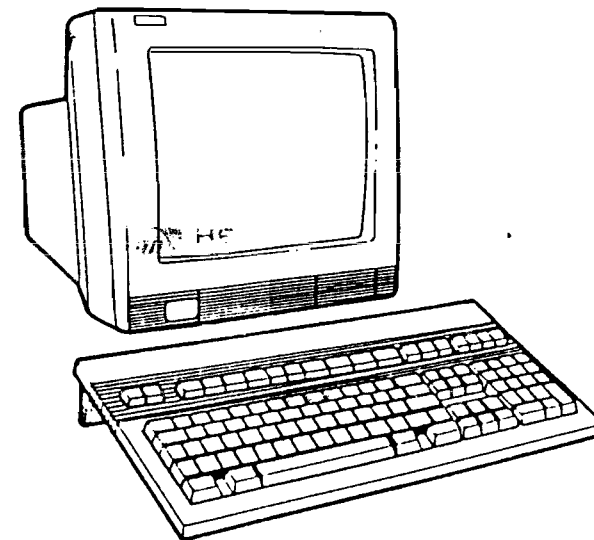


# HP 700/92A Service Manual



C1010-90003

Printed in Taiwan—03/89

HARDWARE SUPPORT MANUAL

# HP 700/92A Service Manual

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Edition 1



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

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Edition 1.....MAR 1989

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## Contents

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	Page
<b>Chapter 1</b>	<b>1-1</b>
<b>Product Information</b>	<b>1-1</b>
Product Description .....	1-1
Product Features .....	1-1
Display .....	1-1
Keyboard .....	1-2
Character Set .....	1-2
Character Generation .....	1-2
Operation .....	1-2
Datacomm .....	1-3
Product Options .....	1-3
<b>Chapter 2</b>	<b>2-1</b>
<b>Product Specifications/Installation</b>	<b>2-1</b>
Product Regulations .....	2-1
Product Specifications .....	2-1
Physical Specifications .....	2-1
Electrical Specifications .....	2-1
Environmental Conditions .....	2-2
Environmental Considerations .....	2-2
Installation .....	2-2
Required Tools .....	2-3
ESD Handling Guidelines .....	2-3
Unpacking the HP 700/92A Terminal .....	2-4
Installation Procedures .....	2-4
Terminal Maintenance Procedures .....	2-8

Contents (continued)

Chapter 3 Configuration	Page
Terminal Configuration Menu .....	3-1
Datacomm Configuration .....	3-3
External Device Configuration .....	3-8
Datacomm Cabling .....	3-9
Recommended Configuration .....	3-10

Chapter 4 Troubleshooting	Page
Troubleshooting Tools .....	4-1
Preliminary Troubleshooting .....	4-2
Detailed Troubleshooting .....	4-3

Chapter 5 Diagnostics	Page
Error Messages .....	5-1
Power On Test .....	5-2
Terminal Test .....	5-3
Port 1 Test .....	5-5
Port 2 Test .....	5-6
Manufacturing Test .....	5-7
Identify ROMs .....	5-9

Contents (continued)

Chapter 6 Adjustments	Page
User Adjustments .....	6-1
Raster Adjustments .....	6-1
Sub-Brightness Adjustment .....	6-3
Vertical Height Adjustment .....	6-4
Horizontal Width Adjustment .....	6-5
Focus Adjustment .....	6-5
Display Tilt Adjustment .....	6-5
Power Supply Adjustment .....	6-6

Chapter 7 Peripherals Configuration/Cabling	Page
Supported Printers .....	7-1
External Device Configuration Menu .....	7-2

Chapter 8 Replacement Parts	Page
Parts Diagrams .....	8-1
General Exploded Diagram .....	8-1
Bezel Diagram .....	8-4
Pedestal Assembly .....	8-6
Replacement Keyboards .....	8-7
Removal and Replacement Procedures .....	8-8



Contents (continued)

ROM Card .....	8-8
Rear Panel .....	8-9
Pedestal Assembly .....	8-11
Case Assembly .....	8-12
Font Card .....	8-14
Video Card .....	8-16
Main Board .....	8-17
CRT/Yoke .....	8-18
Bezel Assembly .....	8-20
Field Replaceable Parts .....	8-21
Chapter 9 .....	Page
Diagrams .....	9-1
Chapter 10 .....	Page
Reference .....	10-1
Chapter 11 .....	Page
Service Notes .....	11-1

Figures and Tables

Figure or Table	Page
Table 1-1. Localization Options .....	1-4
Table 1-2. Cable Accessories .....	1-5
Figure 2-1. HP 700/92A Rear Panel .....	2-5
Figure 2-2. Opening the Module Door .....	2-6
Figure 2-3. Inserting the Module .....	2-6
Table 2-1. Available Power Cords .....	2-5
Table 2-2. ROM Card Options .....	2-6
Figure 3-1. Terminal Function Key Tree .....	3-2
Figure 3-2. Terminal Configuration Menu .....	3-3
Figure 3-3. Datacomm Decision Tree .....	3-4
Figure 3-4. Datacomm Configuration Menu .....	3-5
Figure 3-5. External Device Configuration .....	3-8
Figure 3-6. HP 3000 Series 930 Configuration .....	3-11
Figure 3-7. HP 3000 Series 4X and 6X Configuration .....	3-11
Figure 3-8. HP 3000 Series 37 Configuration .....	3-12
Figure 3-9. HP 9000 Series 800 Configuration .....	3-12
Table 3-1. Datacomm Menu Field Definitions .....	3-5
Table 3-2. HP 700/92A Port 1 Signal Diagram .....	3-9
Figure 4-1. Detailed Troubleshooting .....	4-4
Table 4-1. Recommended Tools .....	4-1
Figure 6-1. Rear Panel Removal .....	6-3
Figure 6-2. Display Adjustment Controls .....	6-4
Figure 6-3. Power Supply Test Points .....	6-7
Figure 7-1. External Device Configuration Menu .....	7-2
Table 7-1. External Config Menu Field Definitions .....	7-3
Figure 8-1. Exploded View .....	8-2
Figure 8-2. Bezel Assembly .....	8-5
Figure 8-3. Pedestal Assembly .....	8-6
Figure 8-4. Rear Panel Release Tabs .....	8-10
Figure 8-5. Case Assembly .....	8-13

Figures and Tables (continued)

Table 8-1. Part List.....	8-3
Table 8-2. Bezel Assembly Part List .....	8-4
Table 8-3. Pedestal Assembly Part List .....	8-7
Table 8-4. Replacement Keyboards.....	8-7
Table 8-5. Field Replaceable Part List.....	8-21

**1 Product Information**

**2 Product Specifications /  
Installation**

**3 Configuration**

**4 Troubleshooting**

**5 Diagnostics**

**6 Adjustments**

**7 Peripherals Configuration /  
Cabling**

**8 Replacement Parts**

**9 Diagrams**

**10 Reference**

**11 Service Notes**



### 1.1 Product Description

The HP 700/92A is Hewlett-Packard's low cost high resolution Asian terminal. It supports both English and either one of the four Asian languages, Japanese, Korean, Traditional Chinese, and Simplified Chinese. It also includes all features necessary for data entry/data retrieval applications, and provides ergonomic features such as display tilt and swivel, and a low profile adjustable keyboard.

### 1.2 Product Features

The following sub-sections present the major features of display, keyboard, character set, character generation, operation and datacomm for the HP 700/92A Terminal.

#### 1.2.1 Display

- o Screen size: 14" diagonal.
- o Display area: 175mm (6.9") x 252mm (9.9").
- o Display memory: 4 pages of display memory.
- o Resolution: 1024 x 768.
- o Screen capacity: 24 lines of text.  
80 ASCII or 40 Asian characters per line.  
25th and 26th lines for 8 programmable soft keys.  
27th line for the status line and Asian input window.
- o CRT type: 90 degree, non-glare, tinted glass.
- o Tube phosphor: Long persistence P39.
- o Display color: Monochrome on black.

- o Refresh rate: 27.8KHz horizontal, 68.5Hz vertical; interlaced.
- o Display enhancement: Inverse, blinking, underline, half-bright, security.
- o Cursor type: Blinking, underline, full size, or half size.

### 1.2.2 Keyboard

- o Localized Kesuari Keyboard.
- o Detachable HP low-profile keyboard with 111 keycaps.
- o Auto-repeat, N-key roll-over.
- o MITF keyboard interface (same as 2392A).
- o 8 screen-labeled user-define function keys.
- o Up to 16 characters for screen label, 80 characters for definition.

### 1.2.3 Character Set

- o Support Country-15 Asian characters.
- o Support Country-8, ROMAN-8, Line Drawing.
- o Downloadable character set (512 characters).

### 1.2.4 Character Generation

- o Alphanumeric:

Capital letter: 11 x 19 dot matrix in a 12 x 28 cell  
 Small with descent: 11 x 18 dot matrix in a 12 x 28 cell  
 Small without descent: 11 x 13 dot matrix in a 12 x 28 cell

- o KATAKANA extension: 11 x 19 dot matrix in a 12 x 28 cell
- o Line Drawing: 12 x 28 dot matrix in a 12 x 28 cell
- o Asian characters: 22 x 22 dot matrix in a 24 x 28 cell

### 1.2.5 Operation

- o Configuration menu: Non-volatile.

- o Video attribute: Memory lock, protected field, user selectable margin and tabs.
- o Editing: Insert character/line, delete character/line, clear line/display.
- o Page control: Next/previous page.
- o Display memory: 4 pages.

### 1.2.6 Datacomm

The HP 700/92A comes standard with 2 independent serial ports: one datacomm, and one external device port.

- o Transmission modes: Full duplex, asynchronous point-to-point.
- o Electrical interface: Port 1: Combined RS-232C/HP-422.  
Port 2: RS-232C.
- o Data rates: 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200 baud, on both ports.
- o Word length: 7 or 8 bits.
- o Parity: None, even, odd, one, zero.
- o Handshaking: Port 1: Software ENQ/ACK, XON/XOFF (transmit and receive), and hardware CS  
Port 2: Software XON/XOFF (transmit only), hardware CS and SRR.

### 1.3 Product Options

The following equipment and documentation is provided at delivery:

HP 700/92A Terminal.  
 HP C1400A Keyboard.  
 HP 700/92A User's Manual.

This manual is translated in local language according to the delivery location. Part Numbers for these manuals are as follows:

- HP 700/92A User's Manual (Japanese) C1010-90011
- HP 700/92A User's Manual (Traditional Chinese) C1010-90021
- HP 700/92A User's Manual (Korean) C1010-90031
- HP 700/92A User's Manual (Simplified Chinese) C1010-90041

\* HP 700/92A Terminal Programmer's Reference Manual (English), P/N C1010-90002, is not localized and must be ordered separately.

The available localization options for the HP 700/92A Terminal are listed in Table 1-1. Note that this is a required option and must be specified for each terminal.

Table 1-1. Localization Options

PRODUCT NUMBER	DESCRIPTION
C1010J #ABJ	Japanese version with localized keyboard, user's manual, and ROM card.
C1010T #AB0	Traditional Chinese version with localized keyboard, user's manual, and ROM card.
C1010K #AB1	Korean version with localized keyboard, user's manual, and ROM card.
C1010C #AB2	Simplified Chinese version with localized keyboard, user's manual, and ROM card.

The datacomm and printer cables are not included with the product. Instead, they are available as accessories. Table 1-2 lists the cable accessories for the HP 700/92A Terminal.

Table 1-2. Cable Accessories

ACCESSORY	DESCRIPTION
40242G	Serial (RS232C) printer cable. Male (25-pin) / male (25-pin), 5m (16ft).
40242M	US/European modem cable. Male (25-pin) / male (25-pin), 5m (16ft).
40242P	HP direct connect type 422 cable. Male (25-pin) / male (5-pin), 5m (16ft).
40242X	HP direct connect type 232 cable. Male (25-pin) / male (3-pin), 5m (16ft).
40242Y	EMP protect cable. Male (25-pin) / male (25-pin), 5m (16ft).

2 Product Specifications /  
Installation

3 Configuration

4 Troubleshooting

5 Diagnostics

6 Adjustments

7 Peripherals Configuration /  
Cabling

8 Replacement Parts

9 Diagrams

10 Reference

11 Service Notes

## 2.1 Product Regulations

The HP 700/92A Terminal meets the following standard requirements:

Safety: IEC 435

RFI: VCCI Class 1



## 2.2 Product Specifications

The following sub-sections describe the display and datacomm specifications for the HP 700/92A Terminal.

### 2.2.1 Physical Specifications

Weight	Monitor:	10 kg (22 lbs)
	Keyboard:	1.85 kg (4.1 lbs)
Dimensions	Monitor:	330 mm wide x 330mm deep x 330 mm high (13.0 inches x 13.0 inches x 13.0 inches)
	Keyboard:	468 mm wide x 198 mm deep x 28 mm high (18.4 inches x 7.8 inches x 1.1 inches)

### 2.2.2 Electrical Specifications

Input Voltage	100VAC (+10%, -10%)	47-53 Hz / 57-63 Hz
	120VAC (+10%, -10%)	47-53 Hz / 57-63 Hz
	220VAC (+10%, -10%)	47-53 Hz / 57-63 Hz
	240VAC (+10%, -10%)	47-53 Hz / 57-63 Hz

## Product Specifications

Power Consumption 45 watts

### 2.2.3 Environmental Conditions

Temperature (free space ambient): Non-operating = -40 to 70 deg C  
Operating = 0 to 45 deg C

Humidity: 15 to 95 percent (at 40 deg C)

### 2.2.4 Environmental Considerations

#### SITE PREPARATION

Avoid installing the HP 700/92A Terminal in areas near contaminants (such as dust, smoke, solvent vapors from liquid spirit duplicating equipment, or wet-process copiers). For most reliable system operation, temperature should be maintained between 20 and 30 degrees Celsius (68 to 86 degrees Fahrenheit).

