Ignore the first digit in the stack value. Locate the entry in the DROM Table entries with the greatest offset that is still less than or equal to the stack value. The error occurred in this DROM. Use the DROM Reference Table given below to determine which DROM this is. Call your TSE or the factory for assistance.

4. If you have reached this point without isolating the cause of the system error, you should check that you have followed the above procedure correctly. When you are sure that you have done so, call your TSE or the factory for assistance.

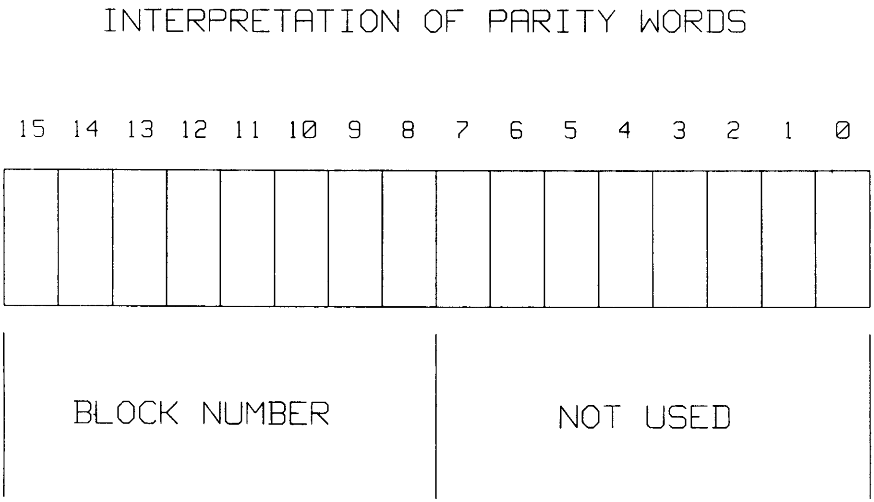
DROM Reference Table for B.08

The following list gives the internal DROM number and the external DROM number for each of the DROMs supported on B.08. This list will allow you to determine which DROM has been involved in a system error, when you have obtained an internal DROM number by following the "System Error Procedure" which is given earlier in this section.

Internal Number	DROM Name	External Number
0	EUROPE	1
1	PACK	2
2	IMAGE	3
3	SORT	4
4	REPORT	5
5	FORMS	6
6	TAPES	7
7	TOOLS	8
8	RIO	9
9	TIO	10
10	TRACE	11
12	TRIG	12
13	MATRIX	13
14	SPOOL	14
15	CS250	15
16	MEDIA	16
17	IMAGE2	17
18	TASK	18
20	IMAGEU	19
21	TIMER	20
22	PERFM	21
23	CTRACE	22
24	VIO	23
25	PTYPE	24
26	UPDATE	25
27	PIO	26
28	NET250	27
29	SYSRR	28
31	DCACHE	29

Finding the Location of a Parity Error

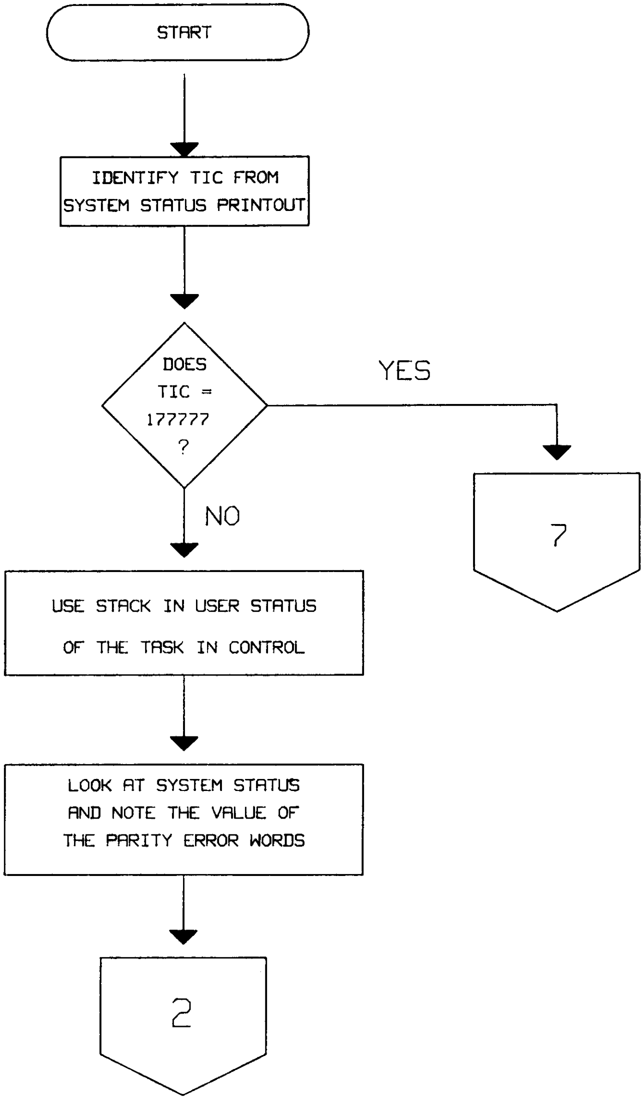
This sub-section shows you how to find the location of a parity error. You already have the values of the 2 parity words from the System Status Printout. The first word is a code that gives the general location of the parity error. The diagram below shows you how to decode the first parity word.



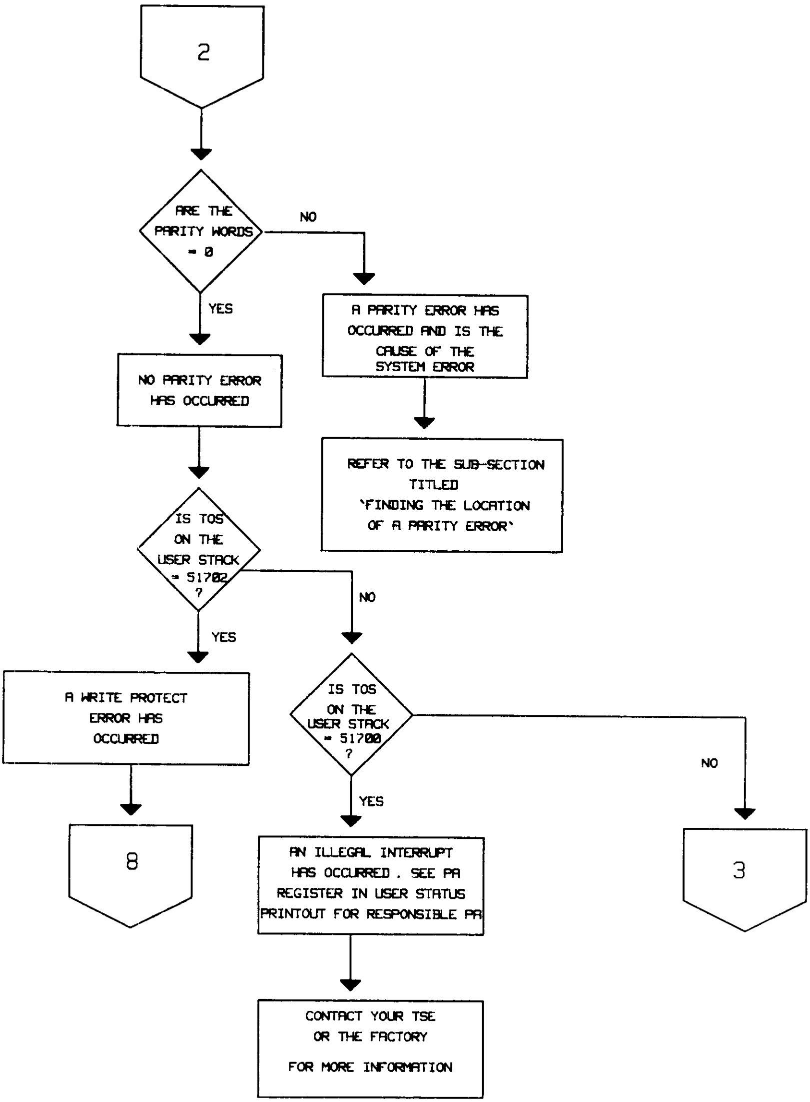
The second parity word gives the address in the operating system where the parity interrupt occurred. If the parity error was caused by a hardware fault, you should change the faulty memory board. To determine whether or not there is a hardware fault you could run the "MEMTEST" program, which is supplied on the CE Diagnostics Tape.

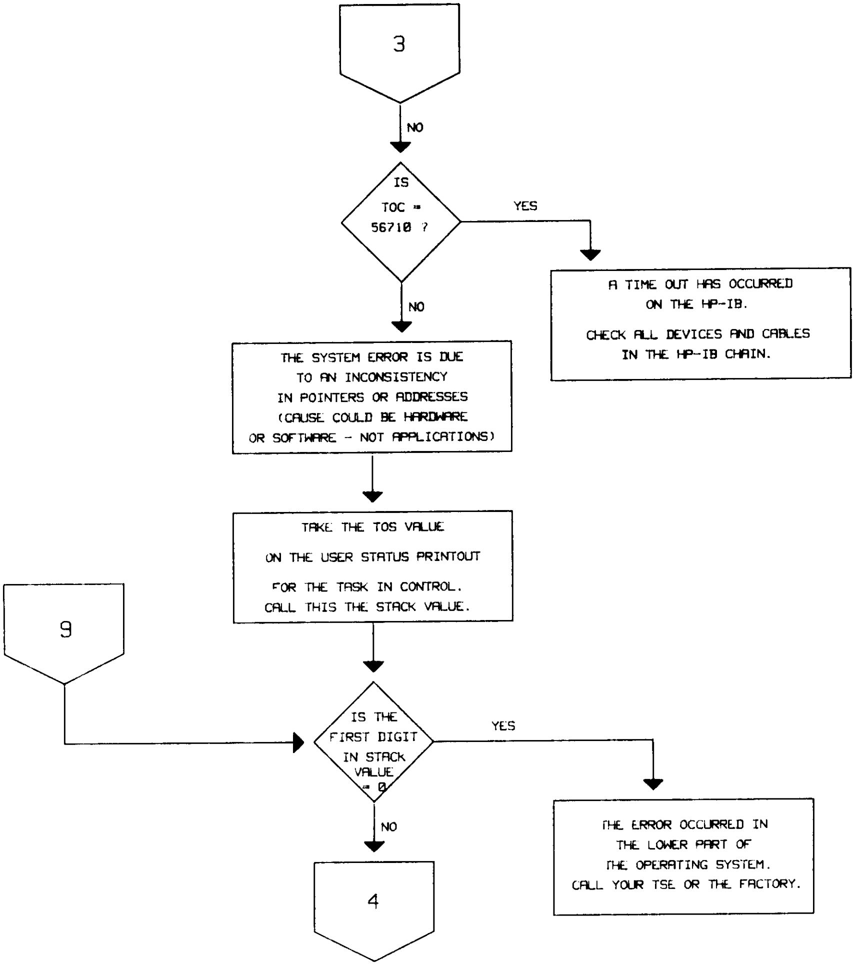
SYSTEM ERROR FLOWCHARTS

The eight flowcharts on the following pages show you how to interpret a system error printout. Some suggestions for further action are given in the charts. Pointers to other parts of this section of the handbook are also given.

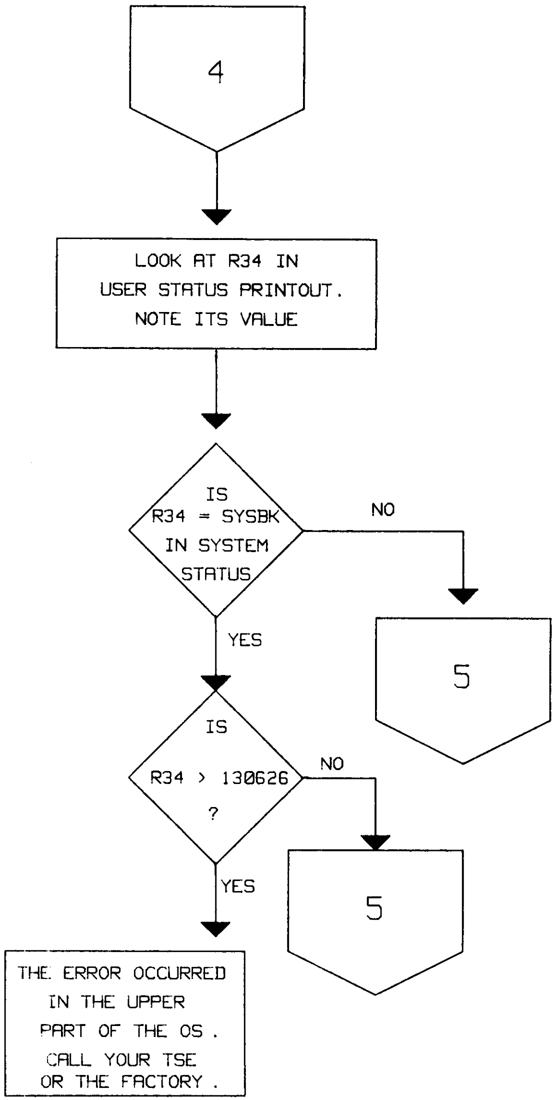


System Error Chart 1 of 8

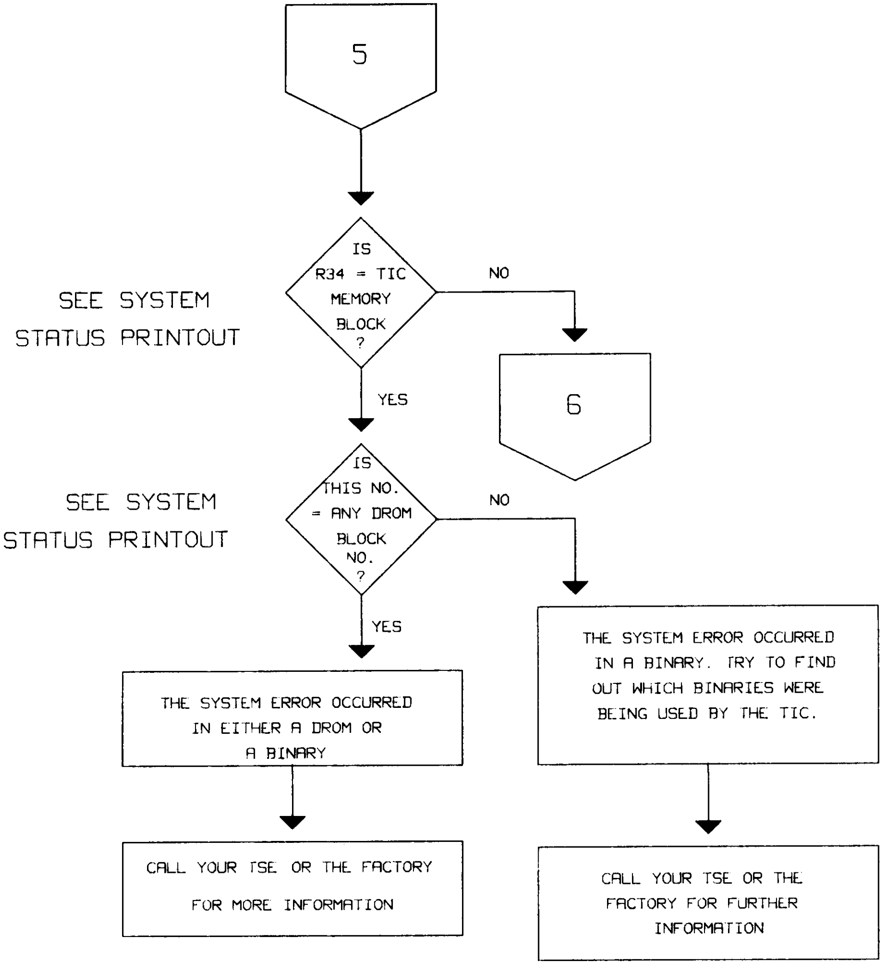

2
ARE THE
PARITY WORDS
= 0
NO
YES
NO PARITY ERROR
HAS OCCURRED
A PARITY ERROR HAS
OCCURRED AND IS THE
CAUSE OF THE
SYSTEM ERROR
REFER TO THE SUB-SECTION
TITLED
'FINDING THE LOCATION
OF A PARITY ERROR'
IS TOS
ON THE
USER STACK
= 51702
?
NO
YES
A WRITE PROTECT
ERROR HAS
OCCURRED
IS TOS
ON THE
USER STACK
= 51700
?
NO
YES
8
AN ILLEGAL INTERRUPT
HAS OCCURRED . SEE PA
REGISTER IN USER STATUS
PRINTOUT FOR RESPONSIBLE PA
3
CONTACT YOUR TSE
OR THE FACTORY
FOR MORE INFORMATION



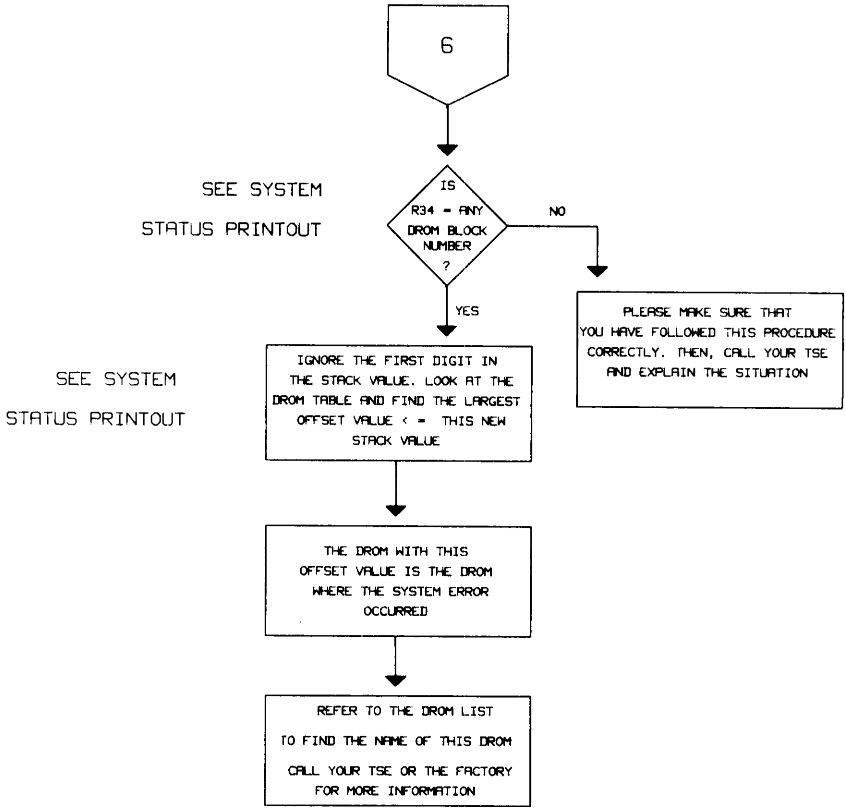
System Error Chart 3 of 8



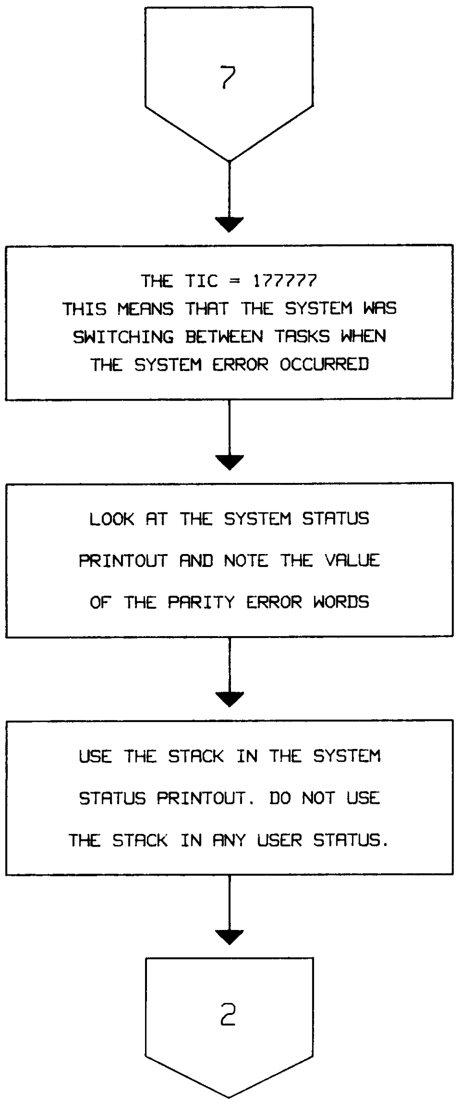
System Error Chart 4 of 8



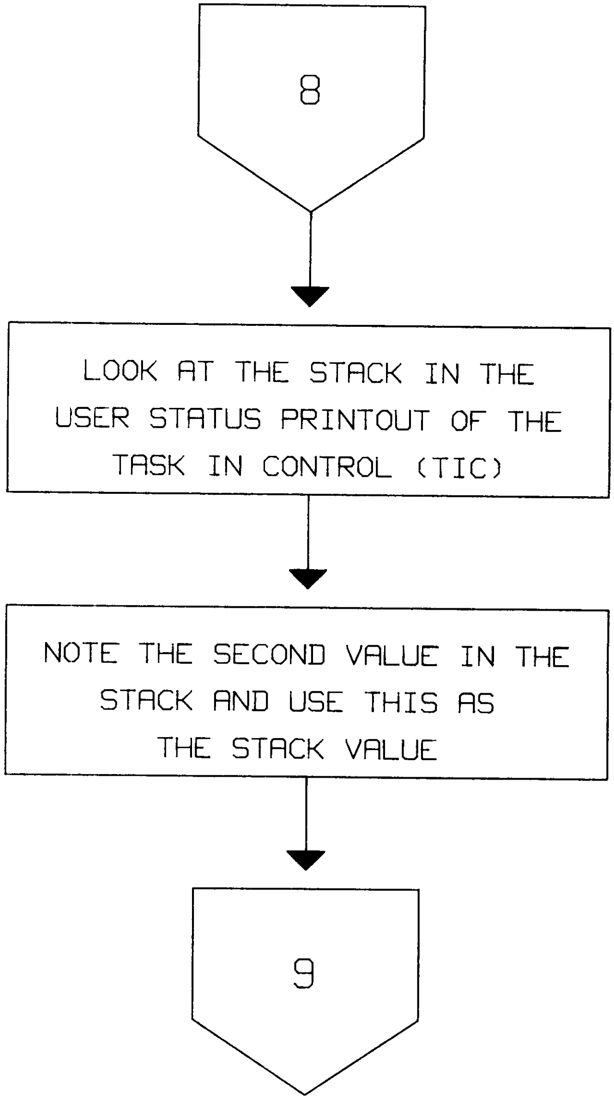
System Error Chart 5 of 8



System Error Chart 6 of 8



System Error Chart 7 of 8



System Error Chart 8 of 8

MEMORY ORGANIZATION

SECTION

14

This section presents diagrams of the organization of the memory of the HP 260 when the B.08 operating system is active.

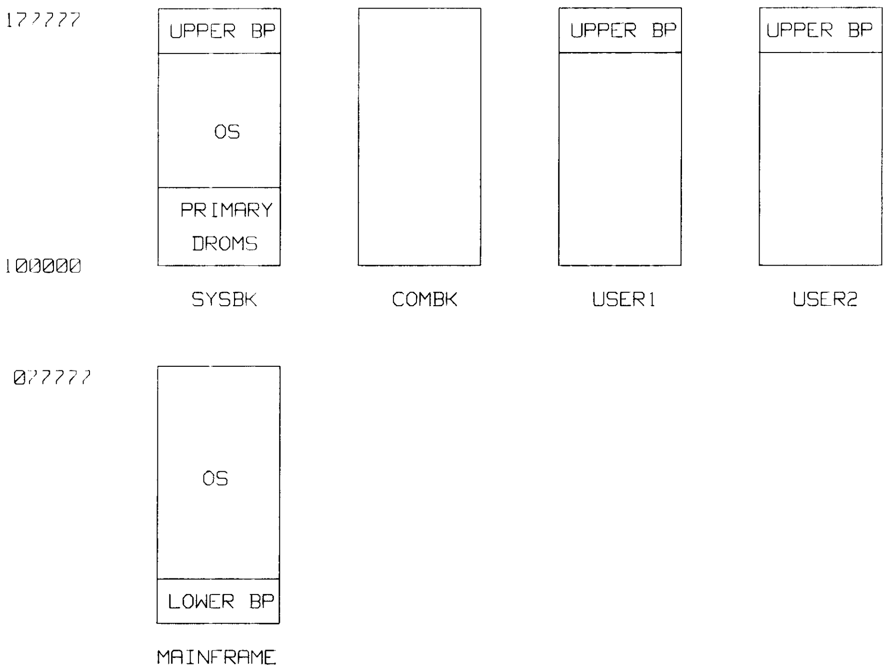
This section also contains the module address tables for the B.08.xx operating system. These tables are useful when you want to trace the cause of a system error to a specific module.

