3025
Notebook
Service Manual

No. 75 Minsheng East Road, Sect. 3
Taipei, Taiwan
Republic of China

Telephone : (02) 501-8231
Telex : 11942 TAIAUTO
Fax : 886-2-501-4265

Part Number :
5615 6619 0014 R00

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Preface

The **3025 Notebook Computer** brings you all the functions and capacity of a high-performance, highly reliable desktop in a compact, light-weight A4-sized chassis. This notebook has been designed for long use and for a wide-range of professional and business applications. It is fully compatible with IBM PC/AT systems and has external connectors for adding expansion features.

This manual has been divided into the following chapters and appendices for your easy reference:

Chapter 1*General System Description* gives the standard specifications, features, and configuration of the system.

Chapter 2*System View and Disassembly* provides a view of the system and gives the system disassembly instructions.

Chapter 3*Internal System Upgrades* gives instructions on installing options on the notebook system board.

Chapter 4*Connector Input/Output Definition* provides connector information of the system board.

Chapter 5*Troubleshooting* provides troubleshooting procedures for problems with the system, keyboard, display, disk drive, and other input/output devices.

Appendix A*Spare Parts* lists the part numbers of the spare parts used for the major components of the notebook.

Appendix B*RS-232 Connection* shows the pin assignment connection between an external device and the RS-232 port of your notebook.

Appendix C*Signal Conventions* lists the manufacturer's signal names and specifications for your notebook's major devices.

Appendix D*Component Layout* shows the component layout of the system board, the video board, and all connectors of your notebook.

You will also find a “MiTAC Global Support Problem Worksheet” at the back of this manual. Please fill in this form when you encounter technical problems with any of our products and send the form to us or to our service dealer.

For better technical support, we will keep you updated on technical information through the Service Bulletin, Question & Answer and Engineering Change Notice.

1 General System Description

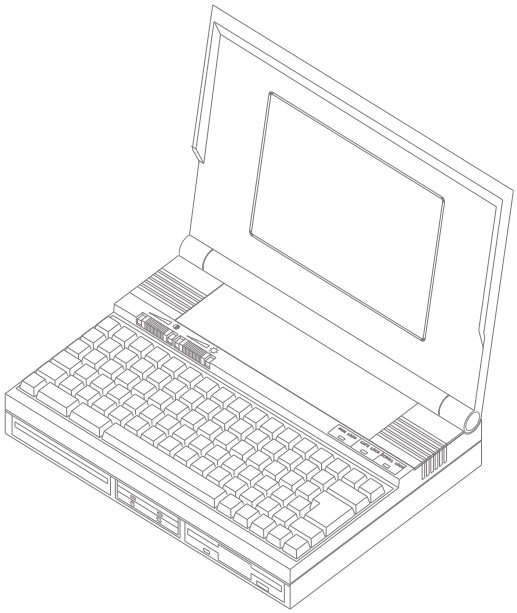


Figure 1-1. The 3025 Notebook Computer

1.1 Introduction

The 3025 — light, compactly designed in an A4-sized clam shell chassis — is a powerful battery-powered notebook computer fully compatible with the IBM PC/AT. It is equipped with the high-performance functions of a 80386SX CPU and is easily upgradable via the expansion connectors.

Salient features of this system include the following:

For Model 3025D:16-MHz 80386SX microprocessor

For Model 3025E:**20-MHz 80386SX** microprocessor

Socket for 80387SX coprocessor

Coprocessor speed should be the same as the CPU speed

LCD display screen

High-contrast, B/W, VGA-compatible with CCFT (**C**old **C**athode **F**luorescent **T**ube) backlighting

Hard Disk Drive

2.5-inch internal hard disk drive (20, 40, 60, 80MB options), 25ms access time

3 1/2-inch floppy disk drive

1.44MB capacity

Ni-Cad (Nickel Cadmium) Battery Pack

Built-in, rechargeable, can last for three hours continuous operation

1MB standard RAM on-board

expandable to 2,3 or 5MB

82/83-key keyboard

with 12 function keys and cursor control keys

AC Switching Power Supply

Portable, brick

Connectors for external expansions

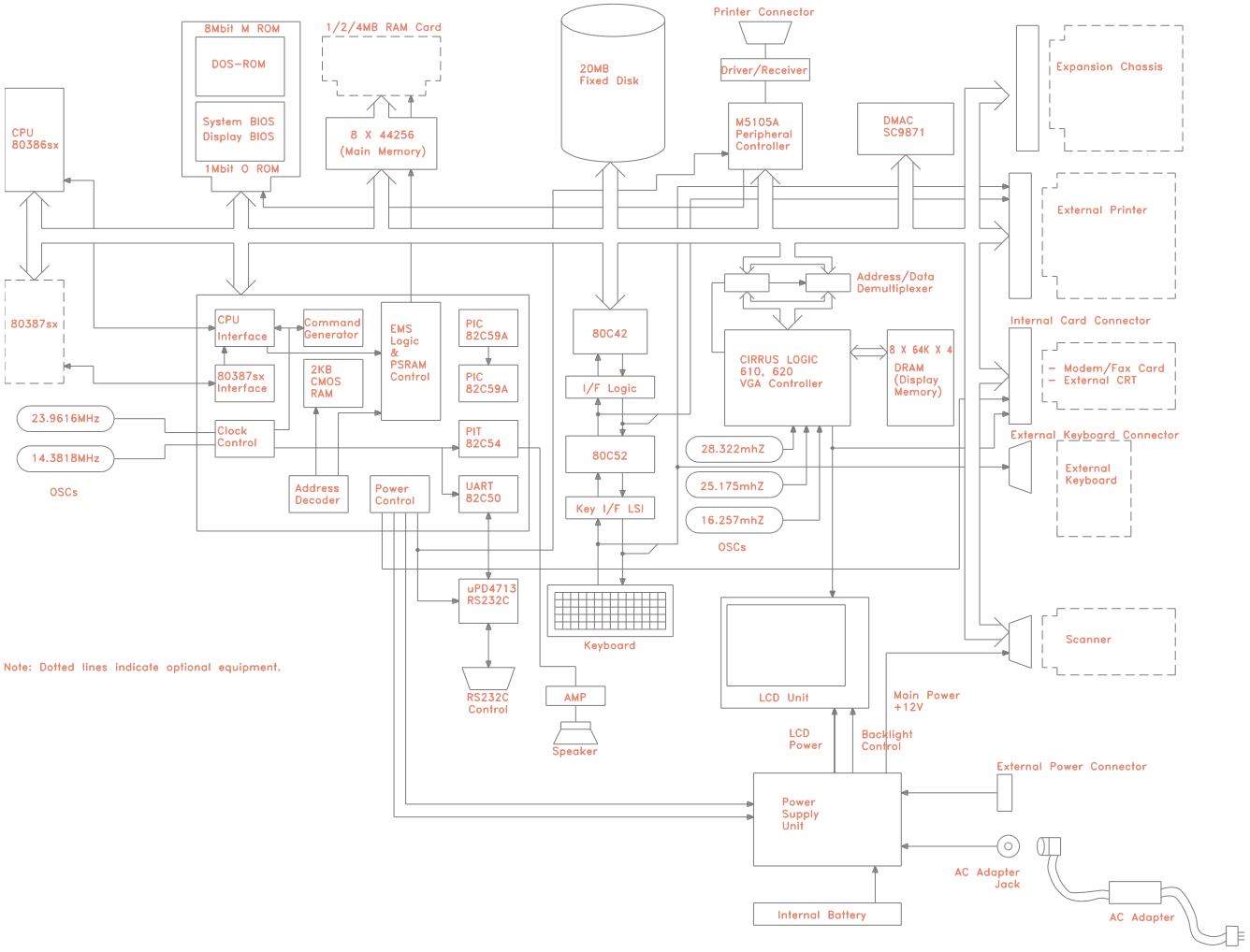
3025E includes a connector for a fax/modem and a handy scanner

Power Saving features

1.2 System Description

Major components of the 3025 include the system board, video board, CPU, system memory, system BIOS, floppy and hard disk drive, LCD display, VGA controller, keyboard, power system, power supply, AC adapter, and the battery pack. The block diagram below shows how these components are integrated :

Figure 1-3. System Board Layout



1.2.1 System Board

The system board was designed for easy access of all major components which include the following:

CPU (U18)
- Intel 80386SX-16 microprocessor, 16MHz (for 3025D)
- Intel 80386SX-20 microprocessor, 20MHz (for 3025E)

Numeric Coprocessor (U19)
- Socket for 80387SX

Memory
- RAM On-board (44256 DIP) 1MB expandable to 5MB

implemented by eight 256K x 4 DRAM chips (U22, U24 - U30)
- System ROM 64KB,
- Video ROM 64KB
- Video RAM 256KB
- Memory Expansion Slot (30-pin SIP module of 1-, 2-, or 4-MB sizes can be plugged into this slot)

On-Board Peripherals and Controllers
- Interrupt Controller (HT21)
- DMA Controller (HT21)
- Real Time Clock/Calendar - U14 (DS1287) 64 Byte,

provides system clock, calendar,

Configuration information stored in CMOS RAM
- Lithium battery backup
- Floppy/Hard Disk Drive Controller (NS87310)
- Serial/Parallel I/O Controller (NS87310)
- Cirrus VGA controller ROM
- M5105 chip - (Super I/O Controller - U2) does I/O and control functions for the fixed disk, diskette drive, parallel port and serial port.
- Keyboard Controller (U17) - 8042

implements all standard PC/AT-compatible keyboard control functions
- System Chipset (U8)-HC21 Headland chipset

integrates PC/AT-compatible CPU and peripheral support functions on a single chip.
- System PAL (U10 and U11)

implements basic system logic and control electronics
- Phoenix BIOS chip implements the basic system control programs

1.2.2 Video Board

The video board is stacked on top of the system board. Built into it is the Video Graphic Array (VGA) controller. It can support 640 x 480 pixels on the LCD display and external monitors. Its RAM has 256KB of memory (4464*4 soldered on the video board). It has one EPROM socket for a 27512 EPROM chip for VGA BIOS.

Major components of the video board include the following:

VGA Controller (U6 and U12) - two chip VGA control chipset by Cirrus Logic. CL-GD610 implements graphic and video attribute control functions;

CL-GD620 implements video output sequencing and flat-panel display control

VGA Memory (U7, U8, U10, U11, U13, U14, U19, and U20) - 256KB video memory implemented by eight 64K x 4 bit DRAM chips

VGA BIOS (U18) - the Cirrus VGA BIOS implements basic display interface and control functions in the computer

RAMDAC (U1) - the BT475 RAMDAC implements the VGA palette and converts screen data (from video memory) to analog signals output to the display

Optional Scanner Controller (U21) - can be installed on the video board as an option.

The following display modes are supported by the VGA adapter:

For a flat panel display
- 40 x 25 text in 16 shades of grey
- 80 x 25 text in 16 shades of grey
- 640 x 480 graphics in 16 shades of grey
- Automatic mapping of 16 or 256 colors into 16 or 32 shades of grey
- 320 x 200 in 32 shades of grey
- 640 x 350 in 32 shades of grey
- 640 x 350, expanded to 640 x 475, in 16 shades of grey
- 640 x 200, expanded to 640 x 475, in 16 shades of grey

For an external monitor
- 40 x 25 text in 16 colors
- 80 x 25 text in 16 colors
- 640 x 480 graphics in high resolution graphics
- 360 x 480 or 320 x 200 resolution, with 256 colors out of the 256K palette
- 800 x 600 high resolution graphics with a multi-frequency color monitor
- 720 x 540 high resolution graphics with a multi-frequency color monitor
- 640 x 350 graphic in 16 colors
- 640 x 200 graphic in 16 colors
- 320 x 200 graphic in 16 colors

1.2.3 LCD Display

- FTN Type Monochrome, B/W VGA LCD,

640 x 480 resolution, 25 lines x 80 characters, 16 gray scales

Brightness/Contrast controls

CCFT backlighting
- Dimensions:

Height: 135 mm

Width:180 mm

Diagonal:225 mm
- Non-glare glass face has a near 180 degree adjustable tilt
- Reverse video feature via keyboard
- Has a power saving feature — screen automatically blanks out after a set period of time of non-operation; can be reactivated when any key is pressed after the screen blank-out

1.2.4 Notebook Keyboard

— 82/83 keys, embedded keyboard, country-dependent layout, numeric/cursor keypad, 12 function keys and a special Fn (Function) key

1.2.5 Floppy Disk Drive

— 3-1/2-inch floppy disk drive, 135TPI, double sided;
Total formatted capacity 1.44MB

Drive Height:19.5 mm

LED IndicatorRed front-panel access LED

Sectors Per Track:256/512/1024

Drive Rotation:300 revs/minute

Transfer Rate:250 KB/second

Average Access time:84 ms (with setting)

1.2.6 Hard Disk Drive

— 2.5-inch; 0.75 inch height
— 20, 40, 60, 80 MB options

1.2.7 Power Source

AC Switching Power Supply
— Switching power supply with a separate AC power cord
— Portable, brick-shaped
— Full-range operating between 100V and 240V
— Frequency 50-60Hz
— Output voltage are 6.2V and 12V with overcurrent and overcharging protection
— Japan 100V AC nominal, 50/60Hz
— U.S./Canada 120V AC nominal, 50/60Hz
— International 220-240V AC nominal, 50/60Hz
— AC input current: 0.7A (RMS) Max. for 115V
0.4A (RMS) Max. for 230V
— Battery charge current: Fast charge 1.4A
— Trickle charge 0.3A

DC-DC Converter
— converts the DC to AC for the CCFT backlit in the LCD panel. The power system has a turbo converter supporting devices that cannot operate in low voltages such as the hard disk and the RS-232 port.
DC-AC Inverter
— supplies the 5V DC power to the system and protects the notebook from over current and power surges
NiCad Battery Pack
— 4 cells D-size (UM-1), nominal capacity 4300 mAh, 4.8V per pack,
— supplies power to the computer up to 3 hours minimum

Note:

When the AC Switching Power Supply is connected to the notebook, it automatically charges the battery pack. Required charging time is approximately seven hours. If the AC power fails, the battery pack will supply power for the system automatically without interrupting the system. If the battery power is low, the power indicator on the front panel blinks and the computer beeps.

1.2.8 Power Conditions

Power Supply - 30 Watts

Operating Temperature - 10^0 C to 35^0 C

Storage Temperature - -20^0 C to 85^0 C

Operating humidity - 20% to 80%, non-condensed

Storage humidity - 10% to 90%, non-condensed

Altitude - 3000 meters

Weight - 1.23 lbs

Size - 6.5" x 3.2" x 2.2"H (LxWxH)

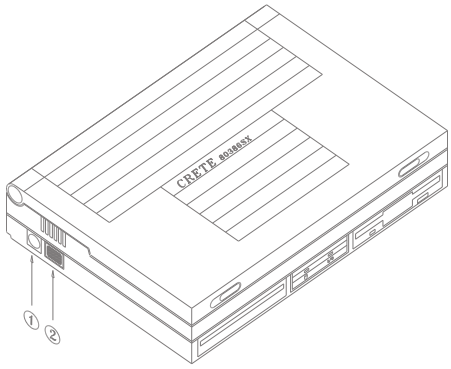
Shock - 5G (10 +/- 3 microseconds pulse duration)

2 System View and Disassembly

2.1 System View

2.1.1 Left/Front Panel

1. DC Power Socket
2. Power ON/OFF Button
3. Hard Disk Drive (HDD) In-Use Indicator
4. Power-On/Low Battery Indicator
5. Floppy Disk Drive (FDD) Indicator
6. 3 1/2-inch Floppy Disk Drive
7. FDD Button
8. Display Cover Latches

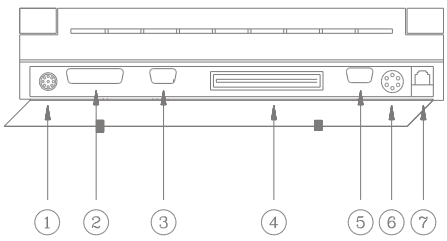


2.1.2 Rear Panel

1. External Keyboard
2. Printer
3. External VGA Monitor
4. Expansion Chassis
5. Serial Port (COM 1)

Only 3025E has the following:

6. Scanner
7. Modem/Fax



2.2 System Disassembly

2.2.1 Preparation

Tools Required

The following tools are needed for the assembly/disassembly work on the notebook computer:

- Phillips screwdriver (small)
- Phillips screwdriver (medium-sized)
- Slotted screwdriver (medium-sized)
- Hex driver (5 mm)
- Awl, pocket-knife, or other sharp, pointed instrument

Some cases will require more specialized tools like the following:

- PLCC insertion removal tools (for installing the scanner option or installing a math coprocessor)
- Desoldering equipment for removing the DC-DC converter or replacing soldered ICs.

