American Megatrends, Inc.

Series 68 Enterprise-III

80486 EISA Motherboard

User's Guide

MAN-680
4/16/93

American Megatrends, Inc.
5555 Oakbrook Parkway, Building 200,
Norcross, GA 30093

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Revision History

10/31/92	Initial release for Rev A of the motherboard.
1/11/93	Revised for Rev B of motherboard.
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Table of Contents

Chapter 1 Introduction to VL-Bus **1**

Chapter 2 Enterprise-III Description **5**

Chapter 3 Installation **13**
Step 1 Unpack the Motherboard 13
Step 2 Set Switch and Jumper Options 15
Step 3 Install Memory 18
Step 4 Install Upgrade Processor 21
Step 5 Install the Motherboard 24
Step 6 Connect the Power Supply 25
Step 7 Connect the Keyboard 28
Step 8 Connect the Mouse 29
Step 9 Connect Cables 30
Step 10 Install Adapter Cards 34
Step 11 Perform Initial Test and Configuration 41

Chapter 4 AMIBIOS Power-On Self Test **43**

Chapter 5 AMIBIOS Setup **49**
Section 1 Running AMIBIOS Setup 51
AMIBIOS Setup Keys 52
Auto Configuration With BIOS Defaults 53
Auto Configuration With Power-On Defaults 53
Write to CMOS and Exit 54
Do Not Write to CMOS RAM and Exit 54
Section 2 STANDARD CMOS SETUP 55
STANDARD CMOS SETUP Options 55
Date And Day Configuration 55
Hard Disk Drive Types 57
Floppy Drive A and Floppy Drive B: 58
Primary Display 58
Keyboard 58
Section 3 ADVANCED CMOS SETUP 59
Typematic Rate Programming, Typematic Rate Delay, and Typematic Rate 60
System Boot Up Num Lock 61
Floppy Drive Seek At Boot 61
System Boot Up Sequence 61
System Boot Up CPU Speed 61
External Cache Memory 61
Password Checking Option 62
Video ROM Shadow 62
Boot Sector Virus Protection 64
Section 4 ADVANCED CHIPSET SETUP 65
Section 5 AMIBIOS Password Support 69

Table of Contents, Continued

Chapter 5 AMIBIOS Setup, cont'd
Section 6 Hard Disk Utility 71
When to Use AMIBIOS Hard Disk Utilities 72
Hard Disk Format Utility 73
Auto Interleave Utility 75
Hard Disk Utility Error Messages 77

Appendix A Boot Block BIOS Utility 79

Appendix B Temperature and Power Considerations 85

Appendix C Heat Dissipation 87

Appendix D EISA Configuration Worksheets 89

Index 107

Preface

To the OEM, VAR, or System Integrator

Thank you for purchasing the high performance Series 68 Enterprise-III AT-compatible motherboard from American Megatrends. It is assumed that you have also licensed the rights to use the technical documentation for the Enterprise-III. This manual was written for American Megatrends customers who are system integrators, VARs, or OEMs to assist in the proper installation and operation of the Enterprise-III motherboard. This manual is not meant to be read by the computer owner who purchases a computer with the Enterprise-III motherboard. It is assumed that you, the computer manufacturer, will use this manual as a sourcebook of information, and that parts of this manual will be included in the computer owner's manual.

Technical Support

If an Enterprise-III motherboard fails to operate as described or you are in doubt about a configuration option, please call technical support at 404-246-8600.

Acknowledgments

This manual was written by Vivek Saxena, Paul Narushoff, and Robert Cheng.

Packing Slip

You should have received:

- an Enterprise-III EISA VLB motherboard,
- the *Enterprise-III Motherboard User's Guide,*
- a diskette containing the American Megatrends ECU and EISA configuration files.
- the *American Megatrends ECU User's Guide,* and
- the AMIFlash Utility program.

Chapter 1

Introduction to VL-Bus

The Series 68 Enterprise-III EISA Local Bus Motherboard conforms to the VESA® (Video Electronics Standards Association) VL-Bus® specifications as well as the EISA (Extended Industry Standard Architecture) specification.

VL-Bus Slots are Buffered

The American Megatrends Enterprise-III VL-Bus implementation is unique. The American Megatrends VL-Bus design fully buffers both VL-Bus expansion slots. This buffering is totally transparent to the end user and preserves complete VL-Bus compatibility.

Advantages of Buffered VL-Bus

Because VL-Bus Adapter Cards sit directly on the CPU bus, the additional loading on the CPU signals can cause unreliable CPU operation. At 33 MHz, most CPU signals have Setup/Hold times in the order of 10^{-9} seconds. It is easy to see how timing can be thrown off by the additional load from devices on the VL-Bus.

The American Megatrends VL-Bus design includes full buffering for all VL-Bus expansion slots. Each VL-Bus expansion slot always appears as a fixed non-capacitive load on the CPU bus. Therefore, the end user can install any type of VL-Bus-compatible Adapter Card on the system and still be certain of totally reliable operation.

American Megatrends VL-Bus Implementation

The VL-Bus

The VL-Bus is designed to standardize the hardware interface of peripherals connected to a microprocessor-level local bus. The VL-Bus Specification is a standard set of interface, architecture, timings, electrical, and physical specifications that permits all VL-Bus products to be totally interchangeable.

VL-Bus is Based on 80486 Local Bus Design

The general architecture of the VL-Bus is designed to Intel® 80486 CPU local bus standards with additional hardware functions that accommodate VL-Bus master devices and facilitate the system I/O bus interface. The timing specifications allow VL-Bus devices to operate at the full 32-bit 80486 CPU bandwidth. *Both VL-Bus slots on the Enterprise-III motherboard have bus mastering capability.*

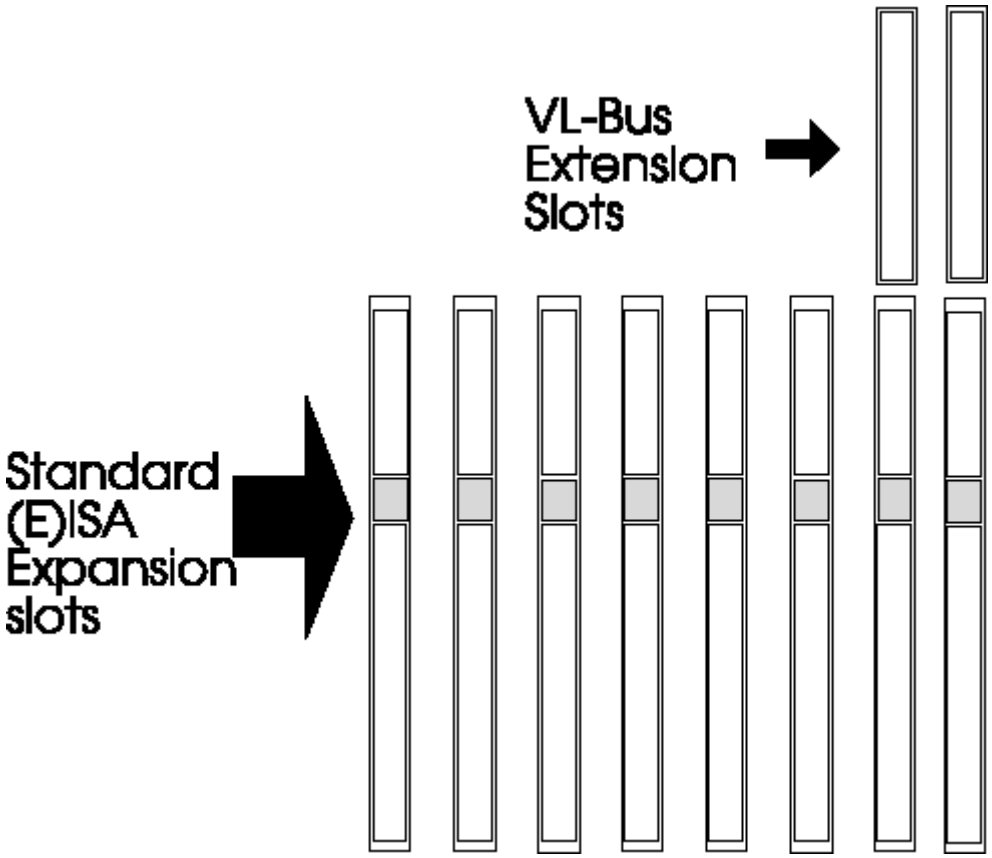
EISA and Local Bus Expansion

The American Megatrends Enterprise-III EISA Local Bus motherboard has six bus master EISA expansion slots and two VL-Bus expansion slots. The VL-Bus slots consist of a standard EISA 32-bit slot connector (with no EISA bus mastering capability but *full VL-Bus bus mastering*) and an inline VL-Bus connector.

American Megatrends VL-Bus Implementation, Continued

The following graphic shows the EISA and VL-Bus expansion slots. You can install 8-bit or 16-bit ISA or 32-bit EISA adapter cards in any expansion slot, including the VL-Bus slots. The VL-Bus expansion slots are EISA non-bus mastering slots *but have full VL-Bus bus mastering capabilities.*

EISA or ISA adapter card will have no VL-Bus functionality when installed in a VL-Bus expansion slot.



The current VL-Bus expansion socket specification includes a 16-bit MCA® (Micro Channel Architecture) expansion socket inline with a standard 32-bit EISA expansion socket connector.

A future VL-bus specification will use a 32-bit MCA connector (a total of 64 bits). The VL-Bus specification supports 32-bit EISA adapter cards.

VL-Bus Adapter Cards

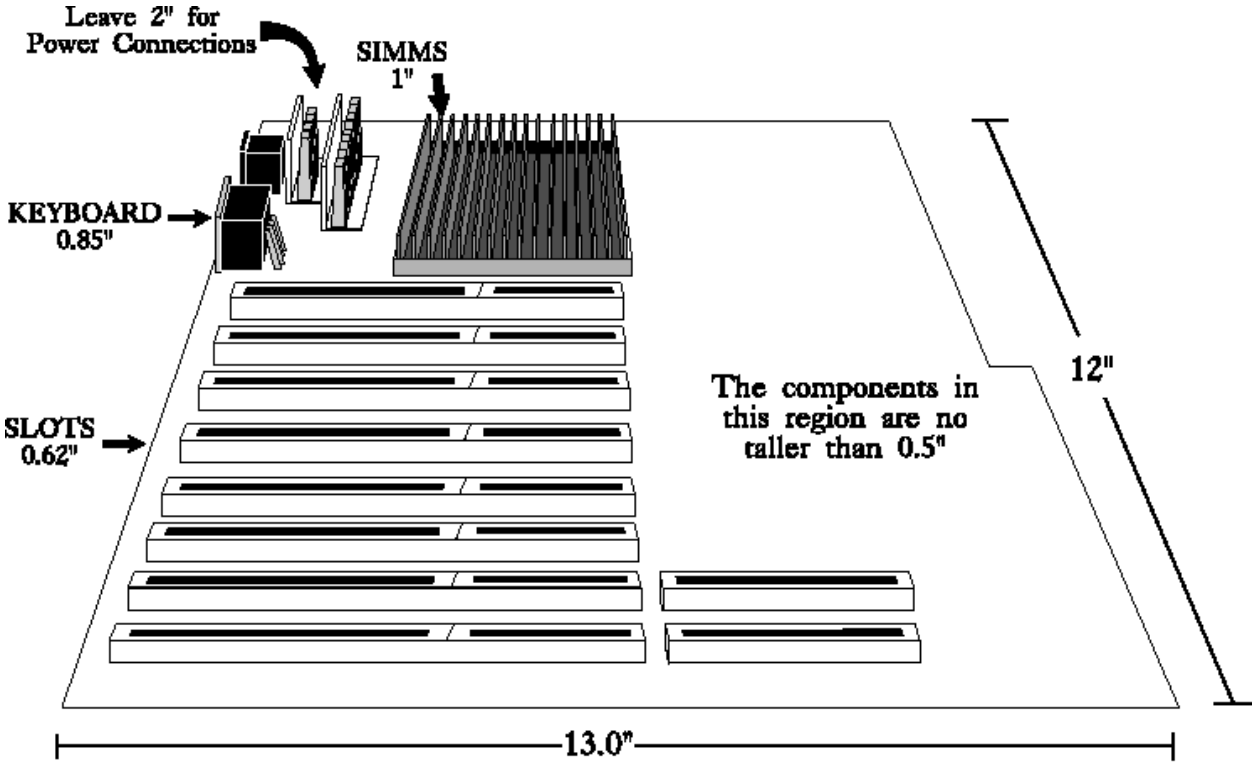
The VL-Bus Adapter Cards have a different set of connectors on the bottom of the card, as shown below. These types of adapter cards will fit in the VL-Bus expansion slots only.

Chapter 2

Enterprise-III Description

Dimensions

The American Megatrends 80486 Enterprise-III EISA Local Bus motherboard is approximately 12" by 13", similar in size to a standard AT motherboard. The mounting hole locations permit the motherboard to be used with any AT chassis. The height of the components is no more than 1½ inches, but allow 2 inches of clearance for the power supply connectors, as shown below.



Series 68 Enterprise III

Specifications

Microprocessor

Microprocessors can be installed in two sockets: the CPU socket and the Upgrade Socket. The motherboard supports the following processors:

In CPU Socket	In Upgrade Socket	Frequencies
80486DX		33 or 50 MHz
80486DX2		25 MHz (50 MHz internally), or 33 MHz (66 MHz internally)
80486SX		25 or 33 MHz
	P24T	25 MHz (50 MHz internally), or 33 MHz (66 MHz internally)
	80487SX	25 or 33 MHz
	P23T	25 MHz (50 MHz internally), or 33 MHz (66 MHz internally)

CPU Socket

The Enterprise-III has a 168-pin PGA socket for an Intel 80486DX, 80486SX, or 80486DX2 CPU.

Overdrive Support

The Enterprise-III has a 240-pin LIF Upgrade Socket for an 80487SX (if an 80486SX is in the CPU Socket) or a future Intel processor, such as the Intel P23T or P24T.

Heat Sink for 50 and 66 MHz CPUs

The Enterprise-III EISA Local Bus motherboard has a heat sink for all motherboards equipped with a 50 MHz 80486DX or 25 MHz (operates at 50 MHz internally) or 33 MHz (operates at 66 MHz internally) 80486DX2 to help dissipate heat. See page 122 for additional information about heat dissipation.

Processor Speeds

The Enterprise-III operates at either of two speeds: high or low. High speed is set at time of manufacture to the processor speed (25, 33, 50, or 66 MHz). Low speed (8 MHz) is simulated by adding extra cycles. The clock speeds can be changed via the <Ctrl> <Alt> <+> and <Ctrl> <Alt> <-> keychords. These keychords can be changed by the OEM via AMIBCP.

System Memory

The Enterprise-III EISA motherboard supports up to 256 MB of onboard memory via four banks of 16 MB x 9 SIMMs. 256 KB x 9, 1 MB x 9, and 4 MB x 9 SIMMs can also be used. Each SIMM bank consists of four SIMM slots, a total of 16 SIMM sockets. The 70 ns SIMMs must support fast page mode.

Cache Memory

The 256 KB secondary (external) cache memory uses a write-through or write-back caching algorithm. Up to 64 MB of system memory is cached. There are zero wait states for cache memory read and write for motherboards operating at speeds up to 33 MHz. Burst mode is supported.

In addition, 80486 processors have an 8 KB internal cache memory. All of system memory is cached in the 80486 internal cache memory.

Both internal and external cache memory is enabled by pressing <Ctrl> <Alt> <Shift> <+> and disabled by pressing <Ctrl> <Alt> <Shift> <->

SRAM Type

The Enterprise-III EISA Local Bus motherboard uses 15 ns 32 KB x 8 SRAM DIPs for cache memory.

ROM

The Enterprise-III EISA motherboard has 128 KB of Read Only Memory in a Flash EPROM used for the system BIOS at E0000h - FFFFFh. The AMIFlash Utility programs the Flash EPROM. AMIFlash is provided with the Enterprise-III motherboard.

Shadow RAM

AMIBIOS Setup allows you to selectively shadow the 128 KB system BIOS, video BIOS (in 32 KB increments), or Adaptor ROM BIOS (in 32 KB increments) in ADVANCED CMOS SETUP in AMIBIOS Setup.

System BIOS

The Enterprise-III EISA motherboard uses a customized AMIBIOS system BIOS with a built-in Setup configuration utility and hard disk drive utilities. Via AMIBIOS Setup, you can configure up to two user-definable hard disk drive types. You can easily configure systems with no video monitor, keyboard, or floppy disk drives in STANDARD CMOS SETUP.

CMOS RAM

The Enterprise-III has 128 bytes of standard ISA CMOS RAM to store system configuration data. ISA CMOS RAM, the real time clock, and the battery are on the Dallas DS1488 CMOS RAM/RTC chip. The Enterprise-III EISA motherboard also includes an additional 8 KB of EISA Extended CMOS RAM.

Built-in Battery

The Enterprise-III EISA motherboard uses a Dallas DS1488 CMOS RAM chip with a built-in battery.

Math Coprocessor

Enterprise-III motherboards equipped with an 80486SX support an optional Intel 80487SX math coprocessor.

Expansion Slots

The Enterprise-III has eight 32-bit EISA expansion slots. Six of these expansion slots are EISA bus mastering slots. The other two slots are VL-Bus bus mastering slots. The VL-Bus and EISA slots also can be used for 8- or 16-bit ISA adapter cards.

Seven DMA Channels

The Enterprise-III has seven DMA channels. In accordance with the EISA specifications, any DMA channel may be programmed for 8, 16, or 32-bit DMA device size and ISA compatible, type A, type B, or burst type C modes.

Fifteen Interrupt Levels

The Enterprise-III has 15 hardware interrupt levels. Of course, NMIs take precedence over the following hardware interrupts.

Priority	Label	Typical Interrupt Source
1	IRQ 0	Interval Timer 1, Counter 0 OUT
2	IRQ 1	Keyboard
3-10	IRQ 2	Used internally for IRQ 8 through IRQ 15
3	IRQ 8	Real-TIme-Clock
4	IRQ 9	EISA bus
5	IRQ 10	EISA bus
6	IRQ 11	EISA bus
7	IRQ 12	PS/2 Mouse
8	IRQ 13	Coprocessor Error
9	IRQ 14	EISA bus (Hard disk drive controller)
10	IRQ 15	EISA bus
11	IRQ 3	EISA bus (Serial Port 2)
12	IRQ 4	EISA bus (Serial Port 1)
13	IRQ 5	EISA bus (Parallel Port 2)
14	IRQ 6	EISA bus and floppy disk controller
15	IRQ 7	EISA bus (Parallel Port 1)

Timer Features

The Enterprise-III has five programmable 16-bit counter/timers.

System Arbiter

The Enterprise-III has standard EISA arbitration features.

Refresh Generation

The Enterprise-III has a refresh generation feature.

I/O Capability

The Enterprise-III accesses 32-, 16-, or 8-bit memory devices and 32-, 16-, or 8-bit I/O devices on both the VL-Bus and the EISA bus.

I/O Address Space

The Enterprise-III uses I/O addresses *x*100h through *x*3FFh for ISA compatible I/O (*x* = a "don't care" character which does not affect mapping location. For example, I/O port addresses 0100h, 1100h, 2100h, and 3100h map to the same location).

The Enterprise-III also uses the following EISA I/O port addresses:

- *s*000h through *s*0FFh for EISA expansion slot
- *s*400h through *s*4FFh for EISA expansion slot
- *s*800h through *s*8FFh for EISA expansion slot
- *s*C00h through *s*CFFh for EISA expansion slot

(*s* = EISA bus slot number, the motherboard is always 0)

Memory Range

The Enterprise-III uses 32-bit memory addresses to access 4 gigabytes of memory address space on the EISA expansion slots.

I/O Channel Check

The Enterprise-III supports the use of the I/O channel check to generate NMIs.

I/O Wait State Generation

The Enterprise-III has an open bus structure (allowing multiple microprocessors to share system resources, including memory). The Enterprise-III supports refresh of system memory from channel microprocessors.

Keyboard and Keyboard Lock

The Enterprise-III has a five-pin IBM AT-compatible DIN connector and has a keyboard lock to prevent unauthorized access.

PS/2 Mouse

A PS/2 mouse can be directly attached to a mouse connector mounted next to the keyboard connector.

Speaker

The Enterprise-III has a standard speaker attachment.

