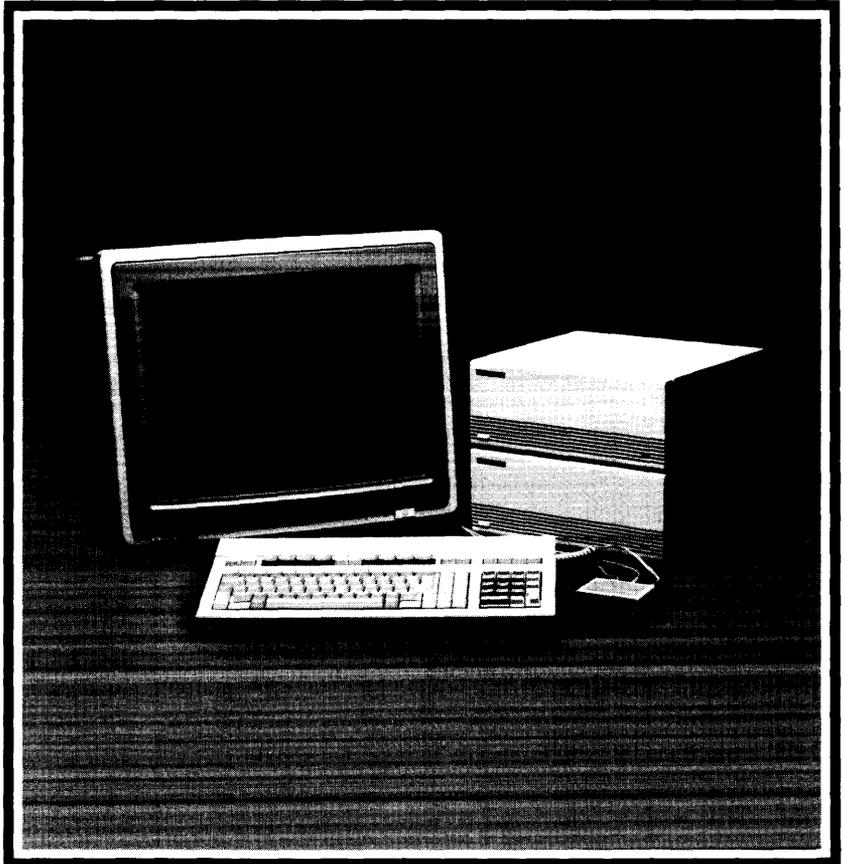


HP 9000 Series 300/500 Computers



HP 98700H CE Handbook



HP 98700H CE Handbook

for HP 9000 Series 300/500 Computers

Manual Reorder No. 98700-90039

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Hewlett-Packard Company

3404 East Harmony Road, Fort Collins, Colorado 80525

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Printing History

New editions of this manual will incorporate all material updated since the previous edition. Update packages may be issued between editions and contain replacement and additional pages to be merged into the manual by the user. Each updated page will be indicated by a revision date at the bottom of the page. A vertical bar in the margin indicates the changes on each page. Note that pages which are rearranged due to changes on a previous page are not considered revised.

The manual printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

August 1985...Edition 1

Product Description

1

HP 98700H Specifications

Table 1-1. HP 98700H Specifications

	Device		
	HP 98700X	HP 98710A	HP 98782A
Power Requirements			
Power line freq.	48 thru 66 Hz.	48 thru 66 Hz.	48 Thru 66 Hz.
Switch sel. Volts	90 thru 125Vac. 195 thru 250Vac.	90 thru 125Vac. 195 thru 250Vac.	90 thru 125Vac. 195 thru 250Vac.
Power Consumption	130 Watts max.	130 Watts max.	220 Watts max.
Heat Dissipation	450 B.T.U./hr.	450 B.T.U./hr.	750 B.T.U./hr.
Environmental			
Operating Temp	0° thru 55°C 32 thru 131 F	0° thru 55°C 32 thru 131 F	10 thru 40 C 50 thru 104 F
Ambient Humidity	5 thru 90% rh.	5 thru 90% rh.	5 thru 90% rh.
Physical			
Height	132 mm 5.2 inches	132 mm 5.2 inches	449 mm 17.7 inches
Width	325 mm 12.8 inches	325 mm 12.8 inches	496 mm 19.5 inches
Depth	285 mm 11.2 inches	285 mm 11.2 inches	596 mm 23.5 inches
Cube	.012 m ³ .43 ft ³	.012 m ³ .43 ft ³	
Weight	6.9 Kg 15.2 lb.	6.9 Kg 15.2 lb	41 Kg 90 lb

HP-HIL Power Loading

HP-HIL, the Hewlett-Packard Human Interface Loop is the HP standard for interfacing terminals, workstations, and personal computers to their human-input devices. HP-HIL provides a simple, asynchronous serial communication protocol that enables the user to select a set of input devices, connect them to a computer product, and work with any application program with ease.

HP-HIL used with the HP 98700 is limited to seven devices on one Loop, and the power available is 12 watts (+12 volts at 0.5 Amp). **Do not exceed this value.** To assist you in determining if the devices you want to use will overload the Loop or not, here is a table listing the individual device power requirements:

Table 1-2. HP-HIL Device Power Requirements

Product No.	Description	Current	Power
46020A	Keyboard	100 ma	1.2 Watts
46060A	Mouse	200 ma	2.4
46080A	Extension Module	25 ma	0.3
46081A	3 metre Ext./Audio	25 ma	0.3
46082A	15 metre Ext./Audio/Video	50 ma	0.6
46082B	30 metre Ext./Audio/Video	50 ma	0.6
46083A	Knob box	110 ma	1.32
46086A	Button Box	80 ma	0.96
46087A	"A" Size Digitizer	200 ma	2.4
46088A	"B" Size Digitizer	200 ma	2.4
46089A	4-Button Cursor	-	-

As stated above the Loop is limited to seven devices. Another restriction is the length of cable between each device. Maximum distance is 2.4 metres, device to device, with a total of 21 metres maximum. This does not include the 15 metre and 30 metre extension options that are available. Overloading the Loop will result in a blown fuse on the Loop interface circuitry. The troubleshooting procedure is to replace the assembly that contains the Loop interface circuitry and then, before restoring power to the system, refigure the power loading on the Loop. If the loading is too high, the Loop will have to be unloaded by removing devices until the power loading is in the proper range.

Documentation

Documentation for the HP 98700H is contained in four documents:

98700-90001	Installation Guide for the graphics display station.
98700-90030	Hardware Support Document for the graphics display station.
98700-90039	CE Handbook Insert for the graphics display station..
98782-90001	Installation Guide for the monitor.
98782-90030	Hardware Support Document for the monitor.
98782-90039	CE Handbook Insert for the monitor.
97089-90039	HP-UX CE Handbook, Series 500.
98680-90039	HP-UX CE Handbook, Series 200.

Other documents that will be helpful are the installation and hardware support documents for the computer system the HP 98700H is a part of.