Anti-Static Precautions

Integrated circuits in the notebook computer are sensitive to static electricity. To avoid damaging chips caused by electrostatic discharge, observe the following precautions

Do not remove a board or chip from its antistatic packaging until you are ready to install it.

Before handling a board or chip, touch an unpainted metal surface for a few seconds to discharge any static electricity from your body.

Wear a wrist grounding strap, available from most electronic stores, when handling boards and chips.

Assembly Overview

The figure below shows the exploded view of the computer when disassembled. Each part is represented by a number. The next sub-sections will discuss at length each major part for disassembly and show corresponding illustrations.

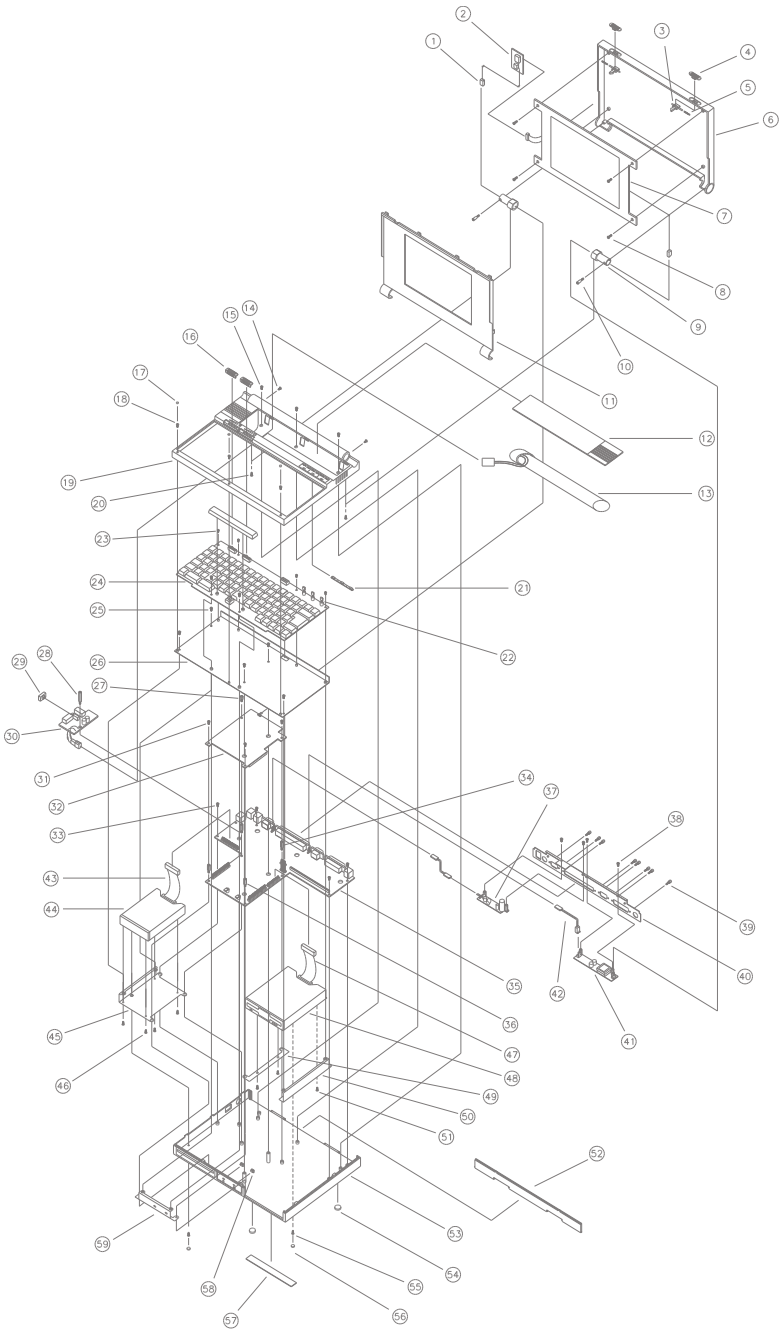


Figure 2-1. Assembly Overview

2.2.2 LCD Section

The top cover and the LCD section come off as a single unit, comprising the upper case of the computer. Eight screws attach the upper case to the lower case.

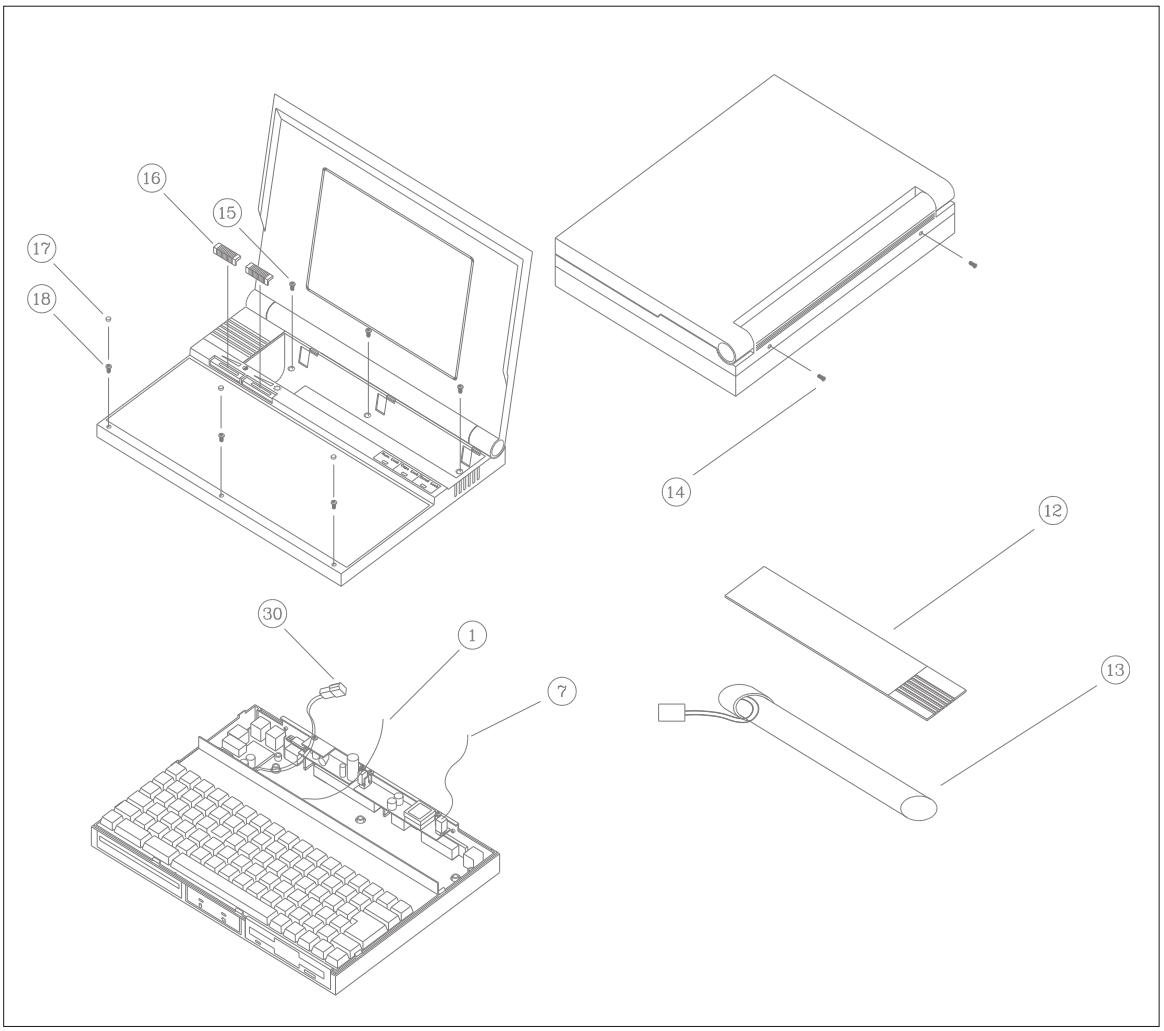


Figure 2-2. LCD Section Removal

— First, remove the cover of the battery compartment (12) and remove the rechargeable battery (13).
— With the awl or knife point, remove the three rubber stoppers (17) to expose three fastening screws at the front of the unit
— Remove the three fastening screws (18).
— Remove the two fastening screws (14) at the back of the unit and the three screws (15) inside the battery compartment.

— Separate the upper case from the lower case. Start from the left side of the rear of the unit (near the power switch).
— Pull the upper case up to separate it from the lower case. You need to push the battery connector (30) through its access hole to free the upper case.
— Detach the AC power cable (7) connected to the LCD panel from the connector at the rear of the unit.

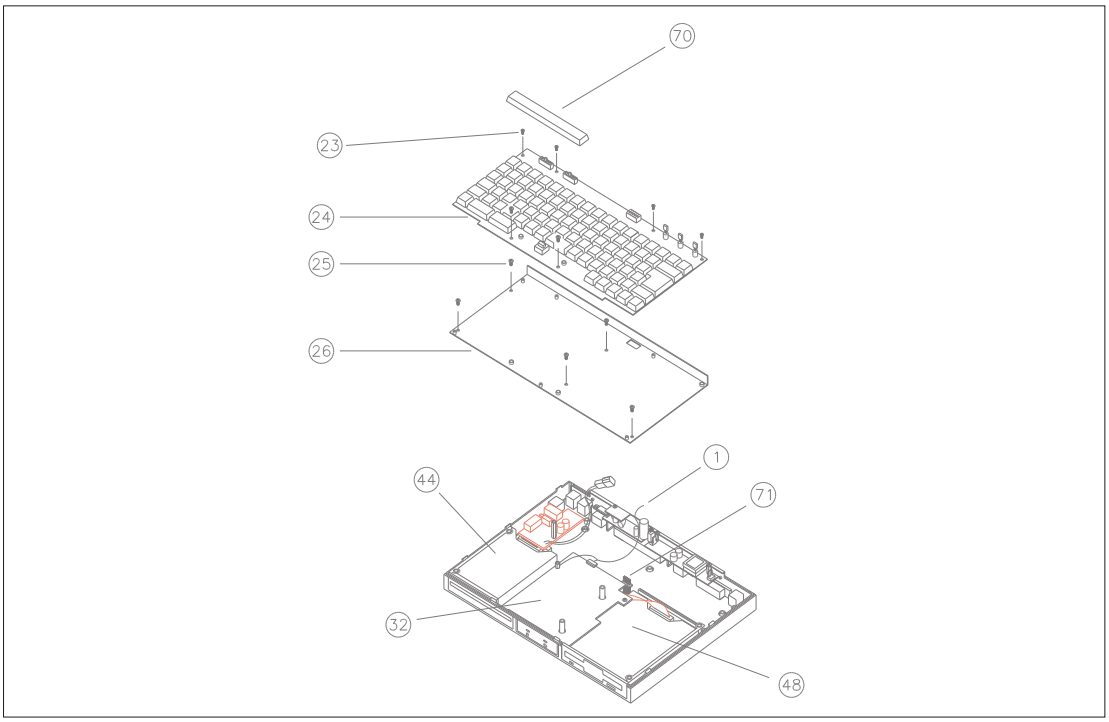
CAUTION:

Do not remove the LCD signal cable (1) yet. Remove it after the keyboard and EMI shield have been removed. Thus, at this point, the upper case is not yet completely detached from the lower case.

2.2.3 Keyboard Section

The keyboard section includes the keyboard itself and an EMI shield directly underneath. The keyboard, with the EMI shield, is attached to the unit with five screws.

Figure 2-3. Keyboard Section Removal



— Loosen the space bar (70) by carefully raising it straight up. It will break away from its mounting post and expose two of the screws underneath.
— Remove the five mounting screws (23).
— Pull the keyboard (24) straight up, away from the lower case until it is free of the keyboard connector (71). The EMI shield (26) will be exposed.
— Remove the five screws (25) attaching the EMI shield to the lower case.
— Pull the EMI shield straight up. You will see the VGA display adapter (32) in the middle, and the HDD (44) and FDD (48) on the left and right, respectively.
— Remove the standoff which secures the grounding lug to the VGA board.
— Carefully, disconnect the LCD signal cable (1). The LCD section is now completely free of the lower case and you may set it aside.

CAUTION:

Never pull the LCD signal cable to disconnect it from the VGA board. Instead, use an awl or other sharp instrument to push the cable header out of the connector. Careless pulling may damage the LCD signal cable.

2.2.4 VGA Board

The VGA board, secured by 4 screws is connected to the system board via two connectors on the left and right. The main components on the VGA board are facing down — towards the system board.

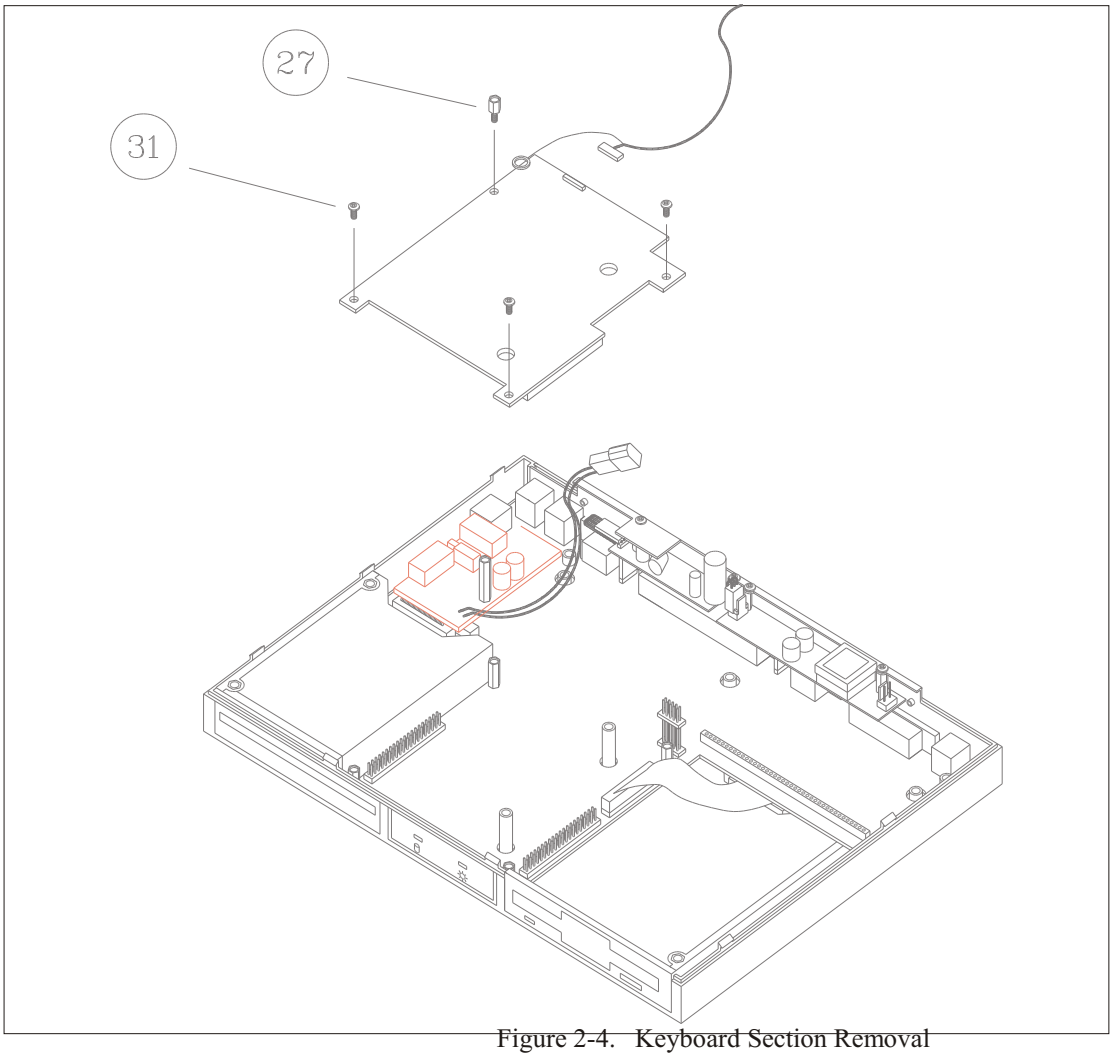


Figure 2-4. Keyboard Section Removal

— Remove the three mounting screws (31) that secure the VGA board in place.
— Remove the stand-off (27) that secures the LCD cable ground. This step is part of removing the keyboard section.
— Pull the VGA board straight up, freeing it from the two connectors. (Note that the system board will then be exposed.