Keep the following guidelines in mind when checking out a suitable location for the HP 700/92A Terminal.

- o Magnetic field.
- o Three-pronged power receptacle with good ground.
- o Electrostatic discharge.
- o Dirt, dust and other air-borne particles.
- o Smooth, flat surface to set the terminal on.
- o Extreme temperature and humidity variations.
- o Routing and length of the datacomm cables.

## 2.3 Installation

This section lists the tools and ESD handling procedures required to install the

## Product Specifications

HP 700/92A Terminal. It provides step-by-step instructions on how to unpack and install the HP 700/92A.

### 2.3.1 Required Tools

- o 3mm (T10) torx screwdriver.
- o 5mm (T25) torx screwdriver.
- o Retainer clip (P/N 5041-6323)
- o RS-232 test hood (P/N 02620-60062)
- o HP-422 DC test hood (P/N 5061-3248)

#### NOTE

The retainer clip is used to fasten the case assembly to the bezel assembly. Six of those are used for each terminal. During disassembly, these clips may be broken. It is recommended that large quantities of these be ordered.

To assist in the isolation of datacomm problems, the following test equipments are recommended.

- o 4955A, 4953A, or 4951A Protocol Analyzer.
- o 1640A Serial Data Analyzer.

### 2.3.2 ESD Handling Guidelines

- o Use an anti-static ground pad with wrist strap (ESD Field Service Kit, HP 9300-1155).
- o Ensure that you, the PCAs, and the anti-static pad are at the same potential.
- o Do not wear clothing subject to static charge buildup, such as wool or synthetic materials.

- o Avoid touching chip circuit leads and the edge connectors of circuit boards. Handle circuit boards and chips by the package only.

### 2.3.3 Unpacking the HP 700/92A Terminal

1. Ensure that the ordered shipment is complete.
2. Remove assemblies from its box.
3. Inspect for any damage.
4. Verify that the ROM Card shipped with the unit matches the country option.

### 2.3.4 Installation Procedures

When installing the HP 700/92A Terminal, it is recommended that the following procedures be observed.

- a) Position the unit on a flat, smooth, clean surface.
- b) Allow enough free space around the unit for normal airflow circulation.
- c) Verify that the power cord shipped with the unit matches the available power source. See Table 2-1 for the various power cord for the HP 700/92A Terminal.

**NOTE**

The power supply used in the HP 700/92A Terminal is continuous from 100 VAC to 240 VAC, thus no voltage selection adjustment is required.

Table 2-1. Available Power Cords

COUNTRIES	PART NUMBER
Japan	8120-4753
Taiwan	8120-1378
Korea	8120-1378
China	8120-1369

- d) To install the keyboard, connect one end of the keyboard cable into the keyboard connector, then plug the other end into the connector labeled KEYBD on the left rear of the terminal.

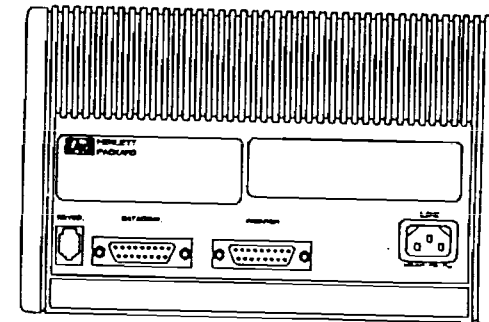


Figure 2-1. HP 700/92A Rear Panel

- e) Verify that the ROM Card shipped with the unit matches the available supported language option (see Table 2-2).

Table 2-2. ROM Card Options

Product Number	Supported Language	ROM Card Part Number
C1010J #ABJ	Japanese	C1010-60003
C1010T #AB0	Traditional Chinese	C1010-60013
C1010K #AB1	Korean	C1010-60023
C1010C #AB2	Simplified Chinese	C1010-60033

To install the ROM card:

- o Locate the ROM door in the lower-front panel of the terminal.
- o Pull down gently on the top of the door until it falls open and exposes the slot.(see Figure 2-2 )
- o Position the ROM Card as shown in Figure 2-3, with the component side up and the row of gold-colored strips adjacent to the slot opening.
- o Slide the card into the slot and gently push the ROM door upwards until it snaps shut.

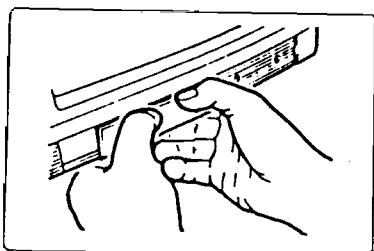


Figure 2-2. Opening the ROM Door

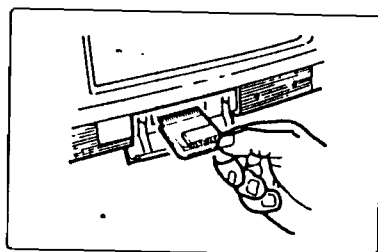
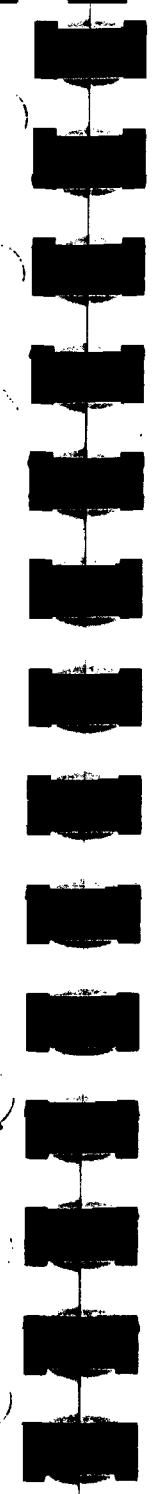


Figure 2-3. Inserting the ROM Card

- f) Connect the power cord to the AC receptacle at the right rear of the terminal (see Figure 2-1). Plug the other end into an appropriate AC power source.



- g) Power on the unit by pressing the power switch on the front panel to the ON position. At this time, the terminal will perform a self-test before displaying the cursor and softkey labels.
- h) If the terminal does not come up, check the following:
  - o Verify that the power cord is properly installed.
  - o Verify the ON-OFF switch is in the ON position.
  - o Verify that the brightness adjustment control is turned up sufficiently to produce a display.
- i) If the problem persists, refer to the troubleshooting techniques in Chapter 4.
- j) If required, connect the data communication cable to the connector labeled DATACOMM on the rear panel of the terminal.
- k) If required, connect the external device cable to the connector labeled PRINTER on the rear panel of the terminal.
- l) Perform a terminal self-test to verify that the unit is still functional. See Chapter 5 for details on terminal self-tests.
- m) If any screen adjustments are required, refer to Chapter 6.
- n) Connect the terminal to the host system and configure as required (refer to Chapter 3 for configuration details). Once configuration is completed, turn off the terminal. After about 10 minutes, power the terminal back on and verify that the configurations are properly saved.

**NOTE**

Once the terminal has been properly configured, it is highly recommended that the configurations be copied and filed away for future reference.



## 2.4 Terminal Maintenance Procedures

Cleaning is the only maintenance required to keep the HP 700/92A Terminal in proper condition for proper operation. The following steps are recommended for cleaning the screen, case and keyboard.

### CAUTION

Avoid getting excess cleaning fluid into the keyboard or terminal.  
Shock hazard or damage to the terminal may result.

- a) Lightly dust the entire terminal and keyboard with a damp, lint-free cloth or paper towel.
- b) Soap and water or isopropyl alcohol can be used to remove stubborn smudges.
- c) Miller-Stephenson (MS-260) plastic, glass and metal cleaner can be used to clean the plastic surfaces of the terminal.

Do not use the following cleaners, as they can cause permanent damage to the plastic case of the terminal or keyboard:

- o "Snap" glass and plastic cleaner, manufactured by Mit Products Inc.  
Excessive use of this cleaner will degrade the plastic.
- o Petroleum based cleaner, such as lighter fluid.
- o Cleaners containing benene, trichlorethylene, ammonia, diluted ammonia, acetone, methyl ethyl ketones, methylene chlorides or aromatics.

## 3 Configuration

## 4 Troubleshooting

## 5 Diagnostics

## 6 Adjustments

## 7 Peripherals Configuration / Cabling

## 8 Replacement Parts

## 9 Diagrams

## 10 Reference

## 11 Service Notes

The HP 700/92A Terminal is based upon the "soft configuration" concept. No hardware straps or switches are used. Configuration data is stored in non-volatile (NV) RAM.

Configuration is performed through the use of screen menus that are accessed from the keyboard via configuration function keys, or in some case, by escape sequences from the host computer. However, only portions of the entire configuration may be accessed by this mean. In addition, changes made through this mean (either locally or from the host computer) are temporary and will be lost whenever a hard reset function or power off-on cycle is performed.

The following sections provide a brief description of the various configuration menus for the HP 700/92A Terminal. Several levels of function keys are accessible to cover all of the terminal's selection needs (see Figure 3-1). All menus will be depicted with the default values for each field. A complete description of the configuration parameters can be found in the programmer's reference manual.

### 3.1 Terminal Configuration Menu

The HP 700/92A Terminal configuration menu is shown in Figure 3-2. To display the terminal configuration menu, press the [User/Sys] key followed by (f8) [config keys], and then press (f5) [terminal config]. Once the menu is displayed, the desired fields are selected by the [TAB] key, and changes are made by using (f2) [NEXT CHOICE] or (f3) [PREVIOUS CHOICE] to set through the field parameters. Once all of the fields are set to the desired values, the configuration can be saved by pressing (f1) [SAVE CONFIG].

The (f4) key [DEFAULT VALUES] is used to view the settings that the HP 700/92A will default to in the event of a loss of NV RAM data. The key (f7)

[DISPLAY FUNCTIONS] is used to enter non-displayable characters such as carriage return or block terminator.

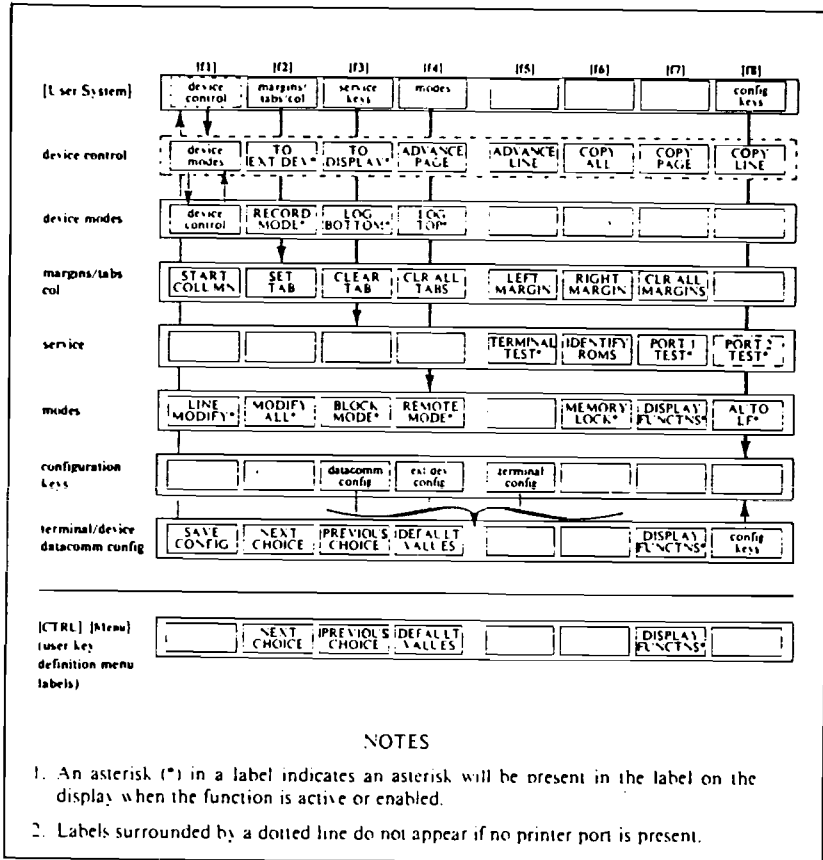


Figure 3-1. Terminal Function Key Tree

TERMINAL CONFIGURATION										
Datacomm/ExtDev	<b>PORT1/PORT2</b>									
Terminal Id	<b>2392A</b>	<b>NO</b>	InhHP16	<b>NO</b>	Language	<b>ENGLISH</b>				
LocalEcho	<b>OFF</b>	CapLock	<b>OFF</b>	Start Col	<b>01</b>	Beil	<b>ON</b>			
XmitFnctn(A)	<b>NO</b>	SPOW(B)	<b>NO</b>	InhExtWrpt(C)	<b>NO</b>	Line/Page(D)	<b>LINE</b>			
InhHndShk(G)	<b>NO</b>	Inh DC2(H)	<b>NO</b>	Esc Xfer(N)	<b>NO</b>					
FldSeparator	<b>U<sub>3</sub></b>	BlkTerminator	<b>R<sub>5</sub></b>	ReturnDef	<b>C<sub>2</sub></b>					
IsDef	<b>B<sub>3</sub></b>	KbdIntprt(I)	<b>OFF</b>	AsnSCP	<b>NO</b>					
AsnKey	<b>NO</b>	Asnkbd lock	<b>NO</b>							
SAVE CONFIG    NEXT CHOICE    PREVIOUS CHOICE    DEFAULT VALUES              DISPLAY FUNCTNS    config keys										

Figure 3-2. Terminal Configuration Menu

**NOTE**

If set "Language" to one of the Asian languages, then all menus and error messages will be displayed in Asian characters.