A table of DROM sizes for the B.08 operating system is given at the end of this section.

This section also contains a description of the function of each of the modules of the B.08 Operating System. You might find this description useful when you are decoding a system error printout. When you have found out which module of the operating system was responsible for the system error, you can then read this section to find out the function of that module. You then have more information about the possible cause of the system error.

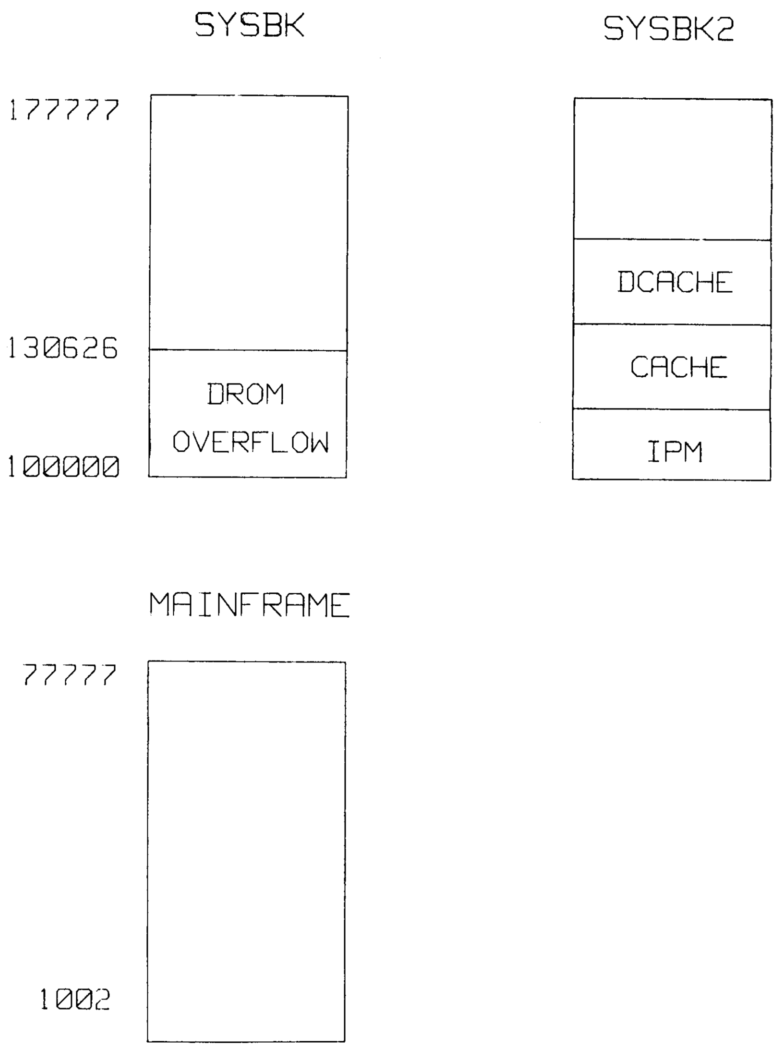
Memory Organization

The following diagram shows the organization of the memory of the HP 260 when the B.08 operating system is active.



Overall Memory Organization

The following diagram shows the overall layout of the B. 08 operating system.



Overall Layout of B. 08

OS MODULE ADDRESSES FOR B.08 OPERATING SYSTEM

The following tables give the starting address (in octal form) of each of the system modules of the B.08 operating system.

MAINFRAME BLOCK

MODULE NAME	STARTING ADDRESS
KEY	1002
STMT	5646
COMMD	6616
COMMD2	7743
NEWST	10523
NEWST2	12737
SYNTX	14004
PROGINT	20653
DISPLAY	22726
CHAR	25746
LINE	27673
CRTHAND	32033
CURSOR	33514
OUTHND	33546
OSUTIL	34326
LDISC	35253
PDISC	42275
LINUS	46353
SUPER	46713
CONTROL	51453
SYSRR	54163
IOSUP	55043
LISTS	61140
QMATH	62572
UPPER	66747
LOMEM	67021
HIMEM	72043
MESSAGE	76234
REDIM	76424
OBP2	76724
KEYTBLS	77172
OBP	77676

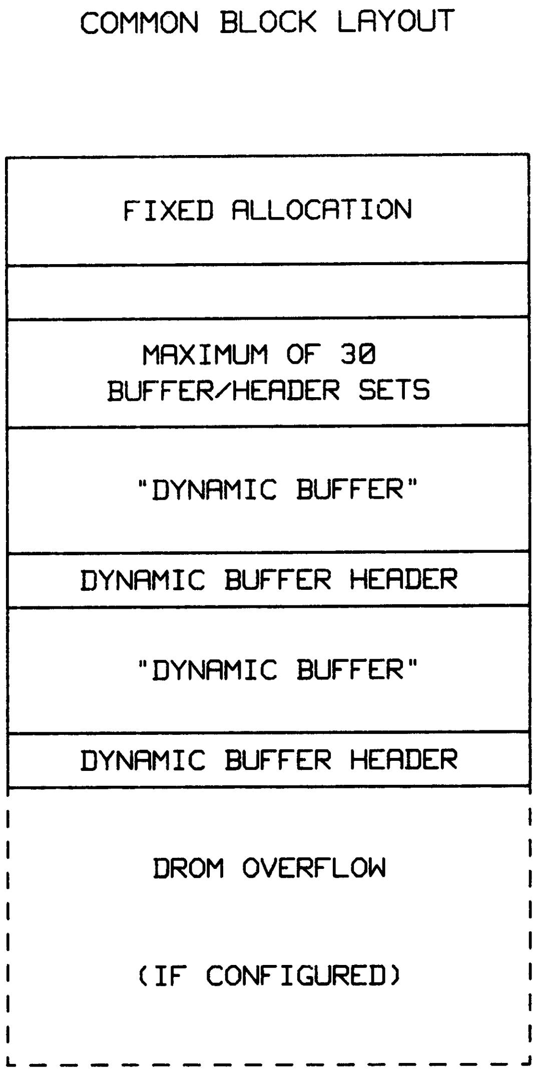
SYSTEM BLOCK

MODULE NAME	STARTING ADDRESS
SAVEAREA	130626
STRUCT	130720
INPUT	132220
OSUTL2	133740
OUTHN2	134220
STMNT2	136163
CURSOR2	136753
HIMEM2	142373
UPPER2	143033
MMTYP	144301
SUBPG	144676
MMPRNT	150604
MMSAVE	155151
BOTH	161132
PRINT	166512
ENCODE	173707
VIOSTAT	173722
UNUSED	173736
SFTAB	174117

SYSBK2

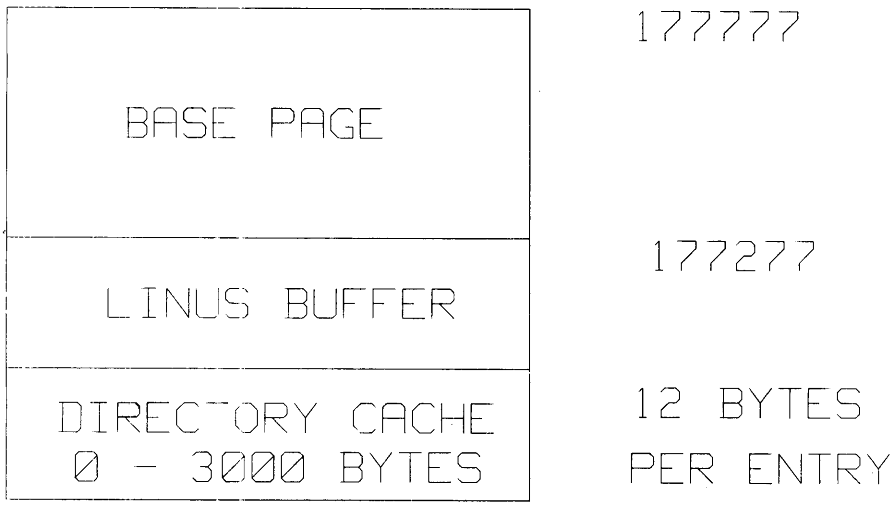
MODULE NAME	STARTING ADDRESS
IPM	100610
CACHE	105040
DCACHE	116454

The following diagram shows the layout of the common block for the B.08 operating system.



Common Block Layout

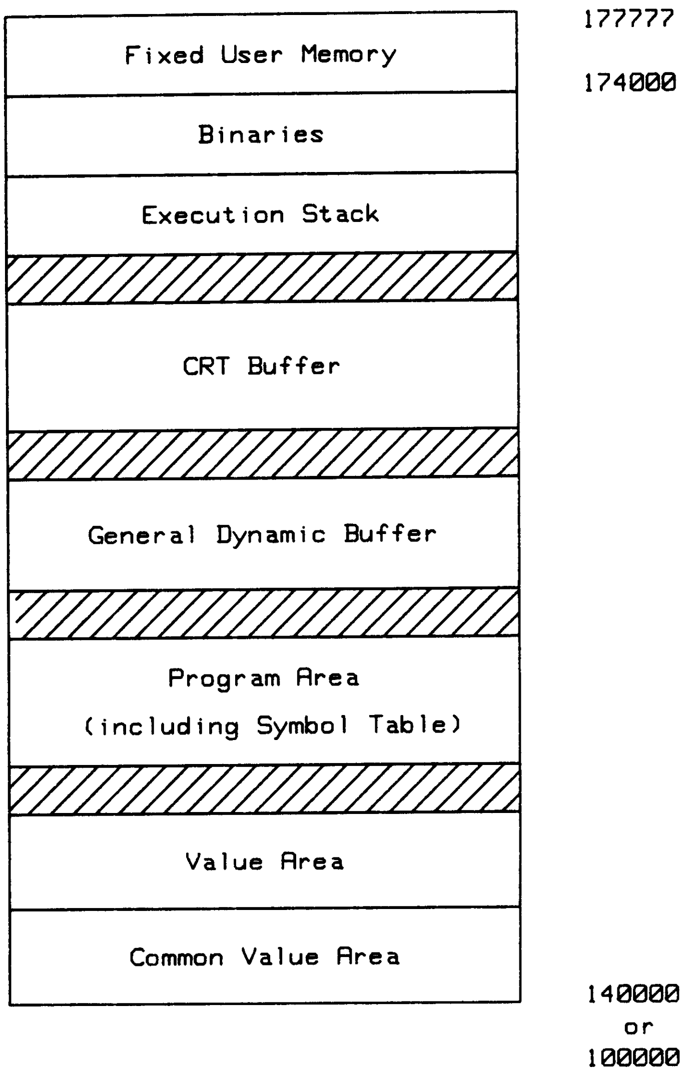
The following diagram shows the layout of the fixed allocation section of the common block for the B.08 operating system.



Common Block Fixed Allocation Layout

Memory Organization

The following diagram shows the layout of each of the user memory blocks for the HP 260 Series 30/40, operating with the B.08 operating system.



User Block Layout

DROM SIZES ON THE B.08 OPERATING SYSTEM

The following table gives the size of each of the DROMs on Operating System B.08. Note that the sizes are given in decimal number of bytes.

DROM	SIZE
EUROPE	588
PACK	1374
IMAGE	17332
SORT	6764
REPORT	6600
FORMS	1204
TAPES	4398
TOOLS	10726
RIO	4684
TIO	5704
TRACE	1928
TRIG	1338
MATRIX	5132
SPOOL	3126
CS250	13000
MEDIA	10264
IMAGE2	3282
TASK	3998
IMAGEU	3570
TIMER	1936
PERFM	3388
CTRACE	1804
VIO	6296
PTYPEP	3000
PIO	12026
NET250	1544
SYSRR	5152
DCACHE	662
UPDATE	2048

NOTE

The size of the EUROPE DROM depends on the primary keyboard language configuration. The size given in the above table is for a US primary keyboard configuration.

FUNCTION OF OPERATING SYSTEM MODULES

The following table gives a description of the function of each of the modules of the B.08 Operating System. You might find this useful when you are investigating system errors.

The modules are listed in alphabetical order.

BOTH
BOTH contains code for miscellaneous file system commands; for example, CREATE, PURGE, CHECKREAD, RENAME, MSI, BUFFER #, PROTECT, ASSIGN, COPY and CAT. BOTH also contains the mass memory unit specifier evaluation routines and directory search utilities.

CACHE
The CACHE module contains the disc-cache code.

CHAR
CHAR contains miscellaneous routines that deal with the CRT; for example, normal alphanumeric key processing, cursor-control key processing, and find-cursor routines.

COMMD
COMMD contains the SCRATCH, STOP, FETCH, LIST, REN, CONT, RUN, DEL, AUTO, PAUSE, and SPACE (IN)DEPENDENT commands.

COMMD2
The COMMD2 module performs the same function as COMMD, but resides in SYSBK.

CONTROL
CONTROL is the system-level supervisor. It contains the interrupt service routines for all peripherals except HP-IB peripherals. It also contains task-switching routines, the control for the initialization and termination of routines, and the HALT, SHIFT HALT, CONTROL HALT, RETURN and EXECUTE key routines.

CRTHND
The CRTHND module contains the high-level interface to the CRT code. This interface is usually only called from the OUTHND module (the output handler).

CURSOR
The CURSOR module implements the CURSOR statement, and contains the input handler.

CURSOR2
The CURSOR2 module performs the same function as CURSOR, but resides in SYSBK.

DISPLAY DISPLAY handles CRT overflow, moves the CRT buffer inside the memory, and handles keyboard interrupts. It also handles CRT refresh routines and softkey display routines.

DROMLDR
This module is present only during power-up. It is responsible for loading all configured DROMs, and for loading all keyboards from the system file. It also builds the DROM tables and displays power-on error messages.

ENCODE
The ENCODE module contains the upper-block listing routine (LISTER2).

HIMEM
HIMEM contains the pre-run execution, the system-memory management, and the expression-evaluation routines.

HIMEM2
The HIMEM2 module performs the same function as the HIMEM module, but resides in SYSBK.

INPUT
The INPUT module contains the INPUT, LINPUT, ENTER and LENTER statements. This module calls the input handler in the CURSOR module to retrieve the data from the CRT buffer.

IOSUP
The IOSUP module handles all HP-IB I/O for all devices except discs. It contains the ownership request and release routines, and schedules DMA. It also handles the system-files table, file locking and unlocking, HP-IB interrupt service-routines, and the printer drivers.

IPM
The IPM module contains the driver for the integrated ports.

KEYTBLS
KEYTBLS contains the keyword conversion tables. There are two tables for each keyword, that is, two tables for the main keyboard, and two tables for the auxiliary keyboard. One table is the ASCII conversion table, and the other is for the ROM ID.

LINUS
LINUS contains the driver for the LINUS tape drive.

LISTS
The LISTS module contains the main listing routine, expression listers, and many list utilities.

LOMEM
LOMEM contains routines which perform string manipulations. It also manages the program area, and handles the store function, the delete function, and the system table.

MESSAGE
The MESSAGE module contains the table of error messages.

MMPRNT
MMPRNT contains the PRINT # and READ statements. It also contains the PRINT LABEL and READ LABEL routines.

MMSAVE
MMSAVE contains all of the code that deals with programs, binaries and key files that are stored on disc, that is, GET, LINK, MERGE, RUN, SAVE, RESAVE, STORE, RESTORE, LOADSUB, LOAD, LOADBIN, STOREBIN, RESTOREBIN, LOADKEY and STOREKEY.

MMTYP
MMTYP contains the TYP, SLEN, WRD, REC, SIZE, AVAIL, and HOLE commands.

NEWST
The NEWST module contains program-area utilities and enhanced BASIC-statements (for example,

FOR/NEXT, WAIT, BEEP). It also contains functions and subprogram routines (for example, USERID, ERRN, CURKEY and SECURE). The NEWST module links with the TRACE DROM.

NEWST2
The NEWST2 module performs the same function as NEWST, but resides in SYSBK.

OBP
The OBP module is the base-page buffer area.

OBP2
The OBP2 module is the base-page buffer area for the upper part of the OS.

OSUTIL
The OSUTIL module contains the integer to ASCII conversion routine, numeric and string array evaluators, a high-level expression evaluator, and a DROM-calling routine.

OSUTL2
The OSUTL2 module performs the same function as OSUTL, but resides in SYSBK.

OUTHND
This is the output handler, which deals with all output to the CRT, and all output to HP-IB devices except discs. The output handler calls either the CRT handler or the printer handler to organize the output.

OUTHND2
The OUTHND2 module performs the same function as OUTHND, but resides in SYSBK.

PDISC
PDISC contains the physical, low-level disc driver which performs such operations as seeking, reading and writing sectors.

POWER
The POWER module is the first module to become active after the loader ROMs have loaded the operating system. This module initializes memory and I/O, checks for configurational errors, and allocates user space, common-block space, and DROM space.

The POWER module also calls the DROMLDR module to load DROMS, and sets up the autostarts that are configured. It then gives control to the CONTROL module. The POWER module exists only at power-up, and is then overwritten by other modules.

PRINT
The PRINT module executes the PRINT (DISP), PRINT USING and LDISP statements. It also executes the secondary keywords TAB, LIN, SPA and PAGE.

PROGINT
PROGINT executes program interruption statements such as ON KEY #. It also contains the typing-aid key code.

QMATH
QMATH executes the numeric operators and functions, and some general mathematical utilities.

REDIM
The REDIM module contains the table for the REDIM statement.

SAVEAREA
SAVEAREA is the buffer between the system area and the DROM overflow space.

SFTAB
SFTAB is the system-file table.

STMT
The STMT module executes the IF, RETURN, END, STANDARD, FIXED, FLOAT, RANDOMIZE, ON, REM, !, ON END #, OFF END #, ENABLE/DISABLE, GOTO, LET, ON/OFF ERROR, ON/OFF HALT, GOSUB and DEFAULT ON/OFF commands.

STMT2
The STMT2 module performs the same function as STMT, but resides in SYSBK.

STRUCT
The STRUCT module executes the IF THEN/ELSE/END IF, WHILE/WHILE END, REPEAT/UNTIL, LOOP/END LOOP, SELECT/CASE/END SELECT, and INDENT statements.

SUBPG
The SUBPG module handles subprogram and function calls and returns.

SYNTX
SYNTX is the main syntax module, which contains statement-syntaxing routines, error routines, and the syntax-checkers for DROMs, binaries and secondary keywords.

SYSRR
SYSRR handles calls to the SYSSR DROM, saves information from the registers, displays the tombstone on system error, and calls the SYSRR routine if it is present.

UPPER
The UPPER module contains syntax routines and statement headers for several statements. The execution code for most of these statements is stored in other modules.

UPPER2
The UPPER2 module performs the same function as UPPER, but resides in SYSBK.

VIOSTAT
The VIOSTAT module contains the video workstation status tables.

MAINFRAME DIAGNOSIS

SECTION 15

INTRODUCTION

This section contains information on the diagnosis of problems in the mainframe of the HP 260.

The first thing to do when you have isolated a problem as a mainframe problem is to use the following preliminary procedure:

1. Check the date codes on all of the boards to make sure that they are currently supported.

2. Check the seating of all boards.

3. Check that all devices (including the SPU and all HP-IB devices) receive power from the same outlet. Check the HP-IB configuration, especially the cable lengths. Make sure that the HP-IB devices are connected in a chain. Refer to Section 9 for the HP-IB configuration recommendations.

4. Determine which boards could be involved in the problem. List the boards in order, from the board most likely to be faulty to the board least likely to be faulty. Refer to the individual diagnosis sections for each of those boards.

5. Do not proceed in a random manner. Instead, plan what you want to achieve with each step before you perform that step. After you perform the step, verify the results. If there is no change, undo the step before doing the next step. This is to make sure that new problems are not introduced.

Interpreting the LED on the Processor Board

This section describes how to interpret the LED on the processor board during power-up. Refer to the section titled "OS DIAGNOSIS" for the details of the use of the LED during the execution of the memory dump program. When there is a functioning principal workstation in the system, the self-test executed at SPU power-on reports its results on this workstation. The LED is of secondary importance because it only provides part of the information given on the screen. The failure of any particular self-test will be indicated on the screen by the appearance of a number with no "P" (the "P" shows that the self-test has passed).

However if the problem with the system includes the malfunctioning of the ASI board or of the principal workstation, you might want to run a power-on self-test when no screen display is available. Then you will use the LED on the processor board to interpret the findings of the self-test. Specifically, the steady value of the LED will show you how far the self-test procedure managed to go before it failed and it will tell you which of the components of the self-test failed. This information is likely to be very valuable to you in isolating the faulty hardware responsible for the mainframe problem, and therefore in helping you to solve the problem and restore the HP 260 to operation.

Mainframe Diagnosis

Refer to the section titled "SELF-TEST DESCRIPTION" for the details of the specific self-tests mentioned below.

LED value	Meaning
0	After "ST 4" displayed and before any tests
1	After "1" displayed on the screen and before BPC Self-test
2	After "P" displayed for BPC Self-test and before "2" displayed for Block Switch Board Register Test
3	After "P" displayed for Block Switch Board Register Test and before "3" displayed for Read/Write Memory Find Test
4	After "P" displayed for Read/Write Memory Find Test and before "4" displayed for Input/Output Controller Self-test
5	After "P" displayed for Input/Output Controller Self-test and before "5" displayed for Extended Math Chip Self-test
6	After "P" displayed for Extended Math Chip Self-test and before "6" displayed for Software Interrupt Test on HP-IB Test board
b	Hi Lock or Lo Lock circuitry on processor board has failed
7	No meaning
8	Power on value of the LED before "ST 4" displayed and the self tests begin
8	After "P" displayed for Processor Board Self-test and before "8" displayed for Remaining Memory Test
9	After "P" displayed for Remaining Memory Test and before "9" displayed for HP-IB Programmed I/O Test
A	(if display steady) After "P" displayed for HP-IB Programmed I/O Test and before "10" displayed for HP-IB Interrupt Logic Test
C	After "P" displayed for HP-IB Interrupt Logic Test and before "11" displayed for HP-IB DMA Logic Test
E	After "P" displayed for HP-IB DMA Logic Test and before I/O Intialization takes place
"||"	Video board is faulty
L	Just after the Loader receives control

"_"	(bottom segment only) After system load and before control is passed from the Loader ROM to the OS
P	After the operating system receives control from the Loader ROM
The dot	The dot indicates write accesses to the memory. In normal operation, the dot pulses on and off, or has a halfbright intensity. If the dot is not displayed at all, or if it is displayed with full intensity, then a system hang is likely.
LED out	If all the segments and the dot are unlit, the power supply to the processor is at fault, or the power sequence circuit (on the processor board) has failed.

Example of the use of the LED

Suppose that no principal workstation is available and there is a problem with the mainframe that you want to diagnose. When you power on the system and watch the LED on the processor board, you notice that its final, steady value is "9". This tells you, when you look at the table of LED values above, that all the tests up to and including the Remaining Memory test have passed, and that the HP-IB Programmed I/O test has failed. This indicates that the HP-IB board may be faulty and, clearly, the replacement of this board is one of the most likely steps you would take to solve the problem.

LOADER ERRORS

Here is a list of the Loader Errors for B.08.

LOADER ERROR A	Checksum error
LOADER ERROR B	Disc read error
LOADER ERROR C	Checkread error
LOADER ERROR E	Interface error
LOADER ERROR F	Disc or system error

SELF-TEST DESCRIPTION

The self test described in the following paragraphs is performed each time the HP 260 SPU is powered on. The self test is performed by the Loader ROMs.

- Binary Processor Chip (BPC) Self-test
- Block Switch Register Test
- Read/Write Memory Find Test
- Input/Output Controller (IOC) Self-test
- Extended Math Chip (EMC) Self-test
- HP-IB Programmed I/O Test
- HP-IB Interrupt Logic Test
- HP-IB DMA Logic Test
- HP-IB Initialization

Description of the Read/Write Memory Find Test

This test attempts to find an upper half-block of memory (32Kb) that can be used during the rest of self-test. The search starts at block 77 (octal) and proceeds down through block 1 until a block is found that passes the following memory test. As soon as such a block is found, the Read/Write Memory Find Test passes.