Real Time Clock

The Enterprise-III has a standard crystal-controlled AT-type real time clock. The real time clock is included with ISA CMOS RAM on the Dallas DS1488 chip.

Chapter 3

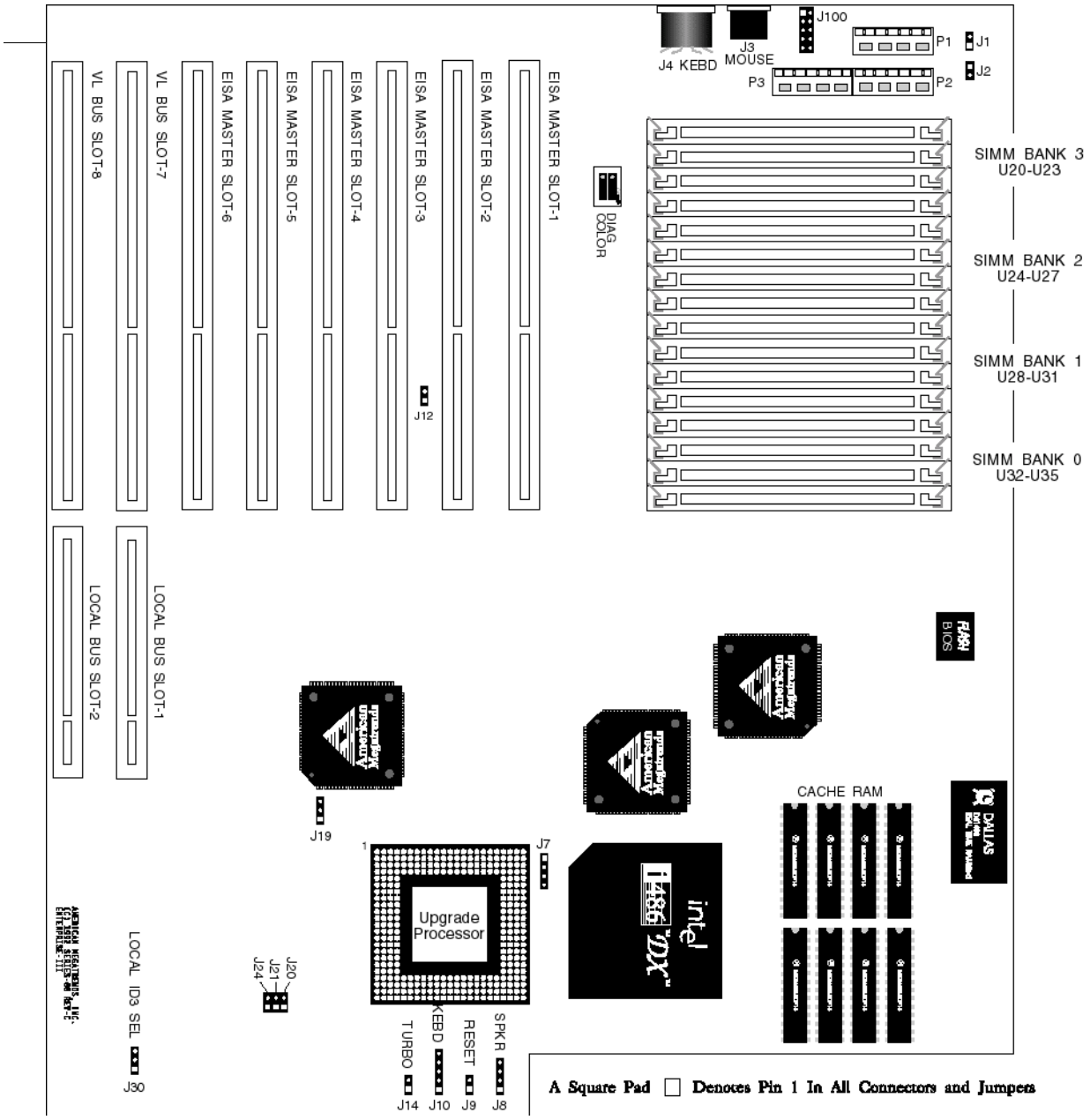
Installation

Step	Action	Turn to
1	Unpack the motherboard	Page 43
2	Set switch and jumper options.	Page 45
3	Install memory.	Page 49
4	Install upgradeable processor or math coprocessor.	Page 53
5	Install motherboard.	Page 56
6	Connect the power supply.	Page 58
7	Connect the keyboard.	Page 62
8	Connect the mouse.	Page 62
9	Connect cables.	Page 64
10	Install adapter cards	Page 68
11	Perform initial test and configuration.	Page 77

Step 1 Unpack the Motherboard

Step	Action
1	If the box is damaged, call Technical Support at 404-246-8600.
2	Perform all unpacking and installation procedures on a grounded anti-static mat. Wear an anti-static wristband, grounded at the same point as the anti-static mat or use a sheet of conductive aluminum foil grounded through a 1 megohm resistor.
3	The motherboard is packed in an anti-static bag, and sandwiched between sheets of sponge. Remove the sponge and the anti-static bag. Save the original packing material.
4	Place the motherboard on a grounded anti-static surface component-side up.
5	Inspect the motherboard for damage. Do not apply power if damaged.
6	Press down on all socketed ICs to verify proper seating.
7	If the motherboard is undamaged, it is ready to be installed.

Enterprise-III Motherboard Layout



CPU and Upgrade Socket

Intel 80486SX, 80486DX, or 8048DX2 CPUs can be inserted in the CPU socket. An Intel 80487SX math coprocessor or an Upgrade Processor (P23T or P24T) can be inserted in the Upgrade Socket.

Step 2 Set Switch and Jumper Options

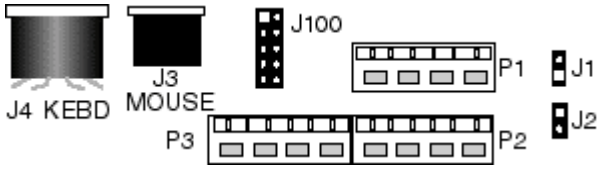
SW1

SW1 has two switches. See the graphic on the previous page for the SW1 location. Set SW1 before installation.

Switch	Description
DIAG	Turns on manufacturing diagnostics. This switch is factory-set to OFF and should remain OFF.
COL/MONO	Sets the video type. It has no effect if an EGA or VGA adapter is used. It is factory-set to OFF (for a monochrome display adapter). Set ON to use a CGA video adapter card.

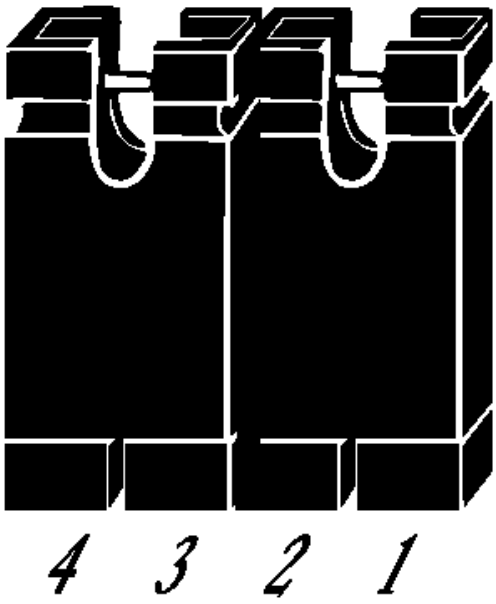
J2 Force Boot to Flash

J2 is a two-pin header next to the power supply connectors which should be OPEN (the default setting). Place a two-pin shorting bridge on J2 only when the Flash EPROM BIOS is to be updated. See the following illustration for the J2 location.



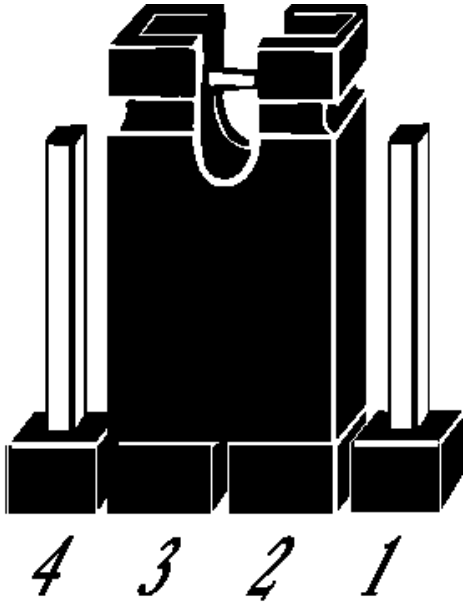
J7 Select Processor Type

J7 is a four-pin single-inline berg that selects the processor type. Pins 1-2 and 3-4 are shorted if the Enterprise-III EISA motherboard has an 80486DX or 80486DX2 microprocessor. Pins 2-3 are shorted if the motherboard has an 80486SX processor. Set J7 before installing the motherboard. See the graphic on the following page for the location of J7. J7 look like this.



Select 486DX

Short pins 1-2 & 3-4

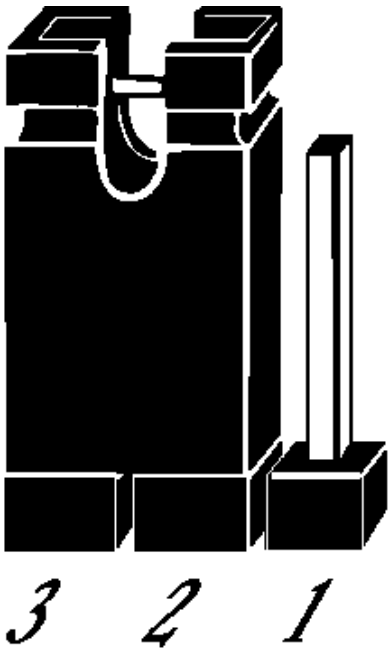


Select 486SX

Short pins 2-3

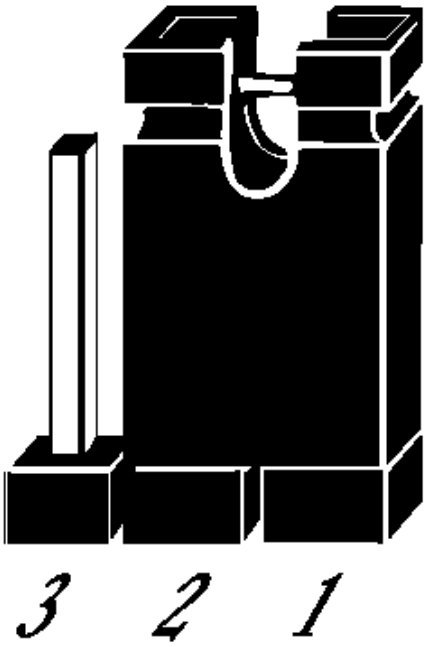
J30 Local Bus ID

J30 is a three-pin single-inline berg. In normal operation, pins 1-2 are shorted when running Local Bus Adapter Cards at 33 MHz or less (the default setting). Short pins 2-3 if running Local Bus Adapter Cards at speeds higher than 33 MHz. J30 is shown below. Set J30 before installing the motherboard. See the graphic on the next page for the location of J30.



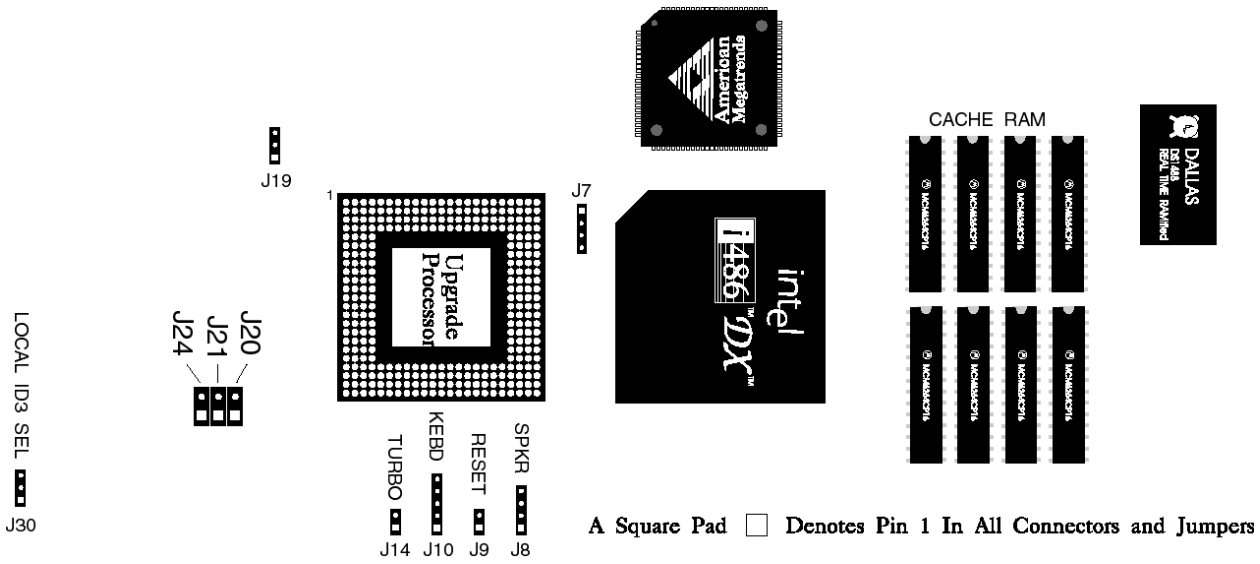
Remote ID3

Pins 2-3 Shorted



Local ID3

Pins 1-2 Shorted



J19 CPU Priority

J19 is a three-pin header that selects the CPU priority. Short pins 1-2 to set Low priority (the default setting). Short pins 2-3 to set High priority.

J20, J21, J24 Select Processor Speed

Set the following two-pin berg headers as described in the table below for 20 MHz operation.

Jumper	Setting
J20	CLOSED
J21	OPEN
J24	OPEN

Step 3 Install Memory

The main memory on the Enterprise-III EISA motherboard consists of four 32-bit memory banks of four SIMM sockets each. The SIMM sockets accept 256 KB x 9, 1 MB x 9, 4 MB x 9, or 16 MB x 9 SIMMs in the combinations shown below.

If used, SIMM banks must be completely filled, no matter which type of SIMMs are used. All SIMMs in a bank must be the same type.

For system memory, fast page mode access and hidden refresh is supported. Burst support is provided.

Possible Memory Configurations

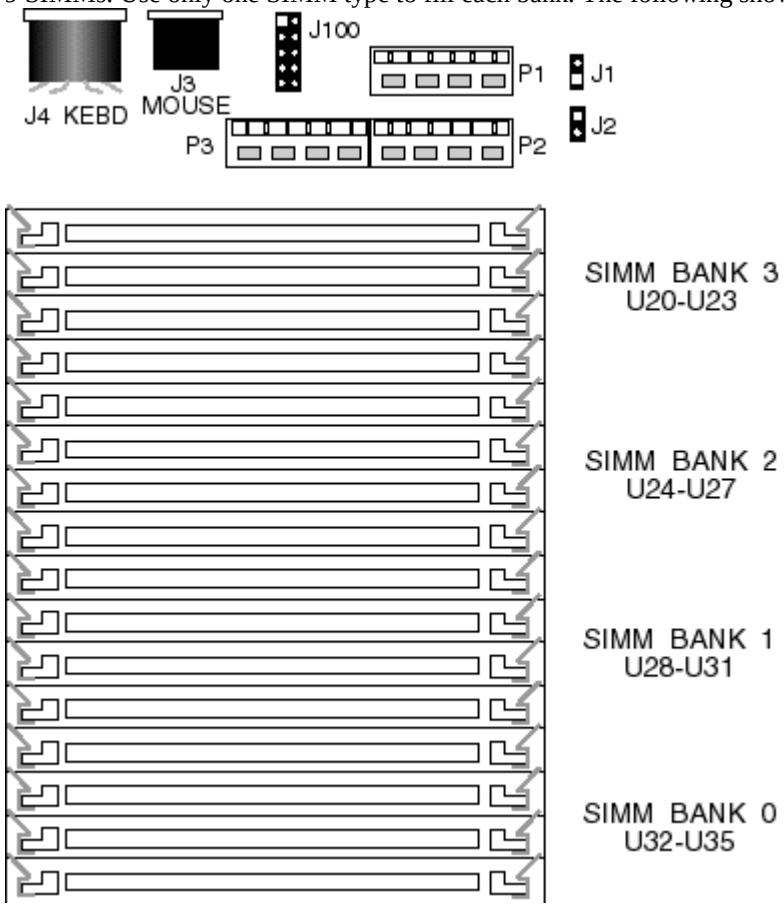
Bank0	Bank1	Bank2	Bank3	Total RAM
256 KB x 9	None	None	None	1 MB
256 KB x 9	256 KB x 9	None	None	2 MB
1 MB x 9	None	None	None	4 MB
256 KB x 9	256 KB x 9	1 MB x 9	None	6 MB
1 MB x 9	1 MB x 9	None	None	8 MB
256 KB x 9	256 KB x 9	1 MB x 9	1 MB x 9	10 MB
1 MB x 9	1 MB x 9	1 MB x 9	None	12 MB
1 MB x 9	1 MB x 9	1 MB x 9	1 MB x 9	16 MB
4 MB x 9	None	None	None	16 MB
256 KB x 9	256 KB x 9	4 MB x 9	None	18 MB
1 MB x 9	4 MB x 9	None	None	20 MB
1 MB x 9	1 MB x 9	4 MB x 9	None	24 MB
4 MB x 9	4 MB x 9	None	None	32 MB
1 MB x 9	4 MB x 9	4 MB x 9	None	36 MB
1 MB x 9	1 MB x 9	4 MB x 9	4 MB x 9	40 MB
4 MB x 9	4 MB x 9	4 MB x 9	None	48 MB
4 MB x 9	4 MB x 9	4 MB x 9	4 MB x 9	64 MB
16 MB x 9	None	None	None	64 MB
16 MB x 9	16 MB x 9	None	None	128 MB
16 MB x 9	16 MB x 9	16 MB x 9	None	192 MB
16 MB x 9	16 MB x 9	16 MB x 9	16 MB x 9	256 MB

SIMM Part Numbers

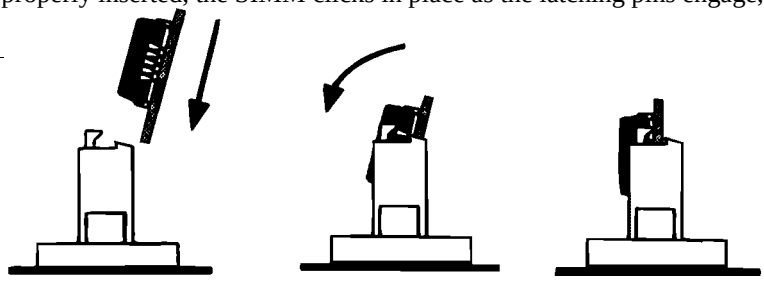
Memory Type	Manufacturer	Part Number
256 KB x 36	Micron®	MT9D25636M-7
	Mitsubishi®	MH26636BJ-7
	Motorola®	MCM36256S-70
	Oki®	MSC2320A-70YS9
	PNY®	P36256-70
	Samsung®	KMM536256B-7
1 MB x 36	Micron	MT12D136M-7
	Mistubishi	MH1M36ADJ-7
	PNY	P361000-70
	Motorola	MCM36100AS-70
	Oki	MSC2355-70YS12
	Samsung	KMM5361000AV-7
4 MB x 36	Micron	MT12D436M-7
	Mitsubishi	MH4M36SAJ-7
	Motorola	MCM36400S-70
	PNY	P364000-70
	Samsung	KMM5364100-7
16 MB x 36	Mitsubishi	MH16M09J-7
	Mitsubishi	MH16M09TJ-7
	Samsung	KMM5916000-7

Installing SIMMs

The SIMM banks have four SIMM sockets each, a total of 16 SIMM sockets. The sockets take 256 KB x 9, 1 MB x 9, 4 MB x 9, or 16 MB x 9 SIMMs. Use only one SIMM type to fill each bank. The following shows the SIMM location.



Place the motherboard on an anti-static mat. With the component side of the SIMM facing you, firmly push the SIMM into the socket. When properly inserted, the SIMM clicks in place as the latching pins engage, as shown below.