Notes

Environmental/Installation/ Preventive Maintenance

2

Introduction

	HP 98700X	Device HP 98710A	HP 98782A
Environmental			
Operating Temp	0° thru 55°C 32 thru 131 F	0° thru 55°C 32 thru 131 F	10 thru 40 C 50 thru 104 F
Ambient Humidity	5 thru 90% rh.	5 thru 90% rh.	5 thru 90% rh.
Physical			
Height	132 mm 5.2 inches	132 mm 5.2 inches	449 mm 17.7 inches
Width	325 mm 12.8 inches	325 mm 12.8 inches	496 mm 19.5 inches
Depth	285 mm 11.2 inches	285 mm 11.2 inches	596 mm 23.5 inches
Cube	.012 m ³ .43 ft ³	.012 m ³ .43 ft ³	
Weight	6.9 Kg 15.2 lb.	6.9 Kg 15.2 lb	41 Kg 90 lb

Site Preparation

Refer to the HP 9000 Series 200/300/500 Site Preparation Document, part number 09000-90041, to assist you in preparing for the installation of the HP 98700H Graphics Display Station. Refer to the lists in Chapter 1 for specific power and environmental requirements.

Cable Restrictions

RGB Cables

There are two styles of RGB cables supported with the display station:

- A single, three metre cable with three shielded conductors. Each conductor is color coded for RGB and terminated with BNC connectors.
- A set of three co-ax cables with BNC connectors. One for each color. There is no real limitation on the length of the cables other than loading. Due to this loading, the maximum supported length is 30 metres. Two lengths are available from Hewlett-Packard, 15 metres and 30 metres.

Series 300 I/O Interconnect Cable

The Series 300 interconnect cable connects the Model 310/320 to the HP 98700. The cable connector key projects outward near the top from each end of the connector shell. Ensure that this is UP when connecting to the I/O card or the HP 98700.

Series 500 Display Station Buffer Interconnect Cable

The Display Station Buffer Interconnect cable (p/n HP 98700-61583) connects the Model 550 to the HP 98700. The interconnect cable is installed by an HP Customer Engineer or HP trained engineer.

The HP 98700 end of the cable is installed with the keys on the connector in the top position. The cabinet connector has two slots on the sides of its shell to accept the keys on the cable connector.

HP-HIL Cables

HP-HIL is limited to seven devices on one loop, and the power available is 12 watts (+12 volts at 1 Amp). **Do not exceed this value.** Another restriction is the length of cable between each device. Maximum distance is 2.4 metres, device to device, with a total of 16.8 metres maximum. This does not include the 15 metre and 30 metre extension options that are available.

Power Cables

The power cord shipped with your graphics display station should be the appropriate one for your location. (See the diagram below that pictures the different power cord options.) If your power cord needs replacement, refer to the diagram and order an exact replacement.



Country	Part Number	Opt.	Voltage
Australia	8120-1369	901	250V, 6A
Denmark	8120-2956	912	250V, 6A
Europe	8120-1689	902	250V, 6A
Great Britain	8120-1351	900	250V, 6A
South Africa	8120-4211	917	250V, 10A
Switzerland	8120-2104	906	250V, 6A
United States	8120-1378	903	120V, 10A

Power cords supplied by HP have polarities matched to the power-input socket on the computer:

- L = Line or Active Conductor (also called "live" or "hot")
- N = Neutral or Identified Conductor
- E = Earth or Safety Ground

NOTE: Plugs are viewed from connector end. Shape of molded plug may vary within country.

Figure 2-1. Power Cord Options

Line Voltage and Fuse Selection

CAUTION

BE SURE THE LINE VOLTAGE SELECT SWITCH IS SET CORRECTLY BEFORE CONNECTING THE POWER CORD. IF THE SWITCH IS SET FOR 95-125 VOLTS AND THE POWER SOURCE IS 195-250 VOLTS, SERIOUS EQUIPMENT DAMAGE WILL RESULT.

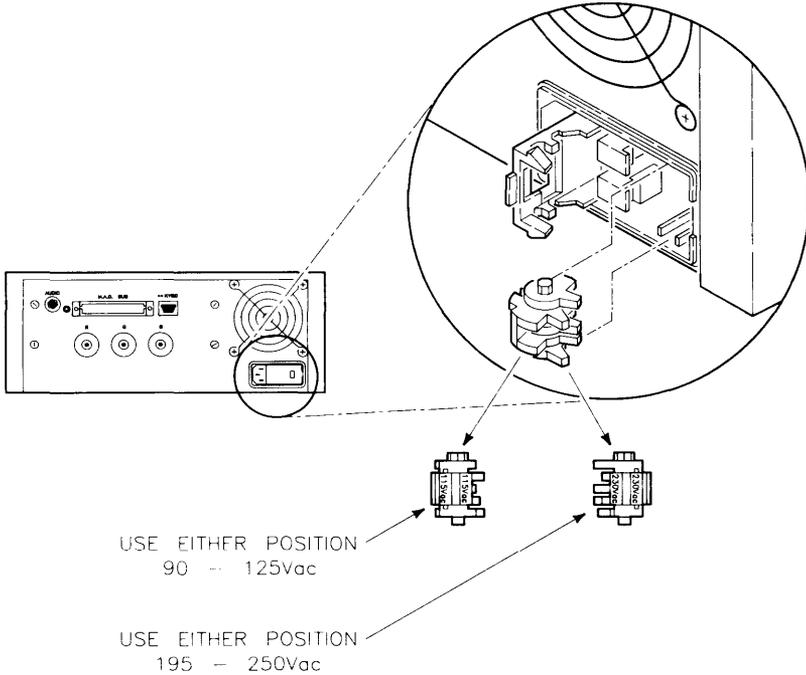


Figure 2-2. Line Voltage Switch Settings

WARNING

BEFORE REMOVING THE FUSE HOLDER CAP TO CHECK OR CHANGE THE FUSE, BE SURE THAT ALL POWER IS DISCONNECTED FROM THE GRAPHICS DISPLAY STATION.

CAUTION

REPLACEMENT FUSES MUST BE RATED FOR 250 VOLTS, AND MUST NOT EXCEED THE CURRENT RATING INDICATED ON THE REAR PANEL. OTHERWISE EQUIPMENT DAMAGE OR FIRE WILL RESULT.

Installation

The HP 98700H Graphics Display Station may be installed as part of a new computer system, or it may be installed as an enhancement to an existing system. In either case the computer must be installed and its performance verified first. Follow the instructions in the computer's *Installation Guide*, and accomplish the self tests. When the computer and its required memory and peripherals are known to be working properly, then proceed with the display station installation.

Required Tools

Installation of the display station does not require special tools. However, here is a list of tools that will be useful:

- Pozidrive[™] screwdriver, number 1, 3 inches long.
- Pozidrive[™] screwdriver, number 2, 4 inches long.
- Antistatic Workstation HP part number 9300-0933.

Connecting the HP 98710A

1. Ensure that the HP 98700 is disconnected from its power source.
2. Remove the cover plate on the front bottom of the HP 98700 and place it in the storage position provided. Plate must be installed over the connector for the HP 98700 to operate by itself. See figure 3-1.
3. Move the locking mechanism on top of the HP 98710A to the rear.
4. Set the HP 98700 on top of the HP 98710A, ensuring that the guide pins enter the guide pin sockets.
5. Gently but firmly press the HP 98700 down until the connector engages and seats.
6. Slide the locking mechanism forward to lock the two together.

