American Megatrends, Inc.

Super Voyager VLB-III

ISA Motherboard

with Green PC and

Advanced Power Management

User's Guide

MAN-707
6/20/95

American Megatrends, Inc.
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Norcross, GA 30093

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Revision History

4/9/94 Initial release.

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Preface

To the OEM

Thank you for purchasing the high performance American Megatrends Super Voyager VLB-III ISA motherboard. This product is a state of the art 486-based motherboard that includes the famous AMIBIOS. It is assumed that you have also licensed the rights to use the American Megatrends documentation for the American Megatrends Super Voyager VLB-III motherboard

This manual was written for the OEM to assist in the proper installation and operation of this motherboard. This manual describes the specifications and features of the Super Voyager VLB-III motherboard. It explains how to assemble a system based on the Super Voyager VLB-III motherboard and how to use the AMIBIOS that is specifically designed for this motherboard.

This manual is not meant to be read by the computer owner who purchases a computer with this 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 American Megatrends 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 Robert Cheng and Paul Narushoff. The writers gratefully acknowledge the assistance of Vivek Saxena and Uma S. Mondal.

Packing List

You should have received the following items:

- an American Megatrends Super Voyager VLB-III ISA motherboard,
- a Warranty Card for the Super Voyager VLB-III ISA motherboard,
- The *American Megatrends Super Voyager VLB-III ISA Motherboard User's Guide,*
- two 10-pin to DB9 connector serial cables (American Megatrends Part Number CBL-SUB-1-10), and
- one 26-pin to DB25 connector parallel cable (American Megatrends Part Number CBL-SUB-2-25).

The cable that attaches to the PS/2 mouse connector is the same as the serial cables listed above (American Megatrends Part Number CBL-SUB-1-10).

If using the Green PC features of this motherboard, you will also need a 10-pin to 25-pin Green PC cable (American Megatrends Part Number CBL-SUB-12-10) that is not supplied with the motherboard.

Call the American Megatrends Sales Department at 800-828-9264 to order the serial cables or Green PC cable.

Chapter 1

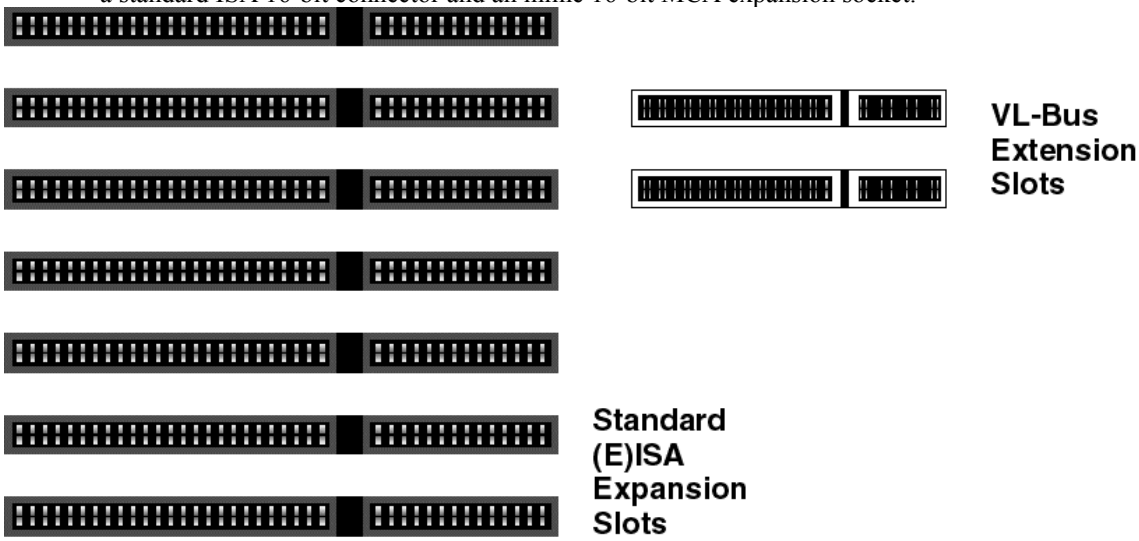
System Overview

The Super Voyager VLB-III is an ISA 486 motherboard with two VESA® (Video Electronics Standards Association) VL-Bus® Local Bus expansion slots and seven standard ISA expansion slots. The Super Voyager VLB-III motherboard supports the EPA Green PC power management specification and provides an easy-to-use BIOS utility.

The VL-Bus Local Bus

The American Megatrends Super Voyager VLB-III Motherboard conforms to the VESA VL-Bus specifications. The VL-Bus is designed to standardize the hardware interface of peripherals connected to a microprocessor-level local bus. The VL-Bus is designed to be compatible with the Intel® i486 microprocessor 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.

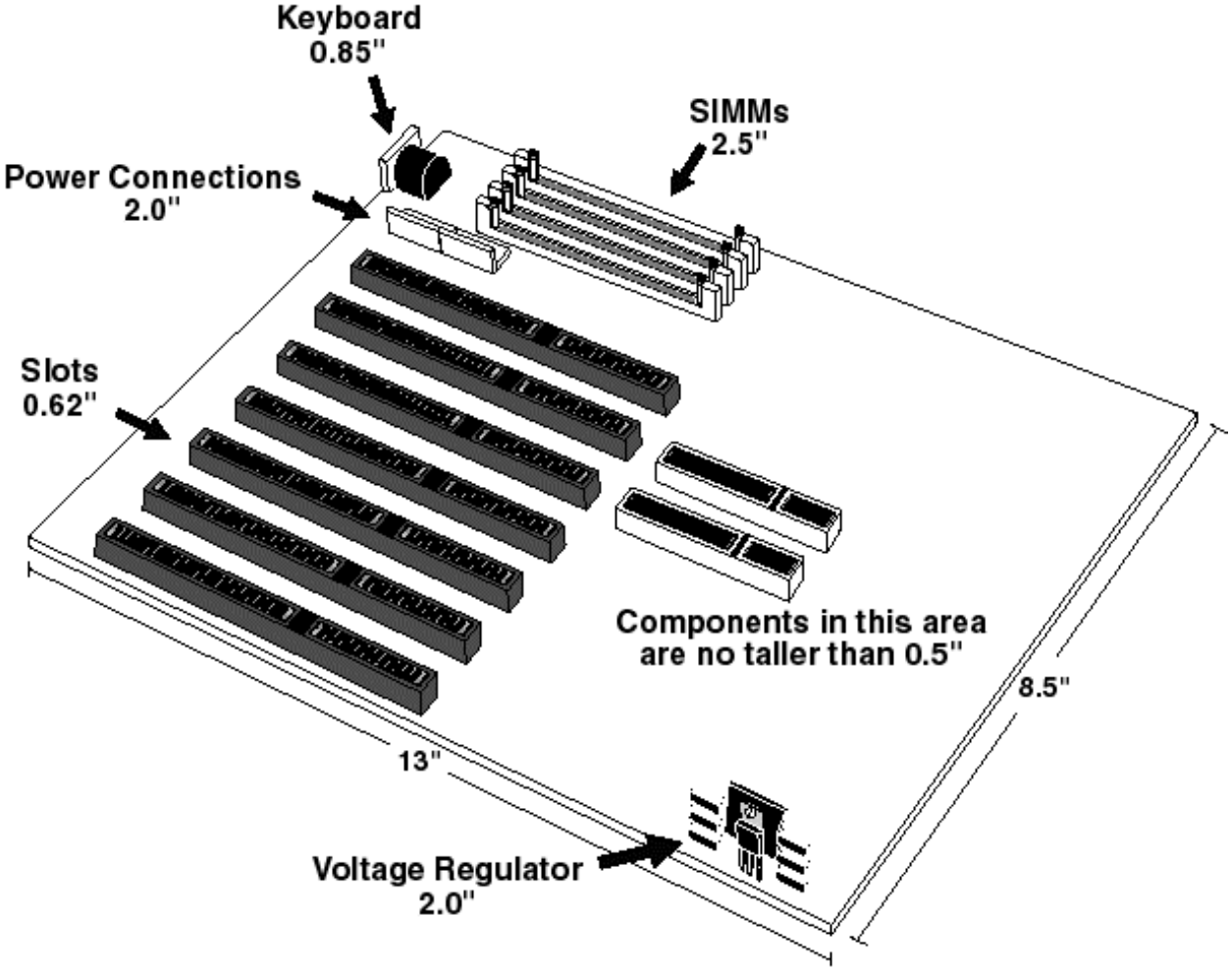
The Super Voyager VLB-III motherboard has two VL-Bus expansion slots. These expansion slots consist of a standard ISA 16-bit connector and an inline 16-bit MCA expansion socket.



Super Voyager VLB-III Dimensions

The Super Voyager VLB-III motherboard is approximately 8.5 inches wide by 13 inches long (the standard Baby AT® size with similar mounting hole locations).

The dimensions and height restrictions are shown below.



Super Voyager VLB III ISA Motherboard

Description

Processor Type and Speed

Processor in ZIF Socket (Upgrade Socket)	PQFP Processor	Frequency
Empty	486SX	20, 25, or 33 MHz
Empty	Enhanced S Series (486DX and SX) 486DX AM486	33, 40, or 50 MHz
486DX AM486 Enhanced S Series (486DX, SX, and DX2)	empty	33, 40, or 50 MHz
486DX2 Overdrive®	empty	25 MHz (50 MHz internal), 33 MHz (66 MHz internal)
486DX4	empty	25 MHz (75 MHz internal), 33 MHz (100 MHz internal)
486SX	486SX	25 or 33 MHz
Future Intel CPUs with internal write-back cache	empty	25 MHz (75 MHz internal), 33 MHz (100 MHz internal)
487SX	486SX	25 or 33 MHz

CPU Sockets

There are two CPU sockets: a PQFP and a ZIF socket. The ZIF socket is the upgrade socket. If both the PQFP and ZIF sockets contain CPUs, the CPU in the ZIF socket will be the active CPU. 486DX, 486SX, and SL Enhanced 486DX and 486SX CPUs can be used in the PQFP socket.

The Super Voyager VLB-III motherboard also will support future Intel processors with internal write-back cache.

Programmable Crystal Oscillator

The Super Voyager VLB-III motherboard has a programmable crystal oscillator that supports all possible motherboard frequencies.

Heat Sink

A heat sink is provided if the following CPUs are installed:

CPU	Frequency
80486DX	50 MHz
80486DX2	50 MHz
80486DX2	66 MHz
80486DX4	66 MHz 75 MHz 100 MHz

Processor Speed

The Super Voyager VLB-III motherboard has two clock speeds: high and low. High clock speed is factory-set to 25, 33, or 50 MHz. Low clock speed is achieved by adding the appropriate number of software delays, depending on the speed of the processor, and emulates an IBM® AT running at approximately 8 MHz. Speed selection is through the turbo switch or the keyboard. Press <Ctrl> <Alt> <+> for high speed and <Ctrl> <Alt> <-> for low speed.

Cache Memory

The Super Voyager VLB-III motherboard supports 64 KB or 256 KB of direct mapped, write-through or write-back L2 external (secondary) cache memory.

Secondary cache memory size	SRAM Type	Maximum System Memory Cached
64 KB	8 KB x 8	64 MB
256 KB	32 KB x 8	128 MB

The Intel 486DX, 486DX2, 486SX, AMD486, and 487SX CPUs have 8 KB of internal cache memory. The 486DX4 CPU has 16 KB of internal cache memory. All system memory can be cached in internal cache memory. The cache read has zero wait states. Burst mode is supported.

Main System Memory

The Super Voyager VLB-III motherboard supports up to 128 MB of onboard system memory in four SIMMs. Each memory socket holds a x 36 SIMM that is actually logically equivalent to a bank of system DRAM memory.

SIMM Types Supported

The Super Voyager VLB-III motherboard supports 256 KB x 36, 512 x 36, 1 MB x 36, 2 MB x 36, 4 MB x 36, 8 MB x 36, or 16 MB x 36 fast page mode SIMMs operating at 70 ns (RAS access time). The SIMMs can be single-sided or double-sided.

Shadow RAM

The system BIOS memory area (F0000h–FFFFFh), video BIOS area (C0000h–C7FFFh), and Adaptor ROM (C80000h – EFFFFFh) can be shadowed via WinBIOS Setup.

