# BoardSite™ 5100

Portable In-Circuit Programmer

Maintenance Manual

**DATA I/O**

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# *S**afety Summary*

General safety information for operating personnel is contained in this summary. In addition, specific **WARNINGS** and **CAUTIONS** appear throughout this manual where they apply and are not included in this summary.

**Antistatic Wrist Strap**

To avoid electric shock, the antistatic wrist strap must contain a 1M$\Omega$ (minimum) to 10M$\Omega$ (maximum) isolating resistor.

**Definitions**

**WARNING** statements identify conditions or practices that could result in personal injury or loss of life. **CAUTION** statements identify conditions or practices that could result in damage to equipment or other property.

**Fuse Replacement**

For continued protection against the possibility of fire, replace the fuse only with a fuse of the specified voltage, current and type ratings.

**Grounding the Product**

The product is grounded through the grounding conductor of the power cord. To avoid electric shock, plug the power cord into a properly wired and grounded receptacle only. Grounding this equipment is essential for its safe operation.

**Power Cord**

Use only the power cord specified for your equipment.

**Power Source**

To avoid damage, operate the equipment only within specified line (ac) voltage.

**Servicing**

To reduce the risk of electric shock, perform only the servicing described in this manual.

**Symbols**

⚠ This symbol indicates that the user should consult the manual for further detail.

V/∿ This symbol stands for Vac, for example, 120 V ∿ = 120 Vac.

◭ This symbol denotes a fuse rating for a user-replaceable fuse.

⏚ This symbol denotes the protective ground connection.

⏚ This symbol denotes a ground connection for a signal or for an antistatic wrist strap with impedance of 1MΩ (minimum) to 10MΩ (maximum).

**Certificate of RFI/EMI Compliance with VDE 0871 Limit B**

Data I/O certifies that this product complies with the Radio Frequency Interference (RFI) and Electromagnetic Interference (EMI) requirements of VDE 0871 Limit B, as required in German postal regulation number vfg 1046/1984, page 1943.

Data I/O further certifies that the German Postal Service (DBP) has been notified of Data I/O's intention to market this equipment in Germany. Data I/O acknowledges that the DBP reserves the right to retest this equipment to verify its compliance with the regulation.

# 1 Introduction

This chapter contains maintenance information for BoardSite 5100, and is divided into the following sections:

| | |
|---|---|
| **Introduction** | Includes the product specifications. |
| **Disassembly and Reassembly** | Explains how to disassemble and reassemble BoardSite 5100 for troubleshooting or maintenance. |
| **Theory of Operation** | Describes BoardSite 5100 theory of operation. Includes general descriptions of the system and of each circuit board. |
| **Maintenance/ Troubleshooting** | Contains routine maintenance procedures for BoardSite 5100, including information on fault isolation. |
| **Diagnostic Messages** | Lists and describes BoardSite 5100 diagnostic messages. |
| **Additional System Information** | Contains additional technical information on the personal computer (PC) subsystem of BoardSite 5100, including port connector wiring and interrupt assignments. |
| **Index** | |

# What Is BoardSite 5100?

BoardSite 5100 is a portable in-circuit programmer with which you can program memory devices that are already installed on a circuit board. BoardSite programs and tests NMOS and CMOS EPROMs, EEPROMs, and single-chip microcomputers. BoardSite 5100 can program up to eight boards simultaneously.

BoardSite 5100 programming data can be stored on the internal cartridge disk or on a floppy disk. Data RAM provides temporary storage of programming data during the programming operations. By connecting a keyboard and monitor, BoardSite 5100 becomes a programming development system. The development system includes board profile and sequence development software that you can use to create custom board profiles. It also contains the Configuration Editor, with which you customize the 5100 LCD menus and prompts.

With the keyboard and monitor attached, the 5100 is a personal computer. You can run standard PC software on the 5100 in addition to using it as a 5100 development system.

# Specifications

## Hardware Interface Signals

**Power Supply Outputs**

VCC1: 0 to 7V dc* (for current, see below)
VPP1: 0 to 25V dc* (for current, see below)
VCC2: 0 to 7V dc* (for current, see below)
VPP2: 0 to 25V dc* (for current, see below)
VNEG: 0 to -8V dc at 0.25A
+12V dc at 25A
-12V dc at 25A

**Power Supply Current Capability**

For BoardSite 5100, the maximum current is:

● Combined VCC1 and VCC2 current, 6A

● Combined VPP1 and VPP2 current, 2A

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\* *These supplies provide overvoltage, undervoltage, and overcurrent detection, and remote sensing.*

**Digital Interface**

| Signal | Description |
|---|---|
| A0-A15 | 16 low-order address lines |
| A16-A31 | 16 high-order address lines, or 16 individually programmable chip enable lines (PCE0-PCE15) |
| D0-D31 | 32 bidirectional data lines |
| C0-C23 | 24 digital control and status lines |
| BE0-BE7 | 8 board enable lines |
| BD0-BD7 | 8 board detect lines |
| ID0-ID7 | 8 adapter identification lines |
| PGM | 1 program strobe line |
| XTAL0, XTAL1 | 2 clock lines with programmable frequency |
| ADAP0, ADAP1 | 2 adapter detect lines |
| LED0-LED7 | 8 status indicator control lines |
| GROUND | 17 ground connections |

## Power Requirements

| | |
|---|---|
| **Operating Voltage** | 90V ac to 132V ac or 180V ac to 264V ac |
| **Frequency Range** | 47 to 63 Hz |
| **Power Consumption** | 500 VA maximum<br>300W maximum |
| **Fuse Ratings** | For either 115V ac (nominal) or 230V ac (nominal) operation,<br>6A/250V fast blow |

## Physical and Environmental

| | |
|---|---|
| **Dimensions** | 27h x 51w x 41d cm<br>10.5h x 20.0w x 16.0d inches |
| **Weight** | 16.7 kg (37 lb) |
| **Temperature** | Operating: +5° to +45°C (+40° to +110°F)<br>Storage: -20° to +70°C (-4° to +158°F) |
| **Relative Humidity** | Operating: 20% to 80% RH non-condensing<br>Storage: 10% to 90% RH non-condensing |
| **Altitude** | Operating: To 3,000 meters (9,800 ft)<br>Storage: To 8,500 meters (28,000 ft) |

## Safety

BoardSite 5100 is designed to comply with the following safety standards.

**Underwriters Laboratories—UL 1244**

**Canadian Standards Association—CSA C22.2 No. 231**

**International Electrotechnical Commission—IEC 348 and IEC 1010-1**

## Electrostatic Discharge (ESD)

IEC 801-2 ± 15 kV

# 2 *Disassembly and Reassembly*

WARNING: The procedures described in this document are designed to be performed by personnel qualified to service electronic equipment. Do not attempt to perform these procedures unless you are qualified to do so.

This section describes how to disassemble and reassemble the BoardSite 5100 for troubleshooting or maintenance.

You will need the following tools and equipment:

- #1 or #2 Phillips screwdriver, with long shank (at least 12 inches)
- 5/16-inch (#6) nut driver
- Right-angle ratchet screwdriver
- Small flathead screwdriver
- Needle nose pliers
- Grounded wrist strap
- Antistatic workstation
- Magnet for retrieving hardware dropped into the 5100 chassis

CAUTION : *Many of the 5100 components are static-sensitive. Observe standard handling precautions AT ALL TIMES. Perform the following procedures at an antistatic workstation and wear a grounded wrist strap; otherwise, damage to the unit may result.*

CAUTION: *To prevent damage to instrument components, perform only those procedure steps required to remove the desired component.*

To reassemble the BoardSite 5100, follow the disassembly procedure in reverse order.

# Reducing Electrostatic Discharge

Some devices installed in or programmed by BoardSite 5100 are susceptible to electrostatic discharge (ESD) damage, which may cause subsequent failure of the component and its related circuitry. ESD damage can be eliminated by using special equipment and procedures. This section describes the methods you can use to prevent ESD damage.

## ESD Precautions

The easiest way to prevent ESD damage is to make sure a common static potential (ground) exists between the static-sensitive device, its environment, and you. To accomplish this, make sure to cover the surface of the work area with an antistatic material, and then ground yourself to the work area with an antistatic wrist strap.

Devices to be programmed may also be protected by either placing them on a non-conductive foam pad or enclosing them in an antistatic material. The most common antistatic material is a special, conductive plastic, commonly referred to as "pink poly."

Use the following precautions at an ESD-prepared workstation.

- Do not install or remove static-sensitive (or any other) devices from a circuit that has power or signals applied to it.

- Install antistatic tops and wrist strap grounding studs on work benches and tables, and ground the 5100 to the work area. If you cannot provide complete ESD protection for the work area, connect the wrist strap to the grounding stud on the BoardSite 5100 front panel. This grounding stud is located to the right of the LCD display.

- Provide antistatic trays, carriers or toteboxes for transporting assemblies.

- Maintain the relative humidity above 40%.

- Connect the 5100 chassis to ground using the grounding stud, which is located to the right of the LCD display.

## Static-sensitive Devices

The following is a partial list of static-sensitive devices you may encounter while operating or servicing BoardSite 5100.

- MOS and CMOS integrated circuits and MOSFETs

- Schottky and low-power Schottky TTL integrated circuits

- Small-signal diodes

- TTL integrated circuits

- JFETs

- Small-signal transistors

- Metal-oxide resistors

# Removing the Display Module

WARNING: To avoid electrical shock, disconnect the power cord before beginning this procedure. Do not reconnect the power cord until all assemblies, including the display module, have been reinstalled.

1. Attach your grounded wrist strap.

Note: When the power cord is disconnected, the ESD wrist strap jack on the 5100 top panel is not operational. Connect your wrist strap to another grounded connection at your workstation.

2. Remove the two screws holding the display module to the 5100 chassis.

3. Disconnect the power cable, signal cable, and ground wire from the display module. See Figure 2-1.

4. Remove the display module and store it in a safe place.

*Figure 2-1*
*Removing the Display Module*



SCREW LOCATION (1 of 2)

5100 CHASSIS

BOTTOM VIEW
DISPLAY MODULE

DISPLAY MODULE
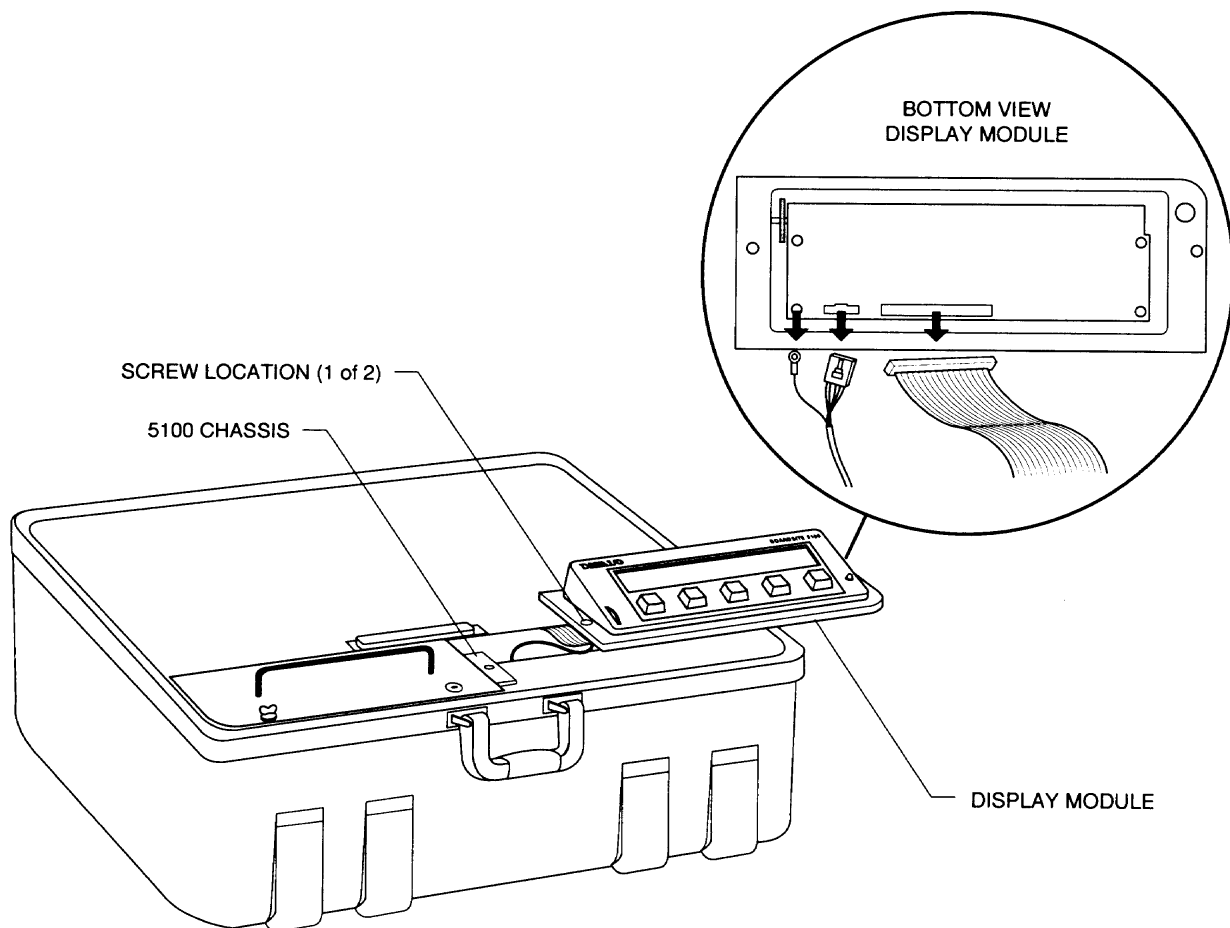
1154-2

# Removing the Cover Plate

1.  Unlock the cartridge disk drive and 1/4-turn fastener, and pull the disk drive up until it latches into position. See Figure 2-2.

2.  Remove the seven 10-32 x 5/8-inch screws and one 10-32 x 3/8-inch screw that hold the cover plate to the chassis.

3.  Remove the cover plate and store it in a safe place.

**Figure 2-2**
*Removing the Cover Plate*
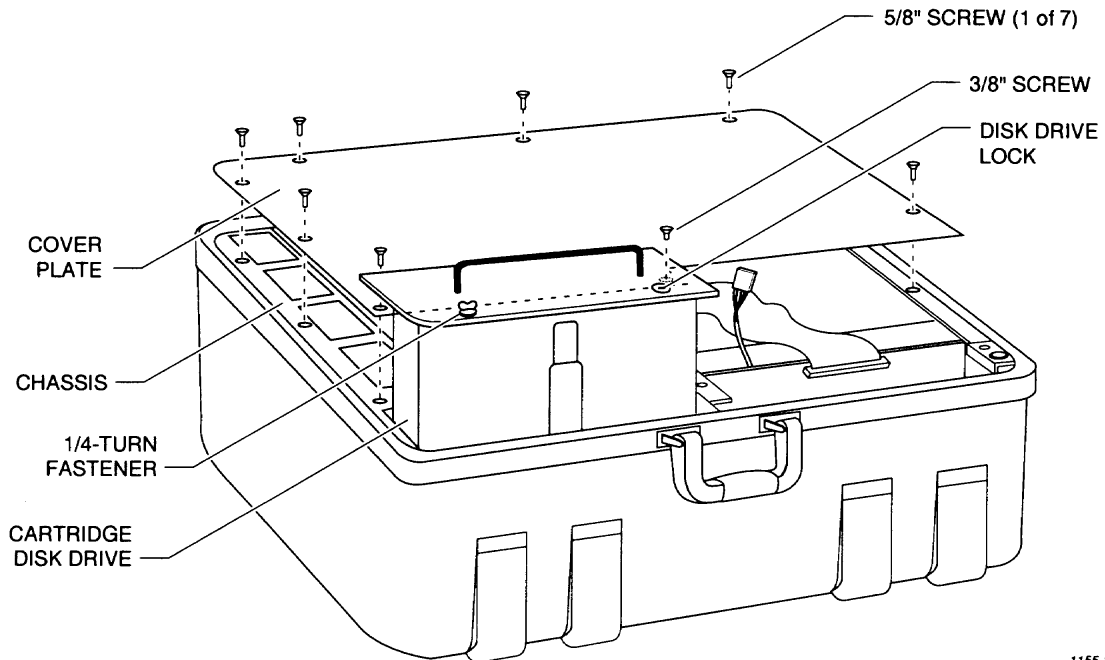
# Removing the Cartridge Disk Drive

1. Make sure the cartridge drive is locked in its raised position.

2. Disconnect the power cable, signal cable, and grounding wire from the right side of the drive. See Figure 2-3.

*Figure 2-3*
*Disconnecting the Cartridge Disk*
*Drive*



POWER CABLE

GROUNDING WIRE

SIGNAL CABLE

STEP 4.
#4 FLATHEAD
SCREW (1 of 3)

RIBBON
CABLE

ACCESS
PANEL
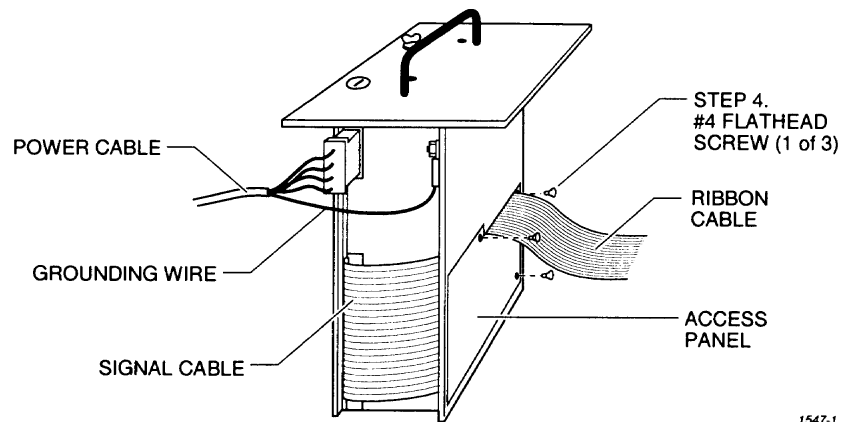
1547-1

3. Remove the two #6 screws that fasten the disk drive handle assembly to the chassis bracket and the two #4 nuts from underneath the chassis bracket. See Figure 2-4. Remove the assembly.

4. Turn BoardSite so the handle is away from you. Remove the three #4 flathead screws on the cartridge disk drive access panel. See Figure 2-3.