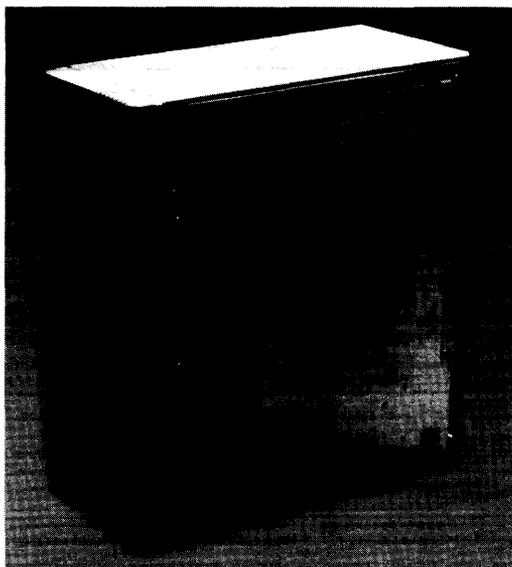


Figure 2-4. Removing the Cover Plate

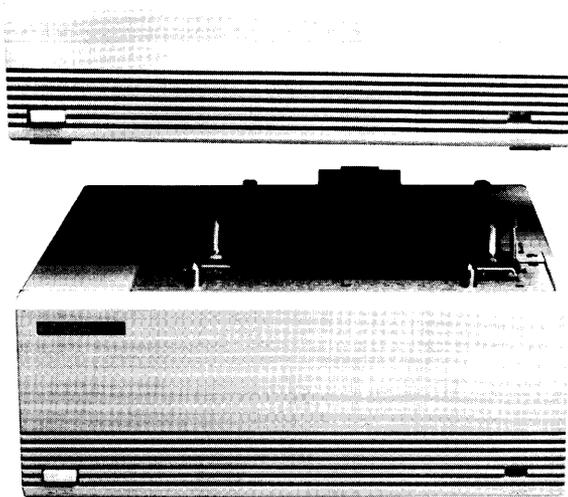


Figure 2-5. Connecting the HP 98700 to the HP 98710A

Series 300 Installation

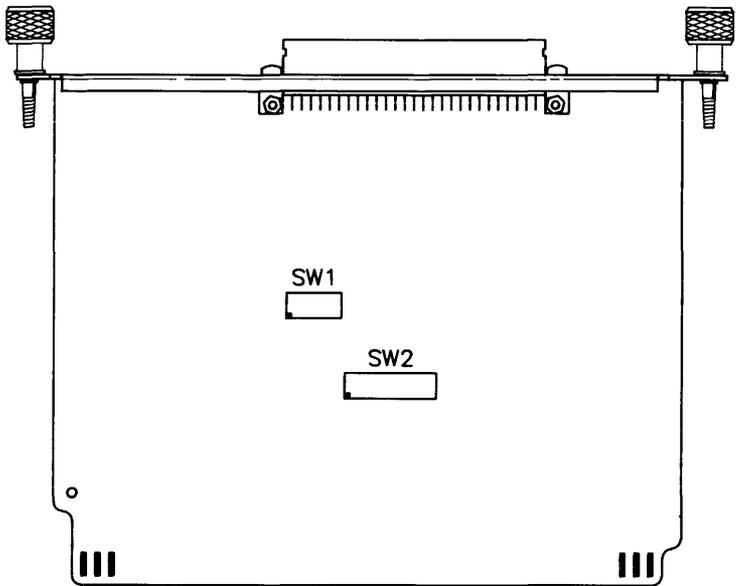


Figure 2-6. Series 300 I/O Card

CAUTION

THE ELECTRONIC ASSEMBLIES IN THE INTERFACE ARE SUSCEPTIBLE TO DAMAGE BY ELECTRO-STATIC DISCHARGE. EXTREME CARE MUST BE OBSERVED WHEN HANDLING PRINTED CIRCUIT ASSEMBLIES. USE AN ANTI-STATIC WORKSTATION.

Carefully remove the HP 98287A I/O card from its protective bag.

There are two switches on the I/O card used to set the locations that the HP Human Interface LOOP (HP-HIL) and the HP 98700 will respond to. Switch 1 is a five section switch that sets the select code of the HP 98700 HP-HIL. Switch 2 is an eight section switch that sets the location of the HP 98700 control space and frame buffer. For switch location see Figure 3-5.

Pascal and BASIC operating systems will not support HP-HIL through the HP 98700H. HP-HIL must be installed through the HP-HIL connector in the rear panel of the Series 300 computer. Refer to the *Installation Guide* for your computer for details.

1. Set the switches as desired. See Figure 2-7.

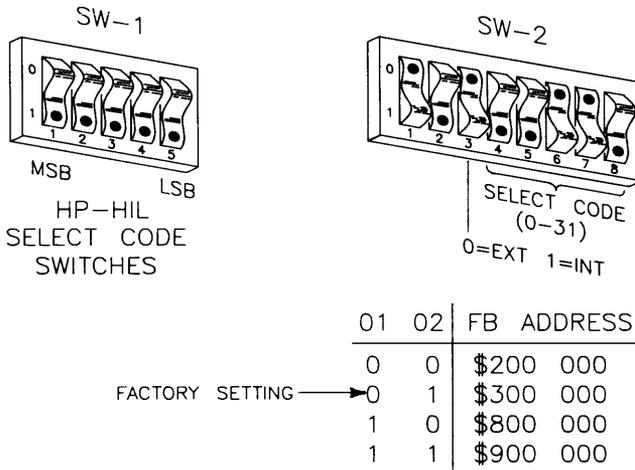


Figure 2-7. Setting the Switches

2. Install the I/O card in any DIO slot in the backplane of the computer or any slot in the expander. Ensure that it is fully seated.
3. Connect the interconnect cable to the I/O card connector. The cable connector key projects outward near the top from each end of the connector shell. Ensure that this is UP when connecting to the I/O card or the HP 98700.

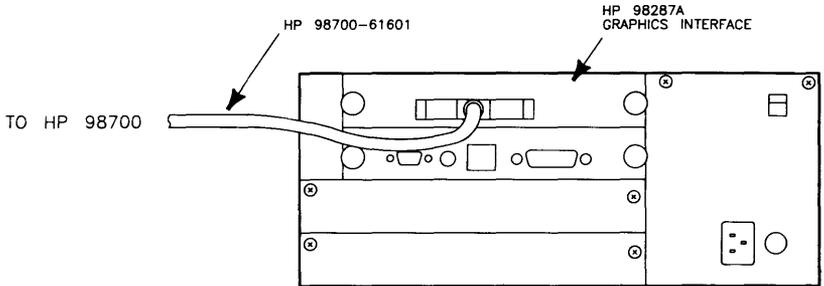


Figure 2-9. Connecting the I/O Interconnect Cable

4. Connect the other end of the cable to the HP 98700.

Continue with the section "Installing the HP-HIL Accessories".

Series 500 Installation

CAUTION

THE ELECTRONIC ASSEMBLIES IN THE DISPLAY STATION ARE SUSCEPTIBLE TO DAMAGE BY ELECTRO-STATIC DISCHARGE. EXTREME CARE MUST BE OBSERVED WHEN HANDLING PRINTED CIRCUIT ASSEMBLIES. USE AN ANTI-STATIC WORKSTATION.

The HP 98288A Display Station Buffer card is installed into the Processor Stack area of the Series 500 Model 550 computer. There are 12 card slots in the processor stack area. The DSB's must be installed in slots 4 through 7 only and the first DSB must be in slot 4. Slots 1 through 12 contain in order;

- 1 contains the CPU
- 2 contains the IOP
- 3 contains RAM
- 4 thru 7 contains either DSB or RAM.
- 8 thru 12 contains RAM.

