

Thank you for purchasing this Factory Service Manual CD/DVD from servicemanuals4u.com.

Please check out our eBay auctions for more great deals on Factory Service Manuals:

servicemanuals4u

Notice

The information in this guide is subject to change without notice.

Compaq Computer Corporation shall not be liable for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

This guide contains information protected by copyright. No part of this guide may be photocopied or reproduced in any form without prior written consent from Compaq Computer Corporation.

Copyright 1994 Compaq Computer Corporation.
All rights reserved. Printed in the USA.

Compaq, Deskpro, LTE, Contura
Registered U.S. Patent and Trademark Office.

Contura Aero is a trademark of Compaq Computer Corporation.

The software described in this guide is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of the agreement.

Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

MAINTENANCE AND SERVICE GUIDE

Compaq Contura Aero Family of Personal Computers

First Edition (February 1994)
Part Number 197235-001

Chapter 1. Illustrated Parts Catalog

Chapter 1.0 Introduction

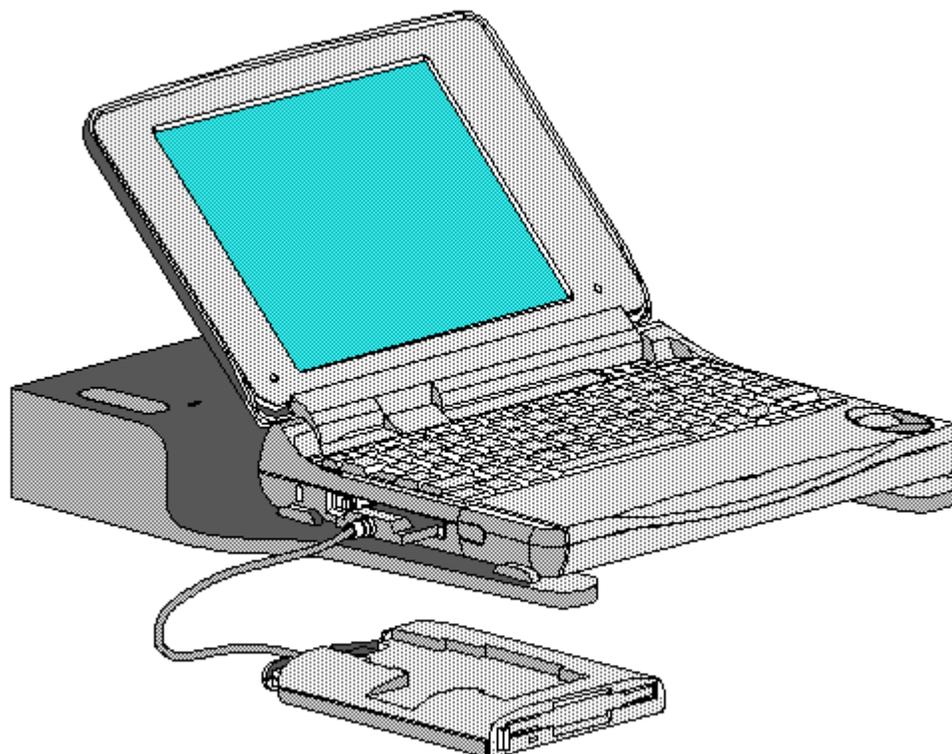


Figure 1-1. Compaq Contura Aero Family of Personal Computers with the PCMCIA External Diskette Drive and the Base Unit

Chapter 1.1 Illustrated Parts Breakdown: Compaq Contura Aero Family Of Personal Computers

The Compaq Contura Aero Family of Personal Computers joins a display assembly and system unit together with a clutch secured by screws in the chassis, display enclosure, and a display pin allowing it to open and close. The display assembly is secured by screws installed in the front of the display enclosure. The system unit is secured to the system unit enclosure by screwlocks in the rear and screws in the bottom of the system unit enclosure.

SYSTEM UNIT MODULE DESCRIPTION

The system unit (Figure 1-4) includes the following replaceable parts:

- o Battery and spacer
- o Base enclosure
- o Keyboard
- o Hard drive
- o Power supply

- o PCMCIA ejector rails
- o Trackball assembly
- o Memory expansion board (optional)
- o System board

The keyboard is secured to the system unit with four screws and a hook latch in the front. Once the screws are removed, the keyboard must be rotated from the rear forward to disengage it from the hook latch. The keyboard must be removed to allow access to any of the system board components. The keyboard is connected to the system board with two ribbon cables and zero insertion force (ZIF) connectors. The cables do not necessarily have to be disconnected to service the system board. The keyboard may be laid on top of the battery compartment to access the system board.

The hard drive is connected directly to the system board with no intervening cables. It is mounted to the chassis with a hard drive bracket. The hard drive bracket is secured to the hard drive with three screws.

The power supply is secured to the system board with one threaded standoff. There is no cable between the power supply and the system board; the power supply connects directly to the system board.

The trackball assembly consists of the trackball, buttons, flex cable, and speaker. The trackball plugs directly into the cable with a low insertion force (LIF) connector and mounts with two screws in the right front corner of the base enclosure. The flex cable includes the buttons and speaker. The buttons fit in a recessed area on the right side of the base enclosure and control the functions of the trackball. The speaker is connected to the flex cable with two wires and fits in a narrow area in the right front corner of the base enclosure. Sound is directed through the enclosure. The remainder of the flex cable is routed behind and over the hard drive assembly and plugs with a LIF connector directly into the system board.

The system board is mounted directly to the chassis. All system module components connected to the system board must be removed prior to removing the system board.

The PCMCIA rails are secured to the system board header with two screws at the top. The rails plug directly into the system board connector.

The memory expansion board plugs into the system board in the bottom of the base enclosure. Remove the door, and the memory expansion board plugs into a single connector. System memory can be increased to a maximum 12 MB by adding an 8 MB Memory Expansion Board. A 4 MB Memory Expansion Board is also available.

DISPLAY ASSEMBLY MODULE DESCRIPTION

The display assembly (Figures 1-5 and 1-6) includes the following replaceable parts:

- o Display bezel
- o Liquid crystal display (LCD) panel
- o Display inverter board
- o Display cable
- o Display shield
- o Display enclosure

Compaq Contura Aero 4/25

The display assembly is secured with two screws in the bottom corners of the display bezel and by a screw in a clutch and a pin to the base enclosure. To remove the display assembly from the base enclosure, the display bezel must be removed first. Then the CPU cover is removed to allow access to the system board.

The monochrome LCD is secured to the display enclosure with two screws in the top left corner and one screw in the top right corner. The bottom right corner has two small cables attached to a connector for the backlight and the inverter board.

The display cable is a flex cable plugged into a connector on the left side of the LCD, folded, and secured to the display shield with a pressure sensitive adhesive. One end of the display cable is exposed at the bottom of the display enclosure and is connected to the system board with a zero insertion force (ZIF) slider. The other end is connected with a low insertion force (LIF) connector to the display inverter board.

The display inverter board is aligned in the bottom of the display enclosure with pins. One end connects to the display cable; the other end plugs into the backlight cable of the LCD panel and is held in place with pressure sensitive adhesive tape.

The display shield lays in the display enclosure.

Compaq Contura Aero 4/33C

The display assembly is secured with two screws in the bottom corners of the display bezel and by a screw in a clutch and a pin to the base enclosure. To remove the display assembly from the base enclosure, the display bezel must be removed first. Then the CPU cover is removed to allow access to the system board.

The color LCD is secured to the display enclosure with four screws in the corners of the LCD panel. The top right corner has two small cables attached to a connector for the backlight and the inverter board.

The display cable is a flex cable plugged into a ZIF connector on the left side of the LCD, folded, and secured to the display shield with a pressure sensitive adhesive. One end of the display cable is exposed at the bottom of the display enclosure and is connected to the system board with a ZIF connector. The other end plugs into a LIF connector on the display inverter board in the lower right hand corner of the display enclosure.

The display inverter board is aligned on the right side of the display enclosure and mounted component side down. One end connects to the display cable; the other end plugs into the backlight cable of the LCD panel.

The display shield lays in the display enclosure and has tabs that bend over the screw holes of the LCD and secure the display shield to the LCD.

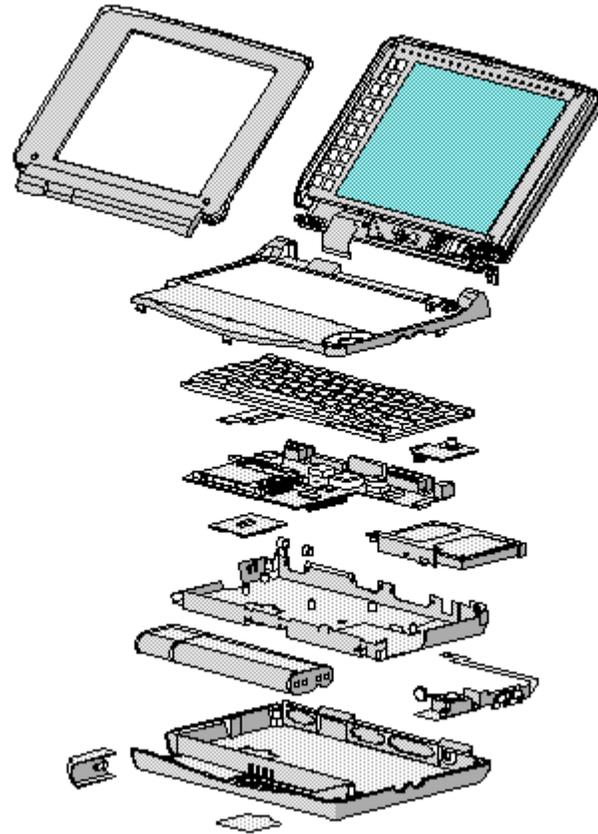


Figure 1-2. Compaq Contura Aero 4/25 Personal Computer

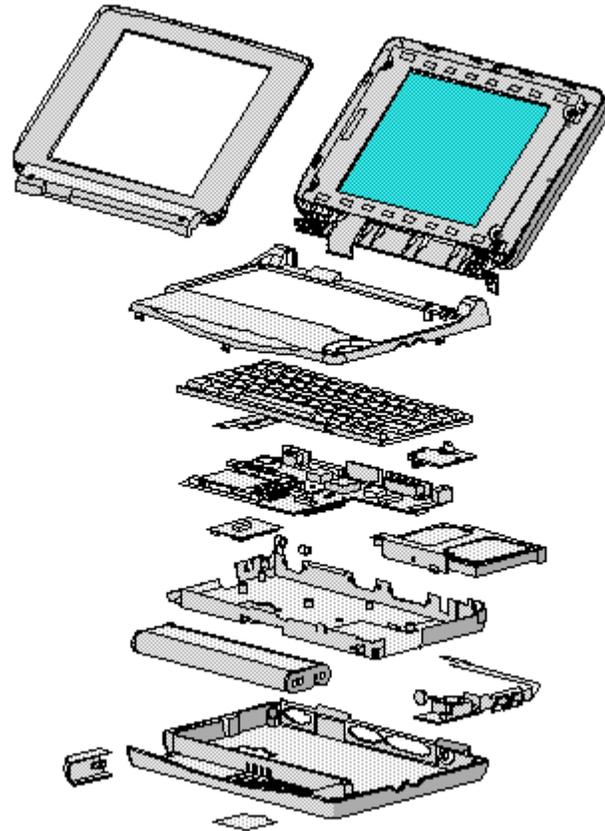


Figure 1-3. Compaq Contura Aero 4/33C Personal Computer

Chapter 1.2 System Unit Module

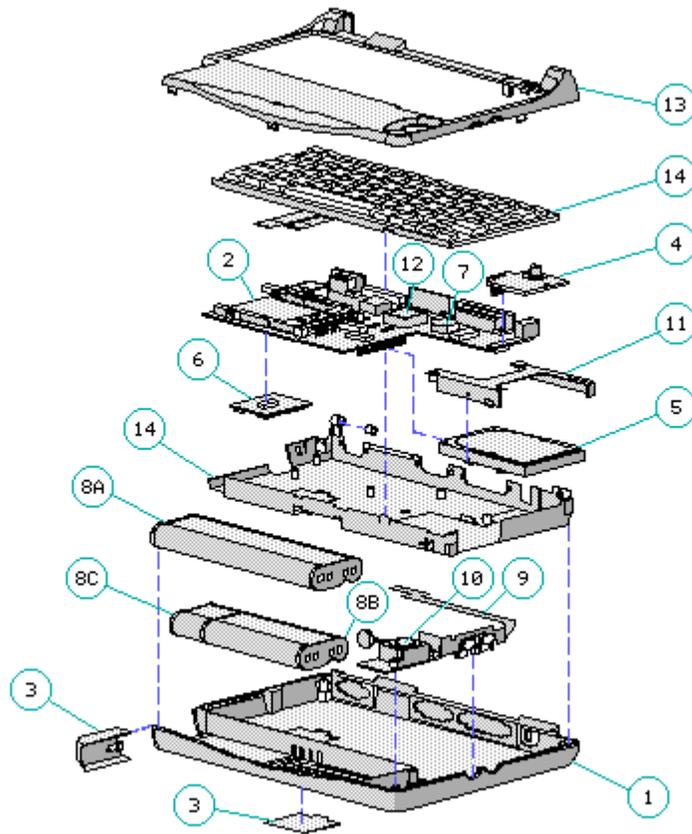


Figure 1-4. System Unit Module

Table 1-1. System Unit

Description	Spare Part No.	Notes
1 Base enclosure	197253-001	Includes screw covers.
2 System board, 4 MB		Does not include PCMCIA ejector rails.
Compaq Contura Aero 4/25	197241-001	Includes screw covers.
Compaq Contura Aero 4/33C	199222-001	
3 Door assembly	197239-001	Includes battery and memory expansion board doors.
4 Power supply, DC-DC	190521-001	Includes screw covers.
5 Hard drive		
- Model 250	199233-001	Does not include hard drive bracket. Includes screw covers.
- Model 170	190661-001	
- Model 84	190660-001	
6 Memory expansion board		

- 4 MB	190565-001	
- 8 MB	190596-001	

7 Real time clock battery	117099-001	

8 NiMH Battery Pack		
- 8A: Extended Life	190626-001	Extended Life battery does not
- 8B: Standard	190697-001	include spacer. Standard battery
- 8C: Spacer	197317-001	includes spacer.

9 Trackball cable and speaker assembly	197312-001	Includes screw covers.

10 Trackball assembly	197286-001	Includes screw covers.

11 Hard drive bracket	197236-001	Includes screws and screw covers.

12 System ROM	197229-001	Includes screw covers.

13 CPU cover	197311-001	Includes screw covers.

14 CPU chassis	199276-001	Includes clip and screw covers.
=====		

Chapter 1.3 VGA Display

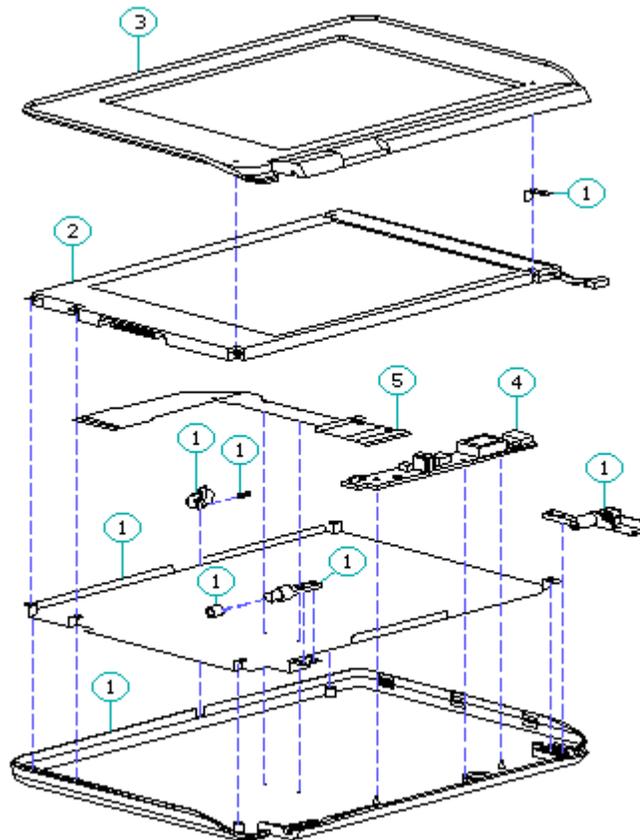


Figure 1-5. Compaq Contura Aero 4/25 Monochrome VGA Display

Table 1-2. Compaq Contura Aero 4/25 Monochrome VGA Display

Description	Spare Part No.	Notes
1 Display enclosure kit	197237-001	Includes enclosure, clutch, pin, latch, spring, screws, display shield, slotted bushing, ground clip, screw covers and logo.
2 Display panel	190624-001	Includes labels, screw covers.
3 Display bezel	197344-001	Includes screw covers.
4 Backlight inverter board	190522-001	Includes adhesive tape, screw covers.
5 Display cable	197238-001	Includes ZIF slider and screw covers.
6 Display hardware *	197316-001	Includes screws, ground clip, and screw covers.

* Not Shown

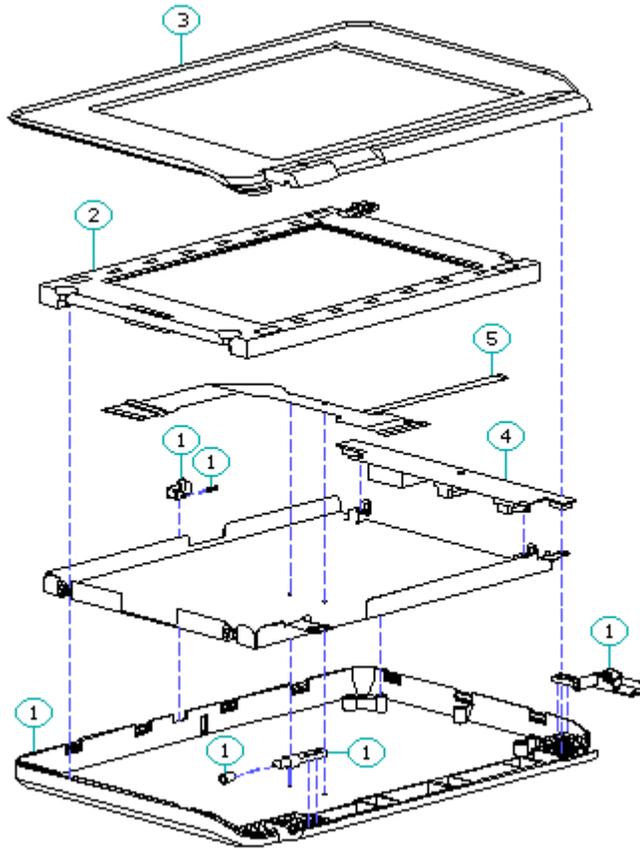


Figure 1-6. Compaq Contura Aero 4/33C Color VGA Display

Table 1-3. Compaq Contura Aero 4/33C Color VGA Display

Description	Spare Part No.	Notes
1 Display enclosure kit	199257-001	Includes enclosure, clutch, pin, latch, spring, screws, display shield, slotted bushing, screw covers and logo.
2 Display panel	199232-001	Includes labels, screw covers.
3 Display bezel	199260-001	Includes screw covers.
4 Backlight inverter board	199223-001	Includes screw covers.
5 Display cable	199258-001	Includes ZIF slider and screw covers.
6 Display hardware *	197316-001	Includes screws and screw covers.

* Not Shown

Chapter 1.4 Keyboards

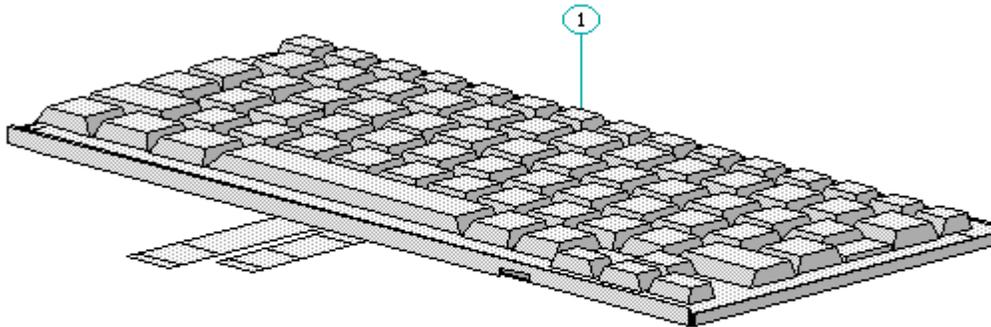


Figure 1-7. Keyboard

Table 1-4. Notebook Keyboards

Description	Spare Part Number
1 U.S.	190620-001
2 U.K.	190620-003 *
3 German	190620-004 *
4 French	190620-005 *
5 Italian	190620-006 *
6 Spanish	190620-007 *
7 Danish	190620-008 *
8 Norwegian	190620-009 *
9 Swedish/Finnish	190620-010 *
10 Swiss	190620-011 *
11 French Canadian	190620-012 *
12 Portuguese	190620-013 *
13 Latin American	190620-016 *
14 Belgium	190620-018 *
15 Japanese	190620-019 *

* Not Shown

Table 1-5. Enhanced Keyboards

Description	Spare Part Number
1 Enhanced II Keyboard U.S.	112573-001 (No longer available)*
2 Enhanced III Keyboard U.K.	140536-103 *
3 Enhanced III Keyboard German	140536-104 *
4 Enhanced III Keyboard French	140536-105 *
5 Enhanced III Keyboard Italian	140536-106 *
6 Enhanced III Keyboard Spanish	140536-107 *
7 Enhanced III Keyboard Danish	140536-108 *
8 Enhanced III Keyboard Norwegian	140536-109 *
9 Enhanced III Keyboard Swedish/Finnish	140536-110 *
10 Enhanced III Keyboard Swiss	140536-111 *
11 Enhanced III Keyboard French Canadian	140536-112 *
12 Enhanced III Keyboard Portuguese	140536-113 *
13 Enhanced III Keyboard Turkish	140536-114 *
14 Enhanced III Keyboard Greek	140536-115 *
15 Enhanced III Keyboard Latin American	140536-116 *
16 Enhanced III Keyboard Arabic	140536-117 *
17 Enhanced III Keyboard Belgian	140536-118 *
18 Enhanced III Keyboard Japanese	140536-119 *
19 Enhanced III Keyboard BHCSY **	140536-120 *
20 Enhanced III Keyboard Hungarian	140536-121 *
21 Enhanced III Keyboard Polish	140536-122 *
22 Enhanced III Keyboard Slovakian	140536-123 *
23 Enhanced III Keyboard Russian	140536-124 *
24 Enhanced III Keyboard Czech	140536-129 *
25 Enhanced III Keyboard Thai	140536-130 *

* Not Shown
** Bosnia-Herzegovina, Croatia, Slovenia, and Yugoslavia

Chapter 1.5 Cables

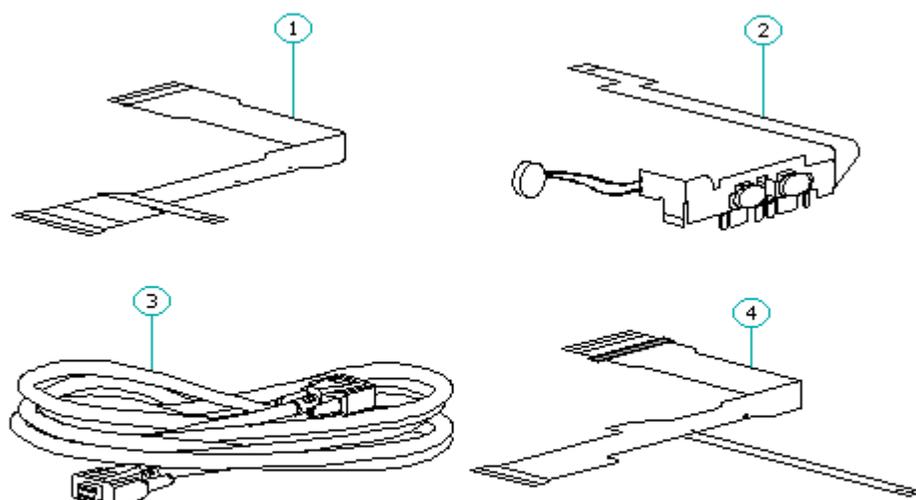


Figure 1-8. Cables

Table 1-6. Cables

Description	Spare Part Number
1 Display Cable (Compaq Contura Aero 4/25)	197238-001
2 Trackball/Speaker Cable	197312-001
3 Communication Cable	197318-001
4 Display Cable (Compaq Contura Aero 4/33C)	199258-001