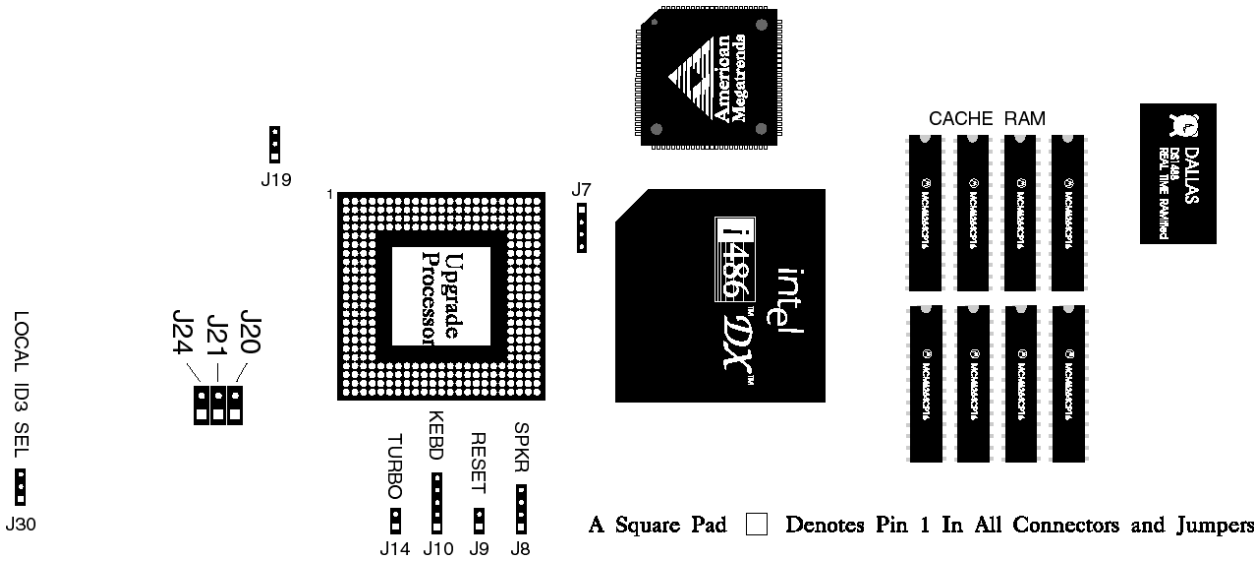
Selecting SIMMs

The SIMMs must meet the following specifications:

Parameter	Specification
Page Mode	Fast
Refresh	CAS before RAS
t_{CAC}	≤ 20 ns
t_{RAC}	≤ 70 ns
t_{AA}	≤ 45 ns
t_{RP}	70 ns
t_{CPA}	≤ 45 ns

Step 4 Install Upgrade Processor

Either an upgrade processor, such as an Intel Overdrive® processor or the Intel 80487SX math coprocessor can be installed in the Upgrade Processor Socket next to the CPU on the motherboard, as shown in the following illustration of the lower half of the motherboard.



80487SX

An 80487SX math coprocessor can be installed only if the CPU is an 80486SX. If installing an 80487SX, make sure the 80487SX coprocessor speed is the same as the 80486SX speed (20, 25, or 33 MHz).

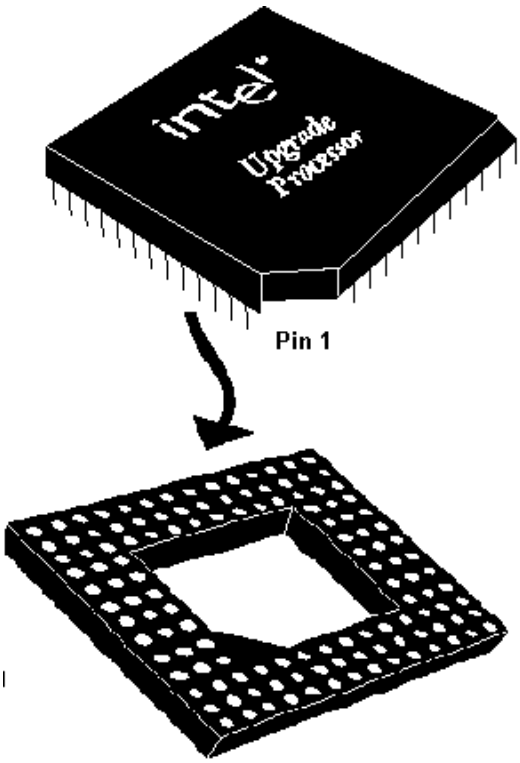
Upgradeable Processor

U33 can also be used to install a 169-pin Intel upgradeable processor, such as an Intel P23T. The installation process is the same as installing an Intel 80487SX. When a 169-pin 80487SX or P23T is installed, the outer row of socket pins is not filled.

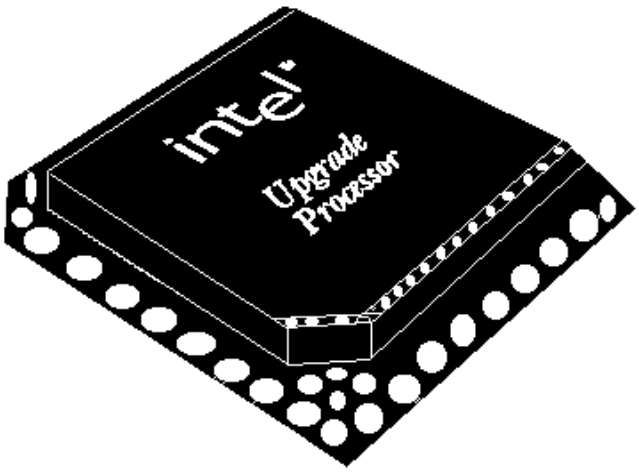
A 240-pin Upgrade Processor, such as an Intel P24T, can also be installed.

Step 4 Install Upgrade Processor, Continued

Pin 1 of the socket is on a corner next to a "1" on the motherboard. Check for bent pins on the chip. Gently straighten any bent pins with a pair of pliers. Install the component in the socket. Align the pins and press the chip firmly in the socket, making sure that pin 1 of the chip is aligned with pin 1 of the socket. When an 80487SX or P23T is properly installed, a row of empty socket pins should show on all four sides of the installed chip *(this will not happen with a P24T — a P24T is a 240-pin chip that uses all socket pins).* See the graphic on the right below.



Pin 1
Installing a Math Coprocessor
or Upgrade Processor



Pin 1
Math Crocessor or Upgrade
Processor after being Installed

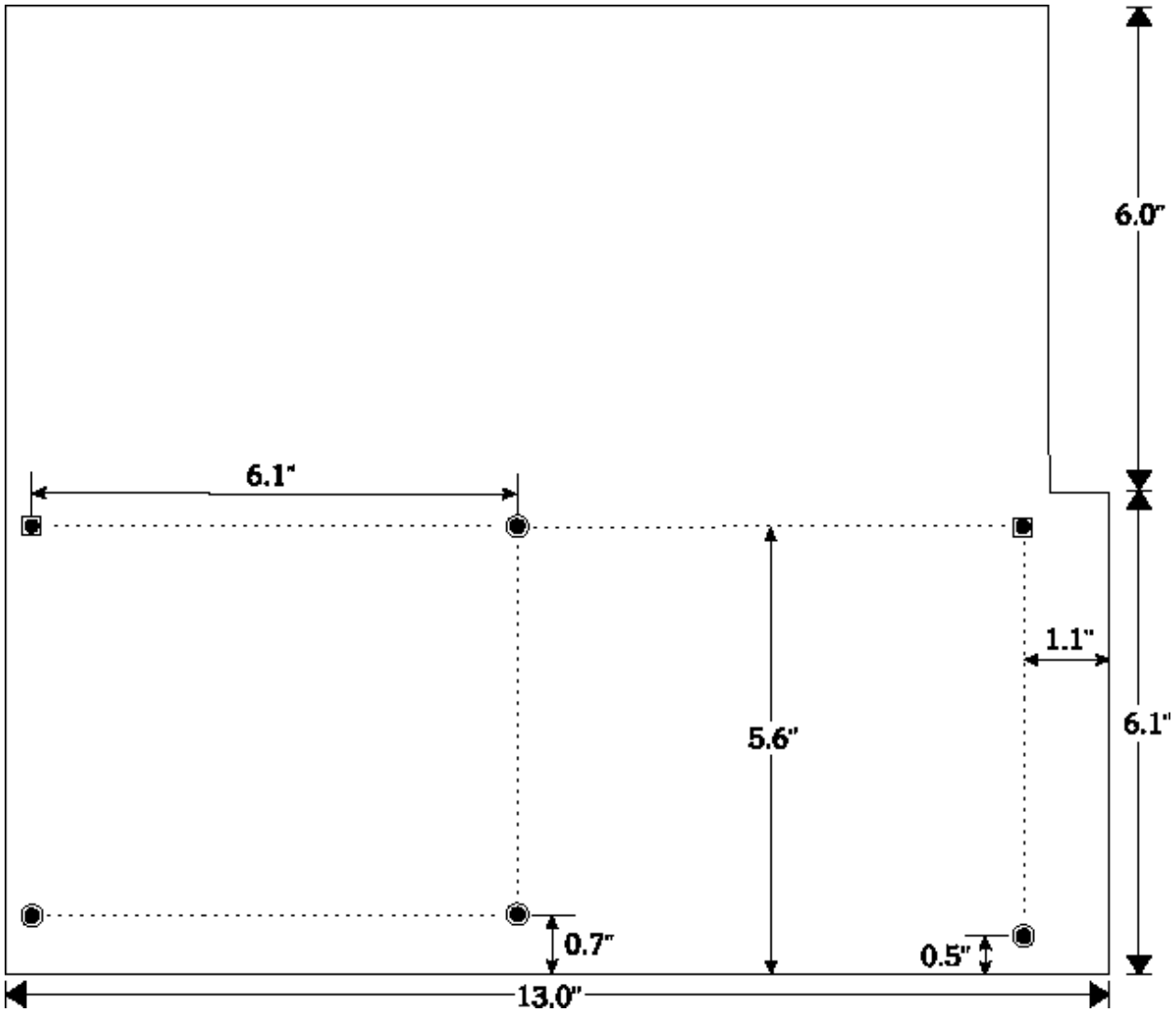
Test for Math Coprocessor

The BIOS System Configuration screen shown at boot up indicates if a math coprocessor is configured. If the coprocessor is shown as Absent, reinstall as follows.

Step	Action
1	Turn the power off.
2	Check the coprocessor orientation.
3	Press the chip firmly to make sure that it is properly inserted.
4	Inspect the coprocessor to make certain that all pins are connected.
5	Power up again. Call Technical Support at 404-246-8600 if still not configured.

Step 5 Install the Motherboard

The mounting holes on the motherboard are the same as an AT motherboard. Standoffs and mounting screws should be supplied with the chassis.



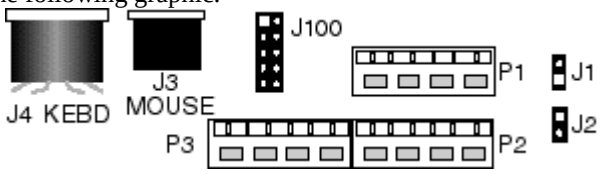
Step	Action
1	Wear an antistatic wristband. Place the chassis for the motherboard on an anti-static mat.
2	Connect the chassis to ground to avoid static damage. Connect an alligator clip with a wire lead to any unpainted part of the chassis. Ground the other end of the lead to the same point as the mat and wristband.

Step	Action
3	Rotate the chassis so that the front is to the right, and the rear is to the left. The side facing you is where the motherboard is mounted. The power supply is mounted near the back end of the chassis.
4	Push four nylon standoffs from the solder side of the motherboard in the holes provided for them. The standoffs lock in place.
5	Find the slots provided for the standoffs on the chassis. Hold the motherboard, component-side up, with the edge with three standoffs toward you and the edge with the power supply connector away from you. The edge connectors for the adapter cards should be on the left.
6	Carefully slide the motherboard into the chassis. Make certain that the standoffs fit the slots provided for them. If the standoffs are properly locked, the motherboard should not slide. It should also rest level with the chassis. The far edge should fit the slots in the plastic clips.
7	Place the two mounting screws in the holes provided for them and tighten them. If necessary, shift the motherboard slightly to align the mounting holes on the motherboard with the holes on the chassis.

Step 6 Connect the Power Supply

The power supply should match the physical configuration of the chassis. Make sure that the power switch is Off before assembly.

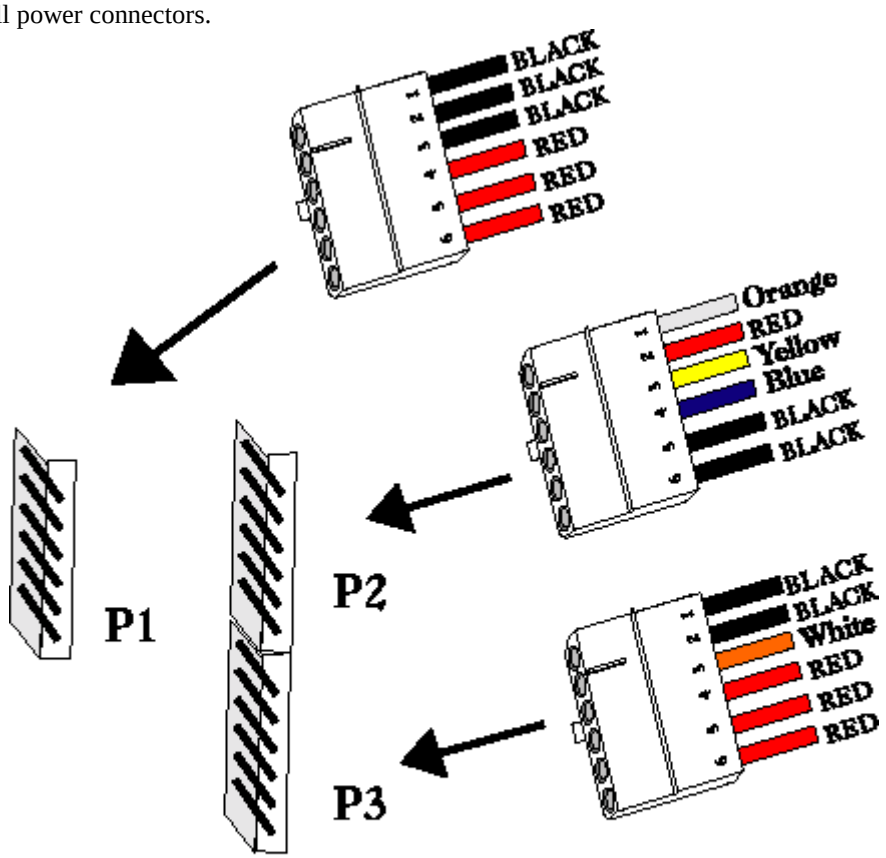
Before attaching the power cables, make sure that the proper voltage is selected. Power supplies often can run on a wide range of voltages, but must be set (usually with a switch) to the proper range. Use at least a 230 watt power supply that has built-in filters to suppress radiated emissions. If all EISA expansion slots are filled, a standard 200-250 watt power supply is not sufficient, a 300-450 watt power supply is needed. The location of the power supply connectors (P1, P2, and P3) is shown in the following graphic.



Step 6 Connect the Power Supply, Continued

Connect to P2 and P3

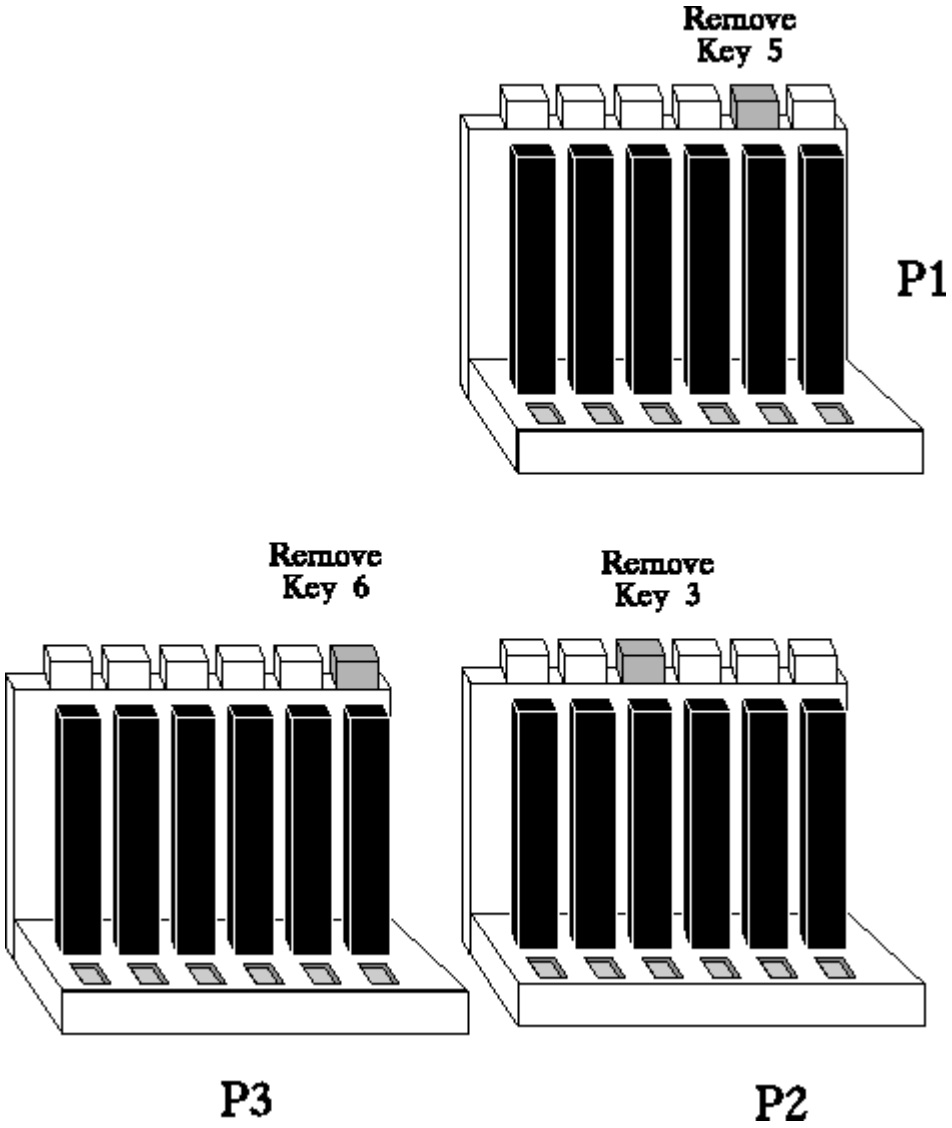
The connector with three red wires and two black wires is attached to P3. The connector with the Orange line 1 is attached to P2. P1 is provided for high capacity power supplies that have an extra cable. The following graphic shows the wire colors for all power connectors.



POWER SUPPLY CONNECTORS

Power Supply Connectors are Keyed

Power supply connectors are keyed to make sure you attach them correctly. The keys must be cut to fit on some power supplies, as shown below.



Step 6 Connect the Power Supply, Continued

P2 Pinout

Pin	Description
1	Power Good (Orange wire)
2	VCC (Red wire)
3	+12 Volts (Yellow wire)
4	-12 Volts (Blue wire)
5	Ground (Black wire)
6	Ground (Black wire)

P3 Pinout

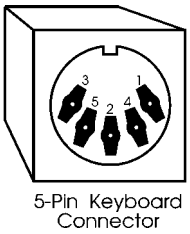
Pin	Description
1	Ground (Black wire)
2	Ground (Black wire)
3	-5 Volts (White wire)
4	VCC (Red wire)
5	VCC (Red wire)
6	VCC (Red wire)

P1 Pinout

Pin	Description
1	VCC (Red wire)
2	VCC (Red wire)
3	VCC (Red wire)
4	Ground (Black wire)
5	Ground (Black wire)
6	Ground (Black wire)

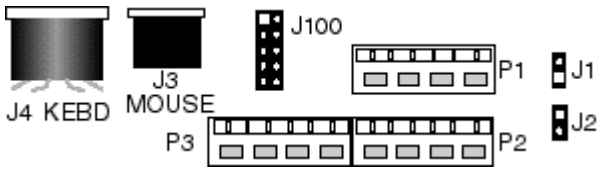
Step 7 Connect the Keyboard

The keyboard connector is a five-pin DIN socket (see below) labeled KEYBRD and J4 on the motherboard. It accepts a standard ISA keyboard.