The processor stack configuration must be contiguous (that is, no empty slots between cards).

There are no configuration switches on the DSB card.

The 98700-61583 interconnect cable is connected to the DSB card, dressed through one of the cable separator slots at the rear of the Model 550 computer, and the Model 550 cover is closed. The other end of the interconnect cable is attached to the HP 98700.

Installing the HP-HIL Accessories

The human interface to the Series 300/500 computer system is through the HP-HIL of the HP 98700. Ensure that you do not exceed 1 000 ma total current on the HP-HIL loop. In any case, HP-HIL will address no more than seven devices on one loop.

CAUTION

HP-HIL SUPPORTS UP TO 12 WATTS, ON THE LOOP. IF THE LOOP IS OVERLOADED, THE LOOP MAY FAIL DUE TO AN OPEN FUSE IN THE HP-HIL CIRCUITRY.

Pascal and BASIC operating systems will not support HP-HIL through the HP 98700H. HP-HIL must be installed through the HP-HIL connector in the rear panel of the Series 300 computer. Refer to the *Installation Guide* for your computer for details.

HP 46081A HP-HIL Extension/Audio Module

The HP-HIL Extension/Audio Module consists of three items:

- The module box
- A 2.4 metre (8-foot) HP-HIL cable
- A 2.4 metre (8-foot) audio cable

Installing the Module

Select a location for the module, install the Dual Lock fastener pad and attach the module to the pad.

Connecting the HP-HIL Extension/Audio Module

CAUTION

THE HP-HIL CABLES ARE NOT END FOR END INTERCHANGEABLE. THE END MARKED WITH TWO DOTS MUST BE CONNECTED INTO A CONNECTOR WITH THE SAME NUMBER OF DOTS. EQUIPMENT DAMAGE WILL RESULT IF THIS PRECAUTION IS NOT FOLLOWED.

To install the HP-HIL Extension/Audio Module, follow this procedure:

1. Ensure that the system has power removed.
2. Plug the one-dot end of the HP-HIL interconnect cable into the one-dot connector on the extension module.
3. Plug the two-dot end of the cable into the two-dot, HP-HIL connector on rear panel of the HP 98700.
4. Plug the one-dot end of the coiled HP-HIL keyboard cable into the one-dot connector on the rear of the keyboard.
5. Plug the two-dot end of the cable into the two-dot connector on the HP-HIL Extension/Audio Module.

6. Finally, Connect the furnished audio cable between the HP-HIL Extension/Audio Module and the audio connector near the HP-HIL connector on the rear panel of the HP98700. The ends of the audio cable are interchangeable.

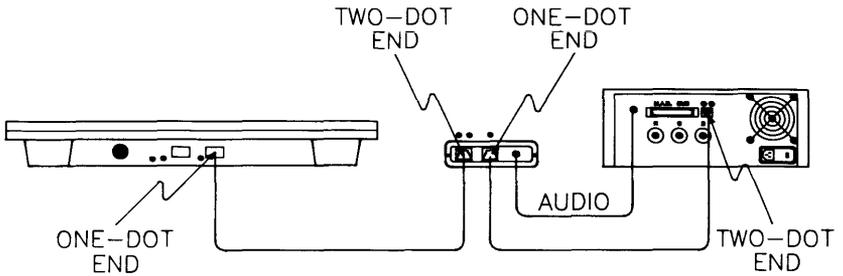


Figure 2-10. Connecting the HP-HIL Extension/Audio Module and Keyboard

The Extension Module and Keyboard are now ready for use.

Installing the HP 98701A

1. Remove the top cover by loosening the two screws at the lower rear of the back panel. Lift the rear of the cover and slide to the rear until clear of the front panel. Carefully set the top cover aside.
2. Loosen the four captive screws all the way.
3. Remove the two flathead screws near the top sides of the rear panel.
4. Swing the rear panel down to gain access to the card cage.
5. Remove the Color Map card from the bottom slot.
6. Remove the HP 98701A from its protective bag and insert it into the card slot above the color map card (the second slot from the bottom).
7. Reinstall the Color Map card in the bottom slot
8. Swing the rear panel up and secure it with the four captive screws.
9. Install the two flathead screws that secure the rear panel to the side frames.
10. Install the top cover and secure it with the two round head screws removed in step 1.

Turn On Procedure.

CAUTION

SHOULD A SINGLE, BRIGHT, HORIZONTAL LINE APPEAR ACROSS THE CENTER OF THE CRT, IMMEDIATELY TURN THE MONITOR OFF TO AVOID DAMAGE. THEN CONTACT YOUR HP SALES AND SERVICE OFFICE FOR SERVICE ASSISTANCE.

First, turn the HP 98700H ON. Wait ten seconds and then turn the rest of the system ON. If the HP 98700H is turned ON last it may reset the system and possibly result in a system error. The power lights should light up and the monitor should display information after a few seconds. You can be assured the system is at least operational if:

1. You turn-on all parts of the system and the power-on indicators light.
2. After a few seconds wait, the monitor starts displaying information.
3. Your system loads and runs an operating system and/or demo program.

Where to Go Next

After the HP 98700H is installed and you are assured that it is functioning properly, load the HP-UX Operating System. Refer to the *HP-UX System Administrator Manual* for information and procedures for installing the HP-UX Operating System.

Configuration

3

HP 98700H Series 300 Interface

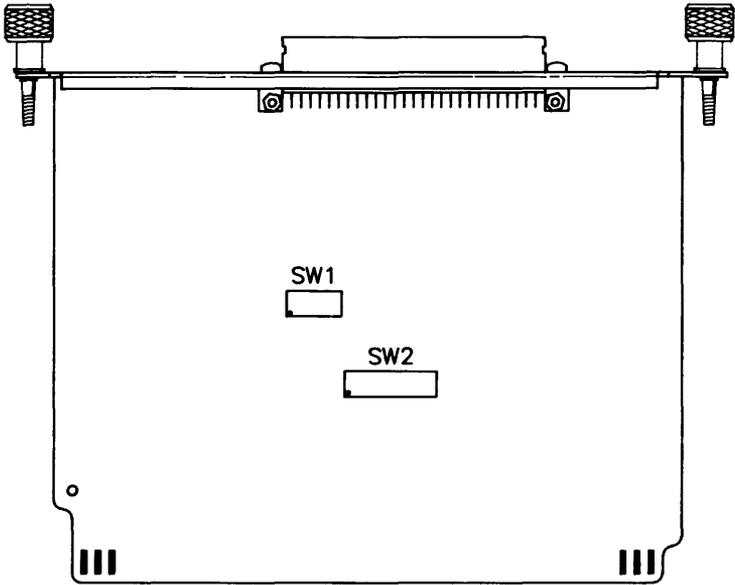


Figure 3-1. Series 300 Interface Card

There are two switches (Sw-1 and Sw-2) on the I/O card. These switches set the select codes for the HP-HIL interface of the HP 98700 and for the frame buffer RAM control space of the HP 98700. Switch 1 is a five section switch that sets the HP-HIL. Switch 2 is an eight section switch that sets the location of the HP 98700 control space and frame buffer.