Chapter 1.6 AC Adapter And Power Cord

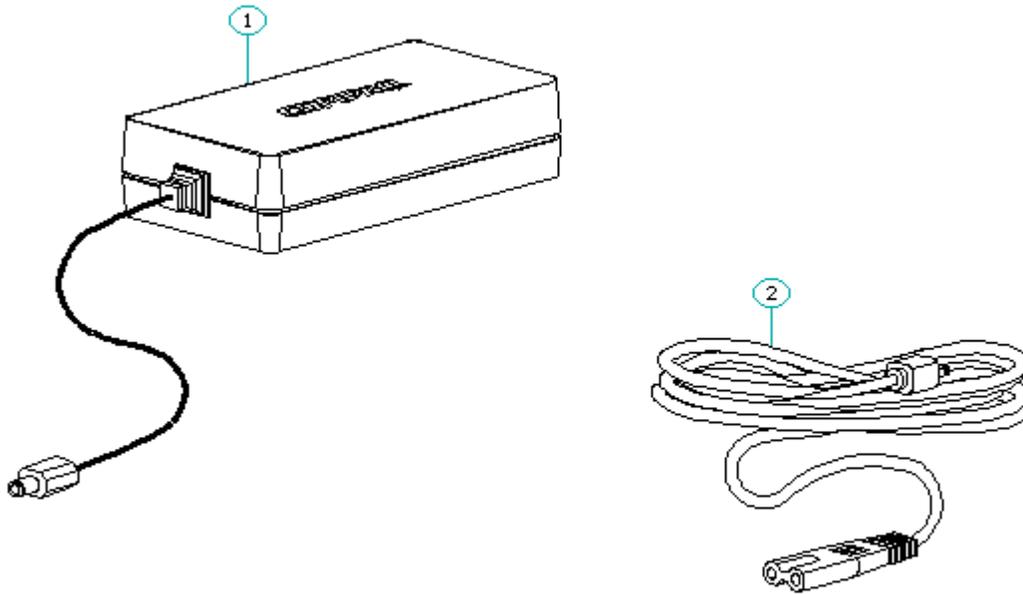


Figure 1-9. AC Adapter

Table 1-7. AC Adapter and Power Cord

Description	Spare Part Number
1 AC Adapter	190621-001
2 Power Cord (U.S./Canada)	197230-001
3 Power Cord (U.K.)	197232-001 *
4 Power Cord (Europe)	197231-001 *
5 Power Cord (Japan)	197233-001 *
6 Power Cord (Asia Pacific)	197234-001 *

* Not shown

Table 1-8. Documentation and Software

Description	Spare Part Number
MAINTENANCE AND SERVICE GUIDE	197235-001
QUICK SETUP CARD, BEYOND SETUP	
English	197243-001
German	197243-041
French	197243-051
Italian	197243-061
Spanish	197243-071

COMPAQ SERVICE QUICK REFERENCE GUIDE 106854-001

LOTUS ORGANIZER MANUAL

English	137885-001
German	137885-041
French	137885-051
Italian	137885-061
Spanish	137885-071

Online USER'S GUIDE

English	190512-001
German	190512-041
French	190512-051
Italian	190512-061
Spanish	190512-071

WINLINK (diskettes)

English	197330-001
German	197330-041
French	197330-051
Italian	197330-061
Spanish	197330-071

=====
Table 1-9. Accessories

Description	Spare Part Number
Automobile adapter	190551-001
Memory expansion board	
4 MB	190565-001
8 MB	190596-001
Base unit	190568-001
PCMCIA external diskette drive	190563-001
Mobile port expander	197364-001
Carrying case	121423-001
Briefcase	129930-001
Slipcase cover	197242-001

=====
Table 1-10. Mounting Hardware

Description	Spare Part Number
Kit, CPU base screws and screwlocks	197315-001
Kit, display screws	197316-001
Trackball removal tool	194041-001

=====
Table 1-11a. Fastener List for CPU Base Screws and Screwlocks

Description	Type	Where Used	Part Number	Drive	Qty
M2.5 x 7.0 *	Hex	System board to chassis	139576-004	3/16	2
M2.5 x 3.55 *	Hex	Power supply board to chassis	197257-001	3/16	1
#4-40 *	Hex	I/O connector	106902-004	3/16	4
M3.0 x 3.0	Pan	Hard drive bracket to hard drive	139574-001	PH/1	3
M2.0 x 7.0	Pan	PCMCIA rails to chassis	144762-002	PH/1	2
M2.0 x 2.5	Truss	Keyboard to chassis	144863-002	T8/SL	3
M2.5 x 12.0	Truss	Hard drive to keyboard to chassis	144864-005	T8/SL	1
M2.5 x 6.0	Truss	Clutch, system board	144865-003	T8/SL	7
M2.5 x 16.0	Truss	Base	144865-005	T8/SL	4

* Screwlocks

Table 1-11b. Fastener List for the Compaq Contura Aero 4/25 Display

Description	Type	Where Used	Part Number	Drive	Qty
M2.0 x 4.0	Truss	Pin	144863-001	T8/SL	2
M2.5 x 4.5	Truss	Clutch	144864-001	T8/SL	2
M2.0 x 6.0	Pan	Bezel	197341-002	PH/1	2
M2.0 x 2.5	Truss	Panel to enclosure	144863-002	T8/SL	3

Table 1-11c. Fastener List for the Compaq Contura Aero 4/33C Display

Description	Type	Where Used	Part Number	Drive	Qty
M2.0 x 4.0	Truss	Pin and inverter board	144863-001	T8/SL	2
M2.5 x 4.5	Truss	Clutch	144864-001	T8/SL	2
M2.0 x 6.0	Pan	Bezel	197341-002	PH/1	2
M3.0 x 6.0	Truss	Panel to enclosure	198889-001	T8/SL	4

Table 1-12. Miscellaneous Kits

Description	Spare Part Number
Base unit tilt feet	197346-001

CPU enclosure feet	197345-001
Battery and memory doors	197239-001
PCMCIA eject rails	197314-001
Carton, quantity 5	137863-001
Carton and buns, quantity 1	137864-001
Display connector slider	140071-001
Plate logo	197251-001
Battery spacer	197317-001
=====	

Chapter 2. Service Preliminaries

Chapter 2.0 Introduction

This chapter provides general service information for the computer and the base unit.

Adherence to the procedures and precautions described in this chapter is essential for proper service.

Chapter 2.1 Electrostatic Discharge (International)

A sudden discharge of static electricity from a finger or other conductor can destroy static sensitive devices or micro circuitry. Often the spark is neither felt or heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Or it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating Static

Table 2-1 shows how different activities generate static electricity and at different electrostatic voltage levels.

Table 2-1. Typical Electrostatic Voltages

Event	Relative Humidity		
	10%	40%	55%
Walking across carpet	35,000V	15,000V	7,500V
Walking across vinyl floor	12,000V	5,000V	3,000V
Motions of bench worker	6,000V	800V	400V
Removing DIPS from plastic tubes	2,000V	700V	400V
Removing DIPS from vinyl trays	11,500V	4,000V	2,000V
Removing DIPS from styrofoam	14,500V	5,000V	3,500V
Removing bubble pack from PCBs	26,000V	20,000V	7,000V
Packing PCBs in foam lined box	21,000V	11,000V	5,000V

NOTE: 700 volts can degrade a product.

Preventing Electrostatic Damage To Equipment

Many electronic components are sensitive to ESD. Circuitry design and

structure determine the degree of sensitivity. The following proper packaging and grounding precautions are necessary to prevent damage:

- o Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- o Keep electrostatic sensitive parts in their containers until they arrive at static free stations.
- o Place items on a grounded surface before removing them from their container.
- o Always be properly grounded when touching a sensitive component or assembly.
- o Place reusable electronic sensitive parts from assemblies in protective packaging or conductive foam.

Use transporters and conveyors made of antistatic belts and metal roller bushings. Mechanized equipment used for moving materials must be wired to ground and proper materials selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Preventing Damage to Drives

To prevent static damage to hard drives, use the following precautions:

- o Handle drives gently, using static guarding techniques.
- o Store drives in the original shipping containers.
- o Avoid dropping drives from any height onto any surface.
- o Handle drives on surfaces that have at least one inch of shock proof foam.
- o Always place drives PCB assembly side down on the foam.

Grounding Methods

The method for grounding must include a wrist strap or a foot strap at a grounded workstation. When seated, wear a wrist strap connected to a grounded system. When standing, use footstraps and a grounded floor mat.

Table 2-2. Static Shielding Protection Levels

Method	Voltages
Antistatic Plastic	1,500
Carbon Loaded Plastic	7,500
Metallized Laminate	15,000

Grounding Workstations

To prevent static damage at the workstation, use the following precautions:

- o Cover the workstation with approved static dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- o Use static dissipative mats, heel straps, or air ionizers to give added protection.
- o Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static free workstations.
- o Avoid contact with pins, leads, or circuitry.
- o Turn off power and input signals before inserting and removing connectors or test equipment.
- o Use fixtures made of static safe materials when fixtures must directly contact dissipative surfaces.
- o Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- o Use field service tools, such as cutters, screwdrivers, vacuums, that are conductive.
- o Use a portable field service kit with a static dissipative vinyl pouch that folds out of a work mat. Also use a wrist strap and a ground cord for the work surface. Ground the cord to the chassis of the equipment undergoing test or repair.

Grounding Equipment

Use the following equipment to prevent static electricity damage to the equipment:

Wrist Straps are flexible straps with a minimum of 1 megohm +/- 10% resistance to the ground cords. To provide proper ground, a strap must be worn snug against the skin. On grounded mats without banana plug connectors, connect a wrist strap with alligator clips.

Heelstraps/Toestraps/Bootstraps can be used at standing workstations and are compatible with most types of boots and shoes. On conductive floors or dissipative floor mats, use them on both feet with a minimum of 1 megohm resistance between operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Recommended Materials and Equipment

Other materials and equipment that are recommended for use in preventing static electricity include:

- o Antistatic tape
- o Antistatic smocks, aprons, or sleeve protectors

- o Conductive bins, and other assembly or soldering aids
- o Conductive foam
- o Conductive table top workstations with ground cord of 1 megohm of resistance
- o Static dissipative table or floor mats with hard tie to ground
- o Field service kits
- o Static awareness labels
- o Wrist straps and footwear straps providing 1 megohm +/- 10% resistance
- o Material handling packages
- o Conductive plastic bags
- o Conductive plastic tubes
- o Conductive tote boxes
- o Metal tote boxes
- o Opaque shielding bags
- o Transparent metallized shielding bags
- o Transparent shielding tubes

SERVICE CONSIDERATIONS

Listed below are some of the considerations that should be kept in mind during the disassembly and assembly of the computer.

Tool Requirements:

- o Flat bladed screwdriver
- o Torx T8 screwdriver (included in 130619-001)
- o Hex socket driver (3/16)
- o 25 Pin printer loopback plug (included in 100767-001)
- o 9 Pin serial loopback plug (included in 100767-001)
- o Cross recess (Phillips) screwdriver (included in 130619-001)
- o Trackball tool (spare part number 194041-001)
- o Case utility tool (spare part number 119070-001 and included in 10076-001)
- o PCMCIA external diskette drive (part number 190533-001)
- o Preloaded application diskettes

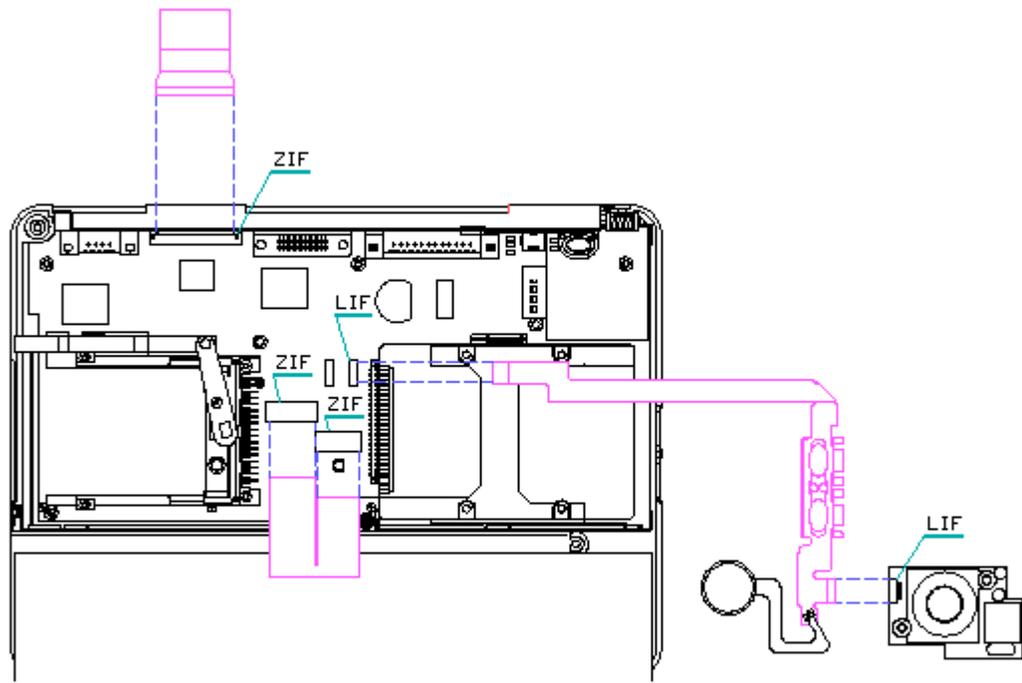


Figure 2-1. ZIF and LIF Connectors and Cable - System Unit

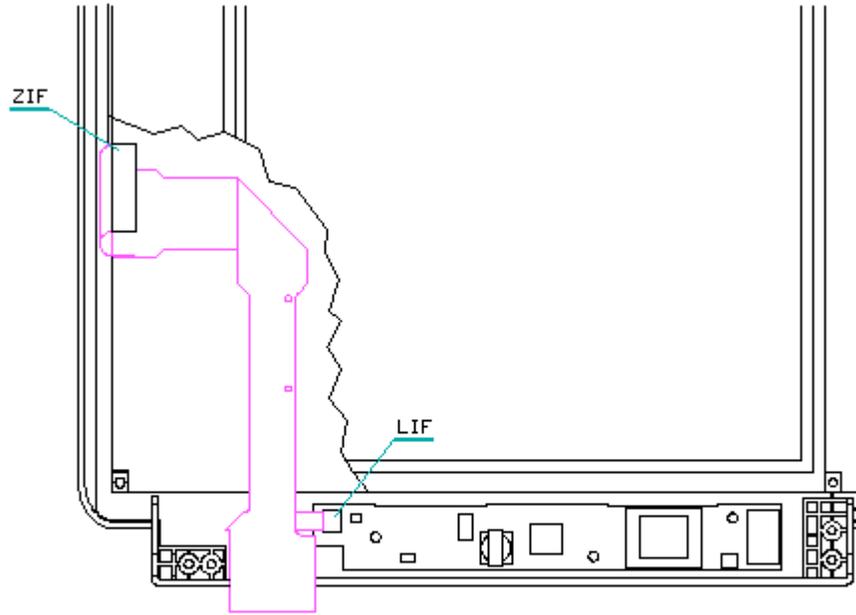


Figure 2-2. ZIF and LIF Connectors and Cable - Compaq Contura Aero 4/25 Display

A sudden discharge of static electricity from a finger or other conductor can destroy static sensitive devices or micro circuitry. Often the spark is neither felt or heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Or it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating Static

Table 2-1 shows how different activities generate static electricity and at different electrostatic voltage levels.

Table 2-1. Typical Electrostatic Voltages

Event	Relative Humidity		
	10%	40%	55%
Walking across carpet	35,000V	15,000V	7,500V
Walking across vinyl floor	12,000V	5,000V	3,000V
Motions of bench worker	6,000V	800V	400V
Removing DIPS from plastic tubes	2,000V	700V	400V
Removing DIPS from vinyl trays	11,500V	4,000V	2,000V
Removing DIPS from styrofoam	14,500V	5,000V	3,500V
Removing bubble pack from PCBs	26,000V	20,000V	7,000V
Packing PCBs in foam lined box	21,000V	11,000V	5,000V

NOTE: 700 volts can degrade a product.

Preventing Electrostatic Damage To Equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following proper packaging and grounding precautions are necessary to prevent damage:

- o Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- o Keep electrostatic sensitive parts in their containers until they arrive at static free stations.
- o Place items on a grounded surface before removing them from their container.
- o Always be properly grounded when touching a sensitive component or assembly.

- o Place reusable electronic sensitive parts from assemblies in protective packaging or conductive foam.

Use transporters and conveyors made of antistatic belts and metal roller bushings. Mechanized equipment used for moving materials must be wired to ground and proper materials selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Preventing Damage to Drives

To prevent static damage to hard drives, use the following precautions:

- o Handle drives gently, using static guarding techniques.
- o Store drives in the original shipping containers.
- o Avoid dropping drives from any height onto any surface.
- o Handle drives on surfaces that have at least one inch of shock proof foam.
- o Always place drives PCB assembly side down on the foam.

Grounding Methods

The method for grounding must include a wrist strap or a foot strap at a grounded workstation. When seated, wear a wrist strap connected to a grounded system. When standing, use footstraps and a grounded floor mat.

Table 2-2. Static Shielding Protection Levels

Method	Voltages
Antistatic Plastic	1,500
Carbon Loaded Plastic	7,500
Metallized Laminate	15,000

Grounding Workstations

To prevent static damage at the workstation, use the following precautions:

- o Cover the workstation with approved static dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- o Use static dissipative mats, heel straps, or air ionizers to give added protection.
- o Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static free workstations.
- o Avoid contact with pins, leads, or circuitry.

- o Turn off power and input signals before inserting and removing connectors or test equipment.
- o Use fixtures made of static safe materials when fixtures must directly contact dissipative surfaces.
- o Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- o Use field service tools, such as cutters, screwdrivers, vacuums, that are conductive.
- o Use a portable field service kit with a static dissipative vinyl pouch that folds out of a work mat. Also use a wrist strap and a ground cord for the work surface. Ground the cord to the chassis of the equipment undergoing test or repair.

Grounding Equipment

Use the following equipment to prevent static electricity damage to the equipment:

Wrist Straps are flexible straps with a minimum of 1 megohm +/- 10% resistance to the ground cords. To provide proper ground, a strap must be worn snug against the skin. On grounded mats without banana plug connectors, connect a wrist strap with alligator clips.

Heelstraps/Toestraps/Bootstraps can be used at standing workstations and are compatible with most types of boots and shoes. On conductive floors or dissipative floor mats, use them on both feet with a minimum of 1 megohm resistance between operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Recommended Materials and Equipment

Other materials and equipment that are recommended for use in preventing static electricity include:

- o Antistatic tape
- o Antistatic smocks, aprons, or sleeve protectors
- o Conductive bins, and other assembly or soldering aids
- o Conductive foam
- o Conductive table top workstations with ground cord of 1 megohm of resistance
- o Static dissipative table or floor mats with hard tie to ground
- o Field service kits
- o Static awareness labels
- o Wrist straps and footwear straps providing 1 megohm +/- 10% resistance

- o Material handling packages
- o Conductive plastic bags
- o Conductive plastic tubes
- o Conductive tote boxes
- o Metal tote boxes
- o Opaque shielding bags
- o Transparent metallized shielding bags
- o Transparent shielding tubes

SERVICE CONSIDERATIONS

Listed below are some of the considerations that should be kept in mind during the disassembly and assembly of the computer.

Tool Requirements:

- o Flat bladed screwdriver
- o Torx T8 screwdriver (included in 130619-001)
- o Hex socket driver (3/16)
- o 25 Pin printer loopback plug (included in 100767-001)
- o 9 Pin serial loopback plug (included in 100767-001)
- o Cross recess (Phillips) screwdriver (included in 130619-001)
- o Trackball tool (spare part number 194041-001)
- o Case utility tool (spare part number 119070-001 and included in 10076-001)
- o PCMCIA external diskette drive (part number 190533-001)
- o Preloaded application diskettes (Compaq Order Center, 1-800-952-7689)

Screws

The screws used in these products are not interchangeable. If an incorrect screw is used during the reassembly process, it could cause damage to the unit. Compaq strongly recommends that all screws removed during the disassembly process be kept with the part that was removed, then returned to their proper locations.

IMPORTANT: As each subassembly is removed from the computer, it should be placed away from the work area to prevent damage.

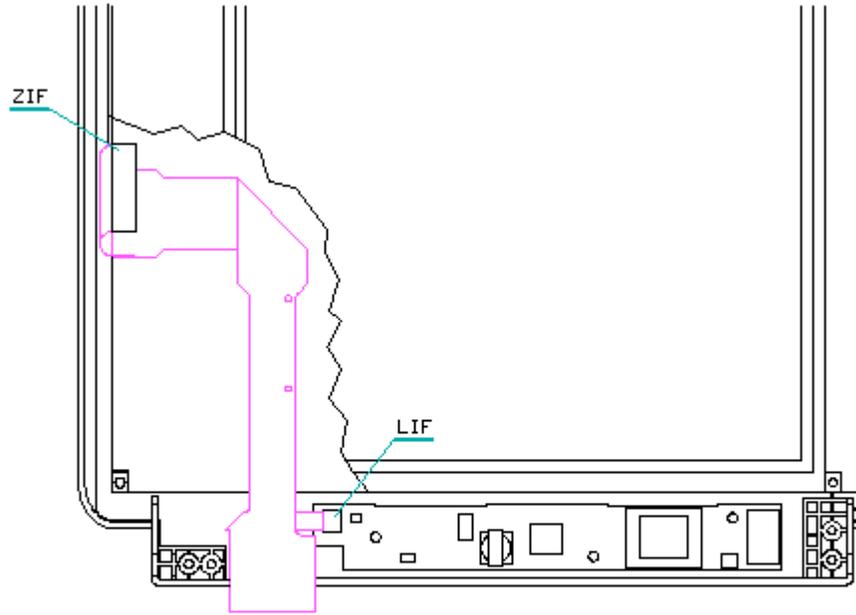


Figure 2-2. ZIF and LIF Connectors and Cable - Compaq Contura Aero 4/25 Display

In the interest of our customers and the protection of our environment, Compaq has initiated a disposal/recycling program for these battery packs. Further, because Compaq is funding all costs associated with the program, it is offered at no cost to the Compaq laptop and notebook customer.

IMPORTANT: Toll Free Number (U.S) 1-800-524-9859, (Canada) 1-800-263-5868

Customers in North America can take advantage of this program immediately. If you want to safely dispose of a depleted Compaq rechargeable battery pack, call the Compaq toll free telephone number. A recorded message asks you to provide your name, mailing address, and information about the battery pack. Within approximately two to three weeks, Compaq will send a postage paid "battery mailer" envelope preaddressed to the reclamation facility. Place the Compaq rechargeable battery pack into the battery mailer and mail it to the Compaq address shown on the mailer. Do not return Compaq rechargeable battery packs to Authorized Compaq Service Providers (except in the case of service or warranty exchanges) nor to any Compaq address other than the address on the preaddressed battery mailer envelope.

Chapter 3. Removal and Replacement Procedures

Chapter 3.0 Introduction

This chapter provides subassembly/module level removal and replacement procedures for the Compaq Contura Aero Family of Personal Computers.

After completing all necessary removal and replacement procedures, run the diagnostics program to verify that all components operate properly.

Chapter 3.1 Replacement Procedures

For replacement procedures, follow the removal procedures in this chapter in reverse order.