System BIOS

The Super Voyager VLB-III motherboard has a 64 KB WinBIOS at F0000h - FFFFFh with built-in WinBIOS Setup. WinBIOS Setup has a graphical user interface that is extremely easy to use. WinBIOS Setup allows you to bypass error messages for missing video, keyboard, or floppy drives to facilitate the building of file servers. The system BIOS is stored in Read-Only Memory (ROM).

CMOS RAM

The Super Voyager VLB-III motherboard has 128 bytes of nonvolatile CMOS RAM with a built-in 3.6V rechargeable NiCad battery backup for configuration.

Real Time Clock

The Super Voyager VLB-III motherboard has a real time clock and CMOS RAM with a built-in 3.6V rechargeable NiCad battery backup.

Timer Features

The Super Voyager VLB-III motherboard has five programmable 16-bit counter/timers.

Refresh Generation

The Super Voyager VLB-III motherboard has a refresh generation feature.

I/O Capability

The Super Voyager VLB-III motherboard accesses 16- or 8-bit I/O devices on the ISA bus.

Description, Continued

ISA Bus

The ISA bus in the motherboard has a system clock generated by the bus clock (BCLK) and operates between 8.00 MHz and 8.33 MHz.

Expansion Slots

The motherboard has seven 16-bit expansion slots for ISA adapter cards. Two of these slots can also be used as VL-Bus expansion slots.

Local Bus

The motherboard has two VESA VL-Bus Local Bus expansion slots. These slots can also be used as standard ISA expansion slots.

Keyboard and Mouse

The keyboard connector is a 5-pin IBM AT-compatible DIN keyboard connector. Adjacent to the keyboard connector is a 10-pin berg connector for the PS/2 mouse. A five-pin berg keyboard lock connector is provided on the motherboard to attach a keyboard lock.

Speaker

The motherboard has a standard speaker attachment.

Onboard I/O

The Super Voyager VLB-III motherboard uses an SMC FDC37C665. The motherboard includes a floppy drive controller, two 16550 UARTs for serial ports, and one parallel port.

Onboard Local Bus IDE Support

The onboard IDE is on the VESA local bus. The IDE controller supports IDE Mode 0, 1, 2, and 3. It also supports IDE read data prefetch and write posting. AMIBIOS supports 32-bit data transfers as well as the following cycle times for each IDE Mode.

IDE Mode	Cycle Time (in nanoseconds)
0	600
1	383
2	240
3	180

Fast ATA Support

This motherboard fully supports the Fast ATA specification. AMIBIOS automatically configures the IDE hard disk drives that conform to the ATA specifications.

Onboard NS16550s

The motherboard has two National Semiconductor NS16550 UARTs for serial port, which provide enhanced serial port features. The end user can enable FIFO for Serial ports 1 and 2 through Peripheral Setup in WinBIOS Setup.

Floppy Drive Support

The motherboard supports up to two floppy drives, including 720 KB, 1.44 MB, and 2.88 MB 3½" drives and 1.2 MB 5¼" drives.

Memory Addresses

The motherboard uses 32-bit memory addresses to access 4 gigabytes of memory address space on the VL-Bus expansion slots. The ISA expansion slots use 16-bit memory addresses to access up to 24 MB.

I/O Wait State Generation

The motherboard has an open bus structure, allowing multiple processors to share system resources, including memory. The motherboard supports system memory refresh from channel processors.

I/O Address Space

The Super Voyager VLB-III motherboard uses I/O addresses 0100h through 03FFh for ISA-compatible I/O.

Seven DMA Channels

The motherboard has seven DMA channels. Any DMA channel can be set for 8 or 16-bit DMA device sizes.

Fifteen Interrupt Levels

The NMI takes precedence over all 15 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	Bus
5	IRQ 10	Bus
6	IRQ 11	Bus
7	IRQ 12	Onboard PS/2 Mouse *or* AT bus through a jumper
8	IRQ 13	Coprocessor Error (internal)
9	IRQ 14	Bus (Hard disk drive or Local Bus IDE controller)
10	IRQ 15	Bus
11	IRQ 3	Bus (Serial Port 2)
12	IRQ 4	Bus (Serial Port 1)
13	IRQ 5	Bus (Parallel Port 2)
14	IRQ 6	Bus and floppy disk controller
15	IRQ 7	Bus (Parallel Port 1)

Green PC Features

The American Megatrends Super Voyager VLB-III motherboard has been designed with the EPA Green PC specifications in mind. The Green PC features include:

- a low power chipset,
- Sleep Mode, which allows the system to go to a low power consumption mode of operation when the PC is idle,
- a special two-pin header issues a TTL level signal used to turn off the auxiliary AC power receptacle on Green PC power supplies while in Sleep Mode,
- a special 10-pin header can be connected to the feature connector of a standard VGA Controller card. A signal from this header drives HSYNC, VSYNC, and Enable Video Low during Sleep Mode. If a Green PC monitor is used, the monitor switches to its own low power mode during Sleep Mode.

Green PC Test System Configuration

The American Megatrends Super Voyager VLB-III motherboard has been tested and found to comply with the EPA Green PC specifications with the following system configuration. There was a margin of 3 watts, which should allow for some variation in the configuration.

- 8 MB of DRAM,
- an Intel 80486DX2-66SA S-Series CPU,
- a Boca PN4430 VGA controller,
- a Western Digital Caviar IDE drive model number WDAC2200-32F,
- a Toshiba 1.2 MB floppy drive, model number ND-0801GR, and
- an Astec 220W Green PC Power Supply, model number PP-200U/220U.

Compliance with EPA Green PC Specifications

To meet the Green PC specifications, a computer system must be able to enter an idle state (Sleep Mode) that reduces the total system power use to 30 watts or less on the input - AC side. The monitor and printer must also use no more than 30 watts.

Responsibility for Meeting Green PC Requirements

The system integrator is ultimately responsible for meeting all Green PC specifications and performing the tests necessary to obtain Energy Star approval, because the motherboard is only one component in the system. Other components have a major impact on system power use.

Green PC Hot Keys

A keyboard hot key is any multiple keystroke operation that causes the keyboard controller to execute a complex system function transparent to the system operating system. The AMIBIOS system BIOS and the American Megatrends MEGAKEY keyboard controller used in the Super Voyager VLB-III motherboard provide several hot key features.

Because of the highly programmable nature of the MEGAKEY and the AMIBIOS, configuring the functionality and keystroke assignments can be done by the OEM. After system BIOS POST (Power On Self Test) completes, AMIBIOS initializes the MEGAKEY keyboard controller using values preset by the OEM via AMIBCP (American Megatrends BIOS Configuration Program). The MEGAKEY supports hot key control of: system security locking and system power down mode.

Using the Turbo LED

The Turbo LED indicates if the system is using low or high operating frequency. The Turbo LED should be controlled by the same MEGAKEY I/O pin that controls the CPU clock switching. If the Turbo LED is on, the system is operating at high operating frequency. If the Turbo LED is off, the system is at low operating frequency.

System Security Locking Hot Key

The default hot key option for this feature is <Ctrl> <Alt> <Backspace>, which can be changed by the OEM through AMIBCP. When the System Password feature is enabled in WinBIOS Setup, the end user can enable the AutoKeyLock feature at any time by pressing <Ctrl> <Alt> <Backspace>. AutoKeyLock is used when the end user must leave the computer unattended and does not want anybody else to use it. Once AutoKeyLock is enabled, the MEGAKEY keyboard controller accepts no keyboard or mouse input until the correct password is entered. The Num Lock, Caps Lock, and Scroll Lock LEDs (and the Password LED if present) blink when the system is password locked.

Indicating AutoKeyLock Status via LEDs

AutoKeyLock is indicated by the keyboard Num Lock, Caps Lock and Scroll Lock LEDs and also through a Password LED, if present. Blinking Num Lock, Caps Lock, and Scroll Lock LEDs indicate that the system is password locked. The Password LED also blinks if present. When the correct password is entered, the lock is deactivated.

Hot Key Sequence Summary

The following table lists the AMIBIOS and MEGAKEY Green PC hot key sequences and the state of Password LED in various modes:

System Condition	Password LED State	Other information
The password feature is enabled through WinBIOS Setup and <Ctrl> <Alt> <Backspace> is pressed.	The LED blinks until the correct password is entered via the keyboard.	The Keyboard Num Lock, Caps Lock,and Scroll Lock LEDs also blink until the correct password is entered via the keyboard.

J39 Password LED Select

J39 is a three-pin berg that selects the Password LED.

J39 Pin Settings	LED selected
Short Pins 1-2	Front panel power LED is Password LED.
Short Pins 2-3	Separate Password LED using J38 *(Factory setting)*.

J38 Password LED Connector

J38 is a two-pin berg that can be attached via a cable to an LED that flashes when the system has been inactive for a specified length of time and Pins 2-3 of J39 are shorted.

The end user must enter the correct system password if the Password LED is blinking. The system has experienced no system activity during the length of time specified in the AutoKeyLock option in WinBIOS Setup Advanced Setup. As a result of the AMIBIOS AutoKeyLock feature being enabled, AMIBIOS does not permit the system to be used until the correct password is entered.

The AMIBIOS system password feature and AMIBIOS Green PC AutoKeyLock feature must be enabled before the Password LED will blink when the correct system password must be entered by the end user.

Green PC Implementation Disclaimers

Green PC Responsibility belongs to System Integrator

The system integrator must be responsible for Green PC compliance. American Megatrends has simply supplied the means to meet the Green PC requirements and cannot be held responsible for final system assembly.

When to Disable Sleep Mode

If a computer will be running an application that requires long durations of microprocessor activity with no input from the keyboard, mouse, COM1, or COM2, Sleep Mode should be disabled in WinBIOS Setup.

If Sleep Mode is not disabled, the system will switch to sleep mode and the system performance will be greatly decreased. Some examples of such applications are: file servers, CAD systems, software compilers, screen savers, and many more.

No Need for Screen Savers

> ***Important***
>
> *Screen saver software should not be used with Sleep Mode enabled.*

Sleep Mode serves the same purpose as a screen saver and obviates the need for a screen saver.

Buses are Slowed during Sleep Mode

The VL-Bus and ISA bus run at a slow speed during Sleep Mode when the **Low Speed Timeout** option is set to *Enabled* in Power Management Setup.

Some VL-Bus adapter cards cannot run at a slow speed. Do not set the Power Management Setup **Low Speed Timeout** option to *Enabled* if any VL-Bus adapter cards are installed.

Chapter 2

Installation

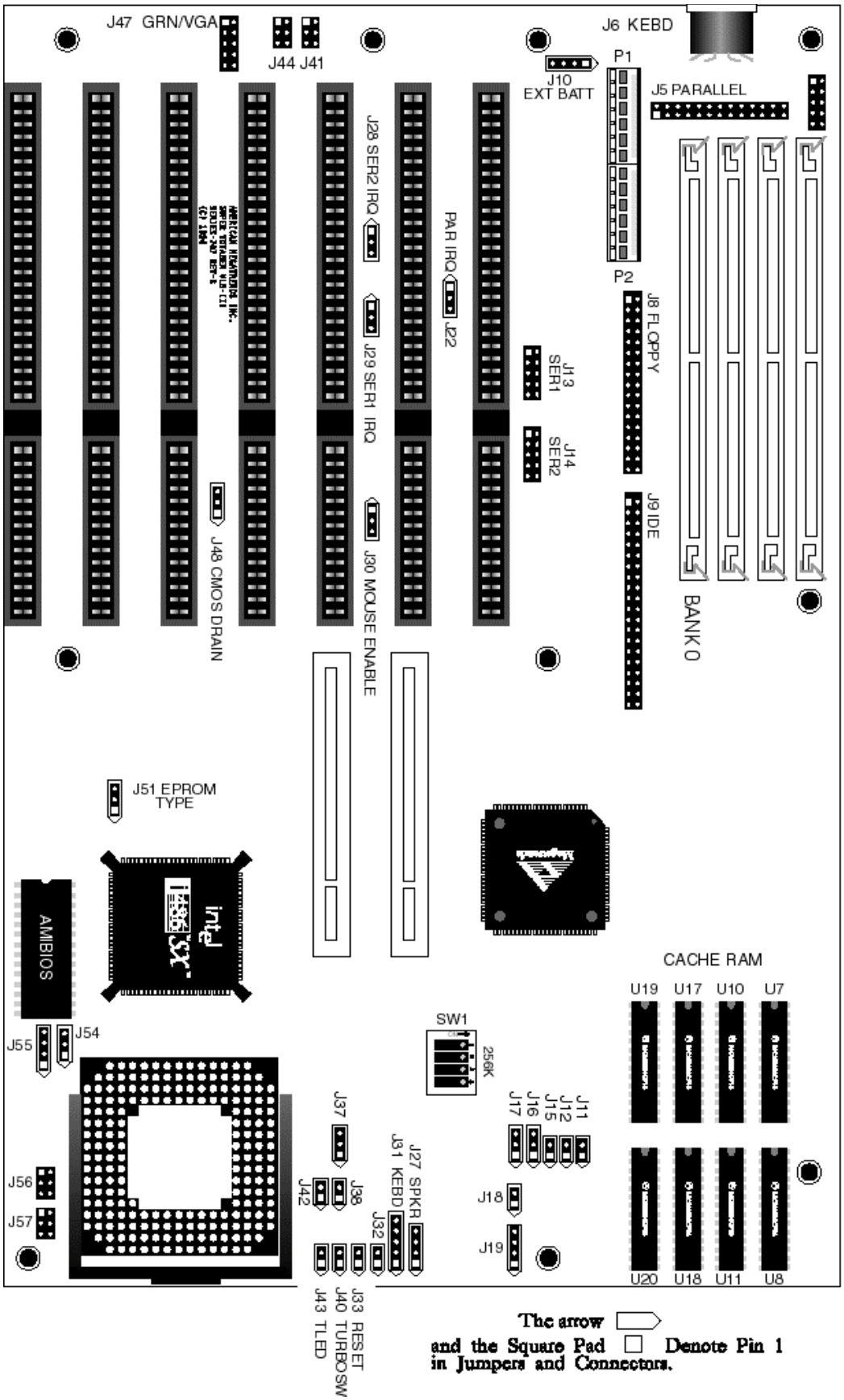
Installation Steps

The steps for assembling a system that uses the Super Voyager VLB-III motherboard are shown in the following table. Each step is discussed in detail in the following pages.