### 3.2 Datacomm Configuration

The HP 700/92A Terminal comes equipped with two datacomm ports. Port 1 is a combined RS-232C/HP-422 port, and Port 2 is just an RS-232C. Either port may be configured, as the datacomm port, with the other becoming the external device port. Both ports are equipped with standard EIA 25-pin female connectors. The external device port will be described in Chapter 7.

The HP 700/92A Terminal supports point-to-point, full-duplex asynchronous communications only.

For point-to-point operation, there are two possibilities, modem links, or hardwired directly to the remote system. Typically, hardwired connections are used when the terminals are near the computer (approximately 50 ft for RS-232C, and up to 4000 ft for HP-422). Modems are often used to connect physically remote sites to the host system. The HP 700/92A Terminal can be configured to operate in either situation. The datacomm decision "tree" is shown in Figure 3-3.

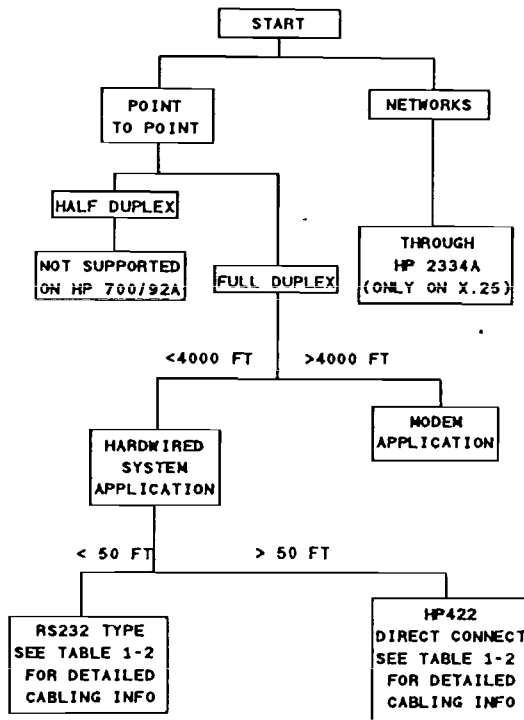


Figure 3-3. Datacomm Decision Tree

The datacomm configuration menu for the HP 700/92A Terminal is shown in Figure 3-4. All fields are shown with their default values. To display the datacomm configuration menu, press the [User/Sys] key, followed by (f8) [config keys] and (f3) [datacomm config].

DATACOMM CONFIGURATION			
BaudRate	<u>2400</u>	Parity/DataBits	<u>Note/8</u>
Asterisk	<u>OFF</u>	EnqAck	<u>YES</u>
RecvPace	<u>None</u>	Chk Parity	<u>NO</u>
XmitPace	<u>None</u>	SR(CH)	<u>LO</u>
		CS(CB)Xmit	<u>NO</u>
SAVE CONFIG		NEXT CHOICE	PREVIOUS CHOICE
DEFAULT VALUES		DISPLAY config	FUNCTIONS keys

Figure 3-4. Datacomm Configuration Menu

Table 3-1 lists the values and definitions for each of the fields in the datacomm configuration menu.

Table 3-1. Datacomm Menu Field Definitions

BaudRate	This field selects the rate for data transmission. For baud rates of 110, the terminal automatically sends two stop bits. All others have one stop bit. The available baud rates are:
----------	---

Table 3-1. Datacomm Menu Field Definitions (continued)

	110	150	600	1800	4800	19200
	134.5	300	1200	2400	9600	
	Default: 2400					
Parity/ DataBits	This field specifies what type of parity generation and checking will be used, and the number of data bit per character.					
	None/8	(no parity bit)				
	0's/7	(parity bit always 0)				
	ODD/7	(odd parity)				
	1's/7	(parity bit always 1)				
	EVEN/7	(even parity)				
	Default: None/8					
Enq/Ack	This field enables or disables the use of the Hewlett-Packard Enq/Ack receive handshake.					
	YES:	Enq/Ack handshake enable.				
	NO:	Enq/Ack handshake not used.				
Asterisk	This field specifies whether the transmit indicator asterisk (located in the status line) is to be activated, and if so, which RS-232C control line it should reflect. When a control line is selected, a TRUE condition is indicated by the presence of the asterisk. No asterisk indicates the FALSE state. The control lines that may be monitored are CS (Clear to Send) or DM (Data Set Ready).					
	OFF:	No asterisk displayed.				
	CS:	Clear to Send line (CB) is selected.				

Table 3-1. Datacomm Menu Field Definitions (continued)

	DM:	Data Set Ready (CC) is selected.
	RR:	Carrier Detect (CF) is selected.
Chk Parity	Selects whether or not the parity checking feature of the terminal is to be used. Note that if the Parity/DataBits field is set to None/8, then this field is ignored.	
	NO:	Parity checking is disabled.
	YES:	Parity checking is enabled.
SR(CH)	This field sets the state of the RS-232C control line CH (Data Signal Rate Selector) at power-up or after a hard reset. This control line selects the baud rate when dual-speed modems are used. Single speed modems ignore this line.	
	LO	
	HIGH	
	Default: LO	
RecvPace	This field selects which type of software pacing, if any, that the terminal will use to control the flow of data from the host system.	
	Xon/Xoff:	DC1/DC3 pacing will be used.
	None:	No receive pacing will be used.
XmitPace	This field selects which type of software pacing, if any, that the terminal will use to allow the host system to control the flow of data from the terminal	
	Xon/Xoff:	DC1/DC3 transmit pacing will be used.
	None:	No transmit pacing will be used.

Table 3-1. Datacomm Menu Field Definitions (continued)

<b>CS(CB)Xmit</b>	<p>This field specifies whether or not a TRUE condition (+12V) on RS-232C Clear to Send (CS/CB) control line is required before data transmission from the terminal can occur.</p> <p><b>NO:</b> Data transmission does not require CS(CB) to be TRUE.  <b>YES:</b> Line CS(CB) must be TRUE for data transmission.</p>
-------------------	---

If the terminal is configured for use with a modem, it may be necessary to power the modem on to make the required setting.

### 3.3 External Device Configuration

The HP 700/92A Terminal external device configuration menu is shown in Figure 3-5. To display the external device configuration, press [User/Sys] key followed by (f8) [config keys], and then press (f4) [ext dev config].

EXTERNAL DEVICE CONFIGURATION			
HandRate <u>2400</u>	Parity/DataBus <u>None/8</u>	PrimerNulls <u>000</u>	
XmitPace <u>None</u>	SRRXmit <u>NO</u>	CS(CB)Xmit <u>NO</u>	
PrinterModel <u>HP41063A</u>	SRRInvert <u>NO</u>		
SAVE    NEXT    PREVIOUS    DEFAULT CONFIG CHOICE    CHOICE    VALUES		DISPLAY config FUNCTNS keys	

Figure 3-5. External Device Configuration

### 3.4 Datacomm Cabling

The HP 700/92A Terminal is designed to communicate with HP systems using standard HP cables. As mentioned earlier, Port 1 is a combined RS-232C/HP-422 interface. Table 3-2 describes the pin-to-signal relationship for Port 1.

Table 3-2 HP 700/92A Port 1 Signal Diagram

PIN NUMBER	RS-232 SIGNAL DESCRIPTION	HP-422 SIGNAL DESCRIPTION
1	Protective Ground (AA)	-
2	Transmit Data (BA)	-
3	Receive Data (BB)	Receive Data A (RDA)
4	Request to Send (CA)	-
5	Clear to Send (CB)	-
6	Data Set Ready (CC)	-
7	Signal Ground (AB)	Signal Ground (SG)
8	Carrier Detect (CF)	-
9	-	Send Data A (SDA)
11	-	Send Data B (SDB)
12	Secondary Received Line Signal Detector (SCF)	-
18	-	Receive Data B (RDB)
19	Secondary Request to Send (SCA)	-
20	Data Terminal Ready (CD)	-
22	Ring Indicator (CE)	-
23	Data Signal Rate Selector (CH/CI)	-

### 3.5 Recommended Configuration

This section provides information related to datacomm configuration to HP systems which include HP 3000 Series 930, HP 3000 Series 4X and 6X, HP 3000 Series 37, and HP 9000 Series 800.

**NOTE**

The following recommended configurations are presented merely an aid to initial system connection or troubleshooting. The configurations herein mentioned apply only to the physical hardware connection between the HP 700/92A Terminal and the referenced HP computers. Standard product configurations are used in testing. This does not imply that all configurations of the HP 700/92A Terminal are supported as are on all software applications available on HP computer systems. Some configuration adjustments may be required for certain conditions.

Figures 3-6 through 3-9 show the recommended cabling for connecting the HP 700/92A to the HP systems mentioned above.

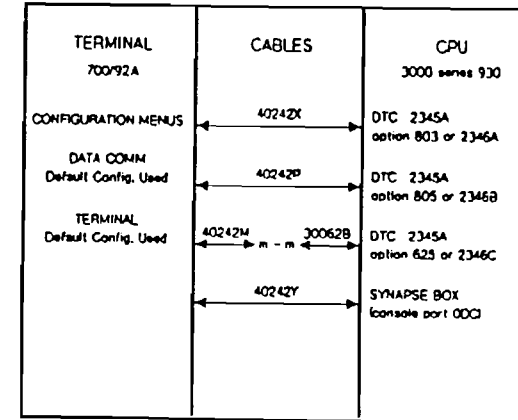


Figure 3-6. HP 3000 Series 930 Configuration

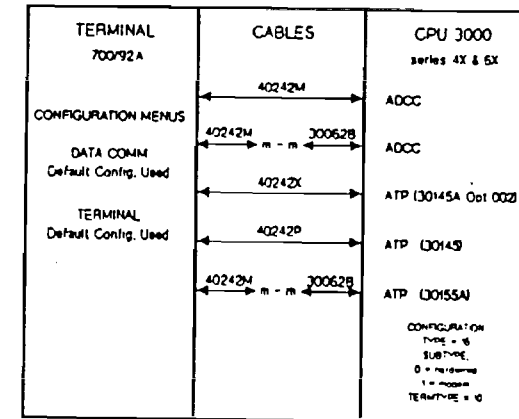


Figure 3-7. HP 3000 Series 4X and 6X Configuration

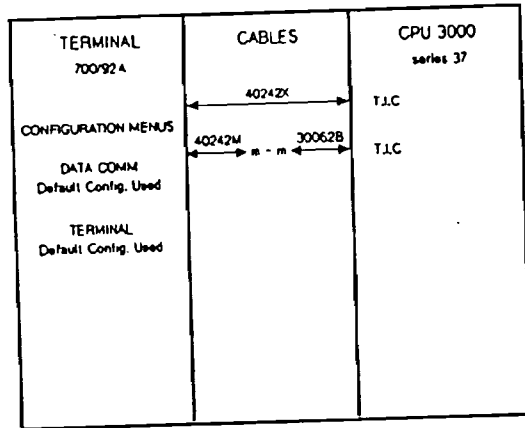


Figure 3-8. HP 3000 Series 37 Configuration

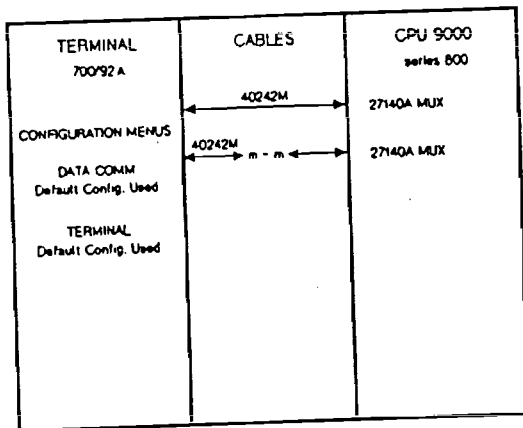


Figure 3-9. HP 9000 Series 800 Configuration

4 Troubleshooting

5 Diagnostics

6 Adjustments

7 Peripherals Configuration /  
Cabling

8 Replacement Parts

9 Diagrams

10 Reference

11 Service Notes



The HP 700/92A Terminal is designed to reduce problem isolation to a minimum. The modular design eliminates the requirement of elaborate troubleshooting techniques or special equipment. In most cases, problems can be diagnosed by self-tests.

#### 4.1 Troubleshooting Tools

The HP 700/92A Terminal provides a set of self-tests that can be used by service personnel to identify any malfunctions quickly to minimize repair times. With the exception of the datacomm/printer port self-tests which require the presence of a loopback hood, all of the HP 700/92A self-tests can be performed without the need of using additional equipment.