2.2.5 System Board

The system board is secured to the lower case with five stand-off fixtures.

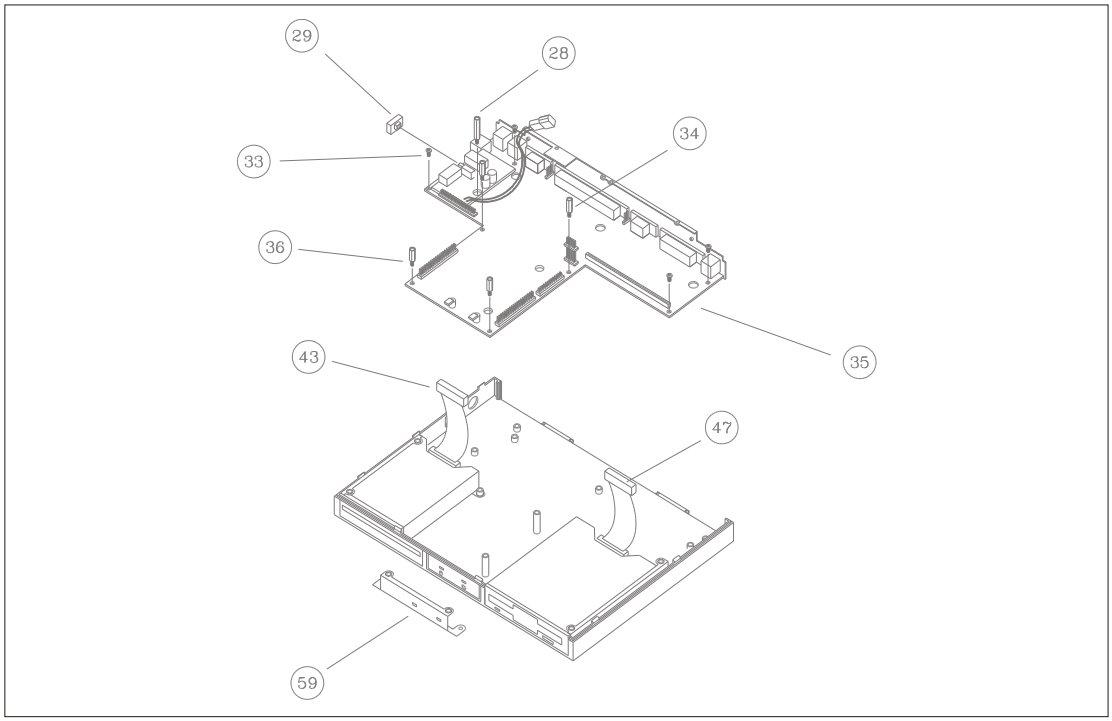


Figure 2-5. System Board Removal

— Remove the tall standoff (28)
— Remove the two short standoffs (36)
— Remove the two medium standoffs (34)
— Remove the four screws (33).
— Remove the LED positioning bracket (59) from the front of the system board. This bracket protects the front panel LED leads.
— Remove the blue power switch cover (29). From the inside of the case, push it out to pop it off the switch.
— Disconnect the FDD signal cable (47).
— Disconnect the HDD signal cable (43).

CAUTION:

Never pull the HDD signal cable to disconnect it from the system board. Instead, use an awl or other sharp instrument to push the cable header out of the connector. Careless pulling may damage the HDD signal cable.

— Finally, lift the system board (35) out of the lower case.

2.2.6 Hard Disk Drive (HDD)

NOTE:

The system board must be removed before the HDD can be removed.

The HDD is mounted on a bracket which sits on the lower case.

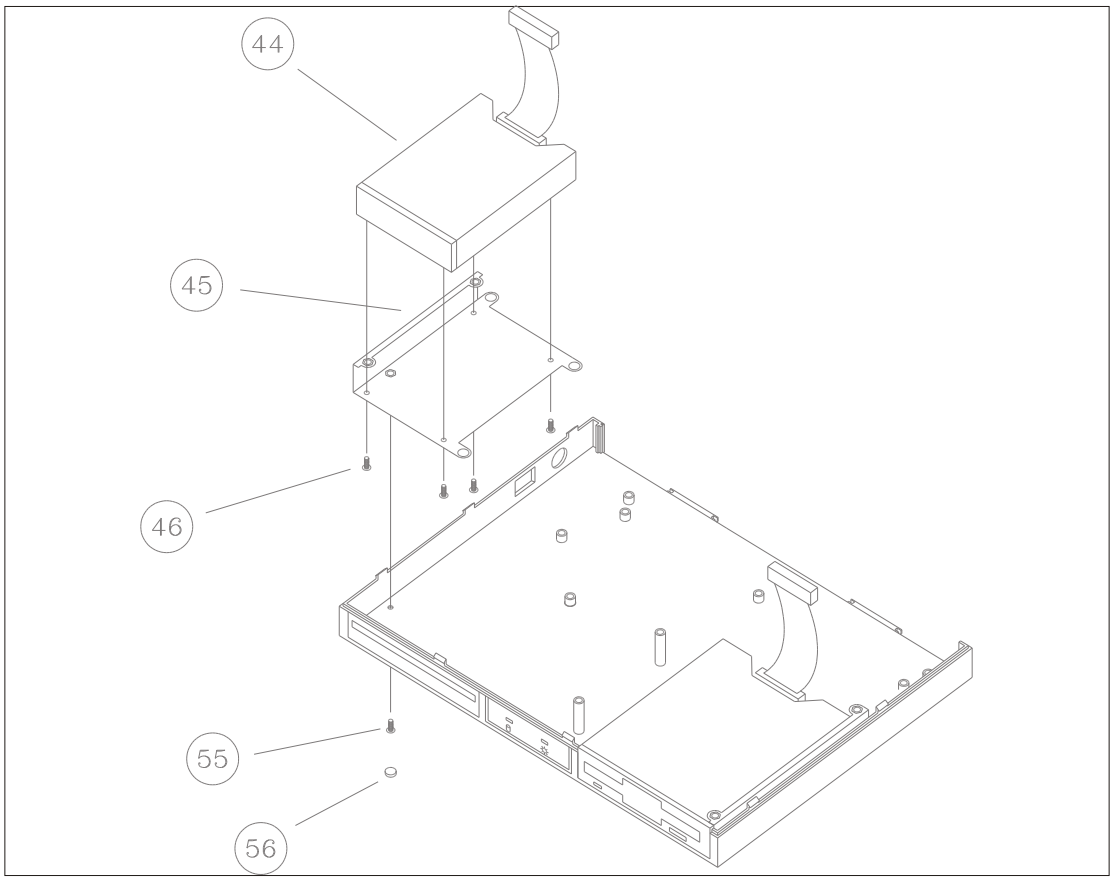


Figure 2-6. Hard Disk Removal

- Turn the lower case upside down. Remove the rubber foot (56) to expose the HDD mounting screw.
- Remove the screw (55).
- Carefully turn the lower case right side up, ENSURING THAT THE HDD DOES NOT DROP in the process.
- Lift the HDD (44) out of the lower case.
- Remove the HDD from its mounting bracket (45) by removing the four mounting screws (46) securing it to the bracket.
- Detach the bracket from the HDD.

2.2.7 Floppy Disk Drive (FDD)

The FDD has two mounting brackets securing it to the lower case.

- Turn the lower case upside down. Remove the rubber foot (56) to expose the FDD mounting screw.
- Remove the screw (55).
- Carefully turn the lower case right side up, ensuring that THE FDD DOES NOT DROP in the process.
- Lift the FDD (48) out of the lower case.
- Remove the FDD from its mounting brackets (49), (50), by removing the three mounting screws (51).
- Lift the brackets off the FDD.

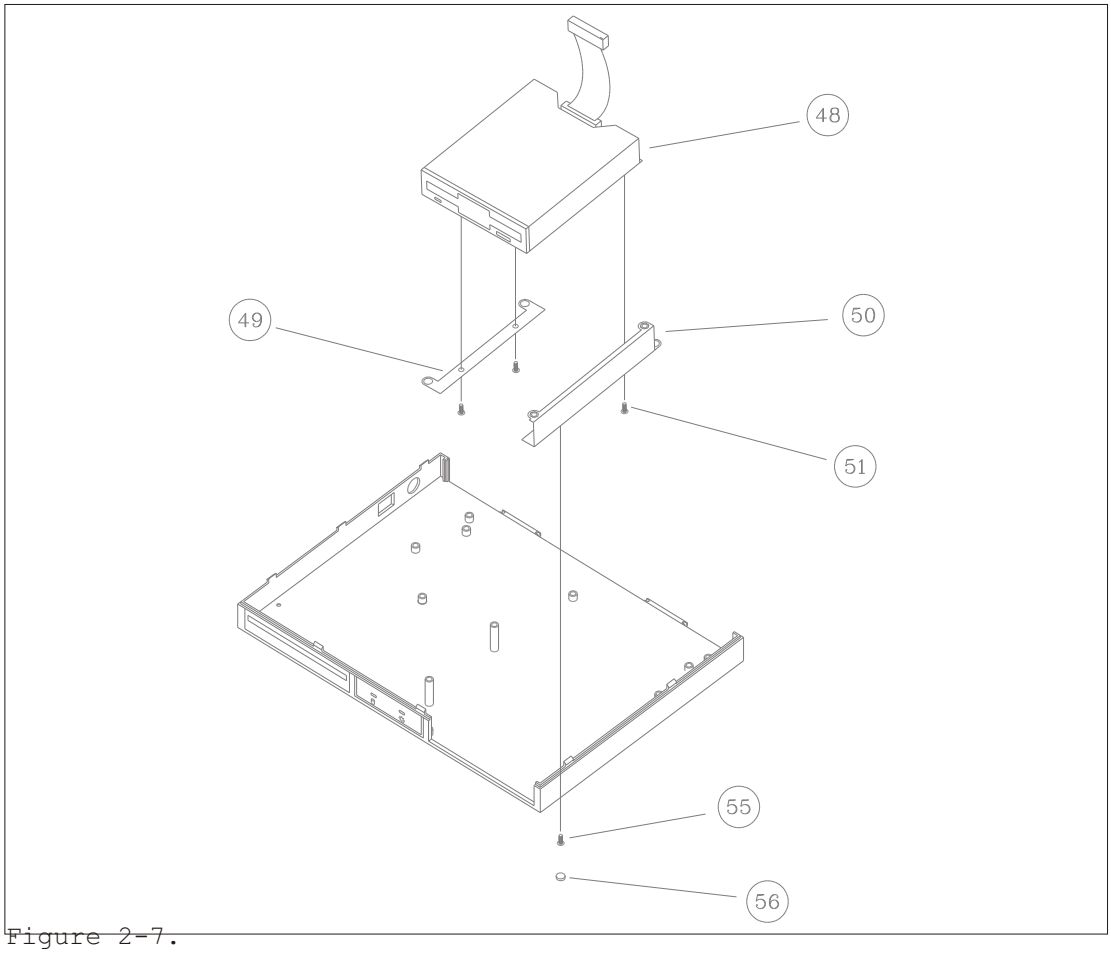


Figure 2-7. Floppy Disk Drive Removal

2.2.8 DC-AC Inverter

WARNING:

NEVER attempt this procedure with the power on. High-voltage is present in the terminals.

The DC-AC inverter supplies power to the LCD panel. It is mounted on the rear bracket of the system board (on the right).

- Detach the LCD power connector from the DC-AC converter.
- Remove the two mounting screws (38).
- Detach the DC-AC converter from the 3-wire cable (42) connecting it to the system board.
- Lift the DC-AC converter (41) out of the case.

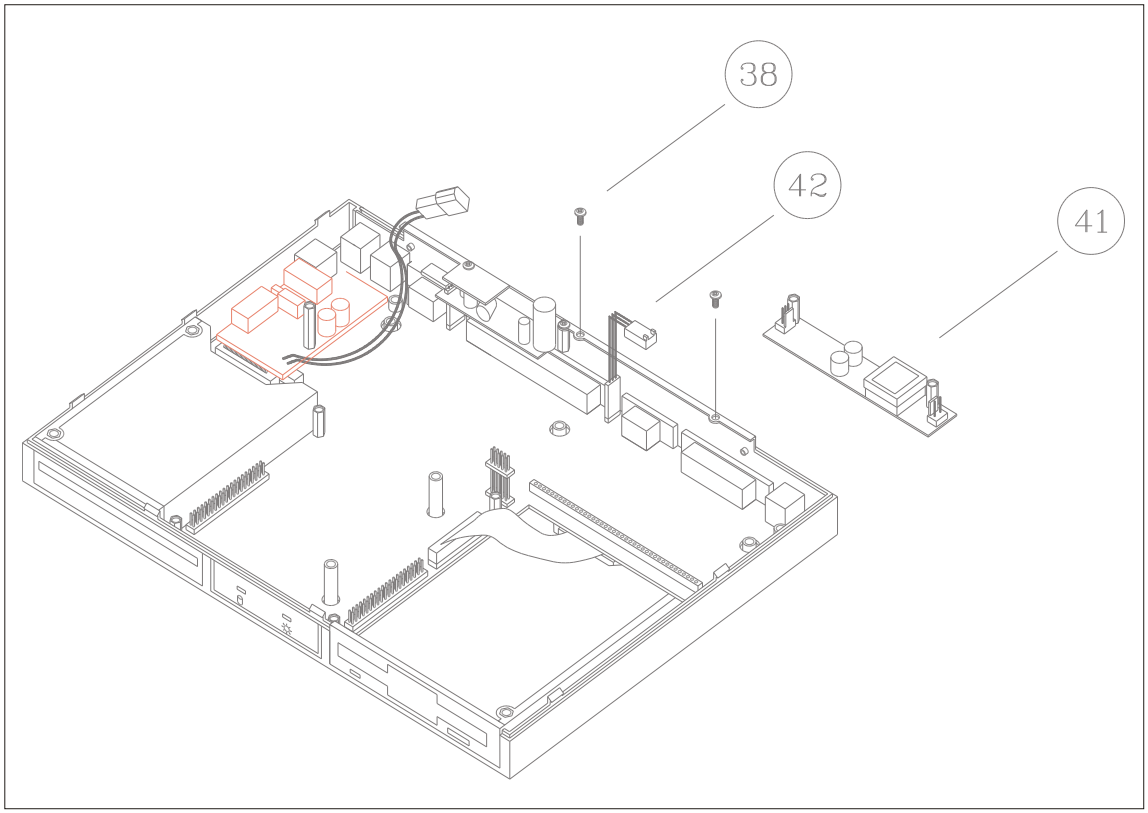


Figure 2-8. DC-AC Inverter Disassembly

2.2.9 Turbo Converter

The Turbo converter supplies extra power to the HDD and RS-232C port. It is mounted on left side of the rear bracket of the system board.