5. Remove the access panel, ribbon cable, and the #6 screws. See Figure 2-4.

6. Carefully slide the drive from the bracket in the direction shown in Figure 2-4 and store it in a safe place.

7. Remove the two #6 screws holding the chassis bracket to the slide and remove the bracket as shown in Figure 2-4.

**Figure 2-4**
*Removing the Cartridge Disk Drive*

REAR VIEW
OF CHASSIS BRACKET

DISK DRIVE HANDLE ASSEMBLY

STEP 3. #4 NUTS (1 of 2)

CHASSIS BRACKET

STEP 3. #6 SCREW (1 of 2)

DISK DRIVE
HANDLE ASSEMBLY

STEP 5.
#6 SCREW (1 of 2)

CARTRIDGE DISK DRIVE

CHASSIS BRACKET

SLIDE

STEP 3. #6 SCREW
(1 of 2)
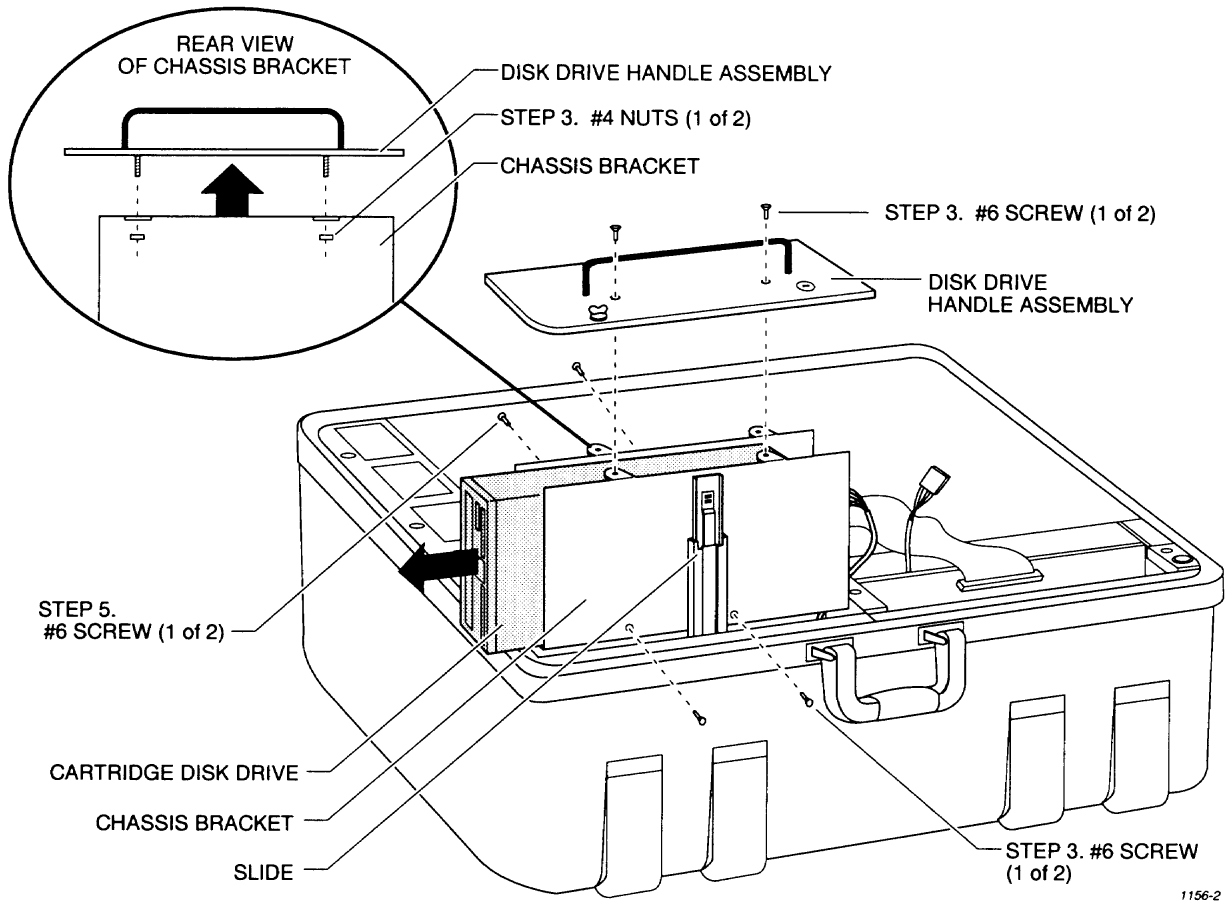
1156-2

# Removing the 286 Processor Board

To remove the processor board from a 286-based system, follow the procedure below. If you have a 386-based system, refer to the two procedures following this one.

1. Disconnect the floppy drive cable and the cartridge disk signal cable from the top edge of the processor board as shown in Figure 2-5.

---

*CAUTION:* *When handling ribbon cables, DO NOT place unnecessary stress on the connector assemblies. To remove connectors, grasp the ribbon cable connector (not the cable itself) and pull away from the connector pins. Some cables have very specific fold patterns; do not attempt to straighten the folds or the cable will not fit correctly when reinstalled.*

2. Make a mental note of the position of the two port cables (for reassembly), then disconnect them.

3. Disconnect the speaker cable.

4. Unscrew the pan head screw holding the rear of the board to the chassis.

5. Carefully pull the board from its connectors and store it in a safe place, preferably in an antistatic bag.

---

*CAUTION:* *The 286 processor board contains batteries (to back up internally stored parameters). Never lay the board on a conductive surface, which may cause the batteries to discharge.*

*Figure 2-5*
*Removing the 286 Processor Board*



FLOPPY DRIVE CABLE
SPEAKER CONNECTION
CARTRIDGE DISK SIGNAL CABLE
PORT CABLE (709-0300)
PORT CABLE (709-0299)
PAN HEAD SCREW
PROCESSOR BOARD

1202-2

# 386-based System — Identifying Your Version

Refer to Figure 2-6 to identify which 386-based system version you have.

*Figure 2-6*
*The Three Versions of the 386-based System and the Pentium System*



**386 - VERSION 1**

15-PIN ANALOG VGA
MONITOR PORT

9-PIN DIGITAL EGA
MONITOR PORT

**386 - VERSION 2**

15-PIN ANALOG
VGA MONITOR PORT

**386 - VERSION 3**

15-PIN ANALOG VGA
MONITOR PORT

**PENTIUM**

15-PIN ANALOG VGA
MONITOR PORT

2269-3

The components of each version are summarized in the table. Refer to the appropriate sections that follow for instructions on removing the components.

| Version | Components | Monitor Port |
| --- | --- | --- |
| 386 Version 1 | Processor board Multifunction board | 9-pin digital EGA 15-pin analog VGA |
| 386 Version 2 | Processor board VGA board | 15-pin analog VGA |
| 386 Version 3 | Processor board | 15-pin analog VGA |
| Pentium | Processor board VGA board | 15-pin analog VGA |

# Removing the 386 Processor Board

To remove the 386 processor board, perform the following procedure.

1. Disconnect the floppy drive cable and the cartridge disk signal cable from the top edge of the processor board. Make a mental note of the position of the port cables (for reassembly), then disconnect them. See Figure 2-7.

---

*CAUTION:* *When handling ribbon cables, DO NOT place unnecessary stress on the connector assemblies. Remove connectors by grasping the ribbon cable connector (not the cable itself) and pulling away from the connector pins. Some cables have specific fold patterns; do not attempt to straighten the folds or the cable will not fit correctly when it is reinstalled.*

---

2. Disconnect the speaker cable.

3. Unscrew the pan head screw holding the board to the chassis.

4. Carefully pull the board from its connectors and store it in a safe place, preferably in an antistatic bag.

---

*CAUTION:* *The 386 processor board contains batteries (to back up internally stored parameters). Never lay the board on a conductive surface, which may cause the batteries to discharge.*

**Figure 2-7**
*Removing the 386 Processor Board*



CARTRIDGE DISK SIGNAL CABLE
SPEAKER CONNECTION
PORT CABLE (709-0298)
PORT CABLE (709-0300)
FLOPPY DRIVE CABLE
PROCESSOR BOARD
PAN HEAD SCREW
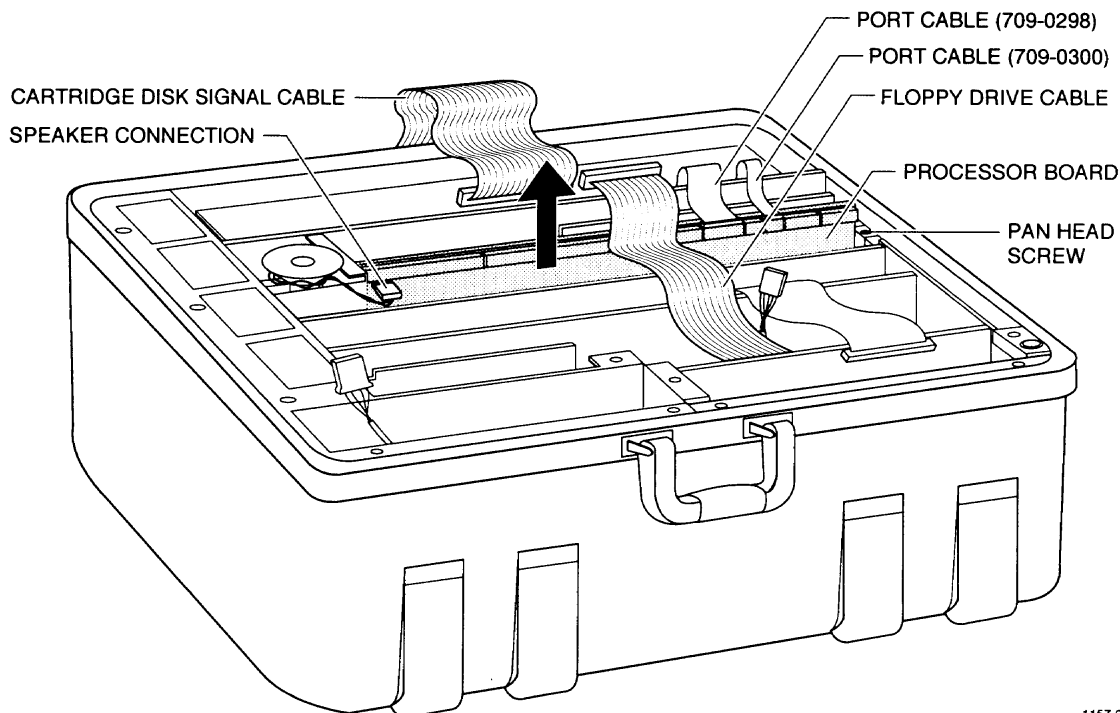
1157-2

# Removing the Pentium Processor Board

To remove the Pentium processor board, perform the following procedure.
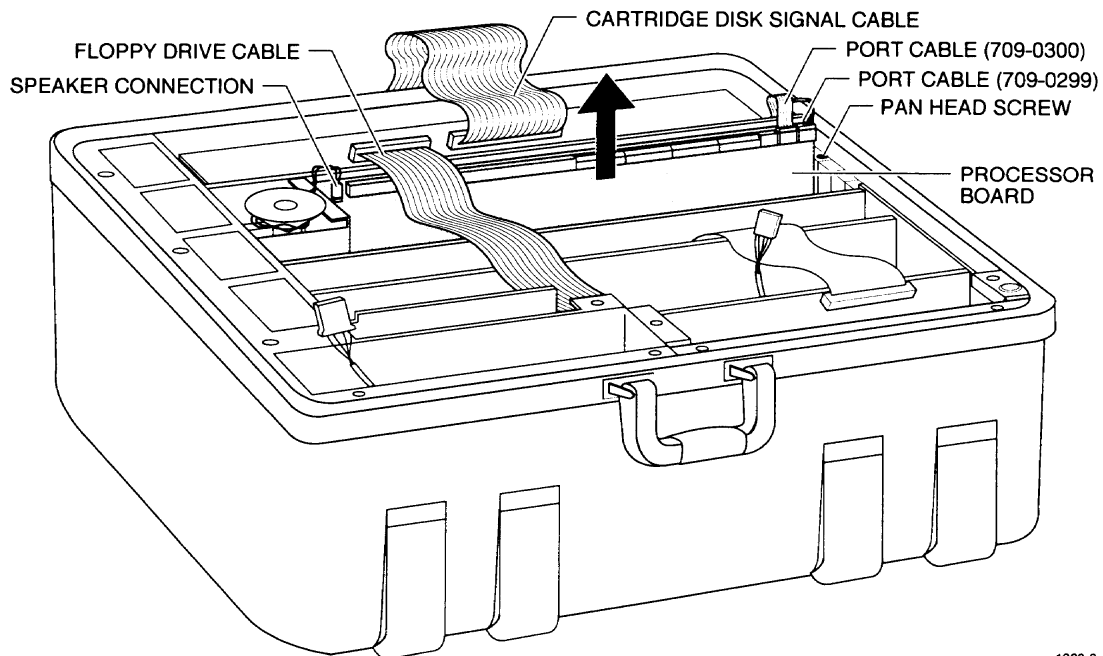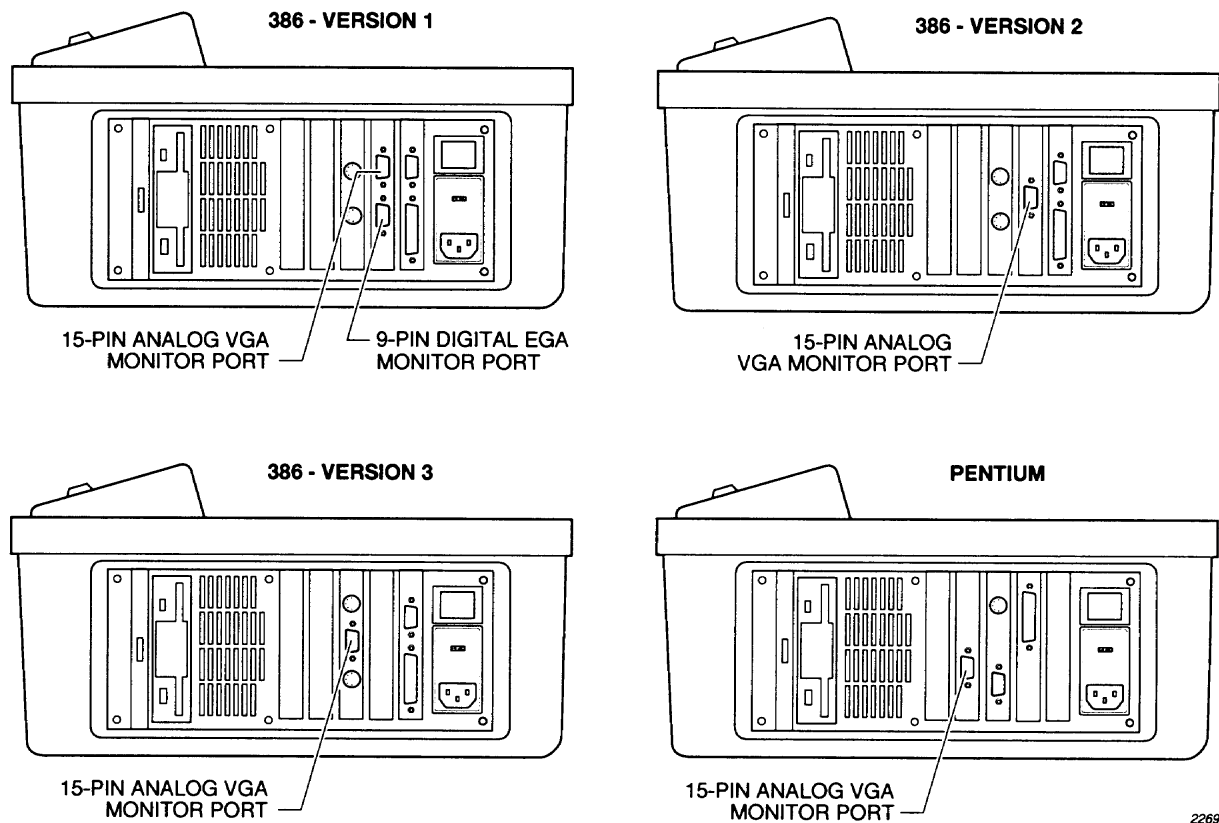
1. Disconnect the floppy drive cable and the cartridge disk signal cable from the top edge of the processor board. See Figure 2-8.

---

*CAUTION:*     *When handling ribbon cables, DO NOT place unnecessary stress on the connector assemblies. Remove connectors by grasping the ribbon cable connector (not the cable itself) and pulling away from the connector pins. Some cables have specific fold patterns; do not attempt to straighten the folds or the cable will not fit correctly when it is reinstalled.*

---

2. Disconnect the speaker cable.

3. Unscrew the pan head screw holding the board to the chassis.

4. Carefully pull the board from its connectors and store it in a safe place, preferably in an antistatic bag.

---

*CAUTION:*     *The Pentium processor board contains batteries (to back up internally stored parameters). Never lay the board on a conductive surface, which may cause the batteries to discharge.*

---

*Figure 2-8*
*Removing the Pentium Processor Board*



CARTRIDGE DISK SIGNAL CABLE
SPEAKER CONNECTION
PROCESSOR BOARD
FLOPPY DRIVE CABLE
PAN HEAD SCREW
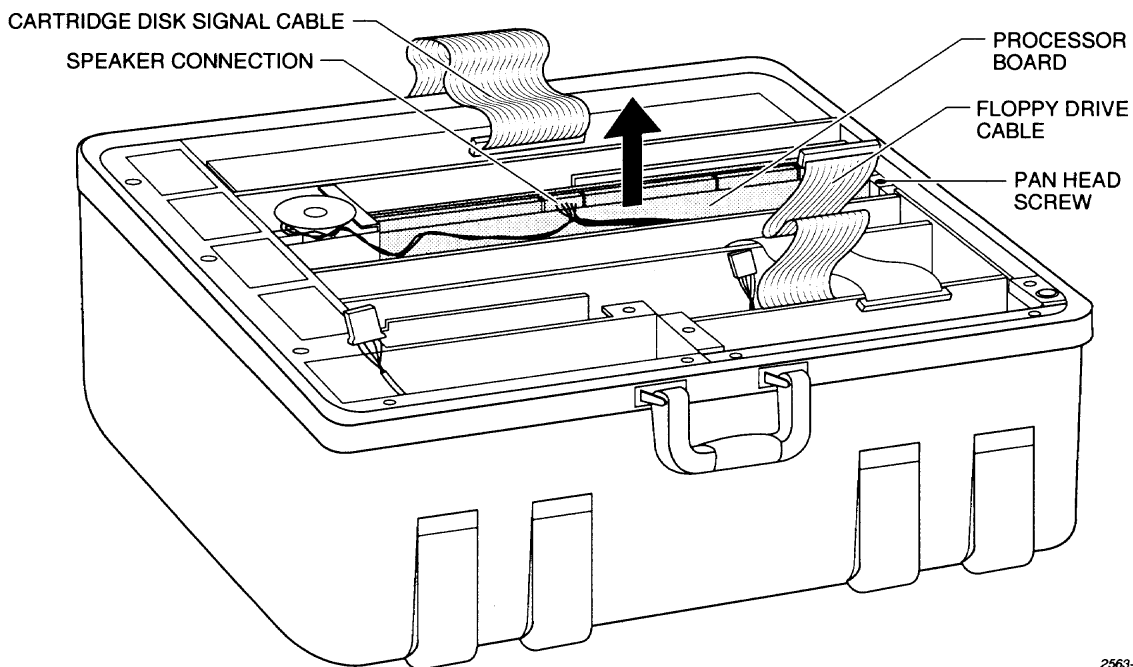
2563-1