Most of the tools required to manipulate the HP 700/92A Terminal are currently available to HP field personnel, as they are recommended for previous terminal products. Table 4-1 lists the tools and documentation required to adequately support the HP 700/92A Terminal. New tools are listed in uppercase letters.

Table 4-1. Recommended Tools

DESCRIPTION	PART NUMBER	SUPPLIER
HP 700/92A SERVICE MANUAL	C1010-90003	DMK
Binder, service manual	9282-0683	DMK
HP-422 DC test hood (25 pin Male)	5061-3248	SMO
RS-232 test hood (25 pin Male)	02620-60062	SMO
Tool, adjustment (239x style)	02390-60008	SMO
Tool, adjustment	8710-1300	SMO
Tool, adjustment	8710-0016	SMO

Table 4-1. Recommended Tools (continued)

Wrist strap & cord	9300-0970	SMO
Portable anti-static kit	9300-0794	SMO
Torx screwdriver (T10)	-	-
Torx screwdriver (T25)	-	-

Self-test descriptions and error messages are presented in Chapter 5.

### 4.2 Preliminary Troubleshooting

In case of a malfunction, it is recommended that the user checks the following instructions before starting any detailed troubleshooting.

**WARNING**

Always verify that the terminal's power switch is in the OFF position and that the power cord is removed before opening the unit. Hazardous voltages are present within the terminal and may result in serious injury if touched.

- a) Verify that the terminal is properly installed with the power cord connected and the power switch in the ON position.
- b) Verify that the country dependent ROM card is installed with the correct version.
- c) Verify that all datacomm/printer cables are correct and properly installed.
- d) Verify that the terminal is properly configured for its intended use. See Chapter 3 for information on the various configurations for the HP 700/92A Terminal.



- e) Reset the terminal. A locked or "hung" terminal can often be restored to normal operation by performing a reset.
- f) Default non-volatile memory. Occasionally, NV RAM can get into an unknown state and cause the terminal to malfunction. On the HP 700/92A Terminal, NV RAM can be defaulted by powering on the unit while holding down the "D" key. Note that doing this will destroy user's configuration. It is necessary to record the configuration values before defaulting NV memory.

### 4.3 Detailed Troubleshooting

If a malfunction still exists after performing the preliminary troubleshooting procedures, refer to the troubleshooting steps detailed in Figure 4-1.



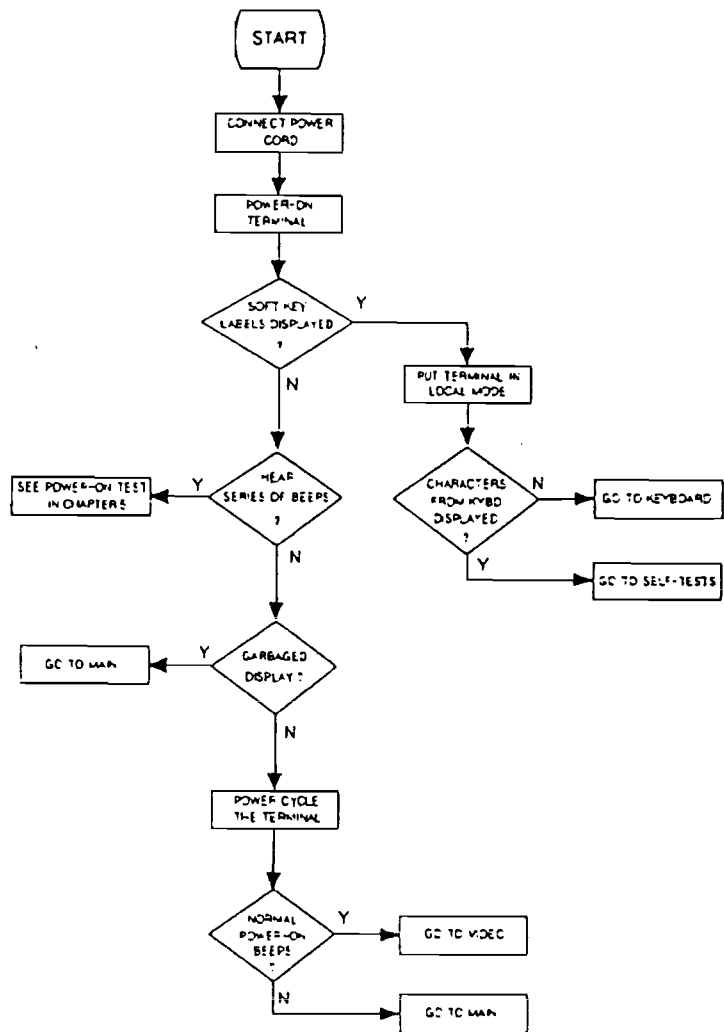


Figure 4-1. Detailed Troubleshooting

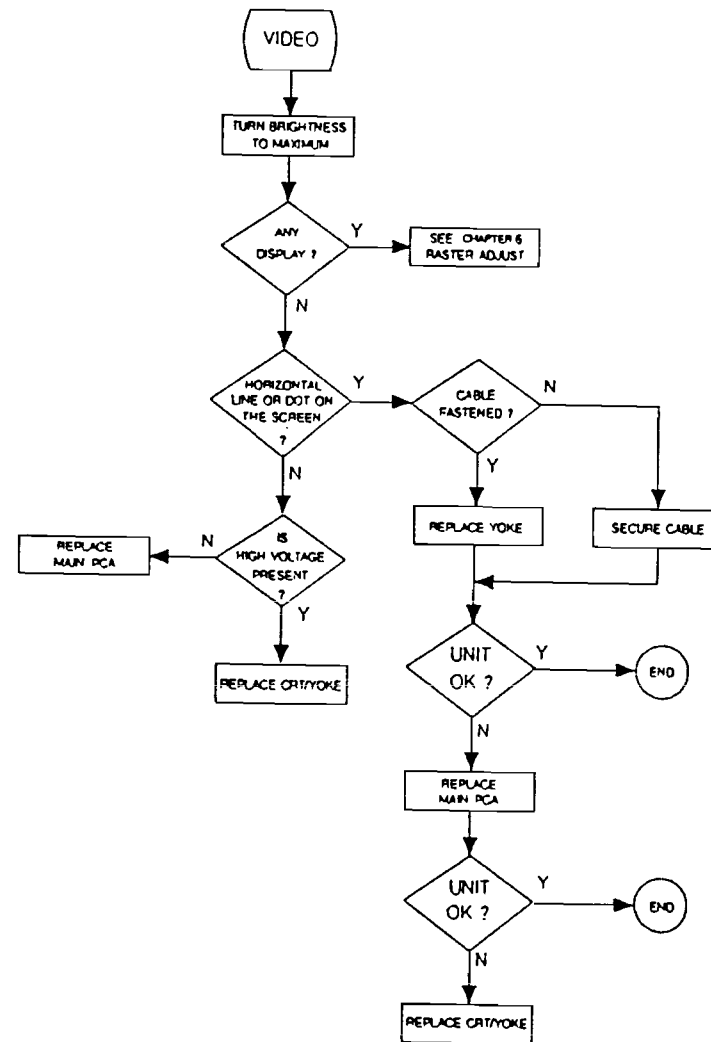


Figure 4-1. Detailed Troubleshooting (continued)

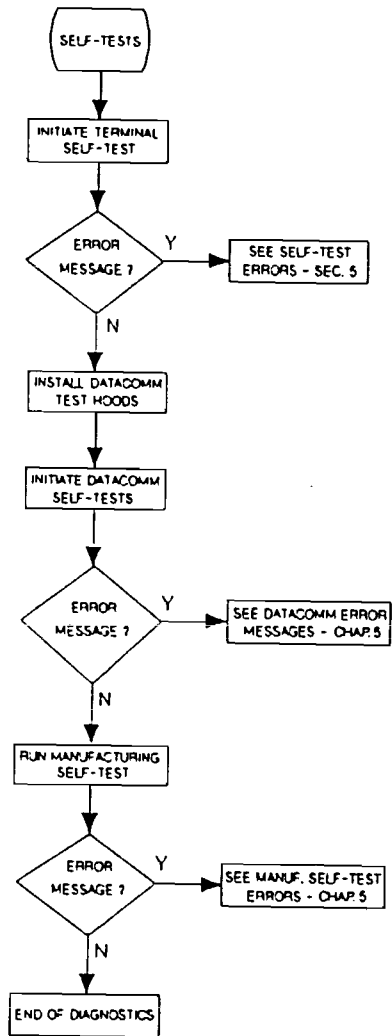


Figure 4-1. Detailed Troubleshooting (continued)

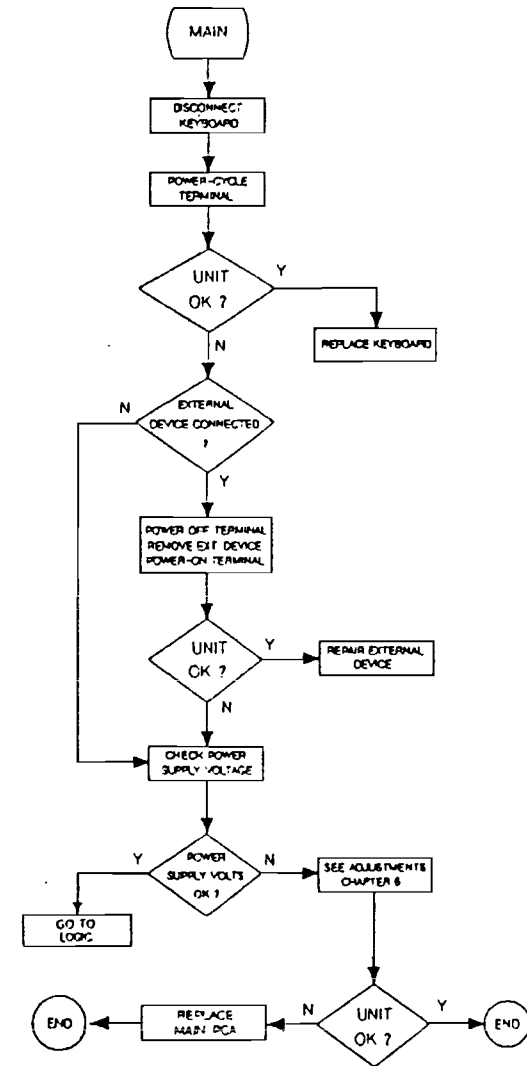


Figure 4-1. Detailed Troubleshooting (continued)

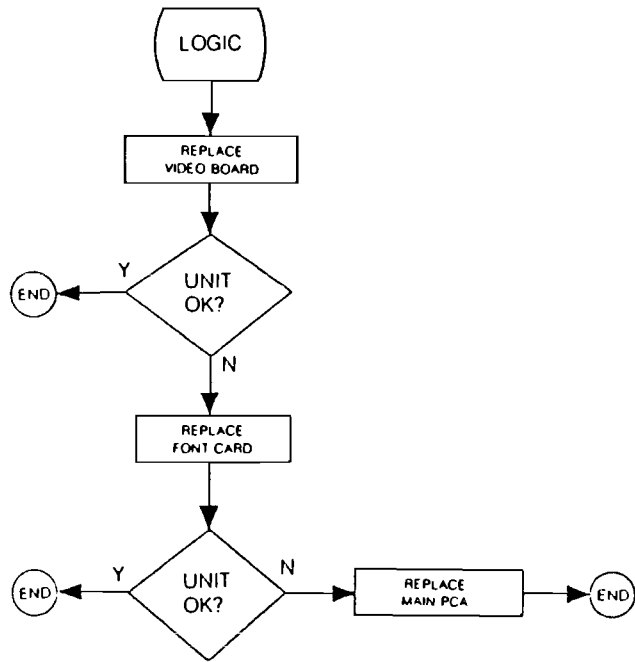


Figure 4-1. Detailed Troubleshooting (continued)

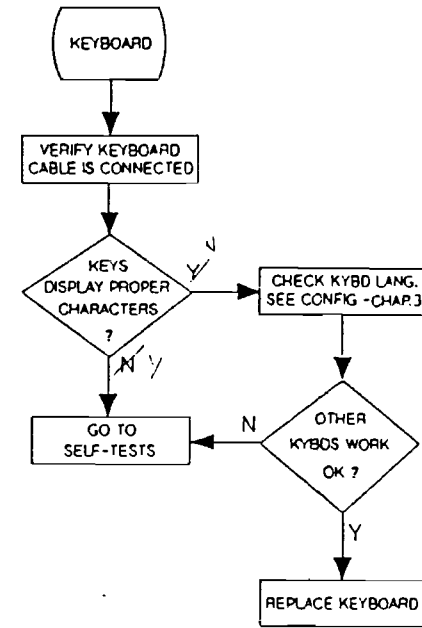


Figure 4-1. Detailed Troubleshooting (continued)

**5 Diagnostics**

**6 Adjustments**

**7 Peripherals Configuration /  
Cabling**

**8 Replacement Parts**

**9 Diagrams**

**10 Reference**

**11 Service Notes**

To assist in troubleshooting and verifying proper operation, the HP 700/92A Terminal is equipped with a series of self-tests. Most terminal malfunctions will be reported by these tests. Results are indicated through audible beeps or by on-screen messages, or in some cases, by both.