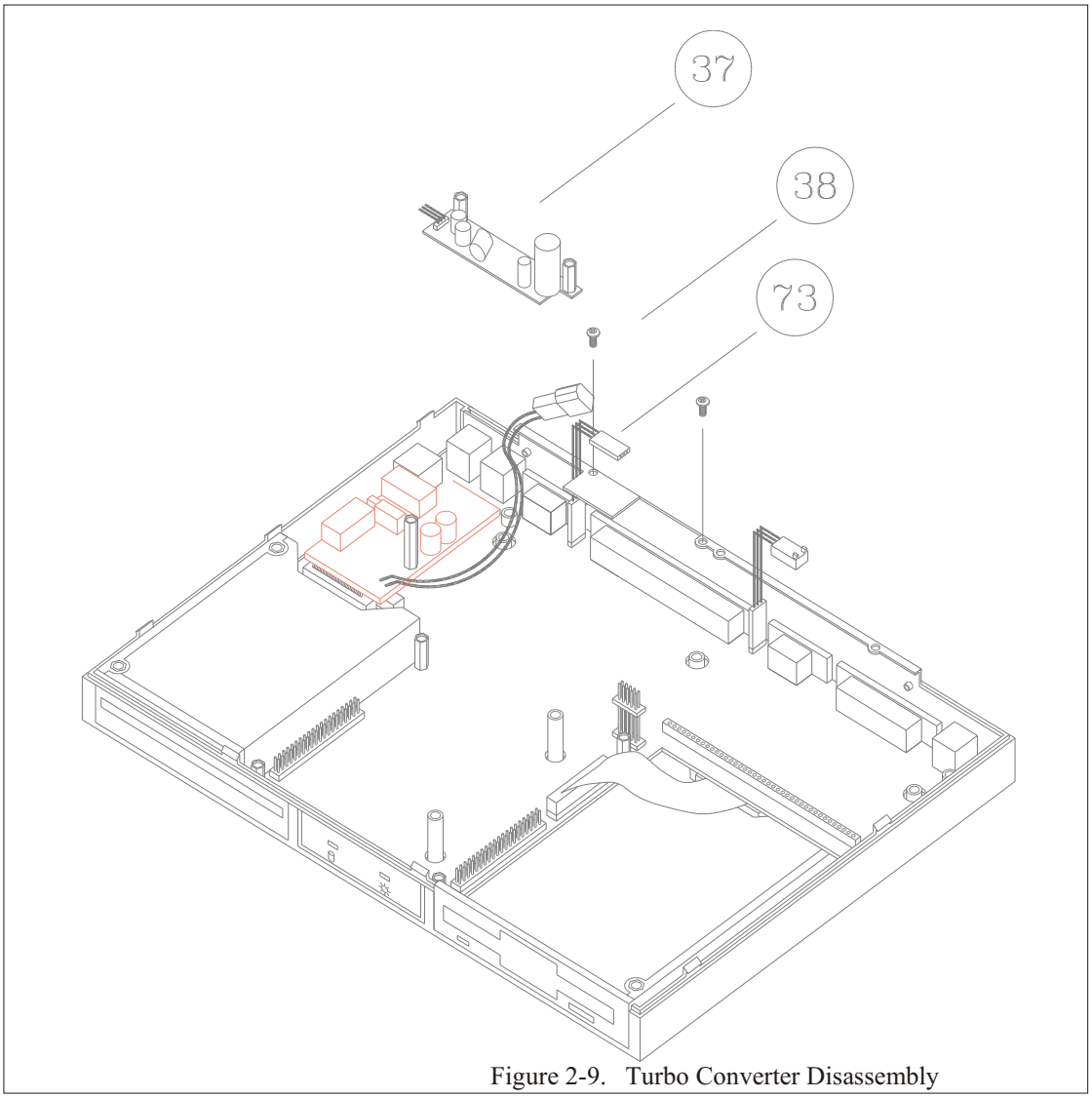


Figure 2-9. Turbo Converter Disassembly

— Detach the power cord connector (73) from the turbo converter.
— Remove the two mounting screws (38).
— Lift the turbo converter (37) out of the case.

2.2.10 DC-DC Converter

The DC-DC Converter is soldered directly to the system board.

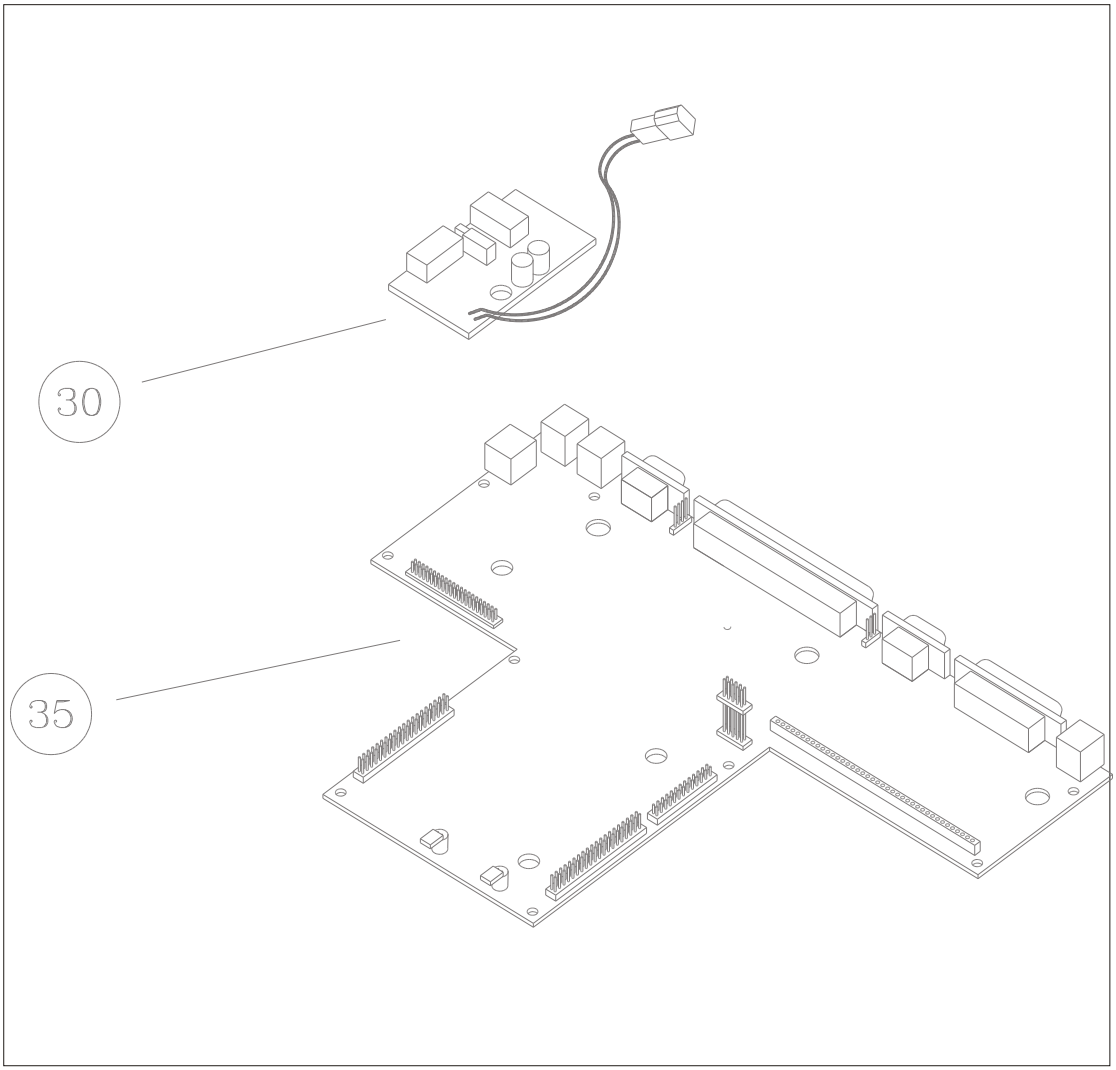


Figure 2-10. DC-DC Converter Disassembly

— There are two rows of pins (35) on the DC-DC converter (30). These must be desoldered in order to remove the DC-DC connector.
— After desoldering the DC-DC converter, lift it away from the system board (35).

2.2.11 LCD Panel

The LCD panel is mounted on the back shell of the upper case.

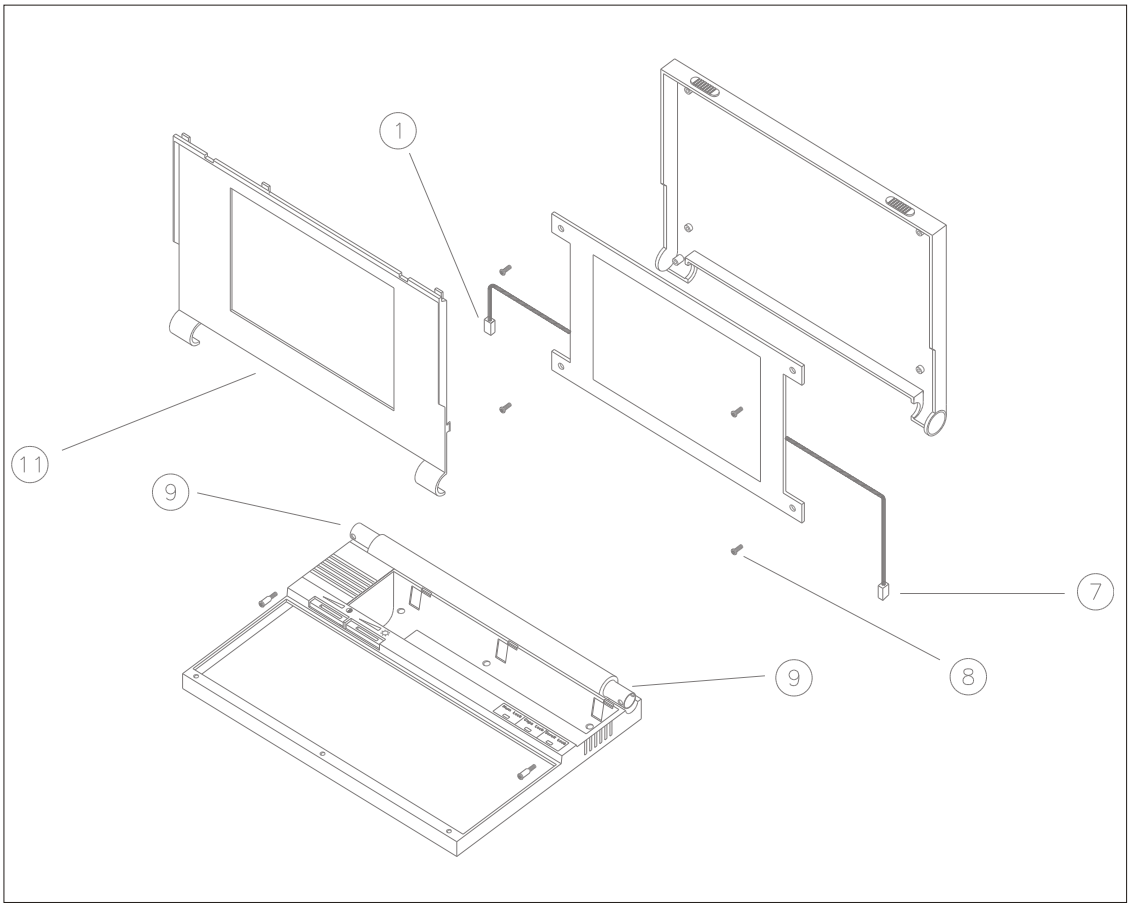


Figure 2-11 LCD Panel Disassembly

— With your fingers, pry the plastic cover (11) away from the back shell of the LCD section. You must pull from the bottom of the cover.
— Slide the cable lock out along the cable to free the LCD signal cable from the cable changer.
— Slide the AC Power Connector (7) out through the hinge.
— Slide the LCD Cable (1) out through the hinge (9).
— Remove the four mounting screws (8) securing the LCD panel to the back shell.
— Carefully lift the LCD panel out.

2.2.12 Cover Hinge

The cover hinges are inside the upper case.

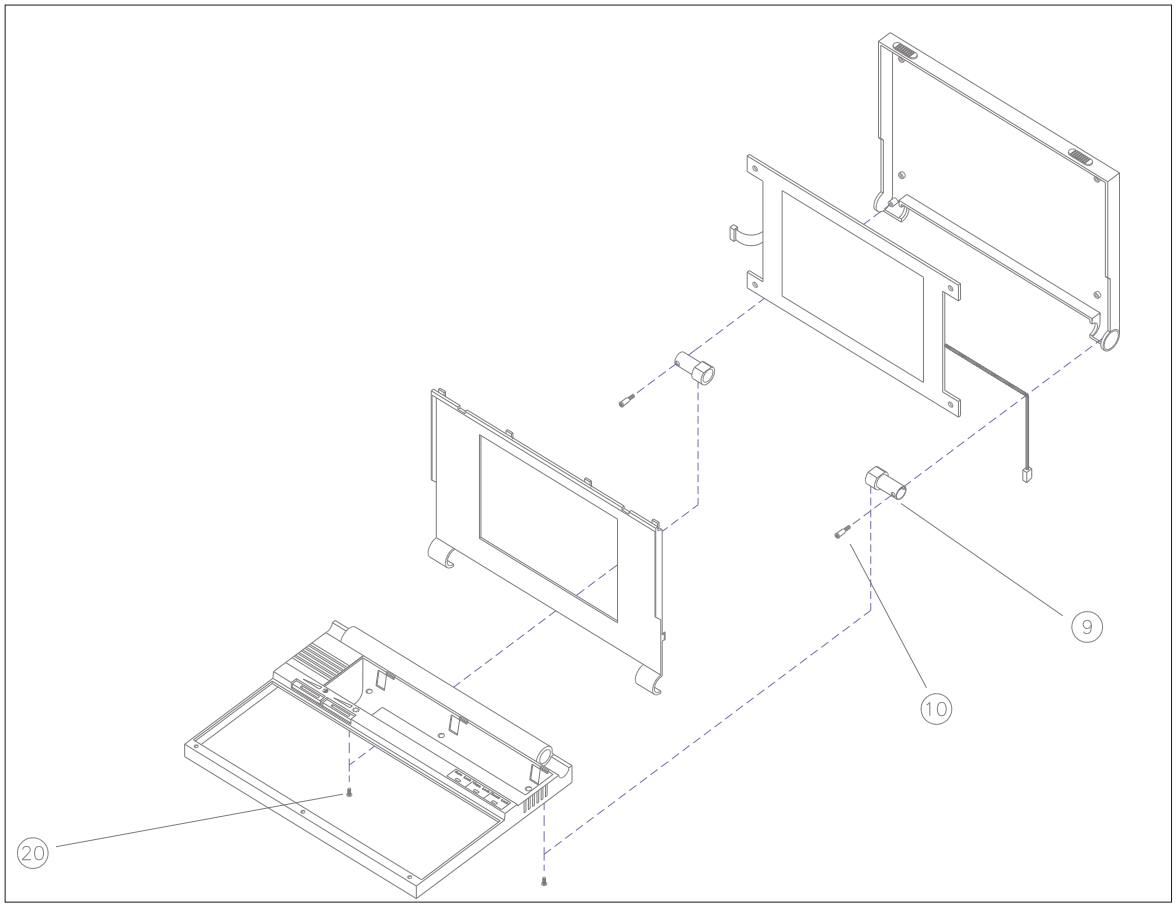


Figure 2-12. Cover Hinge Disassembly

- Close the LCD section. Lay the assembly down as shown. Two guide holes will be visible.
- Remove the hinge locking screws (20). They are inside the guide holes.
- Detach the upper case from the LCD back shell. Pull the cables through the hinge to completely detach it.
- Remove the two screws (10) from the upper case.
- Slide the hinge (9) out of its compartment.