# Removing the Multifunction Board

1. Remove the processor board.

2. Make a mental note or sketch of the position of the cables (for reassembly), then disconnect them. See Figure 2-7.

3. Unscrew the pan head screw holding the multifunction board to the chassis. See Figure 2-9.

4. Carefully pull the board from its connectors and store it in a safe place, preferably in an antistatic bag.

---

*CAUTION:*    *The multifunction board contains batteries (to back up internally stored parameters). Never lay the board on a conductive surface, which may cause the batteries to discharge.*

*Figure 2-9*
*Removing the Multifunction Board*



MULTIFUNCTION BOARD
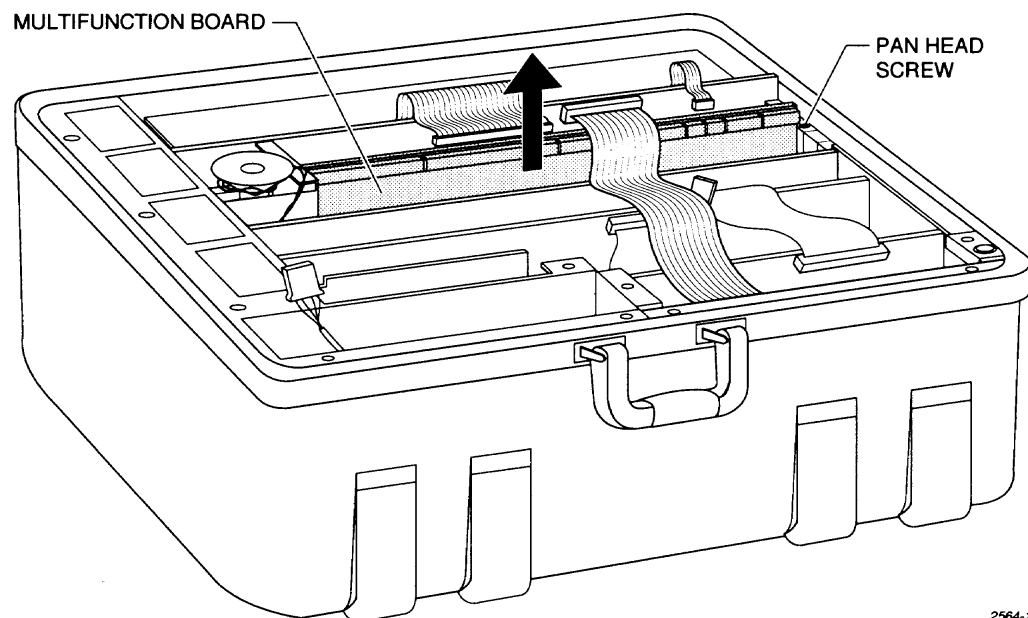
PAN HEAD SCREW

2564-1

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# Removing the VGA Monitor Board

1. Unscrew the pan head screw holding the board to the chassis. See Figure 2-10.

2. Carefully pull the board from its connectors and store it in a safe place, preferably in an antistatic bag.

**Figure 2-10**
*Removing the VGA Monitor Board*



VGA MONITOR BOARD

PAN HEAD SCREW
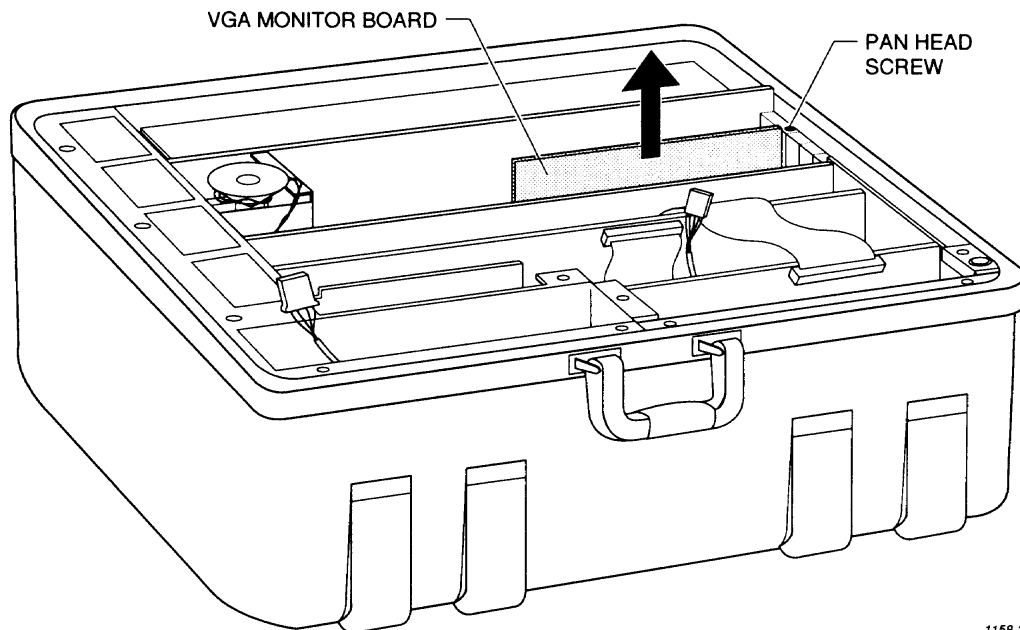
1158-2

# Removing the BoardSite Controller Board

Lift the ejector tab and carefully pull the controller board from its connectors. Make sure that the 40-conductor ribbon cable remains with the board. Store the board in a safe place, preferably in an antistatic bag. See Figure 2-11.

*Figure 2-11*
*Removing the Controller Board*



EJECTOR TAB    CONTROLLER BOARD

40-CONDUCTOR
RIBBON CABLE
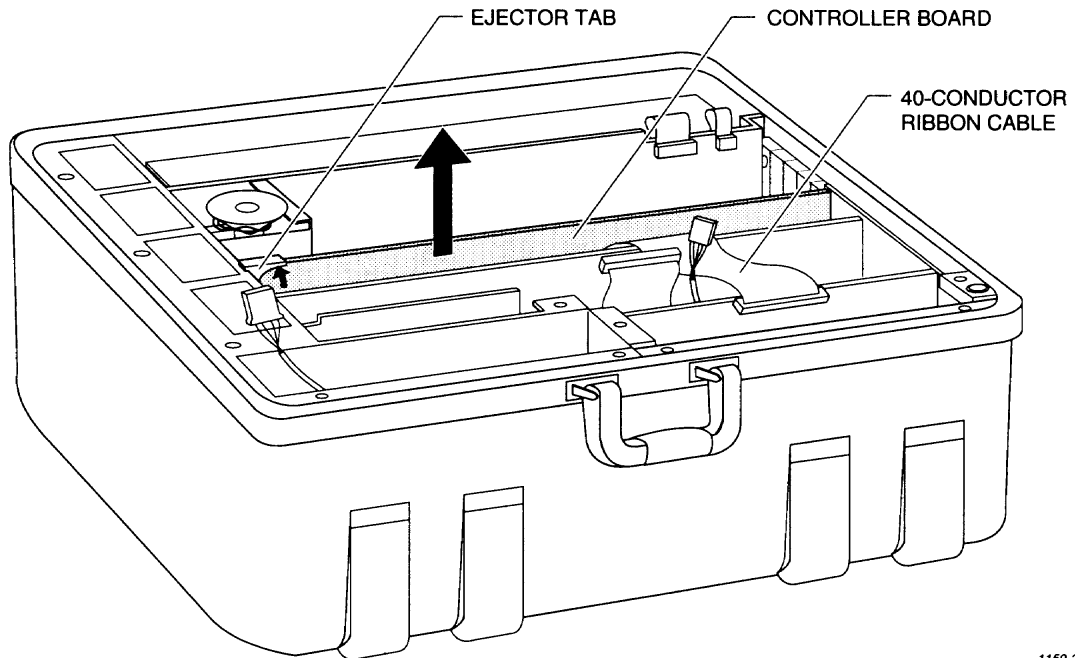
1159-2

# Removing the BoardSite Interface Board

Carefully pull the board from its connectors. Make sure that the 34-conductor ribbon cable attached to the floppy disk drive does not snag on the interface board components. Store the board in a safe place, preferably in an antistatic bag. See Figure 2-12.

*Figure 2-12*
*Removing the Interface Board*

34-CONDUCTOR
RIBBON CABLE

INTERFACE BOARD
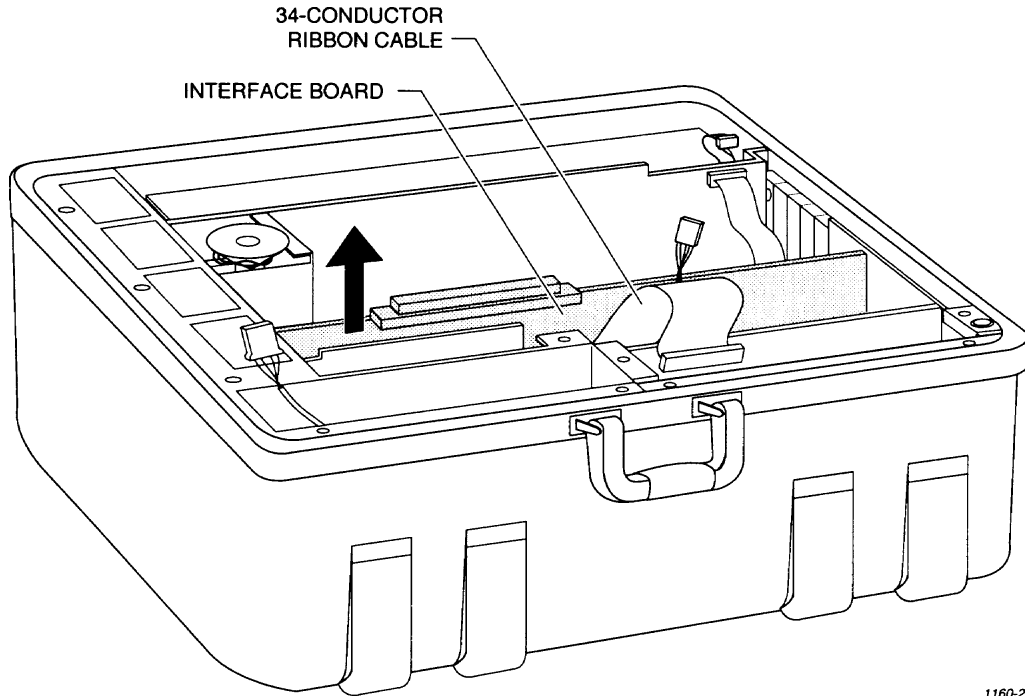
1160-2

# Removing the Chassis from the Case

To remove the floppy disk drive and all remaining subassemblies, you must first remove the chassis from the carrying case.

1. Pull the side cover door all the way out of the chassis. The door attaches to two slides by a spring-loaded pin. Disengage the lower end of the pin from the slide by lifting the pin upward. Then swing the door out of the chassis, thereby disengaging the top end of the pin. See Figure 2-13.

*Figure 2-13*
*Removing the Side Cover*
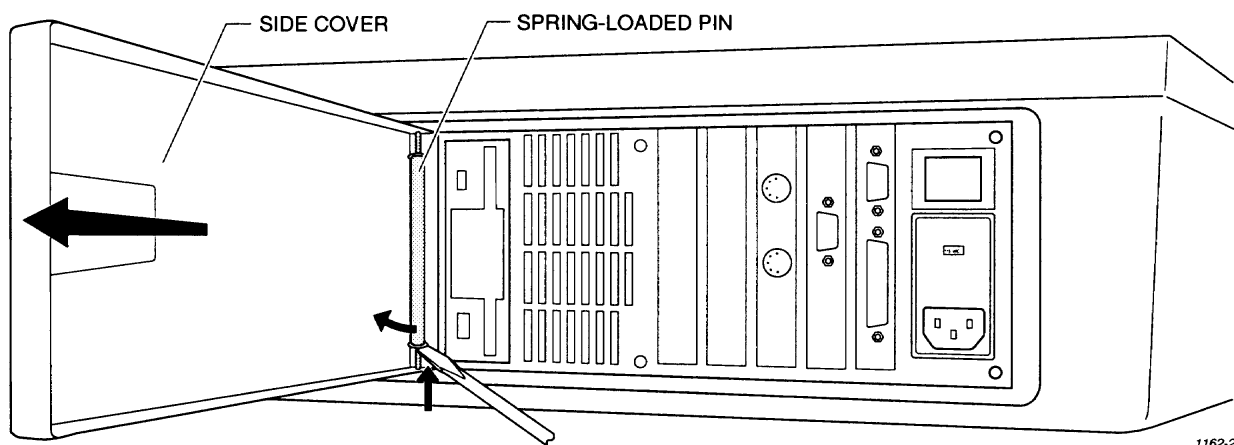


2. Push the side cover slides into the chassis, as shown in Figure 2-14. The slides should be at least two inches inside the chassis.

*Figure 2-14*
*Pushing the Side Cover Slides into the Chassis*
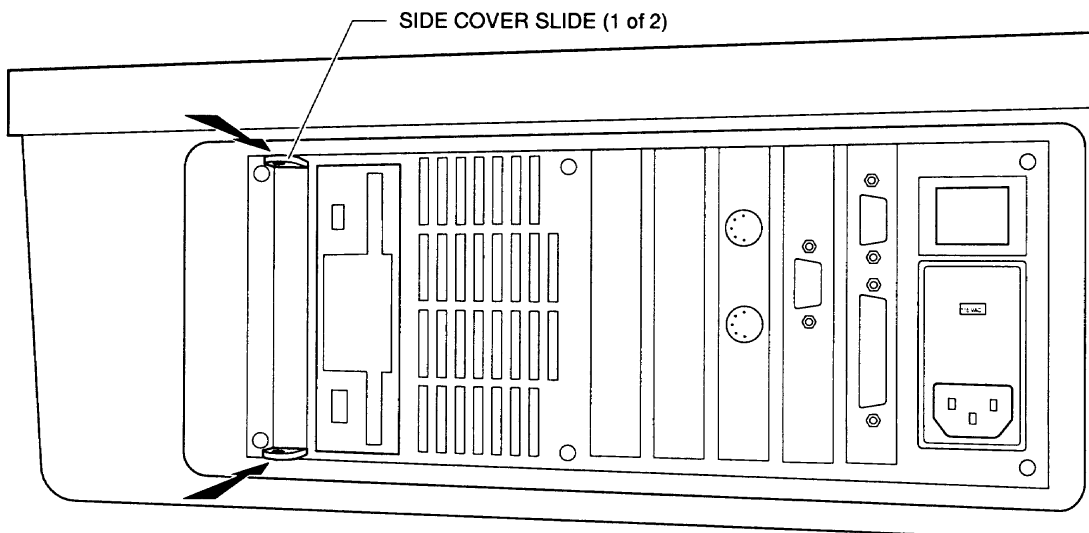
3. Remove the ground wire from the chassis.

4. Remove the two bright-plated pan head screws and the three countersunk black anodized screws, near the opening for the cartridge disk drive, that hold the chassis to the case. See Figure 2-15.

*Note:*   *When reassembling the chassis, be sure to return the two kinds of screws to their original locations.*

5. Carefully lift the chassis from the case. Store the case in a safe area.

**Figure 2-15**
*Lifting the Chassis from the Case*
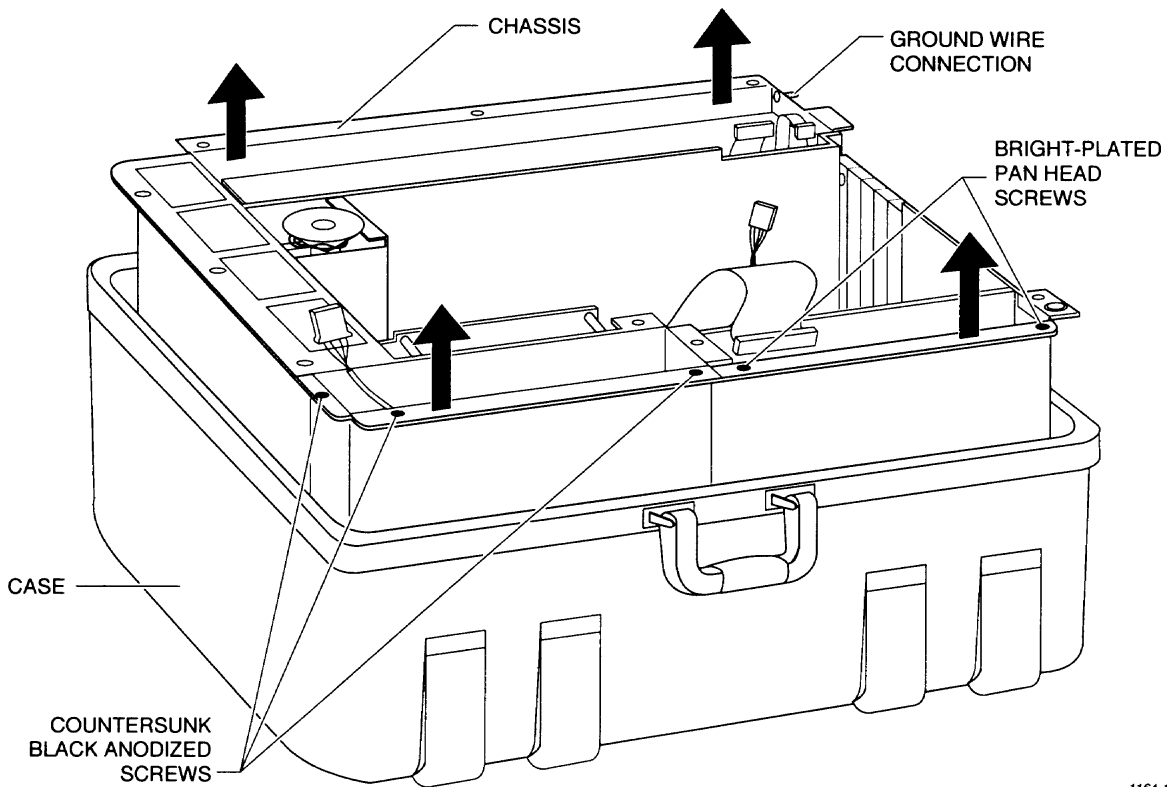
# Removing the Floppy Disk Drive

1. Rotate the chassis up so that it rests on the side next to the main power supply.

2. Remove two screws from the bottom of the chassis, working through the two clearance holes drilled in the chassis. Be careful not to drop the screws before you have removed them through the chassis holes. See Figure 2-16.