The following sections describe the self-test error messages that are available for the HP 700/92A Terminal.

### 5.1 Error Messages

There is a generic set of error messages that may be displayed by the terminal during normal operation (not self-test initiated). These messages are usually an indication of erroneous conditions in the operation or configuration of the terminal.

Default configs used  
Press RETURN to clear

This message is displayed when the terminal attempts to read non-volatile RAM and detects a CRC error. This message usually occurs at power-on.

No 'TO' device  
Press RETURN to clear

This message is displayed when an attempt is made to initiate a device control data transfer (copy line, copy page, etc.) with no destination device defined. After pressing the [RETURN] key, select the [EXT DEV] as the 'TO' device and try again.

**MEMORY FULL**

Press RETURN to clear

This message is displayed whenever memory lock has been initiated, and no more space is available in display memory to enter data.

**Function locked**

Press RETURN to clear

This message is displayed whenever an attempt is made to access a function that has been programatically locked.

**5.2 Power-On Test**

The Power-On test, which is performed automatically every time the terminal is turned on, verifies the integrity of the terminal's Core ROM, NV RAM, System RAM, Extension ROM, UDF RAM, and Font ROM.

The normal power-on sequence of events is:

- o At power-on, the terminal sounds two quick beeps (high/low).
- o Performs the following tests (about 10 seconds).

Core ROM: checksum test

NV RAM: data integrity check

System RAM: read/write check

Extension ROM: checksum test (if ROM card exists)

UDF RAM: read/write check

Font ROM: check country ID, bank ID, and column ID

- o Beeps to indicate successful completion of tests.

- o Turns on the display, with the MODES group of softkey labels.

During the power-on, if an error is found, one of the following will occur:

- o The terminal will not beep.
- o The terminal will beep continuously.
- o After the first two beeps the terminal will beep one or more times, and no display will appear. The number of beeps indicates one of the following failures:

1 = Core ROM (U803)

2 = NV RAM (U804)

3 = System RAM, high nibble (U801)

4 = System RAM, low nibble (U802)

5 = Extension ROM (on ROM card)

6 = UDF RAM (on Font card)

7 = Font ROM (on Font card)

Any one of the above conditions indicates probable processor failure. See Chapter 4, "Troubleshooting" for appropriate action.

**5.3 Terminal Test**

The HP 700/92A terminal test performs the following:

- o Sounds a beep and displays the message "TESTING!" at the bottom of the screen.



- o Verifies the integrity of the terminal ROM.
- o Non-destructively verifies all RAM ICs.
- o Displays a test pattern consisting of all alphanumeric characters and some Asian characters.

To initiate the terminal test, press [User/Sys] key, followed by (f3) [service keys] and (f5) [TERMINAL TEST].

Pressing the [SHIFT] key with [TERMINAL TEST] will start a continuous test and an asterisk will be displayed in the [TERMINAL TEST] softkey label. This statement is saved in NV RAM. Power cycling the terminal does not stop the test, unless by pressing the [SHIFT] key with [TERMINAL TEST] again during the time that the label is displayed between tests, or by defaulting NV RAM (hold down the "D" key during power-on).

If a ROM error is detected, the following message will be displayed at the bottom of the screen.

ROM ERROR # x  
Press RETURN to clear

where x = 1 to 3, indicating one of the following:

- 1 = Core ROM
- 2 = Extension ROM (on ROM card)
- 3 = Font ROMs

If a RAM error is detected, the following message will be displayed.

RAM ERROR # x  
Press RETURN to clear

where x = 1 to 4, indicating one of the following:

- 1 = NV RAM (U 804)
- 2 = System RAM, high nibble (U801)
- 3 = System RAM, low nibble (U802)
- 4 = UDF RAM (or Font card)

Any error occurs in the terminal test most likely implies a problem with the Main Board. See Chapter 4 for appropriate action.

#### 5.4 Port 1 Test

The Port 1 test checks the function of the RS-232C/HP-422 datacomm port. A test hood (P/N 02620-60062 for RS-232C, P/N 5061-3248 for HP-422) must be connected before running the test.

To initiate the test, press the [User/Sys] key, followed by (f3) [service keys] and then (f7) [PORT 1 TEST]. The terminal will beep once and execute a single pass of the test. A continuous test can be run by pressing [SHIFT] key with [PORT 1 TEST]. Similar to the terminal test, an asterisk will be displayed in the [PORT 1 TEST] softkey label. To exit, press [SHIFT] key with [PORT 1 TEST] again while the label is displayed between tests.

While the test is running, the message "TESTING!" will be displayed at the bottom of the screen. If there are no errors, the "TESTING!" message will be cleared and the service level softkey labels will be restored. If an error is detected, the following error message will be displayed:

PORT 1 ERROR # x  
Press RETURN to clear

where x = 1 to 7, indicating one of the following:

- 1 = Test connector not present
- 2 = Error in control lines (RS-232C only)
- 3 = Character did not loop back
- 4 = Received character NOT same as one transmitted
- 5 = Framing error in character
- 6 = A character was overrun
- 7 = Parity error

If errors are reported, see Chapter 4 for appropriate action.

### 5.5 Port 2 Test

The Port 2 test checks the function of the RS-232C datacomm port. A test hood (P/N 02620-60062) must be connected before running the test.

To initiate the test, press the [User/Sys] key, followed by (f3) [service keys] and then (f8) [PORT 2 TEST]. The terminal will beep once and execute a single pass of the test. A continuous test can be run by pressing [SHIFT] key with [PORT 2 TEST]. Similar to the terminal test, an asterisk will be displayed in the [PORT 2 TEST] softkey label. To exit, press [SHIFT] key with [PORT 2 TEST] again while the label is displayed between tests.

While the test is running, the message "TESTING!" will be displayed at the bottom of the screen. If there are no errors, the "TESTING!" message will be cleared and the service level softkey labels will be restored. If an error is detected, the following error message will be displayed:

PORT 2 ERROR # x  
Press RETURN to clear



where x = 1 to 7, indicating one of the following:

- 1 = Test connector not present
- 2 = Error in control lines (RS-232C only)
- 3 = Character did not loop back
- 4 = Received character NOT same as one transmitted
- 5 = Framing error in character
- 6 = A character was overrun
- 7 = Parity error

If errors are reported, see Chapter 4 for appropriate action.

### 5.6 Manufacturing Test

The Manufacturing Test is the most complete portion of the HP 700/92A self-tests. This test is intended primarily for use by the factory, but also can be used by HP field personnel if required.

The Manufacturing Test can be executed by pressing and holding down the [CONTROL], left [SHIFT], right [SHIFT] and [RETURN] keys simultaneously in case there is no ROM Card installed. If the HP 700/92A Terminal is equipped with the ROM Card, the following procedures should be performed.

1. Press the [User/Sys] key, followed by (f8) [config keys] then (f3) [datacomm config].  
Set BaudRate=19200.  
Press (f1) [SAVE CONFIG].
2. Press the [User/Sys] key, followed by (f8) [config keys] then (f4) [ext dev config].  
Set BaudRate=110.  
Press (f1) [SAVE CONFIG].

The Manufacturing Test runs continuously once started. The terminal screen will go blank when the test starts. Note that datacomm tests are required on both ports, or

errors will result.

The Manufacturing Test cycle is as follows:

- o Blanks the whole screen.

- o Performs the following tests:

- System RAM test
- Core ROM test
- NV RAM test
- Extension ROM test
- UDF RAM test
- Font ROM test
- Port 1 test
- Port 2 test

- o Displays an inverse video screen for one second.

- o Scans the keyboard for one of the following keys:

- D = Exit Manufacturing Test and go to Power-On test
- K = Keyboard test
- 1 = Display focal pattern
- 2 = Display inverse video screen
- 3 = Turn the display off
- 4 = Restart Manufacturing Test
- 5 = Display auxiliary focal pattern
- 6 = Display Font Card and ROM Card option
- 7 = UDF RAM R/W check and Font ROM checksum test

If none of the above keys is pressed, go to next step.

- o Returns to step 1.

The Manufacturing Test cycles about every 10 seconds. If an error is detected, it will be saved in NV RAM and the terminal will hang. If the terminal is power cycled, the appropriate error message will be displayed on the screen and then the terminal will hang. The only way to clear errors is to default NV RAM by holding the "D" key while powering up the terminal.

Errors are displayed in the same format as the Terminal Test, Port1 and Port 2 tests, except the message 'Press RETURN to clear' will not be displayed.

## 5.7 Identify ROMs

The Identify ROMs feature lists the identification labels of the firmware ROMs installed in the unit. This includes the HP part number and date code for each ROM.

To initiate the test, press the [User/Sys] key, followed by (f3) [service keys] and then (f6) [IDENTIFY ROMS].

The list of the ROMs is shown as follows:

### Firmware ROMs

C1010-85001 2846 (Core ROM)  
 \*C1010-800X1 2847 (Extension ROM)

\*where X = 0 to 3, indicating one of the following:  
 (The Extension ROMs part number is country dependent.)

C1010-80001 for Japanese  
 C1010-80011 for Traditional Chinese  
 C1010-80021 for Korean  
 C1010-80031 for Simplified Chinese

## Diagnostics

If the ROM Card is not installed, the Extension ROMs part number will not be displayed.

### NOTE

If the ROM card is not installed, the HP 700/92A will be defaulted as English mode which is same as the HP 700/92 Terminal. No Asian language input will be available in this case.

## 6 Adjustments

## 7 Peripherals Configuration / Cabling

## 8 Replacement Parts

## 9 Diagrams

## 10 Reference

## 11 Service Notes

This chapter describes all of the adjustments that are available on the HP 700/92A Terminal. Some of these adjustments are easily available to the user, while others should only be performed by qualified service personnel.

### 6.1 User Adjustments

The only user adjustment for the HP 700/92A Terminal is display intensity.

The slide controls for the display intensity are located just under the bezel on the right hand side of the unit as viewed from the front. Adjustments to the display are made by moving the sliders left or right until the desired levels of brightness are reached.

The level of intensity that is acceptable is a subjective perception that varies from individual to individual. The limit of the intensity is set to cover a range that satisfies most users. This limit can be varied, but should be performed only by qualified service personnel. See Section 6.2.1 for the sub-brightness level adjustment.

### 6.2 Raster Adjustments

There are five display adjustments available on the HP 700/92A Terminal, focus, sub-brightness, width, height, and display tilt.

The following sub-sections describe the procedures for making these adjustments. These procedures should be used whenever a new CRT/Yoke assembly is installed, or in the case of a mis-aligned display.

**CAUTION**

The following sections deal with adjustments that take place within the terminal, with power on. These procedures should be performed by qualified service personnel only.

The following tools are required to perform the display adjustments:

- o Slot head screwdriver, medium size
- o Philips head screwdriver (1-point)
- o Torx screwdriver (T10)
- o Torx screwdriver (T25)
- o Adjustment tool (P/N 02390-60008)
- o Adjustment tool (P/N 8730-0016)
- o Adjustment tool (P/N 8710-1300)

Before performing any of the display adjustments, the power cord and the rear panel must first be removed. To do this, place the unit face down on a smooth flat surface. Be sure to place some sort of protective material between the terminal and the work surface, otherwise, the CRT face may get damaged.

Next, remove the T10 torx screw located just below the Port 2 connector (see Figure 6-1). Locate the two back panel release holes on the bottom of the chassis at the bottom corners of the panel. Insert a small slot-head screwdriver into the opening, and push the back panel retaining tab in towards the center of the unit. At the same time push the bottom of the panel up and out from the chassis. Do this for both sides. Once the bottom of the panel is clear of the chassis, lift it up and away from the unit. To perform the display adjustments, place the terminal back on its pedestal. All of adjustment controls are accessible through the back of the terminal.

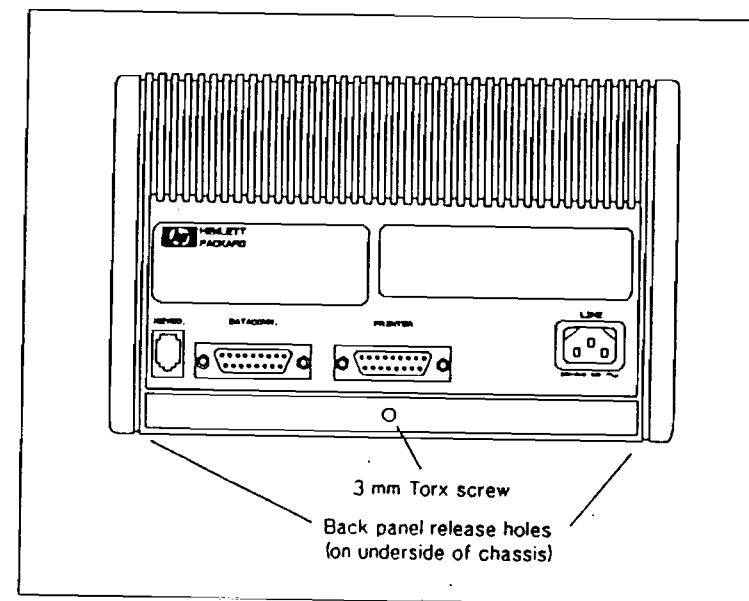


Figure 6-1. Rear Panel Removal

### 6.2.1 Sub-Brightness Adjustment

This adjustment sets the range of the brightness slider control. If the upper or lower brightness limit of the slider is insufficient, an adjustment of the sub-brightness potentiometer will change that limit. The sub-brightness adjustment potentiometer is located on the left rear of the Main Board, just below the width coil (see Figure 6-2).