2.3 Re-assembly Notes

CAUTION:

> Polarity of the AC power connector to the LCD panel is not critical. However, CONNECTION TO THE SYSTEM BOARD IS CRITICAL. Ensure that the V+ of the DC-AC Converter is connected to the VCC on the system board.

To re-assembe the computer, note the following reminders:

The LED fixing bracket must be inserted before the system board is fastened to the lower case

Since the system board uses different-sized standoffs for different mounting points, the location of each standoff is critical. The lower case cannot be properly assembled if the standoffs are in the wrong locations.

The LCD signal cable must be connected before the EMI cover is replaced.

The LCD signal cable must be routed away from the battery compartment.

Jumper 1 sets the hard disk type. Short pin 2-3 for Conner/PrarieTek drives. Short pins 1-2 for JVC disk drives.

If you need to attach the rear bracket to the system board, you must first insert the eight screws. DO NOT TIGHTEN THEM YET. After the computer has been reassembled, tighten the two screws at the back of the unit. Then tighten down the screws that hold the system board rear bracket.

3 Internal System Upgrades

In the 3025 *Guide to Operations*, general procedures to upgrade the computer functions by connecting external devices to the notebook rear connectors have been discussed under Chapter 4 of said manual. Thus, external system upgrades will no longer be discussed in this service manual.

Instead, this chapter describes the general procedures for installing internal options on the notebook's system board. Section 3.1 explains memory expansion procedures. Section 3.2 describes changing or upgrading the HDD. Section 3.3 describes the installation of a math coprocessor.

3.1 Memory Expansion

The computer comes with a standard 1 MB of DRAM soldered directly onto the system board. Additional memory expansion is possible with SIP modules. Table 3-1 lists the expansion options and the number of SIP's required.

System Memory	Total Memory Required	Expansion
	1 MB	None
	2 MB	1 MB SIP
3 MB	2 MB SIP	
5 MB	4 MB SIP	

Table 3-1. Memory Expansion Options

To expand on-board memory:

1. Disassemble the computer according to the procedures described under System Disassembly of Chapter 2. The relevant instructions are from sub-sections 2.2.2 - 2.2.4. Stop when you get to the instruction which will expose the system board. Locate the SIP socket at the rear of the system board.

2. Align the SIP pins with the socket holes. Ensure that the SIP is aligned in the proper orientation.

3. Gently lower the SIP into the socket. Press firmly to ensure that the SIP is securely seated in place.

4. Re-assemble the computer by reversing the steps done in disassembly.

5.

Reboot the computer. Run SETUP to configure the computer for the new memory size.

3.2 HDD Upgrade

1. Disassemble the computer according to the procedures described in sub-sections 2.2.2 to 2.2.6. of Chapter 2.

2. Remove the old HDD from its mounting bracket. (Section 2.2.6).

3. Mount the new HDD on the bracket.

4. Reassemble the computer.

5. Turn the computer power on. If the new hard disk type is different from previous, run SETUP to set the new type.

3.3 Numeric Coprocessor Installation

The numeric coprocessor (U18 socket on the system board) is a 68-pin PLCC (Plastic Lead Chip Carrier) package.

1. Disassemble the computer as described in sub-sections 2.2.2 to 2.2.4. Stop at the part where the coprocessor socket on the system board has become exposed.

2. Align the coprocessor corners with the socket corners and press it down until it sits firmly in place.

3. Re-assemble the computer by reversing the disassembly steps of no. 1.

4. Run SETUP to reflect this installation.

4 Connector Input/Output Definition

This chapter describes all internal and external connectors on the computer.

NOTE:

> Signal names listed in this chapter correspond to the signal names on the 3025D schematics.

4.1 Rear Panel Connectors

4.1.1 Parallel Port

Designation: CONN12, Connector Type: DB-25

Pin	Parallel Port
1	Strobe
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	Ack
11	Busy
12	Pe
13	Slct
14	Auto Feed
15	Error
16	Init
17	Slct In
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND

25GND

4.1.2 Serial Port

Designation: CONN7, Connector Type: DB-9

Pin	Signal/Description
1	/DCD1
2	/RXD1
3	/TXD1
4	/DTR1
5	GND
6	/DSR1
7	/RTS1
8	/CTS1
9	/RI1

4.1.3 External Keyboard

Designation: CONN19, Connector Type: Mini DIN-6

Pin	Signal/Description
1	KBDData
2	Reserved
3	GND
4	+5V/ Fuse
5	KBDCLK
6	Reserved

4.1.4 External VGA Monitor

Designation: CONN11, Connector Type: DB-15

Pin	Signal/Description
1	Red
2	Green
3	Blue
4	GND
5	GND
6	GND
7	GND
8	GND
9	Reserved
10	GND

11	MS0
12	MS1
13	BHSYNC
14	BVSYNC
15	Reserved

4.1.5 Expansion Chassis

Designation: CONN9, Connector Type: 100-pin

Pin	Signal	Pin	Signal
1	GND	2	/IOCHK
3	RESERDRV	4	SD7
5	RESERVED	6	SD6
7	IRQ9	8	SD5
9	RESERVED	10	SD4
11	DRQ2	12	SD3
13	RESERVED	14	SD2
15	WS	16	SD1
17	RESERVED	18	SD0
19	GND	20	IOCRDY
21	/SMEMW	22	AEN
23	/SMEMR	24	SA19
25	/IOW	26	SA18
27	/IOR	28	SA17
29	/DACK3	30	SA16
31	DRQ3	32	SA15
33	/DACK1	34	SA14
35	DRQ1	36	SA13
37	/REFRESH	38	SA12
39	SYSCLK	40	SA11
41	IRQ7	42	SA10
43	IRQ6	44	SA9
45	IRQ5	46	SA8
47	IRQ4	48	SA7
49	IRQ3	50	SA6
51	/DACK2	52	SA5
53	TC	54	SA4
55	BALE	56	SA3
57	RESERVED	58	SA2
59	OSC	60	SA1
61	GND	62	SA0
63	/MEMCS16	64	/SBHE
65	/IOCS16	66	LA23
67	IRQ10	68	LA22
69	IRQ11	70	LA21
71	IRQ12	72	LA20
73	IRQ15	74	LA19

75	IRQ14	76	LA18
77	/DACK0	78	LA17
79	DRQ0	80	/MEMR
81	/DACK5	82	/MEMW
83	DRQ5	84	SD8
85	/DACK6	86	SD9
87	DRQ6	88	SD10
89	/DACK7	90	SD11
91	DRQ7	92	SD12
93	RESERVED	94	SD13
95	/MASTER	96	SD14
97	RESERVED	98	SD15

99GND100GND

4.2 Internal Connectors

4.2.1 VGA Adapter

Designation: CONN15, Connector Type: 40-pin

Pin	Signal/Description
1	+5V
2	GND
3	SA19
4	SD7
5	SA18
6	SD6
7	SA17
8	SD15
9	SA16
10	SD4
11	SA15
12	SD3
13	SA14
14	SD12
15	SA13
16	SD1
17	IOCRDY
18	GND
19	SA12
20	SD0
21	SA11
22	SA0
23	SA10
24	SA1
25	SA9
26	SA2
27	SA8

28	SA3
29	SA7
30	SA4
31	SA6
32	SA5
33	+5V
34	GND
35	Reserved
36	Reserved
37	GND
38	GND
39	GND
40	GND

Designation: CONN18, Connector Type: 40-pin

	Pin	Signal/Description
1	Vee	
2	GND	
3	+5v	
4	Red	
5	Osc	
6	Green	
7	Power	
8	Blue	
9	VD	
10	RHSYNC	
11	AV	
12	BVSYNC	
13	ST	
14	/SMEMW	
15	WG	
16	/SMEMR	
17	AR	
18	RAMDAC	
19	AEN	
20	/SBHE	
21	BALE	
22	/REFRESH	
23	/IOR	
24	MEMCS16	
25	/IOW	
26	DRQ1	
27	FC1	
28	DRQ3	
29	IRQ9	
30	/DACK1	

31	RESETDRV
32	/DACK3
33	+5V
34	GND
35	MS0
36	MS1
37	MS2
38	Reserved
39	+5V
40	GND

4.2.2 DC-DC Inverter

(Input from AC SWPS)

Connector Type: Mini DIN-9, CONN5

Pin	Signal/Description
1	GND
2	GND
3	VA (DC +6.2V/3A MAX)
4	VA (DC +6.2V/3A MAX)
5	GND
6	VB (DC CHARGER TO BATTERY)
7	VA (+6.2V/3A MAX)
8	VB (DC CHARGER TO BATTERY)
9	VS (DC +12V/0.5A MAX)
SHELL	GND

(DC Power to System Board)

Designation: CONN13, Connector Type: 6-pin

Pin	Signal/Description
1	VA (+6V)
2	VA (+6V)
3	VCC (+5V)
4	VCC (+5V)
5	Charge
6	Reserved (N/C)

Designation: CONN6, Connector Type: 8-pin

Pin	Signal/Description
1	Power Good
2	Battery Low
3	DL+
4	DLS
5	VCC (+5V)
6	GND
7	GND
8	GND

4.2.3 Fixed Disk

Designation: CONN14, Connector Type: 44-pin, on system board

Pin	Signal/Description
1	/HOSTRESET
2	GND
3	HD7
4	HD8
5	HD6
6	HD9
7	HD5
8	HD10
9	HD4
10	HD11
11	HD3
12	HD12
13	HD2
14	HD13
15	HD1
16	HD14
17	HD0
18	HD15
19	GND
20	+5V
21	Reserved
22	GND
23	/HOSTIOW
24	GND
25	/HOSTIOR
26	GND
27	Reserved
28	HOSTALE
29	Reserved
30	GND

31	IRQ14
32	/IOCS16
33	HOSTA1
34	Reserved
35	HOSTA0
36	HOSTA2
37	/HCS0
38	/HCS1
39	+5V/LED
40	GND
41	+5V
42	GND
43	GND

44JP1

4.2.4 Diskette Drive

Designation: CONN17, Connector Type: 26-pin, on system board

Pin	Signal/Description
1	+5V
2	/Index
3	+5V
4	/DR0
5	+5V
6	PSKCHG/RG
7	+5V
8	RPM/LC
9	RESERVED
10	/MTR0
11	RESERVED
12	DIR
13	GND
14	/STEP
15	GND
16	/WDATA
17	GND
18	/WGATE
19	GND
20	/TRK0
21	GND
22	/WRTPRT
23	GND
24	/RDATA
25	GND

26HDSEL

4.2.5 Turbo Converter (CONN8)

Pin	Signal/Description
1	VCC, +5V INPUT
2	GND
3	VGG, +5V OUTPUT

4.2.6 DC-AC Converter

Input

Designation: CONN14, Connector Type: 3-pin, on system board

Pin	Signal/Description
1	+5V
2	ADJUST/DISABLE
3	GND

Output: 2-pin AC OUTPUT, 1000V, 10mA MAX.

4.2.7 Keyboard Module

Designation: CONN16, Connector Type: 10-pin, on system board

Pin	Signal/Description
1	KBDCLK
2	RESERVED
3	KBDATA
4	EL
5	+5V
6	VR1
7	/DISABLE
8	VEE-KBD
9	GND
10	RESERVED

4.2.8 SIP Connector

Designation: SIMM1, Connector Type: 40-pin, on system board

Pin	Signal/Description
1	+5V
2	/CASL3
3	D0
4	MA0
5	MA1
6	D1
7	MA2
8	MA3
9	RESERVED
10	D2
11	MA4
12	MA5
13	D3
14	MA6
15	MA7
16	D4
17	MA8
18	MA9
19	GND
20	D5
21	/MEW
22	GND
23	/D6
24	CASH2
25	/D7
26	/RAS2
27	/RAS3
28	/CASH3
29	CASL2
30	RESERVED
31	D8
32	D9
33	D10
34	D11
35	D12
36	D13
37	D14
38	D15
39	RESERVED

400+5V

4.2.9 LCD Connector

Designation: CONN3 (on VGA adapter), Connector Type: 15-pin

Pin	Signal/Description
1	MOD (not used)
2	LD3
3	LD2
4	LD1
5	LD0
6	UD3
7	UD2
8	UD1
9	UD0
10	XSCL
11	START
12	CP1/YSCL
13	VEE
14	GND
15	VCC

5 Troubleshooting

5.1 Introduction

When computer power is turned on, the system BIOS runs a series of internal checks on the hardware. These internal checks comprise the **POST** (**Power-On Self-Test**) which also allows the computer to detect problems as early as the power-on stage. The error messages and system beeps of POST can alert you to the problems of your computer.

If an error is detected during these tests, you will either hear system beep/s or see an error message displayed on the screen. If the error occurs before the display is initialized, the system beeps to report error.

If error is **fatal** (non-correctable), the system halts after reporting the fatal error. If error is **non-fatal** (correctable), the process continues after reporting the non-fatal error.

WARNING:

Only experienced technicians should attempt the procedures described in this chapter.

5.2 Error Messages

Within POST, there are two kinds of messages:

Error messages — failure in hardware, software, or firmware

Informational messages — require no action

Message	Possible Cause	Solution
Diskette drive A failure	The A: drive has either failed or is missing.	Check the A: drive or connector.
Diskette drive reset failed	The diskette controller has failed.	Check the diskette connector. If still failed, replace the system board.
Diskette read failure — strike F1 to retry boot	The diskette is either unformatted or defective.	Replace the diskette with a bootable diskette and retry. Check the Phoenix SETUP too.
Errors found; incorrect configuration information memory size miscompare	POST reports that the size of base or expansion memory does not agree with configuration information.	Rerun Phoenix SETUP and enter correct memory size.
Gate A20 failure	The 8042 is not accepting commands. Cannot leave or enter protected mode.	Replace the system board.
Fixed disk configuration error	The specified configuration is not supported.	Run Phoenix SETUP and correct the fixed disk configuration.
Fixed Disk Drive failure	Bad fixed disk.	Retry boot. If that doesn't work, preformat fixed disk or replace the fixed disk.
Fixed disk read failure — strike F1 to retry boot	The fixed disk is defective.	Retry boot. If that doesn't work, replace the fixed disk.
No boot device available —		
press F1 to retry boot	Either diskette drive A; the fixed disk, or the diskette itself is defective	Retry boot. If problem persists, replace the diskette or the fixed disk.
No boot sector on fixed disk — press F1 to retry boot	The C: drive is not formatted or is not bootable.	Format the C: drive, make it bootable.
Not a boot diskette — strike F1 to retry boot.	The diskette in drive A: is not formatted as a bootable diskette.	Replace the diskette with a bootable diskette and retry boot.