Sw-1 sets the external select code (0 to 31. Note: Select Codes 0-7 are reserved for internals, and Select Code 9 is for RS-232.) that the HP-HIL of the HP 98700 will respond to. Sw-1, 1 is the *msb* and the Sw-1, 5 is *lsb*. Pushing a switch towards the back plate sets the bit to 0, pushing it away from the back plate sets the bit to 1. Factory setting is Select Code 31.

Sw-2 sets the HP 98700 control space select code and the frame buffer address. The Sw-2, 1 and 2 set the start address of the 1M byte frame buffer as shown in Figure 3-2. Factory setting is address *hex*300 000 and should be left at this address. The Sw-2, 3 selects whether the HP 98700 control space is at internal address *hex*560000 or at an external select code as set by Sw-2, 4 through 8. If Sw-2, 3 is a 1, the HP 98700 is set to internal address. If Sw-2, 3 is a 0, the HP 98700 is set to an external select code. Factory setting for Sw-2, 3 is external and Sw-2, 4-8 is Select Code 25.

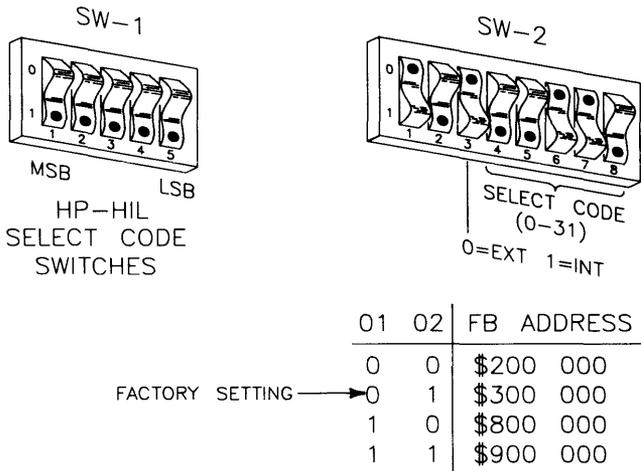


Figure 3-2. Setting the Switches

3. Install the I/O card in any DIO slot in the computer or any slot of the expander. Ensure that it is fully seated.

As with all DIO cards, no two select codes may be the same. If a hard test card is installed, the frame buffer can not be set at *hex*800 000. Note that only 6M bytes of system RAM may be installed if the frame buffer is set to *hex*900 000.

HP 98700H Series 500 Display Station Buffer

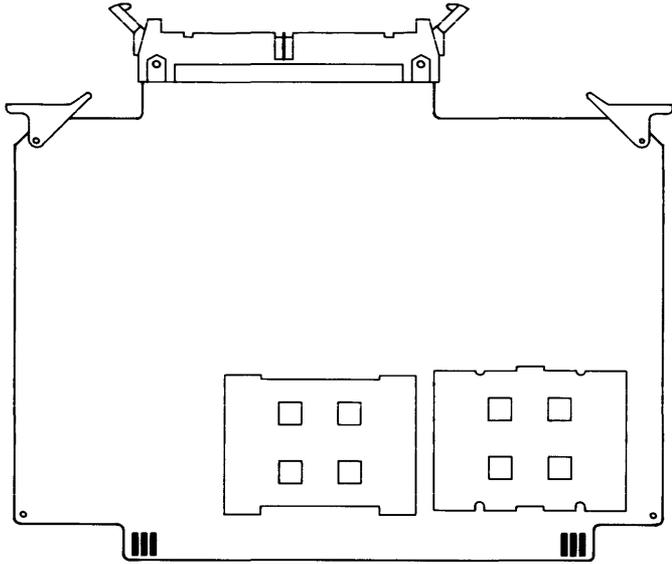


Figure 3-3. Series 500 Display Station Buffer

The Series 500 Display Station Buffer (DSB) card is installed into the Processor Stack area of the Series 500 Model 550 computer. The DSB is normally installed at the factory, however, you may have to install it as an upgrade. There are 12 card slots in the processor stack area. The DSB must be installed in slots 4 through 6 only and the first DSB must be in slot 4. Slots 1 through 12 contain in order;

- 1=CPU
- 2=IOP
- 3=RAM
- 4 thru 7=DSB or RAM.
- 8 thru 12=RAM.

The processor stack configuration must be contiguous (that is, no empty slots between cards).

There are no configuration switches on the DSB card.

Introduction

The HP 98700 is installed between a computer and the HP 98782A color monitor and your job is to determine whether the problem is in the computer, the Graphics Interface card or Display Station Buffer card, the Display Controller, the Graphics Accelerator if present, the Monitor, or in the HP-HIL (Human Interface Loop). The 98700H graphics monitor station consists of:

HP 98287A	Series 300 Graphics Interface (GIO) card.
HP 98288A	Series 500 Display Station Buffer (DSB) card.
HP 98700	HP 9000 Display Controller.
HP 98710A	HP 9000 Graphics Accelerator.
HP 98782A	High Resolution, 19 inch Color Display.
HP 46020A	HP-HIL Keyboard.
HP 46081A	HP-HIL Extension/Audio Module including cables.
98700-61601	Interconnect cable to connect the HP 98287A to the 98700.
98700-61602	Interconnect cable to connect the HP 98288A to the 98700.
HP 98290A	Shielded RGB cables To connect the 98700 to the 98782A.
Power Cords	To connect the HP 98700, the HP 98710A, and the HP 98782A to the power source.

This Chapter discusses how to isolate a faulty assembly. Troubleshooting is broken into two sections:

- Troubleshooting the 98700, including the I/O cards, and
- Troubleshooting the 98710A.

Some troubleshooting hints for the 98782A monitor are also presented here.

Always reinstall any assembly that does not affect the condition or problem.

Troubleshooting

Tools Required

- Number 1 POZIDRIV screwdriver, 3 inches long.
- Number 2 POZIDRIV screwdriver, 4 inches long.
- Standard .250 inch flat tip screwdriver, 4 inches long.
- VOM, HP 3435A or equivalent.
- Test Tools Manual, 09800-90001.
- Series 300 Test Tool Set.
 - 3 inch, HP 09800-12300
 - 5 inch, HP 09800-12500
- HP-UX System Functional Tests.

Initial Troubleshooting

Spend a little time and question the user about the problem. What are the symptoms? When did the problem first occur? Think about what the problem is and what it is not. Then go look yourself. What symptoms do you notice? Call on past experiences and try to remember what section caused that problem before. A little thought in the beginning can save you countless minutes of wasted motion.

The following sections lead you through some tests that you can do with minimum equipment.

Preliminary Troubleshooting

Here are some quick checks that can be made as the computer/Graphics Display Station (GDS) system is turned ON.

Check that the Line Select Switch on each rear panel is in the correct position, and turn the computer/GDS system ON in this order:

1. Turn ON the System Disc drive,
2. Turn ON the HP 98782A Monitor. Listen for the High Voltage crackle that indicates the HV supply in the monitor is working.
3. Turn ON the HP 98710A, if present.
4. Wait for the monitor to warm up and turn ON the HP 98700. Observe that the monitor screen “flashes” as the 98700 is turned ON.
5. Finally, turn the computer ON.

In any case the computer and its peripherals must be operating properly before attempting to troubleshoot the HP 98700H.

Troubleshooting Charts

Here are some troubleshooting charts to assist you in troubleshooting the 98700 Display station.

Chart "A".