*Figure 2-16*
*Clearance Holes in Bottom of Chassis*



5100 CHASSIS
BOTTOM VIEW

CLEARANCE HOLES
AND SCREWS

1165-1
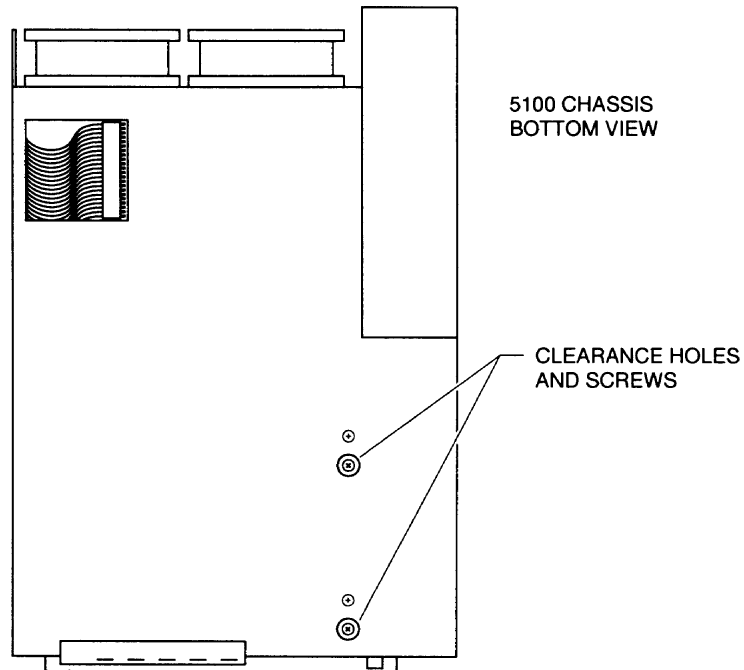
3. Rotate the chassis back to horizontal and remove the two screws from the top bracket. See Figure 2-17.

4. Unplug the floppy disk drive power cable from the mother board, leaving the cable plugged into the drive. See Figure 2-17.

5. Carefully remove the floppy disk drive from the chassis, as shown in Figure 2-17, and store the drive in a safe place.

*Figure 2-17*
*Removing the Floppy Disk Drive*



SCREW LOCATIONS     POWER CABLE     MOTHER BOARD

FLOPPY DRIVE BRACKET

FLOPPY DISK DRIVE

1166-1
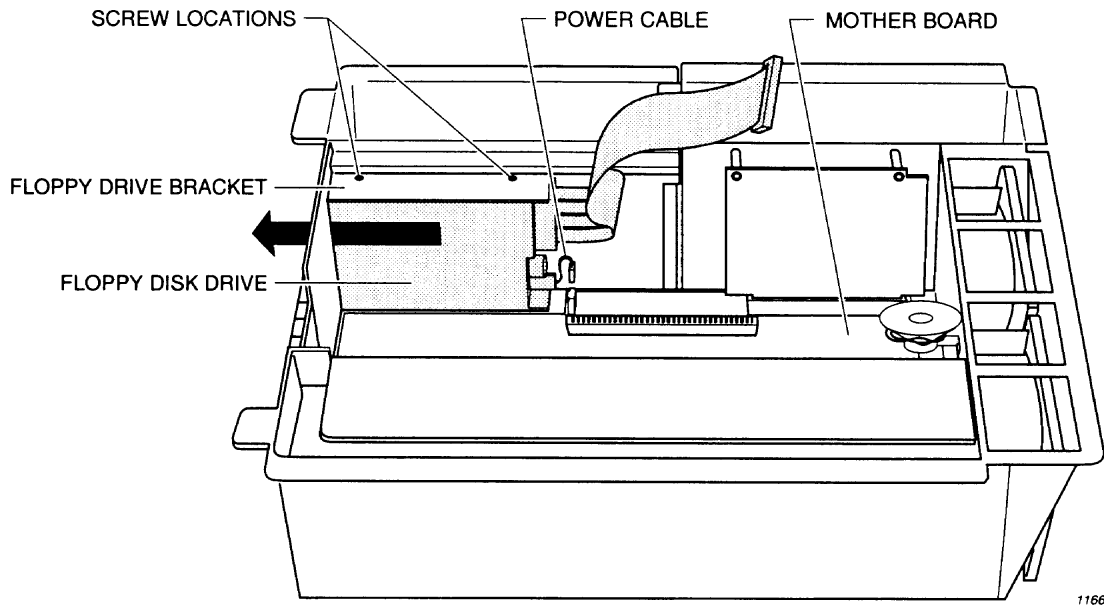
# Removing the Preregulator Board

1. Remove the two screws that hold the preregulator board to the chassis. See Figure 2-18.

2. Carefully lift the preregulator board out of its connector.

3. Store the board in a safe place.

*Figure 2-18*
*Removing the Preregulator Board*
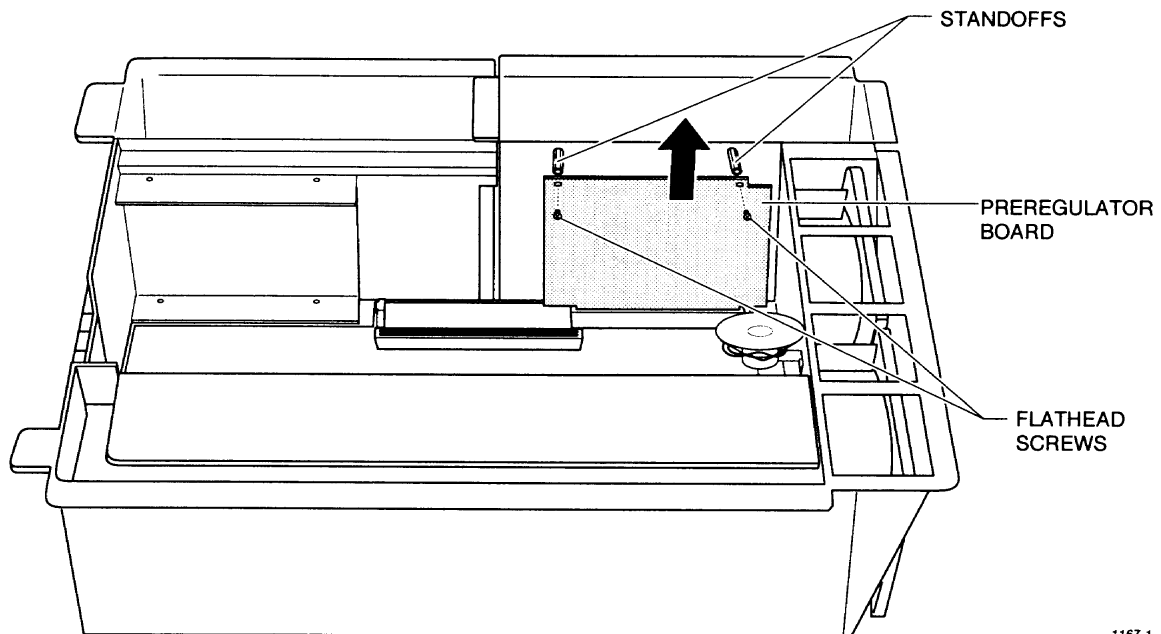
# Removing the Auxiliary Power Supply

1. Remove the four flathead screws holding the auxiliary power supply to the plate covering the opening in the side of the chassis. See Figure 2-19.

**Figure 2-19**
*Screw Location Holding Auxiliary Power Supply to the Plate*

SCREW LOCATIONS

**5100 CHASSIS FRONT VIEW**

PLATE

1169-1
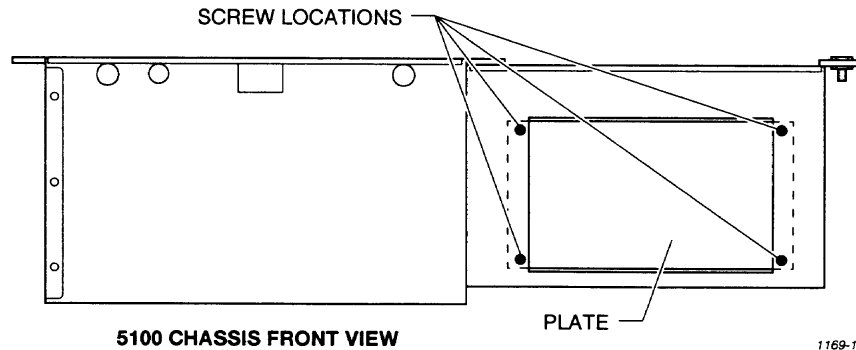
2. Slide the auxiliary power supply out of the opening.

3. Disconnect the ground connector, the ac power connector and the auxiliary power supply cable assembly connectors, as shown in Figure 2-20. Store the auxiliary power supply in a safe place.

**Figure 2-20**
*Removing the Auxiliary Power Supply*

OPENING IN
FRONT OF 5100
CHASSIS

AUXILIARY
POWER
SUPPLY

GROUND CONNECTOR

AC POWER CONNECTOR

AUXILIARY POWER SUPPLY CONNECTORS

1168-1
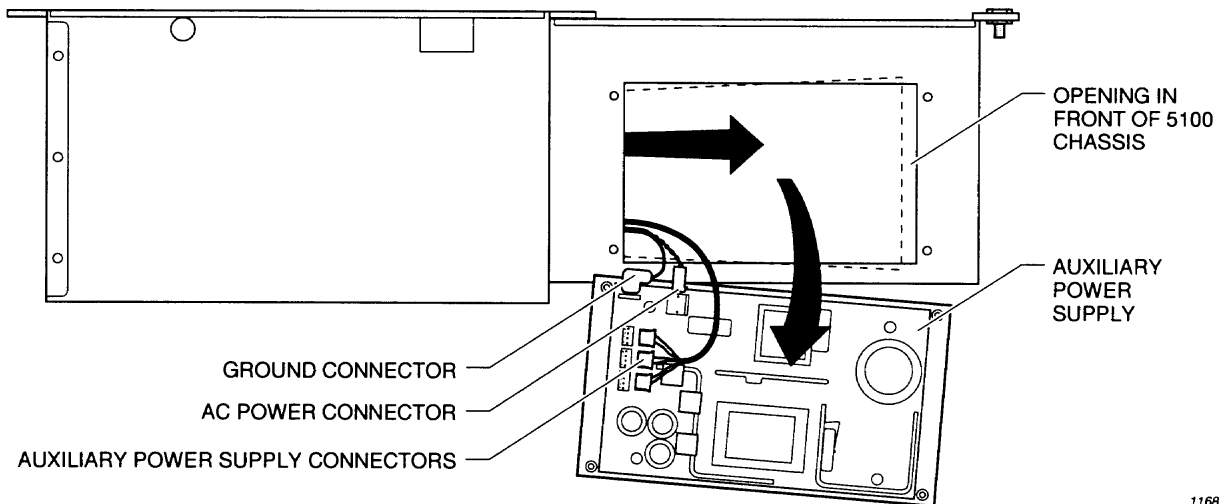
# Removing the Main Power Supply

1. Remove the six screws holding the side panel (the one with the ports) to the chassis. See Figure 2-21.

*Figure 2-21*
*Location of Screws Holding the Side Panel to the Chassis*

SCREW LOCATION (1 of 6) — SIDE PANEL — CHASSIS —

*1178-1*
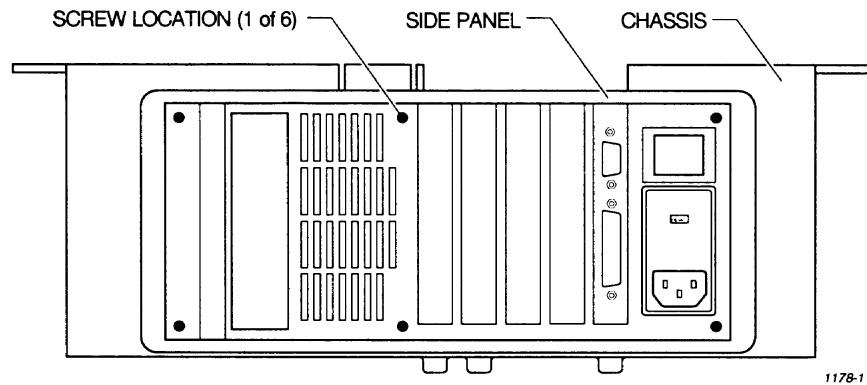
2. Pull the side panel away from the chassis enough to see the main power supply connectors. See Figure 2-22.

*Note: If you have a Computer Products power supply (part number 750-2009-002) installed, call your nearest Customer Support office for instructions.*

3. With a nutdriver, disconnect the ground wires from the chassis.

*Figure 2-22*
*Main Power Supply Connections*

AC CONNECTOR (J1)

AC POWER WIRES

CHASSIS

LINE FUSE WIRES

GROUND WIRE CONNECTION TO CHASSIS

MAIN POWER SUPPLY

AC INLET GROUND WIRE

SIDE PANEL

*1179-1*
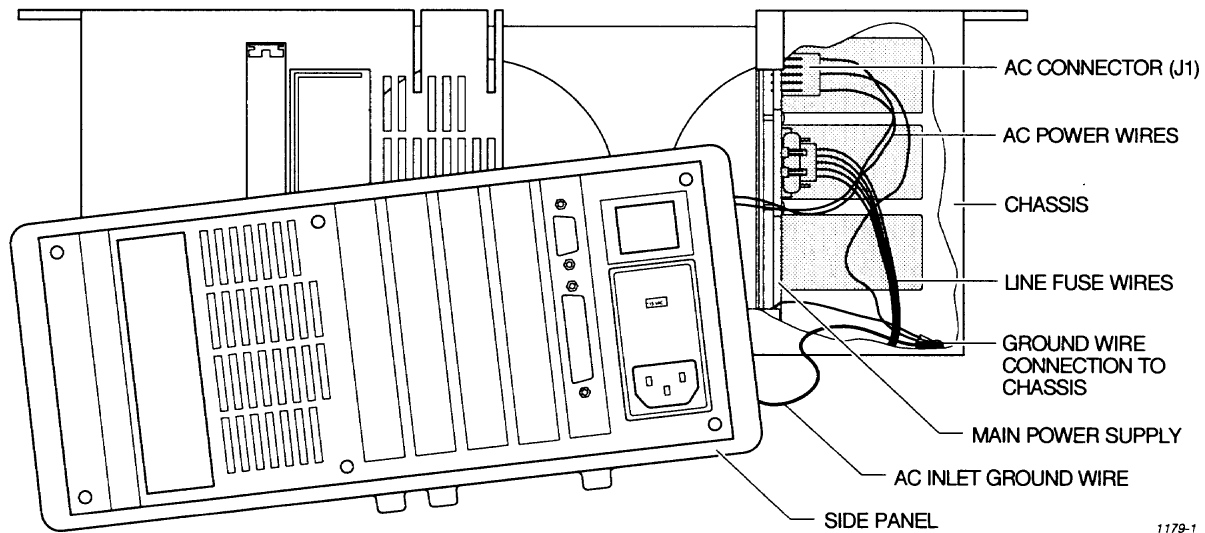
*Note:* During reassembly, reconnect the ground wires to the chassis as shown in Figure 2-23, locating the ground wire from the ac inlet next to the chassis and placing a nut between it and the other two wires.

**Figure 2-23**
*Reconnecting the Ground Wires to the Chassis*
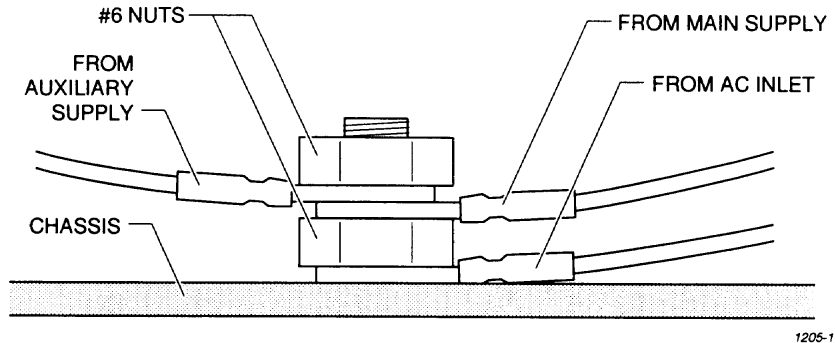


4. Remove the cover plate from the rear of the chassis to access the main power supply, as shown in Figure 2-24.

**Figure 2-24**
*Removing the Cover Plate from the Rear of the Chassis*
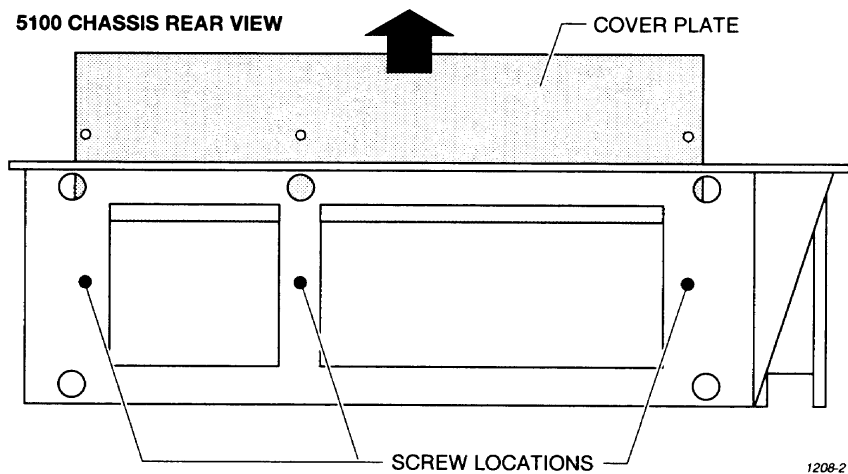


5. Unplug the ac connector from J1 on the main power supply. See Figure 2-25.

**Figure 2-26**
*Main Power Supply ac (J1)*
*Connector*

J1 CONNECTOR

*1212-1*
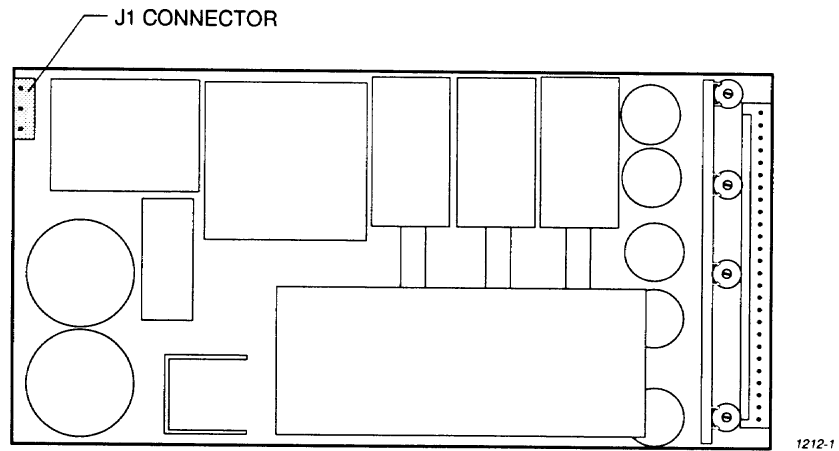
6. Remove the side panel from the chassis and store it in a safe place.