Description of HP-IB DMA Logic Test

This test is the first time in the self-test procedure that a DMA transfer is attempted. Therefore, a failure here might not necessarily be due to the HP-IB board. Such a failure might instead be due to another part of the transfer system.

The following tests are performed:

Set the PA register to 2 (address of the HP-IB) and verify that the status line is set (indicating that the interface is present).

Transfer 8 words from memory
Set the MEDUSA chip for "Talk Always, Listen Always"
Set the processor registers for a DMA read
Execute a DMA read
Verify that the DMA read completed

Transfer 8 words to memory
Set the processor registers for a DMA write
Execute a DMA write
Verify that the DMA write completed
Verify that the data has been transferred correctly

Description of HP-IB Initialization

Set the PA register to 2 (address of the HP-IB) and verify that the status line is set (indicating that the interface is present). Initialize the HP-IB with the HP 260 as the controller-in-charge of the bus and verify.

ON-LINE MEMORY TEST FOR HP 260

This test program is intended for use by both CE's and customers when faults are suspected with the memory hardware of the HP 260. A common example of the type of situation in which the MEMTST program is useful is after a system error. The customer should produce a system error printout, and, perhaps, a memory dump (according to the advice of a CE). The CE can then analyse the printout and/or memory dump to trace the cause of the system error. If a memory error is found to have caused the system error, the MEMTST program should be run to provide more details of the location and type of the memory errors.

General Information

Each time the program is run, the results are stored in a file called "Memtef". Each run of the program adds its results to this file. Each time you run the program, you will have the opportunity to print the results of that run to a printer of your choice. Users should take this opportunity so that they can inform their CE of the results on request.

The MEMTST program is capable of running extremely thorough tests of the memory boards and RAM of the HP 260. However, such thorough tests require long periods (perhaps more than 30 minutes) and also need exclusive access to the system, that is all tasks must be shut down, except the task that is running the MEMTST program. Therefore, the program allows you to decide how thorough you want the test to be. The options are shown in the following table.

TEST MATRIX

TEST TYPE	SHORT			MEDIUM			EXTENDED
	10%	20%	40%	10%	20%	40%	100% PERFORMANCE
SOLID TEST	Y	Y	Y				Y & BPR
CHECKERBOARD				Y	Y	Y	
RANDOM DATA	Y	Y	Y				
RANDOM ADDRESS	Y	Y	Y				
BYTE TEST				Y	Y	Y	Y & BPR
MARCHING PATTERN				Y	Y	Y	
GALLOPING PATTERN							Y & BPR
REFRESH TEST							Y & BPR

The differences between the functionality of the three types of test (short, medium and extended) are shown in the above table. The differences between the demand placed on the system by each of the types is as follows:

- the short type needs no exclusive access (it is completely run-time) and the reduction in system performance experienced during the running of the program is selectable: this reduction is either 10%, 20% or 40%.

- the medium type needs no exclusive access and the reduction in system performance during its execution is selectable (10%, 20%, or 40%). The medium test lasts somewhat longer than the short test.

- the extended type needs exclusive access to the system and a relatively long time for its execution. The extended test is available only on HP 260 Series 30/Series 40 computers and older HP 260 and HP 250 computers that have been upgraded with the HP 250/HP 260 PLUS UPGRADE.

Running MEMTST

1. Start the program by inputting RUN "MEMTST".

2. Select the type of test you want to run; short, medium or extended.

3. The next screen allows you to decide which memory blocks you want to test. The three softkeys ALL, USER and SYSTEM specify the following testing modes:

   ALL - test all blocks except the block running the program

   SYSTEM - test the Operating System space in the system RAM

   USER - test all the user blocks except the block running the program

4. The SELECT softkey allows you to specify interactively which memory blocks you want to test. You do this by marking the blocks that you want to test, using the SELECT and SKIP softkeys.

5. When you have selected which blocks are to be tested, there are two possibilities. If you have selected the extended test, no further action is required. If you are running the short or medium test, you must decide how much of the system performance should be temporarily sacrificed to run the MEMTST program. This choice is made by pressing one of the three softkeys, labelled 10%, 20% or 40%. Clearly, if you select 40%, the program will run more quickly than if you select 10% or 20%.

NOTE

You should not run the MEMTST program from a user block that you suspect of having an error because then the MEMTST program might fail and cause a system hang. Therefore, you should try to run the program from a user block that is likely to be error-free.

Interpreting the Printout from MEMTST

The printout from the MEMTST program comes in two forms:

- On-line listing of memory failures; lists only the results of the current run of the MEMTST program.
- Total file listing of memory failures; lists all memory failures that have been found by the MEMTST program.

The on-line listing prints the date and time of the test, and error information about each error found during the current test. Here is an example of the printed information about an error in block 7.

```
Error found in block  7  , address  13575
defect positions : 0001  0000  0000  0000  00   random address test
```

The above example of an error printout shows the block number and address of the error, in the first line. The second line shows the defect position and the type of test that found the error. The defect position is interpreted in the following way.

```
BBBB    BBBB    BBBB   BBBB    BB
```

The first 16 of the above line of "B's" representing a defect position correspond to the numbers 15-0. These numbers signify the logical numbers of the chips in each block of memory. A chip is marked as faulty by the setting of its logical number to 1.

The last two "B's" in the above line signify a faulty parity chip in the block to which the printout pertains. If the 17th B is set to 1, the upper parity chip is faulty; if the 18th B is set to 1, the lower parity chip is faulty.

The total file listing gives a report of all of the errors reported by the MEMTST program. If the errors are separated by error-free runs of the program, this is shown by the appearance of "memory status" reports, which state simply which tests failed and which passed.

Here is an example of an error report and a "memory status" report from a total file listing.

```
Errorfile for MEMTST program.
26.08.86     13:38:03      Testresult  :
Error found in block  1  , address  13575
defect positions : 0000  0000  0000  0100   00  random data test

26.08.86     14:20:30      Memory status  :
Block  1  : Short test failed
Block  2  : Short test passed
```

PARITY ERRORS

A parity error can be reported in two ways: either as a System Error, or as an Error 1010. In either case, you want to find out which memory board is faulty. The two parity words which are reported with each parity error allow you to do this.

The first word is a code that gives the general location of the parity error. The diagram below shows you how to decode the first parity word.

If the parity error was caused by a hardware fault, you should change the faulty memory board. To determine whether or not there is a hardware fault, you could run the "MEMTST" program, which is supplied on the CE Diagnostics Tape.

The second parity word has no meaning for HP 260 Series 30 and HP 260 Series 40 computers, or for computers that have the HP 45261AH PLUS upgrade installed. Therefore, you should ignore the second parity word.

NOTE

The second parity word is important for all other HP 250 and HP 260 computers. Refer to the HP 250 CE Handbook to fiond out how to interpret it.

INTERPRETATION OF PARITY WORDS

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BLOCK NUMBER								NOT USED							

Decoding the first Parity Word

DATA COMM. DIAGNOSIS

SECTION 16

DATA COMMUNICATION DIAGNOSIS

When you suspect that there is a problem with data communication, before you do anything else, check that the ASI boards are properly positioned and that the data communication cables are firmly connected. When you have checked these things, proceed with the following general troubleshooting procedure.

1. Check the ASI or INP boards for successful completion of self-test.
2. If the LED on the ASI board is on, check whether changing the ASI board fixes the problem.
3. Check the cabling for correct part numbers. You can do this by reading the cable numbers or by using the standard "Blue Box". Refer to the section titled "Datacom Configuration".
4. The wrong control lines may be connected. Use the Blue Box to find out whether this is the case.
5. There may be a protocol or handshaking problem. Use the HP 1640 Data Communications Analyzer to check for these problems.
6. Noisy lines may have caused the problems. Use the HP 1640 Datacomm Analyzer to check for noise on the lines.

Asynchronous Data Comm. Self-test Errors

There are a number of self-test failure messages which are displayed on the principal workstation to alert the system's owner to the problems that have occurred. These error messages can be divided into three categories, according to seriousness:

- Warning messages. These indicate that an error condition exists that should not be ignored. If the cause of the error is not removed, unpredictable results may be produced. In the list of Self-test errors which follows, these errors are indicated with a "W".
- Fatal errors. Such errors make the affected port, or even the entire ASI board, inaccessible. In the list of Self-test errors which follows, these errors are indicated with an "F".
- Catastrophic errors. Such errors will cause a system load failure. In the list of Self-test errors which follows, these errors are indicated with a "C".

Message

ASYNC DATA COMM BOARD ON PA X IS CONFIGURED BUT NOT THERE (W)

This error has 2 known causes:

- A remote device is configured and no ASI board is present
- The ASI board failure status line is not on

Recommended corrective action for the above error message includes the following.

- Verify that the ASI board is present and properly positioned in the card cage

Message

SYSTEM LOAD FAILURE - INT ERR ON PA 5 (C)

The cause of this error message is that the ASI board is unable to clear a data communication interrupt. The ASI board should be replaced.

Message

ASYNC DATA COMM. BOARD ON PA X IS DOWN (F)

There are 2 known causes of this error message:

- The ASI board failed a test of one of the board's functions which is common to all ports
- All of the ports on the ASI board failed self-test

In either of these cases, you should replace the ASI board.

Message

PORT X IS DOWN

This error message shows that the ASI board has failed one of the port dependent tests (for example UART or RS-232C). When you see this message, you should replace the ASI board.

Message

WORKSTATION ON PORT X IS DOWN (W)

The cause of this error message is that a workstation has failed its self-test. The workstation should be repaired if this proves to be straightforward, or replaced, if the problem seems to be serious.

Message

DEVICE ON PORT X IS DISCONNECTED OR TURNED OFF (W)

There are 3 known causes of this error messsage:

- The REMOTE device is powered off.
- The REMOTE device has failed to provide a DSR signal to pin 20 of the SPU connector.
- In general, there is another reason for the failure of the DSR signal to reach the SPU.

The following corrective actions are among those recommended for solving this problem:

- Check that the REMOTE device is powered-on.
- Verify that the REMOTE device is designed to provide a DTR signal.
- If switched modems are used on the system, power up the system, establish the data comm. connection and check the operation of the REMOTE device.
- Replace the ASI board.

PORTS DOWN: TIO DROM NOT LOADED (F)

This error message will appear if the ASI board is present and the TIO DROM is not loaded.

You should run the "CONFIG" program, and change the status of the TIO DROM to "auto load".

Asynchronous Interface Test (ASITST)

The asynchronous interface test (ASITST) tests a single port to determine whether or not the interface port is defective. This test performs the following functional tests on configured ports:

- REQUEST
- ON CONNECT
- ON DISCONNECT
- ON INPUT #Port
- ON OUTPUT #Port
- AOVFL

The INPUT and OUTPUT functions pass a buffer of 256 characters which is initialized with data pattern starting at 0 and incrementing to 255.

NOTE

> For proper execution of this test, the C.E. support tape, disc or microfloppy must contain the TIO-II driver.
>
> The ASITST program cannot be used to test the integrated serial ports on the processor board; the ASITST program tests only the ports on the ASI board.

To start the ASI diagnostic run the program ASITST. You can now select the test port by pressing the softkey SELECT PORT. The ASI test will read the RSTAT memory table and print out any ports configured as class GENERAL. If no GENERAL class ports are found, the following error message is printed:

ERROR: COULD NOT FIND A PORT CONFIGURED AS 'GENERAL'

When this occurs, reconfigure the port to class GENERAL and reboot.

A loopback connector (45120-68801) must be placed on the desired test port before executing the loopback test.

After successfully selecting a port, you have an option of running multiple or single loopback tests. Multiple tests are run by pressing the CYCLE sofkey (CYCLE=ON). If CYCLE is OFF, a single pass will be run. When CYCLE is ON, the test loops indefinitely, until the CYCLE softkey is pressed.

Error Messages

The following error messages are displayed when a hardware or system error condition exists. Possible causes of these errors are also given.

Message	Possible Cause
Port XX CONNECT interrupt failed.	DTR/DSR
Port XX buffer transmit did not complete	SD/RD
Port XX buffer receive did not complete	SD/RD
Port XX xmit/rcv buffer compare failed	UART
Port XX receive buffer overflow failed	UART
Port XX SYSTEM ERROR MESSAGE	SYSTEM PROBLEM
Port XX DISCONNECTED	DTR/DSR
COULD NOT FIND A PORT CONFIGURED AS "GENERAL"	NO GENERAL CLASS PORTS CONFIGURED
UNEXPECTED ERROR	UNKNOWN

Screens associated with the ASITST Program

The following screens belong to the ASITST program.

When you initiate the ASITST program by executing RUN "ASITST", the following screen appears:

```
                                 ASI PORT TEST
                                SELECT FUNCTION


ASI PORT TEST - Tests the currently selected ASI Port. The Port must
be configured as class GENERAL, loopback hood installed on the test
port, and Baud rate set greater than 200 (switch positions 2-8, or
software configured)

SELECT MODE   - Specifies the ASI Port to be tested.

CYCLE MODE    - Toggles the cycle mode. If the cycle mode is ON, the
                ASI PORT TEST will repeat forever.


                                             ASI Port is not defined
                                             CYCLE MODE: OFF
--------------------------------------------------------------------------------
                                          Please select function


   ASI                              SELECT              CYCLE     EXIT
PORT TEST                            PORT               MODE     PROGRAM
```

Select the port you want to test by pressing the SELECT PORT softkey. A screen similar to the following screen appears:

```
                    ASI PORT TEST
                   SELECT ASI PORT

  SELECT PORT                    DEVICE
  -----------
  12                       GENERAL RS-232
  13                       GENERAL RS-232




                               ASI Port is not defined
                               CYCLE MODE: OFF
--------------------------------------------------------------
                           Please select port

| PORT 12 | PORT 13 |   |   |   |   |   | EXIT |
```

This screen shows you all of the ports that are currently configured as GENERAL ports. If the above screen does not appear, and the message "COULD NOT FIND A PORT CONFIGURED AS "GENERAL" is displayed, you must run CONFIG and re-configure the port(s) you want to test as GENERAL ports.

If the above screen does appear, select the port you want to test from the softkey options. The following screen appears to inform you that the test is in progress.

```
                    ASI PORT TEST
                    FUNCTION TEST




                              ASI Port is 12
                              CYCLE MODE: OFF
-------------------------------------------------------
                         System busy

-------------------------------------------------------
|    |    |    |    ||    |    | CYCLE | EXIT |
|    |    |    |    ||    |    | MODE  |      |
```

SYNCHRONOUS DATA COMM. DIAGNOSIS

When diagnosing synchronous-communication problems, the LEDs on the INP board should ALWAYS be checked for a possible solution.

There are two LED readouts that mean the board has passed self-test on bootup:

3E Passed power-on with interface test.

3F Passed power-on self-test.

7F Self-test completed with no errors.

```
Top edge of board >>----------

                         |---|                  |---|
                        /| O | 8  MSB           | O |
  Most Significant /  | O | 4                | * |    4
       Hex Digit      \ | O | 2                | O |
                        \| O | 1  LSB           | O |  _____
                        /| O | 8  MSB           | * |
 Least Significant /  | O | 4                | * |
       Hex Digit      \ | O | 2                | * |    E
                        \| O | 1  LSB           | O |
                         |---|                  |---|

                                           Example=4E (hex)
```

General Failure Codes returned by the IDU Diagnostic

General failure codes are part of the display message when you run the IDU diagnostic - COMMANDED SELF-TEST where:

(xx[yy])

and

xx is General Failure Code yy is decimal readout of Specific Failure Code

Code	Message
2	ROM failure.
3	RAM failure.
4	Panel failure.
5	Timer failure.
6	Interface failure.
7	Serial I/O (SIO) failure.
8	Interrupt failure.
10	Microprocessor failure.

Specific Failure Codes and Messages (LED display on board)

The following table shows the possible LED readings of the INP board, the most likely fix-procedure for the associated error, and a description of the error/failure indicated by the LED reading.

The fix-procedure code is as follows:

B	INP board
Prc	Processor board
Mem	Memory board

The fix-procedure is to replace the board that is indicated as faulty with a new board. For example, the fix-procedure for each of the LED readings that map to a B in the table, is to replace the INP board.

Code	Fix	Message
01	B	First 1K of ROM failed checksum test.
02	B	Second 1K of ROM failed checksum test.
03	B	RAM failed zeros and ones test.
04	B	RAM failed address test.
05	B	RAM failed refresh test.
06	B	Test point interrupt is on.
07	B	External interrupt is on.
08	B	Memory time-out interrupt failed to clear.
09	B	Panel interrupt will not clear.
0A	B	Timer interrupt will not clear.
0B	B	HP260 interrupt will not clear.
0C	B	SIO interrupt will not clear.
0D	B	Direct Memory Access (DMA) interrupt will not clear.
0E	B	Interrupt structure failed self test.
0F	B	EREND interrupt will not set.
10	B	New value was never received in the state register.
11	B	An incorrect value was received in the state register.
12	B/Prc	HP260 interrupt request to controller was never seen.

13	B	HP260 interrupt request to controller was never cleared.
14	B	In flip-flop was never set to receive data from the HP260.
15	B/Mem	Incorrect data received with program receive.
16	B/Prc/ Mem	Characters never received with DMA through interface.
17	B	Incorrect data received with DMA receive.
18	B/Prc/ Mem	Character never sent through interface with DMA.
19	B	Passed extended self test, then illegal state value.
40	B	Bad error codes. Microprocessor problems.
41	B	First 1K of ROM failed checksum test.
42	B	Second 1K of ROM failed checksum test.
43	B	RAM failed zeros and ones test.
44	B	RAM failed address test.
45	B	RAM failed refresh test.
46	B	Test point interrupt is on.
47	B	External interrupt is on.
48	B	Memory timeout interrupt failed to clear.
49	B	Panel interrupt will not clear.
4A	B	Timer interrupt will not clear.
4B	B	HP260 interrupt will not clear.
4C	B	SIO interrupt will not clear.
4D	B	DMA interrupt will not clear.
4E	B	The out register flip-flop failed to clear.
50	B	The Universal Asynchronous Receiver Transmitter (UART) chip failed to reset.
51	B	The Auto Calling Unit (ACU) signature was not read properly.
52	B	The DTR signal failed to wiggle.
53	B	The UART will not send and/or receive.

54	B	The UART will not send and/or receive correctly.
55	B	The UART has a parity problem.
56	B	The UART has overrun error problems.
57	B	Transmit interrupt problems.
58	B	Receive interrupt problems.
59	B	Timer channel 0 failed self test, INT never sent.
5A	B	Timer channel 0 failed accuracy test.
5B	B	Timer channel 1 failed self test.
5C	B	Timer channel 2 failed self test.
5D	B	The SIO failed to reset.
5E	B	The SIO failed to write and read the interrupt vector.
5F	B	The SIO will not send and/or receive.
60	B	Channel B transmit interrupt problems.
61	B	Channel B external/status interrupt problems.
62	B	Channel B receive interrupt problems.
63	B	Channel B special receive interrupt problems.
64	B	Channel A transmit interrupt problems.
65	B	Channel A external/status interrupt problems.
66	B	Channel A receive interrupt problems.
67	B	Channel A special receive interrupt problems.
68	B	The SIO has frame error problems.
69	B	The SIO has CRC/framing error problems.
6A	B	The SIO has overrun error problems.
6B	B	The SIO has parity error problems.
6C	B	SIO special receive-internal conflict (or no interrupt on.)
6D	B	Incorrect character sent and/or received.
6E	B	Receive bit in channel B did not set.

6F	B	Break generation/detection and/or external/status interrupt error.
70	B	Break bit in SIO was not set properly.
71	B	External/status interrupt cannot be reset and/or turned off.
72	B	"Status affects vector" internal problems.
73	B	Nulls never seen in record FIFO after break.
74	B	The DMA controller failed to reset.
75	B	The DMA interrupt set at the wrong time (channel 2.)
76	B	The DMA interrupt never set. Neither did the TC bit.
77	B	The DMA interrupt never set, but the internal TC bit did.
78	B	Wrong data was transferred to memory (channel 2.)
79	B	The DMA interrupt was set, but the internal TC bit(s) did not.
7A	B	Character was never received through SIO (channel 1.)
7B	B/Mem	Wrong character sent through DMA to SIO.
7C	B	DMA interrupt never set. Neither did TC bit (channel 1.)
7D	B	Time-out on full DMA block transfer through SIO.
7E	B	Bad data in block transfer.

Software Diagnostic Tools

Integrated Diagnostic Utility (IDU)

The IDU is a stand-alone diagnostic used to test the INP hardware. It does so through a series of three separate tests, each of which can be allowed to run for an indefinite amount of time: Commanded Self-Test, Connector Loop-Back, and Modem Loop-Back. Each test down-loads a control program onto the INP controller board, which then tests some portion of the hardware. IDU requires exclusive use of the INP. This utility is fully documented in the RJE and DS/260 manuals.

CTRACE/CSDUMP

CTRACE is the trace facility for the INP. It consists of a program that runs in the background while the INP is in use, accepting and storing to disc trace records sent to it from the INP (actually from the CS250 software.) These trace records are generated whenever certain board activities complete. The contents of this trace file can be formatted into report form by CSDUMP. The trace facility is used for diagnostic purposes, and resides in a separate DROM. This DROM must be resident in memory before the link can be used if the TRACE option is specified in the configuration file. This utility is fully documented in the RJE and DS/260 manuals.

DATA BASE DIAGNOSIS USING DBVAL

SECTION 17

DATA BASE VALIDATION PROGRAM (DBVAL)

The DBVAL program is a diagnostic tool intended for the use of both CE's and HP 260 customers. The purpose of DBVAL is to provide information about data base errors and their sources.

A typical use by a VASS might be the checking of new data bases to make sure that they are error-free. An end-user might use the program to try to track down the reasons for data-base errors, after the data base had been re-arranged using DBUNLD and DBLOAD. There are two types of validation carried out by the DBVAL program.

- Data Set only, where the consistency and validity of one or more set(s) is checked, but no associated paths are checked
- Data Set and Data Paths, where the validity of selected paths is checked, in addition to the validity of the data set itself

Each time the DBVAL program is run, the results are stored in a spoolfile. The spoolfiles are numbered chronologically. Spoolfiles provide a permanent record of the state of the relevant data bases at the time of their checking by DBVAL.

There are two ways of using either of the types of validation described above:

- check the validity of one data base at a time
- check the validity of a collection of data bases with one run of DBVAL

These two methods of using DBVAL are described in the following paragraphs.

Starting DBVAL

To run DBVAL, execute the command `RUN "DBVAL"`

The introductory screen appears, describing the major features of the DBVAL program. Press the **CONTINUE** softkey to proceed with DBVAL.

Using DBVAL to check one Data Base

1. Press the **SINGLE DB** softkey. An information screen appears to remind the user that the results of the tests done by DBVAL will be stored in a spoolfile. The name of the spoolfile will have the form: DBERnn (where nn is a number that is raised by 1 for each sequential run of DBVAL).

2. Press the **CONTINUE** softkey. The program then prompts you for the name of the data base to be checked and the root file volume (or device on which the data base resides).

3. After supplying the requested information, press the **ACCEPT INPUT** softkey. The screen then displays the names of each of the data sets in the data base you selected.

4. If you want to check the validity of the entries in all of the data sets, press the **CHECK ALL SETS** softkey. If you want to check the validity of only some of the data sets, press the **SELECT SETS** softkey and decide which data sets to check by pressing the **YES** or **NO** softkey for each of the data sets as they are highlighted.

5. After you have selected which data sets in the data base are to be checked, press the **CONTINUE** softkey. The program will then ask whether you want to check the paths between detail sets and master sets.

6. If you want to check the validity of all of the paths between sets in the entire data base, press the **CHECK ALL LINKS** softkey. If you want to check the validity of only some of the paths, press the **SELECT LINKS** softkey. Then use the **SELECT CHECKING** and the **ACCEPT DEFAULT** softkeys to mark each path with a "Y" or a "N" as required.

   The **ACCEPT DEFAULT** softkey indicates that the currently highlighted path will not be checked. The **SELECT CHECKING** softkey indicates that the currently highlighted path will be checked.

7. When you have selected which paths you want to check, the program will automatically proceed. The display will show which set or path is being checked during the run.