Step	Action	Turn to
1	Unpack the motherboard	Page 33
2	Set switch and jumper options	Page 33
3	Install memory	Page 49
4	Install upgrade processor	Page 54
5	Install motherboard	Page 57
6	Connect the power supply	Page 59
7	Connect the keyboard	Page 61
8	Connect the mouse	Page 62
9	Connect cables	Page 63
10	Connect onboard I/O	Page 70
11	Install floppy disk drives	Page 76
12	Install hard disk drive	Page 76
13	Install adapter cards	Page 78
14	Test and configure	Page 83

Warning

This motherboard contains sensitive electronic components which can be easily damaged by static electricity. Follow the instructions carefully to ensure correct installation and to avoid static damage.



The arrow ⇨ and the Square Pad □ Denote Pin 1 in Jumpers and Connectors.

Step 1 Unpacking the Motherboard

Step	Action
1.	Inspect the cardboard carton for obvious damage. If damaged, call Technical Support at 404-246-8600. Leave the motherboard in its original packing.
2.	Perform all unpacking and installation procedures on a ground connected 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 instead of the anti-static mat. Similarly, a strip of conductive aluminum foil wrapped around the wrist and grounded through a 1 megohm resistor serves the same purpose as the wristband.
3.	Inside the carton, the motherboard is packed in an anti-static bag, and sandwiched between sheets of sponge. Remove the sponge and the anti-static bag. Place the motherboard on a grounded anti-static surface component side up. Save the original packing material.
4.	Inspect the motherboard for damage. Press down on all ICs mounted in sockets to verify proper seating. Do not apply power to the motherboard if it has been damaged.
5.	If the motherboard is undamaged, it is ready to be installed.

Step 2 Set Switch and Jumper Options

Set all user-configurable jumpers and switches and install upgrade processors before placing the motherboard in the chassis. The switches and jumpers are:

SW1	Cache Memory Size,
J26	Diagnostics,
J29	Serial Port 1 IRQ Select,
J28	Serial Port 2 IRQ Select,
J22	Parallel Port IRQ Select,
J30	Enable onboard PS/2 mouse
J37, J54, J55, J19, J43, J57, J56	Select CPU type,
J42	Disable PQFP CPU,
J48	CMOS RAM Drain,
J44, J41	DMA Channel Select,
J57	Select 5V CPU,
J56	Select 3.3V CPU,
J16	Local Bus ID3 Select, and
J17	Local Bus ID2 Select.

SW1

SW1 is a four-position two-bit DIP switch that controls cache memory configuration. See the graphic on page 32 for the location of SW1.

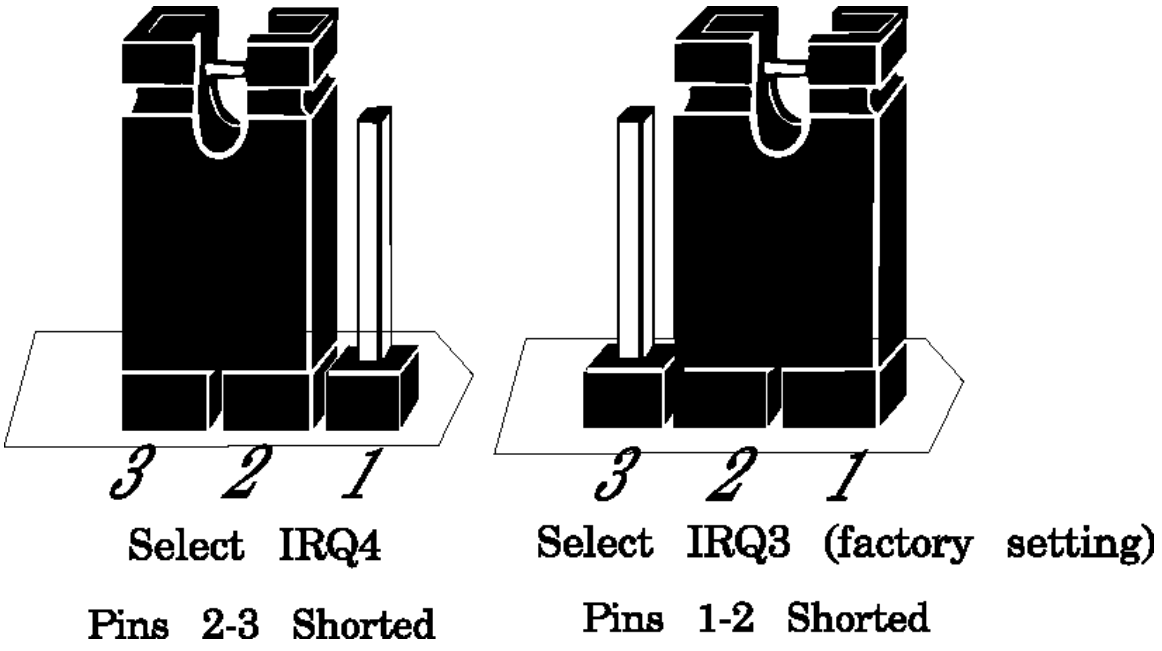
SW1 Switches	Cache Memory Configured
All OFF	64 KB
All ON	256 KB

J26 Diag

J26 is the Manufacturing Diagnostics jumper. The motherboard is shipped with J26 OPEN. J26 should remain OPEN.

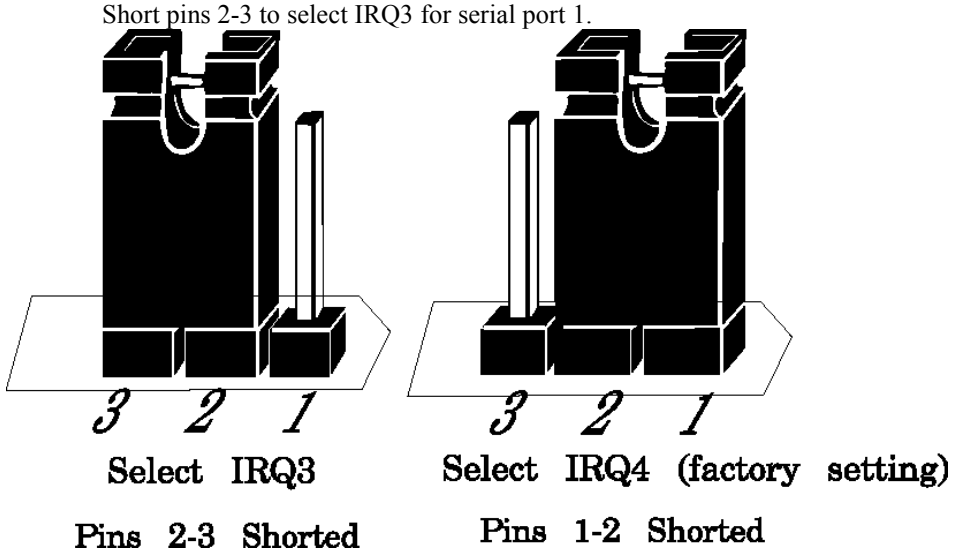
J28 Serial Port 2 IRQ Select

J28 is a three-pin single-inline berg. Short pins 2-3 to select IRQ4 for serial port 2. Short pins 1-2 (the default) to select IRQ3 for serial port 2.



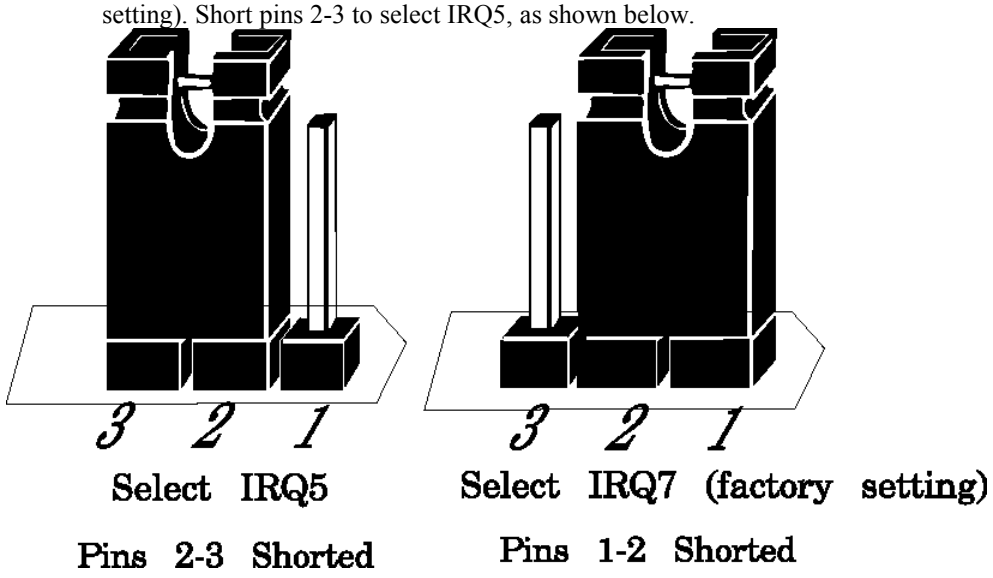
J29 Serial Port 1 IRQ Select

J29 is a three-pin single-inline berg. Short pins 1-2 to select IRQ4 for serial port 1 (the factory setting). Short pins 2-3 to select IRQ3 for serial port 1.



J22 Parallel Port IRQ Select

J22 is a three-pin berg that selects the IRQ for the parallel port. Short pins 1-2 to select IRQ7 (the factory setting). Short pins 2-3 to select IRQ5, as shown below.

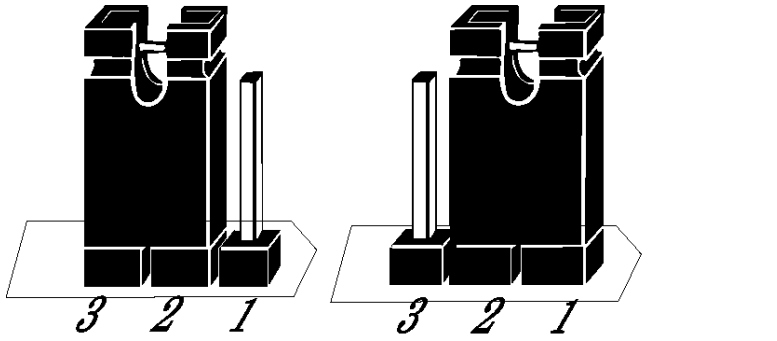


CPU Clock Speed

The CPU Clock speed options will be specified in an American Megatrends Technical Tip to be supplied later.