7. From the bottom of the chassis, unplug the output cable from the mother board. See Figure 2-26.

**Figure 2-25**
*Unplugging the Output Cable*
*from the Mother Board*

OUTPUT CABLE

**5100 CHASSIS - BOTTOM VIEW**

*1189-1*
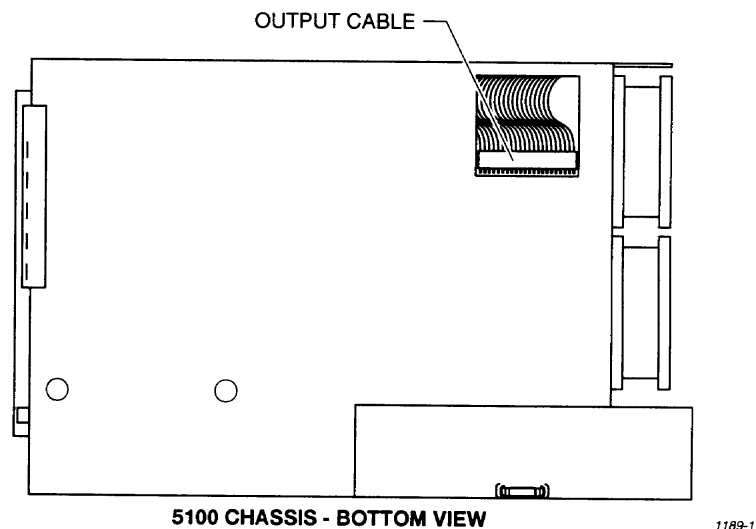
8. With a Phillips screwdriver inserted through the openings in the chassis, unscrew the six screws that fasten the power supply to the chassis. To make reassembly easier, leave the screws in the standoffs (don't remove them completely). See Figure 2-27.

9. Remove the main power supply from the chassis.

**Figure 2-27**
*Removing the Main Power Supply*



MAIN POWER
SUPPLY

OPENING
FOR SCREW
(1 of 6)

*1203-1*
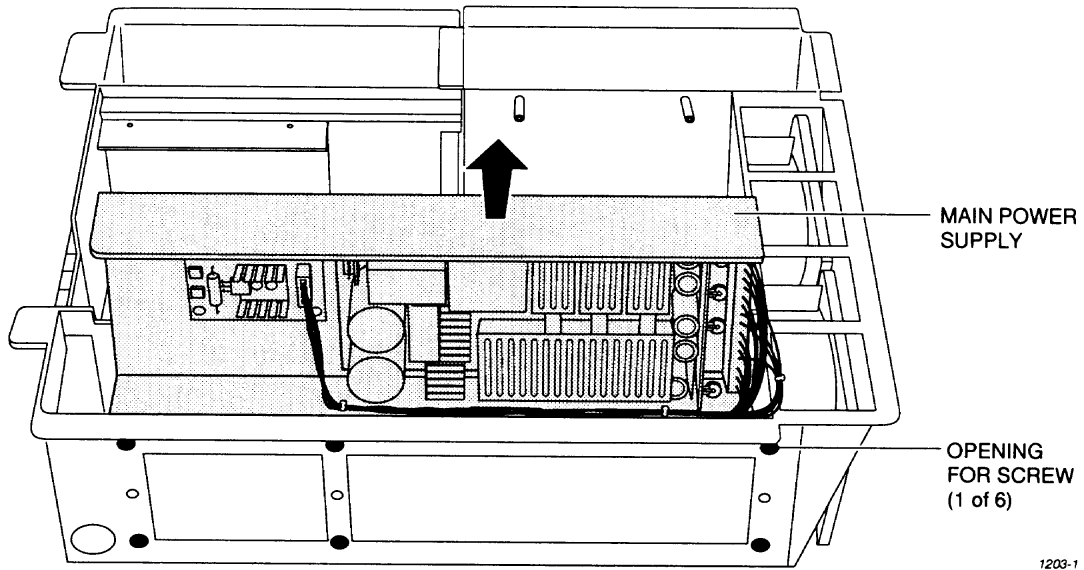
# Removing the Speaker

Remove two screws that fasten the speaker to the chassis, and then remove the speaker from the 5100. See Figure 2-28.

**Figure 2-28**
*Removing the Speaker*



SCREW (1 of 2)

SPEAKER

*1181-2*
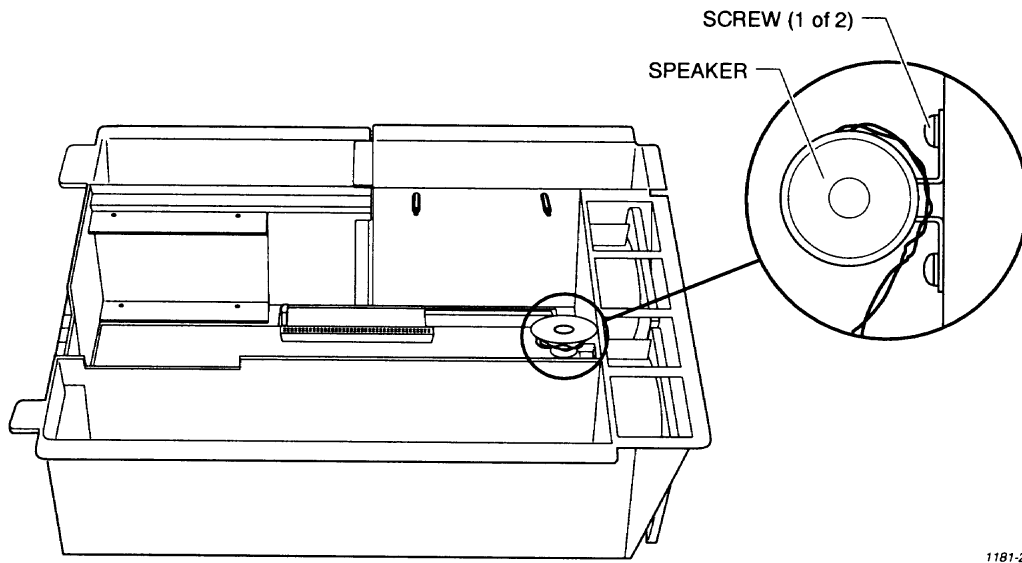
# Removing the Card Guide Bracket

Remove the three nuts holding the card guide bracket to the chassis. See Figure 2-29.

*Figure 2-29*
*Removing the Card Guide Bracket*

**5100 CHASSIS TOP VIEW**

NUT (1 of 3)

CARD GUIDE
BRACKET
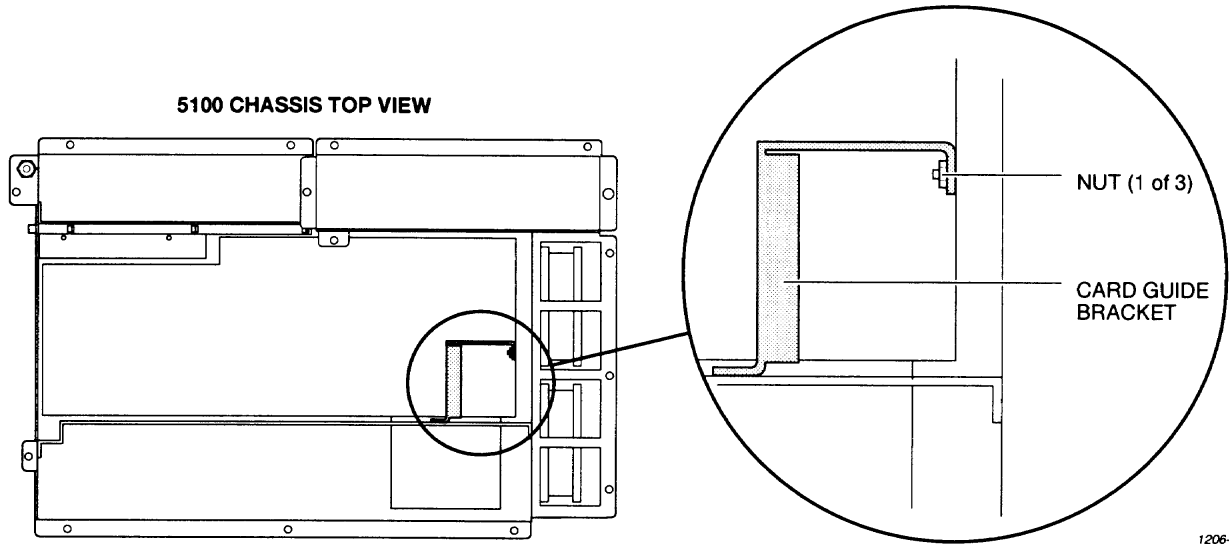
*1206-1*

# Removing the Mother Board

1. Unplug the cartridge disk drive power cable from J6 and unscrew the ground wire. See Figure 2-30.

2. Unplug the fan power cable from J2.

3. Unscrew sixteen screws that fasten the mother board to the chassis.

4. Remove the mother board from the chassis.

*Figure 2-30*
*Removing the Mother Board from the Chassis*

5100 CHASSIS TOP VIEW

CARTRIDGE DISK
DRIVE CONNECTION (J6)

MOTHER BOARD

SCREW LOCATION
(1 of 16)

FAN POWER CABLE
CONNECTION (J2)
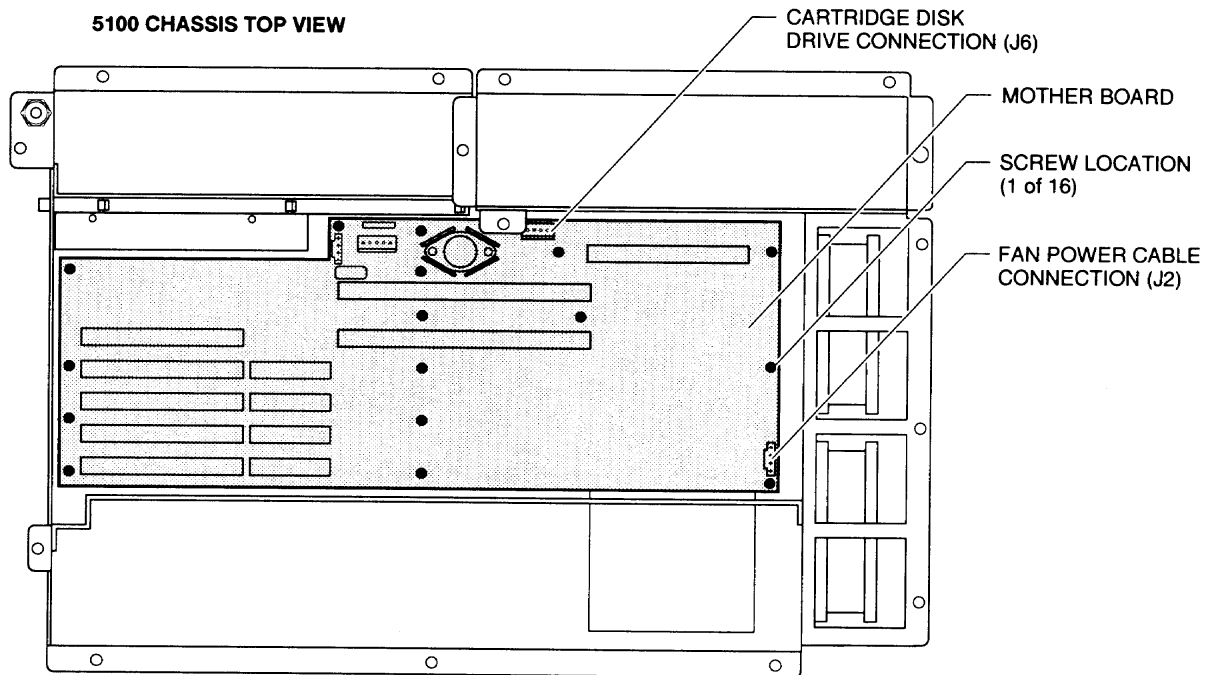
1182-1

# Removing the Fans

1. Remove the shroud from the fan power cable connectors by inserting a small screwdriver between the shroud and the connectors and pulling each connector free. See Figure 2-31.

---

*Note:* *To avoid breaking the shroud, handle it carefully. (There is a replacement shroud in the Spares Kit.)*

**Figure 2-31**
*Removing the Fan Power Cable Connectors from the Shroud*



FAN POWER CABLE

FAN POWER CABLE

GROMMET

FAN POWER CABLE
CONNECTOR (1 of 2)

SHROUD

**5100 CHASSIS - TOP VIEW**
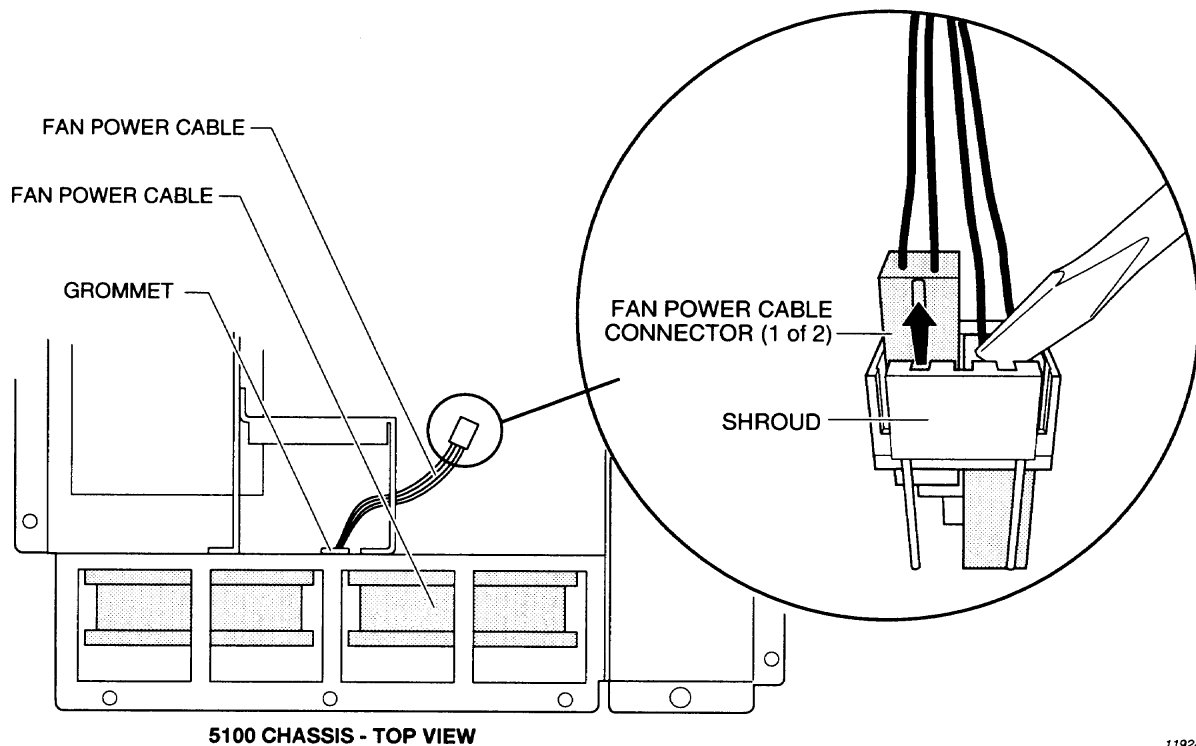
1192-2

2. Remove the four screws that fasten each fan to the chassis. Use a right-angle ratchet screwdriver, because a standard screwdriver will not fit in the space.

3. Pull the fan cables through the opening in the chassis with the grommet and then remove the fans. See Figure 2-32.

---

*Figure 2-32*
*Removing the Fans*

5100
CHASSIS

SCREW
LOCATION
(1 of 4 per fan)

FAN (1 of 2)

OPENING IN CHASSIS
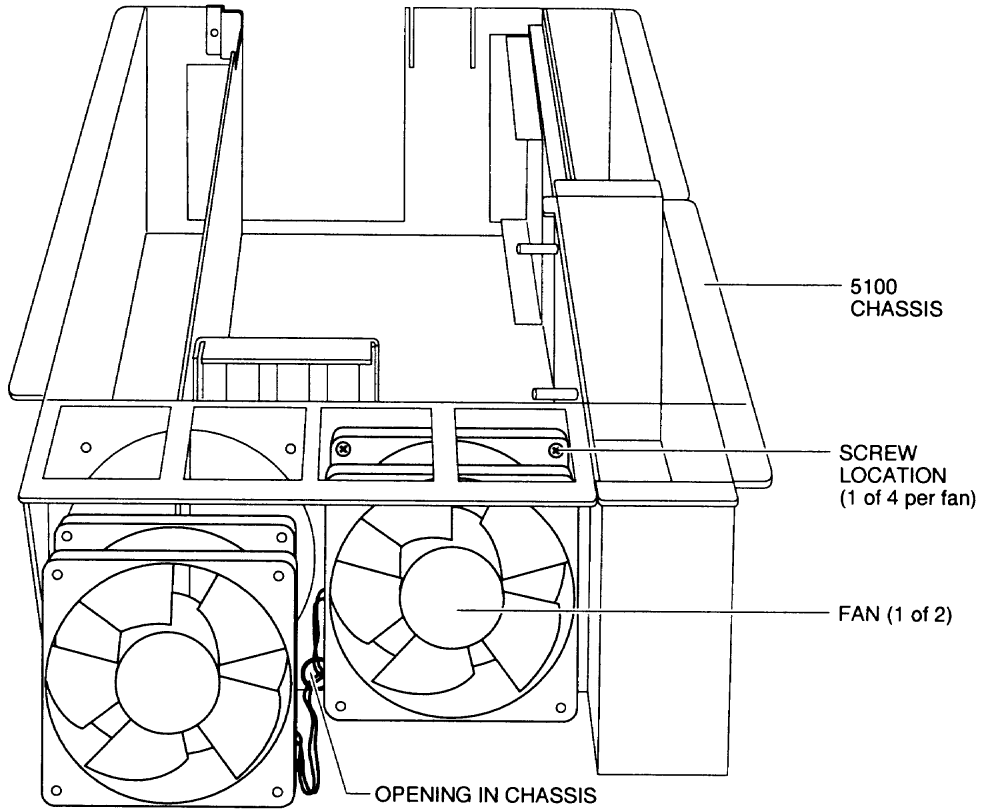
*1183-1*

# 3 *Theory of Operation*

This chapter describes the BoardSite 5100 theory of operation. Because the 5100 maintenance program is based on board exchange, this manual does not contain detailed circuit descriptions of each board.