8. At the end of the run, the display will show you whether any errors were found in the data base. It will also show the name of the spoolfile in which the details of each error are stored. If you want to print the contents of the spoolfile, use the **PRINTER IS** command to specify the output device. Then execute the command: `COPY "DBERnn"` (where nn is a number).

Creating a Collection of Data Bases for Checking by DBVAL

Users with more than one data base might want to have the option of using DBVAL to check all of their data bases at once. To do this, it is necessary to create a file that contains the names of each of the data bases that you want to be simultaneously checked. Such a file is known to the DBVAL program as a "parameter file".

The following procedure shows you how to create a "parameter file".

1. Start the DBVAL program by executing `RUN "DBVAL"`. Then press the **CONTINUE** softkey from the first screen.

2. Press the **NEW PARAM** softkey. The program then creates two temporary files, called DBCNF1 and DBWORK, which are used in the creation of the parameter file. When the temporary files have been created, the program searches all of the mass-storage devices that are currently on-line for data bases, and displays the name of each data base it finds (together with the name of the mass-storage device that holds each data base).

3. Now you should select the data bases that you want to include in the parameter file. If you want to include all of the data bases that appear on the screen in the parameter file, press the **SELECT ALL** softkey.

   To select an individual data base for inclusion in the parameter file, use the **UP** and **DOWN** softkeys to position the cursor next to a data base. Then press the **SELECT** softkey. The data base is then included in the parameter file.

4. When you have selected one data base to be included in the parameter file, the softkey menu changes. To select another data base to be included in the parameter file, press the **MORE DB** softkey. The previous softkey menu returns to the screen, and you can select another data base using the same procedure as in the previous instruction.

5. Repeat the previous two steps for each data base that you want to include in the parameter file.

6. When you have selected all the data bases you want to include, press the **CONTINUE** softkey.

7. The next screen is an information screen. Press the **CONTINUE** softkey to proceed with the creation of the parameter file.

8. The first selected data base is now opened and its structure is displayed on the screen. On this screen, you select which data sets in the data base should be checked. If you want the program to check all of the data sets in this data base (when the parameter file is used by DBVAL), press the **CHECK ALL SETS** softkey, and proceed with Step 10.

   If you want the program to check only some of the data sets, press the **SELECT SETS** softkey. The cursor will appear next to the first data set in the data base, and a new softkey menu will appear. Press the **YES** softkey if you want to check the data set; press the **NO** softkey if you do not want to check it.

9. Repeat the previous step for each of the data sets in the first data base.

10. When you have decided which data sets you want the program to check, press the **CONTINUE** softkey. The new screen that appears allows you to select which paths between the data sets in the data base you want to validate.

11. If you do not want to validate any of the paths, press the **CHECK NO LINKS** softkey. If you want to validate all of the paths, press the **CHECK ALL LINKS** softkey.

    If you want to check some (but not all) of the paths, things are a little more complex. Press the **SELECT LINKS** softkey. A new screen appears, showing each of the paths between data sets in the first data base.

12. Use the **ACCEPT DEFAULT** and **SELECT CHECKING** softkeys to mark each path with a "Y" or a "N" as required. The **ACCEPT DEFAULT** softkey indicates that the currently highlighted path will not be checked. The **SELECT CHECKING** softkey indicates that the currently highlighted path will be checked.

13. When you have made all of the choices from the previous step, the program will open the next data base that you have selected to be part of the parameter file. You will then be prompted to supply the same information as you have already given for the first data base. This procedure must be repeated for each of the data bases that you want to include in the parameter file.

14. When you have selected the paths to be checked in each of the data bases that belong to your new parameter file, the program gives you the opportunity to name the file. The default name of a parameter file is DBCNFG. If you want to have more than one parameter file, you should give them other names, because DBCNFG is easy to overwrite by mistake.

15. If you want to give another name to the new parameter file, press the **ANOTHER NAME** softkey, and input the new name.

16. Press the **CONTINUE** softkey to return to the main menu of the DBVAL program, or press the **EXIT** softkey to leave the program.

Using a Parameter File with DBVAL

If you want to check more than one data base with one run of the DBVAL program, you should use a parameter file. The methods used to create parameter files were presented in the previous section. Use the following procedure to run DBVAL on a configured group of data bases and checking options.

1. Start the DBVAL program by executing `RUN "DBVAL"`. Then press the **PARAM FILE** softkey.

2. The program prompts you to input the name of the parameter file to be used by DBVAL. Input the name and press RETURN.

3. The screen displays the name of the parameter file, and the names of the data bases it includes. Press the **CONTINUE** softkey to start the checking of the data bases, according to the options defined in the parameter file. The **CHANGE NAME** softkey allows you to choose another parameter file (in case you gave the wrong name by mistake).

4. When the program has completed its checks, the display will show you whether any errors were found in each of the data bases included in the parameter file. It will also show the name of the spoolfile in which the details of the errors are stored. If you want to print the contents of the spoolfile, use the **PRINTER IS** command to specify the output device. Then execute the command `COPY "DBERnn"` (where nn is a number).

REPAIRING A DAMAGED DATA BASE

If you find data base errors when you run the DBVAL program, you will want to know how to fix the errors. Unfortunately, at present there are not many opportunities open to you.

However, if you find broken chains in a data base, you can repair them by unloading the data base using the DBUNLD program, and then reloading the data base using the DBLOAD program. Refer to the HP 260 UTILITIES manual or to the HP 260 IMAGE Programming manual for detailed descriptions of these utility programs.

DISC CONFIGURATION

SECTION 18

CONFIGURING DISCS

This section provides information showing you how to configure any mass-storage device that is supported on the HP 260 system.

The following table is a list of the mass storage devices supported on the HP 260 at the time of printing of this handbook. You can check that this list is up-to-date by referring to the current Configuration Guide for the HP 260.

Device	Class
7912P	C
7941A	C
7942A	C
7945A	C
7946A	C
7957A	C
7958A	C
9133H	S
9133L	S
9134H	S
9134L	S
9153B	S
9154B	S
9144A	C

In the above table, the class column shows whether the device is a CS 80 type or an SS 80 type. The two classes support different external diagnostic programs. Refer to the Disc Diagnosis section of this handbook for the details of this difference.

Configuring the 7912P Disc

1. Power off the HP 260.

2. Set the switches on the back of the 7912P to the desired device address between 0 and 7 (be sure it is not the same address as that of any other peripheral on the HP-IB):

Device Address	7912P Switch 1	2	3
0	0	0	0
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1
7	1	1	1

3. Connect the HP-IB cable to the disc and the HP 260. On the 7912P, use the LOWER HP-IB connector (labelled DISC). The upper connector (labelled TAPE) is not used on the single-controller version of the disc supported on the HP 260.

4. Plug in and power on the 7912P. Verify that the value shown on the LED on the disc is "P".

5. Power on the HP 260.

Configuring the 794X and 9144A Devices

The 794X set of discs includes the 7941A, 7942A, 7945A and 7946A discs. Here is the procedure for configuring any of these devices or the 9144A mass storage device.

1. Power off the SPU.

2. Use the information in the following table to set the switches on the back of the device to the desired HP-IB address between 0 and 7. Make sure that the address you select is not already occupied by another peripheral device.

HP-IB Address	Switch Settings X	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1

3. Connect the HP-IB cable to the disc and the SPU.

4. Plug in and power on the disc.

5. Power on the SPU.

Configuring the 795X, 913X and 915X Discs

The 795X set of discs includes the 7957A and the 7958A discs. The 913X set of discs includes the 9133H, 9133L, 9134H and 9134L. The 915X set of discs includes the 9153B and the 9154B discs. Here is the procedure for configuring these devices.

1. Power off the SPU.

2. Determine the HP-IB address of the disc by rotating the address wheel (located in the top left corner of the back of the device) until the desired number is displayed.

3. Check that the configuration switch (the red circle with the white numbers) is set to 0. This switch is set by using a screwdriver to adjust the position of the black arrow until it points to the desired number. Only the 0 configuration setting is supported by the HP 260.

4. Connect the HP-IB cable to the disc and to the SPU.

5. Plug in and power on the disc.

6. Power on the SPU.

NOTE

Discourage customers from using the microfloppies available on 9133H/L discs to store and run data bases. It appears that some customers think that this practice helps to maintain data base security. However, the running of a data base from microfloppies is very slow (compared with using the 9133 disc to store and run the data base). However, microfloppies can be used to back up data bases run on 9133 discs.

Media Preparation

The only utility used in the preparation of mass-storage devices supported on the HP 260 is the INIT utility. Its use for each of the three types of device is described below:

INIT - When used on a CS 80 disc

- Run internal diagnostics
- Read the run-time error log
- Spares any blocks in which more than one error has occurred or in which one or more uncorrectable data errors have occurred.
- Before actual sparing is initiated on a block, this utility performs the error-rate testing for the sector and track.
- Formats the disc using the appropriate interleave
- Clears all error rate logs
- Performs error rate tests using eight patterns
- Spares any blocks found defective and performs the sector and track error rate tests.
- Writes out Record 0, the directory, and availability table

INIT- When used on a CS 80 tape cartridge

- Runs internal diagnostics
- Reads the run-time error log
- If the tape has not been certified, this utility runs the error rate test with automatic sparing
- If the tape has been certified, this utility spares any blocks that are shown as defective in the error log. It also converts "jump spares" (which are spared through a look-up table) into "skip spares" (which use the next available block, similar to the floppy sparing method).
- Writes out Record 0, the directory, and availability table

INIT - When used on an SS 80 disc or cartridge tape

Since SS 80 devices belong to a "subset" of the CS 80 device class, use the INIT utility on SS 80 devices in the same way as on CS 80 devices.

Procedure to Prepare Media

To prepare a CS 80 disc or cartridge tape

- Run INIT

To prepare an SS 80 disc or cartridge tape

- Run INIT

WORKSTATION CONFIGURATION

SECTION 19

CONFIGURING WORKSTATIONS ON THE HP 260

This section shows you how to configure each of the workstations supported on the HP 260. You should, of course, refer to the current Configuration Guide for the HP 260 to make sure that the list of supported workstations is up-to-date. The following table lists the workstations that were supported on the HP 260 at the date of printing of this handbook.

Workstation	I/O
HP 45263D	HP-HIL/VIDEO
HP 150	Asynchronous
HP 2392A	Asynchronous
HP Vectra	Asynchronous
IBM-PC/XT/AT	Asynchronous
HP Portable Plus	Asynchronous

THE PRINCIPAL WORKSTATION

The Principal Workstation on an HP 260 system can be either:

- The Video Workstation on channel 1 of the Video board (the lower video board if there are two)
- The PC or 2392A connected to integrated port -1

NOTE

The PC or 2392A workstation on integrated port -1 can be the principal workstation only when there is no Video workstation in the system. The PC or workstation and integrated port -1 must be configured to 19,200 baud.

Further, no workstation connected to a port on the ASI board can be the principal workstation on an HP 260 system. This does not affect the position of ASI port 1 on older HP 260 systems; it remains possible to use this port for the connection of principal workstations under the B.08 Operating System.

General Information

This section gives basic information about the configuration of each of the workstations supported on the HP 260. It is assumed throughout this section that, when you configure a workstation, you have access to a copy of the owner's manual for that workstation. The customer will have a copy of that manual; it is delivered with the workstation.

Therefore, this section gives no details of how to configure the workstations. Instead, it presents the configuration values that have to be set on the workstations so that they can communicate successfully with the HP 260.

If you need more information about configuring a particular workstation, refer to the owner's manual or the service manual for that workstation.

General Procedure for configuring a workstation on an HP 260

The following procedure will work provided that the Principal Workstation has been properly configured. Check that your configuration of extra workstations is not in conflict with the currently configured Principal Workstation.

1. Power off the HP 260.

2. Connect the workstation to the desired port on the HP 260. Refer to the Data Comm. Configuration section for details on cables and port configuration.

3. Plug in and power on the workstation.

4. Power on the HP 260 and run "CONFIG".

5. Select the appropriate workstation type. Make sure that the required DROM is configured.

Workstation Type

Workstation	Type for Configuration	DROM Required
HP 150	2392	PIO
HP 2392A	2392	PIO
HP Vectra	2392	PIO
HP 45263D	VHIL	VIO
IBM-PC	2392	PIO
HP Portable Plus	2392	PIO

6. If the principal workstation is on integrated serial port -1, it must be set to 19200 baud. Otherwise the power-on messages sent to this workstation will not be readable.

NOTE

If two boards of the same type are installed in the system (that is two VIDEO boards, or two ASI boards), the board nearer to the bottom of the card cage has the lower port or channel numbers. For example, if there are two VIDEO boards in the system, the VIDEO workstation connected to channel 1 of the lower VIDEO board is the principal workstation.

Configuring Specific Workstations

The minimum necessary configurational parameters for operating a workstation on the HP 260 are given below (for each of the workstations supported on the HP 260).

The HP 150

In global configuration, select the terminal option.

In the configuration of the port to which the HP 260 is to be connected, select the following parameters:

```
      Parity:   None
   Data Bits:   8
   Stop Bits:   1
   Baud Rate:   as desired
    Enq/Ack :   Yes
 CS(CB)XMit :   No, for a direct connection
 CS(CB)XMit :   Yes, for modem connection
  DM(CC)Xmit:   Yes
    RecvPace:   Xon/Xoff
```

The HP 2392A

In the datacomm configuration mode, select the following parameters:

```
Parity/Data Bits  :  None/8
          EnqAck  :  Yes
    CS(CB)XMit    :  No, for a direct connection
    CS(CB)XMit    :  Yes, for modem connection
      Baud Rate   :  As desired
        RecvPace  :  Xon/Xoff
```

The HP Vectra

In the datacomm configuration mode, select the following parameters:

```
Parity/Data Bits  :  None/8
          EnqAck  :  Yes
     CS(CB)XMit   :  No, for a direct connection
     CS(CB)XMit   :  Yes, for modem connection
       Baud Rate  :  As desired
        RecvPace  :  Xon/Xoff
    Screen Lines  :  24
```

The IBM-PC

In the datacomm configuration mode, select the following parameters:

```
Parity/Data Bits  :  None/8
          EnqAck  :  Yes
     CS(CB)XMit   :  No, for a direct connection
     CS(CB)XMit   :  Yes, for modem connection
       Baud Rate  :  As desired
       RecvPace   :  Xon/Xoff
    Screen Lines  :  24
```

The HP Portable Plus

In the Com1 Configuration mode of the Portable Plus, select the following parameters:

```
         Baud Rate  :  As desired (default is 9600)
      DSR required  :  NO, for direct connection
      DCD required  :  NO, for direct connection
      RTS required  :  NO, for direct connection
           Parity   :  NONE
     Check parity   :  NO
        Stop bits   :  1
   Xmit indicator   :  OFF
    Receive pacing  :  NONE
  Transmit pacing   :  NONE
  ENQ/ACK pacing    :  YES
```

NOTE

Consult your MODEM supplier to find out which signals (DSR, DCD, RTS) are required by the Portable Plus when it is connected to the HP 260 via a MODEM.

PRINTER CONFIGURATION

SECTION **20**

CONFIGURING PRINTERS

This section shows you how to configure each of the printers supported on the HP 260. The list of printers included is up-to-date at the time of printing of this handbook. You should, of course, refer to the current Configuration Guide to check whether there have been changes in the list of supported printers.

Printers Supported on HP 260

Printer	**I/O**
HP 2932A	Asynchronous
HP 2934A	Asynchronous or HP-IB
HP 2563A	Asynchronous or HP-IB
HP 2686A (Laserjet)	Asynchronous
HP 2225D (Thinkjet)	Asynchronous
HP 2603A	Asynchronous

System Printer Addresses

A system printer on the HP 260 must be connected to one of the following ports:

- HP-IB address 0
- Integrated serial port -1
- Integrated serial port -2
- ASI port 5 (for all HP 250s, or the HP 260 P/N 45261D, but not for the HP 260 Series 30/40)

Configuring the 2932A

The following procedure is for configuring the 2932A.

1. Power off the SPU.

2. Connect the 2932A to the desired RS-232 port of the ASI.

3. Configuration consists of printer settings and interface settings. There are required settings and optional settings.

   Printer Settings (required):

   PRIMARY CHARACTER SET - Roman8
   DISPLAY FUNCTIONS - off
   HP TERMINAL MODE - off
   RESTRICTED SEQUENCES - none
   CR AUTO LF - off
   LF, VT & FF AUTO CR - off
   SUPPORT MODE - 2932A

Printer Settings (optional): the values given below are the factory default values. These optional printer setting values are dependent on the application being run. Therefore, these settings should be selected by the VAR or other person responsible for the application software.

   PRIMARY PRINT PITCH - 10
   SECONDARY PRINT PITCH - 10
   PRIMARY STYLE - Cubic
   SECONDARY STYLE - Cubic
   SECONDARY CHARACTER SET - Line Draw
   LINES PER INCH - 6
   INCHES PER PAGE - 11
   PERFORATION SKIP - off
   TEXT LINES PER PAGE - 60
   LEFT MARGIN - 0
   RIGHT MARGIN - 135

   Interface Settings (required):
   BAUD RATE - 9600
   DATA BITS - 8
   PARITY - none
   PARITY CHECK - off
   STRIP NULL/DEL - off
   XON/XOFF - off
   ENQ/ACK - on
   BINARY ENQ/ACK - off
   DTR/CD - high
   (S)RTS/SCA - Low
   CTS/CB - ignore
   RS/CH - Low

   Interface Settings (optional): none

4. Power on the SPU.

5. Run "CONFIG" and select the Asynchronous Port Configuration option. Configure the 2932A to the PORT CLASS field corresponding to the port to which you have connected the printer.

```
Class:   Printer
Type:    293X
Format:  8N1
```

6. Select DROM EDIT and configure the TIO DROM.

7. Power the SPU off and then on again to allow the system to recognize the new configuration.

Short guide to using the keyboard of 2932A for printer configuration

The SELECT and VIEW keys on the printer keyboard are used to enter the SETTINGS mode. The cursor keys on the keyboard are used to move the print head to the category or sub-category that you would like to change or list. The RESET key is used to exit from the SETTINGS mode without making any permanent changes.

To enter the SETTINGS mode, press the SELECT key once; then press the VIEW key once. To leave the SETTINGS mode and cause any changes that you have made to be permanent, press the VIEW key once.

When you want to change one of the current configuration parameters, use the cursor keys to choose the parameter to be altered and the SELECT key to select the new parameter.

If you need further information on how to change the configuration parameters on the 2932A, refer to the service manual (or the owner's manual) for the printer.

Configuring the 2934A

The 2934A can be connected to the HP 260 using either RS-232 or HP-IB communications. The procedures used for configuring the printers in each of these modes are now given.

Serial Interface using RS-232

1. Power off the SPU.

2. Connect the 2934A to the desired RS-232 port of the SPU.

3. Configuration consists of printer settings and interface settings. There are required settings and optional settings.

Printer Configuration

Printer Settings (required):

PRIMARY CHARACTER SET - Roman8
DISPLAY FUNCTIONS - off
HP TERMINAL MODE - off
RESTRICTED SEQUENCES - none
CR AUTO LF - off
LF, VT & FF AUTO CR - off
SUPPORT MODE - 2934A

Printer Settings (optional): the values given below are the factory default values. These optional printer setting values are dependent on the application being run. Therefore, these settings should be selected by the VAR or other person responsible for the application software.

PRIMARY PRINT PITCH - 10
SECONDARY PRINT PITCH - 10
PRIMARY STYLE - Cubic
SECONDARY STYLE - Cubic
SECONDARY CHARACTER SET - Line Draw
LINES PER INCH - 6
INCHES PER PAGE - 11
PERFORATION SKIP - off
TEXT LINES PER PAGE - 60
LEFT MARGIN - 0
RIGHT MARGIN - 135

Interface Settings (required):

BAUD RATE - 9600
DATA BITS - 8
PARITY - none
PARITY CHECK - off
STRIP NULL/DEL - off
XON/XOFF - off
ENQ/ACK - on
BINARY ENQ/ACK - off
DTR/CD - high
(S)RTS/SCA - Low
CTS/CB - ignore
RS/CH - Low

Interface Settings (optional): none

4. Power on the SPU.

5. Run "CONFIG" and select Option 9. Configure the 2934A to the PORT CLASS field corresponding to the ASI port to which you have connected the printer.

```
Class:    Printer
Type:     293X
Format:   8N1
```

6. Select DROM EDIT and configure the TIO DROM.

7. Power off the SPU and then power it on on again to allow the system to recognize the new configuration.

Short guide to using the keyboard of 2934A for printer configuration

The SELECT and VIEW keys on the printer keyboard are used to enter the SETTINGS mode. The cursor keys on the keyboard are used to move the print head to the category or sub-category that you would like to change or list. The RESET key is used to exit from the SETTINGS mode without making any permanent changes.

To enter the SETTINGS mode, press the SELECT key once; then press the VIEW key once. To leave the SETTINGS mode and cause any changes that you have made to be permanent, press the VIEW key once.

When you want to change one of the current configuration parameters, use the cursor keys to choose the parameter to be altered and the SELECT key to select the new parameter.

If you need further information on how to change the configuration parameters on the 2932A, refer to the service manual (or the owner's manual) for the printer.

Configuring the 2934A on the HP-IB

1. Power off the SPU.

2. Connect the 2934A to the SPU with the HP-IB cable.

3. Configuration consists of printer settings and interface settings. There are required settings and optional settings.

   Printer Settings (required):

   PRIMARY CHARACTER SET - Roman8
   DISPLAY FUNCTIONS - off
   HP TERMINAL MODE - off
   RESTRICTED SEQUENCES - none
   CR AUTO LF - off
   LF, VT & FF AUTO CR - off
   SUPPORT MODE - 2934A

   Printer Settings (optional): the values given below are examples

   PRIMARY PRINT PITCH - 10
   SECONDARY PRINT PITCH - 10
   PRIMARY STYLE - Cubic
   SECONDARY STYLE - Cubic
   SECONDARY CHARACTER SET - Line Draw
   LINES PER INCH - 6
   INCHES PER PAGE - 11
   PERFORATION SKIP - off
   TEXT LINES PER PAGE - 60
   LEFT MARGIN - 0
   RIGHT MARGIN - 135

   HP-IB Interface Settings: (required)

   SECONDARY COMMANDS - on
   LISTEN ALWAYS - off
   SERVICE REQUEST - off
   ADDRESS - 0 if system printer; any between 1 and 7 if not
   system printer.
   SET DEFAULTS n/a

4. Power off the SPU, then power it on again to allow the system to recognize the new configuration.

5. If the 2934A is to be used as the system printer, it should be configured to HP-IB address 0. Otherwise the printer can be configured to any HP-IB address between 1 and 7.

Configuring the 2563A

The 2563A can be connected to the HP 260 via RS-232 or HP-IB communications. The procedures for configuring a 2563A in each of these modes follow.

Serial Interface on RS-232

1. Power off the SPU.
2. Power on the 2563A but make sure that it is off-line.
3. Connect the printer to the desired RS-232 port of the SPU.
4. Using the following four steps set the function numbers on the printer equal to the associated parameter values (shown in the following table).

Function Number	Parameter Value	Meaning
20	01	XON/XOFF enabled
21	00	No hardware handshake used
22	51	Baud rate = 9600. CB signal disregarded.
23	00	Parity disabled. Transmit 8th bit as data.

5. Press the CONFIG key on the operator control panel of the 2563A, and at the same time use the FINE ADJUST keys to obtain the desired function number, that is 20, 21, 22, or 23.
6. Release the CONFIG key to display the associated parameter value.
7. Use the FINE ADJUST keys to set the parameter value for the associated function number to the value shown in the table above.
8. After setting each parameter value, press the ENTER key on the HP 2563.

NOTE

The parameter values given in the table above represent the recommended configuration of the 2563A on the HP 260. However, it may be necessary to alter the baud rate of the data transfer between the printer and the SPU (for example there may be a modem connection between the 2 devices, which has a maximum baud rate of less than 9600). The table below shows the parameter values of function number 22 that correspond to the full range of possible baud rates.

Baud Rate	Function Number	Parameter Value
300	22	01
600	22	11
1200	22	21
2400	22	31
4800	22	41
9600	22	51
19200	22	61

9. Press the ON LINE key to put the printer "on-line".

10. Power on the SPU.

11. Run "CONFIG" and select Option 9. Configure the 2563A to the PORT CLASS field to which you have connected it.

```
Class:   Printer
Type:    2563
Format:  8N1
```

12. Select DROM EDIT and configure the TIO DROM.

13. Power the SPU off and then on again to allow the system to recognize the new configuration.

Configuring the 2563A on the HP-IB

The HP 2563A can use 2 different HP-IB protocols: the CIPER protocol and the NON-CIPER protocol. The protocol is set in the factory where the printer is manufactured.