5-Pin Keyboard Connector

Pin	Assignments
1	Keyboard clock
2	Keyboard data
3	Not used
4	Ground
5	VCC



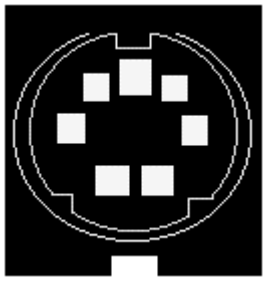
Step 8 Connect the Mouse

The American Megatrends Enterprise-III EISA VL-Bus motherboard now has two types of PS-2-type mouse connectors:

- a standard 6-pin miniDIN plug, and
- a 10-pin berg connector.

You cannot use both mouse connectors simultaneously.

J100 is a 10-pin berg connector that attaches to a PS/2-compatible mouse via a standard serial cable. J3 is a six-pin miniDIN socket (see below) labeled J3 on the motherboard. J3 accepts a PS/2-compatible mouse. The mouse connnectors are next to the keyboard connector. Attach a customized serial cable from the mouse connector to a DB9 serial port connector. You can order this cable from the American Megatrends Sales Department (404-263-8181). Ask for **Cable Assembly DB9, Male, 10-Pin,** part number **CBLSUB1-10.** J100 Pin 10 should be cut. The connector position is shown above. The J100 pinout and J100 itself are shown below. See the graphic above.



Pin	Assignments
1	Mouse clock
2	Mouse data
3	Not used
4	Ground
5	Ground
6	VCC

The DB9 connector pinout (on the other end of the cable) is:

Pin	Assignment	Pin	Assignment
1	Clock	2	N/C
3	N/C	4	N/C
5	Ground	6	N/C
7	N/C	8	FVcc
9	Data	N/A	N/A

Step 9 Connect Cables

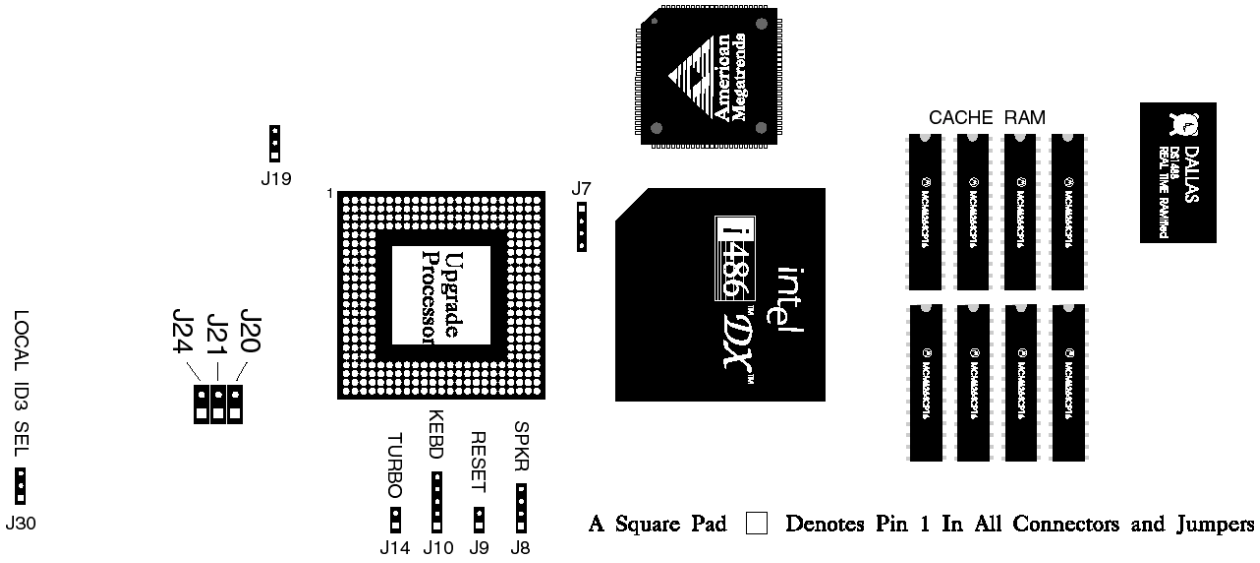
When attaching connectors to the motherboard, make sure you attach the correct end. Most connector wires are color-coded. Match the color of the wires leaving pin 1 on the switch or LED to pin 1 on the connector end. There may be more than one connector with the same color-coded wires. If so, follow the wire to the switch or LED.

Pin 1 of all connectors is labeled on the following graphic and the motherboard. Sometimes the label is obscured by a part. You can always identify Pin 1 by looking at the other side of the motherboard. All Pin 1 locations are always identified by a square pad.

Summary of Connectors

- Reset Switch cable to J9,
- Speaker cable to J8,
- Keyboard Lock cable to J10,
- Turbo LED cable to D5,
- Turbo switch cable to J14, and
- DIAG Led cable to J1.

Step 9 Connect Cables, Continued



J9 Reset Switch Connector

J9 is a two-pin single-inline berg. A hard reset is performed by the system when the Reset switch is pressed. Pin 1 is ground and Pin 2 is Hard Reset. The graphic above shows the location of J9. The following is an illustration of J9.

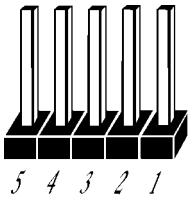
J8 Speaker Connector

J8 is a four-pin single-inline berg. Pin 1 is labeled by a plus (+). See the graphic at the top of the page for the J8 location. J8 is shown below.

Pin	Description
1	VCC
2	Key
3	Ground
4	Data Out

J10 Keyboard Lock Connector

J10 is a five-pin single-inline berg that connects via a cable to the keyboard lock. The keyboard lock allows you to lock the keyboard, protecting the system from unauthorized use. Pin 1 of J10 on the motherboard is labeled with a plus (+) sign. The connector and the J10 pinout is shown below. See the graphic at the top of the previous page for the J10 location.



Pin	Description
1	LED power
2	Key
3	Ground
4	Keyboard Lock
5	Ground

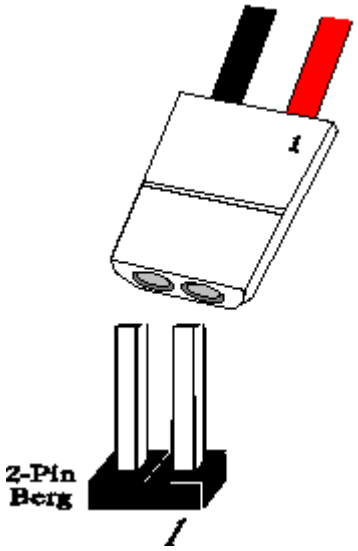
J1 DIAG LED Cable

J1 is a two-pin header that attaches via a two-wire cable to the **DIAG LED**.

Step 9 Connect Cables, Continued

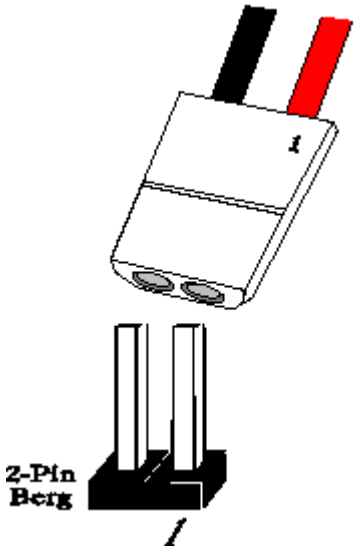
D5 Turbo LED Connector

D5 is a two-pin berg that connects to the Turbo LED via a cable. The LED lights when the board runs at high speed. Connect the Turbo LED to D5. D5 is shown below. See the graphic at the top of page 65 for the D5 location.



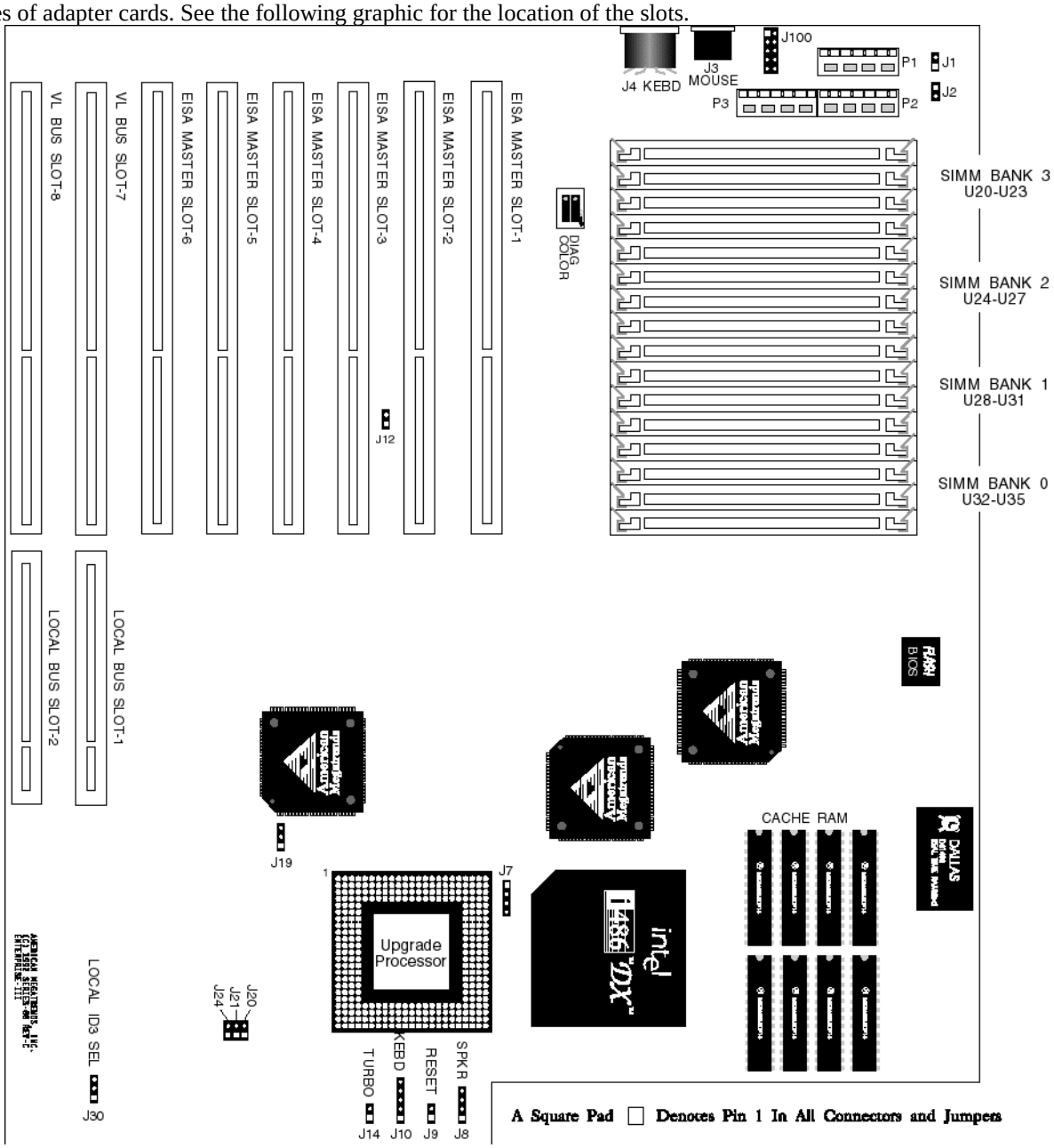
J14 Turbo Switch Connector

J14 is a two-pin berg that connects to the turbo switch mounted on the chassis via a cable, as shown below. The turbo LED switch is bipolar. You can select Low or High speed by pressing the turbo switch, attached to J14 via a connector cable. J14 is shown below. See the graphic at the top of page 65 for the J14 location.



Step 10 Install Adapter Cards

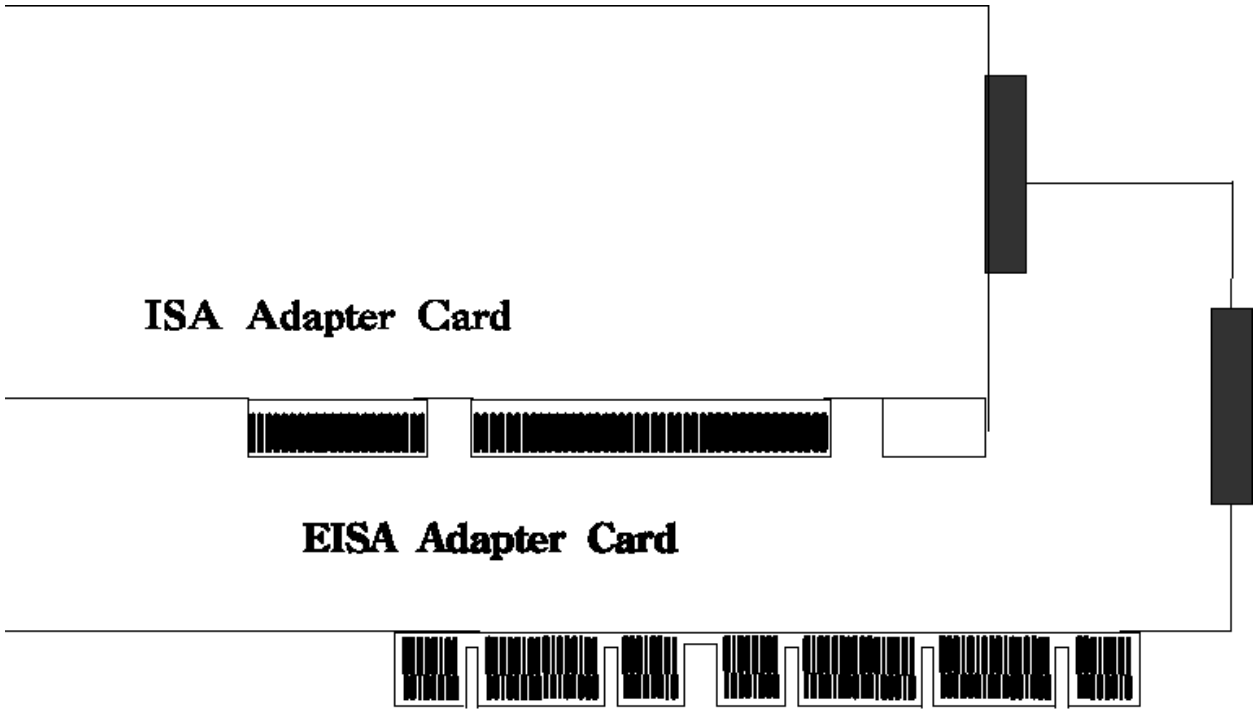
The Enterprise-III EISA motherboard has eight expansion slots numbered SLOT - SLOT8 that can accept the following types of adapter cards. See the following graphic for the location of the slots.



Type of Adapter Card	Slots
VL-Bus *Bus Mastering* 32-bit Local Bus Adapter Cards	Slots 7 and 8
EISA 32-bit *Bus Mastering* Cards	Slots 1 - 6
EISA 32-bit Non-Bus Mastering Cards	Slots 7 and 8
Standard 8-bit XT- and 16-bit AT-compatible Cards	Slots 1 - 8

EISA Adapter Cards

EISA adapter cards have different fingers on the edge connecters than ISA adapter cards. The EISA expansion slots have two rows of contacts, one below the other. AN ISA (AT-compatible) Adapter Card can be inserted into the EISA connector only far enough to make contact with the upper row of contacts. The longer fingers on EISA adapter cards allow contact with the second row of contacts. See the following graphic.



When installing EISA adapter cards, make sure that they snap in twice and are fully seated in the EISA expansion slot. If the card makes contact only with the upper row of contacts, it cannot function properly.

8-Bit ISA Slot Pinout

Pin	Use	Pin	Use
A1	IOCHCK-	B1	GND
A2	SD07	B2	RSTDRV
A3	SD06	B3	+5
A4	SD05	B4	IRQ9
A5	SD04	B5	-5
A6	SD03	B6	DREQ2
A7	SD02	B7	-12
A8	SD01	B8	OWS-
A9	SD00	B9	+12
A10	IOCHRDY	B10	GND
A11	AEN	B11	SMEMW-
A12	SA19	B12	SMEMR-
A13	SA18	B13	IOW-
A14	SA17	B14	IOR-
A15	SA16	B15	DACK3-
A16	SA15	B16	DREQ3
A17	SA14	B17	DACK1-
A18	SA13	B18	DREQ1
A19	SA12	B19	REF-
A20	SA11	B20	SYSCLK
A21	SA10	B21	IRQ7
A22	SA09	B22	IRQ6
A23	SA08	B23	IRQ5
A24	SA07	B24	IRQ4
A25	SA06	B25	IRQ3
A26	SA05	B26	DACK2-
A27	SA04	B27	T/C
A28	SA03	B28	BALE
A29	SA02	B29	+5
A30	SA01	B30	OSC
A31	SA00	B31	GND

16-Bit ISA Extension Pinout

The following 16-bit pins are an extension of the 8-bit board layout and are used in conjunction with the 8-bit board standard pins.

Pin	Use	Pin	Use
C1	SBHE-	D1	MEMCS16-
C2	LA23	D5	IOCS16-
C3	LA22	D3	IRQ10
C4	LA21	D4	IRQ11
C5	LA20	D5	IRQ12
C6	LA19	D6	IRQ13
C7	LA18	D7	IRQ14
C8	LA17	D8	DACK0-
C9	MEMR-	D9	DREQ0
C10	MEMW-	D10	DACK5-
C11	SD08	D11	DREQ5
C12	SD09	D12	DACK6-
C13	SD10	D13	DREQ6
C14	SD11	D14	DACK7-
C15	SD12	D15	DREQ7
C16	SD13	D16	+5
C17	SD14	D17	MASTER-
C18	SD15	D18	GND

32-bit EISA Slot Pinout

The following table identifies the pin values for the pins on each of the eight rows of pins on an EISA adapter card. 8- and 16-bit ISA signals are shown. Pins labeled *xxxxxx* are generally used to isolate signals on the bus from adjacent power pins. Rows A, B, C, and D are upper (ISA) contacts. Rows E, F, G, and H are lower (EISA) contacts. The following table lists the pinouts for Rows F, B, E, and A.