J30 Onboard PS/2 Mouse Enable

J30 is a three-pin single-inline berg. Short pins 2-3 to disable the onboard PS/2 mouse. Short pins 1-2 to enable the onboard PS/2 mouse (the default). *IRQ12 cannot be used by any ISA or VL-Bus adapter card when the onboard mouse is enabled.*

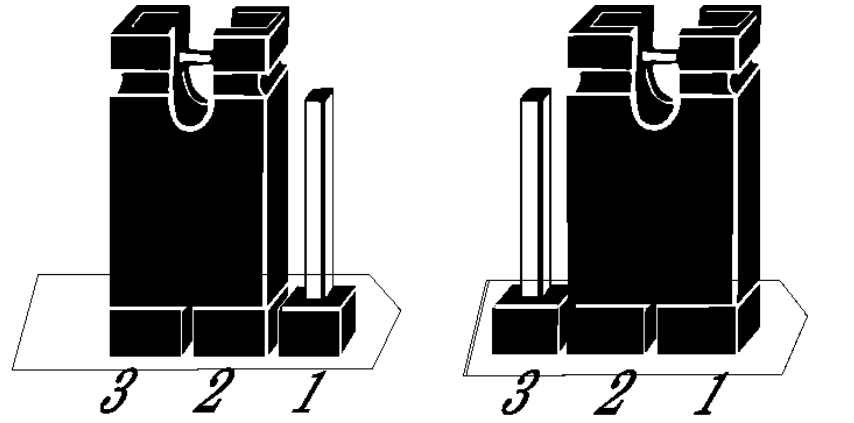


Disable mouse
Pins 2-3 Shorted

Enable mouse (factory setting)
Pins 1-2 Shorted

J17 Local Bus ID2 Select

J17 is a three-pin single-inline berg. In normal operation, pins 1-2 are shorted when running Local Bus Adapter Cards at 20, 25, or 33 MHz. The factory setting depends on the motherboard frequency. Short pins 2-3 if running Local Bus Adapter Cards at speeds higher than 33 MHz. J17 is shown below. See the graphic on page 32 for the location.



40 or 50 MHz CPU
Pins 2-3 Shorted

25 or 33 MHz CPU
Pins 1-2 Shorted

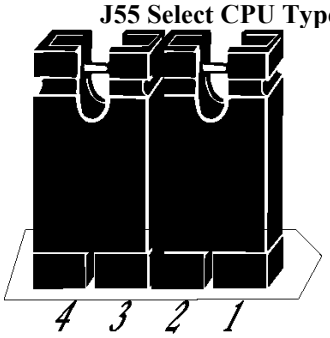
J37, J54, J55, J19, J43, J57, J56 CPU Select

J43 is a two-pin berg. J37 and J54 are three-pin bergs. J55 and J19 are four-pin bergs. J56 and J57 are six-pin bergs. Together, these jumpers select the CPU type.

CPU in ZIF Socket	J37	J54	J55	J19	J43	J57	J56
486SX	OPEN	N/A	Short 2-3	Short 1-2 Short 3-4	OPEN	Short 1-2 Short 3-4 Short 5-6	All OPEN
486DX, 486DX2	OPEN	Short 1-2	Short 1-2 Short 3-4	Short 1-2 Short 3-4	OPEN	Short 1-2 Short 3-4 Short 5-6	All OPEN
487SX, P23T	OPEN	Short 2-3	Short 1-2 Short 3-4	Short 1-2 Short 3-4	OPEN	Short 1-2 Short 3-4 Short 5-6	All OPEN
P4S, P24S, P23S	OPEN	Short 1-2	Short 1-2 Short 3-4	Short 2-3	OPEN	Short 1-2 Short 3-4 Short 5-6	All OPEN
P24D	OPEN	Short 1-2	Short 1-2 Short 3-4	Short 3-4	SHORT	Short 1-2 Short 3-4 Short 5-6	All OPEN
P24T	OPEN	Short 2-3	Short 1-2 Short 3-4	Short 3-4	OPEN	Short 1-2 Short 3-4 Short 5-6	All OPEN
486DX4 (x 2)	Short 1-2	Short 1-2	Short 1-2 Short 3-4	Short 2-3	OPEN	All OPEN	Short 1-2 Short 3-4 Short 5-6
486DX4 (2.5)	Short 2-3	Short 1-2	Short 1-2 Short 3-4	Short 2-3	OPEN	All OPEN	Short 1-2 Short 3-4 Short 5-6
486DX4 (x 3)	OPEN	Short 1-2	Short 1-2 Short 3-4	Short 2-3	OPEN	All OPEN	Short 1-2 Short 3-4 Short 5-6
P24CT	OPEN	Short 2-3	Short 1-2 Short 3-4	Short 3-4	OPEN	All OPEN	Short 1-2 Short 3-4 Short 5-6

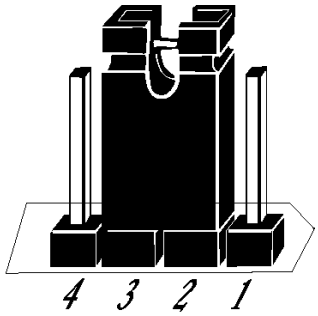
The graphics on the following page depicts the jumper settings.

J55 Select CPU Type



Short Pins 1-2 and 3-4

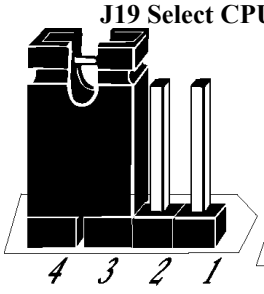
486DX, 486DX2,487SX,
P23T, P4S, P24S,
P23S, P24D, P24T,
486DX4, P24CT



Short Pins 2-3

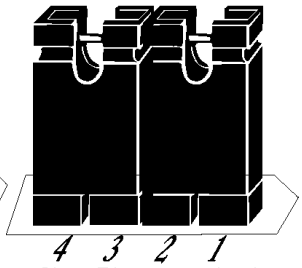
486SX

J19 Select CPU Type



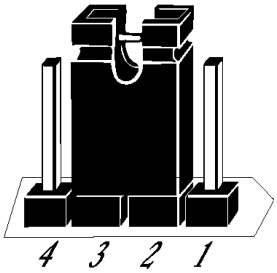
Short Pins 3-4

P24D, P24T, P24CT



Short Pins 1-2 and 3-4

486DX, 486DX2,
487SX, orP23T

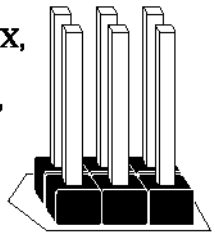


Short Pins 2-3

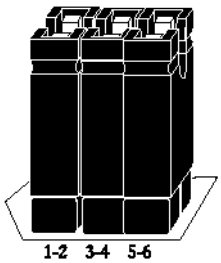
P4S, P24S, P23S,
486DX4, P24D,
P24T, P24CT

J56 Select CPU Type

J56 if 486SX, 486DX,
486DX2, 487SX,
P23T, P4S, P24S,
P23S, P24D,
or P24T CPUs

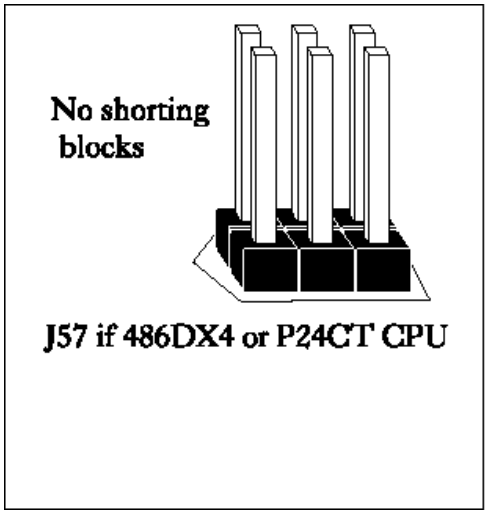


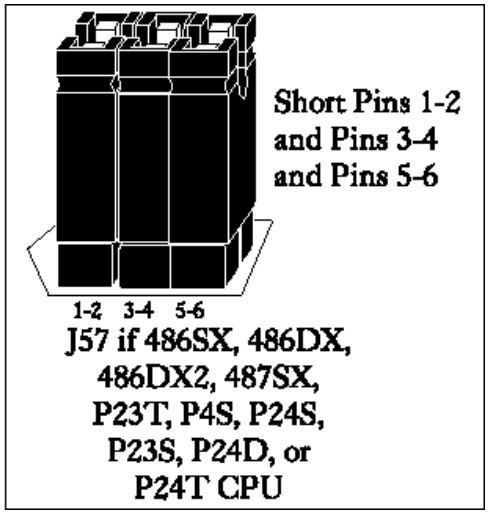
Short Pins 1-2 and
Short Pins 3-4 and
Short Pins 5-6