## Overview

The 5100 contains the following major components:

- PC subsystem

  - 286 system — processor board only

  - 386 system version 1 — processor board and multifunction board

  - 386 system version 2 — processor board and VGA board

  - 386 system version 3 — processor board (with on-board VGA module)

  - Pentium system — processor board and VGA board

- Controller board

- Interface board

- Preregulator board

- Display module

- Mother board

- Mass storage subsystem (cartridge disk drive and floppy disk drive)

- Power supplies

Figure 3-1 shows a block diagram of the BoardSite 5100 components.

**Figure 3-1**
*BoardSite 5100 Block Diagram*

# Board Descriptions

## PC Subsystem

The current configuration for the 5100 PC subsystem is described below.

### Pentium System: Processor Board and VGA Monitor Board

This system contains a processor board with a Pentium microprocessor up to 8 MB of dynamic RAM, ROM with ROM BIOS, a PC/AT compatible keyboard port, a SCSI disk interface for the cartridge disk drive, two serial ports, a parallel printer port, and other support circuitry. For more information on this board, see *ICS Model SB586P(V) Product Manual*.

This configuration also includes a VGA monitor board. This board contains a VGA video display interface. For more information on this board, see the *VGA Monitor Manual*.

## BoardSite Controller Board

This board provides an interface between the XT portion of the microcomputer bus (the 62-pin bus), and the 5100 programming hardware, which uses a proprietary bus. The controller board contains the decoding and data control for the bus interface. It also contains a precision timer to generate accurate timing signals for programming waveform generation. The controller board provides all analog voltage references, and it contains analog read-back capability for system self-tests.

## BoardSite Interface Board

This board provides all digital address, data, and control signals to the 168-pin interface connector mounted on the 5100 front panel. The interface board also provides the precision voltage outputs for the programmable $V_{CC}1$, $V_{CC}2$, $V_{PP}1$, $V_{PP}2$, and $V_{NEG}$ outputs.

## Preregulator Board

This board contains preregulator circuits (programmable DC-to-DC converters) for the $V_{CC}$ and $V_{PP}$ drivers on the interface board. The $V_{CC}$ preregulator converts the system +12V power to a raw supply for the $V_{CC}$ drivers. The $V_{PP}$ preregulator converts the system +31.5V power to a raw supply for the $V_{PP}$ drivers.

## Display Board

The display board contains the 5100 user interface: a 40-character by 4-line LCD and five soft keys. The board also contains an LED array to back-light the LCD, and a power-on indicator.

## Mother Board

The mother board contains passive backplane connections for the PC buses (62- and 36-pin) and for the proprietary programming bus (50-pin). It is also the main power distribution component for all boards and peripherals in the system. The mother board contains a power regulator that converts the system +15V power to +12V for the cartridge disk drive.

## Mass Storage Subsystem

The 5100 contains a cartridge disk drive with removable media, and a 3.5-inch 1.44 MB floppy disk drive. The disk cartridge has a formatted capacity of 200 MB.

## Power Supplies

The 5100 contains two power supplies: the main power supply and the auxiliary power supply.

The main power supply is manufactured by either Power Systems, Inc. (PSI) or Computer Products. Both power supplies provide the following voltages: +5V @ 9A, +12V @ 9.2A, +31.5V @ 3A, -12V @ 1A, and -5V @ 1A.

The auxiliary power supply provides +5V @ 2.5A and +15V @ 2.5A. The +15V supply is regulated to +12V by the power regulator on the mother board. This +12V supply is used for cartridge disk drive power.

The auxiliary power supply +5V provides power for the controller, interface, and preregulator boards. The main power supply +5V provides power for the processor boards and expansion slots.

# 4 *Maintenance and Troubleshooting*

This chapter describes BoardSite 5100 maintenance and troubleshooting. Because the 5100 maintenance program is based on board exchange, this manual does not contain detailed troubleshooting at the circuit board component level.
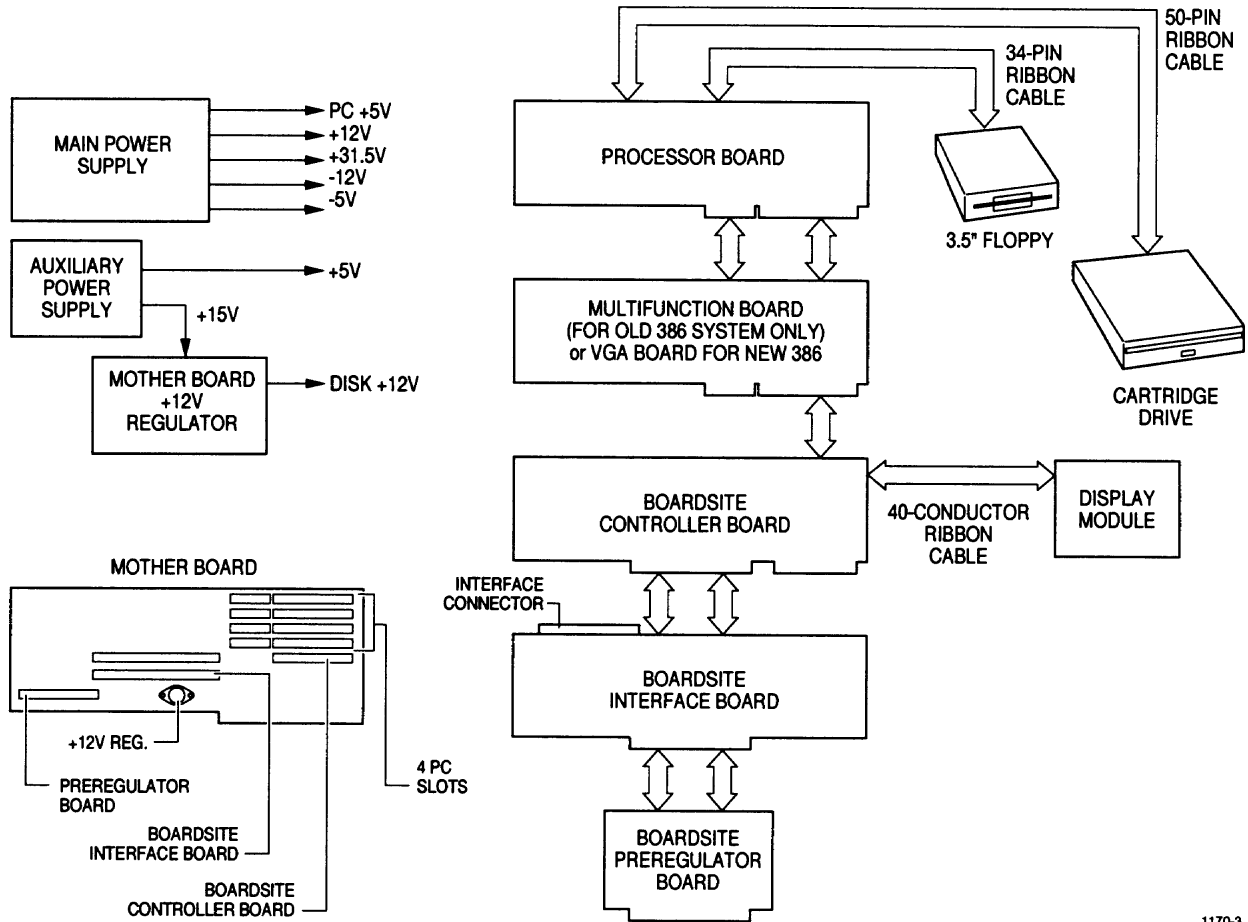
---

WARNING: **This manual is intended for use by service personnel only. Do not attempt any of these procedures unless you are qualified to do so.**

## BoardSite 5100 Universal Spares Kits

BoardSite 5100 Universal Spares Kits contain complete sets of spare parts for the maintenance and repair of the 5100. This chapter assumes that you have purchased the Pentium Universal Spares Kit, or that you have procured replacement components from Data I/O Corporation.

## Pentium Spares Kit

The replaceable components included in the Pentium Universal Spares Kit are listed below.

| Part Number | Description | Qty |
| --- | --- | --- |
| 750-2010-XXX | 5100 display/keyboard assembly | 1 |
| 701-2310-XXX | PC backplane PWA assembly | 1 |
| 701-2197-XXX | Preregulator board PWA | 1 |
| 701-2166-XXX | Interface board PWA | 1 |
| 701-2168-XXX | Controller board PWA | 1 |
| 812-0586-XXX | Pentium single-board computer | 1 |
| 320-1320-XXX | Memory IC, DRAM module, 1Mx32, 60 nsec | 2 |
| 802-0135-XXX | 3.5" disk drive, DS/HD, 1.44 MB | 1 |
| 802-5100-XXX | 5.25" SCSI cartridge disk drive | 1 |
| 806-0050-XXX | Auxiliary power supply, ±15V, +5, 50W | 1 |
| 709-0289-XXX | 5100 floppy drive cable assembly | 1 |
| 709-0290-XXX | 5100 floppy drive power cable assembly | 1 |
| 709-0291-XXX | 5100 hard disk cable assembly | 1 |
| 709-0292-XXX | 5100 hard disk power cable assembly | 1 |
| 709-0293-XXX | 5100 display power cable assembly | 1 |
| 750-2015-XXX | 5100 power supply assembly | 1 |
| 709-0295-XXX | 5100 display controller cable assembly | 1 |
| 709-0297-XXX | 5100 PC power cable assembly | 1 |
| 709-0316-XXX | 5100 cable assembly | 1 |
| 623-0003-XXX | BoardSite fan assembly | 2 |
| 643-0009-XXX | Shield | 1 |
| 750-2011-XXX | 5100 speaker assembly | 1 |

# Maintenance

Periodic maintenance of BoardSite 5100 consists of cleaning the exterior of the unit and checking the interface connector. BoardSite 5100 requires no performance verification, although the power supply voltage may be checked and adjusted if required.

## Cleaning

Clean the exterior of the 5100 with a clean cloth, dampened with water and a mild detergent. Never use caustic cleaning agents, alcohols, organic solvents, or other materials that could damage the surface.

---

**WARNING:  Always turn the 5100 power off and disconnect the power cord before cleaning.**

## Interface Connector Maintenance

The BoardSite 5100 interface connector is a 168-pin Bendix low insertion force connector, Bendix part number PC4-168P. The mate to this connector (the one you have to build into your interface adapter) is IO4-168P, which is a straight PC-board-mounted connector.

If you are certain that the connector has been damaged either by improper installation of the interface adapter or by excessive current through a pin or pins, then you should replace the interface board, on which the connector is mounted.

## Power Supply Performance Verification

BoardSite 5100 does not require a periodic performance verification schedule. All performance verification is performed by software, and internal voltages are compared to a laser-trimmed voltage reference on the controller board.

You can, however, adjust the main and auxiliary power supplies. This should be done whenever you replace one of these supplies. The procedures are described below.

---

**WARNING:  The following procedures should be done by qualified service personnel only. Lethal voltages are present in this equipment. Use extreme caution when making adjustments with the cover removed and power applied.**

## Equipment Required

You will need the following equipment:

- Digital multimeter (at least 4-1/2 digit resolution)
- Insulated potentiometer adjustment tool

## Overview

The following power supply outlets are adjustable:

- Main power supply
    - Computer Products: +5V, +12V, and +31.5V
    - Power Systems, Inc.: +5V, +12V, +31.5V, and -12V
- Auxiliary power supply: +5V

The +15V supply on the auxiliary power supply output tracks with the +5V. The DMM test points are located on the mother board and are labeled for your reference.

**Main Power Supply Performance Verification**

Perform the procedure below with all the PC boards installed.

1. Verify that the 5100 power is off, and then remove the power cord from the ac outlet.

2. Remove the display module and cover plate from the 5100. See "Removing the Display Module" and "Removing the Cover Plate" in Chapter 2.

3. Remove the chassis (with all circuit boards in place) from the case. See "Removing the Chassis from the Case" in Chapter 2.

4. Locate the test points on the end of the mother board next to the fans: the PC+5V, +12V, and +31.5V test points are near the card guide bracket and the -12V, +5V, and +15V test points are located behind the preregulator board.

5. Remove the cover plate from the rear of the chassis to expose the main power supply, as shown in Figure 2-24. Either a Power Systems, Inc. (PSI) power supply or a Computer Products power supply is installed.

6. Locate the adjustment potentiometers on the main power supply, as shown in Figure 4-1 for a PSI power supply and Figure 4-2 for a Computer Products power supply.

*Figure 4-1*
*Adjustment Potentiometers on a Power Systems, Inc. Main Power Supply*
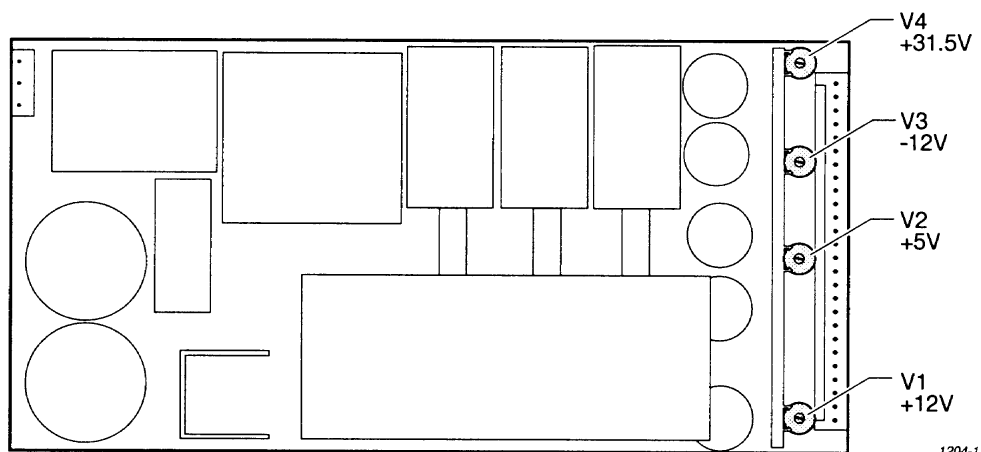
**Figure 4-2**
*Adjustment Potentiometers on a Computer Products Main Power Supply*



7. Connect the power cord to the ac outlet.

---

**WARNING:** **Beware of the high voltage present on the heatsinks and other components within the power supply.**

---

8. Turn on the power switch.

9. Carefully measure the voltages by connecting the DMM between the appropriate test point on the mother board and the GND test point.

10. If any voltage falls outside the limits in Table 4-1, adjust the appropriate potentiometer on the main power supply to bring the voltage back to within the limits shown in the table.

**Table 4-1**
*Main Power Supply Voltage Limits*

|          | Test Point | Minimum  | Nominal | Maximum |
|----------|------------|----------|---------|---------|
| **Both** | PC+5V      | 4.87V    | 5.00V   | 5.13V   |
|          | +12V       | 12.05V   | 12.25V  | 12.45V  |
|          | +31.5V     | 30.90V   | 31.50V  | 32.10V  |
| **PSI only** | -12V   | -12.20V  | -12.00V | -11.80V |

11. When you are finished, turn the power off, remove the power cord from the ac outlet, and then reassemble the 5100. For reassembly instructions, see Chapter 2.

**Auxiliary Power Supply**
**Performance Verification**

Perform the procedure below with all the PC boards installed.

1. Verify that the 5100 power is off, and then remove the power cord from the ac outlet.

2. Remove the auxiliary power supply from the 5100. See "Removing the Auxiliary Power Supply" in Chapter 2.

3. Locate the test points on the upper left corner of the mother board behind the preregulator board. Then locate the adjustment potentiometer on the auxiliary power supply as shown in Figure 4-3.
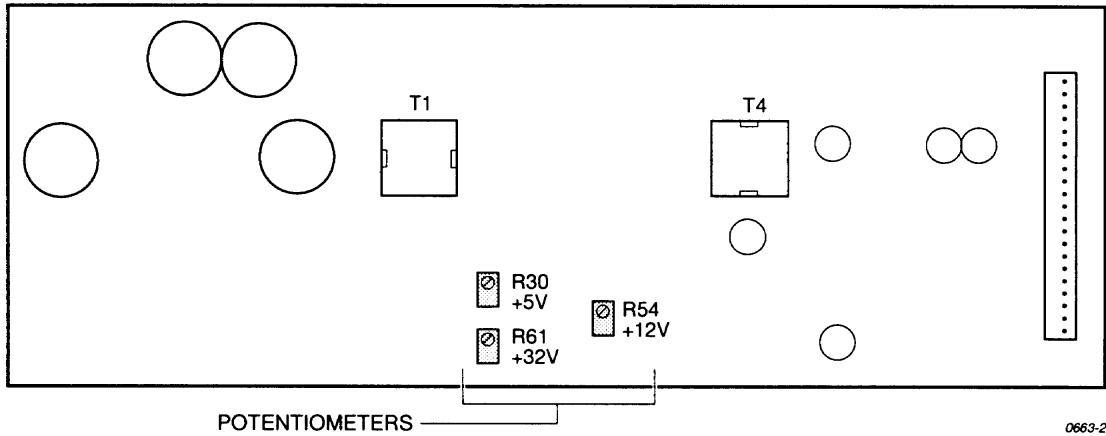
*Figure 4-3*
*Adjustment Potentiometer*
*on the Auxiliary Power Supply*



POTENTIOMETER
1193-1
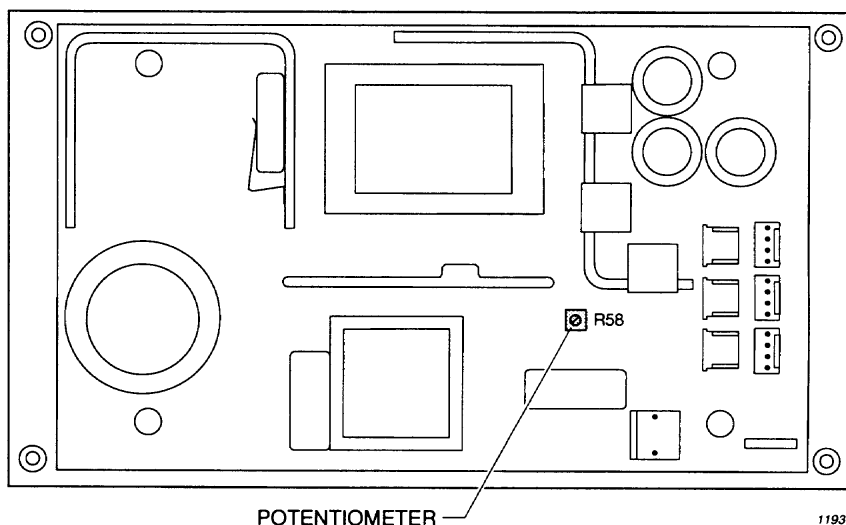
4. Connect the power cord to the ac outlet.