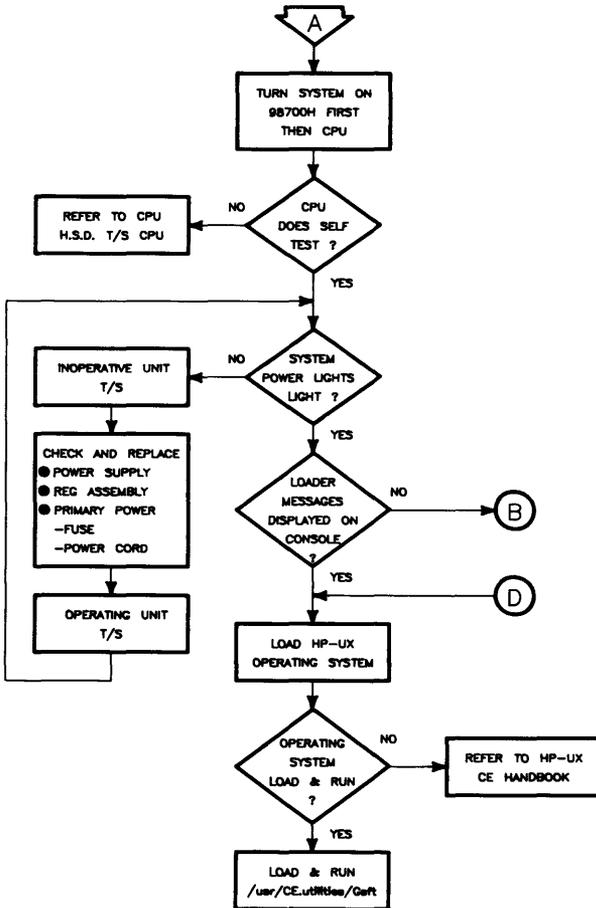


Figure 4-1. Troubleshooting Chart "A"

Troubleshooting Chart A (see Figure 4-1) leads you through some preliminary steps to determine if the computer (CPU) is working. This is determined thru the BootROM self tests. The host computer must be operational before you can determine what is wrong with the 98700H.

After replacing each faulty assembly, check to see if the power on lights come ON. When the power on lights all light continue with step 4. If the power on lights do not light, troubleshoot the assembly that fails to light.

Chart "B"

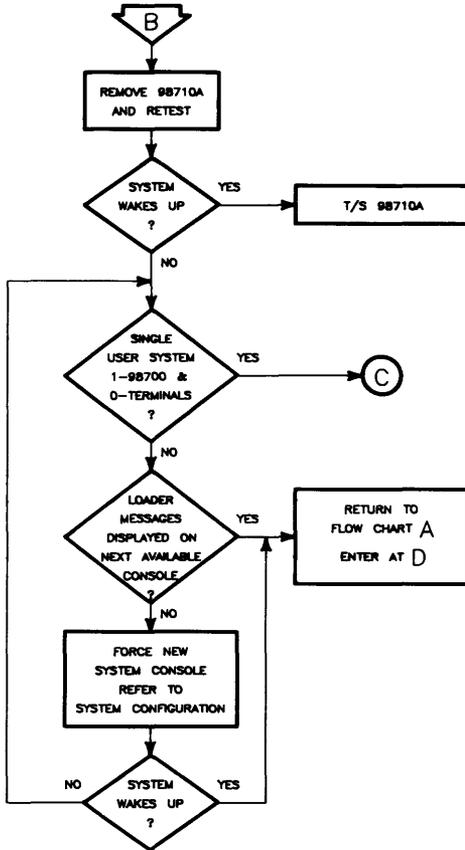


Figure 4-2. Troubleshooting Chart "B"

If Chart A directed to this chart, it is time to start introducing changes into the system to locate the faulty assembly. Follow these steps: (See Figure 4-2)

If messages are not displayed on next console, force a new system console by removing the 98700(H) from the system. Refer to the system configuration for this system.

Chart "C"

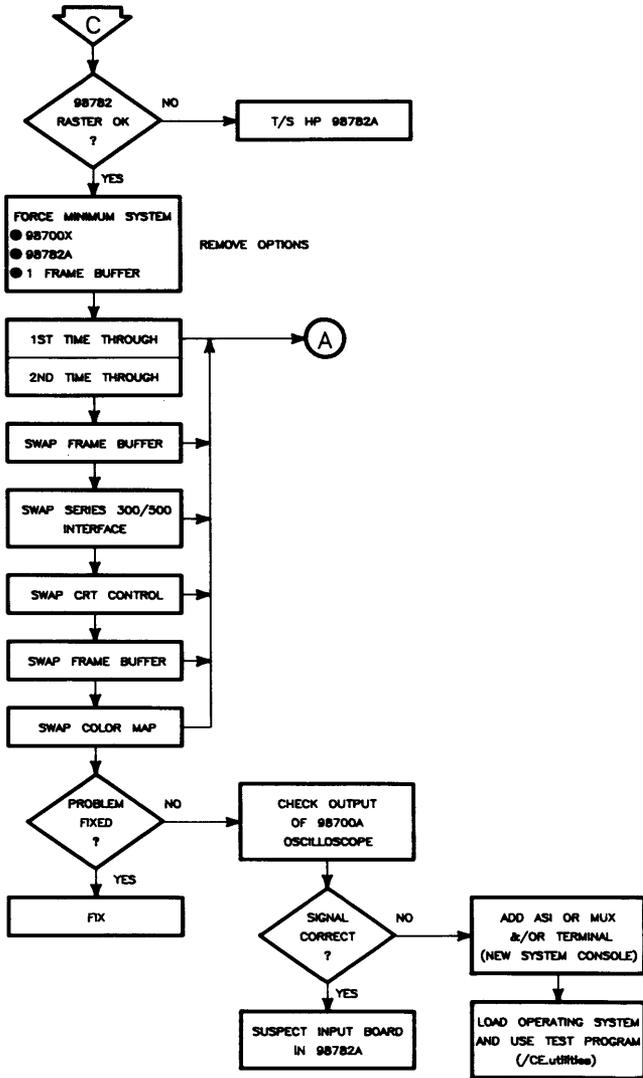


Figure 4-3. Troubleshooting Chart "C"

If step Chart B directed you to this chart, it is time to force a minimum system. Follow this procedure:

Troubleshooting Oddities

An unexpected trouble that can occur is a dead keyboard. If the computer fails to enter data from the keyboard, substitute a new keyboard and try again. If the computer still fails to enter data, the problem is in the HP-HIL loop. Suspect the HP-HIL circuitry in the GDS, the interconnect cable, or the HP-HIL/Audio Extension Module.

Notes

Here are some quick checks that can be made as the computer/Graphics Display Station (GDS) system is turned ON.

Check that the Line Select Switch on each rear panel is in the correct position, and turn the computer/GDS system ON in this order:

1. Turn ON the System Disc,
2. Turn ON the HP 98782A Monitor. Listen for the High Voltage crackle that indicates the HV supply in the monitor is working.
3. Wait for the monitor to warm up and turn ON the HP 98700. Observe that the monitor screen “flashes” as the 98700 is turned ON.
4. Turn ON the HP 98710A, if present.
5. Finally, turn the computer ON. HP Model 310/320 or Model 550.

In any case the computer and its peripherals must be operating properly before attempting to troubleshoot the HP 98700H.