Chapter 3.2 Disassembly/Assembly Sequence Chart

This section provides instructions for removing and replacing these components:

3.4	---BATTERY PACK
3.5	---CPU COVER
3.6	---KEYBOARD
3.7	---VGA BACKLIT DISPLAY
	--Compaq Contura Aero 4/25
	----Bezel
	----Inverter Board
	----LCD Panel
	--Compaq Contura Aero 4/33C
	----Bezel
	----Inverter Board
	----LCD Panel
3.8	---POWER SUPPLY
3.9	---TRACKBALL
3.10	---HARD DRIVE
3.11	---SYSTEM BOARD
	---Real time Clock Battery
3.12	---CHASSIS

Chapter 3.3 Preparation Procedures

Before beginning the removal and replacement procedures, follow these steps (Figure 3-1):

1. Align the slot in the battery pack with the rib inside the computer.
2. Insert the battery pack, with the battery contacts facing to the inside of the battery compartment.
3. Push firmly on the battery pack until it slides into place.
4. Slide the battery door on until the lock snaps into place.

Chapter 3.5 Removing The Cpu Cover

To remove the CPU cover, follow these steps:

1. Remove the battery pack (Figure 3-2).
2. Turn the computer upside down.
3. Remove the four screws from the bottom of the computer (Figure 3-3).
4. Remove the screw from the clutch on the display enclosure in the rear of the computer (Figure 3-3).
5. Turn the computer right side up.

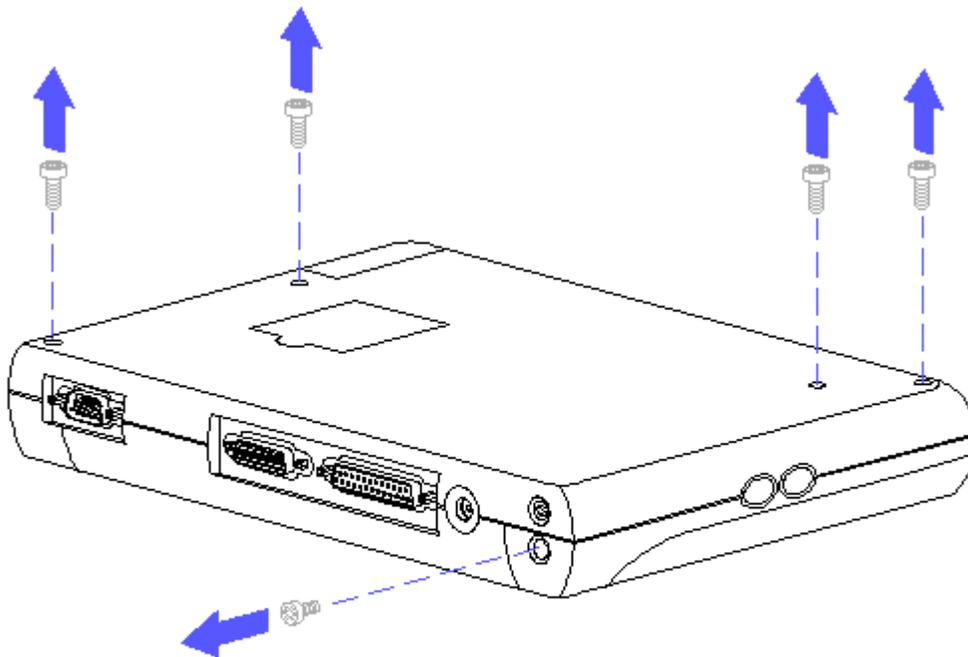


Figure 3-3. Removing the Screws from the Bottom and the Rear Panel

6. Slide the latch on the front of the computer to the right and open the display (Figure 3-4).

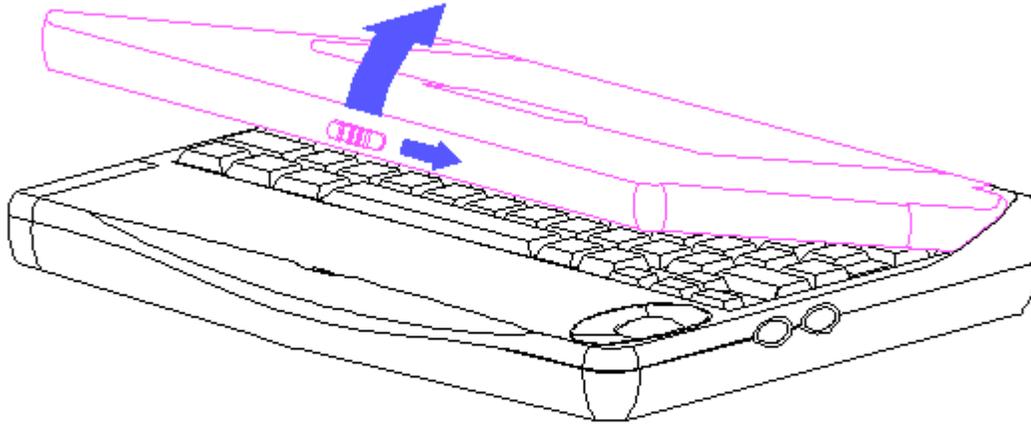


Figure 3-4. Opening the Display

7. Remove the screw covers from the bottom right and left corners of the display panel assembly. Using a Phillips screwdriver, remove the two screws (Figure 3-5).

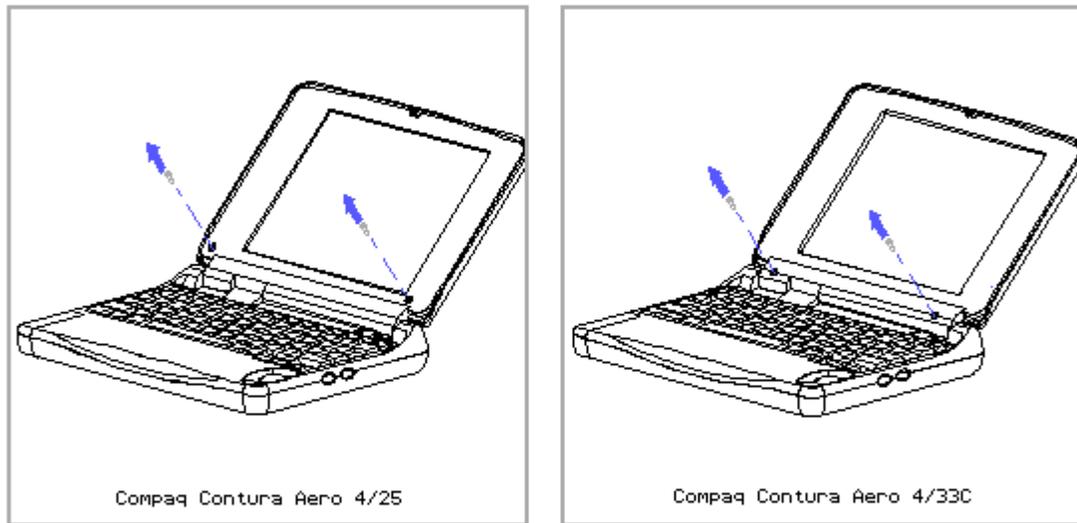


Figure 3-5. Removing Screws from the Display Assemblies

8. Remove the bezel from the display assembly by gently pulling the bezel frame and working from the bottom up (Figure 3-6).

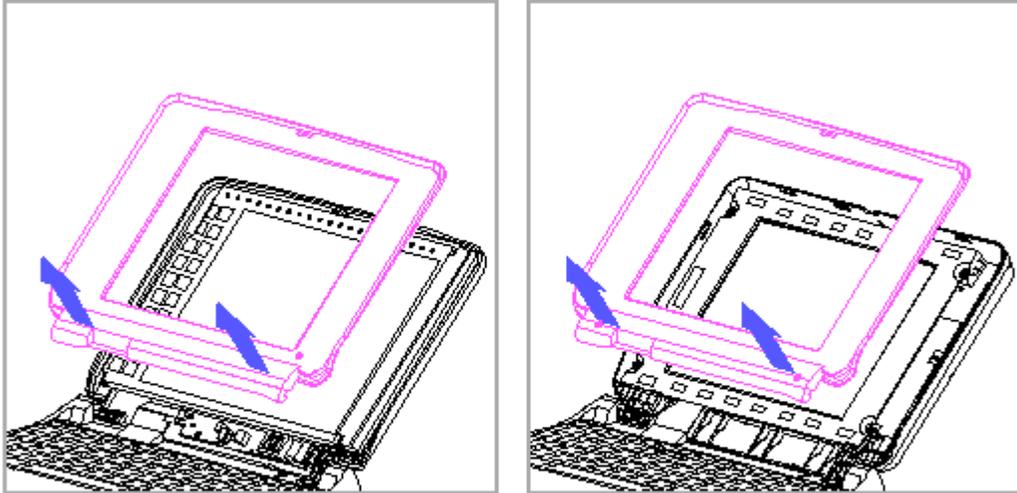


Figure 3-6. Removing the Display Bezel

9. Unsnap the CPU cover with the Case utility tool and lift it off of the computer (Figure 3-7).

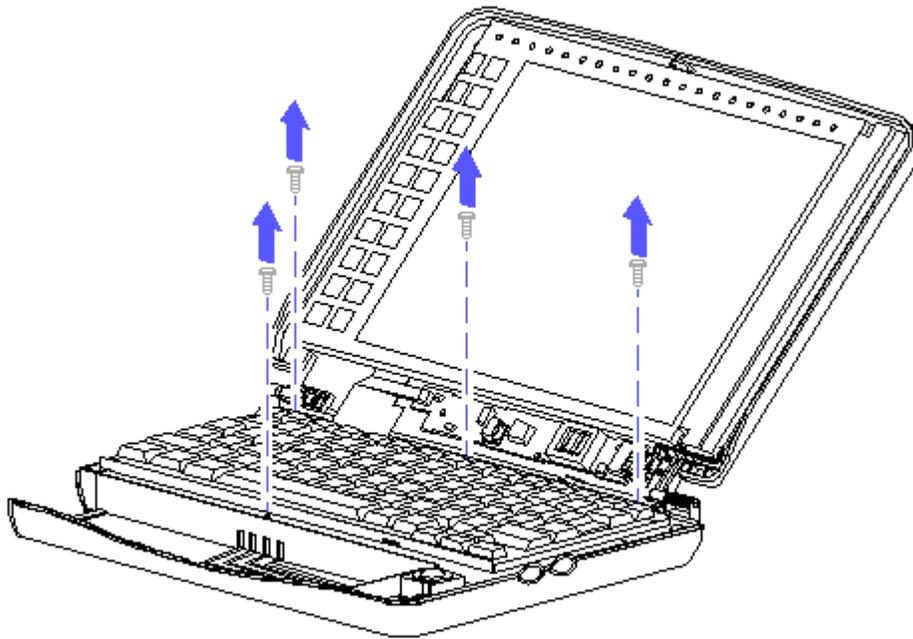


Figure 3-8. Removing Screws from the Keyboard

4. Gently lift up on the rear of the keyboard and unhook it from the hook latches in the front (Figure 3-9).

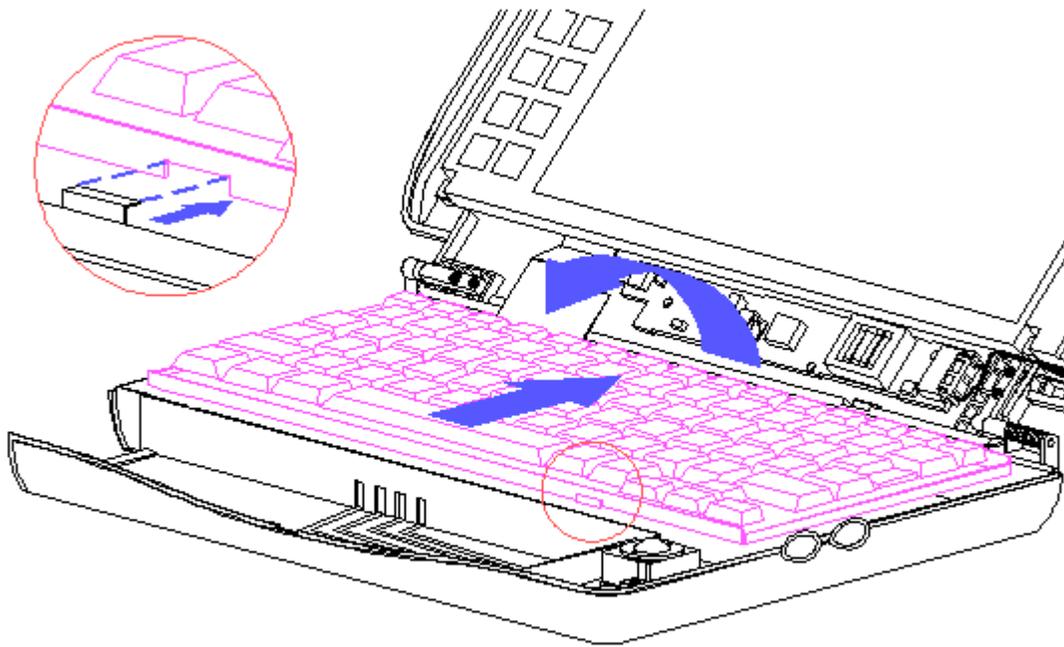


Figure 3-9. Removing the Keyboard

5. Rotate the rear of the keyboard toward you until the two ZIF connectors are exposed and lay the keyboard upside down on top of the battery compartment (Figure 3-10).

NOTE: You may not have to disconnect the cables from the keyboard to have access to the component you want to remove and/or replace.

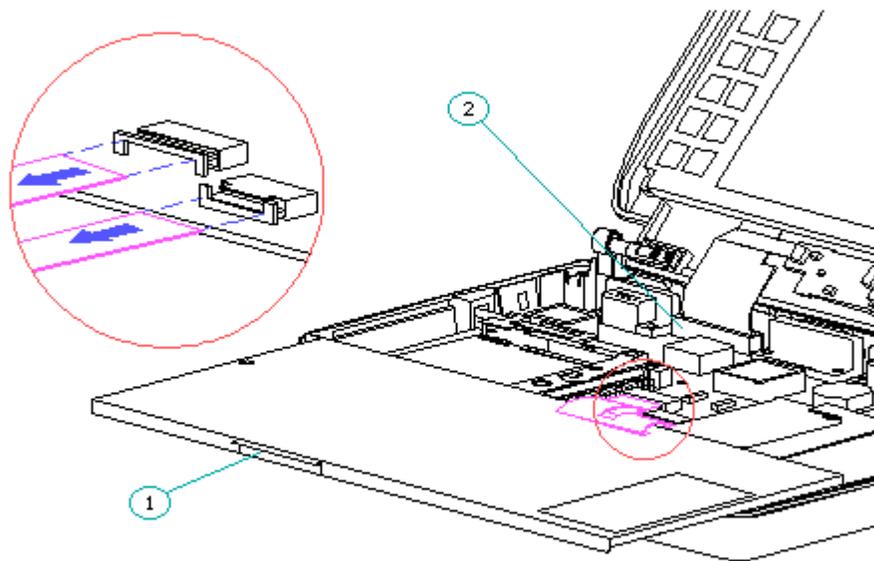


Figure 3-10. Laying the Keyboard Upside Down on Top of the Battery Compartment and Disconnecting the Keyboard Cables

6. Using the Case utility tool, carefully lift up on the two ZIF sliders one at a time to release the keyboard cables (Figure 3-10).
7. Carefully lift the keyboard out of the computer.

To replace the keyboard, reverse the previous steps.

NOTE: When replacing the keyboard, position the clip on the rear of the keyboard [1] on top of the display cable ZIF slider [2] (Figure 3-10).

Chapter 3.7 Removing The VGA Backlit Display

Compaq Contura Aero 4/25 Display

To remove the monochrome VGA backlit display from the Compaq Contura Aero 4/25 Personal Computer, follow these steps:

1. Remove the battery pack (Section 3.4).
2. Remove the display bezel and the CPU cover (Section 3.5).

3. Remove the keyboard (Section 3.6).
4. Release the ZIF slider attaching the display cable to the system board.

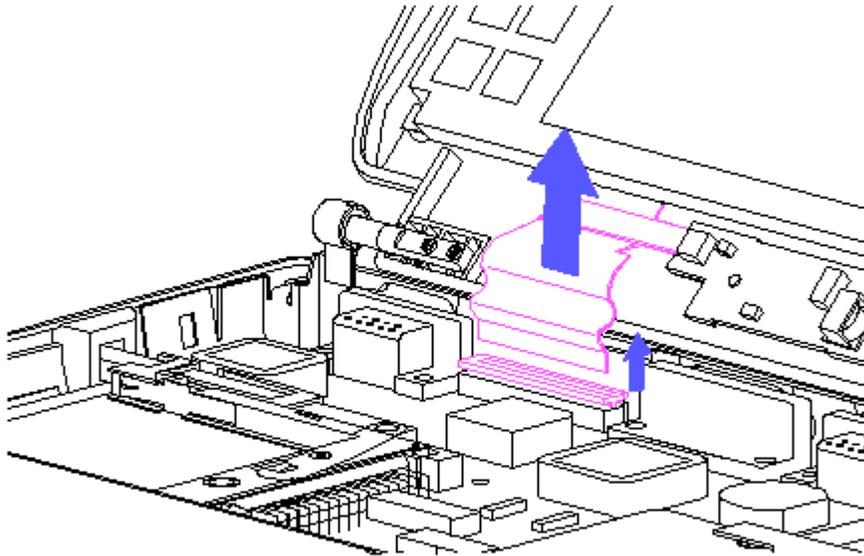


Figure 3-11. Releasing the Display Cable from the System Board

NOTE: It may not be necessary to remove the display assembly from the base enclosure to service the system board. The display will support itself in an open position without falling over.

5. Remove the remaining screw on the back of the display assembly to release the clutch from the base enclosure (Figure 3-12).

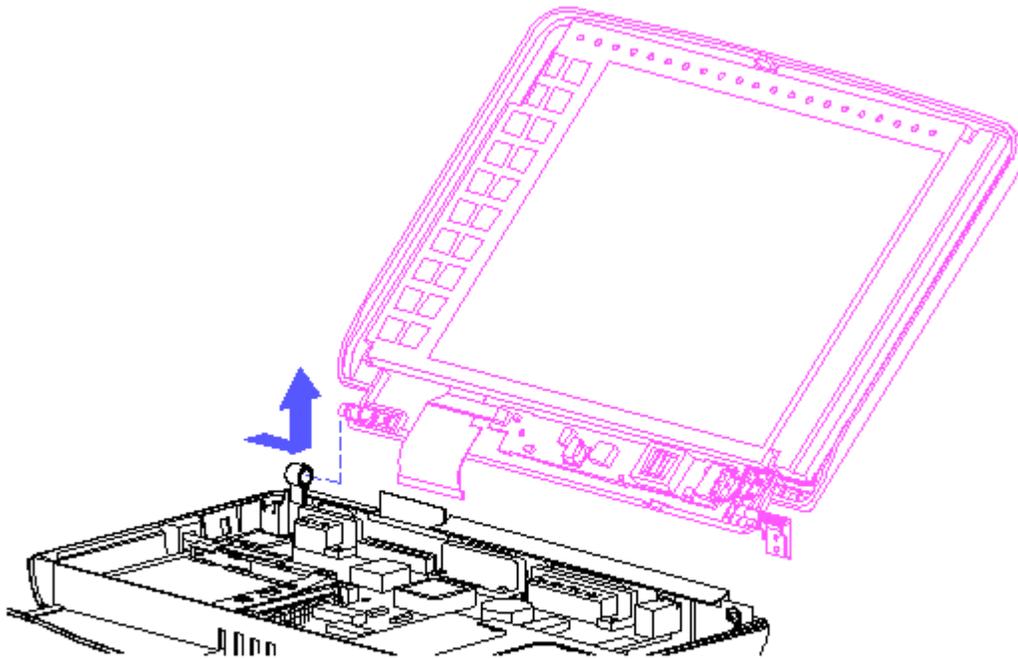


Figure 3-13. Sliding the Display Panel Assembly Out of the Computer

To replace the display assembly, follow these steps:

1. Position the display assembly by aligning the display clutch and pin with the support loop and keyed bushing (Figure 3-14).

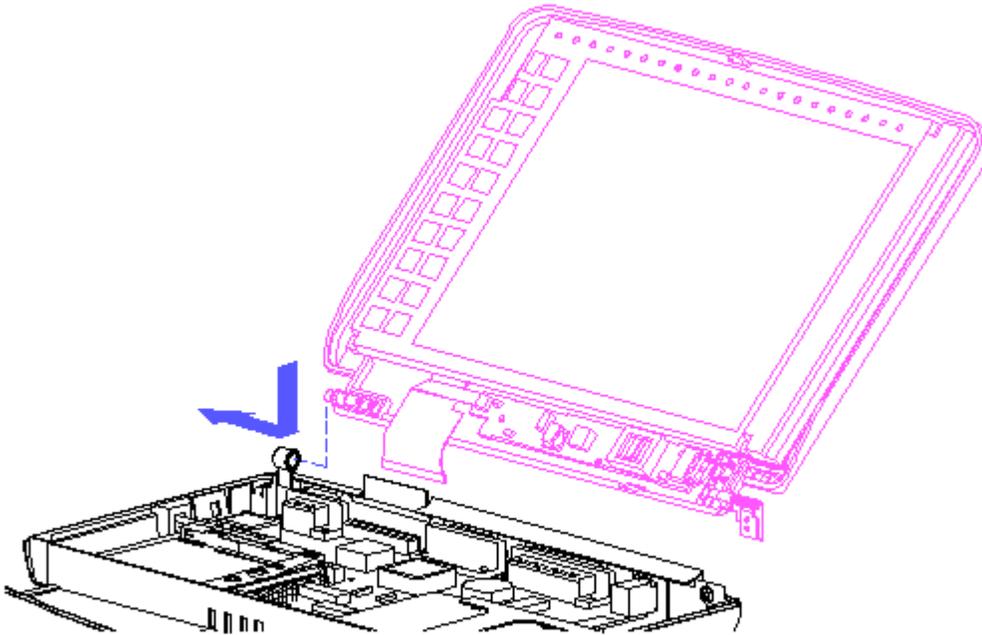


Figure 3-14. Aligning the Display Clutch with the Base Enclosure

2. Reattach the screw to the base enclosure and clutch.

To reconnect the display cable to the system board, follow these steps (Figure 3-15):

1. Insert the display cable into the ZIF connector and lightly press the slider down to lock the connector.
2. Push the curved portion of the display cable inward with your finger, remove your finger, close the computer, and immediately reopen.

The display cable should pop into place around the hinge forming an "S" shape.

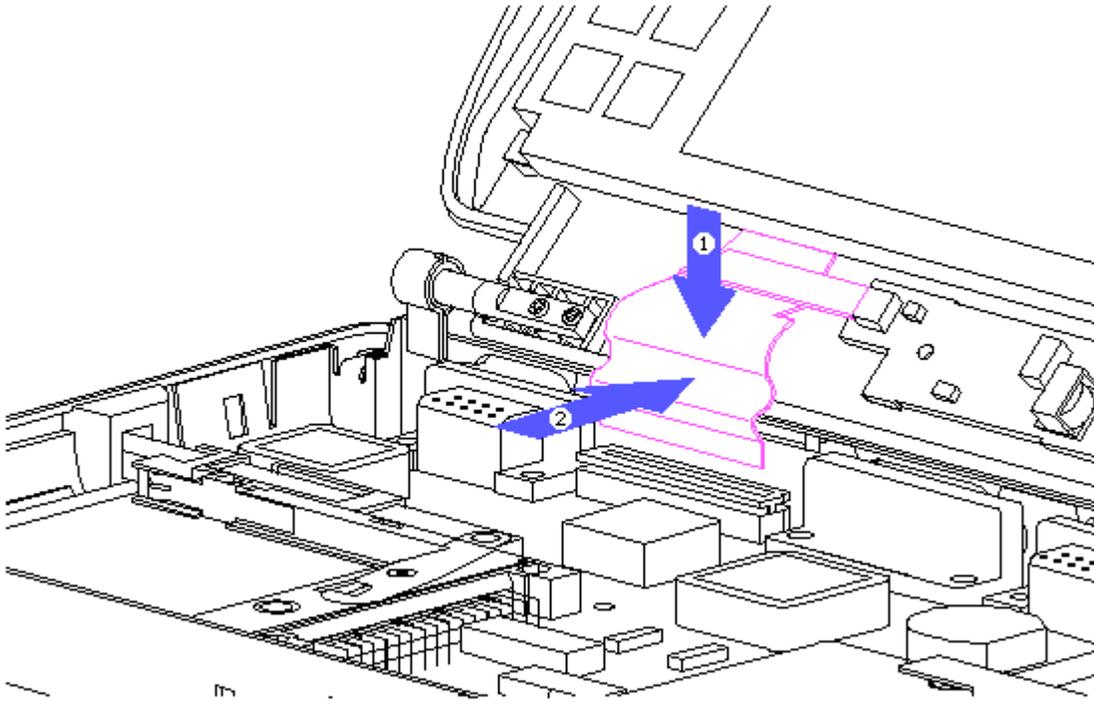


Figure 3-15. Inserting the Display Cable into the System Board and Pushing in the Curved Portion

Display Inverter Board

To remove the display inverter board, follow these steps:

1. Remove the display bezel (Figures 3-5 and 3-6).
2. Remove the display cable and the backlight cable from the display inverter board in the bottom of the display enclosure by gently pulling the cables toward you, then unplugging from the inverter board LIF connector (Figure 3-16).