32-bit EISA Slot Pinout, cont'd

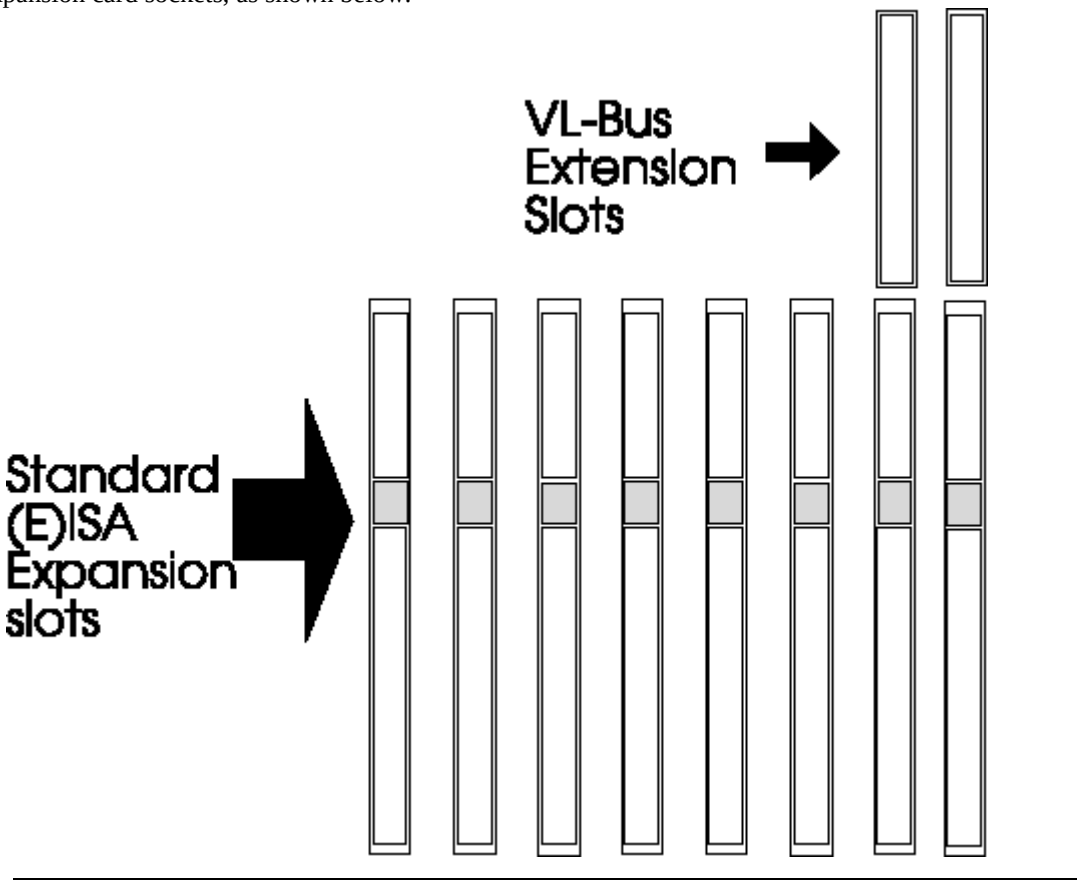
Row F	Row B	Row E	Row A
1 GND	1 GND	1 CMD#	1 IOCHK#
2 + 5 volts	2 RESDRV	2 START#	2 D7
3 + 5 volts	3 + 5 volts	3 EXRDY	3 D6
4 *xxxxxx*	4 IRQ 9	4 EX32#	4 D5
5 *xxxxxx*	5 - 5 volts	5 GND	5 D4
6 Access Key	6 DRQ 2	6 Access Key	6 D3
7 *xxxxxx*	7 - 12 volts	7 EX16#	7 D5
8 *xxxxxx*	8 NOWS#	8 SLBURST#	8 D1
9 + 12 volts	9 + 12 volts	9 MSBURST#	9 D0
10 M-IO	10 GND	10 W-R	10 CHRDY
11 LOCK#	11 SMWTC#	11 GND	11 AEN
12 Reserved	12 SMRDC#	12 Reserved	12 SA19
13 GND	13 IOWC#	13 Reserved	13 SA18
14 Reserved	14 IORC#	14 Reserved	14 SA17
15 BE# 3	15 DAK# 3	15 GND	15 SA16
16 Access Key	16 DRQ3	16 Access Key	16 SA15
17 BE# 2	17 DAK# 1	17 BE# 1	17 SA14
18 BE# 0	18 DRQ1	18 LA# 31	18 SA13
19 GND	19 REFRESH#	19 GND	19 SA12
20 + 5 volts	20 BCLK	20 LA# 30	20 SA11
21 LA# 29	21 IRQ 7	21 LA# 28	21 SA10
22 GND	22 IRQ 6	22 LA# 27	22 SA9
23 LA# 26	23 IRQ 5	23 LA# 25	23 SA8
24 LA# 24	24 IRQ 4	24 GND	24 SA7
25 Access Key	25 IRQ 3	25 Access Key	25 SA6
26 LA16	26 DAK# 2	26 LA15	26 SA5
27 LA14	27 T-C	27 LA13	27 SA4
28 + 5 volts	28 BALE	28 LA12	28 SA3
29 + 5 volts	29 + 5 volts	29 LA11	29 SA2
30 GND	30 OSC	30 GND	30 SA1
31 LA10	31 GND	31 LA9	31 SA0

32-bit EISA Slot Pinout, cont'd

Row H	Row D	Row G	Row C
1 LA8	1 M16#	1 LA7	1 SBHE#
2 LA6	2 IO16#	2 GND	2 LA23
3 LA5	3 IRQ 10	3 LA4	3 LA22
4 + 5 volts	4 IRQ 11	4 LA3	4 LA21
5 LA2	5 IRQ 12	5 GND	5 LA20
6 Access Key	6 IRQ 15	6 Access Key	6 LA19
7 D16	7 IRQ 14	7 D17	7 LA18
8 D18	8 DAK# 0	8 D19	8 LA17
9 GND	9 DRQ 0	9 D50	9 MRDC#
10 D51	10 DAK# 5	10 D52	10 MWTC#
11 D53	11 DRQ 5	11 GND	11 D8
12 D54	12 DAK# 6	12 D55	12 D9
13 GND	13 DRQ# 6	13 D56	13 D10
14 D57	14 DAK# 7	14 D58	14 D11
15 Access Key	15 DRQ# 7	15 Access Key	15 D12
16 D59	16 + 5 volts	16 GND	16 D13
17 + 5 volts	17 MASTER16#	17 D30	17 D14
18 + 5 volts	18 GND	18 D31	18 D15
19 MAXx#		19 MREQx#	

VL-Bus Cards

VL-Bus cards use the standard ISA/EISA connectors, but they also have an additional 166-pin MCA connector inline with the EISA expansion card sockets, as shown below.



VL-Bus

The first two expansion slots on the Enterprise-III EISA Local Bus motherboard are used for VL-Bus adapter cards. These VL-Bus *bus mastering* slots are labeled *Local Bus1 (VL-BUS SLOT-7)* and *Local Bus2 (VL-BUS SLOT-8).* These slots use the standard EISA/ISA sockets and an inline 64-pin extension connector to accomodate VL-Bus-compatible adapter cards. Side A of the VL-Bus connector is the component side. Side B is the solder side. The pinout for the VL-Bus connector follows:

Pin	Use	Pin	Use
A1	DAT01	B1	DAT00
A2	DAT03	B2	DAT02
A3	GND	B3	DAT04
A4	DAT05	B4	DAT06
A5	DAT07	B5	DAT08
A6	DAT09	B6	GND
A7	DAT11	B7	DAT10
A8	DAT13	B8	DAT12
A9	DAT15	B9	VCC
A10	GND	B10	DAT14
A11	DAT17	B11	DAT16
A12	VCC	B12	DAT18
A13	DAT19	B13	DAT20
A14	DAT21	B14	GND
A15	DAT23	B15	DAT22
A16	DAT25	B16	DAT24
A17	GND	B17	DAT26
A18	DAT27	B18	DAT28
A19	DAT29	B19	DAT30
A20	DAT31	B20	VCC
A21	ADR30	B21	ADR31
A22	ADR28	B22	GND
A23	ADR26	B23	ADR29
A24	GND	B24	ADR27
A25	ADR24	B25	ADR25

Step 10 Install Adapter Cards, Continued

VL-Bus, cont'd

Pin	Use	Pin	Use
A26	ADR22	B26	ADR23
A27	VCC	B27	ADR21
A28	ADR20	B28	ADR19
A29	ADR18	B29	GND
A30	ADR16	B30	ADR17
A31	SA00	B31	GND
A32	ADR12	B32	VCC
A33	ADR10	B33	ADR13
A34	ADR08	B34	ADR11
A35	GND	B35	ADR09
A36	ADR06	B36	ADR07
A37	ADR04	B37	ADR05
A38	WBACK#	B38	GND
A39	BE0#	B39	ADR03
A40	VCC	B40	ADR02
A41	BE1#	B41	N/C
A42	BE2#	B42	RESET#
A43	GND	B43	D/C#
A44	BE3#	B44	M/IO#
A45-47	A05#	B45-47	W/R#
A48	LRDY#	B48	RDYRTN#
A49	LDEV<>#	B49	GND
A50	LREQ<>#	B50	IRQ9
A51	GND	B51	BRDY#
A52	LGNT<>#	B52	BLAST#
A53	VCC	B53	ID0
A54	ID5	B54	ID1
A55	ID3	B55	GND
A56	ID4	B56	LCLK
A57	LKEN#	B57	VCC
A58	LEADS#	B58	LBS16#

Step 11 Perform Initial Test and Configuration

Before powering up the system:

_ make sure that all adapter cards are seated properly,
_ make sure all connectors are properly seated,
_ if a math coprocessor or Upgradable Processor is used, make sure it is seated properly,
_ make sure there are no screws or other foreign material on the motherboard,
_ plug the system into a surge-protected power strip, and
_ make sure blank back panels are installed on the back of the chassis to minimize RF emissions.

Step 11 Perform Initial Test and Configuration, Continued

Start the Test

Plug everything in and turn on the switch. If there are any signs of a problem, turn off the unit immediately. Reinstall the connectors. Call Technical Support at 404-246-8600 if there are problems.

Configure the System

Run AMIBIOS Setup to save configuration data in CMOS RAM. The system then resets, runs POST, and boots the operating system. See page 91 for a description of STANDARD CMOS SETUP configuration options.

Running AMIBIOS POST

If the system operates normally, a memory display should appear on the monitor. The BIOS Power On Self Test (POST) should run. POST beeps or displays error messages is unsuccessful.

There is a serious problem if the system beeps. The beeps are part of a Beep Code (see page 80) that indicates a bad component. Make sure the affected part is properly seated and connected. If the BIOS is able to initialize the system video monitor, messages (described on page 81) are displayed on the screen.

Run the ECU

Run the American Megatrends EISA Configuration Utility (ECU) to properly configure the system. The ECU and the appropriate motherboard .CFG and .OVR files are shipped on a floppy disk with all Enterprise-III EISA VL-Bus motherboards. The *American Megatrends EISA Configuration Utility User's Guide* provides complete details about running the ECU.

Chapter 4

AMIBIOS Power-On Self Test

AMIBIOS provides all IBM-standard POST routines as well as enhanced POST routines. POST supports CPU internal diagnostics. POST codes are accessible via the Manufacturing Test Port (I/O Port 80h).

POST Phases

When the system is powered on, AMIBIOS executes POST routines. The POST phases are:

System Test and Initialization (test and initialize motherboards for normal operations) and

System Configuration Verification (compare defined configuration with hardware actually installed).

BIOS Error Reporting

If...	then...
the error occurs before the display device is initialized,	a series of beeps sound. Beep codes indicate that a fatal error occurred. The Beep Codes are described on the next page.
the error occurs after the display device is initialized,	the error message is displayed. Displayed BIOS error messages are explained on page 81. A prompt to press <F1> can also appear with displayed error messages.

Beep Codes

Fatal errors, listed below, are communicated through a series of audible beeps. All errors except Beep Code 8 are fatal. Fatal errors halt the boot process.

In most cases, displayed errors allow the system to continue. AMIBIOS displayed errors are described on page 81.

Beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry on the motherboard is faulty.
2	Parity Error	A parity error was detected in the base memory (the first 64 KB block) of memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.
4	Timer Not Operational	A memory failure occurred within the first 64 KB of memory. Or Timer 1 on the motherboard is not functioning.
5	Processor error	The CPU generated an error.
6	8042 - Gate A20 Failure	Gate A20 on the keyboard controller (8042) allows the CPU to operate in protected mode. The BIOS is not able to switch the CPU to protected mode.
7	Processor Exception Interrupt Error	The CPU generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM Checksum Error	The ROM checksum does not match the value encoded in the BIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed.
11	Cache memory bad — do not enable cache	The cache memory test failed. Cache memory is disabled.

Troubleshooting System Problems

What to Do If the Computer Beeps

Here is what you need to do if your computer has an AMIBIOS and it starts beeping:

If the system beeps...	then...
1, 2, or 3 times...	reseat the memory SIMMs or DIPs. If the system still beeps, replace the memory.
6 times...	reseat the keyboard controller chip. If it still beeps, replace the keyboard controller. If it still beeps, try a different keyboard, or replace the keyboard fuse, if the keyboard has one.
8 times...	there is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS chip is bad. The system probably needs a new BIOS ROM chip.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	the motherboard must be replaced.

AMIBIOS Displayed Error Messages

Error message are displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press the <F1> key to continue
```

and the system halts. The system does not halt if *Wait for <F1> If Any Error* in ADVANCED CMOS SETUP is *Disabled.*

Error Message	Explanation
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry on the motherboard.
C: Drive Error	Drive C: may be missing. Run the BIOS Hard Disk Utility. Check the C: hard disk type in STANDARD CMOS SETUP.
C: Drive Failure	No response from hard disk drive C:. Replace drive C:.
Cache Memory Bad, Do Not Enable Cache!	Cache memory on the motherboard is defective. Test cache memory with AMIDiag.
CH-2 Timer Error	Error in timer 2.
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	After CMOS RAM settings are saved, a checksum is generated. This message appears if the previous checksum differs from the current checksum. Run AMIBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run AMIBIOS Setup.
CMOS Display	The video type in CMOS RAM does not match the type detected

AMIBIOS Displayed Messages, Continued

Error Message	Explanation
Type Mismatch	by the BIOS. Run AMIBIOS Setup.
CMOS Memory Size Mismatch	The amount of memory on the motherboard is different than the amount in CMOS RAM. Run AMIBIOS Setup.
CMOS Time & Date Not Set	Run STANDARD CMOS SETUP to set the date and time in CMOS RAM.
D: Drive Error	No response from hard disk drive D:. Drive D: may be missing. Run the AMIBIOS Hard Disk Utility. Check the D: hard disk type in STANDARD CMOS SETUP.
D: drive failure	No response from hard disk drive D:. Replace drive D:.
Diskette Boot Failure	The boot disk in floppy drive A: is corrupt. It cannot be used to boot the system. Use another boot disk and follow the screen instructions.
Display Switch Not Proper	Some systems require a video switch on the motherboard be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	Error in the DMA controller on the motherboard.
DMA #1 Error	Error in the first DMA channel on the motherboard.
DMA #2 Error	Error in the second DMA channel on the motherboard.
FDD Controller Failure	The BIOS cannot communicate with the floppy controller. Check all connections after the system is powered down.
HDD Controller Failure	The BIOS cannot communicate with the hard disk controller. Check all connectors after the system is powered down.
INTR #1 Error	Interrupt channel 1 failed POST.
INTR #2 Error	Interrupt channel 2 failed POST.
Invalid Boot Diskette	The BIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked...Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue the boot process.
Keyboard Error	Timing problem with the keyboard. Set *Keyboard* in STANDARD CMOS SETUP to *Not Installed* to skip the keyboard POST routines.
KB/Interface Error	Error in the keyboard connector on the motherboard.
No ROM BASIC	Cannot find a proper bootable sector on either drive A: or hard disk drive C:. ROM Basic (INT 18h) does not run. The BIOS cannot find ROM Basic.
Off Board Parity Error	Parity error in adapter card memory. The format is: `OFF BOARD PARITY ERROR ADDR (HEX) = (XXXX)` *XXXX* is the hex address where the error occurred. Run AMIDiag to find memory errors.
On Board Parity Error	Parity error in motherboard memory. The format is: `ON BOARD PARITY ERROR ADDR (HEX) = (XXXX)` *XXXX* is the hex address where the error occurred. Run AMIDiag to find memory errors.
Parity Error ????	Parity error in system memory but the address cannot be determined. Run AMIDiag to fin memory errors.

EISA AMIBIOS Error Messages

Error Message	Explanation
EISA CMOS Checksum Failure	The Checksum for EISA CMOS is incorrect. Replace the EISA Extended CMOS RAM battery.
EISA CMOS inoperational	Read/Write error in extended CMOS RAM. The battery may need to be replaced.
Expansion Board not ready at Slot *X, Y, Z*	Cannot find the adapter card in Slot *X, Y*, or *Z*. Make sure the adapter card is in the correct slot and is seated correctly.
Fail-Safe Timer NMI Inoperational	Devices that depend on the fail-safe NMI timer will not operate correctly.
ID information mismatch for Slot *X, Y, Z*.	The ID of the EISA Adapter Card in Slot *X, Y*, or *Z* does not match the ID in EISA CMOS RAM.
Invalid Configuration Information for Slot X, Y, Z.	The configuration information for EISA Adapter Cards *X, Y*, or *Z* is not correct. The adapter card in this slot cannot be configured. Run the ECU.
Software Port NMI Inoperational	The software port NMI is not working.

EISA NMI Messages

EISA NMI Message	Explanation
BUS Timeout NMI at Slot *n*	Bus Timeout NMI at Slot *n*.
(E)nable (D)isable Expansion Board?	Type *E* to enable the adapter card that had an NMI or *D* to disable it.
Expansion Board Disabled at Slot *n*	The adapter card in Slot *n* is disabled.
Expansion Board NMI at Slot *n*	An expansion board NMI occurred in Slot *n*.
Fail-Safe Timer NMI	Fail-safe timer NMI generated.
Software Port NMI	Software port NMI generated.

ISA NMI Messages

NMI Message	Explanation
Memory Parity Error at *xxxxx*	Memory failed. If the memory location is known, it is displayed as *xxxxx*. If not, the message is *Memory Parity Error ????*.
I/O Card Parity Error at *xxxxx*	An adapter card failed. If the address is known, it is displayed as *xxxxx*. If not, the message is *I/O Card Parity Error ????*.
DMA Bus Time-out	A device drove the bus signal for more than 7.8 µseconds.

BIOS Configuration Summary Screen

```
AMIBIOS System Configuration (C) 1985-1992 American Megatrends Inc.

Main Processor       : 486DX2          Base Memory Size      : 640 KB
Numeric Processor    : Present         Ext. Memory Size      : 15360 KB
Floppy Drive A:      : 1.2 MB 5½       Hard Disk C: Type     : 44
Floppy Drive B:      : 1.44 MB 5¼      Hard Disk D: Type     : None
Display Type:        : VGA/PGA/EGA     Serial Port(s)        : 3F8
AMIBIOS Date:        : 11/11/92        Parallel Port(s)      : 378
```

33MHz CPU Clock
256KB CACHE MEMORY

BIOS Identification Strings

The BIOS Identification String is displayed at the bottom of the screen during the memory test. You will need this string when reporting AMIBIOS problems.