For connection to the HP 260, the 2563A must be set to the NON-CIPER protocol. Therefore, before you configure a 2563A on an HP 260, check which protocol is currently set.

Checking the Protocol

1. Press the ON-LINE key to put the printer off-line.
2. Press the SELF key.
3. Press the ENTER key. The printer begins its self-test.
4. Near the top of the self-test printout, the printer reports which protocol is currently set. The description is either:

   CIPER PROTOCOL or NON CIPER PROTOCOL.

5. If NON CIPER protocol is set, proceed with the configuration of the printer.

   If CIPER protocol is set, change the protocol. Refer to the procedure titled "Setting NON-CIPER Protocol".

Configuration Procedure

1. Press and hold the CONFIG key. The function number will be displayed on the Operator Control Panel.
2. Select function number 20, using the FINE ADJ. keys to increase or decrease the number as necessary.
3. Release the CONFIG key. The HP-IB address (parameter) number is then displayed.
4. Select the desired HP-IB address, using the FINE ADJ keys.
5. Press the ENTER key on the printer's Operator Control Panel to finalize the configuration.
6. Press the ON LINE key to return the configured printer to normal operation.

Setting NON-CIPER Protocol

1. Power off the printer using the main power switch on the back of the 2563A, and unplug the main power cable, which is immediately below the main power switch.
2. Remove the protective covers on the printer to gain access to the interface PCA.
3. On the Control PCA, install a jumper from the CE MODE test point to the ground test point.
4. Plug in the main power cable and power on the printer using the main power switch.
5. Press and hold the CONFIG key to display the function number.
6. Select function number 25, using the FINE ADJ keys.
7. Release the CONFIG key to display the configuration value.
8. Select configuration value 1, using the FINE ADJ keys. This configuration value configures the HP-IB Printer Driver Type to the HP 260.
9. Press ENTER.
10. Remove the jumper from the Control PCA.
11. Replace the protective covers on the printer.
12. Press the ON LINE key to return the printer to normal operation.

Configuring the 2686A

Use the following procedure to configure a 2686A on an asynchronous connection to the HP 260.

1. Power off the SPU.

2. Connect the 2686A to the desired RS-232 port of the SPU.

3. The printer interface is configured before it leaves the factory and it might not be necessary for you to gain access to the interface PCA. However, if you want to alter the default baud rate of 9600, remove the four screws that secure the back panel of the printer and find switch SW1 on the interface PCA.

4. Select the settings of switches 2, 3, and 4 of SW1, as shown in the table below, to obtain the desired baud rate.

S2	**S3**	**S4**	**Baud Rate**
OFF	OFF	OFF	300
OFF	OFF	ON	600
OFF	ON	ON	2400
ON	OFF	OFF	4800
ON	OFF	ON	9600
ON	ON	OFF	19200

Switch 8 on SW1 is the Data Terminal Ready (DTR) bit of the RS-232 configuration. The printer is normally shipped from the factory with this bit set to the ON position (set to active High). The signal polarity of this switch can be inverted by setting the DIP switch to OFF.

The remaining switches on SW1 (1,5,6,7) have no meaning on the Laser Jet printer. On the Laser Jet + printer, switch 5 is an Auto-continue option (default ON) and switch 6 is an option causing an X-ON message to be sent every second (default ON). Both of these switches should be left on their default settings unless you have special reasons for altering them.

5. Power on the SPU.

6. Run "CONFIG" and select Option 9. Configure the printer on the appropriate port as follows:

```
Class:  Printer
 Type:  268X
```

7. Select the DROM EDIT option and configure the TIO DROM.

8. Power off the SPU, then power it back on, to allow the system to recognize the new configuration.

Configuring the 2225D

The following procedure is for the configuration of the 2225D printer on an RS-232 connection to the HP 260.

Serial Interface on RS-232

1. Power off the SPU.

2. Power off the 2225D printer.

3. On the back of the printer there is a bank of eight DIP switches, labelled MODE and another bank of five DIP switches, labelled RS-232C. Set the MODE switches in accordance with the following table and the requirements of the customer's system.

MODE Switches 1-5

MODE switches 1-5 are used to set general features of the printer. For connection to the HP 260 all of these five switches should be set to the DOWN position. The definitions of these five switches is given in the following table:

Switch no.	Function	UP	DOWN
1	CR Definition	CR-LF	CR only
2	LF Definition	CR-LF	LF only
3	Perforation Skip Mode	1 inch perf. area	no perf. area
4	Page Length	12 inches	11 inches
5	Control sequence mode	Alternate	HP

MODE Switches 6-8

MODE switches 6-8 are used to select the character set for the 2225D.

NOTE

The 2225D is guaranteed to perform consistently with the HP Printer Feature Set standard only if all 8 of the MODE switches are set to the DOWN position.

The following table shows the settings of switches 6-8 for each of the character sets available for use with the 2225D. You should point out to the customer that, if a character set other than Roman8 is used, the 2225D cannot be guaranteed to perform consistently with the HP Printer Feature Set standard.

Character Set	**Switch 6**	**Switch 7**	**Switch 8**
Roman8	DOWN	DOWN	DOWN
United States ASCII	UP	DOWN	DOWN
Swedish	DOWN	UP	DOWN
Italian	UP	UP	DOWN
French	DOWN	DOWN	UP
German	UP	DOWN	UP
United Kingdom	DOWN	UP	UP
Spanish	UP	UP	UP

4. Set the RS-232C switches to select the desired baud rate, parity mode and handshake mode, using the following tables.

Handshake Mode - Switch 1

Handshake Mode	**S1**
Data Terminal Ready	ON
X-ON/X-OFF	OFF

For connection to an HP 260, switch 1 should be set to the OFF position to enable the X-ON/X-OFF handshake mode.

Parity Mode Settings - Switches 2 and 3

Select the parity mode None for connection to the HP 260.

Parity Mode	**S2**	**S3**
None	OFF	OFF
Odd	OFF	ON
Even	ON	OFF
Ones	ON	ON

Baud Rate Settings - Switches 4 and 5

The baud rate is set using switches 4 and 5, as shown in the following table. The baud rate selected depends on whether the 2225D is connected to the HP 260 directly or over a MODEM.

Baud Rate	**S4**	**S5**
9600	OFF	OFF
19200	OFF	ON
2400	ON	OFF
1200	ON	ON

5. Connect the 2225D to the desired RS-232 port of the SPU.
6. Run "CONFIG" and select Option 9. Configure the printer on the appropriate port as follows:

```
 Class:   Printer
  Type:   2225D
Format:   8N1
```

7. Select the DROM EDIT option and configure the TIO DROM.
8. Power off the SPU, then power it on again, to allow the system to recognize the new configuration.

Configuring the 2603A

The following procedure is for the configuration of the 2603A printer on an RS-232 connection to the HP 260.

The 2603A is configured at the factory where it is manufactured and these default settings are indicated in the tables of switch settings which follow.

Character Set Selection

The character set is selected using the 4 DIP switches on the left of the array of 4 banks of DIP switches in the 2603A.

Character Set	S1	S2	S3	S4
HP Roman 8/US ASCII *	DN	DN	DN	DN
IBM PC (US Version)	UP	DN	DN	DN
Special	DN	UP	DN	DN
U. K.	UP	UP	DN	DN
German	DN	DN	UP	DN
French	UP	DN	UP	DN
Italian	DN	UP	UP	DN
European Spanish	UP	UP	UP	DN
Latin Spanish	DN	DN	DN	UP
Finnish	UP	DN	DN	UP
Swedish	DN	UP	DN	UP
Norwegian/Danish	UP	UP	DN	UP
Dutch	UP	DN	UP	UP
French Canadian	DN	UP	UP	UP
Swiss	UP	UP	UP	UP

Miscellaneous Settings on DIP Switch Set 2

DIP Switch set 2 is the bank of 8 switches second from the left of the four DIP switch banks.

Functions of DIP Switch Set 2

Switch	Setting	Meaning
1	DN*	6 lines/inch
2	DN*	Standard buffering (64 char.)
2	UP	315 char. buffering
3	DN*	CR = CR
3	UP	CR = CR + LF
4	DN*	Autopaging disabled
4	UP	Autopaging enabled
5	DN*	8 data bits
5	UP	7 data bits
6		Not used
7	DN*	Odd parity
7	UP	Even parity
8	DN*	1 stop bit
8	UP	2 stop bits

In the above table, * denotes the factory settings.

Baud Rate Selection

The baud rate is selected using switches 1,2 and 3 on DIP switch set 3. The following table shows the various speeds and settings that are available.

Baud Rate	S1	S2	S3
9600*	DN	DN	DN
4800	UP	DN	DN
2400	DN	UP	DN
1200	UP	UP	DN
600	DN	DN	UP
300	UP	DN	UP
150	DN	UP	UP
110	UP	UP	UP

In the above table * denotes the factory baud rate setting.

Of the other switches in DIP set 3, switch 5 is the only one that you are likely to want to change. Switch 5 has the following function:

```
Switch 5 down = parity disabled (factory setting)
Switch 5 up = parity enabled
```

Switch 4 in DIP set 3 must be down. Switches 6,7 and 8 are combined with switches 1-6 of DIP set 4 to determine the handshaking protocol. The following table shows the factory settings of these switches; normally you should not change these settings.

Protocol Switches

Switch	Setting
3-6	UP
3-7	UP
3-8	DN
4-1	DN
4-2	DN
4-3	DN
4-4	DN
4-5	DN
4-6	DN
4-7	DN
4-8	DN

These factory settings activate both the XON/XOFF and the DTR handshaking protocols.

Configuration Procedure

1. Power off the SPU.
2. Connect the 2603A to the desired RS-232 port of the SPU.
3. Power on the SPU.
4. Run "CONFIG" and select Option 9. Configure the printer on the appropriate port as follows:

```
 Class:   Printer
  Type:   2603
Format:   8N1
```

5. Select the DROM EDIT option and configure the TIO DROM.
6. Power off the SPU, then power it on again, to allow the system to recognize the new configuration.

PLOTTER CONFIGURATION

SECTION 21

PLOTTER CONFIGURATION

The following set of procedures shows you how to configure each of the plotters supported on the HP 260. Here is a list of these supported plotters.

Plotters Supported

HP 7475A

HP 7550A

HP 7440A

DROMS Needed for Plotter Support

The DROMs that must be configured in order that plotters may be operated on the HP 260 system are:

TRIG, MATRIX and TIO

Therefore, before you begin to configure a plotter on the HP 260, you should check that these three DROMs are auto-configured. This is done by running "CONFIG" and selecting the DROM EDIT option. Configure the DROMs if they are not currently configured, and save the configuration to the system disc.

Configuring the 7475A

1. Power off the HP 260.

2. Connect the plotter to the desired port on the ASI board. Note that the plotter cannot be connected to either of the two integrated, serial ports.

3. Set the switches on the back panel of the plotter as follows:

Mode Switches

Switch	Setting	Function
S2	0 or 1	Parity selector (odd or even)
S1	0	Parity disabled
Y/D	D	Direct connection to HP 260
US/MET	US	Using English DIN A or B paper
US/MET	METRIC	Using metric A3 or A4 paper
A4/A3	A4	Using A4 paper
A4/A3	A3	Using A3 paper

NOTE

Because switch S1 is set to disable parity, it does not matter which setting is made on switch S2.

Baud Rate Switches

Baud Rate	B4	B3	B2	B1	Valid for HP 260?
External	0	0	0	0	NO
75	0	0	0	1	NO
110	0	0	1	0	YES
150	0	0	1	1	NO
200	0	1	0	0	YES
300	0	1	0	1	YES
600	0	1	1	0	YES
1200	0	1	1	1	YES
2400	1	0	0	0	YES
4800	1	0	0	1	YES
9600	1	0	1	0	YES

4. Select the baud rate from the above table, and set the switches on the back of the plotter accordingly.

5. Power on the 7475A. Add a sheet of paper and clamp it in place. Check that the ERROR LED is not lit. Set the reference points for plotting by using the ENTER, P1 and P2 keys, together with the pen holder positioner keys.

6. Power on the HP 260.

7. Run "CONFIG" and select the "Asynchronous Port Configuration" option.

8. Position the cursor in the Class field of the port to which the plotter is connected. Select the ALTER FIELD softkey.

9. Select the TERMINAL softkey.

10. The Type field will display 26xx (its default setting) and need not be changed. The Format field will display 8N1 as its default, and this setting is required for the operation of the 7475A on the HP 260.

11. The Baud Rate field has 9600 baud as its default. If you want to change this setting, position the cursor in the Baud Rate field and select the ALTER FIELD softkey. Then use the NEXT CHOICE softkey to move through the range of available baud rates, one by one. When you reach the baud rate you want, select the DONE softkey.

12. Save this configuration of the plotter to the system disc in the usual way, and power off the HP 260. Then power it on again to allow the system to recognize the new configuration.

13. Now test the configuration of the plotter by entering the command RUN "TEST" , and selecting the PLOTTER TEST option. Refer to the description of the "TEST" program for a plotter (given later in this section) for details on the procedure used to test the plotter configuration.

NOTE

The GPL software must be installed on the system in order for the PLOTTER TEST to be run successfully.

Configuring the 7550A

1. Power off the HP 260.

2. Connect the plotter to the desired port on the ASI board (see the Data Comm. Configuration section for details on cables). Note that the plotter cannot be connected to either of the integrated serial ports.

3. Power on the 7550A and follow the procedure given below to configure this plotter to the HP 260. During the configuration of the 7550A, refer to the "Front Panel Overview" diagram. This diagram should clarify your position in the "level structure" used by the plotter controller to accept configurational information.

4. When you power-on the 7550A, the following display should appear. (If some other message is displayed, you need to load paper or fix another operational problem before beginning to configure the plotter).

VIEW ALIGN
P1 P2

5. Press the ENTER key; then press the NEXT DISPLAY key to move to LEVEL 2 of the panel display field, that is, the connection configuration section. The display should now read:

HP-IB MONITOR
STANDARD SERIAL

6. Around the display panel, you will see four unmarked keys. These are the function keys and they correspond to the current display. In this case you want to look at the MONITOR status, so press the function key on the upper right. The display will now read:

MONITOR MODE
OFF

7. If the display has an ON instead of the OFF, press the lower right function key to turn the MONITOR MODE off. Then press the ENTER key to save this screen in the configuration.

8. Now press the NEXT DISPLAY key to give the following display:

HP-IB MONITOR
STANDARD SERIAL

9. If the display has ENHANCED instead of STANDARD, press the lower left function key to cause STANDARD to appear. Then press the ENTER key to save the new STANDARD setting in the configuration.

10. Press the lower right function key to go to the SERIAL sublevel and display the following information:

DATA FLOW
BYPASS HANDSHAKE

11. Press the upper left function key (the DATA FLOW key) to display the following:

REMOTE
EAVESDROP

12. Press the lower right function key to cause STANDALONE to appear instead of EAVESDROP. (If STANDALONE already appears on the display, you do not need to press the function key). If you have changed EAVESDROP to STANDALONE then press the ENTER key to save this setting in the configuration.

13. Now press the NEXT DISPLAY key to give the following display:

DATA FLOW
BYPASS HANDSHAKE

14. Press the BYPASS function key (lower left) to display the following:

BYPASS OFF

15. If ON appears instead of OFF in the display, press the lower right function key to change the display so that BYPASS OFF appears. If you have changed from ON to OFF, press the ENTER key to save this setting in the configuration.

16. Now press the NEXT DISPLAY key to give the following display:

DATA FLOW
BYPASS HANDSHAKE

17. Press the HANDSHAKE function key (lower right) to display the following:

HANDSHAKE MODE
NONE DIRECT

18. Press the lower left function key to move among the following handshake modes:

NONE
XON/XOFF
ENQ/ACK
HARDWIRE

19. The handshake mode used by the HP 260 is the ENQ/ACK mode. When the ENQ/ACK mode appears on the display, press the ENTER key to save this setting in the configuration.

20. If DIRECT does not appear on the display, and MODEM appears instead, press the lower right function key to cause DIRECT to appear. Then press the ENTER key to save this setting in the configuration.

21. Now press the NEXT DISPLAY key to give the following display:

DATA FLOW
BYPASS HANDSHAKE

22. Press the NEXT DISPLAY key again to move to the data compatibility sublevel. The display should now appear as follows:

DUPLEX PARITY
BAUD

23. Press the DUPLEX function key (upper left) to cause the following display to appear:

DUPLEX FULL

24. If HALF appears instead of FULL in the above display, press the lower right function key to cause FULL to appear. Then press the ENTER key to save this setting in the configuration.

25. Now press the NEXT DISPLAY key to give the following display:

DUPLEX PARITY
BAUD

26. Press the PARITY function key (upper right) to give the following display:

8-BITS OFF

27. Press the 8-BITS function key (lower left) to move between 8-BITS and 7-BITS (data block transmission). When the 8-BITS mode is displayed, press the ENTER key to save this setting in the configuration.

28. Press the OFF function key (lower right) to move among the OFF, EVEN and ODD parity modes. When the OFF mode is displayed, press the ENTER key to save this setting in the configuration.

29. Now press the NEXT DISPLAY key to give the following display:

DUPLEX PARITY
BAUD

30. Press the BAUD function key (lower left) to give the following display:

BAUD RATE
9600

31. Press the function key under the numerical baud rate to step through the available baud rates. The HP 260 supports a maximum baud rate of 9600 for connection with this plotter. However, if you want to connect the two devices over a modem, you might have to select a lower baud rate to establish an operating connection. When the desired baud rate appears on the display, press the ENTER key to save the setting to the configuration.

32. You have now completed the connection configuration of the 7550A. Press the ENTER key, followed by the NEXT DISPLAY key to go back to the display:

HP-IB MONITOR
STANDARD SERIAL

33. Press the NEXT DISPLAY key to return to the power-on display:

VIEW ALIGN
P1 P2

34. Now, of course, the HP 260 must be configured to accept the plotter as a device connected to its ASI board. First, power on the HP 260 and run "CONFIG".

35. Select the "Asynchronous Port Configuration" option of CONFIG.

36. Position the cursor in the Class field of the port to which the plotter is connected. Select the ALTER FIELD softkey.

37. Select the TERMINAL softkey.

38. The Type field will display 26xx (its default setting) and need not be changed. The Format field will display 8N1 as its default and this setting is required for the operation of the 7550A on the HP 260.

39. The Baud Rate field has 9600 baud as its default. If you want to change this setting, position the cursor in the Baud Rate field and select the ALTER FIELD softkey. Then use the NEXT CHOICE

softkey to move through the range of available baud rates, one by one. When you reach the baud rate you want, select the DONE softkey.

40. Save this configuration of the plotter to the system disc in the usual way, and power off the HP 260. Then power it on again to allow the system to recognize the new configuration.

41. Now test the configuration of the plotter by entering the command RUN "TEST", and selecting the PLOTTER TEST option. Refer to the description of the "TEST" program for a plotter (given later in this section) for details on the procedure used to test the plotter configuration.

NOTE

The GPL software must be installed on the system in order for the PLOTTER TEST to be run successfully.

Configuring a new HP 7550A to an HP 260

The general procedure for configuring the 7550A might seem to be rather long, and, in fact, if you want to configure a new 7550A to an HP 260, a much shorter procedure is possible. This is because most of the factory settings of the plotter's configurational parameters are those used in configuring it to an HP 260. The table below lists the factory settings and the settings required by the HP 260.

Factory Set Conditions	Required HP 260 Conditions
MONITOR MODE : OFF	MONITOR MODE : OFF
DATA FLOW : EAVESDROP	DATA FLOW : STANDALONE
BYPASS : OFF	BYPASS : OFF
HANDSHAKE : NONE	HANDSHAKE : ENQ/ACK
DUPLEX : FULL	DUPLEX : FULL
PARITY : 8BITS, OFF	PARITY : 8BITS, OFF
BAUD RATE : 2400	BAUD RATE : Case Dependent

Procedure for Configuring a new 7550A

Use the following procedure to configure a new 7550A plotter on the HP 260:

1. Power on the 7550A.

2. Use the NEXT DISPLAY key on the front panel to step through the configurational parameters until you reach the DATA FLOW setting.

3. Change this setting to STANDALONE and then press the ENTER key to save the setting.

4. Step through the parameters again until you reach HANDSHAKE. Then change the handshake to ENQ/ACK.

5. Step through the parameters until you reach Baud Rate. Select the desired baud rate.

Configuring the 7440A

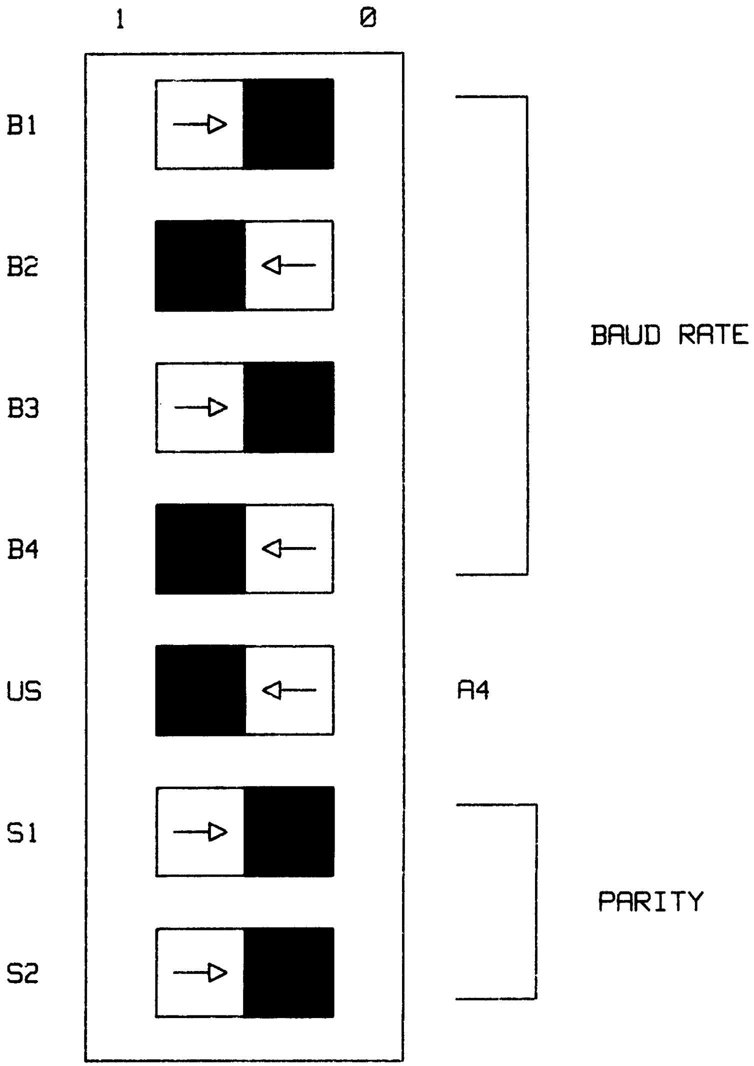
The ColorPro plotter (HP 7440A) comes from the factory pre-set to the following conditions:

Condition	**Factory-set Default**
Baud-rate	9600
Stop bits	1
Data bits	8
Parity	off
US/A4 Paper	US

There are only two of these switch-selected parameters that you might want to change:

- Baud rate - when the ColorPro plotter is connected to the HP 260 via a modem
- US/A4 Paper - if you want to use A4 paper (210 x 297 mm) instead of US paper (8.5 x 11 inch).

The diagram below shows the default settings of the DIP switches on the back of the plotter.



Factory Default Settings of the DIP Switches of the 7440A

Using A4 Paper

If you want to use A4 paper, move the DIP switch marked US/A4 to the "0" position.

Changing the Baud Rate

If you want to change the baud rate from its default setting of 9600, use the table below to select the switch settings for the baud rate you want.

Baud Rate Switches

Baud Rate	B1	B2	B3	B4
150	1	1	0	0
200	0	0	1	0
300	1	0	1	0
600	0	1	1	0
1200	1	1	1	0
2400	0	0	0	1
4800	1	0	0	1
9600	0	1	0	1

NOTE

The baud rate setting of 150 is not supported on the HP 260.