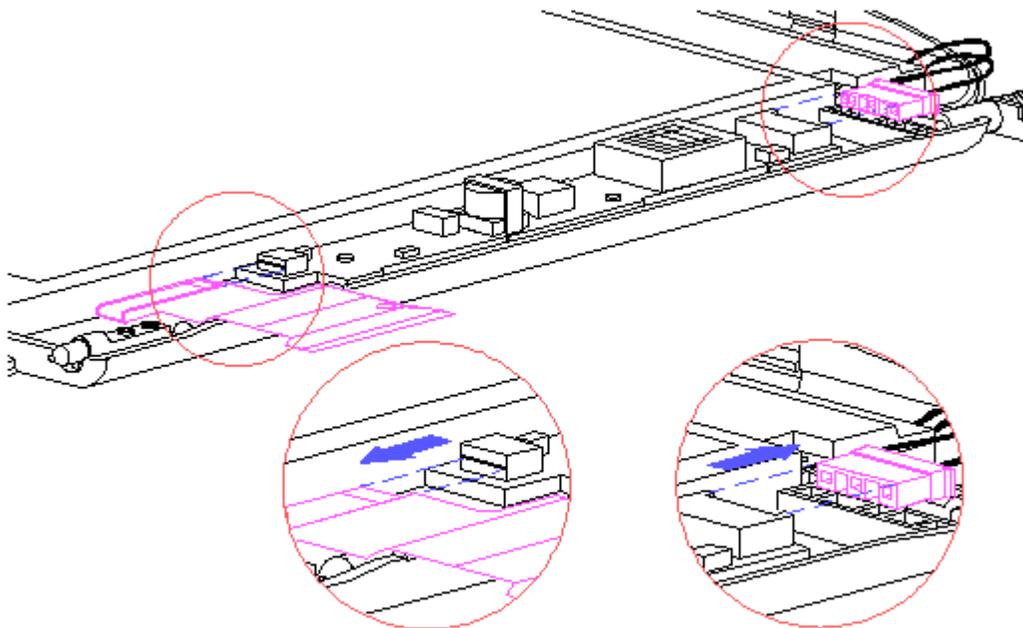


Figure 3-16. Unplugging the Display Cable and Backlight Cable from the Inverter Board

3. Lift the inverter board out of the display enclosure (Figure 3-17).

To remove the backlit liquid crystal display (LCD) panel, follow these steps:

1. Remove the display bezel (Figures 3-5 and 3-6).
2. Remove the remaining two top left screws and the one top right screw that secure the LCD panel to the display enclosure (Figure 3-18).
3. Remove the top clutch screw and ground clip bracket in the bottom right corner of the display enclosure (Figure 3-18).

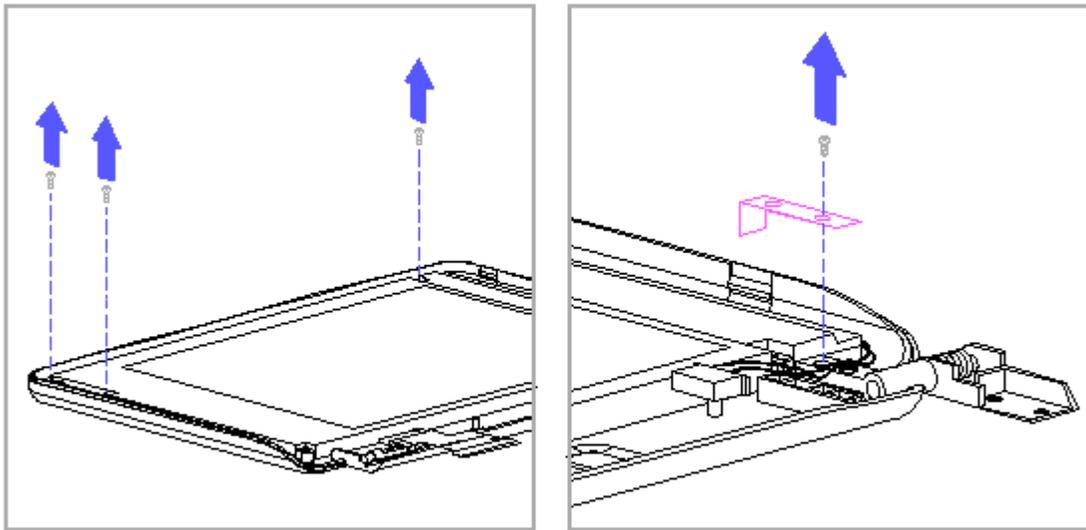


Figure 3-18. Removing Screws and Ground Clip Bracket from the LCD

4. Carefully rotate the LCD panel to the left and out of the display enclosure (Figure 3-19).

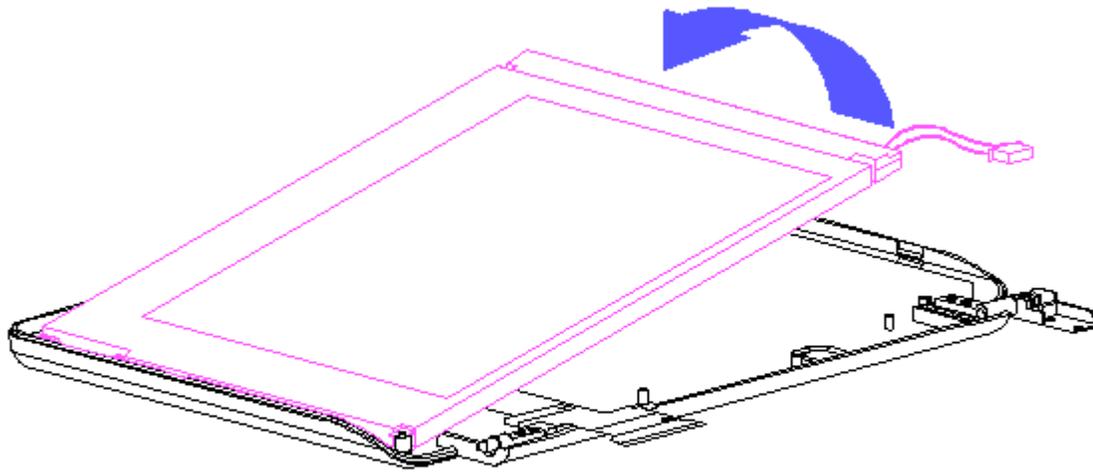


Figure 3-19. Lifting the LCD Panel out of the Display Enclosure

5. Remove the display cable from the rear of the LCD panel by gently pulling the cable toward you (Figure 3-20).
6. Carefully lift up on the ZIF connector to release the display cable from the side of the LCD panel (Figure 3-20).

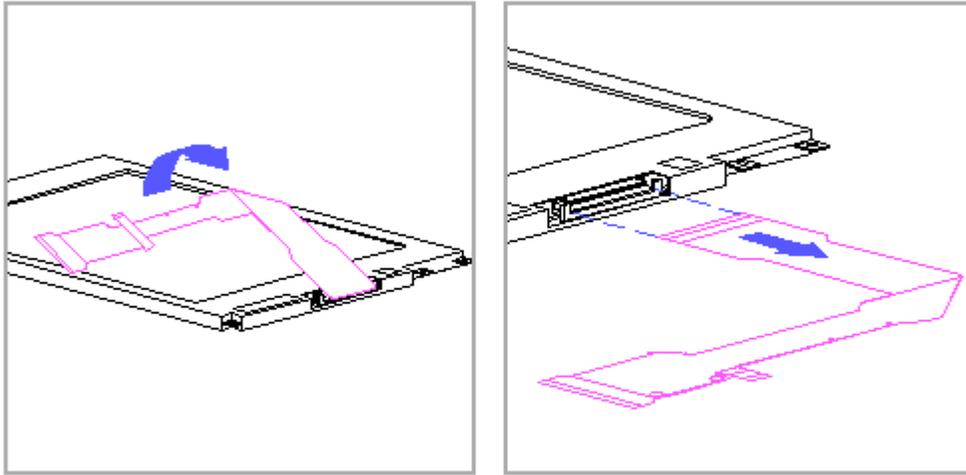


Figure 3-20. Removing the Display Cable from the Rear of the LCD Panel

To replace the LCD panel, follow these steps:

1. Remove the pressure sensitive adhesive backing from the back of the display cable. Align the holes in the cable with the mounting pins on the display enclosure.
2. Connect the display cable to the LCD panel with the ZIF connector.
3. Lay the LCD panel into the display enclosure with the bottom of the display cable exposed.
4. Secure the LCD panel with three screws to the display enclosure.
5. Secure the support bracket with one screw in the bottom right corner of the display enclosure.

Latch, Clutch, Pin, and Display Shield

To remove and replace the latch from the middle of the display enclosure, the clutch, pin, and the display shield, follow these steps (Figure 3-21):

1. Remove the display bezel (Section 3.5).
2. Using a small flat bladed screwdriver, remove the spring from the latch.

Pry the latch away from the display enclosure.

3. Using a Phillips screwdriver, remove the remaining screw from the clutch and then remove the clutch out of the display enclosure.
4. Remove the two screws from the pin and remove the pin from the display enclosure.

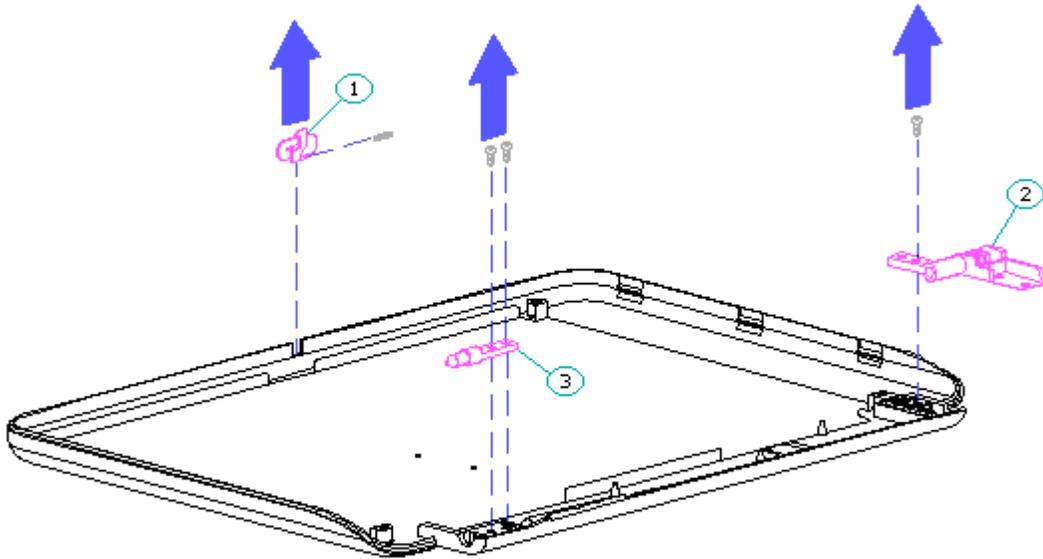


Figure 3-21. Removing the Display Latch, Clutch, and Pin

5. Remove the display shield by lifting it out of the display enclosure (Figure 3-22).

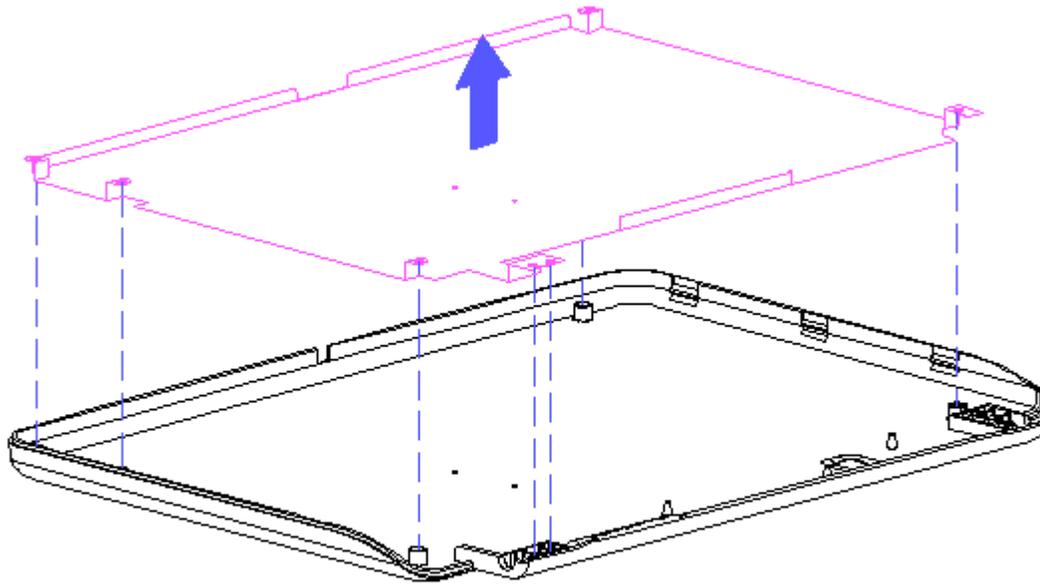


Figure 3-22. Removing the Display Shield

To replace the display shield, lay it inside of the display enclosure.

To replace the latch, attach the spring to the latch and snap them into the display enclosure.

To replace the clutch and pin, reverse the previous steps.

Compaq Contura Aero 4/33C Display

To remove the color VGA backlit display assembly from the Compaq Contura Aero 4/33C Personal Computer, follow these steps:

1. Remove the battery pack (Section 3.4).
2. Remove the display bezel (Figures 3-5 and 3-6).
3. Remove the CPU cover (Section 3.5).
4. Remove the keyboard (Section 3.6).
5. Release the ZIF connector attaching the display cable to the system board (Figure 3-23).

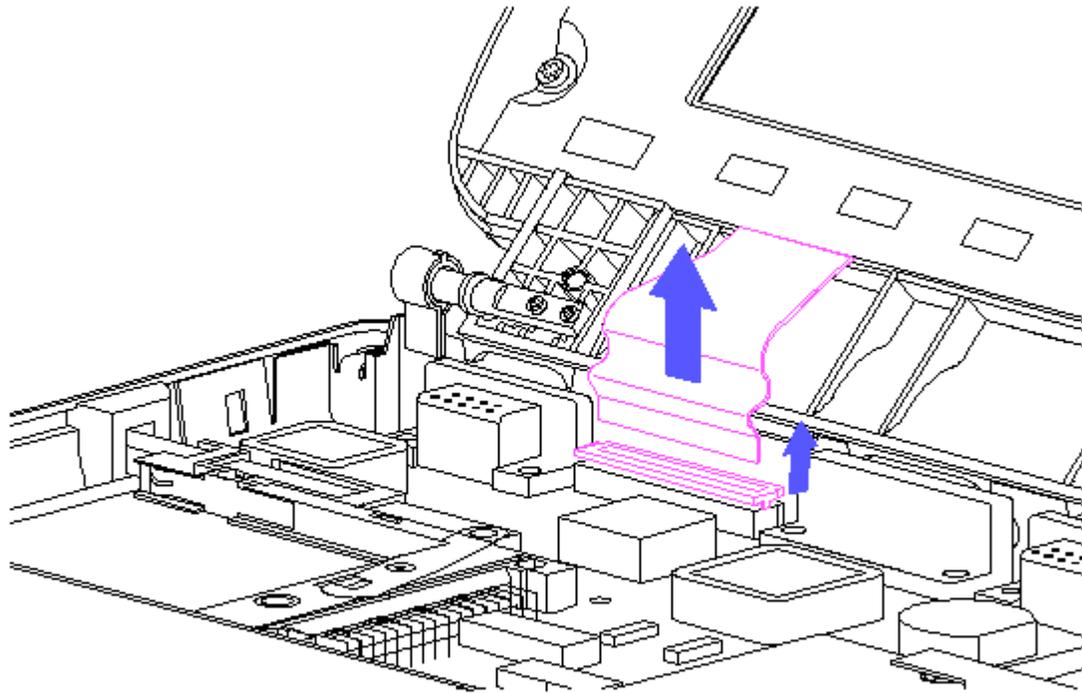


Figure 3-23. Releasing the Display Cable from the System Board

6. Release the clutch from the display enclosure by removing the remaining screw on the back of the base enclosure (Figure 3-24).

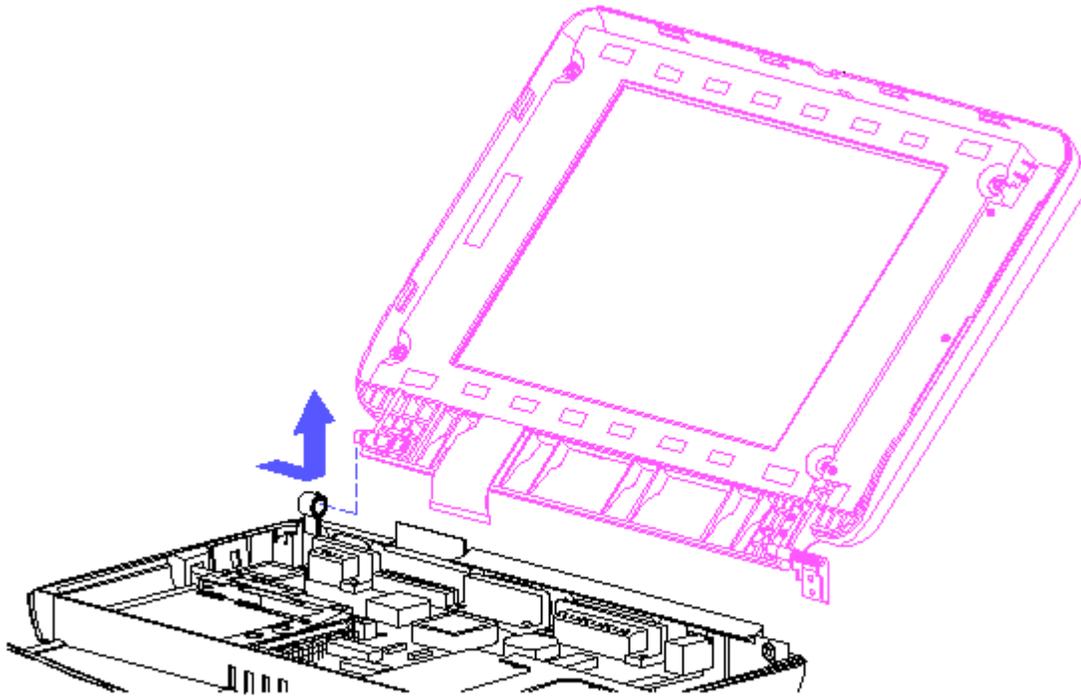


Figure 3-25. Removing the Display Assembly out of the Computer

To replace the display panel assembly, follow these steps:

1. Position the display assembly by aligning the display clutch and pin with the support loop and keyed bushing (Figure 3-26).

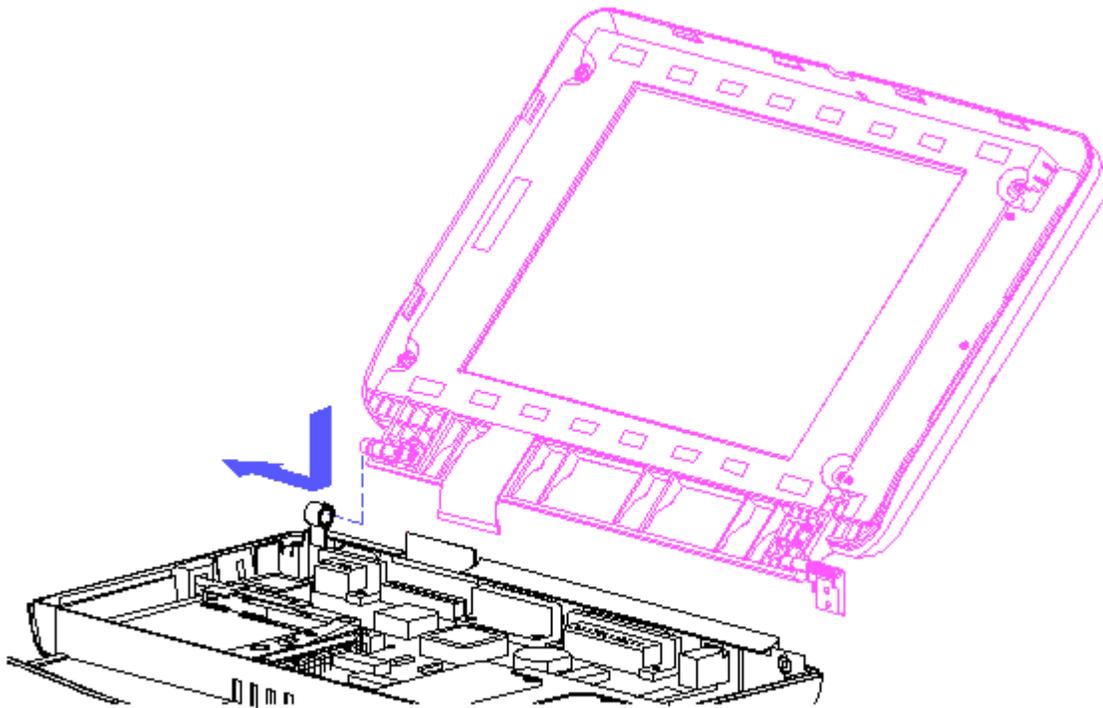


Figure 3-26. Aligning the Display Clutch with the Base Enclosure

2. Reattach the screw to the base enclosure and clutch.

To reconnect the display cable to the system board, follow these steps (Figure 3-27):

1. Insert the display cable into the ZIF connector and lightly press the slider down to lock the connector.
2. Push the curved portion of the display cable inward with your finger, remove your finger, close the computer, and immediately reopen.

The display cable should pop into place around the hinge forming an "S" shape.

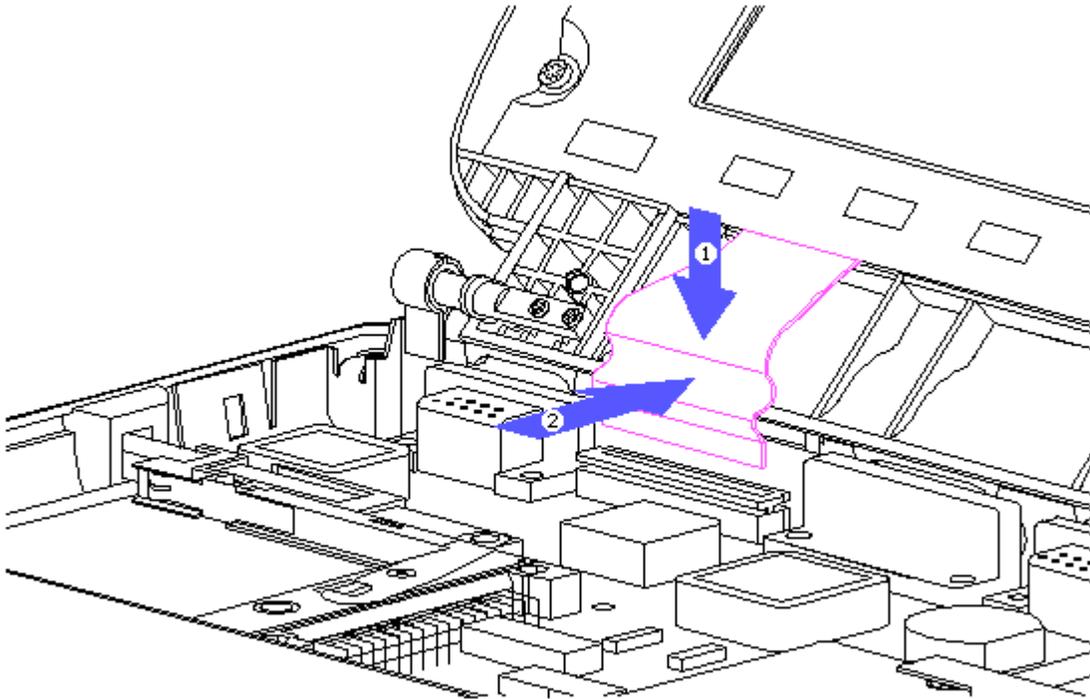


Figure 3-27. Inserting the Display Cable into the System Board and Pushing in the Curved Portion

Display Inverter Board

To remove the display inverter board, follow these steps:

1. Remove the display bezel (Figures 3-5 and 3-6).
2. With a Phillips screwdriver, remove the three screws that secure the inverter board to the display enclosure (Figure 3-28).