```
AMIBIOS (C) 1992 American Megatrends Inc.,
BIOS Release 68121892

xxxxx KB OK

Press <DEL> if you want to run SETUP

(C) American Megatrends Inc.,
41-0000-009999-00111111-060692-AMIS68-F
```

Enable the *Wait for <F1> If any Error* option in ADVANCED CMOS SETUP, then press <Ins> to display two more Strings.

Step	Action
1	When a problem occurs, freeze the screen by powering on the system and holding a key down on the keyboard.
2	Copy the BIOS ID Strings on a sheet of paper before calling American Megatrends technical support at 404-246-8600.
3	Press <F1> to continue the boot process.
4	`Hit <DEL> if you want to run SETUP` is displayed. You can press <Del> to access AMIBIOS Setup.

Chapter 5

AMIBIOS Setup

Keyboard Speed Switching

You can increase processor speeds at any time by pressing <Ctrl> <Alt> <+>. Processor speed can be decreased by pressing <Ctrl> <Alt> <->.

Of course, the OEM can modify these keystroke combinations through AMIBCP. The above settings are the default settings.

Cache Memory Enable

You can enable both internal and external cache memory by pressing <Ctrl> <Alt> <Shift> <+>. You can disable cache memory by pressing <Ctrl> <Alt> <Shift> <->.

Of course, the OEM can modify these keystroke combinations through AMIBCP. The above settings are the default settings.

AMIBIOS Setup Parts

AMIBIOS Setup is divided into three parts:

- STANDARD CMOS SETUP,
- ADVANCED CMOS SETUP, and
- ADVANCED CHIPSET SETUP.

STANDARD CMOS SETUP

AMIBIOS STANDARD CMOS SETUP, discussed in Section 1 beginning on page 91, configures system components such as floppy drives, hard disk drives, monitor type, and the keyboard.

ADVANCED CMOS SETUP

ADVANCED CMOS SETUP, discussed in Section 3 beginning on page 95, configures the system password, keyboard typematic rate, boot sequence and speed, and enables system performance features, such as Fast Gate A20 support.

ADVANCED CHIPSET SETUP

ADVANCED CHIPSET SETUP configures chipset-specific options and is discussed in Section 4, beginning on page 100.

Section 1

Running AMIBIOS Setup

AMIBIOS Setup resides in ROM and is available when the computer is turned on. AMIBIOS Setup permits the end user to configure these system parameters (type of disk drives and monitor, day, date, and time, and so on). The parameters are stored in CMOS RAM. When the computer is turned off, a back-up battery provides power to CMOS RAM, which retains these parameters. The system is configured with these values when powered on.

Default Values

If the configuration values in CMOS RAM become corrupted, the system is configured with the default settings stored in this ROM file. There are two sets of BIOS settings stored in the ROM file: the BIOS Setup defaults and the Power-On defaults. See page 89 for more information on default settings.

Starting AMIBIOS Setup

When POST completes, the following appears:

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

Press <Del> to run AMIBIOS Setup.

Warning Message

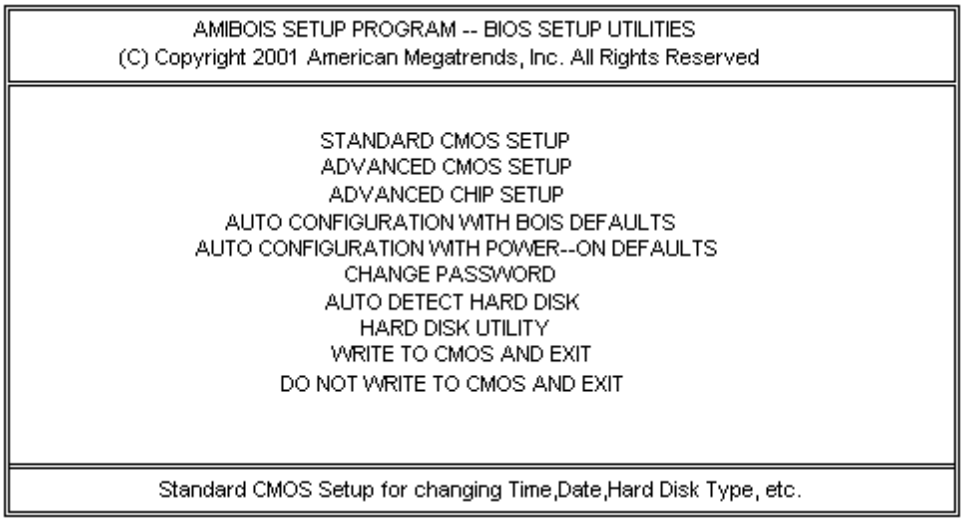
A warning is displayed when STANDARD CMOS SETUP, ADVANCED CMOS SETUP, or ADVANCED CHIPSET SETUP is selected. Press <Enter> to display the next screen.

AMIBIOS Setup Keys

Keystroke	Action
<Esc>	Returns to previous screen.
→, ←, ↓, ↑	Move the cursor from one option to the next.
<PgUp> and <PgDn>; <Ctrl><PgUp> and <Ctrl><PgDn>	Modify the default setting of the options for the highlighted parameter. If there are fewer than 10 options, <Ctrl> <PgUp> and <Ctrl> <PgDn> operate like <PgUp> and <PgDn>.
<F1>	Displays Help.
<F2>	Change background colors.
<F3>	Change foreground colors.
<F5>	Restores the settings resident when the current Setup session began. These settings are taken from CMOS RAM if CMOS RAM was uncorrupted at the start of the session. Otherwise, the BIOS Setup default settings are used.
<F6>	Loads all options in ADVANCED CMOS SETUP and ADVANCED CHIPSET SETUP with the BIOS Setup defaults.
<F7>	Loads all options in ADVANCED CMOS SETUP and ADVANCED CHIPSET SETUP with the Power-On defaults.
<F10>	Saves all changes made to Setup and returns to DOS.

Note: The default settings for <F5>, <F6>, and <F7> is always *N*. To execute these options, change the *N* to *Y* and press <Enter>.

AMIBIOS Setup Main Menu



Auto Configuration With BIOS Defaults

Auto Configuration With BIOS Defaults uses the default system settings for all AMIBIOS Setup options. The BIOS defaults are best-case settings that optimize system performance. If CMOS RAM is corrupted, the BIOS default settings are automatically loaded. Highlight this option, type *Y*, and press <Enter> to use BIOS defaults. The following appears:

```
Default values loaded. Press any key to continue.
```

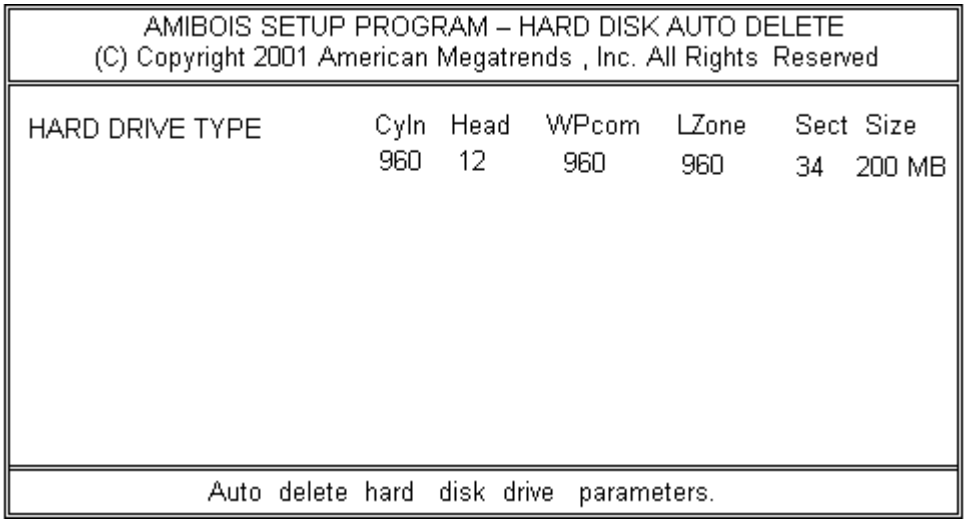
Auto Configuration With Power-On Defaults

This option configures the Power-On default settings for all AMIBIOS Setup options. These are not optimal for system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is erratic. Highlight this option, type *Y*, and press <Enter> to use the Power-On defaults. The following appears:

```
Default values loaded. Press any key to continue.
```

AUTO DETECT HARD DISK

When enabled, this option displays the parameters for IDE hard disk drives. You can accept or reject the parameters. If accepted, these parameters are displayed in STANDARD CMOS SETUP. The parameters are displayed as follows:



Write to CMOS and Exit

The selected options and new password (if any) are stored in CMOS RAM. A checksum is calculated and written to CMOS RAM. Control is passed to AMIBIOS.

```
Write to CMOS and Exit (Y/N)?
```

appears when you press <Enter> when this option is highlighted. Type *N* and press <Enter> to return to the Main Menu. Type *Y* and press <Enter> to save the system parameters and continue the boot process.

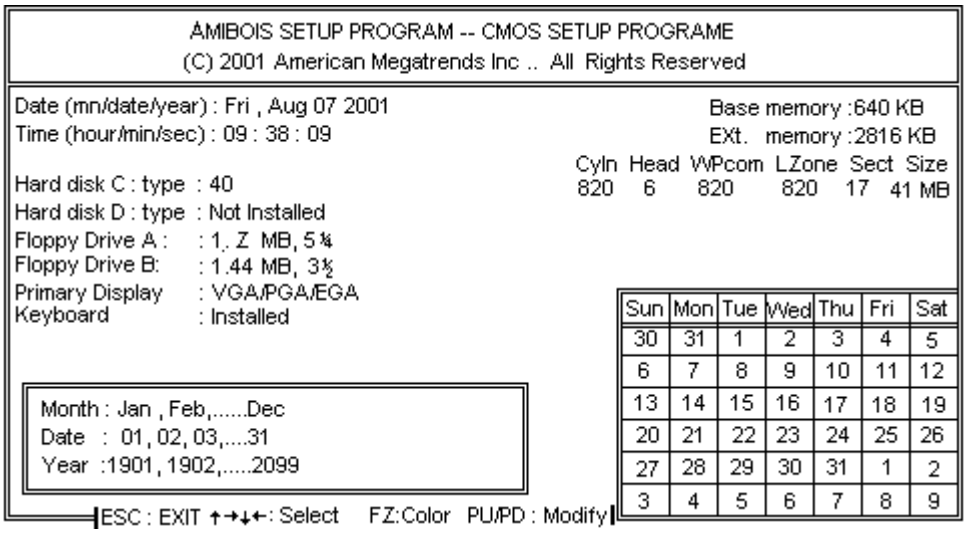
Do Not Write to CMOS RAM and Exit

This option passes control to AMIBIOS. After this option is highlighted and you press <Enter>, type *N* and press <Enter> to return to the Main Menu. Type *Y* and press <Enter> to continue to boot without saving.

Section 2

STANDARD CMOS SETUP

STANDARD CMOS SETUP is the first option on the Main Menu. Press <Enter> when *STANDARD CMOS SETUP* is highlighted. The following screen appears.



STANDARD CMOS SETUP Options

Date And Day Configuration

Move the cursor to the Date field via ↓ or ↑ and set the Date and Day by pressing <PgUp> and <PgDn> to change the settings. Ranges for each setting are shown in the lower right corner of the screen.

Time Configuration

Move the cursor to the Time field via ↓ and ↑ and set the time by pressing <PgUp> and <PgDn>. This option uses a 24 hour clock format, i.e., for PM numbers, add 12 to the hour. Enter 4:30 P.M. as 16:30:00.

Hard Disk Drive C: and D:

Use <PgUp or <PgDn> to select a hard disk drive type. *Not Installed* is used for diskless workstations and SCSI hard disk drives. Type 47 can be used for both hard disks C: and D:, and is primarily for IDE drives. The parameters for type 47 for drives C: and D: can be different, permitting user-definable hard disk drives.

Using Auto Detect Hard Disk

If you select the Auto Detect Hard Disk option from the AMIBIOS Main Menu screen, the AMIBIOS automatically finds all IDE hard disk drive paremeters. AMIBIOS places the hard disk drive parameters that it finds in the Hard Dive C: or Hard Drive D: field in STANDARD CMOS SETUP and sets Type 47. All you have to do is accept these values.

Otherwise, you must enter the hard drive parameters, described in the following table. The hard disk drive type parameters are shown on the following page.

Parameter	Description
Type	The number designation for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads in the disk drive.
Write Precompensation	The size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write precompensation circuitry on the disk drive compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This is the track number where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads normally park when the system is shut down.
Sectors	The number of sectors per track. Hard drives that use MFM have 17 sectors per track. RLL drives have 26 sectors per track. ARLL and ESDI drives have 34 sectors per track. SCSI and IDE drives can have even more sectors per track.
Capacity	The formatted capacity of the drive is the Number of Heads x Number of Cylinders x Number of Sectors per Track x 512 bytes (Bytes per Sector).

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Size
1	306	4	128	305	17	10 MB
2	615	4	300	615	17	20 MB
3	615	6	300	615	17	31 MB
4	940	8	512	940	17	62 MB
5	940	6	512	940	17	47 MB
6	615	4	65535	615	17	20 MB
7	462	8	256	511	17	31 MB
8	733	5	65535	733	17	30 MB
9	900	15	65535	901	17	112 MB
10	820	3	65535	820	17	20 MB
11	855	5	65535	855	17	35 MB
12	855	7	65535	855	17	50 MB
13	306	8	128	319	17	20 MB
14	733	7	65535	733	17	43 MB
16	612	4	0	663	17	20 MB
17	977	5	300	977	17	41 MB
18	977	7	65535	977	17	57 MB
19	1024	7	512	1023	17	60 MB
20	733	5	300	732	17	30 MB
21	733	7	300	732	17	43 MB
22	733	5	300	733	17	30 MB
23	306	4	0	336	17	10 MB
24	925	7	0	925	17	54 MB
25	925	9	65535	925	17	69 MB
26	754	7	754	754	17	44 MB
27	754	11	65535	754	17	69 MB
28	699	7	256	699	17	41 MB
29	823	10	65535	823	17	68 MB
30	918	7	918	918	17	53 MB
31	1024	11	65535	1024	17	94 MB
32	1024	15	65535	1024	17	128 MB
33	1024	5	1024	1024	17	43 MB
34	612	2	128	612	17	10 MB
35	1024	9	65535	1024	17	77 MB
36	1024	8	512	1024	17	68 MB
37	615	8	128	615	17	41 MB
38	987	3	987	987	17	25 MB
39	987	7	987	987	17	57 MB
40	820	6	820	820	17	41 MB
41	977	5	977	977	17	41 MB
42	981	5	981	981	17	41 MB
43	830	7	512	830	17	48 MB
44	830	10	65535	830	17	69 MB
45	917	15	65535	918	17	114 MB
46	1224	15	65535	1223	17	152 MB
47	ENTER PARAMETERS PROVIDED BY HARD DRIVE MANUFACTURER					

Floppy Drive A and Floppy Drive B:

Use <PgUp or <PgDn> to select a setting. The settings are *360 KB 5¼ inch*, *1.2 MB 5¼ inch*, *720 KB 3½ inch*, *1.44 MB 3½ inch*, *2.88 MB 3½ inch*, or *Not Installed*, which could be used for diskless workstations. The BIOS does not generate error messages if *Not Installed* is selected.

Primary Display

Use <PgUp or <PgDn> to select a setting. The settings are *Monochrome*, *Color 40x25*, *Color 80x25*, *VGA/PGA/EGA*, or *Not Installed*, which could be used for network file servers. The BIOS does not generate missing monitor messages if *Not Installed* is selected.

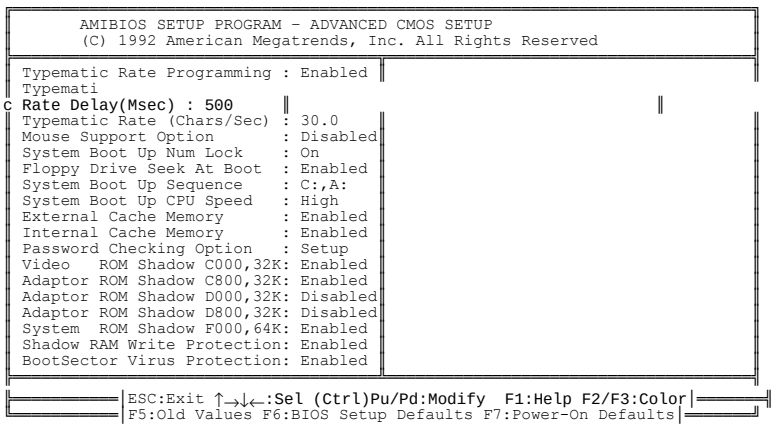
Keyboard

Use <PgUp or <PgDn> to select a setting. The settings are *Installed* or *Not Installed*. Use *Not Installed* in a keyboardless system such as a file server. The BIOS does not generate error message for a missing keyboard if *Not Installed* is selected.

Section 3

ADVANCED CMOS SETUP

The ADVANCED CMOS SETUP options are shown on the following screen. Use the ↑ and ↓ keys to scroll through the options.



Help Screens

Press <F1> to display a Help screen when a Setup option is highlighted.

Warning Message

A warning message is displayed when ADVANCED CMOS SETUP is selected. Press any key to continue.

ADVANCED CMOS SETUP Options

Typematic Rate Programming, Typematic Rate Delay, and Typematic Rate

Typematic Programming enables or disables the following two options. The BIOS default is *Enabled.* The Power-On default is *Disabled.* Typematic Rate Delay *(250, 500, 750 or 1,000 milliseconds)* and Typematic Rate *(6, 8, 10, 12, 14, 16, 24, or 30 characters per second)* control the speed at which a keystroke is repeated. A character is displayed when a key is pressed and held down. After a delay (the Typematic Rate Delay), it repeats at the Typematic Rate. The Typematic Rate Delay BIOS and Power-On defaults are *500.* The Typematic Rate BIOS default is *30.* The Power-On default is *15.*

Mouse Support Option

This option enable PS/2 mouse support. The settings are *Enabled* or *Disabled.* The BIOS and Power-On default is *Disabled.*

System Boot Up Num Lock

This option turns off Num Lock when the system is powered on so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off.* The BIOS and Power-On Defaults are *On.*

Floppy Drive Seek At Boot

This option allows you to disable the search for a floppy drive at system boot. The settings are *Enabled* or *Disabled.* The BIOS default is *Disabled*. The Power-On default is *Enabled.*

System Boot Up Sequence

This option sets the boot drive sequence. The settings are *C:,A:* or *A:,C:*. The BIOS Default is *C:,A:*. The Power-On Default is *A:,C:*.

System Boot Up CPU Speed

This option sets the system boot speed. The settings are *High* or *Low*. The BIOS and Power-On Defaults are *Low*.

External Cache Memory

This option enables secondary cache memory external to the microprocessor. The settings are *Enabled* or *Disabled*. The BIOS Default is *Enabled*. The Power-On Default is *Disabled*.

Internal Cache Memory

This option enables the 8 KB of cache memory in the 80486 microprocessor. The settings are *Enabled* or *Disabled*. The BIOS default is *Enabled*. The Power-On default is *Disabled*.

Password Checking Option

This option enables the password feature. The settings are *Setup* — AMIBIOS Setup is password-protected or *Always* (a user password prompt appears every time the system is turned on). See page 104 for more information on passwords. The BIOS Setup and Power-On default is *Setup*.

Video ROM Shadow C000,32K

This option enables shadowing of 32 KB of Video ROM at C000h – C7FFh to system RAM. The settings are *Enabled* or *Disabled.* The BIOS Default is *Enabled.* The Power-On Default is *Disabled.*

Adaptor ROM Shadow C800,32K
Adaptor ROM Shadow D000,32K
Adaptor ROM Shadow D800,32K

These options enable shadowing of 32 KB memory segments between C8000h and DFFFFh. The settings are *Enabled* or *Disabled.* The BIOS and Power-On defaults are *Disabled.*

SCSI BIOS, ESDI, LAN, or other BIOSes may be located in these segments. Shadowing speeds execution.

System ROM Shadow E000,128K

The EISA System AMIBIOS at E0000h – FFFFh is shadowed when this option is enabled. The settings are *Enabled* or *Disabled.* The system BIOS should always be shadowed for faster execution. The BIOS and Power-On default is *Enabled.*

Shadow RAM Write Protection

When enabled, this option makes sure that code that resides in ROM and has been shadowed to RAM cannot be overwritten. This option should usually be enabled. However, there are some adapter cards that cannot operate with this option enabled. If shadowing is enabled, but the system does not boot, disable this option. The settings are *Enabled* or *Disabled.* The BIOS and Power-On default is *Enabled.*

Boot Sector Virus Protection

When this option is enabled, the BIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* or *Disabled.*

If enabled, the following is displayed if any program attempts to write to the boot sector. You may have to type *N* several times to prevent the boot sector write.