Configuration Procedure on the HP 260

1. Power off the HP 260.
2. Connect the ColorPro to the desired port on the ASI board. Note that the ColorPro cannot be connected to either of the two integrated serial ports.
3. Power on the ColorPro plotter and add a sheet of paper to it.
4. Power on the HP 260.
5. Run "CONFIG" and select the "Asynchronous Port Configuration" option.
6. Position the cursor in the Class field of the port to which the plotter is connected. Select the ALTER FIELD softkey.

7. Select the TERMINAL softkey.

8. The Type field will display 26xx (its default setting) and need not be changed. The Format field will display 8N1 as its default, and this setting is required for the operation of the ColorPro plotter on the HP 260.

9. The Baud Rate field has 9600 baud as its default. If you want to change this setting (to make it compatible with the baud rate you selected on the ColorPro plotter), position the cursor in the Baud Rate field and select the ALTER FIELD softkey. Then use the NEXT CHOICE softkey to move through the range of available baud rates, one by one. When you reach the baud rate you want, select the DONE softkey.

10. Save this configuration of the plotter to the system disc in the usual way, and power off the HP 260. Then power it on again to allow the system to recognize the new configuration.

Running the TEST Program for a Plotter

For the B.08 Operating System, the list of GPL-programs that the "TEST" program requires has been removed from the list of programs that are copied as part of the installation of "TEST" by the "ROUTIL" program. Therefore, the GPL software must be installed on the same volume as the "TEST" program, in order for the PLOTTER TEST to be run successfully.

If the GPL software is not installed , you will receive an error message when you try to run the PLOTTER TEST. The error message will tell you that the "GPLCFT" program is missing. If you receive this message, use the GPLLOD program to install the GPL software.

Provided that the GPL software is installed, you can use the PLOTTER TEST to check the integrity of plotter configurations, and the operability of plotters. Here is the procedure to follow:

1. Enter the command RUN "TEST", and select the PLOTTER TEST option. Make a final check that the plotter is set up correctly and press the CONTINUE softkey.

2. If your plotter appears on the softkey menu at the bottom of the screen, press the relevant softkey.

3. If other plotter numbers appear on the softkey menu, but yours does not, select the EDIT GPL%CF softkey. Then select the ADD PLOTTER softkey, followed by the softkey that has the number of your plotter. Next press the EXIT ADD softkey and then the EXIT EDIT softkey.

4. When the program asks you to select the device you want to test, press the relevant softkey. The program will then ask you to select the ASI port to which your plotter is connected. Again, press the relevant softkey.

5. Select the COMPLETE softkey to fully test the configuration of the plotter.

6. When the test is over, compare the plot produced on the plotter with a reference plot from an earlier configuration. The two plots should be identical, apart from the plotter name, device address and date/time information (which is case-specific).

NOTE

If you run "TEST" and select the PLOTTER TEST option, and the message "The required configuration file "GPL%CF" was not found" is displayed, you should select the CREATE GPL%CF softkey from the menu. Then select the relevant plotter number from the new softkey menu. Next, select the ASI port number to which that plotter is connected, from the softkey menu. After that you will be able to proceed with the "TEST" as above.

DATA ENTRY TERMINAL CONFIGURATION

SECTION 22

CONFIGURING DATA ENTRY TERMINALS

There is only one specific data entry terminal currently supported on the HP 260 - the HP 3081A. However, the HP 150 A/B and the HP 2932A can be used as data entry terminals just as well as they can be operated as workstations. Refer to the Workstation Configuration section for the details of how to configure these devices.

Here is the procedure for configuring the HP 3081A.

1. The first step is to check the setting of the configuration switches on the 3081A. Make sure that the 3081A is powered-off and disconnected from the HP 260.

2. The configuration switches are located on the base of the terminal , underneath the data-cable-access plate. Remove this plate by loosening the screws that secure it. There are eight configuration dip-switches. Four of them have functions that can be altered in the field.

The following table shows the settings of the configuration switches that are required for the operation of the 3081A.

Switch no.	Setting	Function
1	Closed	Bar code reader not installed
2	Closed	Attention key set to DLE CR (sub-system break)
3	Open	DC1 handshake disabled
8	Open	2333A Configuration mode disabled

Switches 4-7 are not used and can be set in either the closed or the open position.

3. Power off the HP 260.

4. Connect the HP 92922A (4-channel adaptor) or the HP 92923A (1-channel adaptor) to the desired port on the ASI board of the HP 260. Note that data entry terminals can not be connected to either of the integrated serial ports.

5. Connect the HP 3081A to the adaptor selected in the previous step. Power on the HP 3081A.

6. Power on the HP 260.

7. Run "CONFIG" and select the Asynchronous Port Configuration option. Position the cursor in the Class field of the port to which the HP 3081A is connected, and select the ALTER FIELD softkey.

8. Select the TERMINAL softkey.

9. The Type field will display 26xx (its default setting) and need not be changed. The Format field will display 8N1 as its default value, and this setting is required for the operation of the 3081A on the HP 260.

10. Position the cursor in the Baud Rate field and select the ALTER FIELD softkey. Then use the NEXT CHOICE softkey to move through the range of available baud rates. When you reach the setting of 2400 baud, select the DONE softkey.

11. Save this configuration in the usual way, and then select the DROM EDIT option of CONFIG. Make sure that the TIO DROM is currently configured.

12. Power off the HP 260 and then power it on again, to allow the system to recognize the new configuration.

13. Create and run the following program to check the configuration of the HP 3081A.

```
 10          INPUT "ENTER PORT NUMBER OF DEVICE UNDER TEST";Port
 20          P=Port + 10
 30          REQUEST P
 40 Pr:      PRINTER IS P
 50          PRINT "ENTER DATA AND PRESS RETURN KEY"
 60          ON INPUT #P GOTO In
 70          WAIT
 80 In:      PRINTER IS 8
 90          DISP AREAD$(P)
100          WAIT 1000
110          GOTO Pr
120          END
```

This program outputs the following message to the 3081A:

ENTER DATA AND PRESS RETURN KEY

Data entered at the 3081A is then transferred to the HP 260, and displayed on the relevant workstation screen.

Press SHIFT BREAK or HALT to stop the program.

NOTE

The HP 3081A cannot be connected directly to the HP 260. Instead the HP 3081A must be connected to a special adaptor which is, itself, connected to the HP 260. This special adaptor can be either the HP 92922A (a 4-channel adaptor which allows up to 4 data entry terminals to be connected to 1 ASI port on the HP 260) or the HP 92923A (a 1-channel adaptor).

BAR CODE READER CONFIGURATION

SECTION 23

CONFIGURING BAR CODE READERS

There are three bar code readers currently supported on the HP 260 - the HP 39800A, the HP 92915A, and the HP 92916A. In this section the procedures for the configuration of each of these bar code readers are given.

Configuring the HP 39800A

1. Power off the HP 260.

2. Connect the HP 39800A to the desired port on the ASI board of the HP 260. Note that bar code readers can not be connected to either of the integrated serial ports.

3. On the back of the HP 39800A, set the switches according to the following table.

Switch	Setting	Function
0	0	Set baud rate to 9600
1	1	Set baud rate to 9600
2	1	Set baud rate to 9600
3	1	Enable odd parity
4	1	Enable odd parity
5	0	Select 1 stop bit
6	0	Disable character delay
7	1	Enable software handshake
8	1	Select ENQ/ACK protocol
9	0	Select character mode
10	0	Disable local echo
11	0	Set terminator to CR
12	0	Set terminator to CR
13	0	Select no block mode terminator

4. Power on the HP 39800A and then power on the HP 260.

5. Run "CONFIG" and select the "Asynchronous Port Configuration" option.

6. Position the cursor in the Class field of the port to which the HP 39800A is connected, and select the ALTER FIELD softkey.

7. Select the TERMINAL softkey.

8. The Type field will display 26xx (its default setting) and need not be changed. Position the cursor in the Format field and select the ALTER FIELD softkey.

9. Select the "7 + odd, 1 stop" softkey. The format field will now display 7O1

10. The Baud Rate field has 9600 baud as its default setting, and, because this setting is the same as that used by the HP 39800A, it is not necessary for you to change it.

11. Save this configuration to the system disc in the usual way and power off the HP 260. Then power it on again to allow the system to recognize the new configuration.

Configuring the HP 92916A or HP 92915A

Exactly the same procedure is used for configuring the HP 92916A as is used for configuring the HP 92915A. However, the two bar code readers are supported on different workstations.

The HP 92916A is supported on the HP 260 only when it is connected to an HP 45263D, HP VECTRA, or an HP 150II workstation.

The HP 92915A is supported on the HP 260 only when it is connected to an HP 2392A or anHP 150A/B workstation.

Use the following procedure to configure an HP 92916A or an HP 92915A.

1. Make sure that the HP 260 is operating satisfactorily with the workstation to which you want to connect the bar code reader.

2. Refer to the bar code reader's Installation manual for help in deciding the mode in which you want to use the bar code reader.

3. For connection to the HP 260, use the following switch settings:

Switch No.	Setting
L1	1
L2	1
L3	1
L4	1
L5	1
L6	1
L7	1
L8	1
R1	1
R2	1
R3	0
R4	0
R5	0
R6	0
R7	0
R8	0

NOTE

In the above table, L stands for the left bank of switches on the bar code reader, and R stands for the right bank. The switches R5-R8 determine the language of the code to be read. When R5-R8 are set to 0, USASCII code is configured. Refer to the bar code reader's installation manual for the details of the switch settings for other code languages.

Note that you must select the same code language as is configured on the workstation's keyboard, and that this language must also be the primary keyboard language on the HP 260. The primary keyboard language is set using the CONFIG program.

4. When you have set the switches, connect the cable of the bar code reader to the empty slot on the back of the keyboard of the workstation.

5. The bar code reader is now ready for use on the HP 260.

DISC DIAGNOSIS

SECTION 24

DISC DIAGNOSIS

This section explains how to interpret the error status messages and codes that are returned after a disc error. In addition to this decoding guide, a general procedure for dealing with disc problems is presented for each of the discs supported on the HP 260 system.

DISC STATUS COMMAND

The **DISC STATUS** command returns the error status for the latest two disc errors that have occurred since the system was powered on. This status is in code form, in that the information it contains is a matrix of octal numbers.

The Disc Status command is available on Operating System B. 04. 00 and all later versions of the operating system. Its syntax is:

```
DISC STATUS[array identifier]
```

where the array, if used, is dimensioned for at least 31 elements. If the array is used, the disc status information is returned in decimal form.

Here is an example using the array:

```
10 DIM A[31]
20 DISC STATUS A(*)
30 PRINT A(*)
40 END
```

If the array is not specified, the entire status array is displayed. The information in the status array is displayed in octal form, in the following manner:

```
LAST
EUSP    OPCD    FREC1    FREC2    STAT11
STAT1   STAT2   STAT3    STAT4    STAT5
STAT6   STAT7   STAT8    STAT9    STAT10

EUSP    OPCD    FREC1    FREC2    STAT11
STAT1   STAT2   STAT3    STAT4    STAT5
STAT6   STAT7   STAT8    STAT9    STAT10
```

Disc Status Command

The data labelled LAST can have only two values:

- the value 000001 indicates that the first set of words in the error status array refers to the most recent error.
- the value 000020 (decimal 16) indicates that the second set of words in the error status array refers to the most recent error.

The first thing to do with the set of words that refers to the most recent error is to convert them from octal to binary form. When you do this, notice that the 6 octal numbers should be converted into only 16 bits. This is because the most significant octal number contains only 1 valid bit. For example:

STAT1 = 010101 (octal)

STAT1 = 0 | 001 | 000 | 001 | 000 | 001 (binary)

EUSP,OPCD,FREC1,FREC2 and STAT11 are known as "Disc Driver Status Words" and are used by the operating system during disc operations. These words are discussed later in this section.

STAT1 through STAT10 are known as "Controller Status Words", and as their name implies, they contain information returned by the disc controller.

We will now look at the Controller Status Words in detail.

CONTROLLER STATUS WORDS

NOTE

In interpreting controller status words, SS 80 discs are treated in exactly the same way as CS 80 discs. Therefore, these two types of disc have been treated as one class in this part of the handbook. When you come to the correction of disc errors, there are differences between the procedures used with SS 80 and CS 80 discs. These differences are discussed in the relevant part of this handbook.

On Operating System B, use the DISC STATUS command (or statement from within a program) to display the status words. To diagnose disc errors, you should use the EXRSIZ program from your CE support tape or disc. With this program you can trace any faulty tracks or sectors and spare them. You can also obtain information on faults and errors associated with the disc driver. Later in this section, some of the more important commands available in the EXRSIZ program are described. If you need more detailed information about the EXRSIZ program, refer to the CS 80 EXTERNAL EXERCISER Reference Manual.

CS 80 Discs

All ten status words (STAT1 through STAT10) are used by the disc controller to show the disc status and all ten words are returned by the controller after a REQUEST STATUS command from the operating system.

CS 80 Status Words

Details for CS 80 Status Words

Here is a brief guide to the interpretation of the CS 80 status words. In this guide, the statement "bit x = string" means that when the identified bit is set (equal to 1), the error identified in the string has occurred.

Error Categories

There are five Error Categories (or fields) plus a Parameters field which contains supplementary information on some of the individual errors (when those errors have occurred). Here is a brief description of the type of each of these Error Categories.

Identification Field

This field is 2 bytes long and contains the volume number and the unit number of the device that is currently returning status.

Fault Errors Field

This field is 2 bytes long and indicates hardware failures. It also tells you whether diagnostic information is available.

Access Errors Field

This field is 2 bytes long and indicates problems found when a specific command was input to the system. For example, an incompatible device format, an unacceptable media condition, or an illegal intervention by an operator would be reported in this field.

Information Errors

This field is 2 bytes long and provides maintenance information to the host. The errors reported in this field were caused by conditions which did not cause the operation being performed to fail. These errors do not need immediate action; in most cases they show potential problems or unusual device performance.

Identification Field

The bits of the Identification Field contain the following information:

- bits 1-3 give the volume number of the mass storage device
- bits 4-7 give the unit number, within the mass storage device, that is currently reporting its status.
- bits 8-15 give the value of the unit of lowest number, within the same mass storage device, that is waiting to display its status. When all of bits 8-15 are equal to 1, no units have status pending.

IDENTIFICATION FIELD (STAT 1)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

VOLUME NUMBER	UNIT NUMBER	OTHER UNITS REQUESTING SERVICE

Reject Errors Field

The bits in the Reject Errors Field contain the following information:

- bit 2 = channel parity error- a channel command was received without odd parity
- bit 5 = illegal opcode- an unrecognizable opcode was received
- bit 6 = module addressing- an illegal volume or unit number was specified for this device
- bit 7 = address bounds- the target address has exceeded the bounds for this device
- bit 8 = parameter bounds- a parameter other than unit, volume or target address has been specified for the device. This is not permitted.
- bit 9 = illegal parameter- a parameter field was the wrong length for the opcode preceding it
- bit 10 = message sequence- the message sequence has been violated. This error information is suppressed if any reject or fault errors have occurred before the message sequence violation.
- bit 12 = message length- the total length of the execution message differs from the current default value

REJECT ERRORS FIELD (STAT 2)

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ø	Ø		Ø	Ø							Ø		Ø	Ø	Ø

Fault Errors Field

The bits in the Fault Errors Field contain the following information:

- bit 17 = cross-unit - an error has occurred during a copy data operation (see parameter field)
- bit 19 = controller fault- a hardware fault has occurred in the disc controller
- bit 22 = unit fault- a hardware fault has occurred in the unit addressed. Notice that for 794X devices bit 22 may also indicate that the Spare Tables cannot be read from the main copy or from any backup copies.
- bit 24 = diagnostic result- the hardware failed the diagnostic identified in the parameter field
- bits 26-28 = release required- the last command issued cannot be executed until the mass storage device has been released
- bit 26 = operator request- release is required for an operator request (for example a load/unload operation)
- bit 27 = diagnostic request- release required for diagnostics initiated from controller (for example a self-test)
- bit 28 = release required for internal maintenance (for example head alignment)
- bit 30 = power failure- the unit's power supply failed, the configuration of the mass storage device was destroyed by a diagnostic, or a pack was loaded. The device must be re-configured.
- bit 31 = retransmit- the preceding transaction should be attempted again

FAULT ERRORS FIELD (STAT 3)

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0		0		0	0		0		0				0		

Access Errors Field

The bits in the Access Errors Field contain the following information:

- bit 32 = illegal parallel operation- the requested operation cannot be executed in parallel with one, or more, of the operations currently in progress
- bit 33 = uninitialized media- the host attempted to access unformatted media, or incompatible, unusable media have been loaded
- bit 34 = no spares available- a spare block cannot be allocated because of the absence of unused space on the disc
- bit 35 = not ready- the selected unit is not yet available for access (for example the heads or the media are not yet fully loaded)
- bit 36 = write protect- the selected volume is write-protected
- bit 37 = no data found- the block addressed during a read operation has not been written
- bit 40 = unrecoverable data overflow- the previous transaction generated more than one unrecoverable error. Therefore, the entire transaction should be considered to be in error, and should be repeated
- bit 41 = unrecoverable data exists in the block(s) identified in the parameter field
- bit 43 = end of file encountered on file structured device
- bit 44 = end of volume- the host attempted to access across a volume boundary

ACCESS ERRORS FIELD (STAT 4)

32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
						Ø	Ø			Ø			Ø	Ø	Ø

Information Errors Field

The bits in the Information Errors Field contain the following information:

- bit 48 = release requested for operator request (for example load or unload)
- bit 49 = release requested from diagnostic control panel in disc controller (for example self-test)
- bit 50 = release requested for internal maintenance (for example head alignment)
- bit 51 = media wear- only one spare track (disc) or one spare block (tape) remains
- bit 52 = data over-run; a latency was induced during the transfer of data, due to a slow transfer rate or a repeated seek. Notice that bit 52 is not utilized by 794X devices.
- bit 55 = auto sparing invoked- a defective block has been automatically spared by the device
- bit 57 = recoverable data overflow- the previous transaction generated more than one recoverable data error
- bit 58 = marginal data- although data was recovered, difficulty was encountered (see parameter field for block address). Notice that 794X devices will try to correct the data using ECC, as a last resort. If this correction is successful, a Marginal Data Error will be reported.
- bit 59 = recoverable data- a latency was introduced in order to correct a data error (see parameter field for address of recovered block)
- bit 61 = maintenance track overflow- error and fault log area is full

INFORMATION ERRORS FIELD (STAT 5)

48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
					Ø	Ø		Ø				Ø		Ø	Ø

Parameter Field

The content of the bytes in the Parameter Field depends on the status of the error bit settings.

When no error bits are set, there are two possibilities:

- P1 through P6 contain the new target address. P7 through P10 contain the fault log, which consists of device-specific information.
- After a spare block command, P1 through P6 contain the beginning address of the affected area, and P7 through P10 indicate the length of the affected area.

Only some of the error bit settings described above have meaningful relations with the Parameter Field. These relations are discussed below:

- When error bit 17 is set (cross unit), P1 through P6 contain the encoded value of each unit that has experienced an error. A byte filled with 1's indicates that there are no additional units
- When error bit 24 is set (diagnostic result), P1 through P6 indicate the results of the internal diagnostic.
- When error bit 41 is set (unrecoverable data), P1 through P6 contain the address of the bad block.
- When error bit 58 is set (marginal data), P1 through P6 contain the address of the block that should be spared.
- When error bit 59 is set (recoverable data), P1 through P6 contain the address of the recoverable block.

In all other cases, that is, when error bits other than those discussed are set, bytes P1 through P6 of the Parameter Field contain the address of the current target.

NOTE

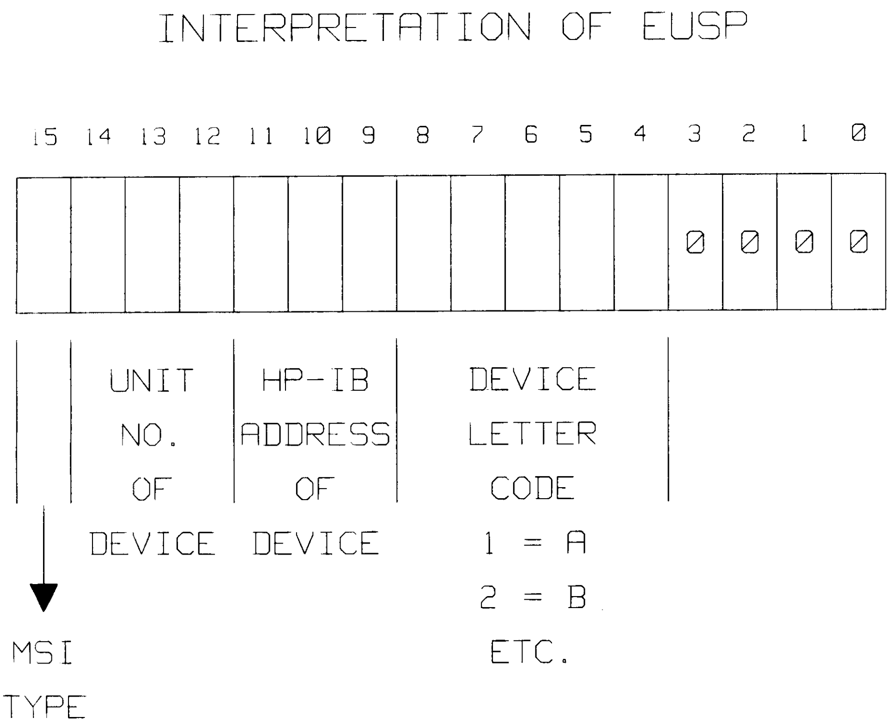
If more than one error bit is set, then the Parameter Field will contain the information relevant to the error with the highest priority. The errors are numbered from the most important upwards; that is, the error with the lowest number has the highest priority.

Disc Driver Status Words

The five words EUSP, FREC1, FREC2, OPCD, and STAT11 are used by the operating system during disc operations. These words identify the type of operation being performed, the device involved, the disc address involved in the transfer, and the status of the operation.

The words are printed on the dumps after a System Error. They can be displayed in Operating System B using the DISC STATUS command, normally used after the occurrence of a disc error.

First let us consider the EUSP, or Encoded Unit Specifier, which uniquely identifies a mass memory device (volume) in the HP 260 operating system. The format of the EUSP is shown below:



Explanatory notes on the above figure

- Bits 0-3 are ignored by the operating system, and are usually set to zero.

- Bit 15 indicates whether the current MSI is a volume label or a device specifier. If bit 15 = 1, the MSI is a volume label. If bit 15 = 0, the MSI is a device specifier. Here is an example, showing how to interpret the EUSP:

  EUSP = 005500 (octal) or 0 000 101 101 000 000 (binary)

  Write in binary grouping as: 0 000 101 10100 0000

  Interpret the information as follows:

  The MSI is in device-specifier form.
  The unit # of the device = 0

The HP-IB address of the device = 5
The device letter = "T"
Therefore the EUSP for the device specifier is ":T2,5,0"

FREC1 and FREC2 Status Words

The FREC1 status word contains the high 7 bits of the disc address and is used with CS 80 discs.

The FREC2 status word contains the low 16 bits of the disc address and is used with all discs.

OPCD Status Word

The OPCD word contains the disc driver operation code that was last performed. The codes are defined as follows (only the four least significant bits are meaningful).

Octal code	Description
00	request status only
01	seek only
03	write to disc
04	verify given records
05	initialize given records
06	read multiple sectors
07	write multiple sectors
10	initialize given track
11	request disc sector address
12	special operation after seek
13	"END"
14	no execution message was received
15	transmit arbitrary bus data sequence
16	last operation was read execution message
17	copy data (CS 80 devices only)

Additional notes to the above table

For cartridge tape units, code 01 means that a write-protect check was the last operation performed.

The "initialize given track", referred to under code 10, is equivalent to a write-only seek.

STAT11 Status Word

The STAT11 status word is the Disc Driver Error Code used during error interpretation. Its least significant 8 bits contain the meaningful information. This information is displayed in the following table:

Decimal	Description
000	disc subsystem error (error 90)
001	status 2 error
002	time-out on read from PHI register 2 (error 81)
003	time-out on write to PHI register 2 (error 81)
004	time-out on parallel poll (error 81)
005	unexpected EOI in Read Byte routine (error 90)
006	DMA transfer did not complete (error 90)
007	invalid QSTAT
010	attempt to access over volume boundary - Error 84 from Cache
020	tape not ready
022	disc buffer not ready
026	tape operation pending
030	disc buffer pending
031	tape door locked
032	tape not certified
034	TAPES DROM is not loaded

GENERAL PROCEDURES FOR ERROR CORRECTION ON DISCS

This section presents general instructions on what to do when disc problems occur. Use it with the service manual for the disc involved. The service manual will contain very detailed information on the reasons behind, and suggested corrective action for, disc-specific errors.