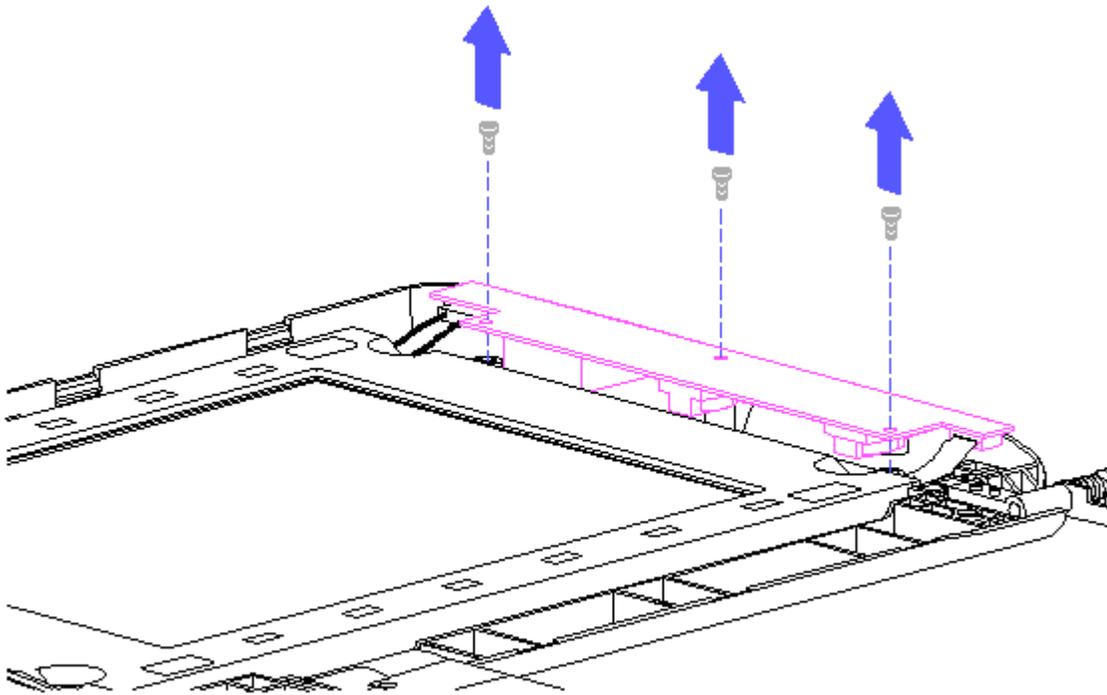


Figure 3-28. Removing Screws from the Inverter Board

3. Gently lift the inverter board out of the display enclosure and unplug the display cable and the backlight cable (Figure 3-29).

Liquid Crystal Display Panel

To remove the backlit liquid crystal display (LCD) panel, follow these steps:

1. Remove the display bezel (Section 3.5).
2. Remove the remaining four screws that secure the LCD panel to the display enclosure and carefully bend back the tabs that secure the display shield to the LCD panel (Figure 3-30).

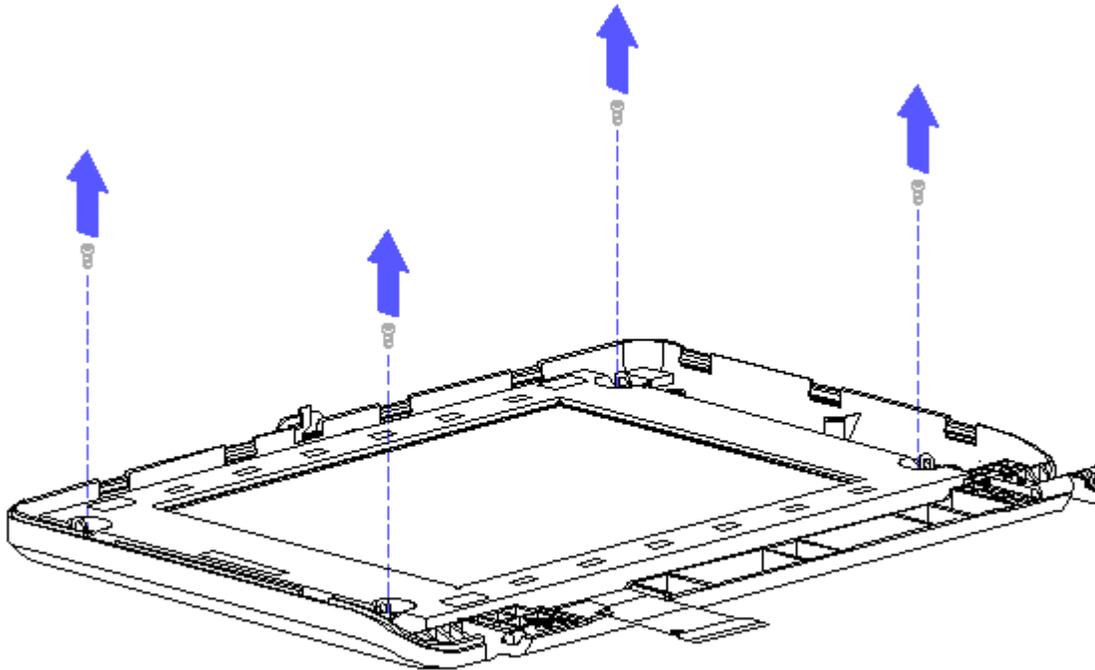


Figure 3-30. Removing Screws from the LCD Panel

3. Carefully rotate the LCD panel to the left and out of the display enclosure (Figure 3-31).

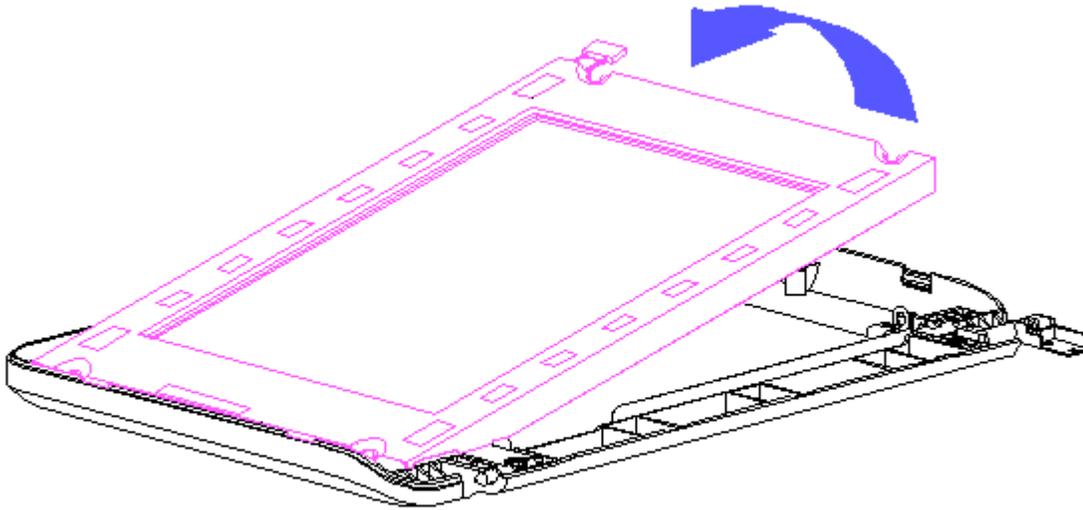


Figure 3-31. Lifting the LCD Panel out of the Display Enclosure

4. Remove the display cable from the rear of the LCD panel by gently pulling the cable toward you (Figure 3-32).
5. Carefully lift up on the ZIF connector to release the display cable from the side of the LCD panel (Figure 3-32).

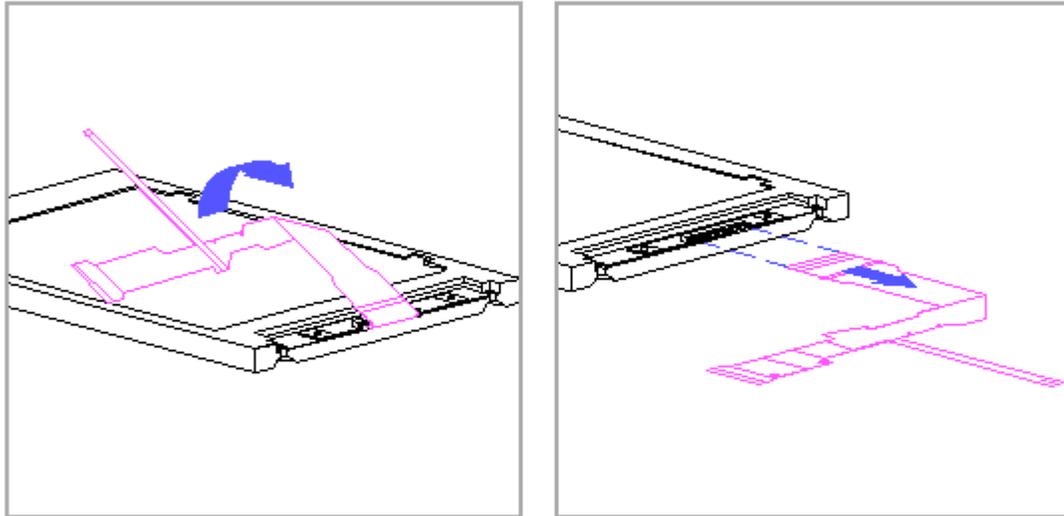


Figure 3-32. Removing the Display Cable from the Rear of the LCD Panel

To replace the LCD panel, follow these steps:

1. Remove the pressure sensitive adhesive backing from the back of the display cable. Align the holes in the cable with the mounting pins on the display enclosure.
2. Connect the display cable to the LCD panel by inserting it into the ZIF connector.
3. Lay the LCD panel into the display enclosure with the bottom of the display cable exposed.

IMPORTANT: Ensure that the ferrite [1] on the display cable is not pinched between the display enclosure and the ZIF connector [2] (Figure 3-33).

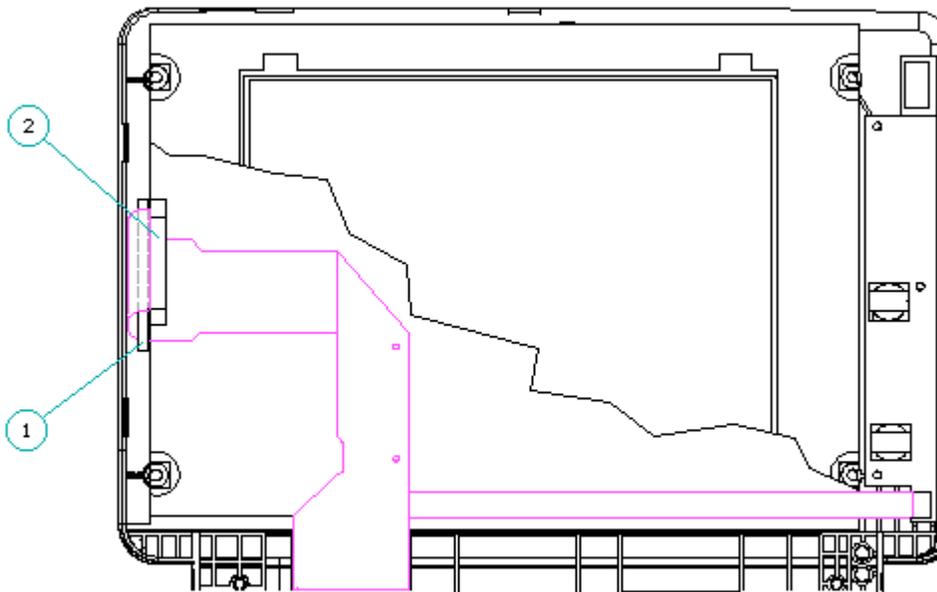


Figure 3-33. Positioning the Display Cable in the Display Enclosure

4. Carefully press down the tabs of the display shield back into place.
5. Secure the LCD panel with four screws to the display enclosure.

Latch, Clutch, Pin, and Display Shield

To remove and replace the latch, the clutch, and display shield from the display assembly, follow these steps:

1. Remove the remaining four screws that secure the LCD panel to the display enclosure and carefully bend back the tabs that secure the display shield to the LCD panel and remove the LCD panel (Figures 3-30, 3-31).
2. Using a Phillips screwdriver, remove the screws from the clutch and the pin (Figure 3-34).
3. Lift the display shield out of the display enclosure (Figure 3-34).

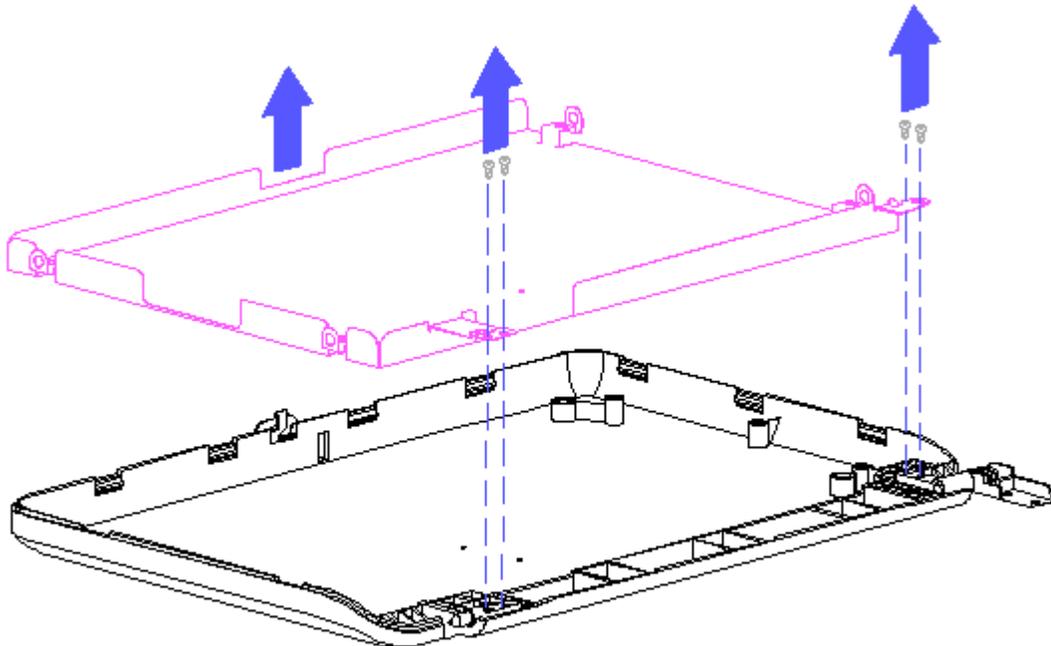


Figure 3-34. Removing the Display Shield

4. Using a small flat bladed screwdriver, remove the spring from the latch. Pry the latch away from the display enclosure [1] (Figure 3-35).
5. Remove the clutch [2] and the pin [3] out of the display enclosure (Figure 3-35).

5. Remove the threaded standoff that secures the power supply (Figure 3-36).
6. Gently grasp the power supply and pull up to unplug (Figure 3-36).

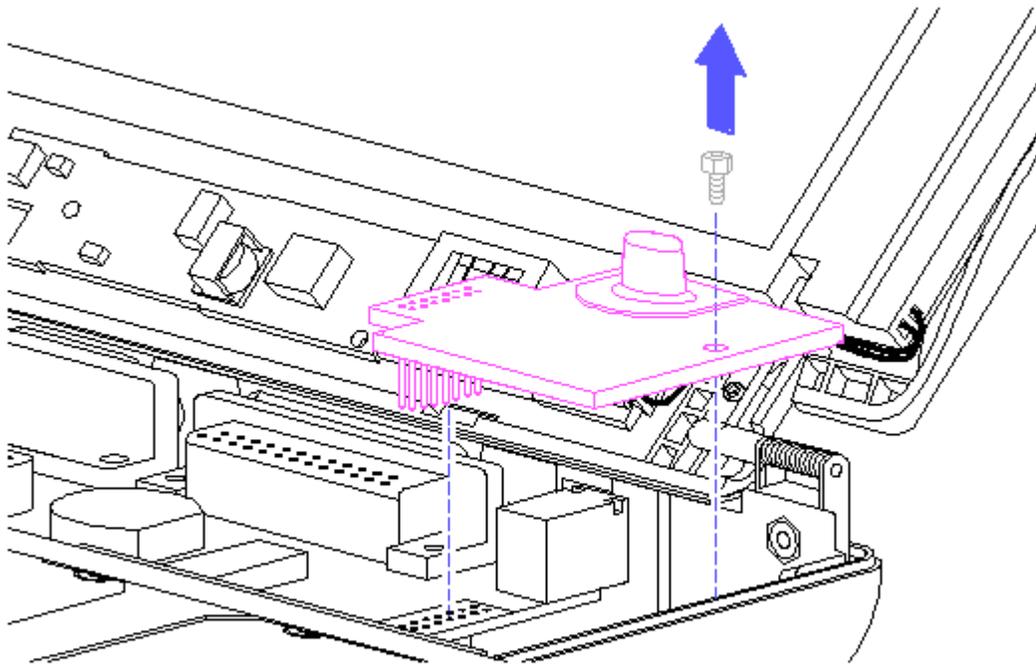


Figure 3-36. Unplugging the Power Supply

To replace the power supply, reverse the previous steps.

Chapter 3.9 Removing The Trackball/Buttons/Speaker Assembly

To remove the trackball, follow these steps:

1. Remove the battery pack (Section 3.4).
2. Remove the display bezel (Figures 3-5 and 3-6).
3. Remove the CPU cover (Section 3.5).
4. Remove the keyboard (Section 3.6).
5. Using a small screwdriver, remove the two screws that secure the trackball to the base (Figure 3-37).

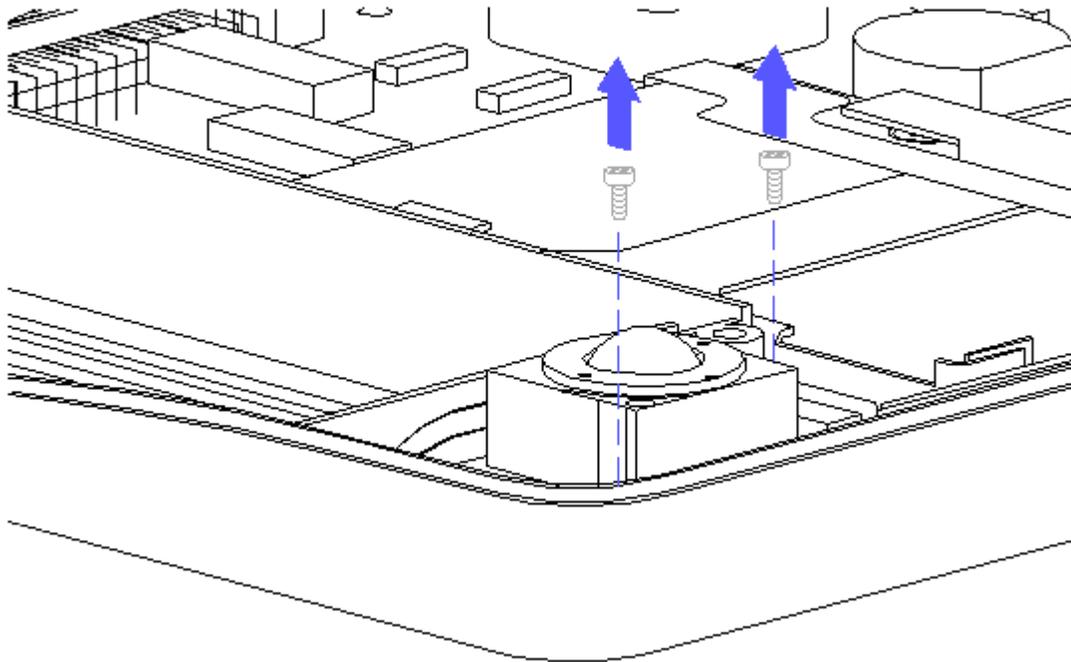


Figure 3-37. Removing Screws from the Trackball

6. With the Case utility tool, disconnect the trackball cable from the system board connector. (Figure 3-38).

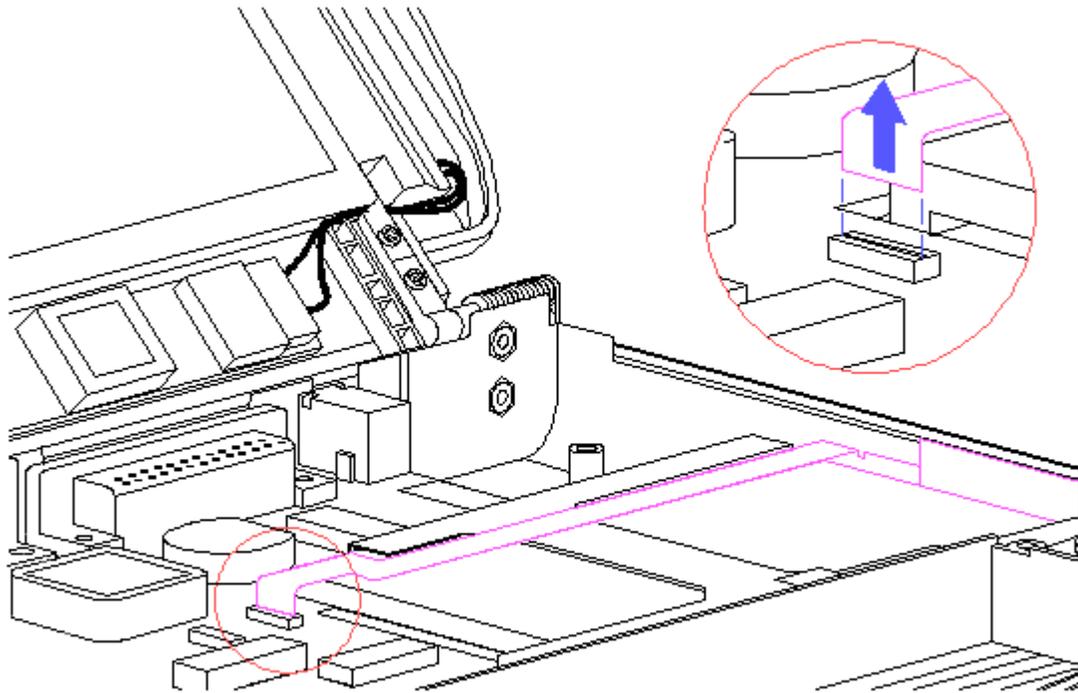


Figure 3-38. Disconnecting the Trackball Cable from the System Board

7. Remove the trackball, speaker, and cable assembly. Unplug the trackball from the cable/buttons/speaker assembly (Figure 3-39).