(Continued on next page)

Message	Possible Cause	Solution
No timer tick interrupt	The timer chip has failed.	Turn the power off, then back on again. If the problem persists, replace the system board.
Option ROM checksum failure	The peripheral card contains a defective ROM.	Replace the peripheral card.
BIOS ROM checksum failure	The ROM BIOS contains an invalid value.	Turn system off, then on again. If problem persists, change ROMs.
Shutdown failure	The keyboard controller or its associated logic has failed.	Check the keyboard controller.
Time and date not set — run Phoenix SETUP program	Clock not set.	Run SETUP.
Timer 2 failure	Timer chip failed.	Turn the power off, then back on again. If the problem persists, replace the system board.
Timer or interrupt controller	Either the timer chip or the interrupt controller is defective.	Replace the system board.
Timer interrupt did not occur	Either the timer chip or the interrupt controller is defective.	Replace the system board.
F2 to enter ROM-based SETUP	Invalid configuration information must be changed.	SETUP must be executed.
Invalid configuration information — please run SETUP	Display controller is configured incorrectly.	
Memory size is incorrect.		
Wrong number of diskette drives.	Run SETUP.	
Keyboard clock line failure	Either the keyboard or the keyboard cable connection is defective.	Ensure proper connections of the keyboard and its cable.
Keyboard data line failure	The keyboard controller firmware has failed.	Check the keyboard cable. If problem persists, change system board.
Keyboard controller failure	The keyboard controller firmware has failed.	Check the keyboard controller.

Message	Possible Cause	Solution
Keyboard stuck key failure	A key(s) is jammed.	Press the key(s) again.
Memory failure at hex-value, read hex-value, expecting hex-value	Circuitry associated with the memory chips has failed.	Turn the power off, then back on again. If the problem persists, replace the system board.
Unexpected interrupt in protected mode	Hardware interrupt or NMI occurred while in protected mode.	Replace the system board.
Real time clock failure	The RTC or battery failed.	Replace the RTC or battery on the system board.
Keyboard is locked — unlock keyboard.	Locked keyboard.	Unlock keyboard.

Table 5-1. Error Messages

5.3 Run-Time Messages

Run time messages are displayed if an error occurs after the boot procedure is complete. The table below lists these errors with corresponding solutions.

Message	Cause	Solution
I/O card parity interrupt at address. Press the S key to shut off NMI, the R key to reboot, or any other key to continue	The peripheral card has failed.	Type (S)hut off NMI.
This will only temporarily allow users to continue. Users must replace the peripheral card.		
Memory parity interest at address. Press the S key to shut off NMI, the R key to reboot, or any other key to continue	A memory chip(s) has failed	Type (S)hut off NMI.
This will only temporarily allow users to continue. Users must replace the memory chip(s).		
Unexpected hardware interrupt interrupt at address.		
Press the R key to reboot or any other key to continue	Hardware problem.	
Not displayed if the extended interrupt handler is not enabled.	Check the hardware.	
Unexpected software interrupt interrupt at address. Press the R key to reboot or any other key to continue	Error(s) in the software program. Not displayed if the extended interrupt handler is not enabled.	Turn the machine off and then on again. If that doesn't work, check the program.
Memory parity NMI	Memory card failed	Replace the card.
Bus lock NMI	A device has driven the —BURST signal line for more than 7.8 microseconds, causing the DMA Controller to generate a bus time-out.	Test the system board and all installed devices for proper operation. Replace if necessary.
Fail safe timer NMI	Applications software package failed.	Check the program being run.
IOCHK NMI	An adapter card has driven the —IOCHK signal line high.	Check all adapter cards for proper operation. Replace if necessary.

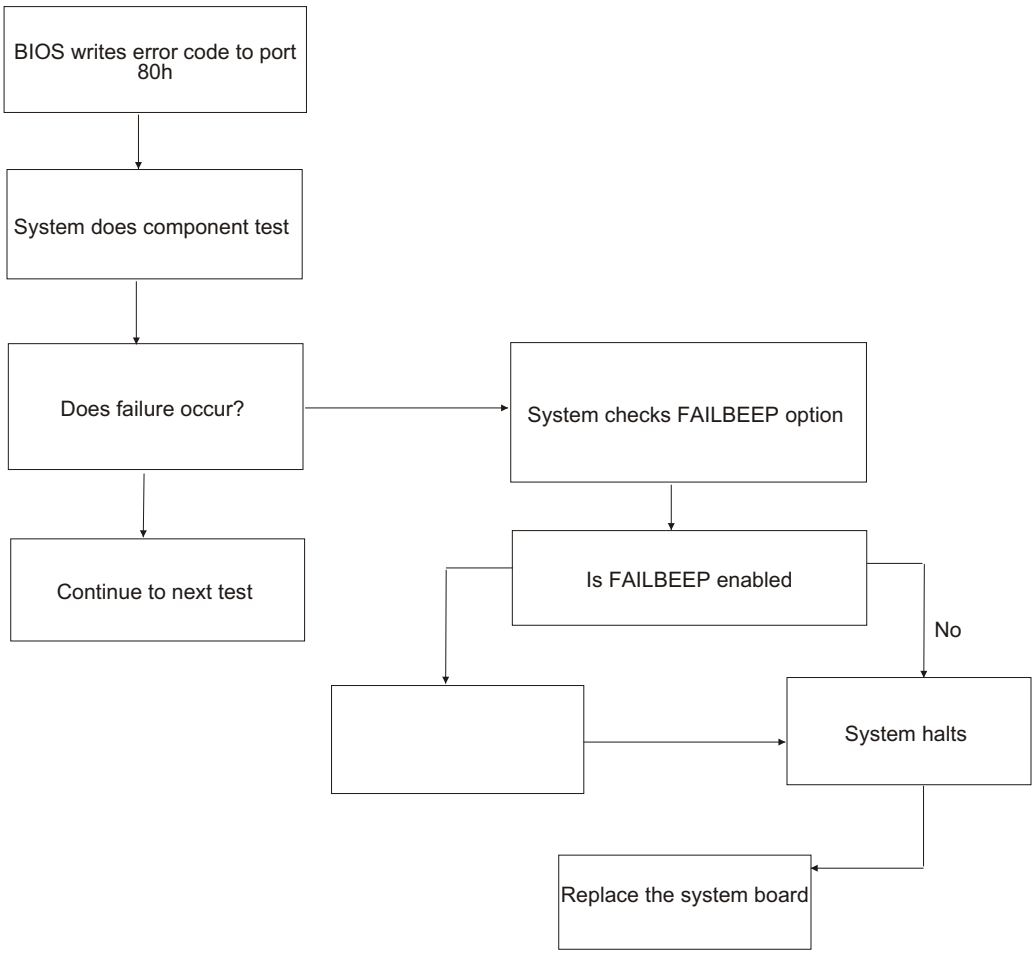
Software NMI	A systems software routine has generated an NMI to halt processing.	Check all programs operating in the system.

Table 5-2. Run-time Messages

5.4 Beep Codes

In some cases, POST errors cannot be reported on the screen. When an error occurs before the screen is initialized or when the system is set to loop on the system board tests, then the error message/s cannot be displayed on the screen. Beep codes are used to identify a POST error that occurs when the screen is not available.

When a POST error occurs, the BIOS writes the error code to port 80h. For example, a beep code of 2-1-4 (a burst of 2 beeps, a single beep, and a burst of 4 beeps) indicates a failure of bit 3 in the first 64k of RAM. The value is written to the diagnostic port 80h at the beginning of the



test. If the test fails, the user can determine what the problem is by reading the last value written to port 80h.

The diagram below shows the process performed by the system if an error occurs and the screen is unavailable.

5.4.1 Using Beep Codes

The table below shows the errors for which beep codes and screen messages are used:

System Board Failure			
Error Type	Fatal	Non-Fatal	Off-board Failure
Looping on system board tests (MANLOOP set to True)	Beep and halt	Beep and halt	Not applicable
Normal power on (MANLOOP set to False)	Beep and halt	Screen message and prompt “Press F1 to continue”	Screen message and prompt to “Press F1 to continue”

Table 5-3. Classification of Beep Error Codes

The following tables list the fatal and non-fatal system board errors separately. Note that no beep code is sounded if a test is aborted while in progress. The contents of port 80h can be read to identify the area of future.

Fatal System Board Errors

Beep Code	Contents Port 80h	Description
none	01h	CPU register test in progress
1-1-3	02h	CMOS write/read failure
1-1-4	03h	ROM BIOS checksum failure
1-2-1	04h	Programmable interval timer failure
1-2-2	05h	DMA initialization failure
1-2-3	06h	DMA page register
1-3-1	08h	RAM refresh verification
none	09h	First 64K RAM test in progress
1-3-3	0Ah	First 64K RAM chip or data line failure, multi-bit
1-3-4	0BH	First 64K RAM odd/even logic failure
1-4-1	0CH	Address line failure first 64K RAM
1-4-2	0DH	Parity failure first 64K RAM
1-4-3	0EH	Fail-safe timer failure

1-4-4	0FH	Software NMI port failure
2-1-1	10h	Bit 0 first 64K RAM failure
2-1-2	11h	Bit 1 first 64K RAM failure
2-1-3	12h	Bit 2 first 64K RAM failure
2-1-4	13h	Bit 3 first 64K RAM failure
2-2-1	14h	Bit 4 first 64K RAM failure
2-2-2	15h	Bit 5 first 64K RAM failure
2-2-3	16h	Bit 6 first 64K RAM failure
2-2-4	17h	Bit 7 first 64K RAM failure
2-3-1	18h	Bit 8 first 64K RAM failure
2-3-2	19h	Bit 9 first 64K RAM failure
2-3-3	1Ah	Bit 10 first 64K RAM failure
2-3-4	1Bh	Bit 11 first 64K RAM failure
2-4-1	1Ch	Bit 12 first 64K RAM failure
2-4-2	1Dh	Bit 13 first 64K RAM failure
2-4-3	1Eh	Bit 14 first 64K RAM failure
2-4-4	1Fh	Bit 15 first 64K RAM failure
3-1-1	20h	Slave DMA register failure
3-1-2	21h	Master DMA register failure
3-1-3	22h	Master interrupt mask register failure
3-1-4	23h	Slave interrupt mask register failure
none	25h	Interrupt vector loading in progress
3-2-4	27h	Keyboard controller test failure
none	28h	CMOS RAM power failure and checksum calculation in progress
none	29h	CMOS RAM configuration validation in progress
3-3-4	2Bh	Screen memory test failure
3-4-1	2Ch	Screen initialization failure
3-4-2	2Dh	Screen retrace test failure
none	2Eh	Search for video ROM in progress
none	30h	Screen running with video ROM
none	31h	Monochrome monitor operable
none	32h	Color monitor (40 column) operable
none	33h	Color monitor (80 column) operable

Non-Fatal System Board Errors

A failure in add-on boards or memory is reported on the monitor. These error messages help isolate the failed subsystem.

Beep codes 4-2-1 through 4-4-3 and above are only reported through the speaker and sent to the diagnostic port if the manufacturing loop option switch MANLOOP is set to TRUE and the manufacturing jumper indicator is on in POST. Otherwise, these errors are reported via the screen. Phoenix sets the MANLOOP to TRUE when building the production BIOS if requested by the system designer.

The table below lists the beep codes and error codes that are written to Port 80h for nonfatal system board errors.

Beep Codes	Contents Port 80h	Description
4-2-1	34h	Timer tick interrupt test in progress or failure
4-2-2	35h	Shutdown test in progress or failure
4-2-3	36h	Gate A20 failure
4-2-4	37h	Unexpected interrupt in protected mode
4-3-1	38h	RAM test in progress or address failure > FFFFh
4-3-3	3Ah	Interval timer channel 2 test or failure
4-3-4	3Bh	Time-of-day clock test or failure
4-4-1	3Ch	Serial port test or failure
4-4-2	3Dh	Parallel port test or failure
4-4-3	3Eh	Math coprocessor test or failure

5.4.2 Fault Isolation Charts

Chart A

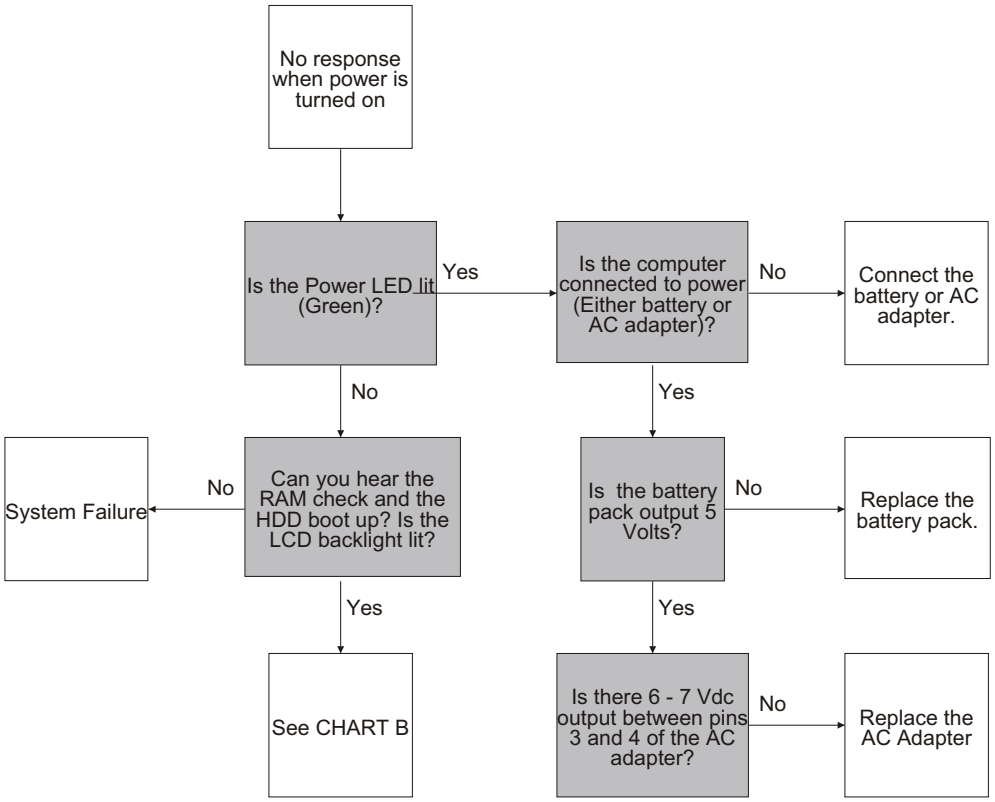


Chart B

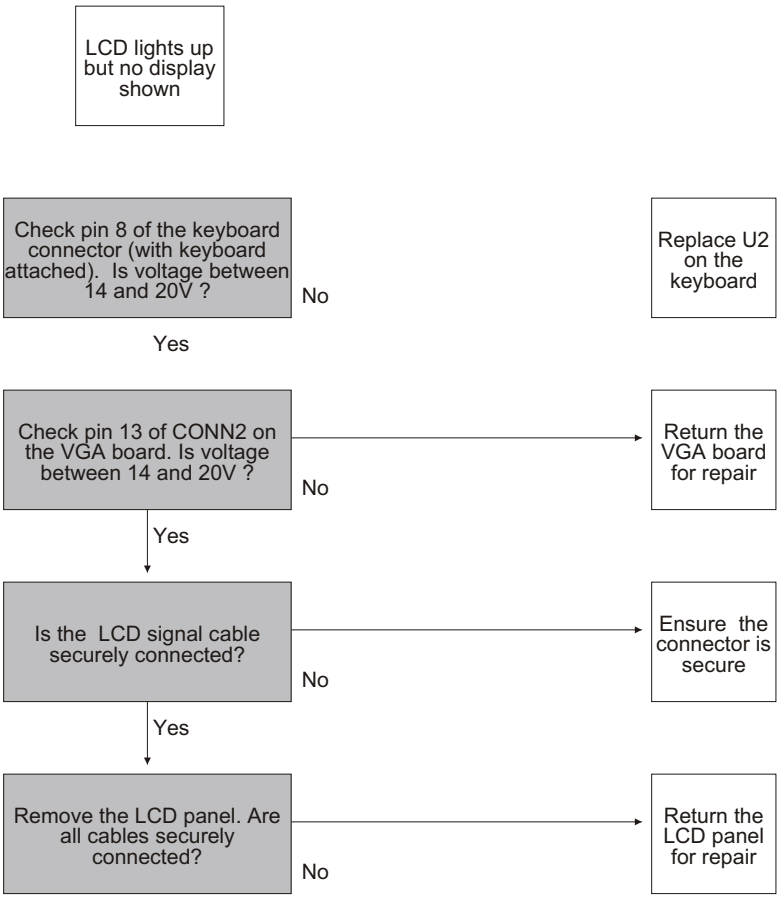

LCD lights up but no display shown
Check pin 8 of the keyboard connector (with keyboard attached). Is voltage between 14 and 20V ?
No
Replace U2 on the keyboard
Yes
Check pin 13 of CONN2 on the VGA board. Is voltage between 14 and 20V ?
No
Return the VGA board for repair
Yes
Is the LCD signal cable securely connected?
No
Ensure the connector is secure
Yes
Remove the LCD panel. Are all cables securely connected?
No
Return the LCD panel for repair