Special Procedure for Errors 160 and 161

The following procedure is recommended for clearing error 160 (Tape operation pending) and error 161 (Disc buffer pending):

CAUTION

Use this procedure **only** if the correct tape cannot be located or the disc buffer cannot be read. It can result in the loss of data.

Procedure

1. If the Cartridge Tape Maintenance Utility must be run from tape, proceed with Step 2. If the utility can be run from disc, proceed with Step 5.
2. Enter the command `DIRECT NOUPDATE` to bypass dumping and the use of a disc buffer.
3. Run "TAPFIX". Clear the appropriate condition.
4. Enter the command `INDIRECT` to return to using the disc buffer.
5. Run "TAPFIX". Clear the appropriate condition.

The following commands can be used when the disc is not working:

`DIRECT` - dumps all pending data in the tape buffer on disc out to tape and sets up a tape buffer in memory to be used for all subsequent tape operations.

`DIRECT NOUPDATE` - sets up a tape buffer in memory to be used for all subsequent tape operations. The tape buffer on disc is **not** dumped out to tape, so some data may be lost. This should be used only when necessary.

`INDIRECT` - dumps out the tape buffer in memory and returns to using the tape buffer on disc.

Error Correction - General Procedure

1. If the operating system has reported any errors, refer to the OS Diagnosis section for information on interpreting the error codes.
2. Use the DISC STATUS command to find out the specific hardware and software status values being returned on an error. Refer to the Disc Status Command section for details.

3. Check the entire configuration of the disc (refer to the Disc Configuration section). This includes all cables and the HP-IB address switch.

4. Run the self-test and the built-in diagnostics on the disc. Refer to the disc Service Manual for details. Correct any error conditions reported.

5. Run "EXRSIZ" from the CE System Support disc or tape cartridge. This program is identical to the External Exerciser that has been implemented on the HP-85. Refer to the External Exerciser Reference Manual (published by Disc Memory Division) for details on running the exerciser and on error code interpretation.

CAUTION

Some tests in the External Exerciser are destructive to customer files. Make sure that the customer data is backed up before running any of these tests.

Major Commands of the EXRSIZ Suite of Programs

Command	Description	EXRSIZ	EXRSI2	TAPE	OPER
CANCEL	cancel previous command	X	X	X	
CERT	certify tape cartridge			X	
CHANNEL	HP-IB channel test utility		X		
CICLEAR	channel independent clear	X	X	X	
CLEAR LOGS	clear drive logs utility	X		X	
CLR	channel independent clear				X
CMPR	write-then-read and compare				X
COMP	complementary command				X
DIAG	execute internal diagnostic		X		
EDIT	replace an OPER program step				X
ENDLP	end loop				X
ERRSUM	read error summary utility	X		X	
ERT LOG	read error rate log utility	X		X	
EXEC	execute OPER program steps				X
EXIT	exit the current program	X	X	X	X
FAULT LOG	read fault log utility	X			
HELP	print list of commands	X	X	X	X
INIT MEDIA	initialize disc or tape		X	X	
INSK	incremental seek				X
LCRD	locate and read				X
LCWR	locate and write				X
LIST	list OPER program steps				X
LOOP	loop				X
NEW	clear current OPER program				X
NULL	delete OPER program step				X

Command	Description	EXRSIZ	EXRSI2	TAPE	OPER
PRESET	preset drive utility	X	X	X	X
RELS	release device				X
REQSTAT	request status	X	X	X	
REV	read firmware revision		X		
RF SECTOR	read full sector		X		
RO ERT	read only error rate test	X		X	
RQST	request status				X
RUN LOG	read run time log utility	X		X	
SDCLEAR	selected device clear	X	X	X	
SENSE	read sensors utility		X		
SPARE	spare block utility	X	X	X	
TABLES	read drive tables utility		X	X	
STOP	exit OPER program				X
UNIT	set unit number utility	X	X	X	
UNLOAD	unload the tape			X	
USE LOG	display tape use log			X	
WRITE FM	write filemark on tape			X	
WTR ERT	write then read ERT	X		X	

Logical Layout Problems

If Error 85 (media not initialized) occurs on media thought to be initialized, proceed as follows:

Standard HP format

1. Run "HMEDIA"
2. Select "Record 0 Recovery" to try and recover any information that may have been lost in record 0
3. If this completes successfully, try to access the disc again

HP Interchange format

1. Make sure that the MEDIA DROM is configured

2. Try to access the media on another system that uses HP Interchange format

IBM format

1. Make sure that the MEDIA DROM is configured

2. Use the commands "IBMDUMP" and "IBMWREC" to examine and recover the information that has been destroyed (refer to MEDIA/260 Programming Manual P/N 45251-90025 for instructions on how to use these commands). Note that these commands will read sectors that have CRC errors. For other occurrences of Error 85, refer to the OS Diagnosis section.

If you observe that files have been purged without your knowledge, or receive file information that is obviously false, available-space information that is definitely wrong, or any other unusual file-information, use one of the following procedures:

Standard HP format

1. Enter the command `CAT`

2. If the information is incorrect, enter the command: `RUN "HMEDIA"`

3. Select the "Recover Directory" softkey to try and recover the directory by using the spare directory

4. If this completes successfully, select the "Check AVT" softkey to rebuild your availability table

5. If this does not complete successfully, your disc will have to be recovered from a backup

HP Interchange and IBM formats

- Use the same procedures as for an Error 85. Refer to the OS Diagnosis Section for details.

- Refer to the Logical Disc Layout section for diagrams.

MASS STORAGE DEVICE TEST PROGRAM

The B.08 Operating System includes a test program for mass storage devices. This is a program which can be used by customers to conduct preventive maintenance on their discs and tapes. You can give this test program to any customer whom you think would find it useful.

The use of the program is documented in the Operating and Managing Manual for B.08. However, you might still be asked for advice on the program or want to run the program yourself. Therefore, a broad description of the program and its use is given here. If you want more details, refer to the B.08 Operating and Managing Manual.

Initiating the Program

Input the command `RUN "MSTEST"`

The program polls the HP-IB channel and displays the names of all of the devices attached to the HP 260.

NOTE

> The MSTEST program is written for CS80 and SS80 devices. Devices that are not covered by these command sets cannot be diagnosed or maintained using the MSTEST program.

There are two major functions of the MSTEST program:

- conducting hard diagnostics
- reading fault logs, run logs and test logs

Conducting Hard Diagnostics on a Specific Device

1. From the main menu press the **SELECT ONE** softkey.
2. The first available CS80 or SS80 device is highlighted in inverse video. If you want to diagnose this device, press the **SELECT THIS** softkey. If you do not want to diagnose this device, use the **BAR UP** or **BAR DOWN** softkey to move the inverse-video bar to the device that you want to diagnose.
3. When the device that you want to diagnose is highlighted in inverse video, press the **SELECT THIS** softkey.

4. Press the **INITIATE SELFTEST** softkey. The program will conduct the hard diagnosis. If no errors are found, the following message appears to the right of the displayed device label:

```
<<<  Selftest passed  >>>
```

5. If errors are found, the following message appears, and the Test Error number(s) and/or Drive Error number(s) are written to a results file.

```
<<<  Selftest failed  >>>
```

6. If no errors were found, press the **EXIT PROGRAM** softkey. If errors were found, press the **OUTPUT PRINTER** softkey. The program displays, as softkeys, the names of the printers that are currently connected to the **HP** 260.

7. Press the softkey with the name of the printer to which you want to print the error information. Make sure that the printer you choose is on-line. If this printer is off-line, the system could appear to hang.

8. If necessary, refer to the CE Handbook for the mass storage devices you are dealing with, or to the Service Manual for these devices. These reference sources contain descriptions of each error and the suggested procedure for dealing with them.

Conducting Hard Diagnostics on all MSDs

1. From the main menu, press the **SELECT ALL** softkey.

2. Press the **INITIATE SELFTEST** softkey. The program will test each of the CS80/SS80 devices connected to the HP 260. If errors are found on any device, the error number(s) will be written to a results file.

3. If no errors were found, press the **EXIT PROGRAM** softkey. If errors were found, press the **OUTPUT PRINTER** softkey. The program displays, as softkeys, the names of the printers that are currently connected to the **HP** 260.

4. Press the softkey with the name of the printer to which you want to print the error information. Make sure that the printer you choose is on-line. If this printer is off-line, the system could appear to hang.

5. If necessary, refer to the CE Handbook for the mass storage devices you are dealing with, or to the Service Manual for these devices. These reference sources contain descriptions of each error and the suggested procedure for dealing with them.

Reading Logs on a Specified Device

1. From the main menu, press the **SELECT ONE** softkey.

2. The first available CS80/SS80 device will be highlighted.

3. If you want to read the logs of this device, press the **SELECT THIS** softkey.

4. If you do not want to read the logs on this device, press the **BAR UP** or **BAR DOWN** softkey to move the inverse-video bar to the device whose logs you want to read. Then press the **READ LOGS** softkey.

NOTE

The logs of SS80 devices cannot be read using the MSTEST program. This is due to the internal structure of the SS80 command set.

5. The program reads the fault log, run log and test log of the specified device, and displays the number of entries in each of these logs.

6. If there are any entries in the logs, the **OUTPUT PRINTER** softkey appears on the screen. If you want to print out the results, press the **OUTPUT PRINTER** softkey. The program will then prompt you to select the printer to which you want to print the logs.

   If you do not want to print out the results, press the **EXIT PROGRAM** softkey, and leave the MSTEST program.

Reading Logs of all Mass-storage Devices

1. From the main menu press the **SELECT ALL** softkey.

2. Press the **READ LOGS** softkey. The program will read the fault logs, run logs and test logs of each of the CS80 devices connected to the HP 260, and displays the number of entries in each of the logs.

3. If the **OUTPUT PRINTER** softkey is on the screen, press it. Then select the printer to which you want to print the results, from the new softkey options. If this softkey is not present, press the **EXIT PROGRAM** softkey.

4. If you have not already done so, press the **EXIT PROGRAM** softkey.

Reading Previous Results Files

The MSTEST program includes a facility for reading the previous results files from the current MSI device.

1. From the main menu, press the **PREVIOUS RESULTS** softkey. The names of the files holding the previous results are displayed. The file names are displayed in the following manner:

   MstfXX DD.MM.YY where:

   XX is a number.

   DD.MM.YY is the date on which the results file was created.

2. If you want to read or purge one or more of the results files, move the inverse-video bar to the name of that results file. Use the **BAR UP** or the **BAR DOWN** softkey to move the inverse-video bar.

   If you do not want to read any of the results files, press the **EXIT** softkey to return to the initial menu of the MSTEST program.

3. Press the **SELECT THIS** softkey to display the entries in the previous results file you have selected.

4. If you want to print the information in the results file, press the **PRINT FILE** softkey. The program then prompts you to select the printer to which you want to send this information.

   If you want to purge the results file, press the **PURGE FILE** softkey.

NOTE

If you want to read the previous results files from another mass storage device on the system, you must use the MSI command to make that device the current MSI device. This command must be input before running the MSTEST program.

Contents of Results Files

Each results file for a disc contains three logs: the fault log, the error rate log and the run log.

Each results file for a tape device contains three logs: the use log, the error rate log and the run-time log.

The contents of each of these logs are described here. Each results file might also contain disc-status reports consisting of words 2-10 of the relevant CS80 disc-status report.

NOTE

When you print out the contents of any of the results files, empty result entries (that is cases where one or more of the logs of some of the devices had no errors) are suppressed by the program, and are not printed out.

Fault Log (discs only)

The fault log contains information about the drive faults and test errors that have occurred since the last time that the fault log was cleared.

The print-out of the fault log takes the following form:

```
device #   unit # : device name    Fault log
------------------------------------------------
address    target   fault
```

In the printout, the following data will be present:

address: the head/track/sector form of the starting address

target: the head/track/sector form of the target address

fault: drive error (DERROR) code in decimal format or test error (TERROR) code

Error Rate Log

An error rate test finds both correctable and uncorrectable read errors, and logs information about each error to the Error Rate Log.

The print-out of the Error Rate Log for discs takes the following form:

```
device #   unit # : device name    Error rate log    head #
----------------------------------------------------------------
physical   logical  error
address    address
```

In the printout, the following data will be present:

physical address: the head/track/sector form of the physical address at which the error occurred

logical address: the head/track/sector form of the logical address at which the error occurred

error: error type and frequency in decimal format

The printout of the Error Rate Log for tape devices takes the following form:

```
device #  unit # : device name     Error rate log
-----------------------------------------------------------------
XXXXXX      blocks tested
  XXX     permanent errors
  XXX     transient errors
  XXX     uncorrectable errors
  XXX     key errors
logical address: XXXXXX            error: XXX
```

In the printout, the following information will be present:

number of blocks tested

number of permanent errors

number of transient errors

number of uncorrectable errors

number of key errors

logical address and error type for each error

Run-time Log

During run-time, data errors are recorded in the run-time log. The print-out of the Run-time Log for discs takes the following form:

```
device #     unit #   :  device name     Run-time log    head #
-----------------------------------------------------------------
physical     logical     error
address      address
```

In the printout, the following data will be present:

physical address: the head/track/sector form of the physical address at which the error occurred

logical address: the head/track/sector form of the logical address at which the error occurred

error: error type and frequency in decimal format

The printout of the Run-time Log for tape devices takes the following form:

```
device #   unit # : device name   Run-time log
----------------------------------------------------------
Y uncorrectable errors
Z key errors
logical address:    XXXXXX          error:     XXX
```

In the printout, the following information will be present:

number of uncorrectable errors

number of key errors

logical address and error type for each error

Use Log (Tape Devices only)

The Use Log contains a load counter and a block access counter. It informs the user how many times a tape with a specific label has been loaded into the tape device. It also informs the user how many blocks have been accessed on the particular tape.

The printout of the Use Log takes the following form:

```
device #  unit #  :  device name     Use Log
---------------------------------------------------

Tape label now XXXXX times loaded XXXXXXXXX  blocks accessed
```

The "X" values are given in octal form.

Status Report

If a serious disc error occurs while the MSTEST program is running, words 2-10 of the CS80 Disc Status Report will be written to the results file. When you read the results file, the disc status will appear as follows:

```
device #   unit #   device name   status report
-------------------------------------------------------------
XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
```

In the printout, the X's are octal values.

Serious Disc Errors during the Operation of MSTEST

If the MSTEST program encounters a serious disc error, it will produce a beep, and words 2-10 of the disc status (returned in response to the CS 80 commmand "REQUEST STATUS") will be written to the current results file. If you encounter this situation, leave the MSTEST program as soon as possible. The results file will then be closed. It is therefore possible to use the results files created by the MSTEST program to build a history of the status of each disc on the system. You can consult these results files to obtain a calendar of disc problems.

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WORKSTATION DIAGNOSIS

SECTION 25

TERMINAL DIAGNOSIS

When there is a problem with a workstation or terminal connected to an HP 260, there are two general classes of causes.

- The problem is with the communication link with the SPU.
- The problem is with the workstation.

General Procedure for Communication Link Diagnosis

There are two classes of workstation problem with which you might be asked to deal:

- The workstation display is in order and the problem is with communicating with the HP 260 (or an intermittent display problem exists). The point here is that you can check the configuration of the workstation easily, and run any test program that is applicable to the situation.
- The workstation display is out of order; you have a blank screen to deal with.

These two classes of problem are approached in different ways. Here are some general recommendations:

When The Workstation Display Is In Operation

1. Check the complete configuration of the workstation, including all cables, ASI port configuration and baud rate compatibility. Also make sure that the PIO DROM is configured by running "CONFIG" and selecting the DROM EDIT option.
2. Run the "TEST" or "CE" program from your support medium and select the "DISPLAY TEST" option to check the integrity of the communication link between the workstation and the SPU.
3. If the problem persists, configure the workstation to another port of the same ASI board or the other integrated port on the Processor board and repeat the previous step.
4. Clearly, if the configuration of the workstation on a new port results in the disappearance of the problem, you have isolated the source of the problem to the port on which the workstation was originally configured. If the problem persists, it is very likely that the ASI board (or the Processor board) is in order, and the problem is with the workstation or the connecting cable.
5. If you have isolated the problem to the ASI board or the Processor board, you should replace the relevant board, reconfigure the customer's system and note any difficulties that arise.
6. If the problem seems to be with the cabling, try replacing each of the cables, one by one, until the problem disappears.

Workstation Diagnosis

When you reach this point without solving the problem, it is likely that the workstation is at the root of the problem. Refer to the service manual for the workstation, where you will find detailed diagnostic procedures and suggested corrective action.

When The Display Is Out Of Operation

1. Check all the cables connecting the workstation to the HP 260 and replace any that appear to be faulty. Also make sure that the PIO DROM is configured by running "CONFIG" and selecting the DROM EDIT option.

2. Try connecting the workstation to another port of the same ASI board and observe whether the display returns to operation. If the workstation is connected to an integrated port, connect it to the other integrated port, and check whether the display returns.

3. Clearly, if the configuration of the workstation on a new port results in the disappearance of the problem, you have isolated the source of the problem to the port on which the workstation was originally configured. If the problem persists, it is very likely that the ASI board (or the Processor board) is in order, and the problem is with the workstation or the connecting cabling.

4. If you have isolated the problem to the ASI board or the Processor board, you should replace the relevant board, reconfigure the customer's system and note any difficulties that arise.

5. If the problem seems to be with the cabling, try replacing each of the cables, one by one, until the problem disappears.

6. If the problem appears to be with the workstation, and it is impossible to bring the display back into operation, try connecting another workstation to the same port. Clearly this procedure will isolate the problem to the workstation or another part of the system. If no other workstation is available, try connecting any other device to the same port. The same conclusion can be drawn from this procedure.

When you reach this point without solving the problem, it is likely that the workstation is at the root of the problem. In this handbook it is impractical to attempt to usurp the role of the service manuals produced for each workstation by the relevant manufacturing division. Therefore, you should refer to the service manual for the workstation, where you will find detailed diagnostic procedures and suggested corrective action.

PRINTER DIAGNOSIS

SECTION 26

This section gives the general procedure for the diagnosis of printer problems and includes some limited information on the diagnosis of particular printers. However, this section is not intended to take the place of the service manuals for the particular printers. You may find it possible to correct the printer problem without having access to the service manual (especially if the problem is related to the communication link or the configuration of the printer on the HP 260).

General Diagnosis

1. Check the entire configuration of the printer on the HP 260. This check includes:

   - Check all cables connecting the printer to the HP 260.
   - Make sure that the baud rate setting and parity mode selection for the relevant port on the HP 260 are compatible with the baud rate setting and parity mode selection on the printer.
   - Make sure that the ASI port or integrated port on the CPU is configured to the correct mode; that is RS-232, RS-422 or MODEM link. This configuration is checked through the CONFIG program by selecting the "Asynchronous Port Configuration" option and using a procedure that has not as yet been defined.
   - If the printer is connected on the HP-IB, make sure that it does not have the same HP-IB address as any other device on the HP-IB.

2. Run the printer's self-test. Brief descriptions of the self-test procedures for some of the printers supported on the HP 260 (at the time of printing of this handbook) are given later in this section. Refer to the specific printer service manual for full details of the self-test procedure.

3. Run "TEST" or "CE" and select PRINTER TEST to check the communication link between the printer and the HP 260.

4. If the problem persists, try configuring the printer on another RS-232 port (if the printer is connected to an RS-232 port) and observe its performance on the new port. It may be that there is a problem with the port to which the printer was originally connected.

5. Run the Asynchronous Interface Test (ASITST) to test the port which appears to be faulty. Refer to the Data Communication Diagnosis section for details on how to run the ASITST.

Running the Self-test on Particular Printers

Brief descriptions of the self-test procedures for some of the printers supported on the HP 260 (at the time of printing of this handbook) are given in this sub-section.

The 2225D Self-test

The following procedure is used to start a printing self-test:

1. Power off the printer.
2. Depress and hold the line feed button while you power the printer on again.
3. Release the line feed button to start the self-test sequence.
4. To stop the self-test, simply power off the printer.
5. During the self-test, the printer should print a complete test pattern. If there are dots missing from this pattern or if the pattern is not printed at all, check the printhead and the connection of the carriage ribbon cable. Try replacing these if they appear to be faulty.
6. If you have reached this stage and the problem has not been solved, refer to the service manual for the 2225D, where a comprehensive troubleshooting guide is presented.

The 2563A Self-test

The self-test on the 2563A is run from the printer's control panel. The standard self-test executes a number of sub-tests which check the operation of specific sections of the printer hardware.

To start the standard self-test, use the following procedure:

1. Make sure that the 2563A is OFFLINE.
2. Press the TEST key on the control panel, then press the ENTER key.
3. If you wish to conduct a continuous self-test, press and hold the TEST key for 5 seconds, (release the key when the status display number changes to 4). Then press the ENTER key.
4. To exit a continuous self-test, press the TEST key.

Using the Error Log

The 2563A has an Error Log which can display a code for each of the last 9 error conditions (including the current error). To display these errors, use the following procedure:

1. Make sure that the 2563A is OFFLINE.
2. Press the CONFIG key and one of the FINE ADJ. keys simultaneously. Both decimal points on the display will illuminate, indicating that the printer is in CONFIGURATION mode.

3. Continue to press the CONFIG key and press one of the FINE ADJ. keys to either increase or decrease the display value until it reads 90.

4. Release the CONFIG key to display the error number of the current error. Note the error number and press either of the FINE ADJ. keys to display the fail code associated with the error. Note the fail code.

5. If you want to look at the earlier errors contained in the Error Log use the procedure given in the last 3 steps with the table below.

ERROR LOG CONTENT	FUNCTION CODE
Current Error	90
Previous Error	91
2nd Previous Error	92
3rd Previous Error	93
4th Previous Error	94
5th Previous Error	95
6th Previous Error	96
7th Previous Error	97
8th Previous Error	98

The usefulness of following the above procedure to obtain the error code numbers for the problems troubling the 2563A depends on how easy it is for you to obtain information from the 2563A service manual. That manual contains an explanation of and some suggested causes of each error code (there are too many for them to be listed here). If you have a copy of the service manual with you at the customer s site, you can obtain the explanation and suggested cause, and proceed from there to solve the problem.

If you do not have the service manual, but you know that there is a copy in your office, you can telephone a colleague there and readily obtain the necessary information. Even if you cannot obtain the further information about the error now, you can use the error codes that you have recorded to analyse the problem later.

NOTE

If a paper-out or platen/ribbon fault condition exists, the printing self-test will not be executed. Therefore, if you try to conduct a self-test and no printout appears, you should check for these 2 conditions. During self-test the status display on the control panel will flash.

The 2932A/2934A Self-test

To conduct the self-test on a 2932A or 2934A printer, press the TEST key on the operator panel on the front of the printer. If the self-test completes successfully, the message:

```
Self Test Passed
```

will be printed.

Test Mode on the 2932A/2934A Printer

The test mode provides several additional printer tests for use when the self-test has failed. The following tests are available:

- Mechanism Test
- Controller Test
- Interface Test
- Alignment Test
- Counters Test

Press the SELECT and the VIEW keys (on the operators panel) simultaneously to enter the test mode. The following menu prints:

```
MECHANISM | CONTROLLER | INTERFACE | ALIGNMENT | COUNTERS
```

Use the cursor keys on the operator's panel to move the print head under the test you want to perform. Then press the SELECT key.

Description of each test

MECHANISM

This test checks the print mechanism controller.

CONTROLLER

This test is similar to the self-test. However, it performs a test on the RAMs (not the NVRAM) that destroys all of the data in them. If the test is completed successfully, the message `Self Test Passed` is printed.

INTERFACE

This test checks the interface board inside the printer. For an HP-IB printer, the test is the writing and reading of the registers. A printer with an RS-232 interface will perform:

- Internal loopback
- Baud rate

- Byte configuration
- Interrupt testing

If the test is completed successfully, the message `Self Test Passed` is printed.

ALIGNMENT

This test allows you to align the printout of the printer by using a dot alignment pattern. Press the RESET key to stop the Alignment test.

NOTE

The three tests: MECHANISM, CONTROLLER and INTERFACE are once-only tests, and, at the end of each of them, the test mode is automatically exited. You must enter the test mode again to conduct another of the tests.