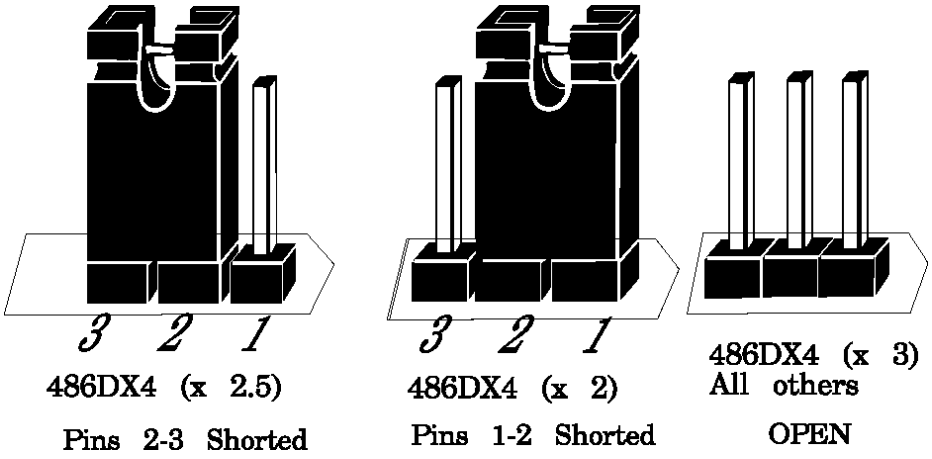
J56 if 486DX4 or P24T CPU

J57 Select CPU Type

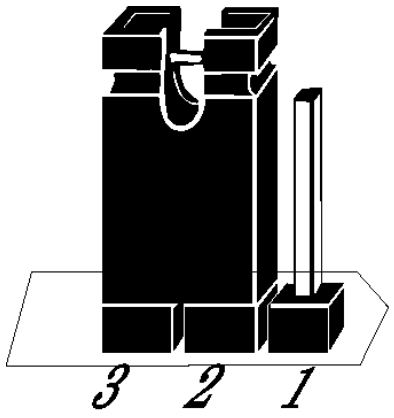




J37 Select CPU Type

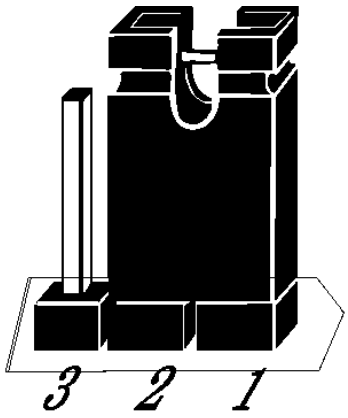


J54 Select CPU Type



487SX, P23T,
P24T, P24CT

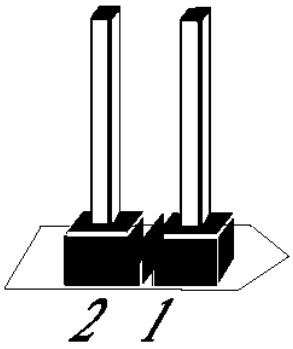
Pins 2-3 Shorted



486DX, 486DX2,
P4S, P24S, P23S,
P24D, 486DX4

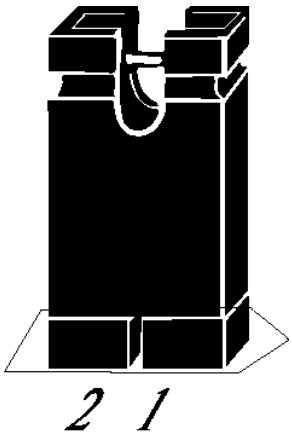
Pins 1-2 Shorted

J43 Select CPU Type



486SX, 486DX, 486DX2,
487SX, P24T, P4S,
P24S, P23S, 486DX4

Pins 1-2 OPEN

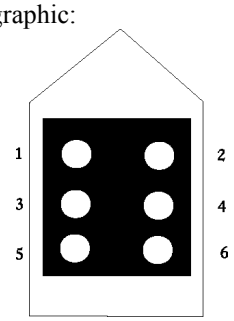


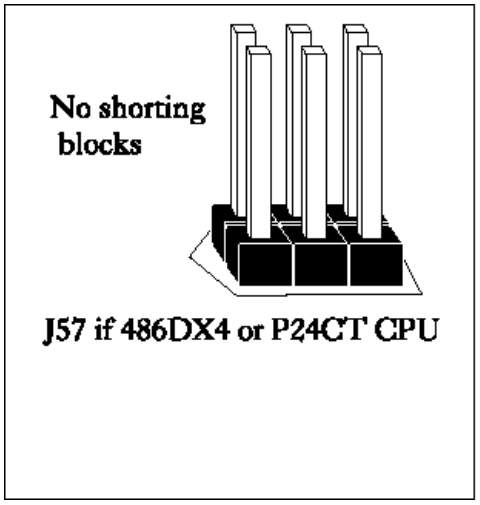
P24D

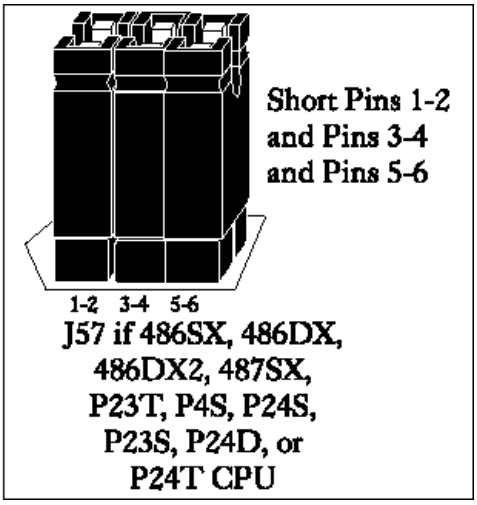
Pins 1-2 Shorted

J57 Select 5V CPU

J57 is a three by two dual-inline berg. Short the following pins together: 1-2, 3-4, and 5-6 when a 5 volt CPU is installed on the motherboard. See the graphic on page 32 for the J57 location. The J57 and J56 pin numbering is shown in the following graphic:





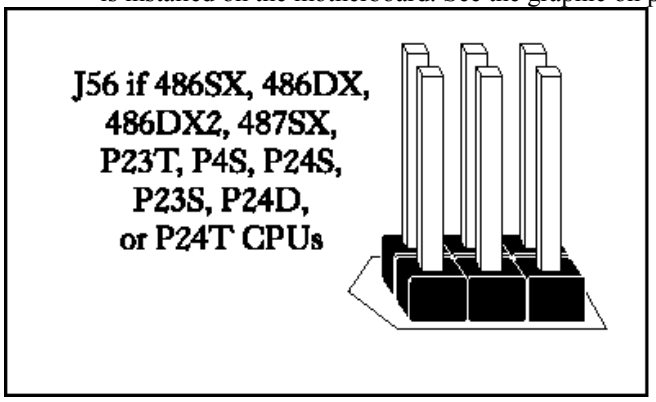


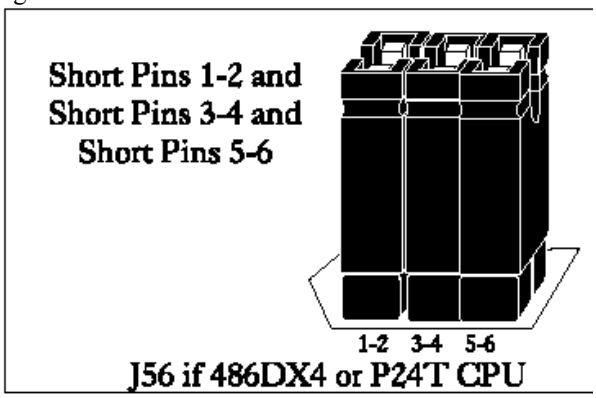
Warning
Short the Pins on either J57 or J56. *NEVER SHORT PINS ON BOTH J57 AND J56.* Short J57 pins for 5V CPUs. Short J56 for 3.3V CPUs.

J56 Select 3.3V CPU

Before using a 3.3V CPU, make sure that a voltage regulator is installed with a heat sink in U63. 3.3V CPUs cannot be used unless this voltage regulator is installed.

J56 is a three by two dual-inline berg. Short the following Pins together: 1-2, 3-4, and 5-6 if a 3.3 volt CPU is installed on the motherboard. See the graphic on page 32 for the J56 location.



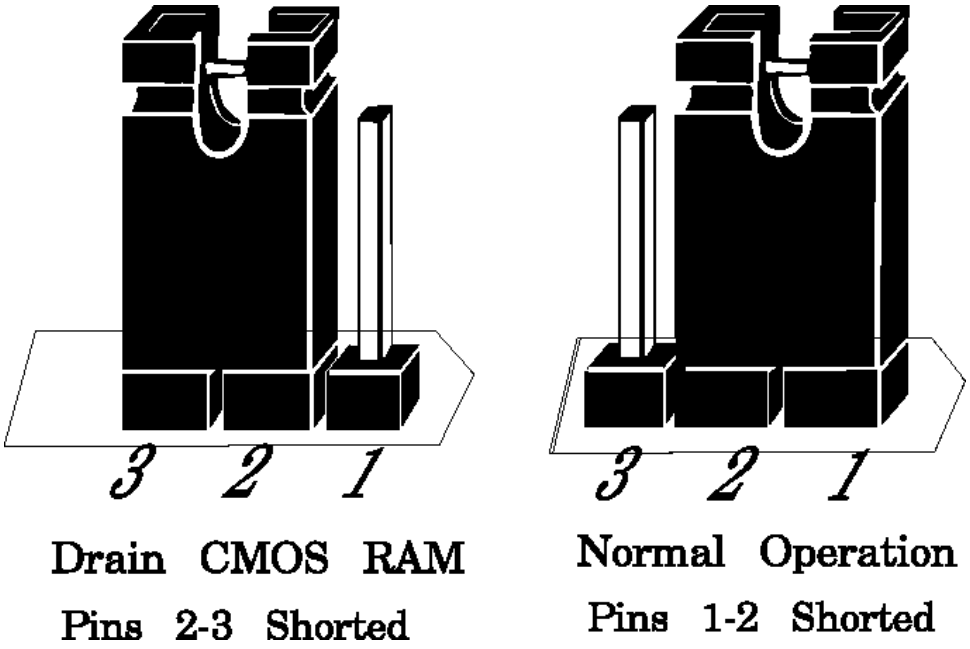


J42 Disable PQFP CPU

J42 is a two-pin single-inline berg. Short Pins 1-2 together to disable the PQFP CPU. You must short these pins when a CPU is installed in the ZIF socket on the motherboard. See the graphic on page 32 for the J42 location.

J48 CMOS RAM Drain

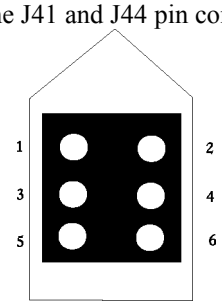
J48 is a three-pin single-inline berg. In normal operation, pins 1-2 are shorted. Short pins 2-3 to drain CMOS RAM.

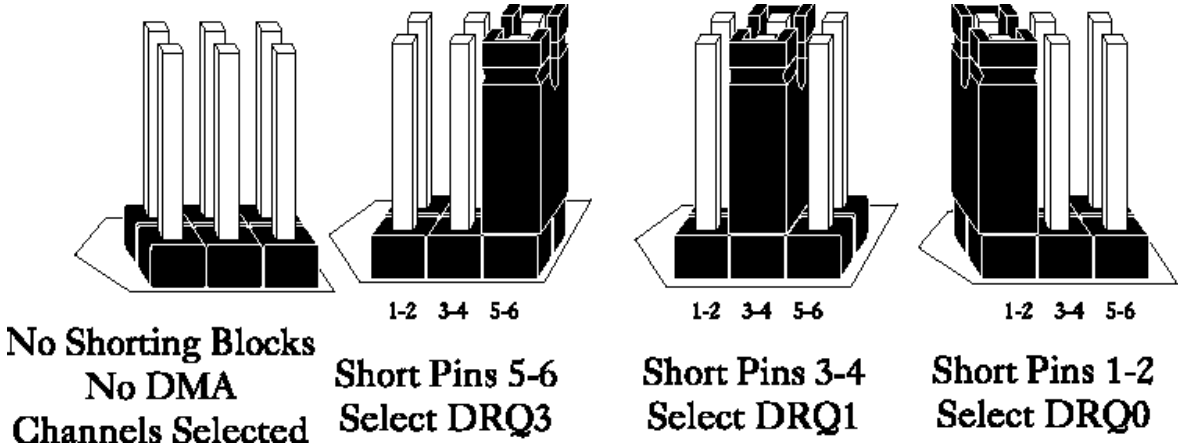


With many motherboards, if you forget the system password, you must remove the battery for at least 20 minutes to erase the password. J48 provides a quicker method. By shorting J48 pins 2-3 together for several seconds, you can quickly drain power from CMOS RAM. You must then place the shorting bridge on Pins 1-2 of J48 again. Then you must run WinBIOS Setup to reconfigure the computer, since no system configuration data will now be stored in CMOS RAM.

J44 Select Enhanced Parallel Port DMA Request

J44 is a six-pin dual-inline header that selects the parallel port DMA request line. The factory setting is OPEN (no DMA channel selected). The J41 and J44 pin configuration is shown in the following graphic:





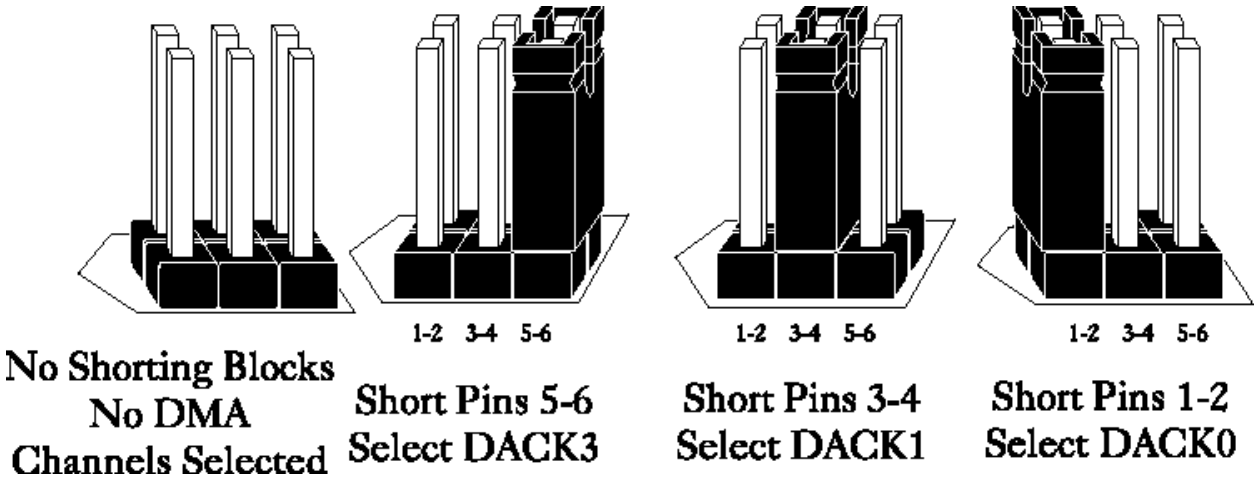
J44 Pin Setting	DMA Channel
All OPEN	No DMA channel selected (factory setting)
Short Pins 1-2	DRQ0
Short Pins 3-4	DRQ1
Short Pins 5-6	DRQ3 *(Factory setting)*

Warning

If Pins 1-2 of J44 are shorted together, Pins 1-2 of J41 must be shorted together.
If Pins 3-4 of J44 are shorted together, Pins 3-4 of J41 must be shorted together.
If Pins 5-6 of J44 are shorted together, Pins 5-6 of J41 must be shorted together.
You can only select one of the J44/J41 options, and they must match.

J41 Select Enhanced Parallel Port DMA Acknowledge

J41 is a six-pin dual-inline header that selects the parallel port DMA Acknowledge line. The factory setting is all OPEN (no DMA channel selected).