```
Boot Sector Write!!!
Possible VIRUS: Continue (Y / N)? _
```

The following is displayed if any program attempts to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

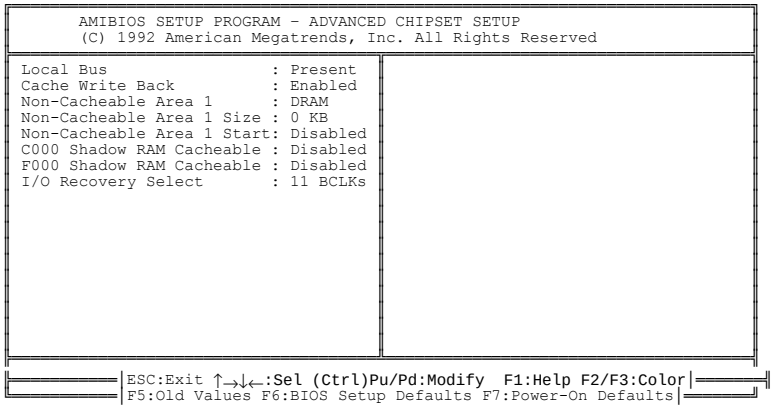
```
Format!!!
Possible VIRUS: Continue (Y / N)? _
```

The BIOS and Power-On default is *Disabled.*

Section 4

ADVANCED CHIPSET SETUP

ADVANCED CHIPSET SETUP is shown below. Use the ↑ and ↓ keys to scroll through the options.



Important Options

The ADVANCED CHIPSET SETUP options used most often are *Local Bus, I/O Recovery Select, C000 Shadow RAM Cacheable.* and *E000 Shadow RAM Cacheable.*

Help Screens

Context-sensitive Help is provided for every ADVANCED CHIPSET SETUP option. Press <F1> when the option is highlighted to display the Help screen.

Warning Screen

A warning screen appears when ADVANCED CHIPSET SETUP is selected. Press any key to continue.

ADVANCED CHIPSET SETUP Options

Local Bus

When enabled, this option adjusts some timing parameters for local bus access. If a VL-Bus Adapter Card is installed, this option must be set to *Present*. The settings are *Present* or *Absent*. The BIOS and Power-On default is *Present*.

Cache Write Back

This option enables the write-back caching algorithm. The settings are *Enabled* or *Disabled*. The BIOS default is *Enabled*. The Power-On default is *Disabled*.

Non-Cacheable Area 1

The user can select a block of memory (*Non-Cacheable Area 1)* that cannot be cached and therefore cannot be written to inadvertently. This option selects the allocation method used for Non-Cacheable Block 1. The settings are *DRAM* (local DRAM) or *ATBus* (DRAM is disabled and the AT bus is used). The BIOS and Power-On Defaults are *DRAM*.

Non-Cacheable Area 1 Size

This option sets the size of the non-cacheable memory block. The settings are *0 KB, 64 KB, 128 KB, 256 KB, 512 KB, 1 MB, 2 MB,* or *4 MB*. The BIOS and Power-On Default is *0 KB*.

Non-Cacheable Area 1 Start

This option sets the start of the non-cacheable memory block. The settings are *Disabled*. The BIOS and Power-On default is *Disabled*.

C000 Shadow RAM Cacheable

The settings are *Enabled* (the 32 KB address segment at C000h can be cached in the 8 KB 80486 internal cache) or *Disabled.* The BIOS and Power-On Defaults are *Disabled.* This internal cache memory cannot be write-protected. It may be corrupted by an external program. Before enabling this option, you must be reasonably certain that the applications running on this system does not write to the C000:0 – 07FFFh area. The BIOS Setup and Power-On default is *Disabled.*

F000 Shadow RAM Cacheable

The settings are *Enabled* (the 64 KB address segment at F000h - FFFFh can be cached in the 8 KB 80486 internal cache) or *Disabled.* The BIOS and Power-On Defaults are *Disabled.* This internal cache memory cannot be write-protected. It may be corrupted by an external program. Before enabling this option, you must be reasonably certain that the applications running on this system does not write to the F000:0 – FFFFFh area. The BIOS Setup and Power-On default is *Disabled.*

I/O Recovery Select

This option sets the length of time that the system has to recover after an I/O operation.

I/O recovery time is extremely important, especially if an 80486DX2 CPU is installed. If I/O recovery time is insufficient, device drivers (particularly those for Unix and Xenix) will fail.

The settings are *3 BCLKs, 4 BCLKs, 5 BCLKs,* or *11 BCLKs.* The setting of this option is related to the processor speed, as shown in the following table.

If the CPU type and speed is...	choose...
25 MHz 80486DX 33 MHz 80486DX	3 BCLKs
50 MHz 80486DX	5 BCLKs
50 MHz 80486DX2	5 BCLKs
66 MHz 80486DX2	11 BCLKs

The BIOS and Power-On default is *11 BCLKs.*

Section 5

AMIBIOS Password Support

AMIBIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when Setup is executed.

Setting a Password

The password check option is enabled in ADVANCED CMOS SETUP (see page 97) by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when AMIBIOS Setup is run). The password is stored in CMOS RAM.

The system asks for a password.

Enter a 1 – 6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system.

If You Do Not Want to Use a Password

Just press <Enter> when the password prompt appears.

Changing a Password

Select the *Change Password* option from the Setup Main Menu.

Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the Main Setup menu. The password is stored in CMOS RAM after Setup completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Password Options Control Prompt

When and if the prompt appears depends on the Password Option settings in ADVANCED CMOS SETUP. If *Always* was set in ADVANCED CMOS SETUP, the prompt appears when the system is powered on. If *Setup* was set, the prompt appears when Setup is executed.

Remember the Password

Keep a record of the new password when the password is changed.

If you forget the password, remove the computer cover, and replace the Real Time Clock / CMOS RAM chip. The reconfigure the system.

Section 6

Hard Disk Utility

AMIBIOS includes three hard disk utilities:

Utility	Purpose	Turn to
Hard Disk Format	Performs a low level format of the hard drive(s). Read the system or hard disk drive documentation to find out if the hard disk is preformatted.	Page 108
Auto Interleave	Determines the optimum interleave factor and then performs a low level format of the hard disk drive.	Page 110
Media Analysis	Analyzes each hard disk drive track to determine whether it is usable. The track is labeled bad if unusable.	Page 55

The hard disk utility error messages are described on page 112.

These routines work on drives that use the MFM, RLL, ARLL, or ESDI data recording techniques. *They do not work on IDE or SCSI Disk Drives.*

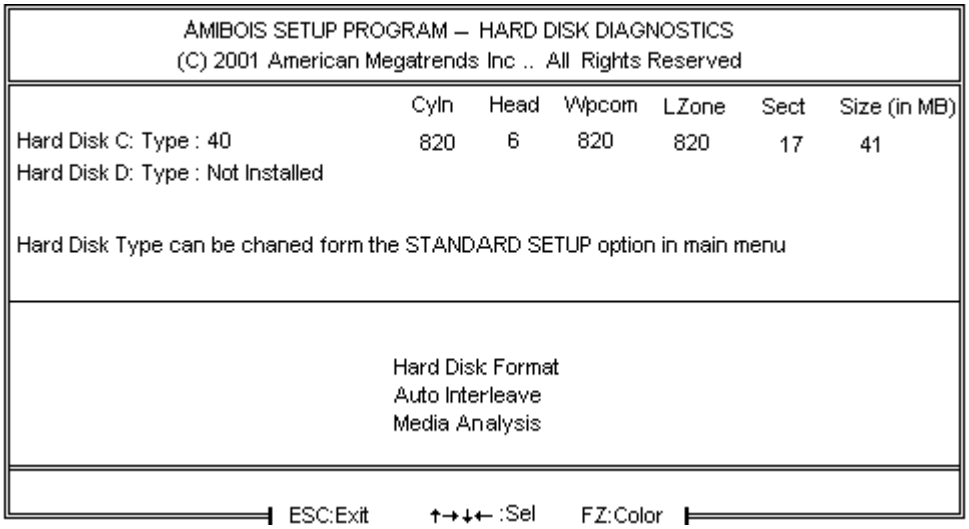
Warning

AMIBIOS Hard Disk Utilities destroy all hard disk data. Back up the data on the hard disk before running this utility.

When to Use AMIBIOS Hard Disk Utilities

When	Conditions	Run...
Installing a new hard disk.	The hard disk drive manufacturer provided a list of bad tracks, the system documentation includes the optimum interleave factor, and the drive is preformatted.	None
Installing a new hard disk.	You do not have a list of bad tracks.	Media Analysis
Installing a new hard disk.	You do not know the optimum interleave factor.	Auto Interleave
Installing a new hard disk.	The drive is not formatted.	Hard Disk Format
Installing a used hard disk drive.	N/A	All Hard Disk Utilities

When Hard Disk Diagnostics is selected, the following screen appears.

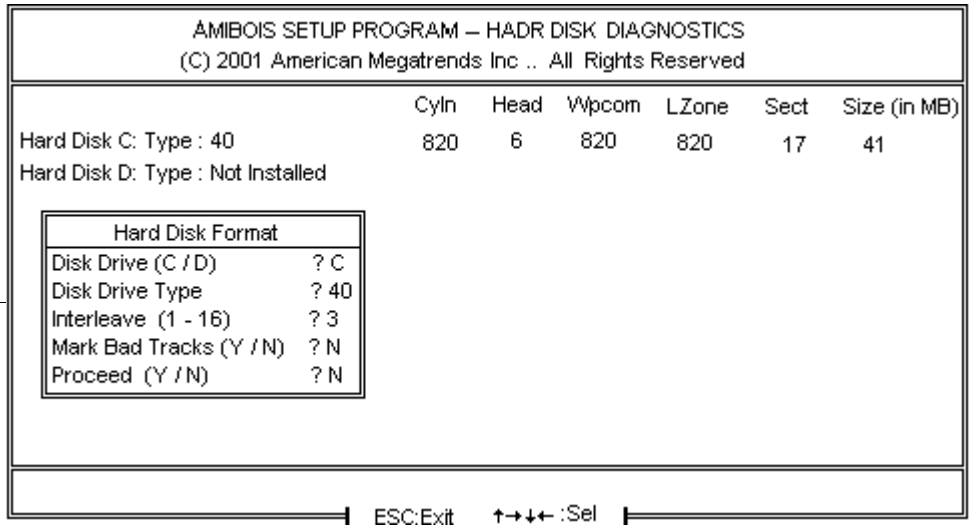


Select an option and press <Enter>.

Hard Disk Format Utility

> ***Warning***
> *The Hard Disk Format utility destroys all hard disk data. Back up the data on the hard disk before running this utility.*

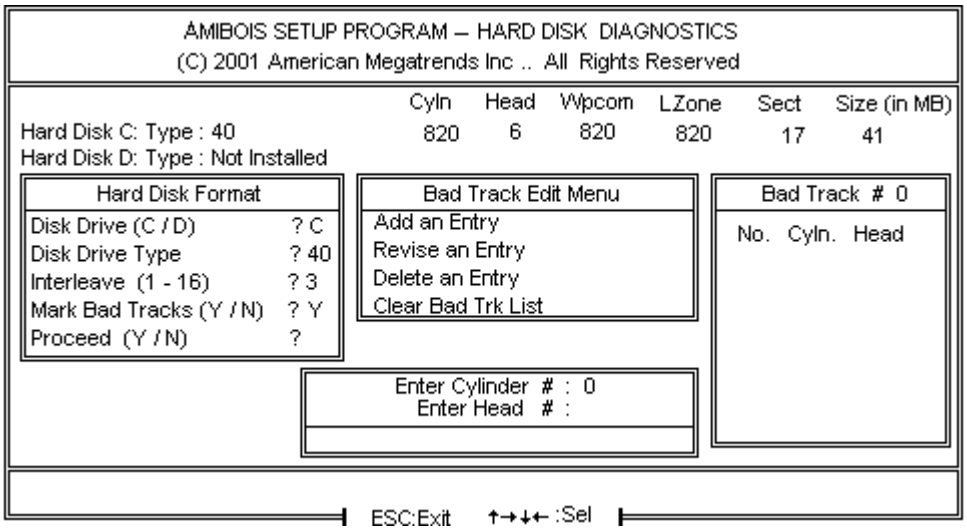
This routine does not work on IDE or SCSI drives. Use Hard Disk Format to integrate a new hard disk to the system, or to reformat a used hard disk which has bad tracks as a result of aging or poor handling. Select Media Analysis to find bad tracks. The following screen appears when Hard Disk Format is selected.



Hard Disk Format Utility, Continued

Answer the questions on the screen. The first two questions are already completed if only one hard disk drive was selected in STANDARD CMOS SETUP and the cursor is on *Interleave*. The Disk Drive Type is read from CMOS RAM. The interleave factor can be selected manually or determined by the Auto Interleave routine.

The hard disk drive manufacturer usually provides a list of bad tracks. Enter these tracks. They are then labeled as bad to prevent data from being stored on them. The following screen is displayed after entering *Y* in Mark Bad Tracks, pressing <Enter>, and selecting add, delete, revise, or clear from the Bad Track Edit Menu.



Type *Y* and press <Enter>. A warning screen appears. Press any key to continue.

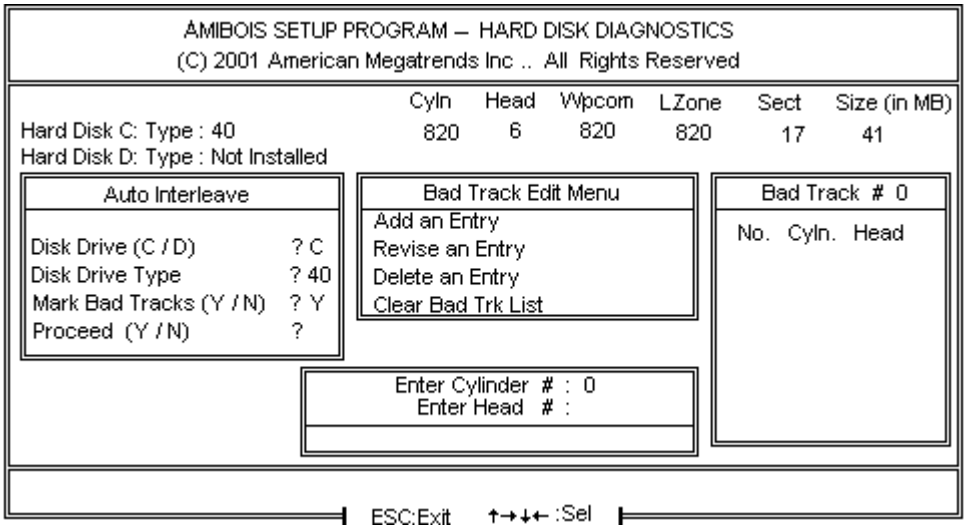
> ***Warning***
> *Data on the hard disk drive will be irrevocably lost.*

Auto Interleave Utility

> ***Warning***
> *The Auto Interleave utility destroys hard disk data. Back up the data on the hard disk before running this utility.*

The Auto Interleave utility calculates the optimum interleave factor through trial and error by measuring the transfer rate for four different interleave values. To determine the best interleave factor, the system formats a portion of the hard disk for each transfer rate calculated. The cylinders, heads and sectors formatted for each value is displayed in the activity box. It does not work on IDE or SCSI drives.

Select Auto Interleave on the main Hard Disk Utility Screen and press <Enter>. The following appears.

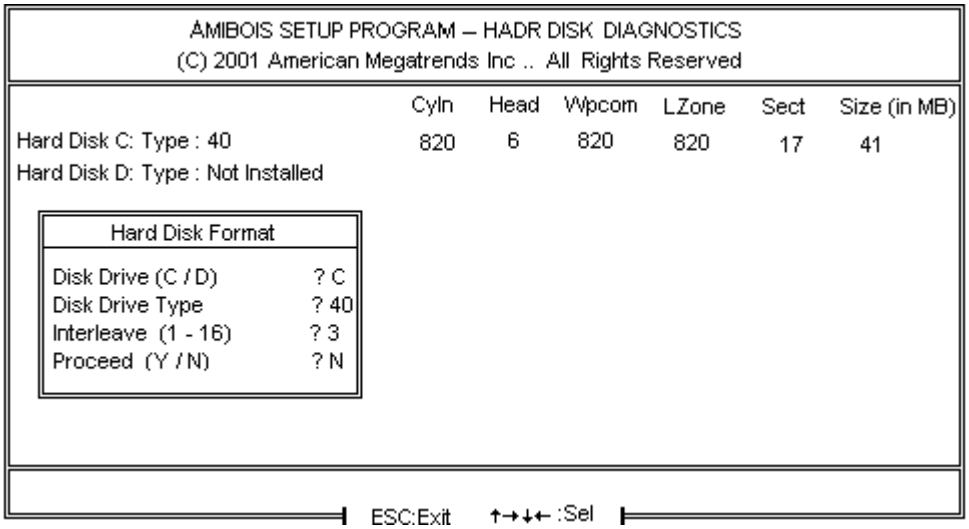


The cursor is on *Mark Bad Tracks.* The default is *N*. To mark additional bad tracks, type *Y* and press <Enter>. After selecting options from the Bad Tracks Edit Menu, press <Esc>. Type *Y* and press <Enter> to proceed with the Auto Interleave process. A warning screen appears. Press <Enter> to return to the main Hard Disk Utility screen. To proceed, type *Y* and press <Enter>.

Media Analysis Utility

The Media Analysis utility performs a series of tests to locate bad or damaged tracks on the hard disk as a result of aging or poor handling. This utility locates all bad tracks and lists them in the Bad Track List Box. Since this test writes to all cylinders and heads on the hard disk to verify any bad tracks, the test requires several minutes to complete. For best results, run this test in its entirety. Media Analysis does not work on IDE or SCSI drives.

Select *Media Analysis* from the main Hard Disk Utility Menu and press <Enter>. The following screen appears.



The cursor is on *Proceed.* The warning screen appears. Press <Enter> to stop. The main Hard Disk Utility screen appears. Type Y and press <Enter> to perform the hard disk drive analysis.

Hard Disk Utility Error Messages

Initialization Errors

Message	Explanation
No Hard Disk Installed	There is no hard disk drive in the system but Hard Disk Utility was selected.
FATAL ERROR Bad Hard Disk	No response from the hard disk, or the hard disk is not repairable. Check all cable and power connections to the hard disk.
Hard Disk Controller Failure	Error response from the reset command sent to the hard disk controller. The controller may not be seated properly.
C: (D:) Hard Disk Failure	The hard disk drive (C: or D:) is not responding to commands. Check power and cable connections to the hard disk.

Hard Disk Utility Error Messages, Continued

Operation Errors

Message	Explanation
Address Mark Not Found	The address mark (initial address) on the hard disk could not be found.
Attachment Failed to Respond	No response from the hard disk drive.
Bad ECC on Disk Read	When the hard disk drive utility writes to the disk, it also calculates an ECC (Error Correction Code) value for the data being written. This ECC value is written to the drive and then read back. The value read back is different from the one calculated.
Bad Sector Flag Detected	An operation was performed on a sector flagged as bad.
Controller Has Failed	A diagnostic command issued to the controller failed.
Drive Not Ready	An operation on the hard disk drive timed out. The hard disk drive utility waited beyond a preset specified time limit.
Drive Parameter Activity Failed	A reset command was sent to the controller followed by drive parameters. Using these parameters, the controller did not get a response from the hard disk. Make sure the drive type is correct.
ECC Corrected Data Error	The ECC value read from the disk is not the same value which was written to the disk. The data is not correct. An attempt was made to correct the data, but the ECC value is not corrected.
Requested Sector Not Found	The requested sector could not be found.
Reset Failed	The reset command did not properly reset the hard disk.
Seek Operation Failed	A seek command failed. A seek operation is the act of finding a particular sector on the hard disk.
Undefined Error - Command Aborted	An unidentifiable error condition occurred.
Write Fault on Selected Drive	A write fault occurred during the write operation on the hard disk drive.

Appendix A

Boot Block BIOS Utility

Overview

The system BIOS for the American Megatrends Enterprise-III EISA VLB motherboard resides on an Intel 28F001BX-T Flash EPROM. Flash EPROM (Erasable Programmable Read-Only Memory) is a device that can store information that can be easily updated without being removed from the system. The principal advantage of Flash EPROM is that the information contained in it can be easily enhanced or updated via code on a floppy disk.

The Boot Block BIOS utility updates the Flash EPROM. If the system AMIBIOS for the Enterprise-III motherboard needs to be updated, American Megatrends will provide a BIOS update file and the Boot Block BIOS Utility.

Why Use Flash EPROMs?

To effect a BIOS change in a system with a traditional BIOS EPROM, you must remove the BIOS ROM EPROMs and insert new EPROM chips. Then you must reconfigure the system via AMIBIOS Setup.

The Boot Block BIOS code can be used to reprogram part of the system BIOS stored on Flash EPROM.

Overview, Continued

How the Boot Block Utility Works

The Boot Block BIOS contains the code protected by the hardware locking feature. This code is used in the Boot Block BIOS to reprogram the onboard Flash EPROM.

After BIOS Power-On Self Test (POST), the Boot Block BIOS code tests the validity of the main system BIOS code. If the system BIOS is OK, the Boot Block BIOS passes control to the system BIOS.

If the main system BIOS is bad or J2 is shorted, it does not pass control to the system BIOS but instead looks for a floppy disk to reprogram the system BIOS.

What the Boot Block Code Does

The Boot Block code:

1. reads S68P.ROM from the root directory of the floppy disk in drive A:,
2. erases the Flash EPROM,
3. programs the Flash EPROM with the data read from the floppy disk in drive A:, and
4. generates a CPU reset, rebooting the system.

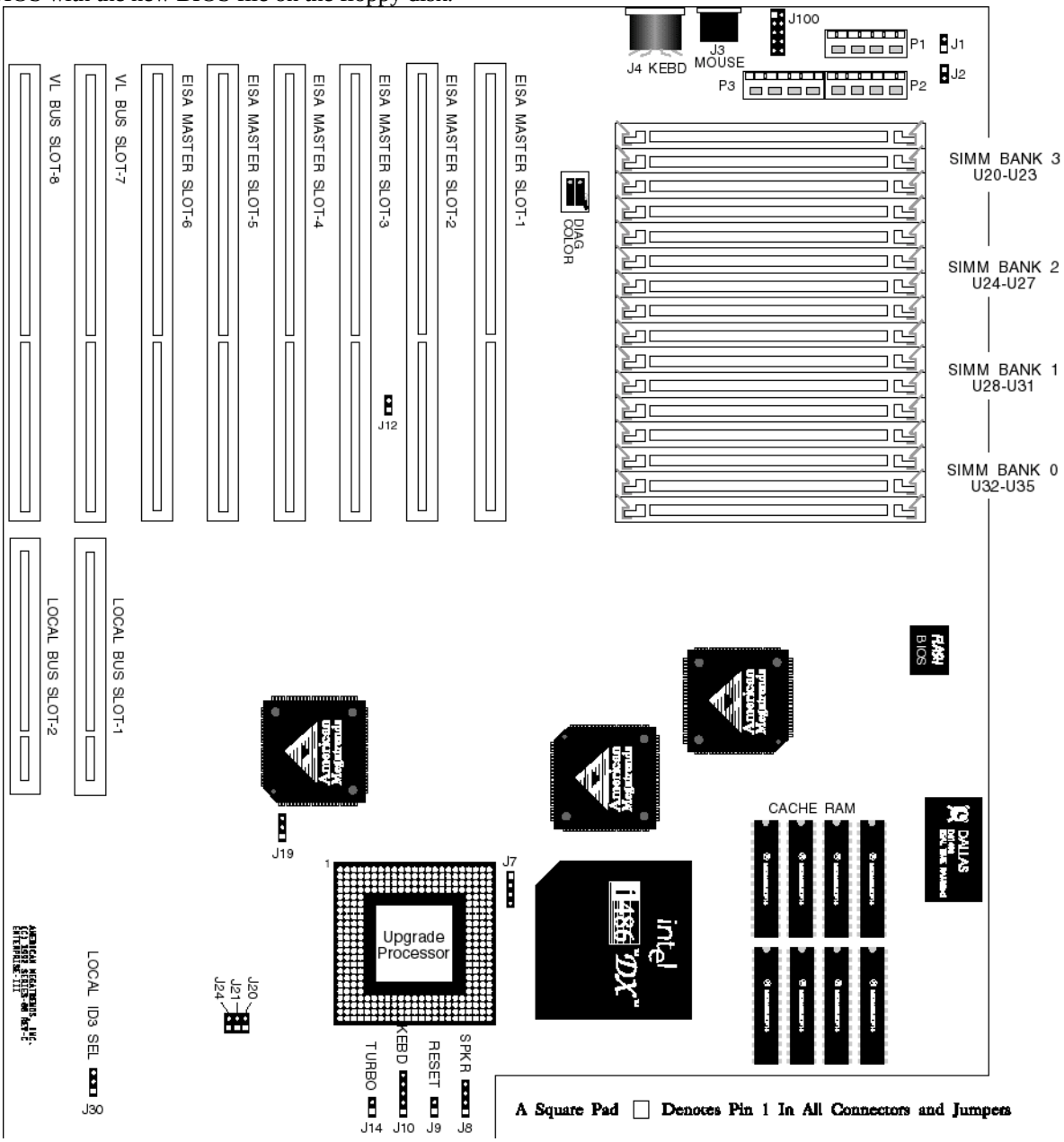
The Boot Block portion of Flash EPROM is not programmed.

S68P.ROM

S68P.ROM contains the updated main BIOS code. It must be present in the root directory of the floppy disk before the onboard Flash EPROM can be reprogrammed. The file that has the main BIOS code must be named S68P.ROM.

Programming the Flash EPROM

J2 on the Enterprise-III motherboard is the Force Boot jumper, next to the keyboard DIN plug. The following graphic shows the Enterprise-III EISA VLB motherboard. J2 is in the top right corner. Short J2 to reprogram the system BIOS with the new BIOS file on the floppy disk.



Programming the Flash EPROM, Continued

Before Beginning Flash Programming

Perform the following steps before programming the Flash EPROM.

Step	Action
1	Turn system power off.
2	Place a Shorting Link on J2.
3	Place the floppy disk that has the latest S68P.ROM BIOS file in floppy drive A:.
4	Make sure that the system has a speaker that is connected.
5	Turn system power on.

Sequence of Operation and Standard Beeps

During normal operation, the Boot Block code produces a series of beeps, keyed to the operation of the Boot Block Code. The Boot Block code beeps to:

- signify completion of a step (as shown on the previous page), and