Chart C

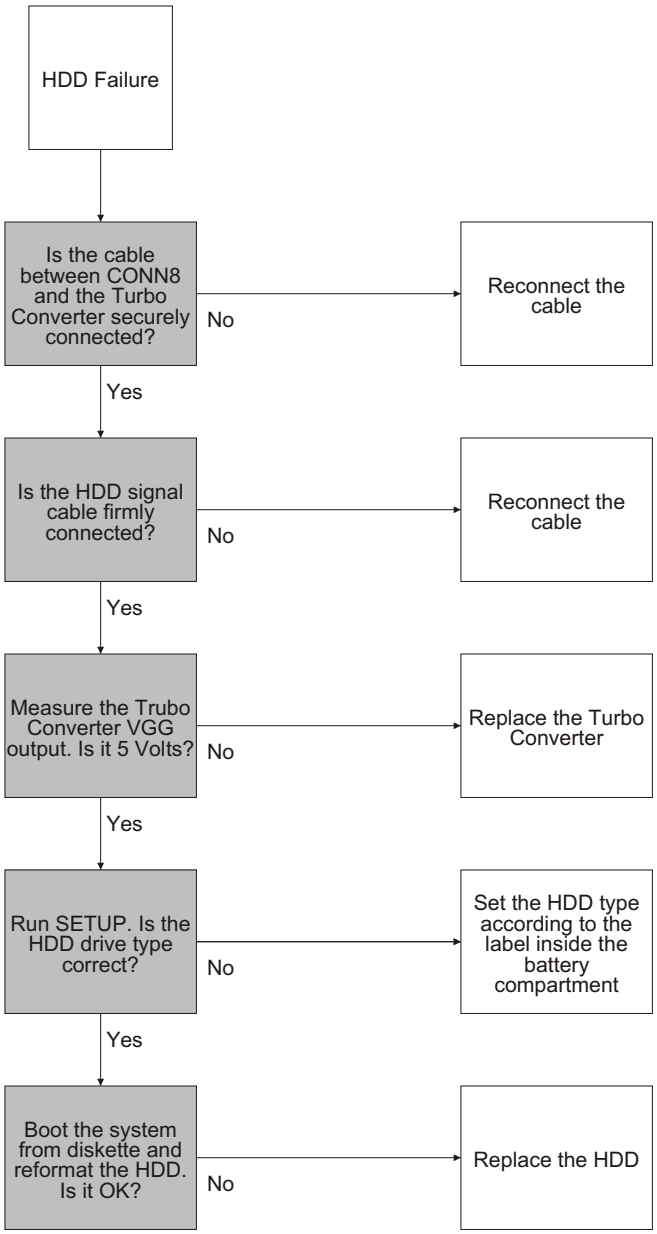

HDD Failure
Is the cable between CONN8 and the Turbo Converter securely connected?
No
Reconnect the cable
Yes
Is the HDD signal cable firmly connected?
No
Reconnect the cable
Yes
Measure the Trubo Converter VGG output. Is it 5 Volts?
No
Replace the Turbo Converter
Yes
Run SETUP. Is the HDD drive type correct?
No
Set the HDD type according to the label inside the battery compartment
Yes
Boot the system from diskette and reformat the HDD. Is it OK?
No
Replace the HDD

Chart D

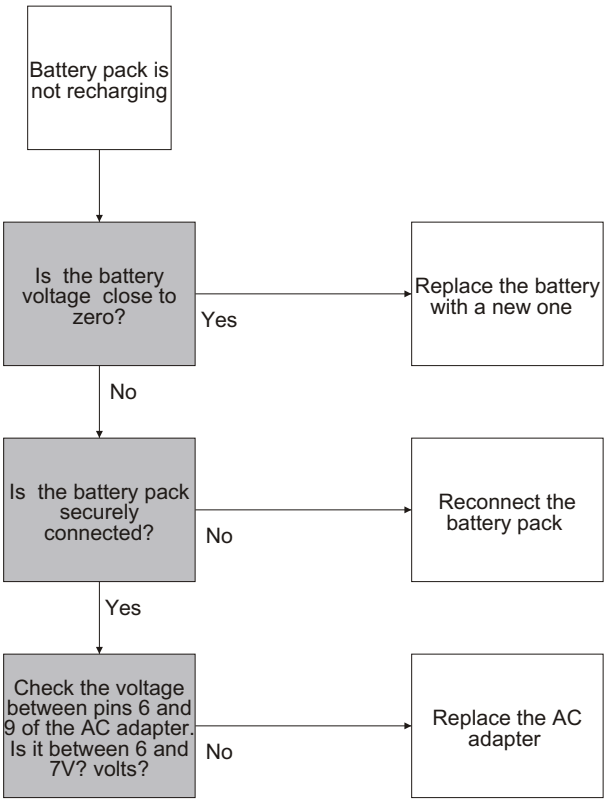
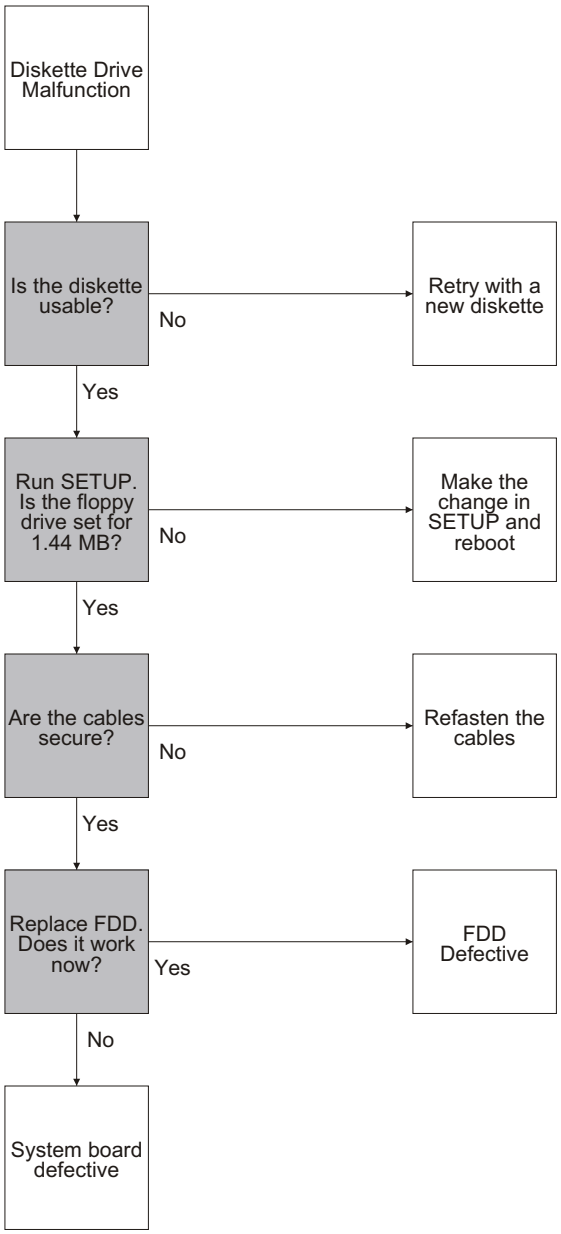
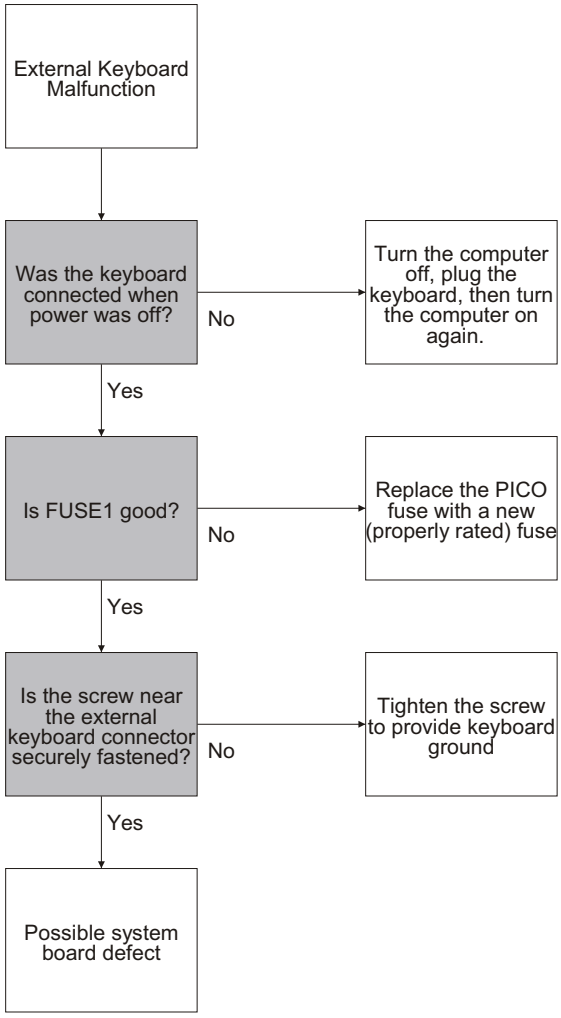

Battery pack is not recharging
Is the battery voltage close to zero?
Yes
Replace the battery with a new one
No
Is the battery pack securely connected?
No
Reconnect the battery pack
Yes
Check the voltage between pins 6 and 9 of the AC adapter. Is it between 6 and 7V? volts?
No
Replace the AC adapter

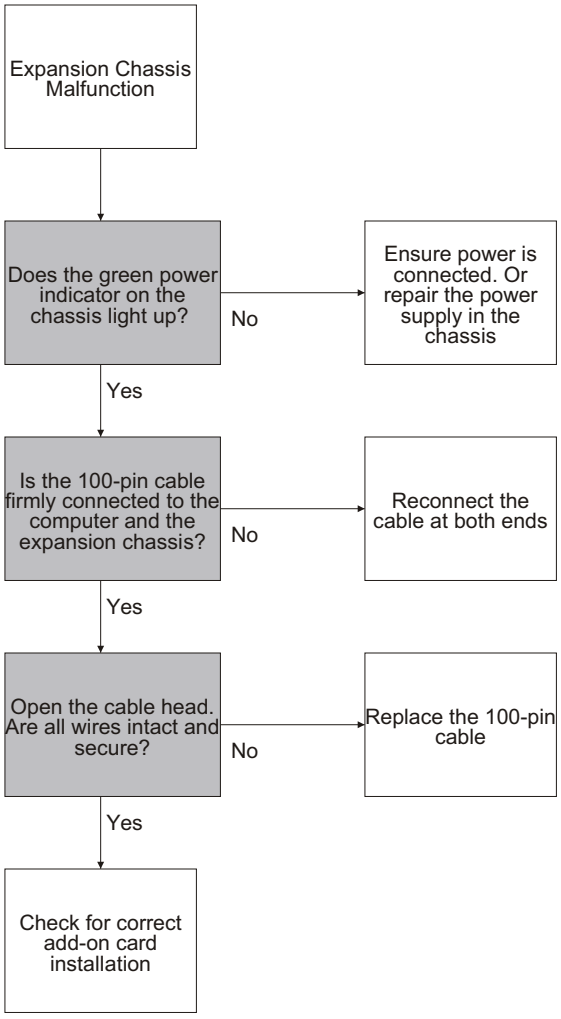
Chart E


Diskette Drive Malfunction
Is the diskette usable?
No
Retry with a new diskette
Yes
Run SETUP. Is the floppy drive set for 1.44 MB?
No
Make the change in SETUP and reboot
Yes
Are the cables secure?
No
Refasten the cables
Yes
Replace FDD. Does it work now?
Yes
FDD Defective
No
System board defective

Expansion Keyboard



Expansion Box



A Spare Parts

This appendix lists the part numbers of the spare parts used for the major components of the 3025.

Part No.	Description	Qty Used	Location
316661900001	PCB, PWA-3025D MBD	1	
331031103001	CON; HDR, MA, 3PX1, 0.1, ST.GLD1JP1		
331031104001	CON; HDR, MA, 4PX1 0.1, ST.GLD1CONN8		
331031110001	CON; HDR, MA, 10PX1 0.1, ST.GLD1CONN4		
331032226001	CON; HDR, MA, 3PX2 0.1, ST.GLD1CONN17		
331032240001	CON; HDR, MA, 20PX2 0.1, ST.GLD2CONN15,CONN18		
331032244001	CON; HDR, 22PX2, 2MM HEADER 3P	1	CONN14
331510010001	CON; RBN, FM,100P, R/A, HI-PACKEL1CONN9		
331722209018	CON; D, MA, 9P, HOOK LUG, R/A. B-L.3’8"1CONN7		
331722715006	CON; D, FM, 15P R/A, GL, B-L, 3’5"1CONN11		
331722625014	CON; FM, 25P, HOOK LUG, R/A, B-L. 3’8"1CONN12		
331872706019	CON; DIN, SKT, 6P MINI, R/A, PCB, MT1CONN19		
331872708017	CON; DIN, SKT, 8P, MINI WITH SHIELD1CONN3		
331872709016	CON; DIN, SKT, 9P MINI, PCB, MT 1CONN9		
331031103001	CON; HDR, MA, 3PX1, 0.1 ST, GLD 1JP1		
331661540001	SIMM SOCKET; 40PX1 0.1, ST. GLD 1SIMM1		
316619000002	PCB VGA 331032640001CON; HDR, FM, 20X2, 0.I, PC/MT 2CON1,CON3	1	
331421115001	CONN, CON, WFR, 15PX1, 1.27 mm, R/A, HI-DENSITY1CON2		

Part No.	Description	Qty Used	Location

331150020001 CONN, FPC/FFC, 20P, 1.25MM
PITCH R/A, FEED, W/L1VGA LCD ADAPTER
331421115001 CONN, 15P WAFER-R
1.27MM, R/A, HI-DENSITY 1 VGA LCD ADAPTER
421661900002 CABLE, 3P-3P 70MM
WIRE ASSY; MC-CONN10

INVERT TO LCD CCFT1—INVERTER
421661900003 CABLE, 3P-3P 70MM MB-CONN8
WIRE ASSY; MBD TO INVERT1—TURBO-CONN1
4216619000034 CABLE, 13PX2-13PX2 150MM
CABLE ASSY; FDD, 26P,