J41 Pin Setting	DMA Channel
All OPEN	No DMA channel selected (factory setting)
Short Pins 1-2	DRQ0
Short Pins 3-4	DRQ1
Short Pins 5-6	DRQ3

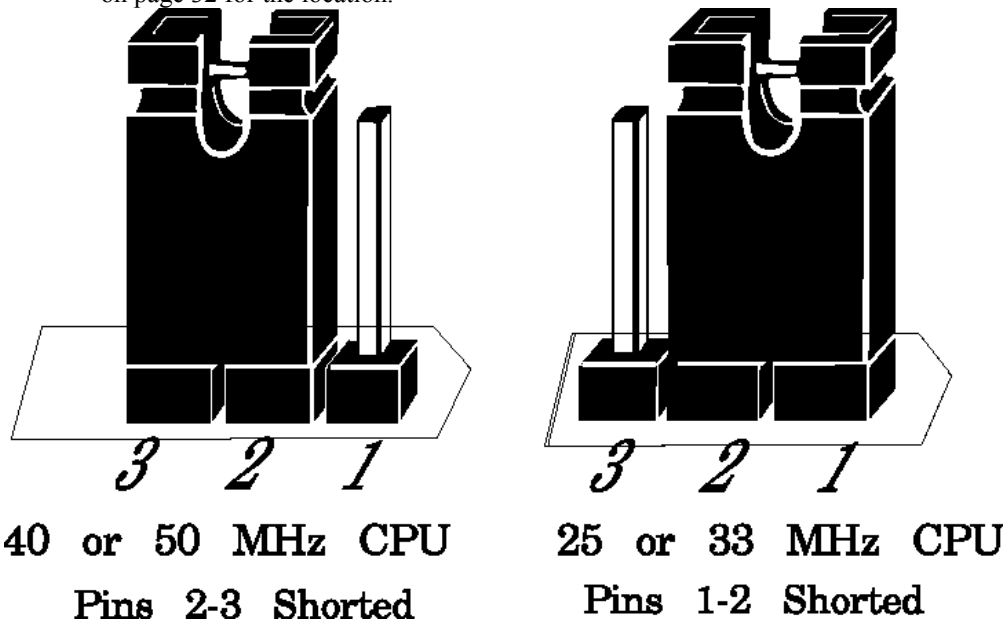
J39 Password LED Enable

J39 is a three-pin berg that enables the Password LED. The end user must enter the correct system password if the Password LED is blinking. If the password LED blinks, the system has experienced no system activity during the length of time specified in Power Management Setup. The WinBIOS system password feature and WinBIOS Power Management feature must be enabled before the Password LED will blink when the correct system password must be entered by the end user.

J4 Pin Settings	LED selected
Short Pins 1-2	Front panel power LED is Password LED. *(Factory setting)*.
Short Pins 2-3	Separate Password LED using J38.

J16 Local Bus ID3 Select

J16 is a three-pin single-inline berg. In normal operation, pins 1-2 are shorted when running Local Bus Adapter Cards at 20, 25, or 33 MHz. The factory setting depends on the motherboard frequency. Short pins 2-3 if running Local Bus Adapter Cards at speeds higher than 33 MHz. J16 is shown below. See the graphic on page 32 for the location.



Step 3 Install Memory

The main memory subsystem on the Super Voyager VLB-III motherboard consists of four 32-bit SIMM memory sockets. Each socket can hold one SIMM unit. One x 36 SIMM packages is the equivalent of four x 9 SIMM packages (and is actually a bank of memory in itself). You can use 256 KB x 36, 512 KB x 36, 1 MB x 36, 2 MB x 36, 4 MB x 36, 8 MB x 36, or 16 MB x 36 SIMMs.

The SIMMs can be single-sided or double-sided. The Super Voyager VLB-III motherboard uses fast page mode SIMMs operating at 70 ns (RAS access time).

Reporting Memory

The system memory is reported by AMIBIOS as it boots and again when the AMIBIOS System Configuration Screen is displayed just before DOS is booted.

If the system has 8 MB of system memory, the memory reported by AMIBIOS is 128 KB less than the total amount of memory installed in the system because some of the memory between 640K and 1024K is used to shadow the video and system BIOS.

If the system has 16 MB of memory or more, the memory displayed by AMIBIOS on the System Configuration Screen is 384 KB less than the total memory installed, because all of the memory between 640K and 1024K is used by AMIBIOS for shadowing.

Motherboard Memory Configurations

The Super Voyager VLB-III motherboard supports the following motherboard memory configurations.

BANK0	BANK1	BANK2	BANK3	Total
256 KBx36-S	None	None	None	1 MB
256 KBx36-S	256 KBx36-S	None	None	2 MB
256 KBx36-S	256 KBx36-S	512 KBx36-D	None	4 MB
256 KBx36-S	256 KBx36-S	1 MBx36-S	None	6 MB
256 KBx36-S	256 KBx36-S	512 KBx36-D	1 MBx36-S	8 MB
256 KBx36-S	256 KBx36-S	1 MBx36-S	1 MBx36-S	10 MB
256 KBx36-S	256 KBx36-S	4 MBx36-S	None	18 MB
512 KBx36-D	None	None	None	2 MB
512 KBx36-D	512 KBx36-D	None	None	4 MB
512 KBx36-D	1 MBx36-S	None	None	6 MB
512 KBx36-D	512 KBx36-D	1 MBx36-S	None	8 MB
512 KBx36-D	512 KBx36-D	1 MBx36-S	1 MBx36-S	12 MB
512 KBx36-D	4 MBx36-S	None	None	18 MB
512 KBx36-D	512 KBx36-D	4 MBx36-S	None	20 MB
512 KBx36-D	512 KBx36-D	1 MBx36-S	4 MBx36-S	24 MB
512 KBx36-D	512 KBx36-D	4 MBx36-S	4 MBx36-S	36 MB
1 MBx36-S	None	None	None	4 MB
1 MBx36-S	1 MBx36-S	None	None	8 MB
1 MBx36-S	1 MBx36-S	1 MBx36-S	None	12 MB
1 MBx36-S	1 MBx36-S	1 MBx36-S	1 MBx36-S	16 MB
1 MBx36-S	4 MBx36-S	None	None	20 MB
1 MBx36-S	1 MBx36-S	4 MBx36-S	None	24 MB
1 MBx36-S	4 MBx36-S	4 MBx36-S	None	36 MB
1 MBx36-S	1 MBx36-S	4 MBx36-S	4 MBx36-S	40 MB
2 MBx36-D	None	None	None	8 MB
2 MBx36-D	2 MBx36-D	None	None	16 MB
2 MBx36-D	2 MBx36-D	2 MBx36-D	None	24 MB
2 MBx36-D	2 MBx36-D	2 MBx36-D	2 MBx36-D	32 MB
4 MBx36-S	None	None	None	16 MB
4 MBx36-S	4 MBx36-S	None	None	32 MB
4 MBx36-S	4 MBx36-S	4 MBx36-S	None	48 MB
4 MBx36-S	4 MBx36-S	4 MBx36-S	4 MBx36-S	64 MB
256 KBx36-S	1 MBx36-S	None	None	5 MB
256 KBx36-S	4 MBx36-S	None	None	17 MB
256 KBx36-S	16 MBx36-S	None	None	65 MB
1 MBx36-S	16 MBx36-S	None	None	68 MB
1 MBx36-S	1 MBx36-S	16 MBx36-S	None	72 MB
4 MBx36-S	16 MBx36-S	None	None	80 MB
4 MBx36-S	4 MBx36-S	16 MBx36-S	None	96 MB
16 MBx36-S	None	None	None	64 MB
16 MBx36-S	16 MBx36-S	None	None	128 MB
1 MBx36-S	8 MBx36-D	None	None	36 MB
1 MBx36-S	8 MBx36-D	8 MBx36-D	None	68 MB

BANK0	BANK1	BANK2	BANK3	Total
1 MBx36-S	1 MBx36-S	8 MBx36-D	None	40 MB
1 MBx36-S	1 MBx36-S	8 MBx36-D	8 MBx36-D	72 MB
4 MBx36-S	8 MBx36-D	None	None	48 MB
4 MBx36-S	8 MBx36-D	8 MBx36-D	None	80 MB
4 MBx36-S	4 MBx36-S	8 MBx36-D	None	64 MB
4 MBx36-S	4 MBx36-S	8 MBx36-D	8 MBx36-D	96 MB
8 MBx36-D	None	None	None	32 MB
8 MBx36-D	8 MBx36-D	None	None	64 MB
8 MBx36-D	8 MBx36-D	8 MBx36-D	None	96 MB
8 MBx36-D	8 MBx36-D	8 MBx36-D	8 MBx36-D	128 MB

LEGEND: -S single-sided SIMMs
-D double-sided SIMMs

Selecting SIMMs

Make sure SIMMs meet the following specifications:

Parameter	Specification
Page Mode	FAST
Refresh	CAS before RAS
t_{CAC}	≤ 20 ns
t_{RAC}	≤ 80 ns
t_{AA}	≤ 45 ns
t_{RP}	70 ns
t_{CPA}	≤ 45 ns

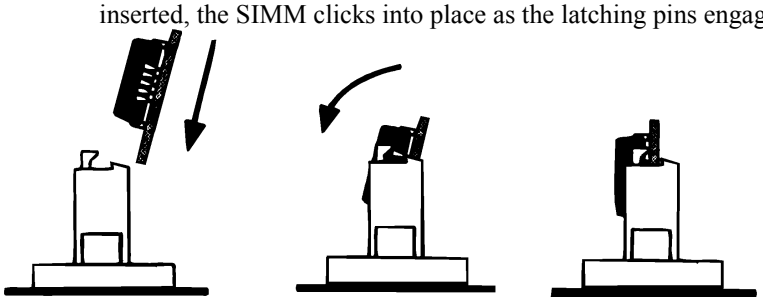
SIMM Part Numbers

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
512 KB x 36	Samsung	KMM536512W-7 (single-sided) KMM536512W3-7 (double-sided)
	Motorola	MCM36512S-70
1 MB x 36	Micron	MT12D136M-7
	Mitsubishi	MH1M36ADJ-7
	PNY	P361000-70
	Motorola	MCM36100AS-70
	Oki	MSC2355-70YS12
	Samsung	KMM5361000AV-7
2 MB x 36	Micron	MT24D236M-7
	Samsung	KMM5362000A-7
	Motorola	MCM36200S70
4 MB x 36	Micron	MT12D436M-7
	Mitsubishi	MH4M36SAJ-7
	Motorola	MCM36400S-70
	PNY	P364000-70
	Samsung	KMM5364100-7
8 MB x 36	Motorola	MCM36800S-70
	PNY	P368000-707
	Samsung	KMM5368100-7

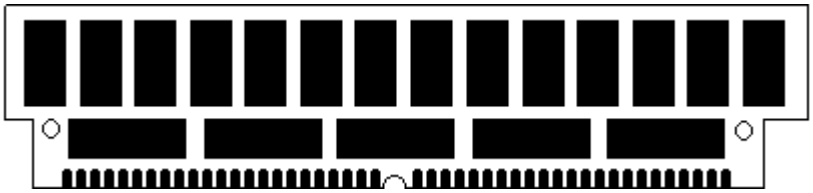
Installing SIMMs

There are four x 36 SIMM sockets located on the Super Voyager VLB-III motherboard. Each x 36 SIMM is the equivalent of four x 9 SIMMs. These sockets can be filled with either 256 KBx36-S, 512 KBx36, 1 MBx36-S, 2 MBx36, 4 MBx36-S, 8 MBx36, or 16 MBx36 SIMMs.

Place the motherboard on an anti-static mat. With the component side of the SIMM facing you, firmly push the SIMM into the socket at a 45 degree angle, then push it up to a vertical position. When properly inserted, the SIMM clicks into place as the latching pins engage.



The 1 MBx36-S SIMMs look like this:



Step 4 Install Upgrade Processor

Follow the procedures described in this step to install an upgrade processor in the empty ZIF socket near the CPU.

> ***Warning***
> Improper Upgrade Processor installation can damage the Upgrade Processor and/or the motherboard. You must follow the procedures in this section exactly as documented.