Series 500 Multi-seat System

Use the turn-on procedure listed above and observe that the monitor screen “flashes” as the 98700 powers up. If the screen does “flash” then turn the computer ON. These loader messages should appear on the monitor of the Graphics Display Station (GDS) whose DSB is in the lowest numbered slot (=GDS0):

```
Loader revision 4.1
Testing Memory...
Looking for a System...
HP-UX Model 530/540 Release 5.00 (97089C)
```

```
Load Done
```

If the loader messages do not appear, check the other two GDS monitors. If the messages appear on one of the other GDS monitors (GDS1 or GDS2) then the DSB for GDS0 or its interconnect cable is defective. (If the loader messages appear on the monitor for GDS2, then the DSB cards or cables for GDS0 and 1 have a problem.) If the loader messages appear on a terminal connected to either the 27130A (MUX) card or 27128A (ASI) card, then that indicates that the loader ROM was unable to talk to any GDS in the system because of DSB card or cable problems.

If the system must be powered down do so during the “Testing Memory” period.

After assuring that the loader ROM messages are appearing on the appropriate GDS, allow the system to completely load HP-UX operating system. Look for the HP-UX copyright messages on the system console, and the login prompts on all other terminals and consoles.

Gsft, Graphics System Functional Tests

With the HP-UX operating system loaded and running, log on to the system and run the *Graphics System Functional Tests (Gsft)* of the *CE.utilities* (super user capability not required). The path name is:

```
/usr/CE.utilities/Gsft
```

and press . Note the upper and lower case letters.

For a more complete discussion on HP-UX *CE.utilities*, refer to the HP-UX CE Handbook (part number 98680-90039) Chap 5, or the HP-UX System Administrator document, part number 98680-90011.

For help, type:

```
./help
```

and press .

To run the HP 98700/98710A/98782A tests. type:

```
./test98700
```

and press . The following menu will appear on screen:

```
98700 Test Utilities
```

- 0) Exit
- 1) Short Test
- 2) Long Test
- 3) 98710A Graphics Accelerator Test
- 4) CRT Patterns

Please enter the # corresponding to the test and then press .

The monitor will then display:

```
Which GPH Slot do you want to test (0-3)?
```

Enter the *slot number* and press .

Short Test patterns

Select the #1 test from the menu. The monitor screen will display several patterns to indicate that tests are taking place. If the screen goes dark and stays dark the test has failed or the system has failed. Refer to the HP-UX Series 500 CE Handbook for recovery procedure. If the test is passed a message similar to the following appears:

```
The 98700 in pos 0 passed its test.  
1 device was found in the HP-HIL loop.
```

The HP-HIL part of the message will change depending on what HP-HIL configuration and accessories you have on the loop.

If the test is failed a message similar to the following appears:

```
Test failed. Suspect the 665XX board.  
1 device was found on the HP-HIL loop.
```

where 665XX denotes a board that is probably causing the fault. The board is designated by the suffix of the part number:

66583	Display Station Buffer
66570	CRT Control
66573	Color Map, discrete.
66574	Color Map, Neried
66572	Frame Buffer, Top slot
66572	Frame Buffer, 3rd slot
66577	Transform Engine, 98710A
66576	Scan Converter, 98710A

No. of devices How many devices were recognized in the HP-HIL loop. If number is less than you have, one or more are faulty.

Long Test patterns

Select #2 test from the menu. If the test is passed a message similar to the following appears:

```
The 98700 in pos 0 passed its test.  
1 device was found in the HP-HIL loop.
```

If the test is failed a message similar to the following appears:

```
Test failed. Suspect the 665XX board.  
1 device was found on the HP-HIL loop.
```

98710A Graphics Accelerator Test

Select #3 test from the menu. If the test is passed a message similar to the following appears:

```
The 98700 in pos 0 passed its test.  
1 device was found in the HP-HIL loop.
```

If the test is failed a message similar to the following appears:

```
Test failed. Suspect the 665XX board.  
1 device was found on the HP-HIL loop.
```

CRT Patterns

Select #4 from the menu. The monitor screen will display a new menu of patterns to be used for alignment of the monitor. Each pattern will stay on screen until you select a new pattern. Refer to the HP 98782A Hardware Support Document, part number 98782-90030 for monitor alignment procedure.

Notes

Adjustments

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There are no adjustments for the HP 98700/98710A. Adjustments for the HP 98782A are contained in the 98782A Hardware Support Document, part number 98782-90030.

Notes

Table 7-1. HP-HIL Devices

Product No.	Description
46020A	Keyboard
46060A	Mouse
46080A	Extension Module
46081A	3 metre Ext./Audio
46082A	15 metre Ext./Audio/Video
46082B	30 metre Ext./Audio/Video
46083A	Knob box
46086A	Button Box
46087A	“A” Size Digitizer
46088A	“B” Size Digitizer
46089A	4-Button Cursor

Notes

Replaceable Parts

Introduction

Here are lists of replacement parts and exchange assemblies and hardware components included in the peripheral.

Part numbers in the form xxxxx-69xxx refer to rebuilt assemblies that are available on an exchange basis. Numbers in the form xxxxx-66xxx, -67xxx, or -68xxx refer to new assemblies. All PC assemblies listed are fully loaded boards. Empty PC boards are not available.

The HP 98700 and the HP98710A share some common assemblies. In the following tables, only those parts that are specific for either are identified, otherwise, the assemblies will interchange.

For HP 98782A monitor parts, refer to the Hardware Support Document for the monitor. Part number is 98782-90030.

Table 8-1. HP 98700H Assemblies

HP Part No.	Qty Used	Description	Exchange or Non-Exchange
98700-90001	1	98700 Installation Man.	Non-Exch.
46020A	1	ASCII ITF Keyboard	Non-Exch
46060A	1	HP-HIL Mouse	Non-Exch
46081A	1	Buffer Box/Speaker	Exch.
98700-66501	1	Backplane Ass'y, 98700	Non-Exch.
98700-66502	1	Backplane Ass'y, 98710	Non-Exch.
98700-66551	1	Post Regulator	Non-Exch.
98700-69570	1	CRT Controller, 98700	Exch.
98700-69572	1	Frame Buffer Ass'y, 98700	Exch.
98700-69574	1	Color Map, 98700	Exch.
98700-69576	1	Scan Converter, 98710	Exch.
98700-69577	1	Transform, 98710	Exch.
98700-69582	1	Series 300 Interface	Exch.
98700-69583	1	Series 500 Interface	Exch.
09817-66552	1	Power Supply	Non-Exch.
98700-61602	1	Interconnect Cable	Non-Exch.
98700-61603	1	RGB Cable, 3 Metre	Non-Exch.
46060-60001	1	Cable, ITF Keyboard	Non-Exch.
46060-xxxxx	1	Ball, Mouse Roller	
46080-84300	1	Lock, Dual	Non-Exch.

Fuse

HP Part No.	Qty Used	Description
2110-0055	1	Fuse, 4.0 A/250 V

Hardware Parts List

Here is a list of part numbers for selected hardware items used in the HP 98700H display subsystem. Hardware and cabinet parts listed in Table 8-2 are shown in figures 8-1 and 8-2, 98700H exploded views 1 and 2.