**WARNING: Beware of the high voltage present on the heatsinks and other components within the power supply.**

5. Turn on the power switch.

6. Carefully measure the two voltages by connecting the DMM between the appropriate test points on the mother board and the ground test point.

7. If either voltage falls outside the limits shown in Table 4-2, adjust the potentiometer on the auxiliary power supply to bring both voltages to within these limits. Note that the +15V supply tracks to an equal percentage of the +5V supply, and that both are adjusted by a single potentiometer.

*Table 4-2*
*Auxiliary Power Supply*
*Voltage Limits*

| Test Point | Minimum | Nominal | Maximum |
|------------|---------|---------|---------|
| +5V | 4.97V | 5.10V | 5.23V |
| +15V | 14.72V | 15.60V | 16.48V |

8. When you are finished, turn the power off, remove the power cord from the ac outlet, and then reassemble the 5100, see Chapter 2.

# Troubleshooting

## Using Self-Test to Isolate Problems

BoardSite 5100 performs a self-test when power is applied. If the PC subsystem and display module are operating, and there are self-test errors, BoardSite displays

```
Self-Test FAILED
Press ERRORS to view error messages
Press PRINT for report
[REPEAT ] [ERRORS]          [PRINT ] [ EXIT ]
```

Press ERRORS to view the messages. If a hardware problem causes the error, the message is a diagnostic message (it has a number between 800 and 999). Refer to Chapter 5, "Diagnostic Messages," to isolate the fault to a board.

## LCD is Blank

Problems in the PC subsystem can cause the LCD to be inoperative. To troubleshoot the PC subsystem, place the 5100 in its development configuration as follows.

1. Turn the 5100 power off.

2. Connect a monitor (EGA for a 286-based system, VGA/EGA for an older 386-based system, or VGA for a newer 386-based or Pentium-based system) to the appropriate monitor port.

3. Connect a PC/AT compatible keyboard to the appropriate keyboard port.

4. Turn the 5100 power on. You should see the standard DOS messages (RAM test, BIOS version, autoexec.bat).

If nothing appears on the monitor screen, suspect the PC subsystem boards or the power supplies. To check the power supplies, follow the procedure in the "Power Supply Performance Verification" section in this chapter. If all supply voltages appear normal, make sure all boards are seated in their mother board connectors and that all ribbon cables are securely plugged in.

If the screen is still blank, turn the 5100 power off and replace the processor, multifunction, or VGA monitor board (depending on your system) with the corresponding boards from the appropriate BoardSite 5100 Universal Spares Kit. If the system still does not boot, the controller board may have a fault that is causing errors on the PC bus. Turn power off, temporarily remove the controller board from the system, and try again.

---

*Note: When you are using the 5100 development configuration, with the keyboard and monitor, you can run the 5100 software by typing* **5100LCD** *at the DOS prompt. This enables the LCD display and soft keys, and disables the keyboard and monitor.*

## Additional Troubleshooting Information-PC Subsystem

The manuals for the processor and multifunction boards contain additional troubleshooting information. Refer to Appendix A, Chapter 4 of the ICS Model SB586P(V) Product Manual for the Pentium-based system.

Do not attempt to return these boards to the manufacturer's address in the manual. Always contact your nearest Data I/O Customer Support office for service information on these components.

## Using the DIAG Command

The DIAG command runs the system diagnostic software. You can run DIAG with or without the optional BoardSite Diagnostic Test Adapter. If you run DIAG with the Diagnostic Test Adapter, the system diagnostics verify all power supplies and programming signals up to the interface connector. In this configuration, DIAG performs the following test sequence:

1. Checks all system boards for correct installation.

2. Tests the controller board.

3. Tests the display board.

4. Tests the preregulator board.

5. Tests the interface board, up to the interface connector.

**To Run DIAG**

Run DIAG as follows:

1. Press [DIAG] from the top-level menu.

2. Press [BEGIN] to start DIAG.

3. If the 5100 displays a message, press [ERRORS] to view the messages, press [REPEAT] to run DIAG again, or press [EXIT] to display the top-level menu.

If the 5100 displays a message, use the message and number to isolate the problem. Refer to Chapter 5, "Diagnostic Messages," for a complete list and explanation of diagnostic messages.

# 5 *Diagnostic Messages*

This chapter lists the BoardSite 5100 diagnostic error messages. For most failures, you can use these messages to isolate a fault to a given board or other major component. Refer to Chapter 4, "Maintenance and Troubleshooting," for more information on troubleshooting.

**ERROR 175: +15V Supply Over-Voltage**
Suspect a problem with the mother board or main power supply.

**ERROR 176: +15V Supply Under-Voltage**
Suspect a problem with the mother board or main power supply.

**ERROR 177: DISK+12V Supply Over-Voltage**
Suspect a problem with the mother board or main power supply.

**ERROR 178: DISK+12V Supply Under-Voltage**
Suspect a problem with the mother board or main power supply.

**ERROR 179: PC+5V Supply Over-Voltage**
Suspect a problem with the mother board or main power supply.

**ERROR 180: PC+5V Supply Under-Voltage**
Suspect a problem with the mother board or main power supply.

**ERROR 181: LCD Display RAM failed**
Suspect a problem with the display board.

**ERROR 182: Keypad controller failed**
Suspect a problem with the display board.

**ERROR 183: LCD Display failed visual test**
Suspect a problem with the display board.

**ERROR 184: Keypad failed response test**
Suspect a problem with the display board.

**ERROR 802: Sequence Port Failed to Reset**
Suspect a problem with the controller board.

**ERROR 803: Sequence Port Failed Read/Write**

BoardSite was unable to successfully perform a read/write test of its internal bus system. Suspect either a faulty controller board or interface board.

**ERROR 804: Timer Status Busy When Not Expected**

Suspect a problem with the controller board.

**ERROR 805: Timer Status Not Busy When Expected**

Suspect a problem with the controller board.

**ERROR 806: Timer 0 Failed Read/Write**

Suspect a problem with the controller board or an interface board.

**ERROR 807: Timer 1 Failed Read/Write**

Suspect a problem with the controller board or an interface board.

**ERROR 808: Timer 2 Failed Read/Write**

Suspect a problem with the controller board or an interface board.

**ERROR 809: User Clock Failed Rate Setup**

Suspect a problem with the controller board.

**ERROR 810: Timer Clock Failed Rate Setup**

Suspect a problem with the controller board.

**ERROR 811: Program Pulse Width Incorrect**

Suspect a problem with the controller board.

**ERROR 812: Overprogram Pulse Width Incorrect**

Suspect a problem with the controller board.

**ERROR 813: PGM Control Circuit Failed**

Suspect a problem with the controller board.

**ERROR 814: PGM Generation Circuit Failed**

Suspect a problem with the controller board.

**ERROR 815: VPP1 Hi/Lo Control Switch Failed**

Suspect a problem with the controller board.

**ERROR 816: VPP2 Hi/Lo Control Switch Failed**

Suspect a problem with the controller board.

**ERROR 817: MUX Control Switch Failed**

Suspect a problem with the controller board.

**ERROR 818: +32V Supply Over-Voltage**

Main power supply out of calibration or suspect a problem with the controller board.

**ERROR 819: +32V Supply Under-Voltage**

Main power supply out of calibration or suspect a problem with the controller board.

**ERROR 820: +12V Supply Over-Voltage**

Main power supply out of calibration or suspect a problem with the controller board.

**ERROR 821: +12V Supply Under-Voltage**

Main power supply out of calibration or suspect a problem with the controller board.

| | |
|---|---|
| **ERROR 822: +10V Reference Over-Voltage** | Suspect a problem with the controller board. |
| **ERROR 823: +10V Reference Under-Voltage** | Suspect a problem with the controller board. |
| **ERROR 824: +5V Supply Over-Voltage** | Main power supply out of calibration or suspect a problem with the controller board. |
| **ERROR 825: +5V Supply Under-Voltage** | Main power supply out of calibration or suspect a problem with the controller board. |
| **ERROR 826: Analog Ground Over-Voltage** | Suspect a problem with the controller board, the mother board, or the main power supply. |
| **ERROR 827: Analog Ground Under-Voltage** | Suspect a problem with the controller board, the mother board, or the main power supply. |
| **ERROR 828: -3.5V Supply Over-Voltage** | Suspect a problem with the controller board, an interface board, or the preregulator board. |
| **ERROR 829: -3.5V Supply Under-Voltage** | Suspect a problem with the controller board, an interface board, or the preregulator board. |
| **ERROR 830: -5V Supply Over-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 831: -5V Supply Under-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 832: -12V Supply Over-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 833: -12V Supply Under-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 834: +12V PC Supply Over-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 835: +12V PC Supply Under-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 836: +5V PC Supply Over-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 837: +5V PC Supply Under-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 838: -5V PC Supply Over-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 839: -5V PC Supply Under-Voltage** | Suspect a problem with the mother board or the main power supply. |

| | |
|---|---|
| **ERROR 840: -12V PC Supply Over-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 841: -12V PC Supply Under-Voltage** | Suspect a problem with the mother board or the main power supply. |
| **ERROR 842: VCC1 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 843: VPP1HI DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 844: VPP1LO DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 845: VCC2 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 846: VPP2HI DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 847: VPP2LO DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 848: VNEG DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 849: ICC1 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 850: IPP1 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 851: ICC2 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 852: IPP2 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 853: INEG DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 854: VCC1 Regulator Out of Range at 0V** | Suspect a problem with the preregulator board. |
| **ERROR 855: VPP1 Regulator Out of Range at 0V** | Suspect a problem with the preregulator board. |
| **ERROR 856: VCC2 Regulator Out of Range at 0V** | Suspect a problem with the preregulator board. |
| **ERROR 857: VPP2 Regulator Out of Range at 0V** | Suspect a problem with the preregulator board. |
| **ERROR 858: Test REF 1 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 859: Test REF 2 DAC Cannot be Set to 0V** | Suspect a problem with the controller board. |
| **ERROR 860: VCC1 DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |

| | |
|---|---|
| **ERROR 861: VPP1HI DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 862: VPP1LO DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 863: VCC2 DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 864: VPP2HI DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 865: VPP2LO DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 866: VNEG DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 867: ICC1 DAC Cannot be Set to 6A** | Suspect a problem with the controller board. |
| **ERROR 868: IPP1 DAC Cannot be Set to 2A** | Suspect a problem with the controller board. |
| **ERROR 869: ICC2 DAC Cannot be Set to 6A** | Suspect a problem with the controller board. |
| **ERROR 870: IPP2 DAC Cannot be Set to 2A** | Suspect a problem with the controller board. |
| **ERROR 871: INEG DAC Cannot be Set to 250mA** | Suspect a problem with the controller board. |
| **ERROR 872: VCC1 Regulator Out of Range at 5V** | Suspect a problem with the preregulator board. |
| **ERROR 873: VPP1 Regulator Out of Range at 5V** | Suspect a problem with the preregulator board. |
| **ERROR 874: VCC2 Regulator Out of Range at 5V** | Suspect a problem with the preregulator board. |
| **ERROR 875: VPP2 Regulator Out of Range at 5V** | Suspect a problem with the preregulator board. |
| **ERROR 876: VCC1 Regulator Out of Range at 7V** | Suspect a problem with the preregulator board. |
| **ERROR 877: VPP1 Regulator Out of Range at 25V** | Suspect a problem with the preregulator board. |
| **ERROR 878: VCC2 Regulator Out of Range at 7V** | Suspect a problem with the preregulator board. |
| **ERROR 879: VPP2 Regulator Out of Range at 25V** | Suspect a problem with the preregulator board. |
| **ERROR 880: Test REF 1 DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |
| **ERROR 881: Test REF 2 DAC Cannot be Set to 5V** | Suspect a problem with the controller board. |

ERROR 882: BE Port Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 883: Control Port 3 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 884: BD Driver Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 885: ID Driver Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 886: LED Driver Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 887: Control Port 1 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 888: Control Port 2 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 889: Address Port 1 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 890: Address Port 2 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 891: Address Port 3 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 892: Address Port 4 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 893: Data Port 1 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 894: Data Port 2 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 895: Data Port 3 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 896: Data Port 4 Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 897: 8-Bit CE Port Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 898: 16-Bit CE Port Failed Read/Write        Suspect a problem with an interface board. Could also indicate a problem with the controller board.

ERROR 899: Delay Timer Busy When Not Expected        Suspect a problem with the controller board.

**ERROR 900: Delay Timer Not Busy
When Expected**

Suspect a problem with the controller board.

---

*Note:* *Errors 901 through 990 indicate a problem with an
interface board. Several errors on multiple interface
boards could indicate a problem with the controller board.*

**ERROR 901: Power Sequencer RAM
Failed Read/Write**

**ERROR 902: Power Sequencer Manual
Control Failed**

**ERROR 903: Power Reset Circuit
Failed to Reset**

**ERROR 904: Power Sequencer
Automatic Control Failed**

**ERROR 905: VCC1 Supply Cannot be
turned OFF**

**ERROR 906: VPP1HI Supply Cannot
be turned OFF**

**ERROR 907: VPP1LO Supply Cannot
be turned OFF**

**ERROR 908: VCC2 Supply Cannot be
turned OFF**

**ERROR 909: VPP2HI Supply Cannot
be turned OFF**

**ERROR 910: VPP2LO Supply Cannot
be turned OFF**

**ERROR 911: VNEG Supply Cannot be
turned OFF**

**ERROR 912: +12V Switch Cannot be
turned OFF**

**ERROR 913: -12V Switch Cannot be
turned OFF**

**ERROR 914: BE Port Failed Loopback**

**ERROR 915: Control Port 3 Failed
Loopback**

**ERROR 916: BD Driver Failed
Loopback**

**ERROR 917: ID Driver Failed
Loopback**

**ERROR 918: LED Driver Failed
Loopback**

**ERROR 919: Control Port 1 Failed
Loopback**

**ERROR 920: Control Port 2 Failed
Loopback**

**ERROR 921: Address Port 1 Failed
Loopback**

**ERROR 922: Address Port 2 Failed
Loopback**

**ERROR 923: Address Port 3 Failed
Loopback**

**ERROR 924: Address Port 4 Failed
Loopback**

**ERROR 925: Data Port 1 Failed
Loopback**

**ERROR 926: Data Port 2 Failed
Loopback**

**ERROR 927: Data Port 3 Failed
Loopback**

**ERROR 928: Data Port 4 Failed
Loopback**

**ERROR 929: Analog MUX Failed Data
Readback**

**ERROR 930: Power Error Latch Failed
to Set Error**

**ERROR 931: VCC1 Supply
Over-Voltage at 5V**

**ERROR 932: VCC1 Supply
Under-Voltage at 5V**

**ERROR 933: VCC1 Supply
Over-Voltage at 7V**

**ERROR 934: VCC1 Supply
Under-Voltage at 7V**

**ERROR 935: VCC1 Supply
Over-Voltage Circuit Failed**

**ERROR 936: VCC1 Supply
Under-Voltage Circuit Failed**

**ERROR 937: VCC1 Supply
Over-Current Circuit Failed**

**ERROR 938: VCC2 Supply
Over-Voltage at 5V**

**ERROR 939: VCC2 Supply
Under-Voltage at 5V**

ERROR 940: VCC2 Supply
Over-Voltage at 7V

ERROR 941: VCC2 Supply
Under-Voltage at 7V

ERROR 942: VCC2 Supply
Over-Voltage Circuit Failed

ERROR 943: VCC2 Supply
Under-Voltage Circuit Failed

ERROR 944: VCC2 Supply
Over-Current Circuit Failed

ERROR 945: VPP1 Supply
Over-Voltage at 5V

ERROR 946: VPP1 Supply
Under-Voltage at 5V

ERROR 947: VPP1 Supply
Over-Voltage at 25V

ERROR 948: VPP1 Supply
Under-Voltage at 25V

ERROR 949: VPP1 Supply
Over-Voltage Circuit Failed

ERROR 950: VPP1 Supply
Under-Voltage Circuit Failed

ERROR 951: VPP1 Supply
Over-Current Circuit Failed

ERROR 952: VPP1 Supply Slew Select
Circuit Failed

ERROR 953: VPP1 Supply Hi/Lo
Switch Circuit Failed

ERROR 954: VPP2 Supply
Over-Voltage at 5V

ERROR 955: VPP2 Supply
Under-Voltage at 5V

ERROR 956: VPP2 Supply
Over-Voltage at 25V

ERROR 957: VPP2 Supply
Under-Voltage at 25V

ERROR 958: VPP2 Supply
Over-Voltage Circuit Failed

ERROR 959: VPP2 Supply
Under-Voltage Circuit Failed

ERROR 960: VPP2 Supply
Over-Current Circuit Failed

ERROR 961: VPP2 Supply Slew Select
Circuit Failed

ERROR 962: VPP2 Supply Hi/Lo
Switch Circuit Failed

ERROR 963: VNEG Supply
Over-Voltage at -5V

ERROR 964: VNEG Supply
Under-Voltage at -5V

ERROR 965: VNEG Supply
Over-Voltage at -8V

ERROR 966: VNEG Supply
Under-Voltage at -8V

ERROR 967: VNEG Supply
Over-Voltage Circuit Failed

ERROR 968: VNEG Supply
Under-Voltage Circuit Failed

ERROR 969: VNEG Supply
Over-Current Circuit Failed

ERROR 970: +12V Switch
Over-Voltage

ERROR 971: +12V Switch
Under-Voltage

ERROR 972: -12V Switch Over-Voltage

ERROR 973: -12V Switch
Under-Voltage

ERROR 974: VPP1 Reference Output
Out of Range

ERROR 975: VPP2 Reference Output
Out of Range

ERROR 976: Power Regulator Error
Latch Failed

ERROR 977: Power Error Generator
Failed to Set Error

ERROR 978: Power Error Generator
Failed to Reset

ERROR 979: Sequence Port Failed to
Set Fault

ERROR 980: Digital Drivers Failed to
Tri-state

ERROR 981: ID Pull-up Switch Failed

ERROR 982: BD Pull-up Switch Failed

**ERROR 983: Power Sequencer
Address Inverter failed**

**ERROR 984: Power Sequencer Stop
Indicator Failed**

**ERROR 985: Common Mode Decode
Control Failed**

**ERROR 986: Hardware Interrupt
Circuit Failed**

**ERROR 987: Board ON/OFF control
circuit failed**

**ERROR 988: INEG DAC cannot be set
to 500mA**

**ERROR 989: VNEG Supply over
voltage at 19.5V**

**ERROR 990: VNEG Supply under
voltage at -19.5V**

**ERROR 991: Expansion Board not
detected**

This error indicates that the diagnostics could not find a
5100 display board. Check all cables to that board.
Otherwise, suspect the 5100 display board.

**ERROR 992: controller board not
detected**

Suspect a problem with the controller board.

**ERROR 993: preregulator board not
detected**

If all boards in the system are detected except the
preregulator board, suspect a bad interface board. This
error is almost never caused by the actual preregulator
board (unless the board is missing or not inserted properly.)