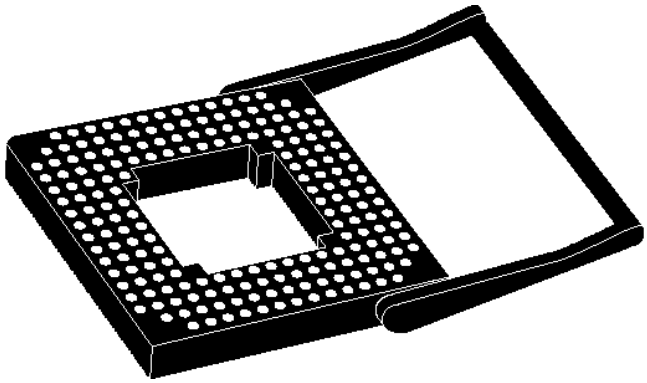
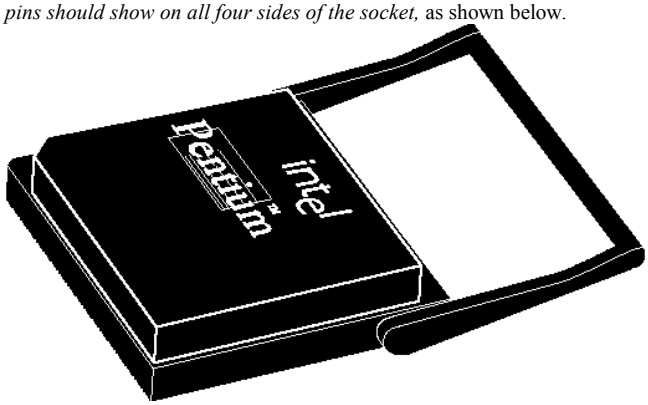
Processor Type and Speed

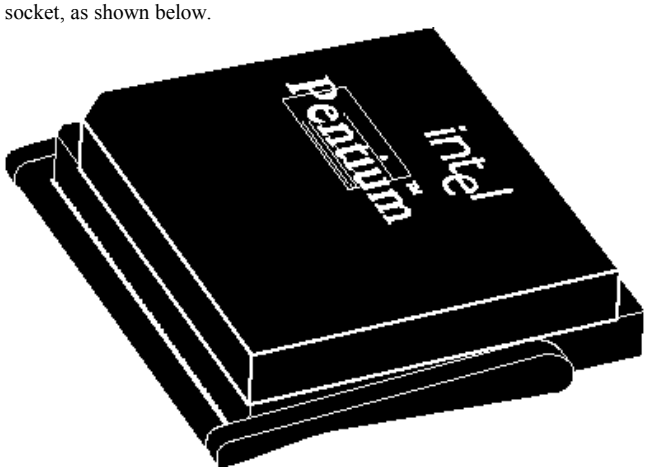
The Upgrade Processor socket is a 240-pin socket near one edge of the board. The Super Voyager VLB-III motherboard supports the following CPUs and Upgrade Processors:

Processor in ZIF Socket (Upgrade Socket)	PQFP Processor	Frequency
Empty	486SX	20, 25, or 33 MHz
Empty	Enhanced S Series (486DX and SX) 486DX AM486	33, 40, or 50 MHz
486DX AM486 Enhanced S Series (486DX, SX, and DX2)	empty	33, 40, or 50 MHz
486DX2 Overdrive®	empty	25 MHz (50 MHz internal), 33 MHz (66 MHz internal)
486DX4	empty	25 MHz (75 MHz internal), 33 MHz (100 MHz internal)
486SX	486SX	25 or 33 MHz
Future Intel CPUs with internal write-back cache	empty	25 MHz (75 MHz internal), 33 MHz (100 MHz internal)
487SX	486SX	25 or 33 MHz

Installing an Upgrade Processor

The following discussion applies only to 169-pin processors, such as the 486DX, 486DX2, 486DX4, 486SX, 487SX, AM486, SL Enhanced S Series, P23T, or P24. Upgrade Processor installation is easy because a ZIF (zero insertion force) socket is used.

Step	Action
1	Lift the lever on the ZIF socket. The empty Upgrade Processor socket looks like this. 
2	Pin 1 of the socket has a white diagonal line across one corner on the motherboard, which corresponds to pin 1 of the Upgrade Processor. Check for bent pins on the Upgrade Processor chip. Gently straighten any bent pins with pliers. Place the Upgrade Processor squarely in the middle of the socket, *making sure that one row of socket pins shows on all four sides.* Make sure that pin 1 of the Upgrade Processor is aligned with pin 1 of the socket.
3	The Upgrade Processor socket is a 240-pin socket. But the 486DX, 486DX2, 486DX3, 486SX, 80487SX, P24, and P23T come in 169-pin packages. *When these processors are installed, an extra row of socket pins should show on all four sides of the socket,* as shown below. 

Step	Action
4	Complete installation by lifting the ZIF lever to the other side of the socket, as shown below. 

Installing a P24T or P24CT

The P24T and P24CT upgrade processors are 240-pin package that uses all socket pins. Use the same procedure describe above to install a P24T or P24CT. However, when properly installed, these CPUs use all 240 pins, so no extra socket pins can be seen.

Step 5 Install the Motherboard

The motherboard mounting hole pattern is the same as the mounting hole pattern on the AT motherboard. Standoffs and mounting screws are not supplied with the motherboard. The chassis manufacture should supply these parts.

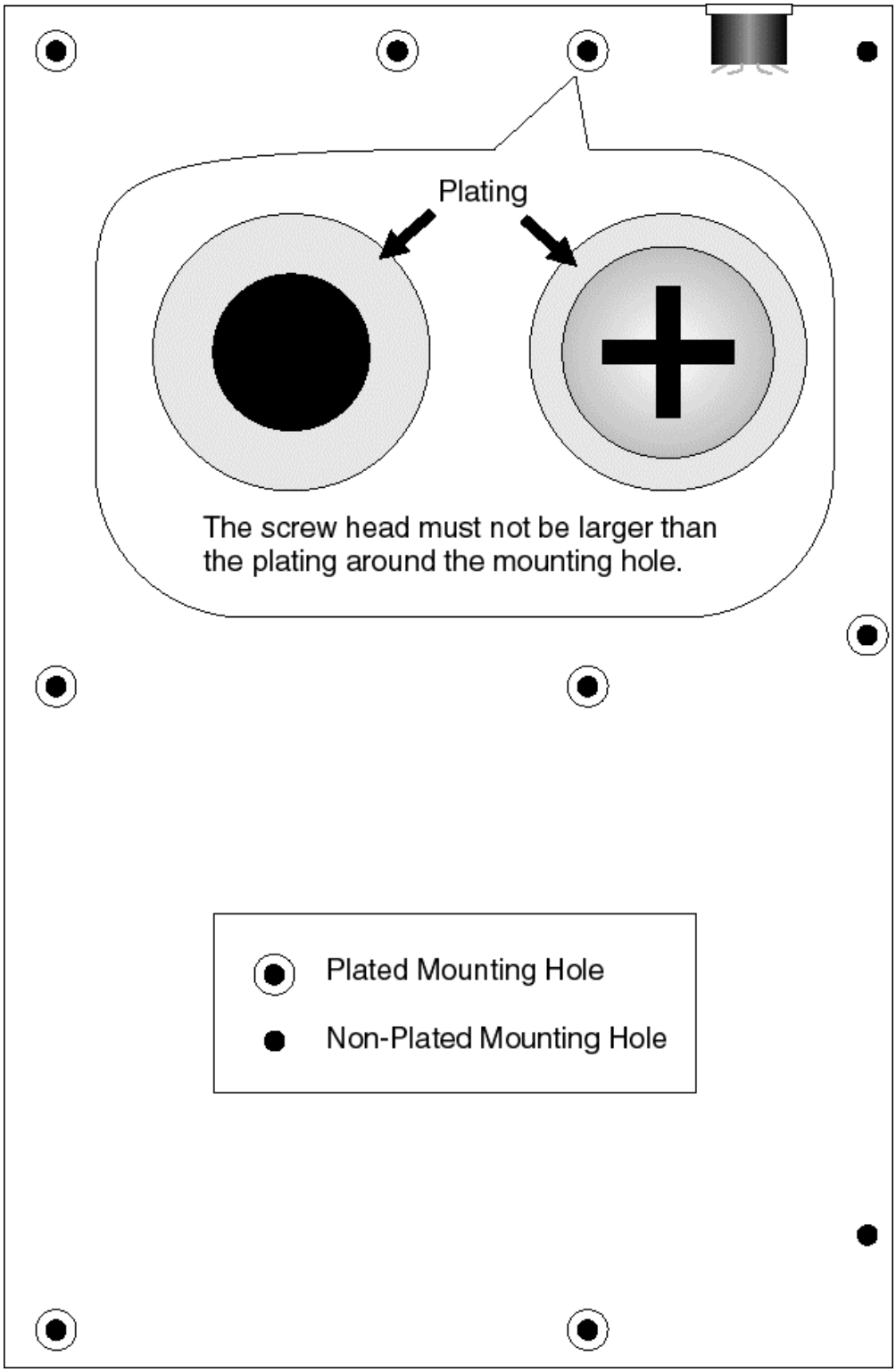
Step	Action
1	Place the chassis on an anti-static mat. Connect the chassis to ground to avoid static damage during installation. Connect an alligator clip with a wire lead to any unpainted part of the chassis. Ground the other end of the lead at the same point as the mat and the wristband.
2	Rotate the 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 at the far end of the chassis.
3	Push four nylon standoffs from the solder side of the motherboard in the holes provided for them. The standoffs lock in place. Find the slots provided for the standoffs on the chassis. Hold the motherboard, component-side up, with the edge with the standoffs toward you and the edge with the power supply connector away from you. The edge connectors for the adapter cards should be to the left.
4	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.
5	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. Refer to the graphic on page 32.

Warning

If using metallic screws, make sure that you use them only in the plated mounting holes.

If using metallic screws, make sure that the head of the screw fits completely inside the plated mounting holes.

See the graphic on the following page.


Plating
The screw head must not be larger than the plating around the mounting hole.
Plated Mounting Hole
Non-Plated Mounting Hole

Step 6 Connect the Power Supply

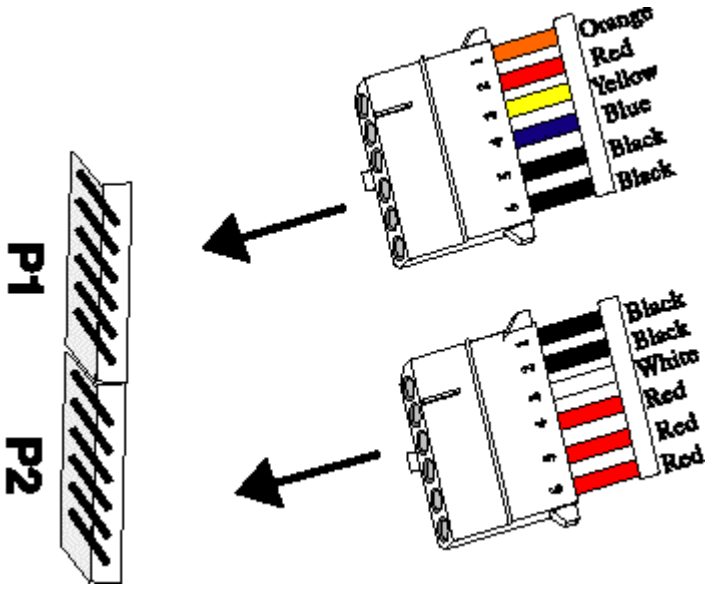
The power supply should match the physical configuration of the chassis. Make sure that the power switch is Off before assembly.

Before attaching all components, make sure that the proper voltage has been selected. Power supplies often can run on a wide range of voltages and must be set (usually via a switch) to the proper range. Use at least a 230 watt power supply, which should have built-in filters to suppress radiated emissions.

Connect to P1 and P2

Attach the power supply cables to P1 and P2 on the motherboard. AT-compatible power supplies have two 6-pin connectors. The 6-pin connector with 3 red wires and 2 black wires is connected to P2 and the remaining 6-pin connector is connected to P1, as shown below.