- when there is an error.

The following table lists the sequence of operation and the expected behavior of the Boot Block Code.

Step	Expected behavior
1 Look for the floppy disk.	The system beeps one time before the BIOS attempts to read from floppy drive A:.
2 Look for S68P.ROM on the floppy disk.	The BIOS searches for S68P.ROM in the root directory of the floppy disk in drive A:. It does not beep if this step is completed successfully.
3 Read the floppy disk.	The BIOS reads the floppy disk. It does not beep if this step is completed successfully.
4 Check for BIOS file size.	The BIOS checks the BIOS file size. It does not beep if this step is completed successfully.
5 Check for Flash EPROM.	The BIOS looks for an Intel i28F001BX-T Flash EPROM. It does not beep if this step is completed successfully.
6 Erase the Flash EPROM.	Two beeps sound when the BIOS begins erasing the Flash EPROM.
7 Program the Flash EPROM.	Three beeps sound when the Boot Block Code begins reprogramming the the Flash EPROM.
8 Continue programming the Flash EPROM.	Four beeps sound when reprogramming has been successfully completed.
9 Boot Block BIOS resets the CPU.	A CPU reset is generated (the system reboots). *Make sure you remove the shorting link from J2 at this point.*
10 Manually reboot the system.	Reboot the system.

Error Beep Codes

The error beeps are arranged in a coded sequence and have different meanings depending on when they occur. The following list describes the error beep codes and when they can occur.

Step	Beeps	Description
—	None	Successful completion.
1	Continuous Single Beep	There is no floppy disk in Drive A:.
2	Five Beeps	S68P.ROM is not present in the root directory of the floppy disk in the A: drive.
3	Seven Beeps	Floppy Read Error.
4	Six Beeps	BIOS File Size Error.
5	Eight Beeps	An Intel i28F001BX-T Flash EPROM is not present.
6	Continuous Two Beeps	There is a problem in erasing the Flash EPROM.
7	Continuous Three Beeps	There is a problem in programming the Flash EPROM.
9	Continuous Four Beeps	The BIOS is not able to reset the CPU or J2 is still shorted.

Boot Block BIOS POST Checkpoint Codes

Code	Description
02h	Verify the Boot Block BIOS checksum and disable internal cache memory.
0Eh	Make the CMOS RAM checksum bad and initialize the CMOS RAM status registers.
10h	Disable DMA Controllers 1 and 2. Disable Interrupt Controllers 1 and 2.
13h	Initialize the chipset registers.
18h	If the main BIOS is good, transfer control to the main BIOS.
1Bh	Initialize the system timer.
1Dh	Begin the refresh test.
20h	Begin the 16 KB base memory test.
23h	Initialize the interrupt vectors.
28h	Determine the CPU clock frequency.
30h	Program the system speed-dependent parameters according to the CPU clock frequency.
40h	Begin the memory test.
50h	The memory test has completed.
65h	Initialize the DMA controller.
67h	Initialize the interrupt controller.
80h	Initialize the I/O chipset, if any.
85h	Enable the appropriate IRQs.
86h	Enable the internal cache memory.
88h	Initialize the floppy drives.
90h	Indicate an error. The BIOS stops here if there is an error.
A0h	Reading the floppy disk in drive A: to program the Flash EPROM.
E0h	Configure the proper stack.
E3h	Display a message to ask the user to insert the Boot Block Floppy Disk in drive A:.
E4h	Floppy read error.
E5h	Begin the search for the S68P.ROM file in the floppy disk root directory.
E6h	The S68P.ROM file not present in the floppy disk root directory.
E7h	Begin reading the File Allocation Table.
E8h	Begin reading S68P.ROM, sector by sector.
E9h	S68P.ROM is not the proper size.
EFh	Disable internal cache memory.
F0h	Enable and reset flash memory.
F1h	Detect the flash type if present.
F2h	Flash memory not detected.
F3h	Begin erasing flash blocks.
F4h	Begin programming flash blocks.
FFh	Flash programming successful and the system reboots, if possible.

Appendix B

Temperature and Power Considerations

Temperature Ranges

The values in the following table are ambient temperatures inside the computer case. The board temperatures reflect the 80486 CPU Heat dissipation requirements because it is the hottest component. Temperature specifications vary with the CPU frequency.

Frequency	Heat Sink	Airflow over CPU	Airflow over other components	Temperature Range
20 or 25 MHz	NO	400 feet per minute	Not critical	0 ◦ through 47 ◦ C.
33 MHz	NO	400 feet per minute	Not critical	0 ◦ through 36 ◦ C.
50 MHz	YES	200 feet per minute	Not critical	0 ◦ through 50 ◦ C.

Humidity

The recommended humidity range for operation of the American Megatrends Enterprise-III EISA VL-Bus motherboard is 20% to 80% non-condensing.

Power Considerations

Power Supply Requirements

The American Megatrends Enterprise-III EISA motherboard requires +5V, -5V, +12V, -12V, and about 44 Amps maximum.

Power Consumption

The four SIMM memory banks consume 2 Amps each, for a total of 8 Amps.

Each EISA expansion slot is gated at 4.5 Amps maximum. There are eight EISA expansion slots, so the total power consumption for EISA expansion slots is 36 Amps. The total maximum power consumption is 44 Amps at +5V with a 220 Watt power supply.

Power Source

Three power connectors (P1, P2, and P3) are provided on the Enterprise-III EISA motherboard. These connectors provide seven +5V connects. Each is rated at approximately 5 Amps. The total power consumption for all three connectors is approximately 35 Amps.

Conclusion

The minimum rating of the power supply should be 230 Watts for a fully loaded motherboard, including a 12V power source. The maximum power consumption on each EISA slot is 4.5 Amps at 5V.

Appendix C

Heat Dissipation

The 50 MHz 80486DX and 66 MHz 80486DX2 and P24T are very high performance CPUs that can rival the performance of any currently available CPU, including RISC processors. However, there is an undesirable side effect to the high performance — the heat generated by high power consumption.

These CPUs can dissipate 5 – 8 watts of power. Since this power is concentrated in a small area, it is necessary to remove the heat generated by this power consumption. For this reason we have supplied a heat sink with all American Megatrends motherboards that have a 50 MHz 80486DX / DX2 or 66 MHz 80486DX2 CPU.

Since American Megatrends manufactures only the motherboard and CPU Card system components, American Megatrends has no control over operating factors such as air flow and ambient temperature inside the computer case. The system integrator must make sure that the CPU always operates within a safe operating temperature range.

Heat Dissipation, Continued

Test Procedure to Assure Proper Operating Temperatures:

1. Install the motherboard in a fully loaded system.
2. Install a temperature sensor (such as a thermocouple) so that the surface of the heat sink can be measured without opening the case.
3. Turn on the system and run a diagnostics utility program such as AMIDiag for at least one hour.

Expected Results

If the temperature on the surface of the heat sink is 75 degrees centigrade or below, there will be no problem with the operation of the computer.

Identifying a Problem

If the temperature exceeds 75 degrees centigrade, the system integrator must take the necessary measures to ensure that the CPU does not overheat.

Potential Solutions

- Install a fan to increase the air flow over the CPU. Some power supplies may have larger or more powerful fans.
- Install a different heat sink with a greater surface area.
- Different case styles may have better ventilation allowing for more air-flow over the CPU.

Appendix D

EISA Configuration Worksheets

This appendix consists of a two-page worksheet for up to eight EISA adapter cards. Complete a worksheet for each EISA adapter card in the system to simplify the EISA configuration process. These worksheets are helpful used in conjunction with the American Megatrends EISA Configuration Utility (ECU) when configuring an EISA system with many EISA adapter cards.

Motherboard Configuration

Serial Number _____

Revision Number _____

ECN Number _____

Memory Type for Bank0 and Bank1: ___ 1 MB x 9 SIMMs
(check the type used) ___ 4 MB x 9 SIMMs
___ 16 MB x 9 SIMMs

Memory Type for Bank2, Bank3, ___ 1 MB x 9 SIMMs
Bank5, and Bank6: ___ 4 MB x 9 SIMMs
___ 16 MB x 9 SIMMs

Memory Installed: ___ Bank0
(check the banks installed) ___ Bank1
___ Bank2
___ Bank3

Total Amount of Memory: _____ MB

Other Options: ___ Weitek
(check the options installed)

EISA Slot 1

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 1, cont'd

Interrupt Description

Edge-Triggered Interrupts:

Interrupt line used: ____ IRQ3 ____ IRQ4
____ IRQ5 ____ IRQ6
____ IRQ7 ____ IRQ9
____ IRQ10 ____ IRQ11
____ IRQ12 ____ IRQ14
____ IRQ15

Share: ____ Yes ____ No

Level-Triggered Interrupts

Interrupt line used: ____ IRQ3 ____ IRQ4
____ IRQ5 ____ IRQ6
____ IRQ7 ____ IRQ9
____ IRQ10 ____ IRQ11
____ IRQ12 ____ IRQ14
____ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 2

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 2, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 3

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 3, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 4

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 4, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 5

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 5, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 6

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 6, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA NON-MASTER Slot 7 (VL-BUS SLOT-7)

Card Description: _____

Manufacturer: _____

VL-Bus Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 7, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA NON-MASTER Slot 8 (VL-BUS SLOT 8)

Card Description: _____

Manufacturer: _____

VL-Bus Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 8, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

Index

8042 - Gate A20 Failure 45
Adapter Card
    16-Bit Card Pinout 37
    32-Bit EISA Card Pinout 37, 39
    8-Bit Pinout 36, 40
Adaptor ROM Shadow C800,32K 63
Adaptor ROM Shadow D000,32K 63
Adaptor ROM Shadow D800,32K 63
ADVANCED CHIPSET SETUP 66
ADVANCED CMOS SETUP 60
Auto Interleave 72
Auto Interleave Utility 76
Base 64 KB Memory Failure 45
BIOS
    Beep Codes 45
    Error Reporting 43
    Fatal Errors 45
    Hard Disk Utilities 72
    Non-Fatal Error Messages 46
    Password Check 63
    Password Support 70
BIOS Identification Strings 49
BIOS Setup 50
Board Layout 14
Boot Block BIOS 81
Boot Sector Virus Protection 65
Built-in Battery 9
C: Drive Error 46
C000 Shadow RAM Cacheable 68
C000h 68
Cables 30
Cache Write Back 67
CMOS Display Type Mismatch 47
CMOS Shutdown Register Read/Write Error 45
CMOS System Options Not Set 47
Configuring System 41
Connectors
    D5 Turbo LED Connector 33
    EISA 38
    ISA 37
    J10 Keyboard Lock Connector 32
    J14 Turbo Switch Connector 33
    J3 Keyboard Connector 28, 29
    J8 Speaker Connector 31
    J9 Reset Switch Connector 31
    Keyboard 28
    Mouse 29
    Power supply 26, 87
    VL-Bus 39
Coprocessors
    Test 23
D5 Turbo LED 33
E000h 68
EGA Adapters 15
EISA Adapter Card
    Pinout 37, 39
EISA Configuration Worksheets 90
EISA Expansion Slots 34, 36, 37
ESDI BIOS 63
External Cache Memory 62
F000 Shadow RAM Cacheable 68
Figures
    Attaching power connectors 26
    Auto Detect Hard Disk Screen 55
    Auto Interleave Utility 76

Cutting keys on power connectors 26
D5 Turbo LED connector 33
EISA and ISA edge connectors 35
Hard Disk Format Utility screen 74
Hard Disk Utility Main Menu 73
Height restrictions 5
Installing Math Coprocessor 23
Installing SIMMs 20
Installing the motherboard 24
Installing Upgrade Processor 23
J10 Keyboard lock connector 32
J10 Select Processor Type 16
J14 Turbo Switch Connector 33
Keyboard connector 28
Media Analysis Utility 77
Motherboard layout 14
Mouse connector 29
Speaker connector 31
STANDARD CMOS SETUP 56
VL-Bus Card Connector edge 4
VL-Bus slots 3
Floppy Drive 59
Hard Disk Format 72
Hard Disk utilities
Error messages 78
When to use 73
Hard Disk Utility 72
Heat Sink for 50 MHz CPUs 6
I/O Port 80h 43
I/O Recovery Select 69
Installing Adapter Cards 34, 36, 37, 40, 41
Installing the Motherboard 24
Intel 28F001BX-T 80
Intel Upgradable Processor 22
Interleave factor 76
Internal Cache Memory 63
J1 DIAG LED Cable 32
J10 Keyboard Lock Connector 32
J10 Select Processor Type 16
J14 Turbo Switch 33
J19 CPU Priority 17
J2 Force Boot to Flash 15
J24 Select Processor Speed 17
J27 Local ID3 Select 16
J8 Speaker Cable 31
J9 Reset Switch Connector 31
Jumpers 15
J30 Local ID3 Select 16
J7 Select Processor Type 16
SW1 15
Keyboard
J3 Connector 28, 29
Keyboard Lock Connector 32
LAN BIOS 63
Layout 14
Local Bus 67
Manufacturing Test Port 43
Mark Bad Tracks 76
Media Analysis 72
Media Analysis Utility 77
Memory
Installation 18
Microprocessor 6
Monitor 59
Motherboard Layout 14
Mouse 29
Mouse Support Option 62

NMI
EISA 48
Non-Cacheable Area 1 Size 67
Non-Cacheable Area 1 Start 67
Num Lock 62
P1 27
P2 27
P3 27
Pinouts
EISA Adapter Cards 38
ISA Adapter Cards 36, 37
Keyboard connector 28
Keyboard Lock connector 32
Mouse connector 29
Power supply connectors 27
Speaker connector 31
VL-Bus Cards 40
Power 86
Power Considerations 87
Power Consumption 87
Power Source 87
Power Supply 25, 26
Pinouts 27
Processor error 45
PS/2 Mouse 12
Reset Button Connector 31
SCSI 74
SCSI BIOS 63
Setup 50
ADVANCED CHIPSET SETUP 66
ADVANCED CMOS SETUP 60
Auto Configuration 54
Auto Configuration, BIOS Defaults 54
Auto Configuration, Power-On Defaults 54
Exiting 55
Floppy Drive Seek At Boot 62
Floppy Drives 59
Key Usage 53
Keyboard 59
Monitor 59
Options, Main Menu 54
Password Check 63
ROM Shadow 63
Running Setup 52
Standard CMOS Setup 56
System Boot Up CPU Speed 62
System Boot Up Num Lock 62
System Boot Up Sequence 62
Typematic Rate 61
Typematic Rate and Delay 61
Typematic Rate Delay and Typematic Rate 61
Warning Message 52
Warning Screen 60
Shadow RAM Write Protection 64
SIMM 20
Parameters 20
Specifications 20
SIMMs 18
Installing 19
Part numbers 19
Speaker Cable Connector 31
Specifications 6
SRAM Type 8
STANDARD CMOS SETUP 56
SW1 15
Switch and Jumper Options 15

Switches
SW1 15
System ROM Shadow F000,64K 64
Table
80486 Operating Temperatures 86
Adapter Cards 34
AMIBIOS Setup keys 53
BBS Phone numbers vii
Beep code troubleshooting 46
Beep codes 45
BIOS error messages 46
BIOS error reporting 43
BIOS Hard Disk Utilities 72
BIOS ID strings 49
BIOS System Configuration 49
EISA Card Pinouts 38
EISA Configuration 90
EISA error messages 48
Hard Disk Drive Parameters 57
Hard Disk Drive Types 58
Hard disk utility error messages 79
I/O Recoevery Select parameters 69
Installation steps 13
Interrupts 10
ISA Card Pinouts 36, 37
Keyboard connector pinouts 28
Keyboard Lock connector pinouts 32
Math coprocessor test 23
Memory configurations 18
Microprocessors supported 6
Motherboard installation 24
Mouse connector pinouts 29
NMI error messages 48
POST Memory Test 49
Power Connector pinouts 27
SIMM part numbers 19
Speaker connector pinouts 31
Unpacking instructions 13
Tables
Mouse Connector Pinout 29
Temperature 86
Testing System 41
Testing the Motherboard 41
Troubleshooting
Startup problems 46
Turbo LED 33
Turbo Switch 33
Typematic Rate 61
Typematic Rate Delay 61
Typematic Rate Programming 61
U33 22
Unpacking 13
Upgradable Processor 22
VGA adapters 15
Video ROM Shadow C000,32K 63
VL-Bus Pinouts 40, 41
Warning Message 52