**ERROR 994: interface board not
detected**

Suspect a problem with the interface board or controller
board.

**ERROR 996: Power Connector not
detected on Diagnostic Test Adapter**

This error indicates that one or more of the jumpers on the
J5 connector in the Diagnostic Test Adapter were not
detected when performing tests on the interface board.
Check to see that all 10 of the jumpers are seated properly
on the J5 connector pins.

**ERROR 998: Diagnostic Test Adapter
not detected on interface board**

The Diagnostic Adapter is either not on the proper interface
board connector, or is not seated properly. If the error
persists suspect a bad interface board.
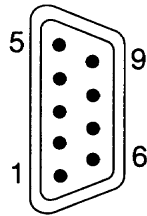
# $A$ Additional System Information

This appendix contains additional information you may require to service the BoardSite 5100. The information is organized as follows:

# Serial Port Wiring

The pin assignments for the 5100 serial port are shown in Table A-1.

*Table A-1*
*5100 Serial Port Pin*
*Assignments*

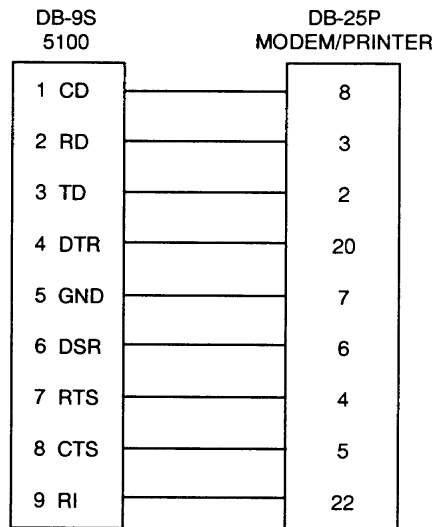| Pin | Signal |
|-----|--------|
| 1 | Carrier detect (CD) |
| 2 | Receive data (RD) |
| 3 | Transmit data (TD) |
| 4 | Data terminal ready (DTR) |
| 5 | Signal ground (GND) |
| 6 | Data set ready (DSR) |
| 7 | Request to send (RTS) |
| 8 | Clear to send (CTS) |
| 9 | Ring indicator (RI) |

To connect the 5100 to a standard external PC modem or printer, you can use a standard 9- to 25-pin cable, available at a computer dealer. You can also build a cable, based on the information in Figure A-1. Use a DB-9S for the 9-pin connector, and use a DB-25P for the 25-pin connector.

*Note:* *If you build a cable to connect the 5100 to another computer (instead of a modem or serial printer), then you must reverse pins 2 and 3, 4 and 5, and 6 and 20 on the 25-pin connector.*

*Figure A-1*
*Pin Designations for a 9- to 25-pin Serial Cable*

| DB-9S 5100 | DB-25P MODEM/PRINTER |
|------------|----------------------|
| 1 CD | 8 |
| 2 RD | 3 |
| 3 TD | 2 |
| 4 DTR | 20 |
| 5 GND | 7 |
| 6 DSR | 6 |
| 7 RTS | 4 |
| 8 CTS | 5 |
| 9 RI | 22 |

1200-1

# Pentium Cartridge Disk Initialization

For more information regarding DOS commands used in this procedure, refer to the *DOS User Guide*.

1. With the 5100 in the development configuration, with a keyboard and a monitor attached, install the cartridge disk in the cartridge disk drive as described in the *BoardSite 5100 User Manual*.

2. Turn on the 5100 power.

3. If the cartridge is not initialized, the 5100 displays the message

   `No boot device available.`

4. Locate the DOS Setup disk, which is in the DOS package shipped with your 5100.  Insert this disk in the floppy disk drive and then reboot the 5100 by pressing $\boxed{\text{Ctrl}}$ + $\boxed{\text{Alt}}$ + $\boxed{\text{Del}}$ .

---

*Note:*  *Ensure that the disk used to boot the 5100 contains the following files: FDISK.EXE and FORMAT.COM.*

   If a setup/boot disk is not available, you can create one using the procedure described in the *DOS User Guide*.

5. FDISK Cartridge (a:\fdisk)

   a. Create a 50 MB Primary DOS Partition, set it as the active partition ("C" Drive), and assign a Volume Name of "SYSTEM" to this partition.

   b. Create 140 MB Extended Partition ("D" Drive) and assign a Volume Name of "DATA" to this partition.

6. FORMAT Cartridge

   a. Format the "C" Drive partition with the DOS system files.
      (a:\Format C: /s)

   b. Format the "D" Drive partition
      (a:\Format D:)

7. Create a DOS directory on the "C" Drive (C:\DOS) and copy all the DOS files to this directory.

8. Copy the following files to the root directory on the "C" drive:

   - CONFIG.SYS

   - AUTOEXEC.BAT

   - WINA20.386 (available in DOS)

   - SQDRIVER.SYS
     You can download this file from the "SCSIINST.EXE" file on the Syquest bulletin board.  The address and phone numbers for Syquest are:

     Syquest Technology
     47071 Bayside Parkway
     Fremont, CA 94538
     800-249-2440 (Technical Support)
     (510) 656-0473 (Bulletin Board)

9. Ensure that no disk is in drive A and reboot the system. If a "Bad command or file name" message is displayed, it is because no BoardSite software has been loaded yet and can be ignored.

10. Insert the EZ-SCSI LITE V4.00B Installation Disk in drive A and type **INSTALL** from the A: prompt to install the Pentium Processor Board SCSI ASPI driver on drive C.

*Note:* *This driver, which is provided to Data I/O by Industrial Computer Services, must be installed on drive C.*

11. Using the two Data I/O-supplied BoardSite Installation disks, install the BoardSite software on the "C" drive partition.

12. Check the **autoexec.bat** and **config.sys** files to ensure that their contents are as follows:

### AUTOEXEC.BAT File

```
echo off
path c:\;c:\brdsite;c:\dos;c:\scsi;
mode co80
set comspec=c:\dos\command.com
set boardsite=c:\brdsite
set disk=d:
set ram=e:
set floppy=a:
set tmp=e:\
prompt $p$g
keysense
```

### CONFIG.SYS File

```
device=c:\scsi\aspi8dos.sys /d
device=sqdriver.sys
device=c:\dos\himem.sys
dos=high
files=40
buffers=40
device=c:\dos\smartdrv.exe 128
device=c:\dos\ramdrive.sys 4096 128 128 /e
shell=c:\dos\command.com /e:1024 /p
```

13. Return to the root directory of C drive and display all of its directories using the **dir** command. To free memory space, you may delete the following two files:

- CONFIG.NEW
- AUTOEXEC.NEW

14. This completes the procedure for setting up the 200 MB Cartridge for use with the BoardSite 5100 Pentium System.

# CMOS RAM Setup Utilities

When the 5100's CPU processor board is replaced, you may have to reinitialize the system configuration parameters stored on the board. The following boards contain CMOS RAM to store the configuration parameters: DTI CAT904B in the 286-based 5100, DTI CAT980A and DTI CEX571 in version 1 of the 386-based 5100, DTI CAT990 in version 2, DTI CAT991 in version 3, and ICS Model SB 586P in the Pentium-based 5100. This RAM is powered by a lithium battery when the 5100 power is off.

To set the CMOS RAM parameters, you must power up the 5100 in the development configuration, with a keyboard and a monitor attached. Depending on what is already stored in the system parameters, the system may boot normally, or it may display a configuration error and stop.

## CMOS Setup for the 286-Based 5100

You set all system configuration parameters with one utility in the 286-based 5100. If the system boots normally, press Ctrl + Alt + Esc to run the DTI CAT904B setup software. If the system displays a configuration error, press F2 to run the setup software.

For more information on running the setup software for the 286-based processor board, see the *DTI CAT904B* manual. Figure A-2 shows the factory settings for the DTI CAT904B board.

*Figure A-2*
*Factory Settings for the DTI CAT904B Board*

```
                         AT CMOS SETUP PROGRAM
             (c) Copyright 1990, Diversified Technology, Inc.

                    DATE: MM/DD/YY    TIME: HH:MM:SS

  DISKETTE 1       1,4M
  DISKETTE 2       NONE
                         CYLINDERS  HEADS  SECTORS  PRECOMP  SIZE
  FIXED DISK 1     NO EXTERNAL CONTROLLER FOUND
  FIXED DISK 2     NO EXTERNAL CONTROLLER FOUND

  VIDEO            EGA/VGA

  BASE MEMORY                       640
  EXTENDED MEMORY                   3456

  SCSI ID (NORMALLY 7)              7
  SCSI DATA AREA          0000:     0280h
  SCSI DATA MODE                    DEMAND TRANSFER

  HALT CONDITIONS                   NO HALT ON KEYBOARD ERROR
  BOOT SPEED                        FAST
```

*Note:  The VIDEO parameter refers to the type of display adapter used, not the type of monitor attached. This parameter should always be EGA/VGA.*

**WARNING:  Keep the SCSI DATA AREA parameter set to address 0280h. If you change this setting, you could lose all the data on the cartridge disk.**

When you finish the DTI CAT904B setup software, press F10 and then press F5 to store the changes.

---

## CMOS Setup for Version 1 of the 386-Based 5100

For Version 1 of the 386-based 5100 system, you must run two setup programs, one for the DTI CAT980A processor board, and another for the DTI CEX571 multifunction board.

If the system boots normally, press [Ctrl] + [Alt] + [Esc] to run the DTI CAT980A setup software. If the system displays a configuration error message, press [F2] to run the setup software.

For more information on running the setup software for the 386-based processor board, see the *DTI CAT980A* manual. Figure A-3 shows the factory settings for the DTI CAT980A board.

*Figure A-3*
*Factory Settings for the DTI CAT980A Board*

```
                    AT CMOS SETUP PROGRAM
          (c)Copyright 1989, Diversified Technology, Inc.

                  DATE:   MM/DD/YY   TIME:  HH:MM:SS

        DISKETTE 1      1,4M
        DISKETTE 2      NONE
                              CYLINDERS   HEADS   SECTORS PRECOMP SIZE
        FIXED DISK 1    NONE
        FIXED DISK 2    NONE

        VIDEO           EGA/VGA

        BASE MEMORY            640
        EXTENDED MEMORY        7168
        POST MEMORY TEST      EXECUTE MEMORY TEST

        HALT CONDITIONS      NO HALT ON KEYBOARD ERROR
        BIOS SHADOWING       SHADOW SYSTEM BIOS
        INITIALIZE SPEED     FAST
        DRAM WAIT STATES     2 DRAM WAIT STATES
        PS/2 MOUSE PORT      DISABLED
```

*Note:* The VIDEO parameter refers to the type of display adapter used, not the type of monitor attached. This parameter should always be EGA/VGA. Also, the DRAM WAIT STATES parameter should be set to 2 for 80 ns or faster DRAM modules.

When you finish the DTI CAT980A setup software, press [F10] and then press [F5] to store the changes.

While in the DTI CAT980A setup software, press [Ctrl] + [Alt] + [Home] to run the DTI CEX571 setup software. For more information on running the setup software for the DTI CEX571 board, see the *DTI CEX571* manual, included as a separate document.

## CMOS Setup for Version 2 of the 386-Based 5100

For version 2 of the 386-based 5100 system, you must run the setup program for the DTI CAT990 processor board.

If the system boots normally, you must type a three-key sequence to run the setup software. If the system boots normally, press [Ctrl] + [Alt] + [Esc] to run the DTI CAT990 setup software. If the system displays a configuration error, press [F2] to run the setup software.

For more information on running the setup software for the processor board used in version 2 of the 386-based 5100, see the *DTI CAT990 manual*, included as a separate document. Figure A-7 shows the factory settings for the DTI CAT990 board.

*Figure A-4*
*Factory Settings for the DTI CAT990 Board*

```
                    AT CMOS SETUP PROGRAM
          (c)Copyright 1990, Diversified Technology, Inc.

                   DATE:   MM/DD/YY   TIME: HH:MM:SS

     DISKETTE 1      1,4M
     DISKETTE 2      NONE
                       CYLINDERS   HEADS   SECTORS PRECOMP SIZE
     FIXED DISK 1   NONE
     FIXED DISK 2   NONE

     VIDEO          EGA/VGA

     BASE MEMORY            640
     EXTENDED MEMORY        3072
     MEMORY TEST            EXECUTE

     HALT CONDITIONS        HALT ON ALL ERRORS
     SHADOW VIDEO BIOS      ENABLED
     PS/2 MOUSE PORT        ENABLED
     CACHE                  ENABLED
     PS/2 MOUSE PORT        DISABLED
```

*Note:* *The VIDEO parameter refers to the type of display adapter used, not the type of monitor attached. This parameter should always be EGA/VGA. Also, the DRAM WAIT STATES parameter should be set to 2 for 80 ns or faster DRAM modules.*

When you finish the DTI CAT990 setup software, press [F10] and then press [F5] to store the changes.

## CMOS Setup for Version 3 of the 386-Based 5100

For version 3 of the 386-based 5100 system, you must run the setup program for the DTI CAT991 processor board.

If the system boots normally, you must type a three-key sequence to run the setup software. If the system boots normally, press Ctrl + Alt + Esc to run the DTI CAT991 setup software. If the system displays a configuration error, press F2 to run the setup software.

For more information on running the setup software for the processor board used in version 3 of the 386-based 5100, see the *DTI CAT991* manual, included as a separate document. Figure A-5 shows the factory settings for the DTI CAT991 board.

*Figure A-5*
*Factory Settings for the DTI CAT991 Board*

```
CAT 991
ROM UTILITIES                         CMOS SETUP

F1-SYSTEM INFO         DATE (mth/day/year)..      08/23/94
                       TIME (hour:min:sec)..      12:34:09
F2-CMOS SETUP          DAYLIGHT SAVINGS.....      DISABLED

F3-PERIPHERALS         DISKETTE 1... 1.4M
                       DISKETTE 2... NONE
F4-BIOS OPTIONS                      CYLS HEADS SECTS PRECOMP SIZE
                       HARD DISK 1.. NONE
F5-PASSWORD SETUP      HARD DISK 2.. NONE

F6-HARD DISK PREP      VIDEO........ EGA/VGA    ┌────────────────────────┐
                       KEYBOARD..... INSTALLED │ BASE MEMORY :   640 KB │
F7-PROM DISK                                    │ EXT. MEMORY : 7168 KB │
                                                └────────────────────────┘
F8-ADVANCED SETUP
SELECT,ENTER:EXECUTE
                             ESC: EXIT WITHOUT SAVING
F10-SAVE & EXIT

        COPYRIGHT (c) 1993, DIVERSIFIED TECHNOLOGY, INCORPORATED
```

*Note:* *The VIDEO parameter refers to the type of display adapter used, not the type of monitor attached. This parameter should always be EGA/VGA. Also, the DRAM WAIT STATES parameter should be set to 2 for 80 ns or faster DRAM modules.*

When you finish the DTI CAT991 setup software, press F10 to store the changes.

# BIOS Setup for Pentium-Based 5100

To complete the BIOS setup for your Pentium-based 5100, perform the following steps.

1. Run the AMI WIN-BIOS Setup Program by pressing [Del] during the initial power-up sequence when you see the following message (which is displayed for only a very short period of time):

   ```
   Press <DEL> if you want to run SETUP
   ```

2. Move to the Default Setup screen, using [Tab] or your mouse, and select the Failsafe Mode of operation.

---

*Note:* **This is the most critical step in the BIOS setup procedure** *because BoardSite software will not work properly unless this mode of operation is selected.*

3. From the Standard Setup screen, set up the following parameters. Use the arrow keys or the mouse to make selections and press ⏎ to accept your choices.

   a. **Date and Time** — Select the proper date and time. The (-) and (+) keys decrement or increment the actual parameter value.

   b. **Floppy Drive A** — Select the Floppy "A" icon, press ⏎ , and select the 1.44 3 ½" drive A.

   c. **Floppy Drive B** — Select the Floppy "B" icon, press ⏎ , and select NOT INSTALLED.

   d. **Hard Disk C** — Select the Hard Disk "C" icon, press ⏎ , and select NOT INSTALLED.

   e. **Hard Disk D** — Select the Hard Disk "D" icon, press ⏎ , and select NOT INSTALLED.

   f. Exit the Standard Setup Screen by pressing [Esc] .

4. From the Advanced Setup screen, make the following modifications. To change a parameter, use your arrow keys or mouse to highlight your selection and press ⏎ to accept your choice.

   a. System Keyboard: ABSENT
   b. Above 1 Meg Memory Test: ENABLED
   c. Parity Error Check: ENABLED
   d. System Boot Up Num Lock: OFF
   e. Exit the Advanced Setup screen by pressing [Esc] .

**ChipSet Setup**

From the ChipSet Setup screen, make the following modifications. Use your arrow keys or mouse to highlight your selection and press ⏎ to accept your choice.

1. On Board PCI IDE: DISABLED

2. On Board PCI VIDEO: DISABLED

3. Exit the ChipSet Setup Screen by pressing [Esc] .

**Peripheral Setup**

From the Peripheral Setup screen, make the following modifications. Use your arrow keys or mouse to highlight your selection and press ⏎ to accept your choice.

1. Serial Port1: 3F8H

2. Parallel Port: 378H

3. Parallel Port Mode: Bi-Dir

4. Exit the Peripheral Setup Screen by pressing Esc .

**Utility and Security Menus**

No modifications to the Utility and Security Menu options are required. (You may set these options if you wish, but it is recommended that you keep them as they are.)

**Save and Exit**

To save the BIOS changes you have made and to reboot the system, press Esc until the Saving the Changes and Exiting the Setup Program menu is displayed, select the Save Changes and Exit option, and press ⏎ .

The Pentium processor is now ready to operate with the BoardSite hardware and software.

## Pentium Processor Jumper and Cable Setup

For the proper operation of the Pentium Processor Board when installed in the BoardSite 5100 System, set up the jumpers and connect the cables as shown in the following tables.

Set up the jumpers on the Pentium processor board as shown in Table A-2. Connect the cables to the processor board as shown in Table A-3.

*Table A-2*
*Processor Board Jumper Setup*
*for Pentium-based 5100*

| Jumper | Configuration |
|--------|---------------|
| JP1 | Installed |
| JP2 | Not Installed |
| JP3 | Not Installed |
| JP4 | Not Installed (2 places) |
| JP5 | Top two positions jumpered (1 & 2) |
| JP6 | Top two positions jumpered (1 & 2) |

*Table A-3*
*Cable Connections for*
*Pentium-based 5100*

| Connect the Cable for this Component: | To This Connector: |
|---------------------------------------|--------------------|
| Pentium Processor fan | J11 |
| Keyboard/speaker assembly | J3 |
| Floppy drive | J6 |
| Serial port (COM1) | J9 |
| Syquest Drive* | J4 |

* *Requires the special SCSI cable adapter that is shipped with each processor board.*

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