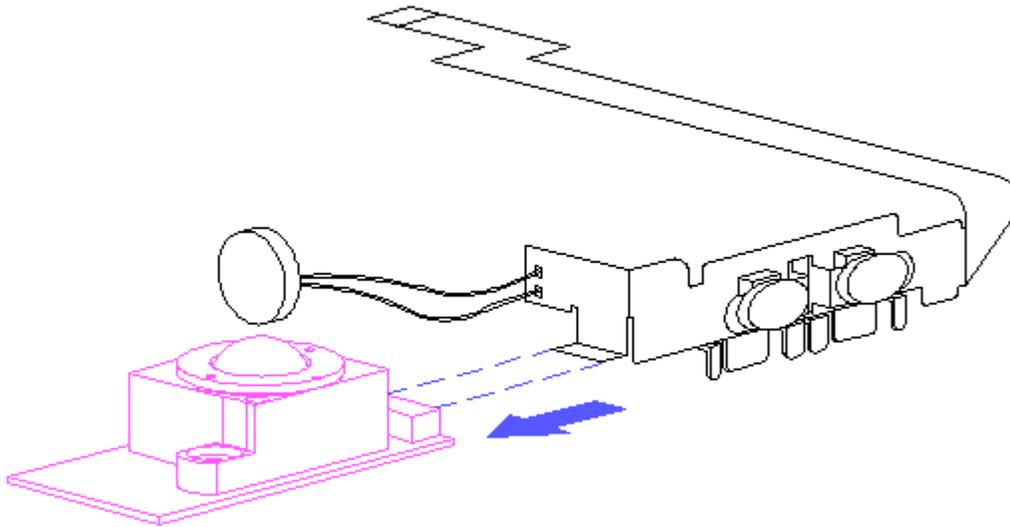


Figure 3-39. Unplugging the Trackball

To replace the trackball/cable assembly, follow these steps:

1. Connect the trackball to the small tab on the cable assembly (Figure 3-40).

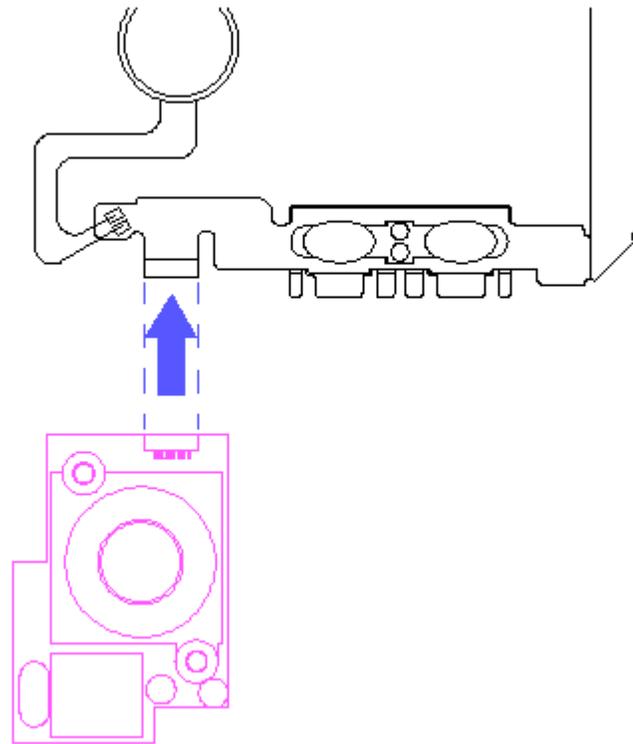


Figure 3-40. Connecting the Trackball to the Cable Assembly

2. Fold up the trackball and fold back the button section of the cable (Figure 3-41).
3. Place the speaker in the recessed area in the right front corner of the base enclosure and the buttons in the recessed area on the right and secure with two screws (Figure 3-41).

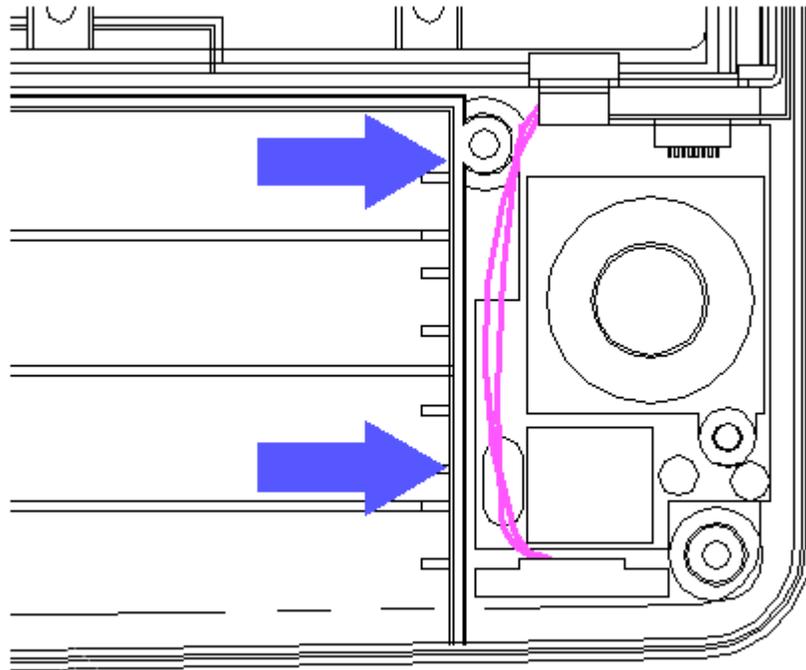


Figure 3-42. Routing the Speaker Wires

5. Route the folded portion of the trackball cable behind and over the hard drive. Plug the cable into the system board LIF connector (Figure 3-43).

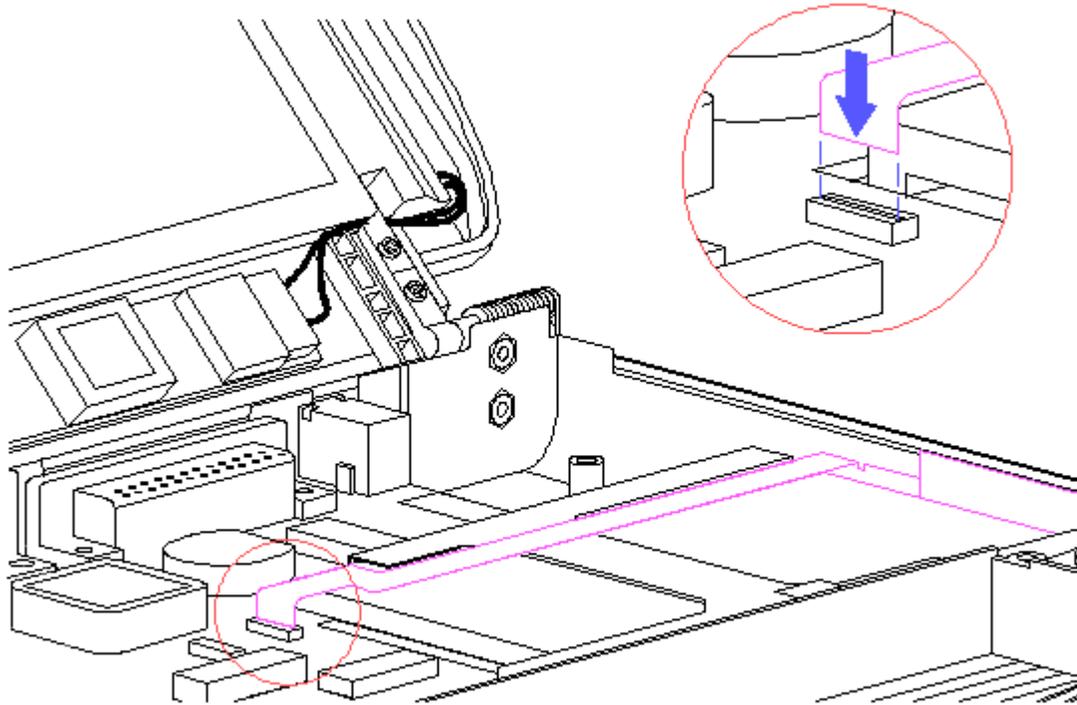


Figure 3-43. Routing and Connecting the Trackball Cable

Chapter 3.10 Removing The Hard Drive

To remove the hard drive, follow these steps:

1. Remove the battery pack (Section 3.4).
2. Remove the display bezel (Figures 3-5 and 3-7).
3. Remove the CPU cover (Section 3.5).
4. Remove the keyboard (Section 3.6).
5. Disconnect the trackball cable from the system board, but do not remove the trackball cable assembly completely (Section 3.9).
6. Remove the hard drive and bracket assembly from the system chassis by gently sliding the hard drive bracket horizontally off the system board connector (Figure 3-44).

IMPORTANT: Do not pull up on the hard drive before the system board connector and drive connector are disengaged.

7. After the connectors separate, lift the hard drive and the bracket straight up and out of the computer (Figure 3-44).

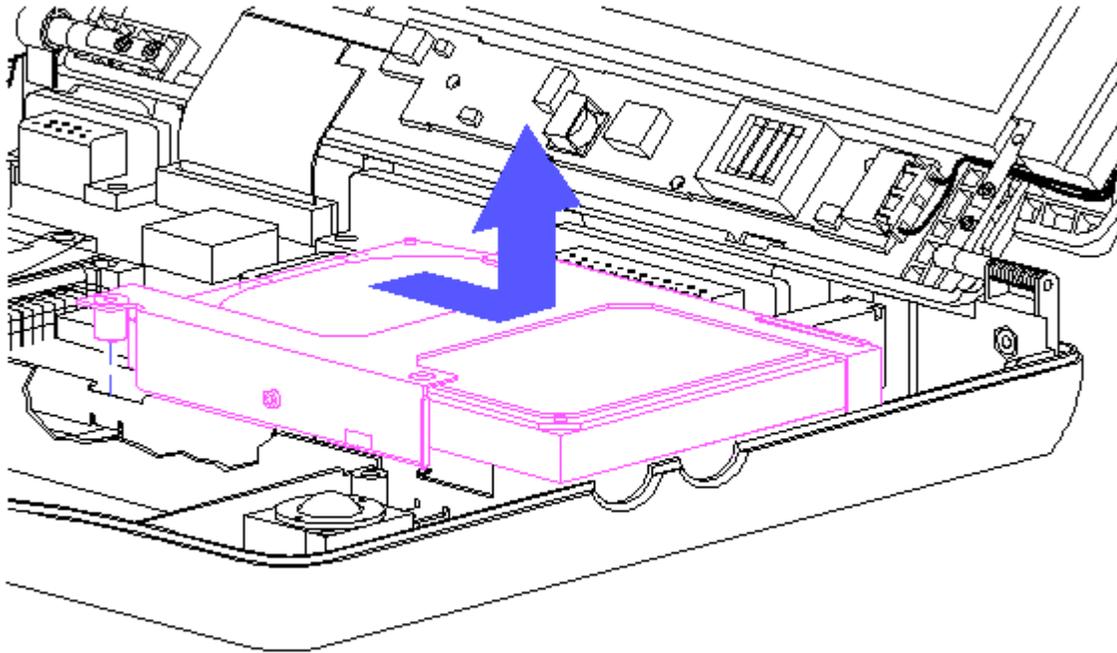


Figure 3-44. Removing the Hard Drive

8. To remove the hard drive bracket from the hard drive, with a P1 screwdriver, remove the three screws from the sides of the bracket and slip the hard drive out of the bracket. (Figure 3-45).

IMPORTANT: Ensure that the screwdriver tip fits the recess properly or damage may occur to the screw head.

1. Remove the battery pack (Section 3.4).
2. Remove the display bezel (Figures 3-5 and 3-6)
3. Remove the CPU cover (Section 3.5).
4. Remove the keyboard (Section 3.6).
5. Remove the power supply (Section 3.8).
6. Remove the trackball (Section 3.9).
7. Remove the hard drive (Section 3.10).
8. Using a hex socket driver, remove the six screw locks from the rear of the computer that secure the connectors to the chassis (Figure 3-46).

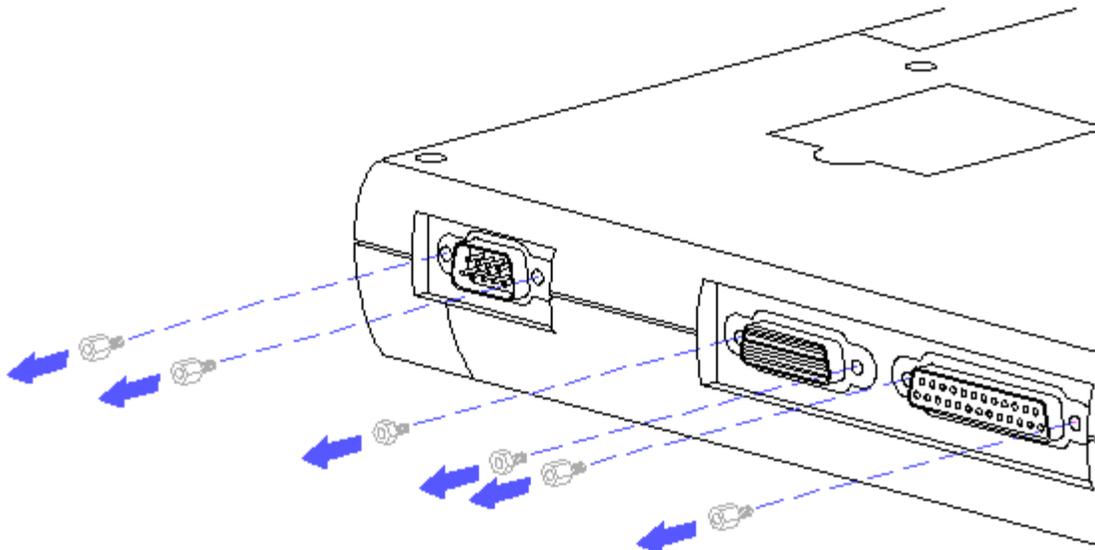


Figure 3-46. Removing the Six Screw Locks

9. Open the computer and remove the two remaining standoffs from the system board with a hex socket driver (Figure 3-47).

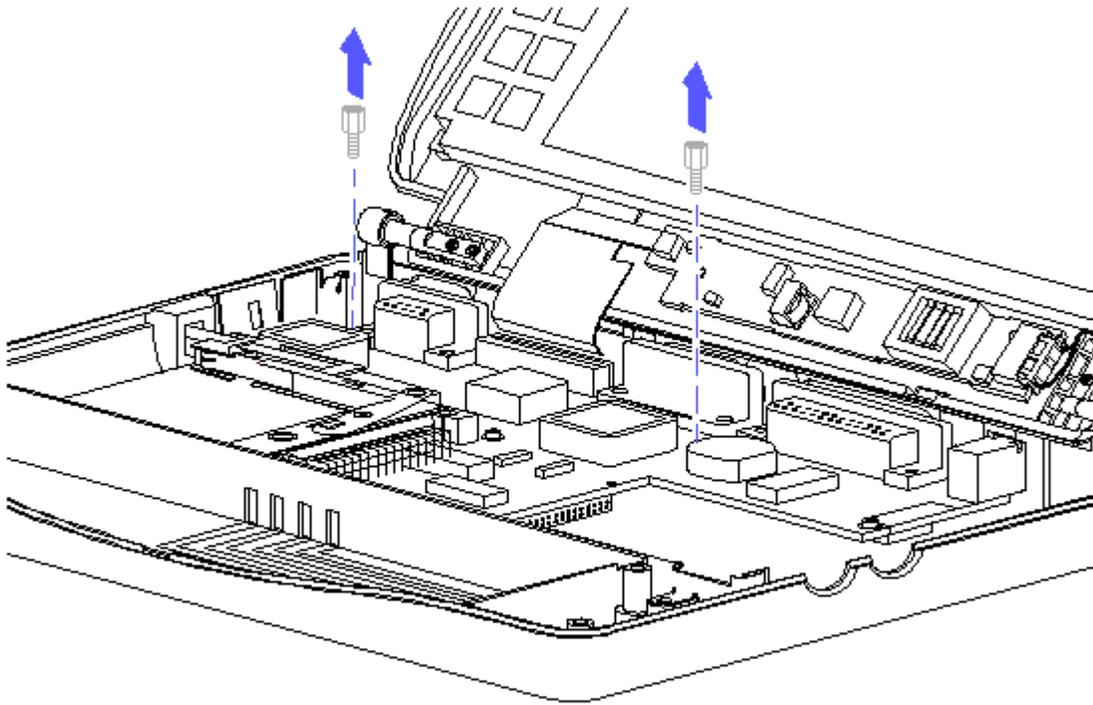


Figure 3-47. Removing the Standoffs

10. Remove the two Phillips screws from the PCMCIA rails (Figure 3-48).

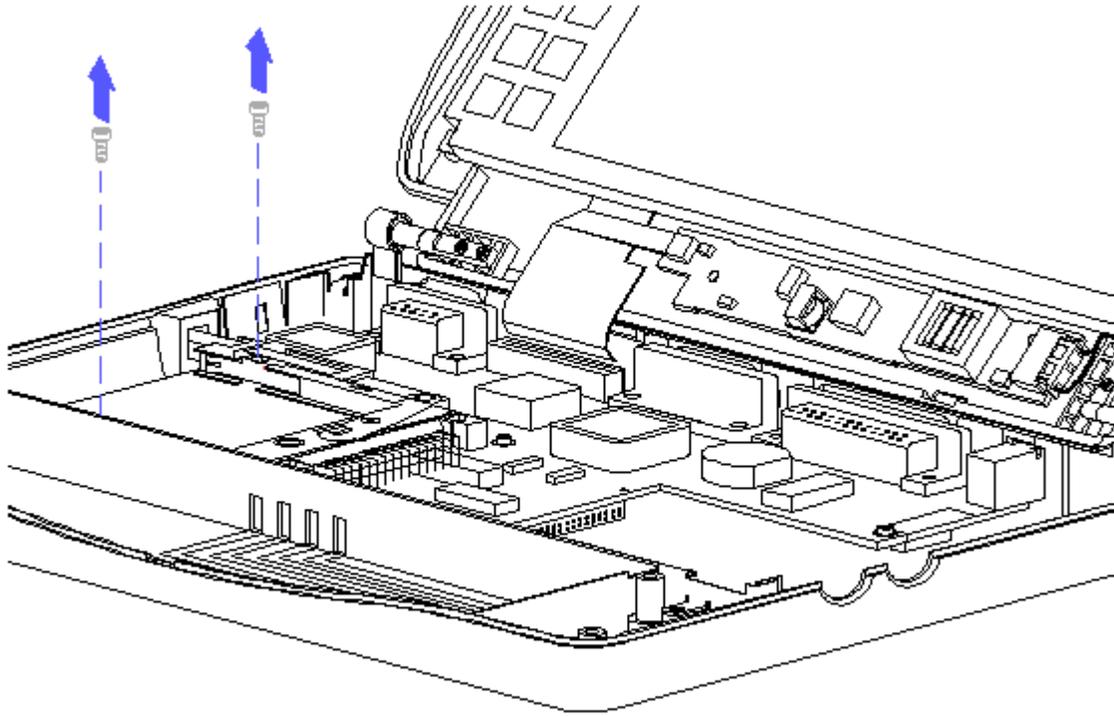


Figure 3-48. Removing the Screws from the PCMCIA Rails

11. Remove the three remaining screws from the system board (Figure 3-49).

NOTE: An insulator must be present under the center screw. If the insulator is not present, order a new system board.

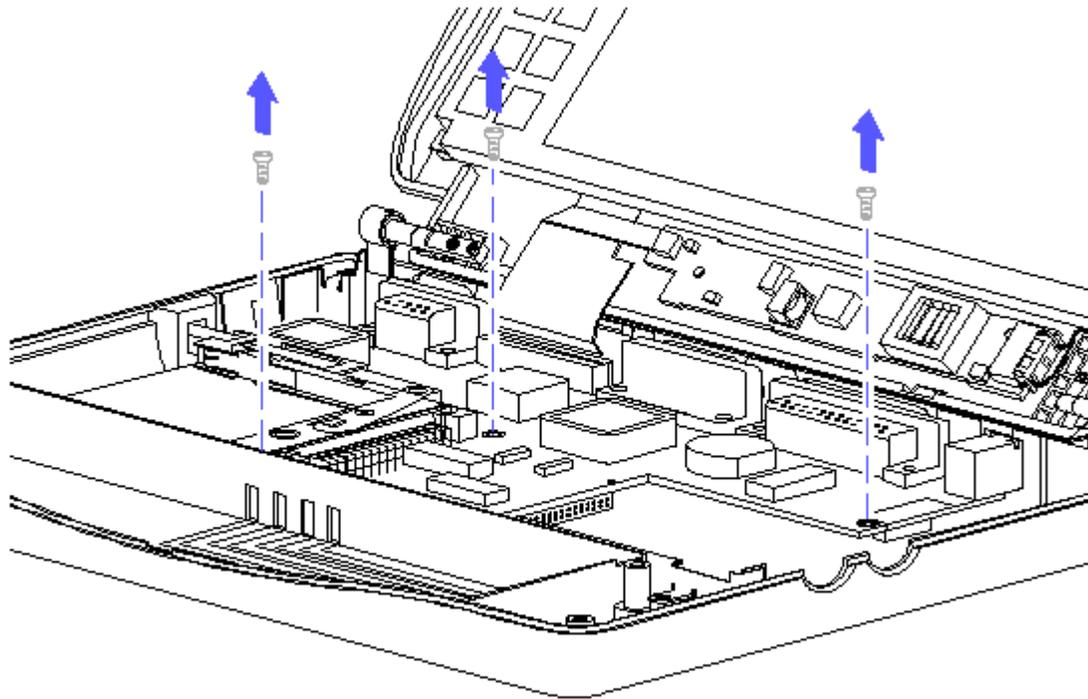


Figure 3-49. Removing the Remaining Screws from the System Board

12. Rotate the system board out of the system chassis (Figure 3-50).

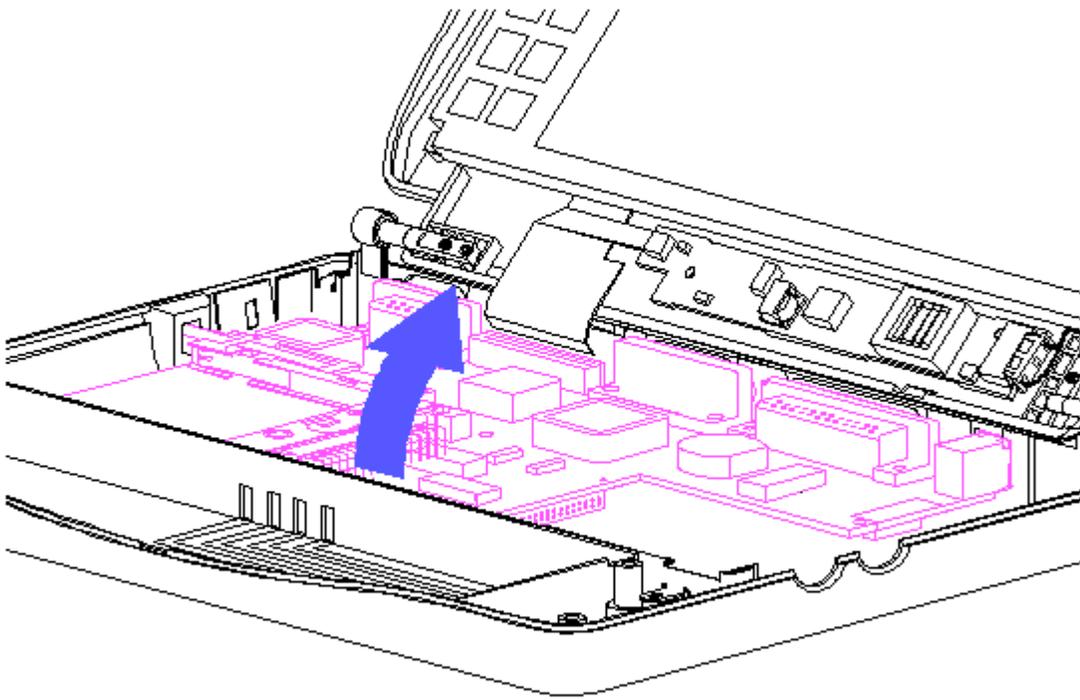


Figure 3-50. Removing the System Board

13. Slide the PCMCIA rails out of the system board (Figure 3-51).

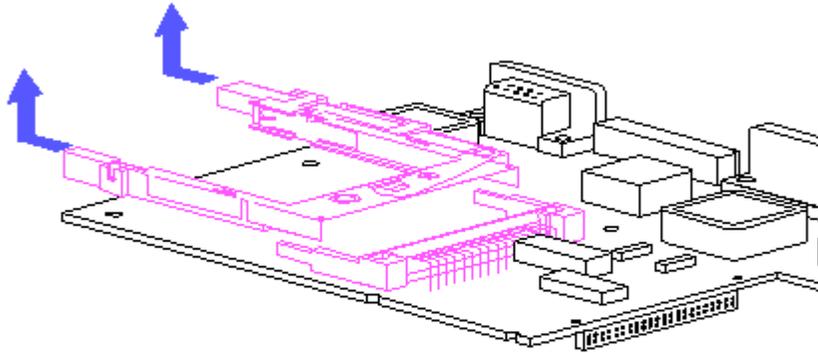


Figure 3-51. Removing the PCMCIA Rails

To replace the system board, reverse the previous steps.