Use the adjustment tool 8710-1300 (or equivalent) to set the sub-brightness potentiometer to the desired level.

### 6.2.2 Vertical Height Adjustment

This adjustment is used to modify the height of the display. The height control potentiometer is located just above the sub-brightness pot, next to the width coil (see Figure 6-2). This adjustment requires the use of adjustment tool 8710-1300. To modify the display, rotate the pot until the desired display height is reached.

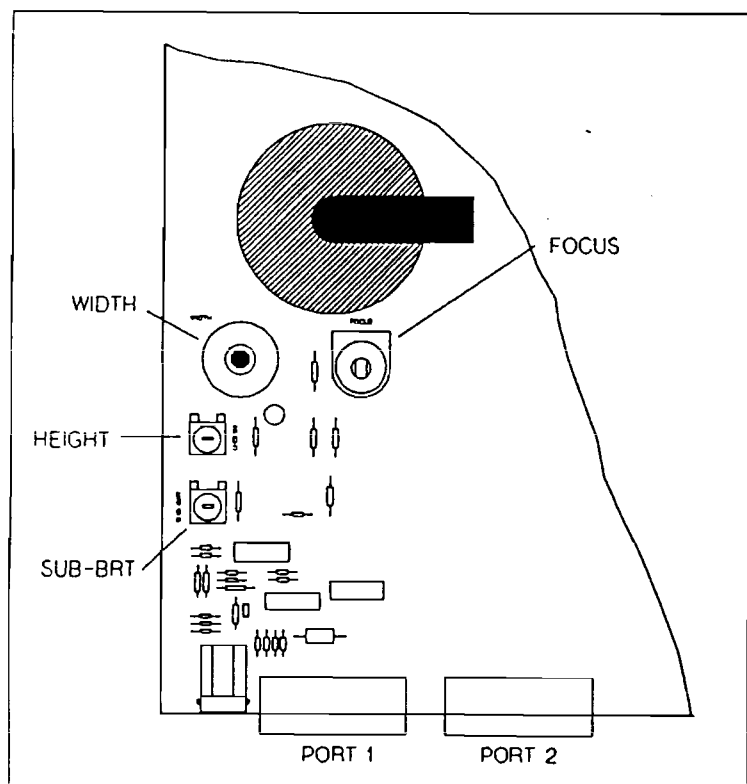


Figure 6-2. Display Adjustment Controls

### 6.2.3 Horizontal Width Adjustment

This adjustment is used to modify width of the display on the screen. The width adjustment coil is located on the left edge of the Main Board, right next to the flyback transformer (see Figure 6-2).

#### CAUTION

Dangerous voltages are present at the flyback transformer. Operate with **EXTREME** caution when making this adjustment.

To adjust the width, place the hex shaped end of adjustment tool 8730-0016 into the core of the width coil and then rotate to achieve the desired display appearance.

### 6.2.4 Focus Adjustment

This adjustment is used to vary the focus of characters on the screen. The focus control potentiometer is located on the right of the width coil, just below the flyback transformer (see Figure 6-2). To make this adjustment, fill the screen with characters (the "@" character is recommended) and then rotate the pot until the desired focus is achieved.

### 6.2.5 Display Tilt Adjustment

This adjustment is made by rotating the CRT deflection yoke until the display is horizontal. Loosen the yoke collar screw located at the end of the yoke. Grasp the yoke and rotate slowly until the proper display is achieved. Tighten the yoke collar and then check again the display to ensure that the yoke does not shift while tightening the screw.

When all display adjustments have been made, replace the back panel. See Section 8.2.2 for replacement procedures.

### 6.3 Power Supply Adjustment

The power supply for the HP 700/92A, although pre-set at the factory, may require adjustment at some time. The only adjustment is for the +5V, all others track this one.

The following tools are required to adjust the power supply:

- o Torx screwdriver (T25)
- o Adjustment tool (8710-1300)
- o Digital voltmeter (HP 3476A or equivalent)

It is necessary to remove the case from the terminal in order to adjust the power supply. See Section 8.2.4 for disassembly procedures.

#### CAUTION

With the case removed, the Main Board is no longer secured to the chassis. Do not move the terminal from the face-down position until the case is re-installed and fastened to the chassis.

With the case off, and the terminal face down on a smooth surface, find the +5V test points (TP1 and TP2) located just on the right of the power switch on the component side of the Main Board (see Figure 6-3). Attach the voltmeter leads to these test points.

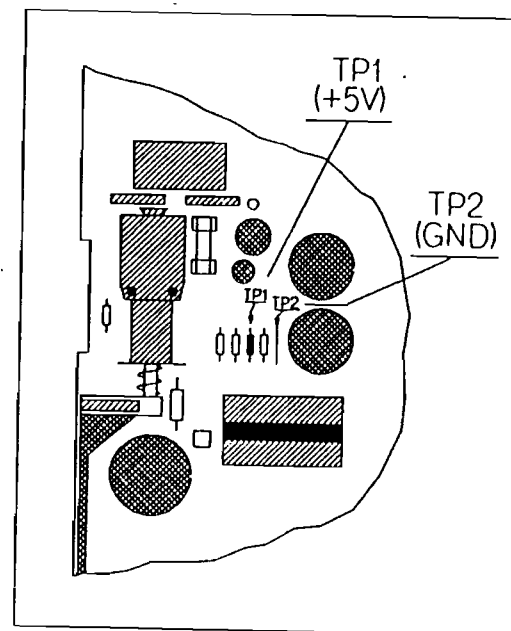


Figure 6-3. Power Supply Test Points

As viewed from the back side of the Main Board (circuit side), the power supply adjustment potentiometer is located in the lower right-hand corner, just to the left of the power switch extender bar. Because of this location, the pot must be accessed through a hole in the Main Board. With the terminal powered on, use adjustment tool 8710-1300 to vary potentiometer until the voltmeter reads the following:

$$+5.15V \pm 0.01V$$

At this point, power off the terminal and re-install the case. See Section 8.2.4 for assembly procedures.



**7 Peripherals Configuration /  
Cabling**

**8 Replacement Parts**

**9 Diagrams**

**10 Reference**

**11 Service Notes**

This chapter describes the external device configurations of the HP 700/92A Terminal.

### 7.1 Supported Printers

The supported printers for use with the HP 700/92A Terminal are listed as follows:

#### 41063A (\*Option 040) Asian Workstation Printer (PCL Version)

- 001 Japanese Character Set
- 002 Simplified Chinese Set
- 003 Traditional Chinese Set

\*Option 040 --- Replace HP-IB I/F with RS-232C I/F.

#### 41063B (\*Option 040) Asian Workstation Printer (ESC/P Version)

- 001 Japanese Character Set
- 002 Simplified Chinese Set
- 003 Traditional Chinese Set

\*Option 040 -- Replace Centronics I/F with RS-232 C I/F

The recommended cable for use with the HP 700/92A Terminal and the supported printers mentioned above is the 40242G cable.

## 7.2 External Device Configuration Menu

The external device configuration menu for the 700/92A Terminals is shown in Figure 7-1. All fields are displayed with the default values.

To display the external device menu, press the [User/Sys] key, followed by (f8) [config keys] and the (f4) [external device].

EXTERNAL DEVICE CONFIGURATION			
BaudRate	<u>2400</u>	Parity/DataBits	<u>None/8</u>
		PrinterNulls	<u>000</u>
XmitPace	<u>None</u>	SRRXmit	<u>NO</u>
PrinterModel	<u>HP41063A</u>	SRRInvert	<u>NO</u>
		CS(CB)Xmit	<u>NO</u>
SAVE NEXT PREVIOUS DEFAULT		DISPLAY config	
CONFIG CHOICE CHOICE VALUES		FUNCTNS keys	

Figure 7-1. External Device Configuration Menu

Table 7-1 lists the external device configuration menu fields and field definitions of the HP 700/92A Terminal.

Table 7-1. External Config Menu Field Definitions

BaudRate	This field selects the rate for data transmission. For baud rates of 110, the terminal automatically sends two stop bits. All others have one stop bit. The available baud rates are:  <table border="0"> <tr> <td>110</td> <td>300</td> <td>1800</td> <td>9600</td> </tr> <tr> <td>134.5</td> <td>600</td> <td>2400</td> <td>19200</td> </tr> <tr> <td>150</td> <td>1200</td> <td>4800</td> <td></td> </tr> </table> Default: 2400	110	300	1800	9600	134.5	600	2400	19200	150	1200	4800	
110	300	1800	9600										
134.5	600	2400	19200										
150	1200	4800											
Parity/DataBits	This field specifies what type of parity generation and checking will be used, and the number of data bit per character.  <table border="0"> <tr> <td>None/8</td> <td>(no parity bit)</td> </tr> <tr> <td>0's/7</td> <td>(parity bit always 0)</td> </tr> <tr> <td>ODD/7</td> <td>(odd parity)</td> </tr> <tr> <td>1's/7</td> <td>(parity bit always 1)</td> </tr> <tr> <td>EVEN/7</td> <td>(even parity)</td> </tr> </table> Default: None/8	None/8	(no parity bit)	0's/7	(parity bit always 0)	ODD/7	(odd parity)	1's/7	(parity bit always 1)	EVEN/7	(even parity)		
None/8	(no parity bit)												
0's/7	(parity bit always 0)												
ODD/7	(odd parity)												
1's/7	(parity bit always 1)												
EVEN/7	(even parity)												
Printer Nulls	This field specifies the number of null codes to be transmitted to an external printer after each ASCII control code. Values are from 000 to 255.  Default: 000												
SRRXmit	This field specifies whether or not an "ON" state (+12V) on the RS-232C Secondary Receiver Ready (SRR) is a required condition for transmitting data.												

Table 7-1. External Config Menu Field Definitions (continued)

XmitPace	<p>YES NO</p> <p>Default: NO</p> <p>This field selects which type of software pacing, if any, that the terminal will use to allow the external printer to control the flow of data from the terminal</p> <p>Xon/Xoff: DC1/DC3 transmit pacing will be used. None: No pacing will be used.</p>
SRRInvert	<p>This field only applies when the SRRXmit field is set to yes. It is used to reverse the "ON" sense of the SRR control line.</p> <p>NO: SRR ON state = +12V YES: SRR ON state = -12V</p> <p>Default: NO</p>
CS(CB)Xmit	<p>This field specifies whether or not a TRUE condition (+12V) on RS-232C Clear to Send (CS/CB) control line is required before data transmission from the terminal can occur.</p> <p>NO: Data transmission does not require CS(CB) to be TRUE. YES: Line CS(CB) must be TRUE for data transmission.</p> <p>Default: NO</p>
Printer Model	<p>This field specifies which model of printer should be used as the external printer.</p>

Table 7-1. External Config Menu Field Definitions (continued)

	<p>HP 41063A: Asian Workstation Printer (PCL Version)</p> <p>Option 001: Japanese Character Set Option 002: Simplified Chinese Set Option 003: Traditional Chinese Set</p> <p>HP 41063B: Asian Workstation Printer (ESC/P Version)</p> <p>Option 001: Japanese Character Set Option 002: Simplified Chinese Set Option 003: Traditional Chinese Set</p>
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Refer to an appropriate printer reference manual for recommended printer settings.



8 Replacement Parts

9 Diagrams

10 Reference

11 Service Notes

This chapter contains the part location diagrams and HP part number reference tables for the HP 700/92A Terminal. Also included are removal and replacement procedures for the major assemblies.

### 8.1 Parts Diagrams

The following sub-sections present exploded views of the major components of the HP 700/92A Terminal. Each part in the diagrams is denoted by a number which indicates an HP part number in the corresponding parts identification table for each figure.

#### 8.1.1 General Exploded Diagram

The general exploded diagram for the Model 700/92A Terminal is shown in Figure 8-1. Table 8-1 provides a description and HP part number for the items denoted in Figure 8-1. Note that in some cases there are more than one part number for each denoted item.