PLOTTER DIAGNOSIS

SECTION 27

DIAGNOSING PLOTTERS

This section gives the general procedure for the diagnosis of plotter problems and includes some limited information on the diagnosis of particular plotters. However, this section is not intended to take the place of the service manuals for the particular plotters. You may find it possible to correct the plotter problem without having access to the service manual (especially if the problem is related to the communication link or the configuration of the plotter on the HP 260).

General Diagnosis

1. Check the entire configuration of the plotter on the HP 260. This check includes:

    - Check all cables connecting the plotter to the HP 260.
    - Make sure that the baud rate setting and parity mode selection for the relevant port on the HP 260 are compatible with the baud rate setting and parity mode selection on the plotter.
    - Make sure that the ASI port or integrated port on the CPU is configured to the correct mode; that is RS-232, RS-422 or MODEM link. This configuration is checked through the CONFIG program by using a procedure which has not yet been defined.

2. Run the plotter's self-test. Refer to the specific plotter service manual for full details of the self-test procedure.

3. Run "TEST" or "CE" and select PLOTTER TEST to check the communication link between the plotter and the HP 260.

4. If the problem persists, try configuring the plotter on another RS-232 port (if the plotter is connected to an RS-232 port) and observe its performance on the new port. It may be that there is a problem with the port to which the plotter was originally connected.

5. Run the Asynchronous Interface Test (ASITST) to test the port which appears to be faulty. Refer to the Data Communication Diagnosis section for details on how to run the ASITST.

DATA ENTRY TERMINAL DIAGNOSIS

SECTION 28

DIAGNOSING DATA ENTRY TERMINALS

This section gives the general procedure for the diagnosis of data entry terminal problems. This section is not intended to take the place of the service manuals for the particular data entry terminals. You may find it possible to correct the data entry terminal problem without having access to the service manual (if the problem is related to the communication link or the configuration of the data entry terminal on the HP 260).

General Diagnosis

1. Check the entire configuration of the data entry terminal on the HP 260. This check includes:

   - Check all cables connecting the data entry terminal to the HP 260.
   - Make sure that the baud rate setting and parity mode selection for the relevant port on the HP 260 are compatible with the baud rate setting and parity mode selection on the data entry terminal.
   - Make sure that the ASI port or integrated port on the CPU is configured to the correct mode; that is RS-232, RS-422 or MODEM link. This configuration is checked through the CONFIG program by selecting the "Asynchronous Port Configuration" option, and proceeding in a manner that has not yet been defined.

2. Run the data entry terminal's self-test. Refer to the specific data entry terminal service manual for full details of the self-test procedure.
3. If the problem persists, try configuring the data entry terminal on another RS-232 port (if the data entry terminal is connected to an RS-232 port) and observe its performance on the new port. It may be that there is a problem with the port to which the data entry terminal was originally connected.
4. Run the Asynchronous Interface Test (ASITST) to test the port which appears to be faulty. Refer to the Data Communication Diagnosis section for details on how to run the ASITST.

BAR CODE READER DIAGNOSIS

SECTION 29

DIAGNOSING BAR CODE READERS

This section gives the general procedure for the diagnosis of bar code reader problems. This section is not intended to take the place of the service manuals for the particular bar code readers. You may find it possible to correct the bar code reader problem without having access to the service manual (if the problem is related to the communication link or the configuration of the bar code reader on the HP 260).

General Diagnosis

1. Check the entire configuration of the bar code reader on the HP 260. This check includes:

   - Check all cables connecting the bar code reader to the HP 260.

   - Make sure that the baud rate setting and parity mode selection for the relevant port on the HP 260 are compatible with the baud rate setting and parity mode selection on the bar code reader.

   - Make sure that the ASI port or integrated port on the CPU is configured to the correct mode; that is RS-232, RS-422 or MODEM link. This configuration is checked through the CONFIG program by selecting the "Asynchronous Port Configuration" option and using a procedure that has not yet been defined.

2. Run the bar code reader's self-test. Refer to the specific bar code reader service manual for full details of the self-test procedure, including the wand test using the bar code on the bottom of the reader.

3. Run "TEST" or "CE" and select BCRTST to check the communication link between the bar code reader and the HP 260.

4. If the problem persists, try configuring the bar code reader on another RS-232 port (if the bar code reader is connected to an RS-232 port) and observe its performance on the new port. It may be that there is a problem with the port to which the bar code reader was originally connected.

5. Run the Asynchronous Interface Test (ASITST) to test the port which appears to be faulty. Refer to the Data Communication Diagnosis section for details on how to run the ASITST.

SERVICE MATERIALS

SECTION **30**

EXCHANGE ASSEMBLIES

The following table lists the exchange assemblies for the HP 260 Series 30 and the HP 260 Series 40.

Exchange Assembly	**Exchange Part-#**	**New Part-#**
Processor Board (Series 30)	45070-69567	45070-66567
Processor Board (Series 40)	45072-69567	45072-66567
Memory Board (0. 5Mb)	45008-69501	45008-66501
HP-IB Board	45070-69507	45070-66507
Video Board	45128-69501	45128-66501
ASI Board	45127-69501	45127-66501
INP Board	45129-69501	45129-66501
Power Supply	0950-1760	

NOTE

The memory board in the above table is the first memory board that is added to slot #2 of the main box of the HP 260.

NON-EXCHANGE ASSEMBLIES

The following table lists the non-exchange assemblies for the HP 260 Series 30 and the HP 260 Series 40.

Assembly	**New Part-#**
Cover Assembly (Main box)	45070-0003
Door Power Supply	45070-0002
Backplane (Main box)	45070-66501
Backplane (Extender box)	45071-66501
Cover Assembly (Extender box)	45071-60002
Memory board (0. 5Mb)	45009-66501
Fan Plate	45070-00001
Fan Assembly (small)	45070-67901
Fan Assembly (large)	45070-67900
LED Cable Assembly	5180-0467
Cable-Battery Assembly	45070-61600
Cable 2xRS232	45127-61601

NOTE

The memory board in the above table is either the second or the third add-on memory board (in slot#2 of the main box).

FIELD REPLACEABLE COMPONENTS

The following table lists the field replaceable components for the HP 260 Series 30 and HP 260 Series 40.

Component Description	**New Part-#**
Front Cover	5041-2413
Battery	1420-0352
White Pushbutton	5041-1203
Power Switch Shaft	5041-2412

USEFUL TABLES

SECTION 31

This section contains several tables of information that you might find useful in various circumstances. The tables included are:

- B.08 DROM Table
- Unit Specifiers for Mass Storage Devices
- B.08 System Error Stack Interpretation
- File Copy Utilities Description

B.08 DROM Table

DROM Name	Function
EUROPE	Lexical Compares for European Characters
PACK	Pack and Unpack String Variables
IMAGE	Data Base Commands
SORT	Data Base Select and Sort
REPORT	Report Writer Statements
FORMS	Forms Interface Statements
TAPES	Cartridge Tape Drive Handler for LINUS and BUFFALO
TOOLS	Provides Supported Binaries in DROM Form
RIO	Workstation Interface
TIO	Terminal, Printer and HP 3000 Interface
TRACE	Program Trace Capability
TRIG	Trigonometric Functions (needed for plotters)
MATRIX	Contains Matrix Commands (needed for plotters)
SPOOL	Allows Print Files to be Dumped to Disc and Printed
CS260	Allows Synchronous Data Communications
MEDIA	Interface to IBM 3740 and HP Interchange Discs

B. 08 DROM Table (continued)

IMAGE2	Contains Predicate Locking Statements
TASK	Allows use of Background Tasks
IMAGEU	Contains Image Utilities
TIMER	Provides Real time Clock
PERFM	Allows OS to Process a Data File as User-supplied Input
CTRACE	Synchronous Trace Capability
VIO	Video Input/Output (needed for Video Workstations)
PTYPE	Interface to HP 2601/2,HP 2608 and HP 9871
UPDATE	Enhancement of Current OS (Bug Fixes)
PIO	PC Integration I/O and HP 2392A support
NET260	Provides Asynchronous Networking Between HP 260's
SYSRR	System Error Dump Facility
DCACHE	Provides Directory Cache Facility

Notes on B. 08 DROMs

- The TAPES, PTYPE, and PIO DROMs are new for B. 08.
- The HP-IB DROM is now (with B. 08) a binary. This makes it possible to use the code in test programs, particularly the CS 80-exerciser programs.
- The P2601, P2608 and the EUR71 DROMs are combined to form the PTYPE DROM.
- The COPY DROM is incorporated into the SPOOL DROM.
- The MEMSIZ DROM has been removed from the B. 08 set. This will not cause any problems, because the MEMSIZ function is performed by the STATUS binary.

File Copy Utilities Description

Utility	Description
FVBACK	Copies entire volume from a disc to a cartridge tape, or from a cartridge tape to a disc.
DUPL	Copies entire volume from one medium to another medium of the same type. For example, a 7945A disc can be duplicated to another 7945A disc. There is an indirect option to allow you to copy one cartridge tape to another using only one disc drive.
BACKUP	Copies specified list or group of files from a volume to a file of type BKUP on any other volume.
RECOVR	Recovers BKUP files to a disc. The destination volume can be of a different type to the source volume.
ROUTIL	This utility copies and purges run-only programs. It can also be used to convert ordinary programs to run-only programs.
XCOPY	This binary copies specified files of any type except SYST type files and DROM type files
DBSTORE	This binary copies an entire data base (or part of a data base) to a BKUP file
DBRESTORE	This binary restores a data base from a BKUP file to any disc
DBUNLD	This utility is used with the DBLOAD utility to restructure a data base or to recover data from a corrupt data base
DBLOAD	This utility is used with the DBUNLD utility to restructure a data base or to recover data from a corrupt data base

NOTE

Consult the "HP 260 Utilities Manual" for detailed explanations of these utilities and instructions for their use.

The COPY statement

The COPY statement is part of HP 260 BASIC and allows you to copy specified files of the following types:

- BKUP
- DATA
- PROG
- BPRG
- FORM
- KEYS

COPY **cannot** be used to copy the following file types:

- DROM
- SYST
- DSET
- ROOT
- OTHR

NOTE

Run-only programs (RO -type) can be copied only by using the ROUTIL program. Protected programs can only be copied if you know the protect code.

Unit Specifiers for Mass Storage Devices

This table lists the unit specifiers for each of the mass storage devices supported on the HP 260.

Device	Unit Specifier
7912P	S
7941/42A	T
7945/46A	U
7957/58A	V
9153B	N
9133H/L	M
Cartridge Tape Unit (including 9144A)	K
Microfloppy (3. 5 inch)	A

NOTE

If there are two mass storage devices with the same unit specifier connected to an HP 260, (for example two 7946As or one 7941A and one 7942A), the MSI command obeys an order of priority. The default mass storage device will be the device with the lowest HP-IB address. However, if one of the two devices is the device from which the Operating System was loaded the last time the HP 260 was powered on, this load-device will be the default mass storage device.

QUICK REFERENCE GUIDE TO ERRORS

Numbered Errors

Error number	Cause of Error
2	Memory overflow
18	Substring out of range or substring too long
52	Improper volume label or mass storage unit specifier
53	Improper file name
54	Duplicate file name
55	Directory overflow
56	File name is undefined
57	Attempt to use device of unknown type for mass storage
65	Incorrect data type
78	Possible volume label conflict (unexpected interrupt)
80	Mass storage device door open or medium has been removed
81	Mass storage device failure
82	Mass storage device not present
83	Mass storage device is write-protected
84	Record not found
85	Mass storage medium not initialized
86	Access not allowed to specified device
88	Read data error
89	Checkread error
90	Mass storage system error
97	Door opened (unexpected interrupt) - data files closed
98	Door opened (unexpected interrupt) - data lost
99	Locked door opened
142	Door open - spool operation aborted
160	Tape operation pending
161	Disc buffer pending
162	Buffer disc not ready
163	Tape door locked
164	Writing not allowed to tape until it is initialized
165	Self-test failure on disc
166	TAPES DROM not loaded
226	Corrupt data base - must recreate it (IMAGE)
227	Corrupt data base - must erase it in its entirety
240	Program lost due to disc failure (SORT)
1003	Cannot get exclusive acces to device
1004	Keyword not recognized by this operating system revision
1005	Memory overflow in common block
1010	Memory parity error

Power-on Messages

CONFIGURED DEFAULT MASS STORAGE DEVICE IS NOT PRESENT

DROM LOADER FAILURE WITH drom name; reason

HP-IB HANDSHAKE ABORT - LOAD FAILURE

Inn

IMAGE DROM NOT LOADED TO MAKE ROOM FOR PRINCIPAL WSTN (RIO/VIO/PIO)

INP CHANNEL #1 -- FAILED INTERNAL SELF-TEST

NO INP CONTROLLERS INSTALLED

VIDEO I/O NOT PRESENT CONFIGURED VIDEO CHANNEL 1 REMOVED PORT-1 HAS BEEN CONFIGURED AS WORKSTATION

VIDEO I/O NOT PRESENT, TASKS CONVERTED TO SECONDARIES

SECONDARY TASK n DOWN; NO MEMORY AVAILABLE

SYSTEM LOAD FAILURE

THE "SYSTEM" FILE WAS NOT FOUND

WORKSTATION ON PORT n DOWN; NO MEMORY AVAILABLE

WORKSTATION ON PORT n GIVEN EXTRA MEMORY

WORKSTATIONS DOWN; RIO OR PIO DROM NOT LOADED

HP-HIL ERROR ON CHANNEL #

SYSTEM LOAD FAILURE - UNABLE TO LOAD TAPES DROM

NO RESPONSE TO SYSTEM SELF-TEST FROM WORKSTATION ON PORT #

PORTS DOWN; TIO DROM NOT LOADED

SYSTEM LOAD FAILURE - UNABLE TO LOAD VIO DROM

LESS MEMORY FOUND THAN CONFIGURED

LOADER ERRORS

Here is a list of the Loader Errors for B.08.

LOADER ERROR A	Checksum error
LOADER ERROR B	Disc read error
LOADER ERROR C	Checkread error
LOADER ERROR E	Interface error
LOADER ERROR F	Disc or system error

SERIAL CONFIGURATION TABLE

Device	Class	Type	Format	Speed	DROMs	Remarks
Printers						
HP 2225x	Printer	2225	8N1	9600	TIO	
HP 2563A/B	Printer	2563	8N1	9600	TIO	
HP 2603A	Printer	2603	8N1	9600	TIO	
HP 2686A	Printer	268x	8N1	9600	TIO	
HP 2932A	Printer	293x	8N1	9600	TIO	
HP 2934A	Printer	293x	8N1	9600	TIO	
Plotters						
HP 7440A	Terminal	26xx	8N1	9600	TIO	Not on Ports -1, -2
HP 7475A	Terminal	26xx	8N1	9600	TIO	Not on Ports -1, -2
HP 7550A	Terminal	26xx	8N1	9600	TIO	Not on Ports -1, -2
Workstations						
HP 2392A	Workstn	2392	8N1	19200	PIO	
HP 150	Workstn	2392	8N1	19200	PIO	
HP 110 Portable Plus	Workstn	2392	8N1	19200	PIO	Need REFLECTION 1
HP Vectra	Workstn	2392	8N1	19200	PIO	Need AdvanceLink 2392
IBM PC, PC AT, PC XT	Workstn	2392	8N1	19200	PIO	Need AdvanceLink 2392
Data Entry Terminal						
HP 3081A	Terminal	26xx	8N1	2400	TIO	Not on Ports -1, -2
Other Devices						
HP 39800A Bar Code	Terminal	26xx	7O1	9600	TIO	Not on Ports -1, -2
HP 2334A Multimux						

NOTE

The baud rates listed here are for direct serial communication (RS-232-C or RS-422). If modems are used then, refer to the modem documentation for the recommended speed.

The HP 2392A and the Personal Computers can also operate as terminals. The configuration values for these devices when operating as terminals are as listed above except that (1) the **Class** is "Terminal", not "Workstn" and (2) terminals require the TIO DROM, not the PIO DROM.

Direct or Modem Communication

If you use direct serial communication (RS-232-C or RS-422) no additional configuration is necessary. If you use modems between your HP 260 and a peripheral, then you must tell the HP 260 what type of modem you use. The modem types, and the abbreviation used in the the CONFIG utility field labeled **SwConf** are listed below.

Modem Type	"SwConf" Value
Switched European	MSwEU
Leased European	MLeHi
Switched U.S.	MSwUS
Leased U.S.	MLeLo

If you use modems, you must also obtain the baud rate from the modem documentation. Both the HP 260 and the peripheral must be set to communicate at this baud rate.

HP 260 RS-232C CONNECTOR PIN DEFINITIONS

Here are the definitions of the pins used in the connection of devices to the ASI board ports and the integrated serial ports of the HP 260.

Connector Pin#	Port ID	Function	RS-232-C Characteristics	RS-422 Characteristics
1	AaI	Protective Ground	SHIELD GROUND	SHIELD GROUND
2	AaI	Received Data	INPUT	DIFFERENTIAL INPUT 1
3	AaI	Transmitted Data	OUTPUT	
4	A I	Request To Send	OUTPUT	
5	A I	Clear To Send	INPUT	
6	A I	Data Terminal Ready	OUTPUT	
7	AaI	Signal Ground	SIGNAL GROUND	SIGNAL GROUND
8	A I	Data Carrier Detected	INPUT	
9	Aa	Send Data		DIFFERENTIAL OUTPUT 1
10	Aa	Send Data		DIFFERENTIAL OUTPUT 2
18	Aa	Receive Data		DIFFERENTIAL INPUT 2
20	A I	Data Set Ready	INPUT	
23	A I	Data Rate Select	OUTPUT	

Notes on the above Table

- All of the other pins on the standard, 25-pin connector are unused.
- The port ID A refers to ASI ports 1,2,3,6,7,8.
- The port ID a refers to ASI ports 4,5,9,10
- The port ID I refers to the integrated SPU ports -1,-2.
- RS-422 signals are not available on integrated ports.
- Communication via modem is not available on ASI ports 4,5,9,10.

PERIPHERALS SUPPORT LIST FOR B.08

The following tables list the set of peripherals supported on the HP 260 (Part Number 45070A/45072A) running the B.08 Operating System. This support list is complete and accurate for the release date of the B.08 Operating System. For current, up-to-date information, refer to the latest support bulletin or other field communication document.

WORKSTATIONS

Product	I/O	Comments
HP 45263D	V	1
HP 150A/B	S	2,3,4
HP 150II	S	1,2,4
HP 2392A	S(4)	2,5
HP Vectra	S	1,2,6
HP Portable Plus	S	7

Comment Key

1. HP 92916A bar code reader connection supported

2. HP 2225D (Thinkjet), HP 2686A (Laserjet), HP 2932/34A printers will work as local printers. Other printers might work.

3. HP 150A/B integral printer is not supported.

4. File transfer requires AdvanceLink Version A.03.02 or later. Workstation operation does not require AdvanceLink.

5. HP 92915A bar code reader connection supported.

6. Workstation operation requires AdvanceLink 2392 Version A.05.04 or later.

7. Workstation operation requires Reflection 1 software.

MISCELLANEOUS ASYNCHRONOUS DEVICES

Product	I/O	Comments
HP 3081A	S	1,2
HP 39800A	S	1
HP 150A/B	S	1
HP 150II	S	1
HP 2392A	S	1
HP Vectra	S	1,3
HP Portable Plus	S	1,4
HP 2334A	S	1,5

Comment Key

1. Cannot be connected to the integrated serial ports of the HP 260.

2. Must be connected to the HP 260 via the HP 92922A 4-channel adaptor or the HP 92923A 1-channel adaptor.

3. AdvanceLink 2392 must be running on the HP Vectra (Version A.05.04 or later).

4. Reflection 1 must be running on the HP Portable Plus.

5. The HP 2334A Packet Assembly/Disassembly Facility (PAD) is supported for the connection of the HP 2392A, HP 150, HP Vectra, HP Portable Plus to the HP 260 over an X.25 communication link.

MASS STORAGE DEVICES

Product	I/O
HP 7912P	HP-IB
HP 7941A	HP-IB
HP 7942A	HP-IB
HP 7945A	HP-IB
HP 7946A	HP-IB
HP 7957A	HP-IB
HP 7958A	HP-IB
HP 9133H	HP-IB
HP 9134H	HP-IB
HP 9133L	HP-IB
HP 9134L	HP-IB
HP 9153B	HP-IB
HP 9154B	HP-IB
HP 9144A	HP-IB

NOTE

All of these devices are supported as OS load devices. Therefore, if there is a SYSTEM type file on the device, you can load the operating system from it.

PRINTERS

Product	I/O
HP 2225D (Thinkjet)	S
HP 2563A/B	HP-IB/S
HP 2603A	S
HP 2686A/B (Laserjet)	S(4)
HP 2932A	S(4)
HP 2934A	HP-IB/S(4)

PLOTTERS

Product	I/O
HP 7475A (6-pen)	S
HP 7550A (8-pen)	S
HP 7440A (8-pen) (ColorPro)	S

I/O Key

S	Asynchronous Serial Communication (RS-232C only)
S(4)	RS-232C and RS-422 protocols supported
HP-IB	Hewlett-Packard Interface Bus

OS MODULE ADDRESSES FOR B.07 OPERATING SYSTEM

The following tables give the starting address of each of the system modules of the B.07 operating system. There are separate tables for the lower system block and the upper system block.

NOTE

B.07 is not the current version of the operating system. The current version is B.08. Refer to the section of this handbook titled "Memory Organization" for the module addresses of B.08.

LOWER SYSTEM BLOCK

MODULE NAME	START ADDRESS
KEYWRD	1002
STMT	5646
COMMD	6616
NEWST	7743
SYNTAX	12107
PROGINT	16756
DISPLY	21031
CHAR	24005
LINE	25662
CRTHND	27762
CURSOR	31413
OUTHND	31445
OSUTIL	32167
LDISC	33026
PDISC	37711
LINUS	43631
SUPER	47777
CONTRL	52531
SYSSRM	54603
IOSUP	55271
LISTER	61270
QMATH	62722
UPPER	67072
LOMEM	67144
HIMEM	72166
MESSAGE	76307
REDIM	76477
OBP2	76730
KEYTBLS	77172
OBP	77676

UPPER SYSTEM BLOCK

MODULE NAME	START ADDRESS
SAVEAREA	130477
STRUCT	130567
INPUT	132061
OSUTIL2	133631
COMMD2	134111
OUTHND2	134671
STMT2	136634
CURSOR2	137434
HIMEM2	142714
NEWST2	143354
UPPER2	144414
MMTYP	145664
SUBPG	146261
MMPRNT	152167
MMSAVE	156543
BOTH	162556
PRINT	170116
ENDCODE	175223
VIOSTAT	175236
UNUSED	175252
SFTAB	175510

DROM SIZES ON THE B.07 OPERATING SYSTEM

The following table gives the size of each of the DROMs on Operating System B.07. Note that the sizes are given in decimal number of bytes.

DROM	SIZE
EUROPE	970
PACK	1360
IMAGE	17302
SORT	6736
REPORT	6586
FORMS	1190
EUR71	392
TOOLS	10406
RIO	4618
TIO	5300
TRACE	1914
P2608	1570
TRIG	1322
MATRIX	5116
SPOOL	2442
CS250	12980
MEDIA	10224
IMAGE2	3268
TASK	3896
COPY	682
IMAGEU	3556
TIMER	1516
PERFM	3376
CTRACE	1790
VIO	5694
P2601	1064
NET250	1008
SYSRR	4708
DCACHE	660

NOTE

The size of the EUROPE DROM depends on the primary keyboard language configuration. The size given in the table above is for a US primary keyboard configuration.

The DROM sizes for the B.08 Operating System are given in the section of this handbook titled "MEMORY ORGANIZATION".

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INFORMATION SHEET

THIS PAGE IS NOT PART OF THE HANDBOOK. IT IS AN INFORMATION SHEET FOR HP 260 CEs.

Future Edition of The HP 260 CE Handbook

This edition of the HP 260 CE Handbook (March 1987) is a preliminary edition. There will be another new edition of the CE Handbook later in 1987 (currently planned for July/August). The July/August edition will contain the details of the new CE tools-package for the B. 08 Operating System.

Comments and Suggestions

Your comments and suggestions about the CE Handbook are very welcome, because they help us to improve the quality of the handbook. Please send all HPDESK mail regarding the CE Handbook to:

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