Table 8-2. Mechanical Hardware Part Numbers

Front Panel Assembly

HP Part No.	Qty Used	Description
09817-04102	1	Sub-Panel, Front, Metal
09817-60201	1	Panel Assembly, Front, Plastic
09817-47700	1	Light Pipe
09817-61602	1	LED Cable Assembly
1450-0625	1	Retainer, LED
0624-0450	4	8-16×.375 Screw, Self tap

Rear Panel Assembly

HP Part No.	Qty Used	Description
98700-00202	1	Panel, rear
3160-0398	1	Fan, DC
3160-0309	1	Finger Guard
0515-0219	4	M3×6 Screw, Flat head

Chassis Assembly

HP Part No.	Qty Used	Description
0403-0427	2	Foot, Bumper
1400-0249	3	Cable Tie
09121-48303	2	Foot, Molded
09817-04104	1	Plate, Top
98700-04105	1	Air Deflector, 98710A only
09817-64104	1	Top Cover, 98700
98700-67904	1	Top Cover Ass'y, 98710

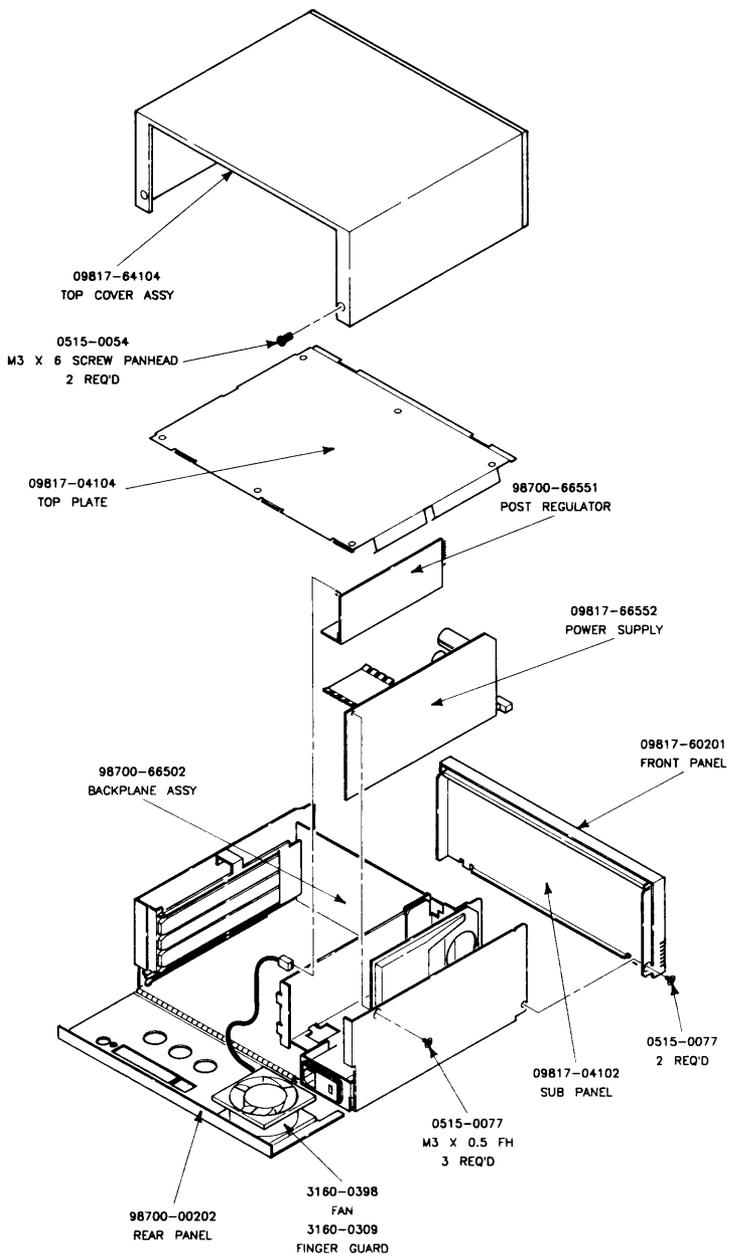


Figure 8-1. 98700 Exploded View 1

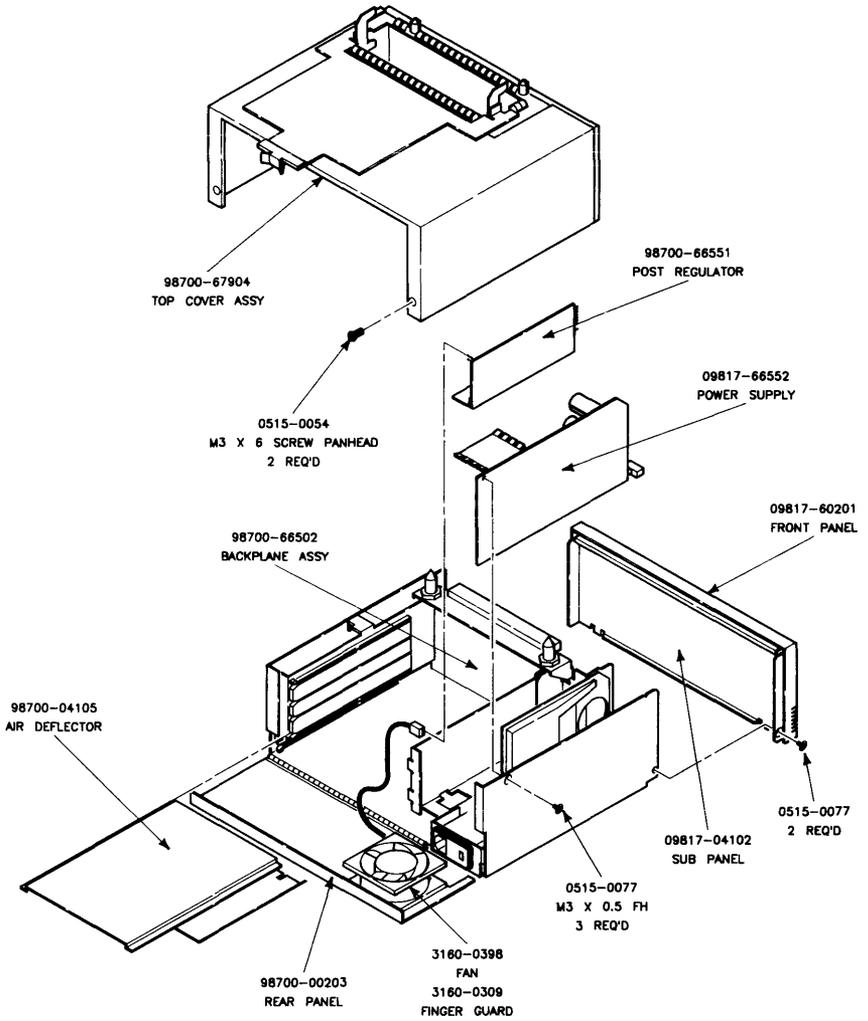


Figure 8-2. 98710H Exploded View 2

Notes

Diagrams

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Introduction

No additional diagrams are contained in this handbook. Refer to the HP 98700H Hardware Support Document (part number 98700-90030) and HP 98782A Hardware Support Document (part number 98782-90030) for diagrams, other Diagrams that will be helpful.

Notes

Reference

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Introduction

Reference material such as operating notes, maintenance records, notes on specific operating methods, and other material may be kept here.

Notes

Service Notes

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Introduction

Here is a place to keep application notes, service notes, and personal notes you may wish to keep.

Reorder Number
98700-90039

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