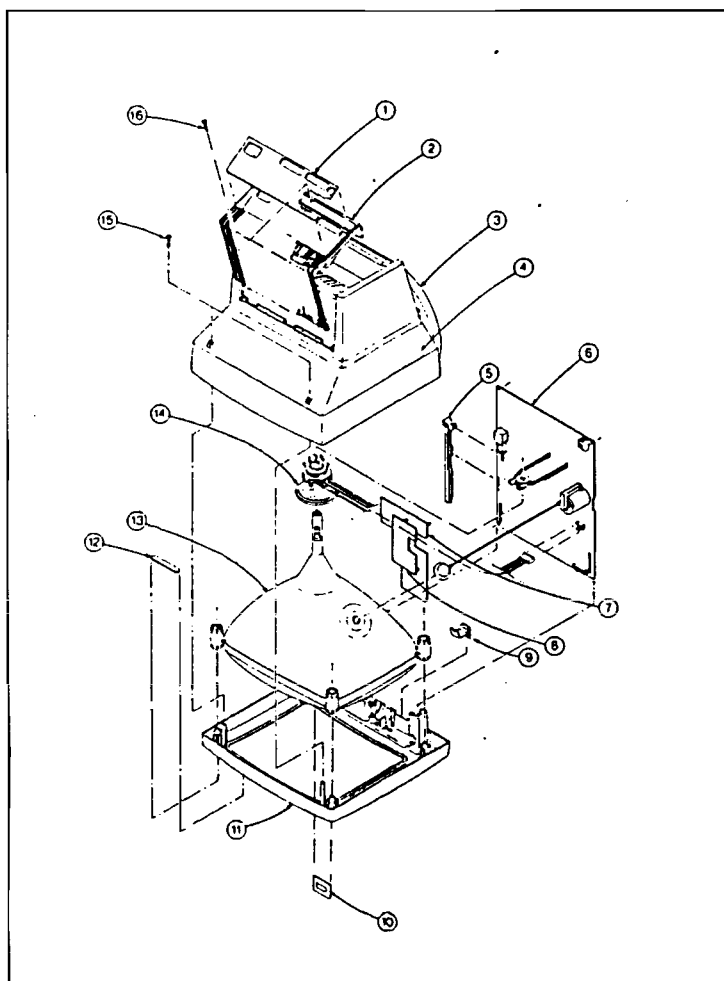


Figure 8-1. Exploded View

Table 8-1. Part List

INDEX NO. (Fig 8-1)	PART DESCRIPTION	HP PART NUMBER	QTY USED
1	Rear Panel Label	C1010-80004	1
2	Rear Panel	5041-6315	1
3	Tilt/Swivel Assembly	5061-8850	1
4	Case Assembly (includes 6 clips not shown)	5061-8851	1
5	On/Off Extender Bar	5041-6311	1
6	Main Board	C1010-60001	1
7	Video Card	C1010-60010	1
8	Font Card	C1010-60102 (Japan)	1
		C1010-60112 (Taiwan)	1
		C1010-60122 (Korea)	1
		C1010-60132 (China)	1
9	Brt/Contr Slider	5041-6312	2
10	ROM Card	C1010-60003 (Japan)	1
		C1010-60013 (Taiwan)	1
		C1010-60023 (Korea)	1
		C1010-60033 (China)	1
11	Bezel Assembly	5061-8849	1

Table 8-1. Part List (continued)

12	HP Logo/Label	C1010-40001	1
13	CRT/Yoke Assembly (includes 4 grommets)	C1010-60005	1
14	Deflection Yoke	9140-1256	1
15	Screw - Plastic Case	0515-1905	4
16	Screw - Rear Panel	0515-1890	1

8.1.2 Bezel Diagram

Figure 8-2 is a detailed exploded diagram of the HP 700/92A bezel assembly. Table 8-2 provides the descriptions and part numbers for each of the denoted items.

Table 8-2. Bezel Assembly Part List

INDEX NO. (Fig 8-2)	PART DESCRIPTION	HP PART NUMBER	QTY USED
1	Bezel	5041-6307	1
2	Brт/Cont Slider	5041-6312	2
3	ROM Door	5041-6310	1
4	On/Off Button	5041-6309	1
5	Brт/Cont Icon Panel	5041-6319	1

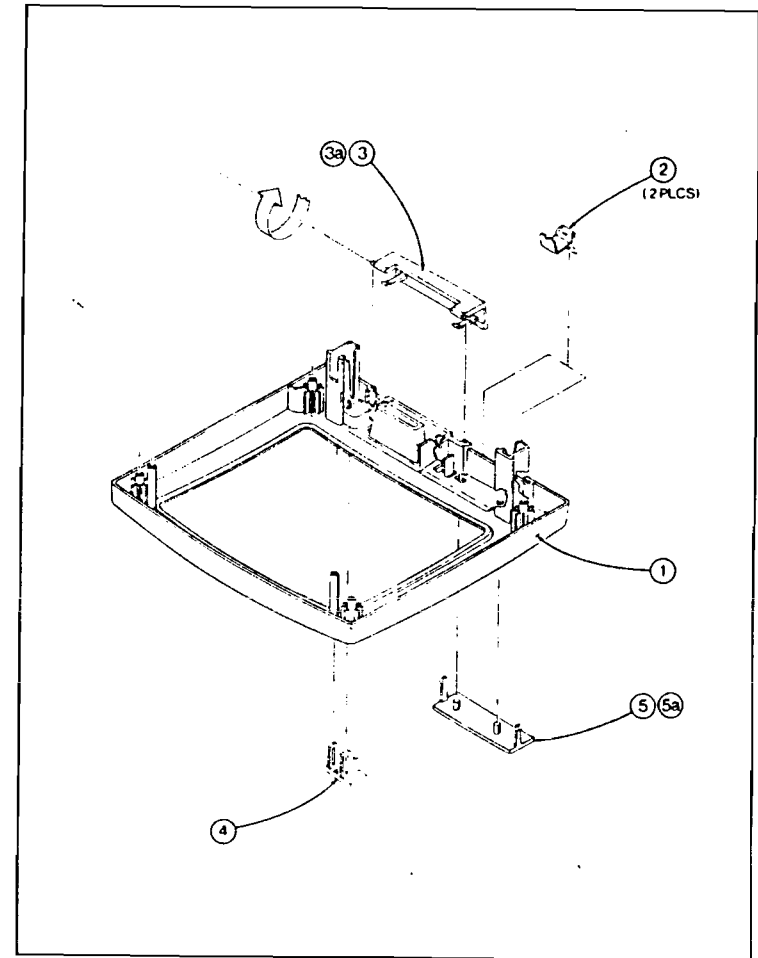


Figure 8-2. Bezel Assembly



8.1.3 Pedestal Assembly

Figure 8-3 shows an exploded diagram of the pedestal assembly. Table 8-3 lists the descriptions and part numbers for the denoted items.

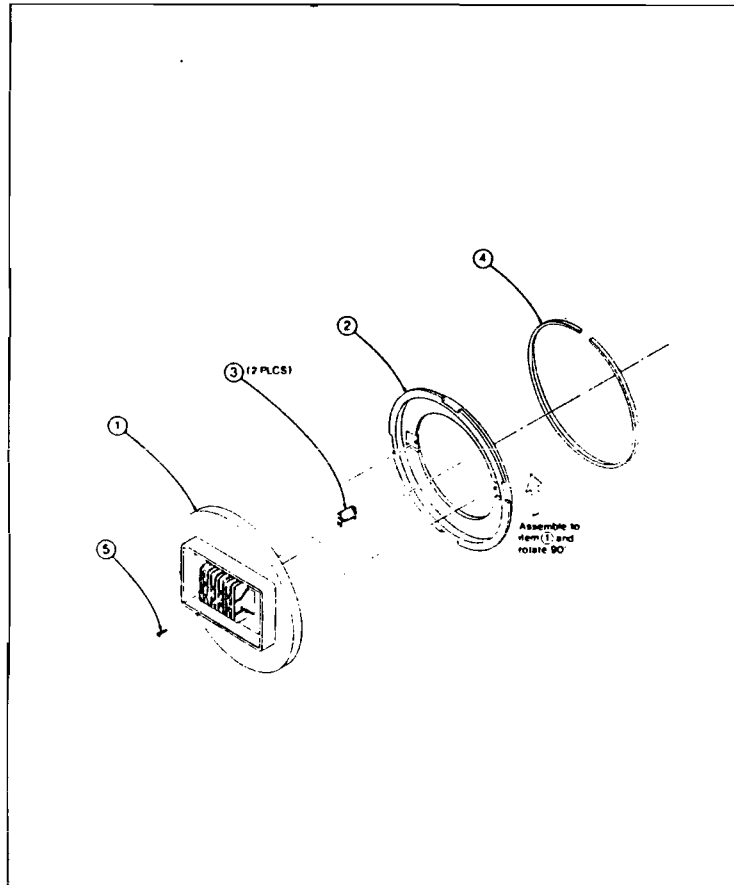


Figure 8-3 Pedestal Assembly

Table 8-3 Pedestal Assembly Part List

INDEX NO. (Fig. 8-3)	PART DESCRIPTION	HP PART NUMBER	QTY USED
1	Base	5041-6314	1
2	Ring	5041-6313	1
3	Tilt Clip	5021-5202	1
4	Foot	5041-6318	1
5	Shoulder Screw	0515-1906	1

8.1.4 Replacement Keyboards

The replacement keyboards for the HP 700/92A terminal are listed in Table 8-4.

Table 8-4. Replacement Keyboards

PRODUCT NUMBER	DESCRIPTION	PART NUMBER
C1010J Opt #ABJ	Keyboard Assembly (Japanese version)	C1400-62224
C1010T Opt #AB0	Keyboard Assembly (Traditional Chinese version)	C1400-62223
C1010K Opt #AB1	Keyboard Assembly (Korean version)	C1400-60221
C1010C Opt #AB2	Keyboard Assembly (Simplified Chinese version)	C1400-62222

## 8.2 Removal and Replacement Procedures

The following sub-sections deal with the disassembly and assembly of the HP 700/92A Terminal.

### **WARNING**

Hazardous voltages are present within the 700/92A Terminal when power is on. Always disconnect the power cord before attempting to dis-assemble the unit.

### 8.2.1 ROM Card

The ROM Card is used to support local language input conversion and printer drivers.

#### Required Tools:

- o None

#### Removal:

1. Open the ROM door by grasping the top of the door and pulling down. The ROM door is located on the bezel between the ON/OFF button and the brightness/contrast icon panel.
2. Push the right hand corner of the ROM Card to the left. This will bring the edge of the card out of the ROM slot for grasp. Hold the exposed corner of the card and remove it from the ROM slot.

#### Replacement:

1. Slide the ROM Card (connector end first) into the ROM slot and press firmly into place.

2. Close the ROM door by rotating the door upwards until it is flush against the bezel.

### 8.2.2 Rear Panel

Removal of the rear panel is required to perform any of the display adjustments.

### **CAUTION**

The unit should be placed face-down on a smooth flat surface prior to any removal of the rear panel, case assembly or pedestal assembly. To avoid possible damage to the CRT screen, some protective material must be placed between the terminal and the work surface.

#### Required Tools:

- o Torx screwdriver (T10)
- o Slot head screwdriver, medium size

#### Removal:

1. Remove the 3 mm (T10) torx screw located at the bottom center of the panel.
2. Find the two rear panel release holes located on the underside of the chassis, near the bottom corners of the rear panel (see Figure 8-4).
3. Insert a slot-head screwdriver into the opening and locate the blade into the recess on the release tab. Using the outside edge of the release hole as a

## Replacement Parts

fulcrum, lever the release tab in towards the center of the unit. Do this for both sides.

4. Once both release holes are clear, lift the rear panel out and away from the unit.

### Replacement:

1. Locate the three hinge tabs on the rear panel into the appropriate receptacles on the case. Rotate the rear panel down and snap the release tabs into place.
2. Replace the 3 mm (T10) torx screw and place the terminal back on its pedestal.

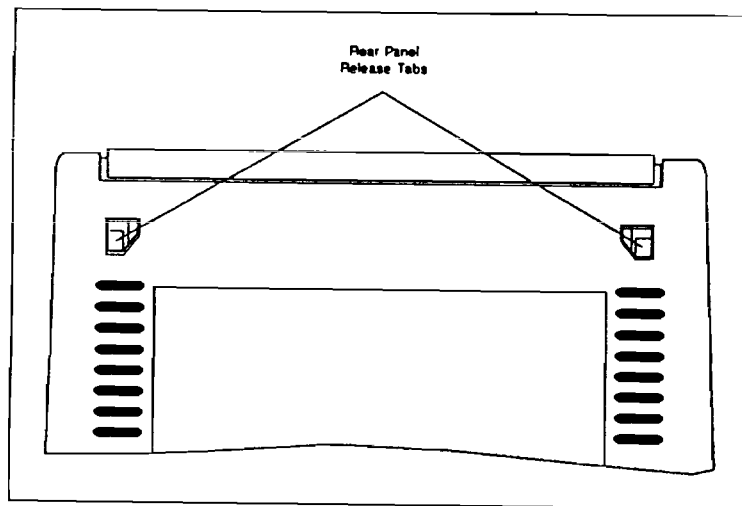


Figure 8-4 Rear Panel Release Tabs

## Replacement Parts

### 8.2.3 Pedestal Assembly

#### Required Tools:

- o Torx screwdriver (T10)
- o Slot head screwdriver, medium size

#### Removal:

1. Place the unit face-down on a smooth flat surface.
2. Remove the pedestal retainer screw from the bottom of the pedestal assembly (see Figure 8-3).
3. Grasp the top of the pedestal assembly, pull out and down to remove it from the case.
4. Included in the pedestal assembly are four parts that can be replaced if damaged. (see Figure 8-3). These parts are the base, swivel ring, tilt clip and rubber foot. These parts may be replaced as follows:
  - a) Swivel Ring: To separate the swivel ring from the base, rotate the ring until the release tabs are against the stops on the base. Using a slot-head screwdriver, lift the tab over the edge of the stop and rotate the ring until it comes free. To replace, line up the slots on the edge of the ring with the tabs on the base, press in and rotate the ring until it snaps into place.
  - b) Tilt Clip: The tilt clips (normally three) are used to adjust the amount of force required to tilt the terminal forwards or backwards. To remove, press either the top or the bottom of the clip until it slides out from between the tilt vanes. When replacing the clips, do not leave any gaps between the clips.
  - c) Rubber Foot: Using a screwdriver or other pointed tools, lift one end of the rubber strip out of its channel. Grasp the exposed end and pull the strip

completely out. To replace, press one end of the rubber strip into the channel and then feed the remainder into the channel.