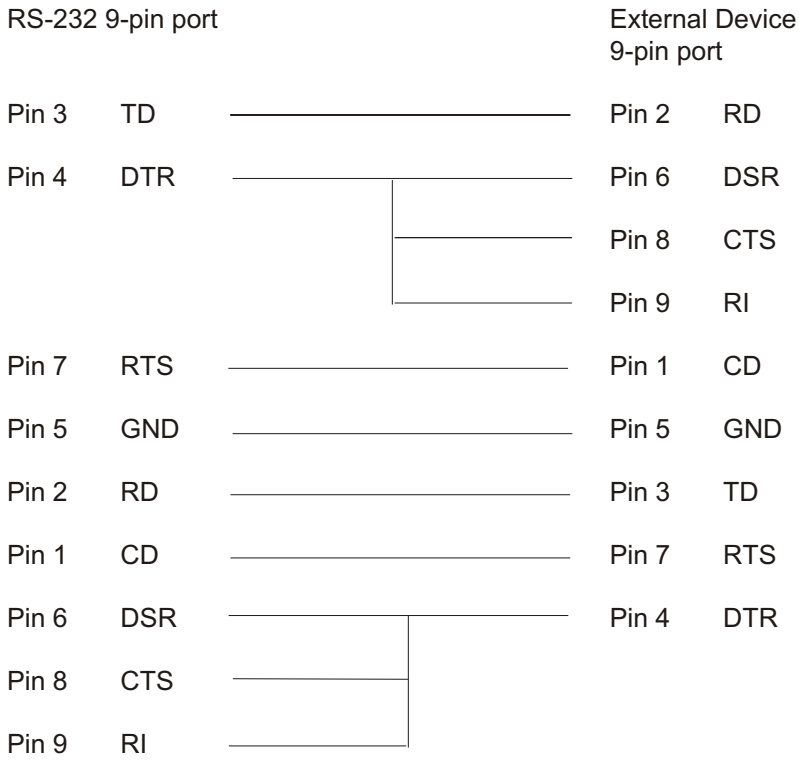
140MM1MBFDD
421661900001 CABLE, 15P-15P 300MM SHIELD
WIRE ASSY, VGABD TO LCD1VGA—LCD
332810318152 AC CORD, PWR CORD,
125V/10A, 6FT, SHIELD, BLK1
4216619000035 CABLE, FPC 44PX43MM
CABLE ASSY, HDD,

44P * 43MM 1HDDMB
220661800004 CARRYING BAG, SMALL,
NOTEBOOK COMMON0
531012570100 KB; 80, EN, FDB-8/A 1
413000020004 LCD; LM64P701, B&W,
640 X 480, GLARE1
523409500089 HDD 20MB 2.5", #CP2024
EMBEDDED/AT 1
411661900003 PWA; PWA-3025D, SYSTEM BD 1
411661900002 PWA; PWA-3025D, VGA BD 1
471063500001 PWR ASSY; AC ADAPTER, 3025D 1
411661900002 CONVERTER, TURBO
WIRE ASSY, INVERT TO LCD CCFT1
412661900001 PCB ASSY; DC/DC INVERTER
PCB ASSY, 3025D1
338948010001 BATTERY PACK; 4, 8V
4300 MAHR, WITH INSULT1

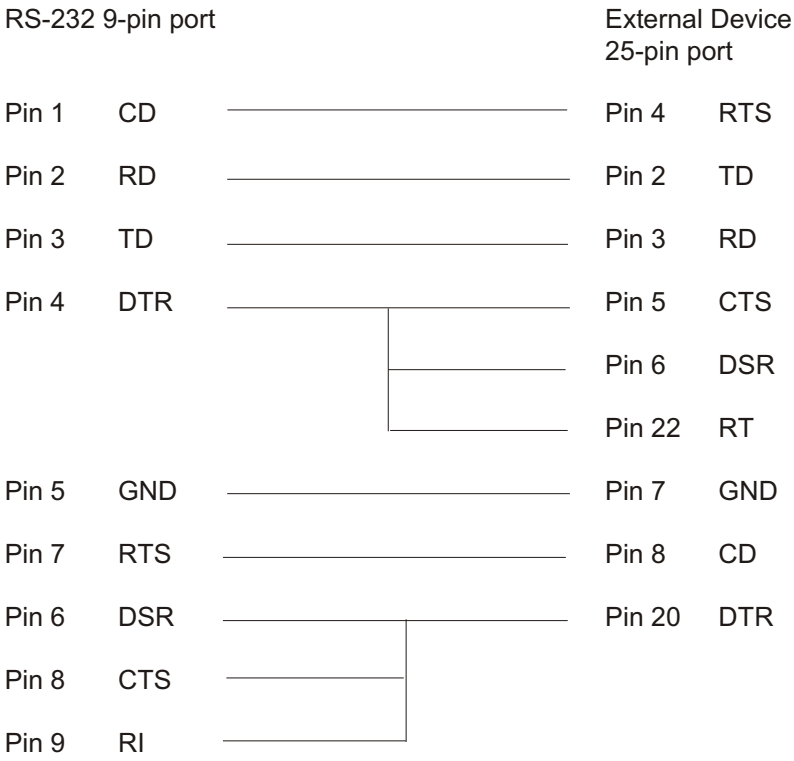
B RS-232 Connection

To connect an external device to the RS-232 9-pin port, follow the cable pin orientation below:

B.1 Connecting to a 9-Pin External Device



B.2 Connecting to a 25-pin External Device


RS-232 9-pin port
External Device
25-pin port
Pin 1 CD
Pin 2 RD
Pin 3 TD
Pin 4 DTR
Pin 5 GND
Pin 7 RTS
Pin 6 DSR
Pin 8 CTS
Pin 9 RI
Pin 4 RTS
Pin 2 TD
Pin 3 RD
Pin 5 CTS
Pin 6 DSR
Pin 22 RT
Pin 7 GND
Pin 8 CD
Pin 20 DTR

C Signal Conventions

This appendix lists the manufacturer's signal names and specifications for:

3.5-inch diskette drive

Fixed disk drive

LCD display panel and CCFT

C.1 3.5-Inch Diskette Drives

This section describes the signal interfaces to diskette drives used in the 3025.

Citizen U0DA-07A Diskette Drive

Pin	Signal	Pin	Signal
1	VCC	2	INDEX
3	VCC	4	DRIVE SELECT 0
5	VCC	6	DISK CHANGE
7	VCC	8	READY
9	RESERVED	10	MOTOR ON
11	RESERVED	12	DIRECTION
13	GND	14	STEP
15	GND	16	WRITE DATA
17	GND	18	WRITE GATE
19	GND	20	TRACK 00
21	GND	22	WRITE PROTECT
23	GND	24	READ DATA
25	GND	26	SIDE 1 SELECT

Performance

1 MB Mode2 MB Mode

Unformatted Capacity (KB)		
per disk	1000	2000
per surface	500	1000
per track	6.25	12.5
Formatted Capacity (KB)		
256 bytes/sector	655.2(16)	1311(32)
512 bytes/sector	737.2(9)	1475(18)
1024 bytes/sector	819.2(5)	1638(10)
Transfer Rate (K-bits/second)	250	500
Average Latency (msec)	100	100
Access Time (msec)		
track-to-track (w/o settling)	3	3
average (with settling)	94	94
Settling Time (msec)	15	15

Motor Start Time (sec)0.50.5

Functional

1 MB Mode2 MB Mode

Rotational Speed (rpm)	300	300
Recording Density (BPI)	8717	17434
Track Density (TPI)	135	135
Tracks	160	160

Encoding MethodMFMMFM

C.2 Fixed Disk Drives

This section describes the signal interfaces to fixed disk drives used in the 3025D.

Signal Descriptions

Pin	Signal	Pin	Signal
1	-RESET	2	GND
3	+DATA 7	4	+DATA 8 (AT ONLY)
5	+DATA 6	6	+DATA 9 (AT ONLY)
7	+DATA 5	8	+DATA 10 (AT ONLY)
9	+DATA 4	10	+DATA 11 (AT ONLY)
11	+DATA 3	12	+DATA 12 (AT ONLY)
13	+DATA 2	14	+DATA 13 (AT ONLY)
15	+DATA 1	16	+DATA 14 (AT ONLY)
17	+DATA 0	18	+DATA 15 (AT ONLY)
19	GND	20	KEY
21	RESERVED	22	GND
Pin	Signal	Pin	Signal

23	-IOW	24	GND
25	-IOR	26	GND
27	-DACK		
(XT ONLY)	28RESERVED		
29	+DRQ	30	GND
(XT ONLY)			
31	+IRQ	32	-IO16 (AT ONLY)
33	+ADDR 1	34	-PDIAG (AT ONLY)
35	+ADDR 0	36	+ADDR 2 (AT ONLY)
37	-CSO	38	-CS1 (AT ONLY)
39	-ACTIVE	40	GND
(LED)			
41	5 VOLTS	42	5 VOLTS (MOTOR)
(LOGIC)			

43GND44XT/AT

Pin Descriptions

Signal Name	Dir	Pin	Description
-RESET	O	1	Reset signal from the host system which is active low during power up and inactive thereafter in both XT and AT mode.
GND	O	2, 19, 22, 24, 26, 30, 40, 43	Ground between the drive and the host
+DATA 0-15	I/O	3 - 18	16-bit bidirectional data between the host and the drive In AT mode, the low 8 bits, HD0 - HD7, are used for register and ECC access. The high bits are used for data transfers. In XT mode, only the lower 8 bits are used. These are tri-state lines with 10mA drive capability
KEY	N/C	20	An unused pin clipped on the drive and plugged on the cable. Used to guarantee correct orientation of the cable
RESERVED	O	21, 28	Reserved
-IOW	O	23	Write strobe, the rising edge of which clocks data from the host data bus into a control register or the data register of the drive.
-IOR	O	25	Read strobe, which, when low enables data from a status register or the data register of the drive onto the host data bus. The rising edge of IOR latches data from

the drive at the host.
-DACK O 27 DMA handshake signal used to select a drive data register (XT-only)

+DRQI29DMA handshake signal used to select a drive data register (XT-only)

Signal Name	Dir	Pin	Description
+IRQ	I	31	Interrupt to the host system. In AT mode, this signal is enabled only when the drive is selected, and the host activates the -IEN bit in the Digital Output Register. When the -IEN bit is inactive, or the drive is not selected, this output is in a high-impedance state regardless of the state of the +IRQ bit. The interrupt is set when the +IRQ bit is set by the drive CPU. +IRQ is reset to zero by a host read of the status register or a write to the command register. In XT mode, this signal is enabled when the +IRQ enable bit is set and the drive has completion status available for the host. This signal is a tri-state line with 12 mA drive capacity.
+5V (Logic)	O	41	5 volt +/- 5% to drive circuitry
+5V (Motor)	O	42	5 volt +/- 10% supply to drive motors
-XT/AT	O	44	Interface mode select. This signal is sampled on power up and will select XT or AT operating mode as requested by the host.
-IO16	I	32	Indication to the host system that the 16-bit data register has been addressed and that the drive is prepared to send or receive a 16-bit data word. This line is tri-state line with 20 mA drive capacity (AT mode only)
-PDIAG	I	34	Passed diagnostic. This signal is ignored by the drive.
+A0. A1, A2	O	35, 33, 36	But binary coded address used to select the individual registers in the drive.
-CS0	O	37	Chip select decoded from the host address bus. Used to select some of the host-accessible registers. NOTE: This signal should be disabled by the host when DMA transfers are in progress.
-CS1	O	38	Chip select decoded from the host address bus. Used to select three of the registers in the Task File (AT mode only).

-ACTIVEI39Signal from the drive used to drive an active LED

whenever the disk is being accessed.

Fixed Disk Drive Specifications

Conner Prairie Tek JVC JVC **CP2024120JD-JD** **E2825P-E2850P**								
CMOS SETUP TYPE		2		2		47		47
Formatted Capacity (MB)		21.4		21.4		21.4		42.5
Number of Disks	1		1		1		2	
Number of Heads		2		2		2		3
Cylinders		653		615		581		791
Bytes/Sector		512		512		512		512

Conner Prairie Tek JVC JVC **CP2024120JD-E2825PJD-E2850P**								
Sectors/Track		33		34		36		35
Track Density (TPI)		1700		1350		1465		1700
Bit Density (BPI)	38,451		39,665		42,145			
Flux Density (FCPI)		25,634		26,443		25,430		
Rotation Speed (RPM)		3444		3307		3109		3109
Seek Times (ms)								
Track-to-Track	5		8		8		9	
Average	25		23		23		25	
Maximum	40		45		45		47	
Average Latency (ms)		8.7		9.1				
Control Overhead (msec)		1		1				
Data Transfer (MByte/sec)								
Media		1.25		1.25				
Buffer		3.75		4.25		10.		10.
Coding		2-7 RLL		2-7 RLL		2-7 RLL		
Interleave		1:1		Program		1:1		1:1
Start Time (sec)		7		2		10		10

Stop Time (sec)3355

C.3 LCD Display Panel and CCFT

This section lists manufacturers' signal naming conventions for the LCD display and CCFT backlight.

LCD

Pin	Signal	Description	Level
1	VCC	Power for logic and LCD (+5V)	
2	GND	Ground potential	
3	VEE	Power supply for LCD (-)	
4	CP1	Input data latch signal	Hi to Lo

5	NC			
6	NC			
7	YSCL	ROW scan shift clock		Hi to Lo
8	S	Scan start-up signal	Hi	
9	CP2	Data input clock signal		Hi to Lo
10	NC			
11	DU0	Display data signal (upper half)		Hi (ON)
12	DU1			Lo (OFF)
13	DU2			
14	DU3			
15	DL0	Display data signal (lower half)		Hi (ON)
16	DL1			Lo (OFF)
17	DL2			
18	DL3			
19	EI	Enable input		IC(9) Enable In
20	EO	Enable output		IC(8) Enable out

CCFT

Pin	Signal	Description
1	HV	High voltage line (from inverter)
2	NC	
3	NC	
4	NC	
5	GND	Ground line (from inverter)

D Component Layout

D.1 System Board Components

Lettermark on the Drawing	Component Location on the System Board	Name of Component
A	U8	Memory controller, address buffer, interrupt controller, data buffer (HT21)
B	U22, 24-30	DRAM 1MB (44256)
C	U2	Parallel, serial, fixed disk, floppy disk controller (87310)
D	U1	Serial Port Driver (AD241)
E	BU1	Speaker
F	U23	ROM BIOS (27C512C)
G	U14	RTC (Dallas 1287)
H	U19	CPU (Intel 80386SX)
I	U17	Keyboard controller (80C42)
J	U18	80387SX Coprocesor socket
K	OSC1	24MHz Oscillator
L	OSC2	32MHz Oscillator
M	OSC3	14.318 MHz Oscillator

D.1.1 VGA Board Components

Lettermark on the Drawing	Component Location on the VGA Board	Name of Component
A	U7-8, U10-11, U13-14, U19-20	Video RAM
B	U21	Video Controller (620)
C	U6	Video Controller (610)
D	OSC2	24 MHz Oscillator
E	OSC3	32.514 MHz Oscillator

D.1.2 Connector Layout

Lettermark on the Drawing	Component Location on the System Board	Name of Component	Number of Pins
A	CONN 1	Modem/ FAX SIO2 Interface	
B	CONN 4	Modem/ FAX SIO2 Interface	
C	CONN 3	Modem Phone Interface	
D	CONN 5	AC SWPS Input	9
E	CONN 6	D/D Module Input	6
F	CONN 13	D/D Module Output	8
G	CONN 7	SIO1, RS-232-C Interface	9
H	CONN 9	Expansion Chassis	100
I	CONN 11	VGA CRT Monitor	15
J	CONN 12	Parallel Port Interface	25
K	CONN 19	External Keyboard Interface	
L	CONN 14	Fixed Disk Interface	44
M	CONN 16	Notebook Keyboard Interface	10
N	CONN 8	Turbo Module Input/Output	3
O	CONN 10	D/A Module Input	3
P	CONN 17	Floppy Disk Interface	26
Q	CONN 15	VGA Board Adaptor Interface	40
R	CONN 18	VGA Board Adaptor Interface	40
S	SIMM 1	Expansion Memory Module	40