Real Time Clock Battery

To remove the real time clock battery, follow these steps:

1. Remove the display bezel (Figures 3-5 and 3-6).
2. Remove the CPU cover (Section 3.5).
3. Remove the keyboard (Section 3.6).
4. Remove the real time clock battery from the system board by inserting a nonconductive probe into the battery holder and pushing back on the battery to release it (Figure 3-52).

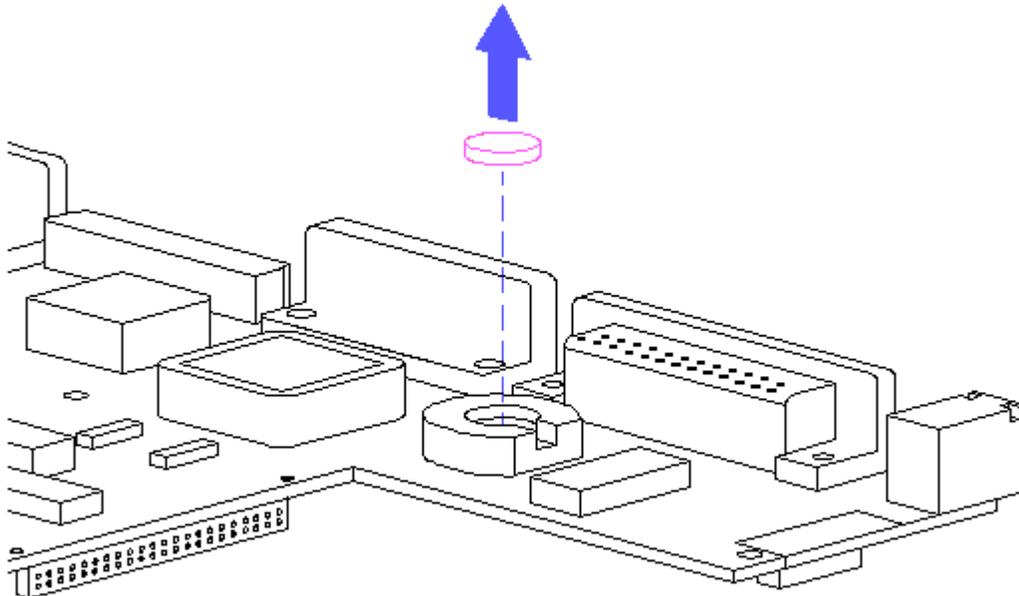


Figure 3-52. Removing the Real Time Clock Battery

To replace the real time clock battery, reverse the previous steps.

Chapter 3.12 Removing The Chassis

To remove the system chassis, follow these steps:

1. Remove the battery pack (Section 3.4).
2. Remove the display bezel (Figures 3-5 and 3-6).
3. Remove the CPU cover (Section 3.5).
4. Remove the keyboard (Section 3.6).
5. Remove the VGA backlit display.
6. Remove the power supply (Section 3.8).
7. Remove the trackball (Section 3.9).
8. Remove the hard drive (Section 3.10).
9. Remove the system board (Section 3.10).
10. Remove the system chassis by gently separating it from the computer

base and lifting it out (Figure 3-53).

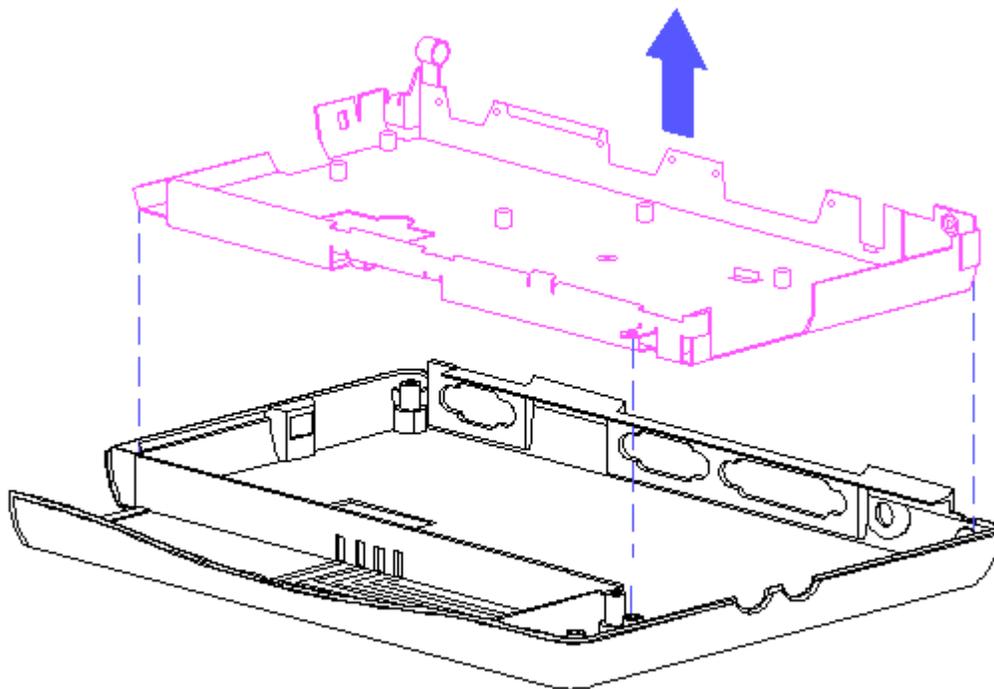


Figure 3-53. Removing the System Chassis

To replace the system chassis, reverse the previous steps.

Chapter 4. Power On Self Test (POST)

Chapter 4.0 Introduction

This section lists the assemblies checked by the Power On Self Test (POST). The section also includes procedures for clearing the power on password.

Chapter 4.1 POST

POST is a series of diagnostic tests that run automatically when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

- o Keyboard
- o Power supply
- o System board
- o System memory
- o Memory expansion board
- o Controller circuitry
- o VGA display
- o Hard drive

POST also detects the type of mass storage device installed in the computer. If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. Refer to Chapter 5, "Error Messages and Codes," for more information about the error codes and a

recommended course of action.

Chapter 4.2 Preliminary Steps

If you encounter an error condition, complete the following steps before starting troubleshooting procedures:

1. Turn off the computer by holding down the FN key and pressing the power button. Do not remove the battery pack.
2. Remove the computer from the base unit, if applicable. Connect the AC Adapter. Connect the printer if you want to test it or use it to log error messages.
3. Install all appropriate loopback plugs and terminating plugs for complete testing.
4. Turn on the computer by pressing the power button.
5. Clear the power on password, if preset by the user.

You will know that the power on password is set when a key icon (o--m) appears on the screen when POST completes. If this occurs, you must enter the password to continue. If you enter the password incorrectly, a broken key icon (o-x-m) is displayed. Try again. After three unsuccessful tries, you must turn off the computer, then on again before

you can continue. To delete the password, type the current password immediately followed by a backslash (\) and press the Enter key.

NOTE: If you don't have access to the power on password, you must disable the power on password by removing the real time clock battery. Refer to section 3.11, "Real Time Clock Battery," for removal procedures. Once the real time clock battery is removed, short the real time clock battery terminals in the processor board by touching the battery terminals with two ends of a wire. Replace all components, and resume POST.

Chapter 5. Error Messages and Codes

Chapter 5.0 Introduction

This chapter contains Power On Self Test (POST) messages, Diagnostic error codes, and memory error codes.

The messages and codes appear in tables that include a description of the error, the probable cause, and the recommended action that should be taken to resolve the error condition.

Chapter 5.1 Power On Self Test Messages

An error message results if a problem is encountered from the Power On Self Test utility. This utility runs automatically when the system is turned on.

Table 5-1 lists the messages for POST, the audible (beep) message, probable cause, and recommended action.

Table 5-1. Power On Self Test Messages

Message:	101 ROM Error
Beeps:	1 Long, 1 Short (Beeps can be disabled by the user from the Computer Setup utility.
Probable Cause:	ROM checksum option
Recommended Action:	1. Verify the correct ROM. 2. Replace the system board.

Message:	101 ROM Error
Beeps:	1 Long, 1 Short (Beeps can be disabled by the user from the Computer Setup utility.
Probable Cause:	System ROM
Recommended Action:	1. Verify the correct ROM. 2. Replace the system board.

Message:	101 ROM Error
Beeps:	1 Long, 1 Short (Beeps can be disabled by the user from the Computer Setup utility.
Probable Cause:	VDU ROM checksum error
Recommended Action:	1. Verify the correct ROM. 2. Replace the system board.

Message:	101 ROM Error
Beeps:	1 Long, 1 Short (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: System, ROM checksum error

Recommended Action: 1. Verify the correct ROM.
2. Replace the system board.

Message: 101 ROM Error

Beeps: 1 Long, 1 Short (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Second system ROM does not pass the checksum

Recommended Action: 1. Verify the correct ROM.
2. Replace the system board.

Message: 101 ROM Error

Beeps: 1 Long, 1 Short (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Option ROM does not pass the checksum

Recommended Action: 1. Verify the correct ROM.
2. Remove PCMCIA card and retest.
3. Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: System Board

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Counter zero check failed

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Refresh bit does not toggle

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: CMOS read/write failed

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: DMA register read/write test failed

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Protected mode test failed enabling/disabling A20 or entering/existing protected mode

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Failed entering protected mode for memory test

Recommended Action: Replace the system board.

Message: 102 System Board Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Test of timer zero interrupt failed (no interrupt occurred)

Recommended Action: Replace the system board.

Message: 162 System Options Not Set

Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Configuration incorrect

Recommended Action: Run Computer Setup.

Message: 162 System Options Not Set

Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: CMOS reflects that an invalid configuration has been set

Recommended Action: Run Computer Setup.

Message: 164 Memory Size Error
Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility).
Probable Cause: Increase in the memory size found compared to the one stored in CMOS
Recommended Action: Run Computer Setup.

Message: 164 Memory Size Error
Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility).
Probable Cause: Decrease in the memory size found compared to the one stored in CMOS
Recommended Action: Run Computer Setup.

Message: 167 Lost Power
Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility).
Probable Cause: Real time clock/calendar battery
Recommended Action: Replace real time clock battery.

Message: 167 Lost Power
Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility).
Probable Cause: RTC has lost power. This only shows up on a cold boot, no beeps
Recommended Action: Replace real time clock battery.

Message: XX000YZZ 201 Memory Error
Beeps: None (Beeps can be disabled by the user from the Computer Setup utility).
Probable Cause: RAM failure
Recommended Action: 1. Replace the memory expansion board (Figure 5-1).
2. Replace the system board.

Message: XX000YZZ 201 Memory Error
Beeps: None (Beeps can be disabled by the user from the Computer Setup utility).
Probable Cause: Memory test data error
Recommended Action: 1. Replace the memory expansion board (Figure 5-1).
2. Replace the system board.

Message: XX000YZZ 201 Memory Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: XX000YZZ RAM failure

Recommended Action: Replace the system board.

Message: 203 Memory Address Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Memory test high address line error

Recommended Action: Replace the memory expansion board (Figure 5-1).

Message: 205 Memory Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Cache memory error

Recommended Action: 1. Remove PCMCIA card and retest.
2. Remove memory expansion board and retest (Figure 5-1).
3. Replace the system board.

Message: 205 Memory Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Cache memory data error

Recommended Action: 1. Remove PCMCIA card and retest.
2. Remove memory expansion board and retest (Figure 5-1).
3. Replace the system board.

Message: 208 Invalid Memory Expansion Board

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Memory expansion board is an invalid type

Recommended Action: Replace memory expansion board (Figure 5-1).

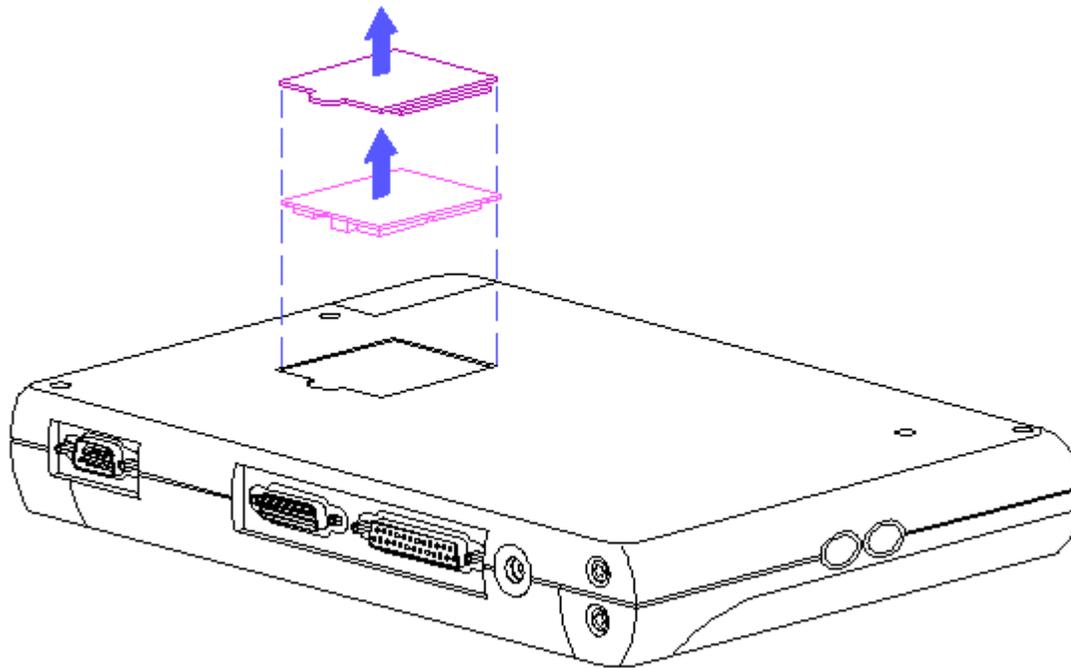


Figure 5-1. Memory Expansion Board Location

Message: 301 Keyboard Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Keyboard

Recommended Action: Replace the keyboard.

Message: 301 Keyboard Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Keyboard or test fixture installed

Recommended Action: Replace the keyboard.

Message: 301 Keyboard Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Keyboard loopback plug installed

Recommended Action: Replace the keyboard.

Message: 301 Keyboard Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Bad results from keyboard test

Recommended Action: Replace the keyboard.

Message: 301 Keyboard Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Keyboard failed interface test

Recommended Action: Replace the keyboard.

Message: 303 Keyboard Controller Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: 8042 error clearing the output buffer

Recommended Action: 1. Replace the keyboard
2. Replace the trackball and trackball cable.
3. Replace the system board.

Message: 303 Keyboard Controller Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Keyboard controller (8042) self test failed

Recommended Action: 1. Replace the keyboard.
2. Replace the trackball and trackball cable.
3. Replace the system board.

Message: 303 Keyboard Controller Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: System board keyboard controller

Recommended Action: 1. Replace the keyboard.
2. Replace the trackball and trackball cable.
3. Replace the system board.

Message: 303 Keyboard Controller Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.)

Probable Cause: Reset of A20 failed

Recommended Action: 1. Replace the keyboard.
2. Replace the trackball and trackball cable.
3. Replace the system board.

Message: 304 Keyboard of System Unit Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Keyboard

Recommended Action: 1. Replace the keyboard.
2. Replace the trackball and trackball cable.
3. Replace the system board.

Message: 304 Keyboard of System Unit Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Reset of keyboard failed

Recommended Action: 1. Replace the keyboard.
2. Replace the trackball and trackball cable.
3. Replace the system board.

Message: 601 Diskette Controller Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Diskette controller circuitry

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace PCMCIA external diskette drive.
3. Replace the system board.

Message: 1125 Internal Serial Port Failure

Beeps: 2 Short (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Internal serial port failed to respond

Recommended Action: Replace the system board.

Message: 1780 Primary Hard Drive 0 Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Disk 0 failed to respond

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the hard drive.

Message: 1780 Primary Hard Drive 0 Failure

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Hard drive format error

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the hard drive.

Message: 1781 Disk 1 Failure

Beeps: None (Beeps can be disabled by the user from the
Computer Setup utility.

Probable Cause: Disk 1 failed to respond

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.

Message: 1781 Disk 1 Failure

Beeps: None (Beeps can be disabled by the user from the
Computer Setup utility.

Probable Cause: Hard drive format error

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.

Message: 1782 Disk Controller Failure

Beeps: None (Beeps can be disabled by the user from the
Computer Setup utility.

Probable Cause: Reset of the hard drive subsystem failed

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.
3. Replace the system board.

Message: 1790 Disk 0 Error

Beeps: None (Beeps can be disabled by the user from the
Computer Setup utility.

Probable Cause: Disk 0 responded with an error

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.
3. Replace the system board.

Message: 1790 Disk 0 Error

Beeps: None (Beeps can be disabled by the user from the
Computer Setup utility.

Probable Cause: Hard Drive Error

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.
3. Replace the system board.

Message: 1791 Disk 1 Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Disk 1 responded with an error

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.
3. Replace the system board.

Message: 1791 Disk 1 Error

Beeps: None (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Hard Drive 1 Error

Recommended Action: 1. Run Computer Checkup (TEST).
2. Replace the drive.
3. Replace the system board.

Message: None

Beeps: 1 Short or 2 Short (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Power on successful

Recommended Action: None

Message: None

Beeps: 1 Short or 2 Short (Beeps can be disabled by the user from the Computer Setup utility.

Probable Cause: Resume= "F1" key as indicated to continue

Recommended Action: None

Chapter 5.2 Diagnostic Error Codes

Diagnostic error codes occur if the system recognizes a problem while running the Computer Checkup (TEST). These error codes help identify possible defective subassemblies.

Tables 5-2 through 5-15 list possible error codes, a description of the error condition, and the action required to resolve the error condition.

IMPORTANT: Retest the system after completing each step. If the problem has been resolved, do not proceed with the remaining steps.

For assistance in the removal and replacement of a particular subassembly, see Chapter 3, "Removal and Replacement Procedures."

Table 5-2. System Test Error Codes

Error Code	Description	Recommended Action
101 - xx	CPU test failed	Replace the system board and retest.
103 - xx	DMA page registers test failed	Replace the system board and retest.
104 - xx	Interrupt controller master test failed	The following steps apply to 104 - xx through 105 - xx error codes:
105 - xx	Port 61 error	Replace the system board and retest.
106 - xx	Keyboard controller self test failed	Replace the system board and retest.
107 - xx	CMOS RAM test failed	The following steps apply to 107 - xx through 113 - xx error codes:
108 - xx	CMOS interrupt test failed	Replace the system board and retest.
109 - xx	CMOS clock load data test failed	
110 - xx	Programmable timer load data test failed	
111 - xx	Refresh detect test failed	
112 - xx	Speed test slow mode out of range	
113 - xx	Protected mode test failed	
114 - 01	Speaker test failed	1. Check system configuration. 2. Verify cable connections. 3. Replace the system board and retest.
116 - xx	Cache test failed	Replace the system board and retest.

Table 5-3. Memory Test Error Codes

Error Code	Description	Recommended Action
200 - xx	Invalid memory configuration	Reinsert memory expansion board (Figure 5-1).
201 - xx	Memory machine ID test failed	The following steps apply to 201 - xx through 202 - xx error codes:
202 - xx	Memory system ROM checksum failed	1. Replace the memory expansion board and retest (Figure 5-1).

2. Replace the system board and retest.

203 - xx	Memory write/read test failed	The following steps apply to 203 - xx through 211 - xx error codes:
204 - xx	Memory address test failed	If you don't have a memory expansion board, replace the system board.
210 - xx	Increment pattern test failed	If you have a memory expansion board:
211 - xx	Random pattern test failed	Replace the memory expansion board and retest (Figure 5-1).

Table 5-4. Keyboard Test Error Codes

Error Code	Description	Recommended Action
301 - xx	Keyboard short test 8042 self test failed	The following steps apply to 301 - xx through 304 - xx error codes:
302 - xx	Keyboard long test failed	1. Check the keyboard connection.
303 - xx	Keyboard LED test, 8042 self test failed	If an external keyboard is disconnected, turn off the computer and connect the keyboard.
304 - xx	Keyboard typematic test failed	2. Replace the keyboard and retest. 3. Replace the system board and retest.

Table 5-5. Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401 - xx	Printer failed or not connected	The following steps apply to 401 - xx through 498 - xx error codes:
402 - xx	Printer data register failed	1. Connect the printer.
403 - xx	Printer pattern test failed	2. Check the power to the printer.
498 - xx	Printer failed or not connected	3. Install the loopback connector and retest.
		4. Replace the printer cable and retest.
		5. Replace the system board.

Table 5-6. PCMCIA External Diskette Drive Test

Error Code	Description	Recommended Action
600 - xx	Diskette ID drive types test failed	The following steps apply to 600 - xx through 698 - xx error codes:
601 - xx	Diskette format failed	1. Replace the diskette and retest.

602 - xx	Diskette read test failed	2. Check and/or replace the diskette power and signal cables and PCMCIA external diskette drive.
603 - xx	Diskette write, read, compare test failed	3. Replace the diskette drive and retest.
604 - xx	Diskette random seek test failed	4. Replace the system board and retest.
605 - xx	Diskette ID media failed	
606 - xx	Diskette speed test failed	
607 - xx	Diskette wrap test failed	
608 - xx	Diskette write protect test failed	
609 - xx	Diskette reset controller test failed	
610 - xx	Diskette change line test failed	
697 - xx	Diskette type error	
698 - xx	Diskette drive speed not within limits	

699 - xx	Diskette drive/media ID error	1. Replace diskette. 2. Run Computer Setup.
=====		

Table 5-7. Serial Test Error Codes

Error Code	Description	Recommended Action
1101 - xx	Serial Port test	The following steps apply to 1101 - xx through 1109 - xx error codes: Replace the system board and retest.
1109 - xx	Clock Register test	

Table 5-8. PCMCIA Modem Test Error Codes

Error Code	Description	Recommended Action
1201 - xx	Modem Internal Loopback Test	The following steps apply to 1201 - xx through 1210 - xx error codes:
1202 - xx	Modem Time Out Test	
1203 - xx	Modem External Termination Test	1. Refer to modem documentation for correct Computer Setup procedures. 2. Check the modem line.

- 1204 - xx Modem Auto Originate Test 3. Replace the modem and retest.
- 1206 - xx Dial Multifrequency Tone Test
- 1210 - xx Modem Direct Connect Test

=====
 Table 5-9. Hard Drive Test Error Codes
 =====

Error Code	Description	Recommended Action
1700 - xx	Hard ID drive types test failed	The following steps apply to 1700 - xx through 1799 - xx error codes:
1701 - xx	Hard drive format test failed	1. Run Computer Setup and verify drive type.
1702 - xx	Hard drive read test failed	2. Replace the hard drive and retest.
1703 - xx	Hard drive write/read/compare test failed	3. Replace the system board and retest.
1704 - xx	Hard drive random seek test failed	
1705 - xx	Hard drive controller test failed	
1706 - xx	Hard drive ready test failed	
1707 - xx	Hard drive recalibration test failed	
1708 - xx	Hard drive format bad track test failed	
1709 - xx	Hard drive reset controller test failed	
1710 - xx	Hard drive park head test failed	
1714 - xx	Hard drive file write test failed	
1715 - xx	Hard drive head select test failed	
1716 - xx	Hard drive conditional format test failed	
1717 - xx	Hard drive ECC *	

test failed

1719 - xx Hard drive power mode
test failed

1799 - xx Invalid hard drive
type failed

* Error Correction Code
=====

Table 5-10. Video Test Error Codes

Error Code	Description	Recommended Action
2402 - xx	Video memory test failed	The following recommendation applies to 2402 - xx through 2456 - xx error codes: Replace the system board.
2403 - xx	Video attribute test failed	
2404 - xx	Video character set test failed	
2405 - xx	Video 80 x 25 mode 9 x 14 character cell test failed	
2406 - xx	Video 80 x 25 mode 8 x 8 character cell test failed	
2407 - xx	Video 40 x 25 mode test failed	
2408 - xx	Video 320 x 200 mode color set 0 test failed	
2409 - xx	Video 320 x 200 mode color set 1 test failed	
2410 - xx	Video 640 x 200 mode test failed	
2411 - xx	Video screen memory page test failed	
2412 - xx	Video gray scale test failed	
2414 - xx	Video white screen test failed	
2416 - xx	Video noise pattern test failed	
2418 - xx	ECG/VGC memory test failed	

2419 - xx ECG/VGC ROM checksum
test failed

2421 - xx ECG/VGC 640 x 200
graphics mode test
failed

2422 - xx ECG/VGC 640 x 350
16 color set test
failed

2423 - xx ECG/VGC 640 x 350
64 color set test
failed

2424 - xx ECG/VGC monochrome
text mode test failed

2425 - xx ECG/VGC monochrome
graphics mode test
failed

2431 - xx 640 x 480 graphics
test failure

2432 - xx 320 x 200 graphics
(256 color mode)
test failure

2448 - xx Advanced VGA
Controller test
failed

2451 - xx 132 column Advanced
VGA test failed

2456 - xx Advanced VGA 256 color
test failed

2458 - xx Advanced VGA BitBLT
test The following recommendation applies
 to 2458 - xx through 2480 - xx error
 codes:

2468 - xx Advanced VGA DAC test Replace the system board and retest.