## Replacement:

1. Place the pedestal assembly into position against the case so that the tilt guides the pedestal are lined up with those of the case. Using a rocking motion, press the pedestal assembly in towards the terminal until it seats against the case.
2. Replace the pedestal retainer screw.

## 8.2.4 Case Assembly

## Required Tools:

- o Torx screwdriver (T25)
- o Slot-head screwdriver, medium size
- o Retainer clips (6 required)

## Removal:

1. Place the unit face-down on a smooth flat surface. Observe the precautions described in Section 8.2.2. Remove the pedestal assembly as described in Section 8.2.3.
2. Using the T25 torx screwdriver, remove the four screws that fasten the case to the bezel assembly.

## NOTE

Initially, units shipped are equipped with both screws and retainer clips. These units require 6 new retainer clips during re-assembling the case to the bezel assembly.

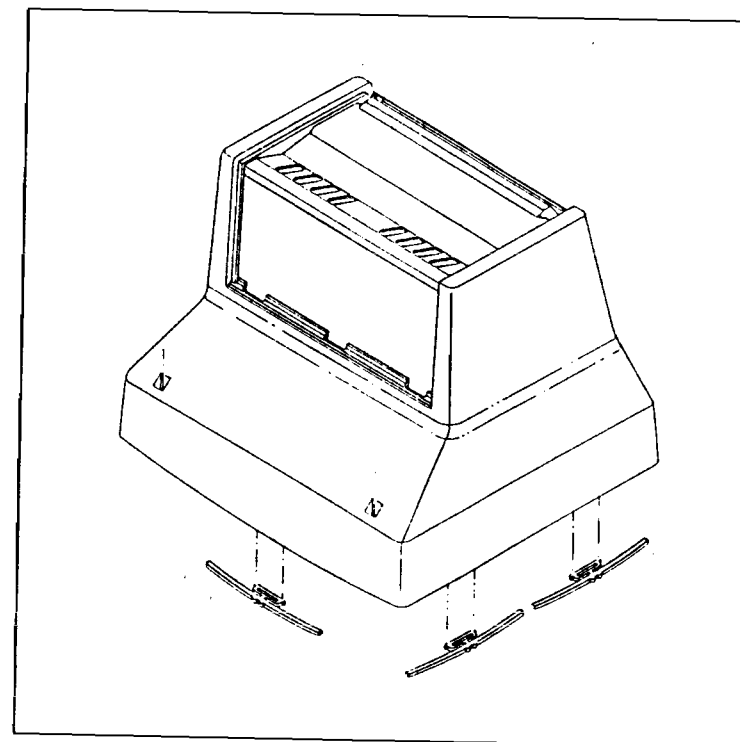


Figure 8-5. Case Assembly

For those units that have retainer clips, place a blade of a medium flat-head screwdriver at right angles to the groove in the center of the clip (Figure 8-5) and press in towards the center of the terminal until the clip snaps in two, or the ends of the clip are permanently bent away from the edge of the case. Do this for all six clips.



## Replacement Parts

3. With the screws removed (and the clips bent out), grasp the top of the case with both hands and lift up. It may be necessary to hold the bezel with one hand while pulling up the case with the other to release the case from the CRT grommets.

4. Once the case is free of the bezel, lift it straight up until it clears the CRT.

### Replacement:

1. If the unit is equipped with retainer clips, snap six new ones into place (see Figure 8-5). Slide the case assembly down over the CRT and PCAs until it seats against the CRT grommets. Be sure that the keyboard and datacomm connectors are properly aligned with the appropriate openings in the rear of the case assembly.
2. If the unit has retainer clips, press down on the top of the case until the clips snap into place. Then, replace the four torx screws and tighten them down. On units without clips, replace the four retaining screws.
3. Replace the pedestal assembly as described in Section 8.2.3.

## 8.2.5 Font Card

### Required Tools:

- o Torx screwdriver (T25)
- o Slot-head screwdriver, medium size with insulated handle
- o Retiner clips (6 required)
- o Grounding wire with alligator clips on both ends

### Removal:

1. Remove the ROM Card as described in Section 8.2.1.

## Replacement Parts

2. Remove the case assembly as described in Section 8.2.4. Be sure to observe the precautions regarding the CRT face.

### **WARNING**

Although the HP 700/92A Terminals have CRT bleeder circuits, high voltages may be present at the CRT anode connector. Discharge the CRT before attempting to remove the anode connector.

3. Connect one end of the ground wire to the copper tab on the CRT tension band, and the other end to the shaft of the screwdriver. Carefully slip the end of the screwdriver under the cap on the anode connector, and touch it to the metal prongs at the end of the anode connector.
4. Carefully disconnect the anode connector from its receptacle in the CRT. It may be necessary to lift up the edge of the connector cap and observe the direction of the metal prongs.
5. Disconnect the deflection coil cable from the connector on the Main Board. Then, remove the cathode connector from the rear of the CRT.
6. Lift the PCAs stack up from the bezel, maintaining the same tilt angle until the whole assembly clears the unit.
7. Loosen the three white spacers from the Font Card, one at a time while lifting that area of the Font Card. When the three white spacers are loosened, carefully disconnect the Font Card from the two connectors (J1 and J2) on the Video Card.

## Replacement Parts

### CAUTION

Do not damage the pins on the Video Card and the Main Board while removing any of the printed circuit assembly.

#### Replacement:

1. Properly position the Font Card with the three white spacers, so that the pin of the two connectors(J1 and J2) located on the component side of the Video Card mates the pin sockets(J1 and J2) on the circuit side of the Font Card. Install the Font Card.
2. Lower the PCAs stack vertically into the retainer cavities until it contacts the bezel. While keeping the whole assembly in the vertical position, align the tabs on the brightness and contrast potentiometers with the slots in the bezel slider controls.
3. Tilt the whole PCAs stack back until it locks into position. Lift the power switch extender bar up and down to verify that it is properly attached to the ON/OFF button. If not, tilt the board forward and try again.
4. Reconnect the CRT anode, cathode and deflection coil leads.
5. Replace the case assembly as described in Section 8.2.4

### 8.2.6 Video Card

#### Required Tools:

- o Torx screwdriver (T25)
- o Slot-head screwdriver, medium size with insulated handle
- o Retiner clips (6 required)
- o Grounding wire with alligator clips on both ends

## Replacement Parts

#### Removal:

1. Remove the Font PCA as described in Section 8.2.5.
2. Disconnect the 5V power cable (black and red) from the J701 connector on the Main Board.
3. Carefully release the Video Card from the three white spacers on the Main Board. When the three white spacers are loosed, carefully disconnect the Video Card from the 84-pin connector (E817) on the Main Board.

#### Replacement:

1. Properly position the Video Card with the three white spacers, so that the 84-pin socket (E817) located on the circuit side of the Video Card matches with the 84-pin connector on the Main Board. Carefully install the Video Card on top of the Main Board.
2. Connect the power cable with the J701 connector on the Main Board.
3. Replace the Font Card, case assembly described in Section 8.2.4 and 8.2.5.

### 8.2.7 Main Board

#### Required Tools:

- o Torx screwdriver (T25)
- o Slot-head screwdriver, medium size with insulated handle
- o Retiner clips (6 required)
- o Grounding wire with alligator clips on both ends

## Replacement Parts

### Removal:

1. Remove the Font Card and the Video Card as described in Section 8.2.5 and 8.2.6.
2. There is no field replacement part on the Main Board.

### Replacement:

Install the Main Board with the Font Card and the Video Card as described in Section 8.2.5 and 8.2.6.

## 8.2.8 CRT/Yoke

### Required Tools:

- o Torx screwdriver (T25)
- o Slot-head screwdriver, medium size with insulated handle
- o Retainer clips (six required)
- o Grounding wire with alligator clips on both ends

### Removal:

1. Remove the pedestal and case assemblies as described in Section 8.2.3 and 8.2.4, respectively.
2. Observe the precautions mentioned in Section 8.2.5. Carefully disconnect the annode connector from its receptacle in the CRT. It may be necessary to lift up the edge of the connector cap and observe the direction of the metal prongs.
3. Disconnect the deflection coil cable from the connector on the Main Board. Then, remove the cathode connector from the rear of the CRT.
4. Lift the Main Board stack up from the bezel, maintaining the same tilt angle until the whole assembly clears the unit.

## Replacement Parts

5. Lift the CRT away from the bezel assembly.

### Replacement:

1. The replacement CRT/Yoke assembly should come with 4 rubber grommets. If not, use the ones already with the unit.
2. If not in place, slide the grommets over the tabs on each corner of the CRT/Yoke assembly.
3. Place the CRT into position on the bezel. Be sure that the slots in the rubber grommets are aligned with the ribs on the CRT retaining posts, and that the CRT annode connector is on the left side of the terminal (as seen from the inside, looking out).
4. Lower the PCAs stack vertically into the retainer cavities until it contacts the bezel. While keeping the whole stack in the vertical position, align the tabs on the brightness and contrast potentiometers with the slots in the bezel slider controls.
5. Tilt the PCAs stack back until it locks into position. Lift the power switch extender bar up and down to verify that it is properly attached to ON/OFF button. If not, tilt the board forward and try again.
6. Reconnect the CRT annode, cathod and deflection coil leads.
7. Replace the case assembly and pedestal assembly as describe in Section 8.2.3 and 8.2.4.
8. If any display adjustments are required, see Chapter 6 for the necessary instructions.

8.2.9 Bezel Assembly

Required Tools:

- o Torx screwdriver (T25)
- o Slot-head screwdriver, medium size
- o Retainer clips (six required)
- o Grounding wire with alligator clips at both ends

Removal:

1. Remove the pedestal, case, PCAs and CRT/Yoke assemblies according to the directions given in Section 8.2.3, 8.2.4, and 8.2.8. Observe all precautions given in those sections.
2. Replace the bezel assembly with a new one if required.
3. There are four parts associated with the bezel assembly that can be replaced separately (see Figure 8-2): the ON/OFF button, the brightness/contrast icon panel, the brightness/contrast slider controls, and the ROM door. Of these, only the ROM door can be removed without dis-assembling the unit. Each of the other three is a snap-out, snap-in type of part.

Replacement:

1. Set the new bezel assembly in position on a flat, smooth surface with an appropriate protection for the CRT.
2. Reassemble the CRT/Yoke, PCAs, case and pedestal assemblies as previously described.
3. See Chapter 6 if any display adjustments are required.

8.3 Field Replaceable Parts

Table 8-5 is a field replaceable part list for the HP 700/92A Terminal.

Table 8-5. Field Replaceable Part List

PART NO.	PART DESCRIPTION	QTY	AFR %
C1400-60224	Keyboard Assembly - (Japan)	1	0.5
C1400-60223	Keyboard Assembly - (Taiwan)	1	"
C1400-60221	Keyboard Assembly - (Korea)	1	"
C1400-60222	Keyboard Assembly - (China)	1	"
C1010-60001	Main Board	1	0.9
C1010-60102	Font Card - (Japan)	1	0.45
C1010-60112	Font Card - (Taiwan)	1	"
C1010-60122	Font Card - (Korea)	1	"
C1010-60132	Font Card - (China)	1	"
C1010-60010	Video Card	1	0.8
C1010-60003	ROM Card - (Japan)	1	0.45
C1010-60013	ROM Card - (Taiwan)	1	"
C1010-60023	ROM Card - (Korea)	1	"
C1010-60033	ROM Card - (China)	1	"
8120-4753	Power Cord - (Japan)	1	
8120-1378	Power Cord - (Taiwan)	1	
8120-1378	Power Cord - (Korea)	1	
8120-1369	Power Cord - (China)	1	
5180-4721	Keyboard Cable	1	
C1010-60005	CRT/Yoke Assembly (include grommet), Green	1	0.35
9140-1256	Deflection York	1	
C1010-40001	HP Logo/Label	1	
C1010-80004	Rear Panel Label	1	
5041-6315	Rear Panel	1	
5061-8849	Bezel Assembly	1	



Replacement Parts

Table 8-5. Field Replaceable Part List (continued)

5041-6307	Bezel	1
5041-6312	Brt/Contr Slider	2
5041-6310	ROM Door	1
5041-6309	On/Off Button	1
5041-6319	Brt/Contr Icon Panel	1
5061-8851	Case Assembly	1
5041-6323	Retainer Clip	6
5061-8850	Tilt/Swivel Assembly	1
0380-1322	Spacer, Snapin Plastic	6
5041-6311	On/Off Extender Bar	1
0515-1905	Screw - Plastic Case	4
0515-1890	Screw - Rear Panel	1
2110-0782	Fuse	1

9 Diagrams

10 Reference

11 Service Notes

## Diagrams

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9

This chapter is intentionally left blank.

## Reference

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10

It is recommended that the programmer's reference manual (HP C1010-90002 ) be consulted for the detailed terminal functions such as character codes, escape sequence summary, etc.