2477 - xx Advanced VGA data path
test

2478 - xx Advanced VGA BitBLT
test

2480 - xx Advanced VGA Linedraw
test

=====

Table 5-11. Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601 - xx	Pointing Device Interface test failed	1. Replace with a working pointing device and retest.

2. Replace the system board and retest.

=====
Table 5-12. Audio Test Error Codes
=====

Error Code	Description	Recommended Action
3206 - xx	Audio System Internal Error	Replace the system board and retest.

=====

Chapter 6. Specifications

Chapter 6.0 Introduction

This chapter provides physical, environmental, and performance specifications for the following Compaq Contura Aero Family of Personal Computer subsystems:

- o Computer
- o VGA Display
- o Hard Drives
- o Internal Power Supply
- o NiMH Battery Pack
- o AC Adapter
- o Base Unit
- o External Diskette Drive

Chapter 6.1 System Unit

	U.S.	Metric
Dimensions:		
Contura Aero 4/25		
Height	1.53 in	3.81 cm
Width	10.25 in	26 cm
Depth	7.5 in	19 cm
Contura Aero 4/33C		
Height	1.7 in	4.32 cm
Width	10.25 in	26 cm
Depth	7.5 in	19 cm
Weight (approximate):		
Contura Aero 4/25		
Model 84 (standard battery)	3.5 lbs	1.59 kg
Model 84 (extended life)	3.9 lbs	1.77 kg
Model 170 (standard battery)	3.6 lbs	1.63 kg
Model 170 (extended life)	4.0 lbs	1.81 kg
Contura Aero 4/33C		
Model 170	4.3 lbs	1.95 kg
Power Requirements	10.8V	10.8V
Environmental Requirements:		
Temperature		
Operating	50oF to 104oF	10oC to 40oC
Nonoperating	-4oF to 140oF	-20oC to 60oC
Relative Humidity (noncondensing):		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Shock and Vibration		
Shock		
Operating	10g, 11ms, half sine	

Nonoperating	60g, 11ms, half sine
Vibration	
Operating	0.25g, 5-500 Hz 1/2 octave/min sweep, 1 hour duration
Nonoperating	1.00g, 5-500 Hz 1/2 octave/min sweep, 1 hour duration

Maximum Altitude (unpressurized):		
Operating	10,000 ft	3,658m
Nonoperating	30,000 ft	12,192m

Chapter 6.2 VGA Display

	U.S.	Metric
Dimensions		
Height	4.82 in	122.4 mm/12.24 cm
Width	6.42 in	163.2 mm/16.32 cm
Diagonal Size	8.03 in	20.4 cm
Mounting	Internal	
Display	MSTN Backlit LCD	
Gray Scales	16 High Resolution (640 x 480) 64 Low Resolution (340 x 200)	
Brightness/Contrast	Adjustable	
Maximum Pixel Resolution	640 x 480	
Character Display	80 x 25	
Frequency:		
Horizontal	31.2 KHz (CRT mode) 32 KHz (LCD mode)	
Vertical	125 Hz (60 VGA/70 CGA)	
Display Inverter Board:		
Operating Voltage (Backlight)	+5.1V, +9V , +18.7V	
Operating Output Voltage	310 Vrms	
Maximum Input Power	1.8W	
Maximum Output Power	1.25 Wrms	

Table 6-3. Compaq Contura Aero 4/33C Color VGA Display

	U.S.	Metric
Dimensions (Image area):		
Height	4.74 in	120.5 mm/12.05 cm
Width	6.34 in	161 mm/16.10 cm
Diagonal Size	7.75 in	196.9 mm/19.69 cm

Mounting	Internal
Display	CSTN Backlit LCD
Color Resolution	256 Colors - low resolution 16 Colors - high resolution
Brightness/Contrast	Adjustable through keyboard
Maximum Pixel Resolution	640 x 480
Character Display	80 x 25
Frequency:	
Horizontal	31.2 KHz (CRT mode) 32 KHz (LCD mode)
Vertical	125 Hz (70 VGA/70 CGA)
Display Inverter Board:	
Operating Voltage (Backlight)	+26V, +34V,+38V
Maximum Input Power	2.8W
Maximum Output Power (Backlight)	2.0 Wrms

Chapter 6.3 Hard Drives

Model	170	84
Standard Configurations	170	84
Formatted Capacity Per Drive (MB):		
Physical	171.6	85
Logical	171.6	85
Drives Supported	One	One
Drive Height (with drive frame)	12.7 mm	12.7 mm
Drive Size (inches)	2.5 x 0.5	2.5 x 0.5
Drive Type	65	65
Transfer Rate (Mbps)	14.72 - 22.13	14.32 - 28.33
Sector Interleave	1:1	1:1
Typical Seek Time (including settling):		
Track to Track (ms)	7	8
Average (ms)	20	19
Maximum (ms)	28	27
Physical Configuration:		
Cylinders	1440	1389
Heads	4	2
Sectors/Track	48 - 72	44 - 75
Bytes Per Sector	512	512

 Logical Configuration:

Cylinders	873	722
Heads	16	10
Sectors/Track	24	23
Bytes Per Sector	512	512

=====

Chapter 6.4 Internal Power Supply

 Input Requirements:

Input Voltage	10.8 - 17.5 VDC
Standby	10.8 - 17.5 VDC

Power Output:

Steady State	10W
Peak	17W

VDC Output	V01 (+5)	V02 (+12)	V03 (+40)
Nominal Voltage	5.10V	12.0V	43.0V
Continuous Current	1.25A	60.0 mA	40.0 mA
Peak Current	3.0A	60.0 mA	40.0 mA
Regulation Tolerance	+/- 3%	+/- 5%	+/- 5%

=====

Chapter 6.5 Nickel Metal Hydride (NIMH) Battery Pack

	Standard		Extended Life	
	U.S.	Metric	U.S.	Metric

Dimensions:				
Height	0.725 in	1.84 cm	0.725 in	1.84 cm
Length	5.37 in	13.64 cm	8.07 in	20.5 cm
Width	2.04 in	5.18 cm	2.04 in	5.18 cm

Weight (approximate)	0.696 lb	0.316 kg	1.09 lb	0.494 kg

Power Supply:				
Nominal Voltage	10.8		10.8	
Capacity	1500 mAh		2300 mAh	

Battery Life *				
Contura Aero 4/25	2.5 to 4 hr		4 to 6 hr	
Contura Aero 4/33C			2.5 to 4 hr	

Environmental Requirements:				
Operating				
Standard (U.S.)	50oF to 104oF			
Standard (Metric)	10oC to 40oC			
Extended Life (U.S.)	50oF to 104oF			
Extended Life (Metric)	10oC to 40oC			
Nonoperating				
Standard (U.S.)	-4oF to 122oF			

Standard (Metric)	-20oC to 50oC
Extended Life (U.S.)	-4oF to 122oF
Extended Life (Metric)	-20oC to 50oC

* Battery life is based on an estimated typical use pattern of an average user. Battery life will vary based on the configuration of the computer and the usage pattern of the individual user. To maximize battery life, Compaq recommends that power conservation be set to high.

Chapter 6.6 AC Adapter

	U.S.	Metric
Dimensions:		
Height	1.1 in	2.79 cm
Depth	2.4 in	6.10 cm
Width	2.24 in	11.68 cm
Weight (without cords)	6 oz	0.227 kg
Voltage	17.5 - 20 volts, 1.4 amps	
Power (watts):		
Minimum	17	
Maximum	20	
Minimum Charge Time	1.0 hr	

Chapter 6.7 Base Unit

	US	Metric
Dimensions:		
Height	2.63 in	6.67 cm
Width	12.0 in	30.5 cm
Depth	12.4 in	31.6 cm
Weight	2.9 lbs	1.32 kg
Environmental Requirements:		
Temperature		
Operating	50oF to 104oF	10oC to 40oC
Nonoperating	-7.6oF to 140oF	-20oC to 60oC
Relative Humidity:		
Operating	10% to 90%, noncondensing	
Nonoperating	5% to 95%, noncondensing	
Shock and Vibration:		
Shock		
Operating	10g, 11 ms, half sine	
Nonoperating	60g, 11 ms, half sine	

Vibration		
Operating	0.25g, 5-500 Hz/octave/min sweep	
Nonoperating	1.00g, 5-500 Hz/octave/min sweep	

Maximum Unpressurized Altitude:		
Operating	10,000 ft	3,658 m
Nonoperating	40,000 ft	15,750 m

Chapter 6.8 External Diskette Drive

	US	Metric
Dimensions:		
Disk Drive		
Height	1.10 in	2.8 cm
Width	4.25 in	10.8 cm
Depth	5.87 in	14.9 cm
PCMCIA Interface Card		
Height	0.19 in	0.48 cm
Width	2.13 in	5.40 cm
Depth	4.37 in	11.1 cm
Diskette Size	3.5 in	8.89 cm
Weight	12.2 oz	340 g
Led Indicator	Green	
Capacity Per Diskette	1.44 MB/720 KBYTE	
I/O Space Configuration:		
Primary	3FX	
Secondary	37X	
PCMCIA Interface Card	Type II	
Read/Write Heads	2	
Voltage Requirement	+5 Vdc	
Environmental Requirements:		
Temperature		
Operating	41oF to 113oF	5oC to 45oC
Nonoperating	-7.6oF to 140oF	-22oC to 60oC
Relative Humidity:		
Operating	10% to 90%, noncondensing	
Nonoperating	5% to 90%, noncondensing	
Shock and Vibration:		
Shock		
Operating	8g, 11 ms, half sine	
Nonoperating	100g, 11 ms, half sine	
Vibration		
Operating	1.0g, 5-500 Hz/octave/min sweep	
Nonoperating	1.5g, 5-500 Hz/octave/min sweep	

Appendix A.1 External Connectors

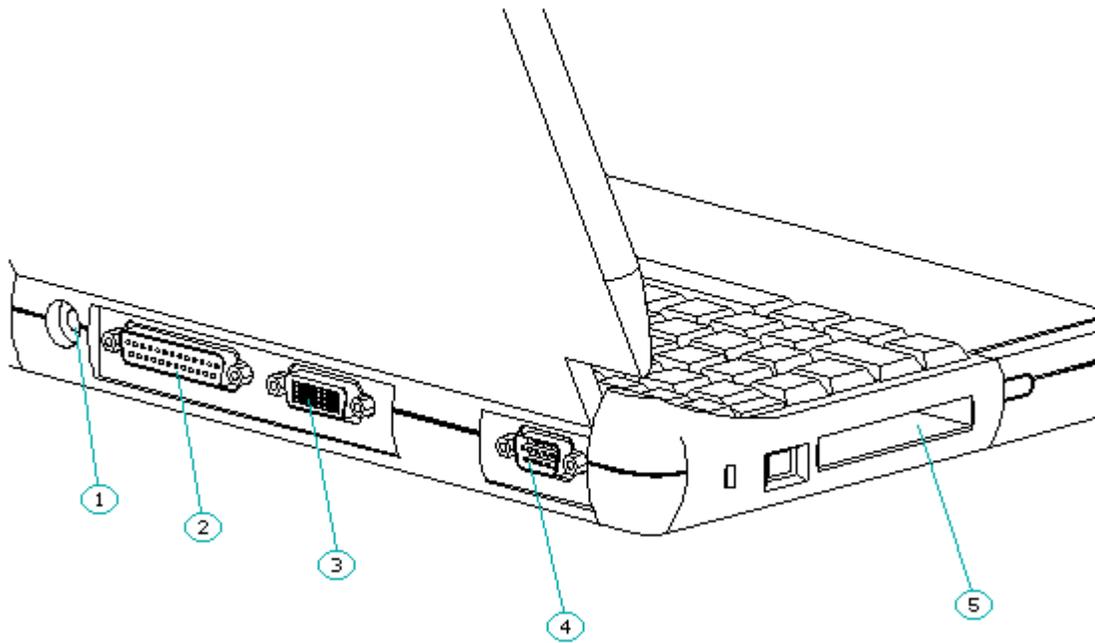


Figure A-1. Compaq Contura Aero External Connectors

Table A-1. Compaq Contura Aero and External Connectors

Index	Description
1	AC Adapter
2	Parallel (25 pin)
3	External Options (60 pin)
4	Serial (9 pin)
5	PCMCIA Slot

Appendix B.1 Base Unit

This appendix contains information about the base unit that is available for use with the Compaq Contura Aero Family of Personal Computers.

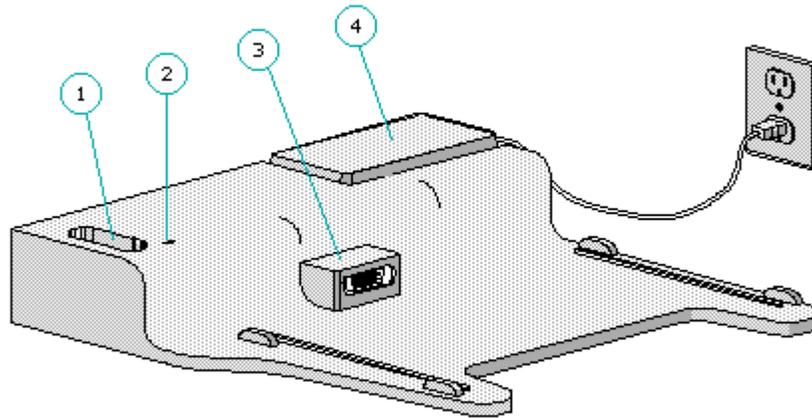


Figure B-1. Base Unit

Table B-1. Front View

Index	Description
1	Battery Charger Slot
2	Charger Light
3	External Options Connector
4	AC Adapter

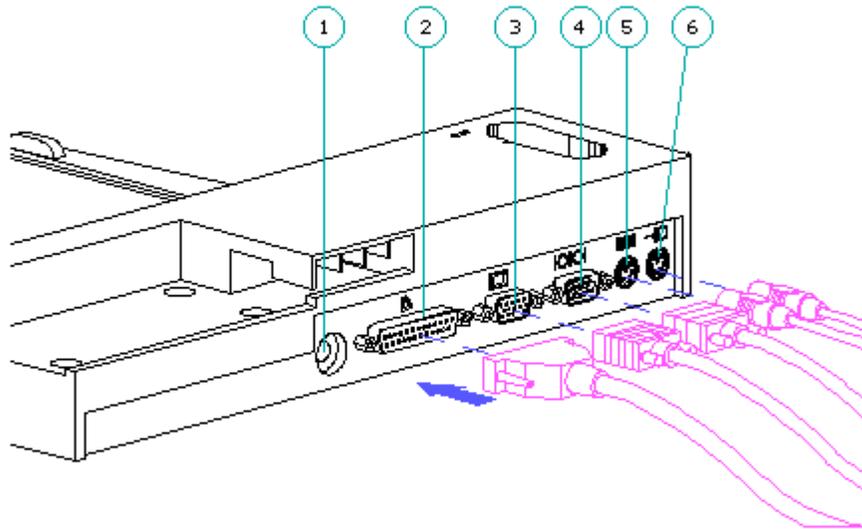


Figure B-2. Base Unit External Connectors

Table B-2. Base Unit External Connectors

Index	Description
1	DC Power
2	Parallel port
3	External VGA monitor
4	Serial port
5	External keyboard
6	PS/2 mouse

Troubleshooting the Base Unit

If the battery charger does not work, follow these steps:

1. Disconnect the computer from the base unit and reinsert the battery pack in the charger.

2. Try another AC Adapter.
3. Check the battery slot and make sure it is clear.

If the mouse or keyboard does not work, check to make sure they are plugged into the correct jack.

If the printer or serial ports do not work, follow these steps:

1. Disconnect the computer from the base unit.
2. Connect the cables to the printer and serial ports of the computer.
3. If the ports work on the computer, the base unit is defective.

Replacing the Tilt Feet

To replace the tilt feet on the base unit, follow these steps:

1. Remove the computer from the base unit.
2. Turn the base unit upside down.
3. Open up the foot and remove the screw that secures the foot to the base.
4. Pull out the foot, then press in a new one.
5. Replace the screw.

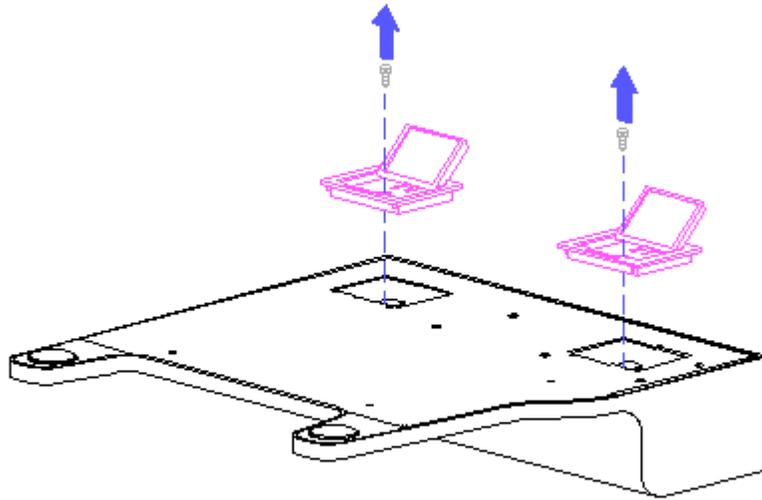


Figure B-3. Replacing the Tilt Feet

Appendix C.1 Connector Pin Assignments

Parallel Connector

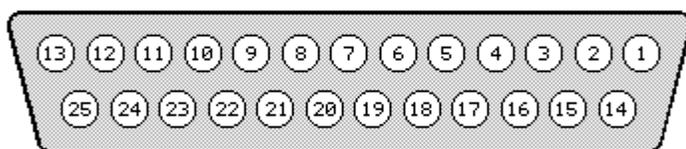


Figure C-1. Parallel Connector

C-1. Parallel Connector Pin Assignments

Pin	Signal	Pin	Signal
1	Strobe *	13	Select
2	Data Bit 0	14	Auto Linefeed *
3	Data Bit 1	15	Error *
4	Data Bit 2	16	Initialize Printer *
5	Data Bit 3	17	Select In *
6	Data Bit 4	18	Ground
7	Data Bit 5	19	Ground
8	Data Bit 6	20	Ground
9	Data Bit 7	21	Ground
10	Acknowledge *	22	Ground
11	Busy	23	Ground
12	Paper Out	24	Ground
		25	Ground

* Active low

Serial Connector

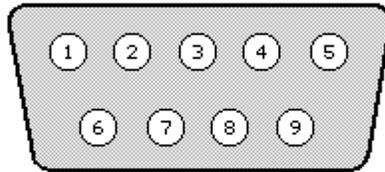


Figure C-2. Serial Connector

Serial Connector Pin Assignments

Pin	Signal
1	Carrier Detect
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Ground
6	Data Set Ready
7	Ready to Send
8	Clear to Send
9	Ring Indicator

External Options Connector

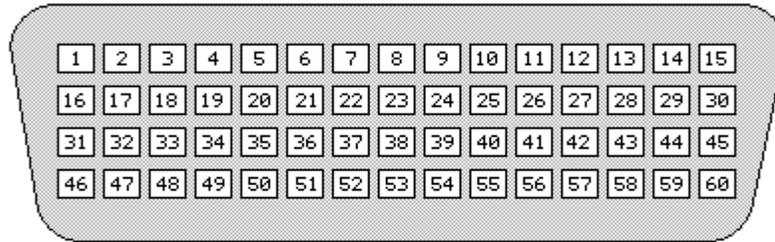


Figure C-3. External Options Connector

External Options Connector Pin Assignments

```

=====
Pin          Signal
=====
1            Not Connected
2            Ground
3            Ground
4            Serial Carrier Detect
5            Serial Ring Indicator
6            Serial Data Set Ready
7            Keyboard Data
8            Keyboard Clock
9            Mouse Clock
10           Printer Busy
11           Printer Paper Out *
12           Printer Auto Line Feed *
13           Printer Error *
14           Printer Select In *
15           Not Connected
16           Battery LED
17           CRT - Vertical Sync
18           CRT - Horizontal Sync
19           Ground
20           Serial Ready To Send
21           Ground
22           Ground

```

23	Ground
24	Printer Strobe *
25	Ground
26	Printer Select
27	Ground
28	Printer Initialize *
29	Ground
30	Not Connected
31	Ground
32	Ground
33	Ground
34	Serial Data Term Ready
35	Ground

 * Active low
 =====

Pin	Signal
36	Serial Clear To Send
37	Ground
38	Ground
39	Ground
40	Printer Data Bit 7
41	Ground
42	Printer Data Bit 4
43	Ground
44	Printer Data Bit 1
45	Battery Voltage (Main DC Unit Voltage)
46	CRT - Blue Analog
47	CRT - Green Analog
48	CRT - Red Analog
49	Serial Transmit Data
50	Serial Receive Data
51	VCC
52	VCC
53	Mouse Data
54	Printer Acknowledge *
55	Printer Data Bit 6
56	Printer Data Bit 5
57	Printer Data Bit 3
58	Printer Data Bit 2
59	Printer Data Bit 0
60	Battery Voltage (Main DC Unit Voltage)

 * Active low
 =====

Pcmcia Connector

PCMCIA Connector Pin Assignments

Pin	Signal
1	Ground
2	Data bit 3
3	Data bit 4
4	Data bit 5
5	Data bit 6

6	Data bit 7
7	Card enable 1
8	Address bit 10
9	Output enable
10	Address bit 11
11	Address bit 9
12	Address bit 8
13	Address bit 13
14	Address bit 14
15	Program/Write enable
16	Ready or busy/Interrupt request
17	Power
18	Programming and peripheral supply 1
19	Address bit 16
20	Address bit 15
21	Address bit 12
22	Address bit 7
23	Address bit 6
24	Address bit 5
25	Address bit 4
26	Address bit 3
27	Address bit 2
28	Address bit 1
29	Address bit 0
30	Data bit 0
31	Data bit 1
32	Data bit 2
33	Write protect/IO Port is 16 bit
34	Ground
35	Ground
36	Card detect 1
37	Data bit 11
38	Data bit 12
39	Data bit 13
40	Data bit 14
41	Data bit 15
42	Card enable 2
43	Refresh
44	IO Read
45	IO Write
46	Address bit 17
47	Address bit 18
48	Address bit 19

```

=====
Pin      Signal
=====
49      Address bit 20
50      Address bit 21
51      Power
52      Programming and peripheral supply 2
53      Address bit 22
54      Address bit 23
55      Address bit 24
56      Address bit 25
57      Reserved
58      Card reset
59      Extend bus cycle
60      Input port acknowledge
61      Register select and IO
62      Battery voltage detect 2/Audio digital waveform

```

63 Battery voltage detect 1/Card status changed
64 Data bit 8
65 Data bit 9
66 Data bit 10
67 Card detect 2
68 Ground

=====