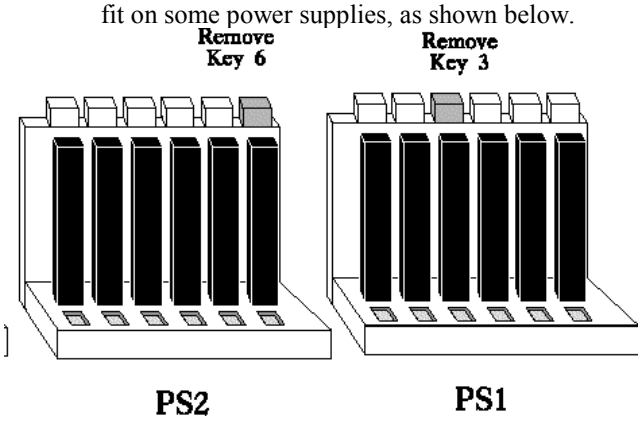
Power Supply Connectors



Step 6 Connect the Power Supply, Continued

Power Supply Connectors are Keyed

The power connectors are keyed to prevent incorrect installation. The keys on the connector must be cut to fit on some power supplies, as shown below.



P1 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)

P2 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)

Step 7 Connect the Keyboard Cable

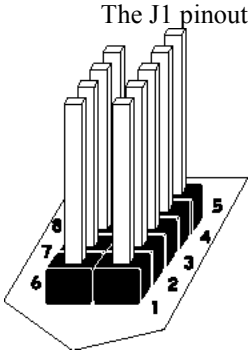
The keyboard attaches via a standard 5-pin DIN keyboard connector. Adjacent to the keyboard connector is a 10-pin berg for attaching a PS/2-type mouse.

The keyboard connector is a 5-pin DIN socket labeled KEYBRD and J6 on the motherboard. The keyboard connector position is shown on page 32. Attach a standard AT-compatible keyboard cable. Use a 5-pin DIN to 6-pin miniDIN converter to connect a PS/2-type keyboard.

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

Step 8 Connect the Mouse Cable

The mouse connector (J1) is a ten-pin dual-inline berg. Attach a customized serial cable from the mouse connector to a DB9 serial port connector. You can order this cable from the many parts suppliers. Ask for a **Cable Assembly DB9, Male, 10-Pin**. J1 Pin 10 should be cut. The connector position is shown on page 32. The J1 pinout is:



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

The DB9 connector pinout is:

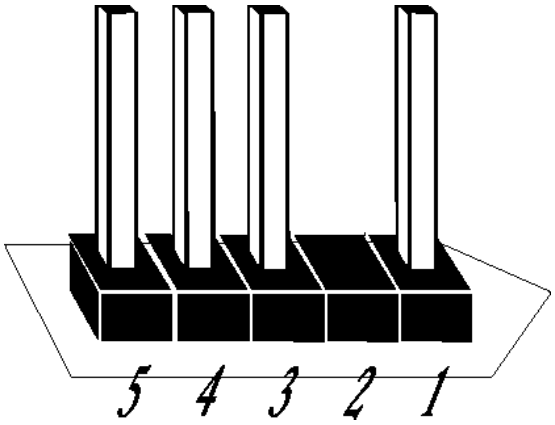
Pin	Assignment	Pin	Assignment
1	Clock	2	N/C
3	N/C	4	N/C
5	Ground	6	N/C
7	N/C	8	FVcc
9	Data	N/A	N/A

Step 9 Connect Cables

When connecting chassis connectors to the motherboard, make sure to connect the correct connector end. Most connector wires are color-coded. Match the color of the wires leaving the switch or LED to the same pin 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.

All motherboard components are outlined by a white rectangular box with a broad arrow at one end. Pin 1 is always at the arrow end of the white outlined box, as shown in the following drawing.



The following cables should be connected to the motherboard:

- Password LED cable to J38,
- Green PC power switch to J3,
- Green PC feature connector to J47,
- Reset Switch cable to J32,
- Speaker cable to J27,
- Keyboard Lock cable to J31,
- Turbo LED cable to J40,
- External Battery connector to J10,
- Turbo Switch cable to J33, and
- IDE LED Activity Indicator LED cable to J2.

J38 Password LED Connector

J38 a two-pin berg that can be attached via a cable to an LED that flashes when the system has been inactive for a specified length of time and Pins 2-3 of J39 are shorted.

If a Password LED is not mounted on the computer case, another LED, such as the Power LED, can be made to flash if Pins 1-2 of J39 are shorted.

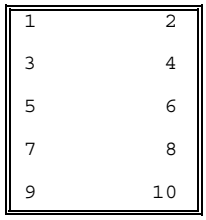
J3 Green PC Power

J3 is a two-pin berg that attaches to the Green PC power switch. This switch can be used to turn power off during Green PC mode. The + on Pin 2 denotes the positive connector.

J47 Green PC Monitor Connector Pinout

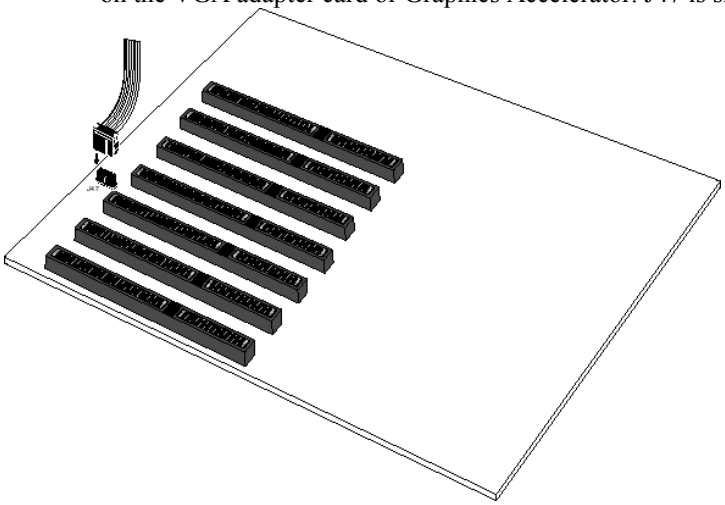
Pin	Signal Description	Pin	Signal Description
1	N/C	2	N/C
3	N/C	4	N/C
5	TTL output for SYNC enable	6	Open Collector output for HSYNC control
7	N/C	8	Open Collector output for VSYNC control
9	N/C	10	GND

The J47 monitor connector pins are arranged as follows:

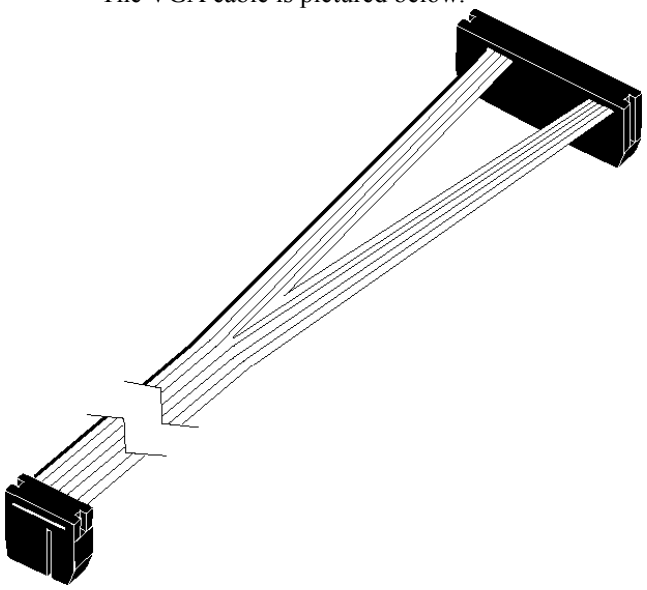


J47 Green PC Monitor Connector

Attach a 10-wire 10 to 26-pin flat cable between J47 on the motherboard and the VGA Feature Connector on the VGA adapter card or Graphics Accelerator. J47 is shown below.



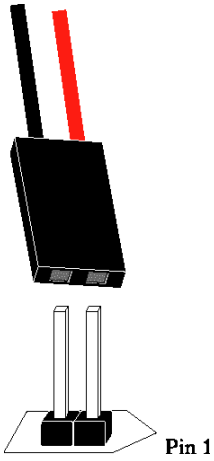
The VGA cable is pictured below.



After the timeout period specified in Power Management Setup expires, the motherboard drives the SYNC ENABLE, HSYNC, and VSYNC signals Low through open collector outputs. Monitors that support the Display Power Management Specification (DPMS) can turn power off after examining this condition, saving power.

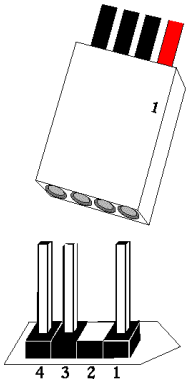
J32 Reset Switch Connector

J32 is a two-pin single-inline berg that is attached via a cable to an externally-mounted reset switch. When the reset switch is pressed, the system performs a hard reset. Pin 1 is ground and Pin 2 is Hard Reset.



J27 Speaker Connector

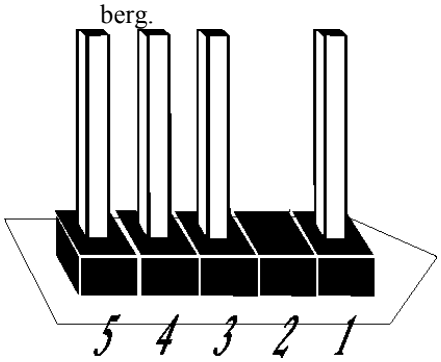
J27 is a four-pin single-inline berg that is attached via a cable to the system speaker. AMIBIOS signals hardware problems through the speaker. Pin 1 on the motherboard is identified by the arrow on the white box around the berg.



Pin	Description
1	Data Out
2	Key
3	N/C
4	VCC

J31 Keyboard Lock Connector

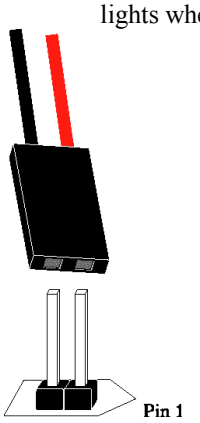
J31 is a five-pin single-inline berg that is attached via a cable to the keyboard lock connector. The keyboard lock allows the user to lock the keyboard, protecting the system from unauthorized use. This connector is keyed with a blank hole. Pin 1 on the motherboard is identified by the arrow on the white box around the berg.



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

J40 Turbo LED

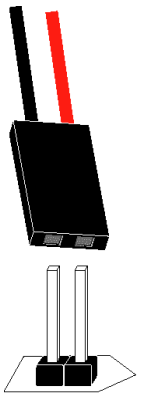
J40 is a two-pin berg that is attached via a cable to the externally-mounted bipolar Turbo LED. The LED lights when the motherboard is running at high speed.



J2 IDE Activity Indicator LED

J2 is a two-pin berg that is attached via a cable to the externally-mounted IDE Activity LED. This LED lights when the IDE drive is running.

> ***Warning***
>
> In some IDE drives, you may have to disable the IDE LED mounted on the drive by changing a jumper or setting a switch on the IDE drive itself, before the IDE drive sends a signal to J2.



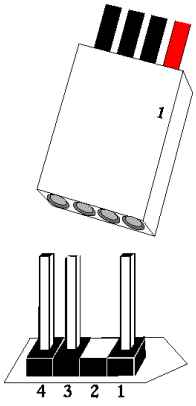
J33 Turbo Switch Connector

J33 is a two-pin single-inline berg that is attached via a cable to the externally-mounted bipolar Turbo switch on the chassis. The turbo switch allows the user to change the motherboard clock speed between high and low speeds.

Step 9 Connect Cables, Continued

J10 External Battery Connector

There is a built-in rechargeable battery on the motherboard. An external battery is not necessary, but can be used. Connect the external battery to J10 via a four-wire cable. If you attach an external battery to J10, the battery on the motherboard is automatically electrically isolated. J10 is a four-pin berg that connects to a 3.6 volt external battery. The positive (+) terminal (the red wire) connects to J10 Pin 1. The J10 pinout and connector are shown below.



Pin	Description
1	VBat (red wire)
2	KEY pin
3	Ground
4	Ground (Black wire)

Step 10 Connect Onboard I/O

Onboard Adapters

The Super Voyager VLB-III motherboard has two serial ports (J13 and J14) and a parallel port (J5) onboard. It also has an IDE controller on the VL-bus local bus (J9), and a floppy controller (J8).

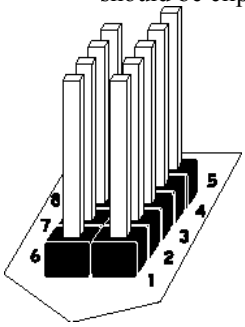
The serial and parallel port connectors are described below. The IDE connector is described on page 78. The floppy connector is described on page 76.

Checking for Conflicts

AMIBIOS is designed to minimize conflicts between onboard and offboard I/O. AMIBIOS automatically checks the adapter cards installed in the expansion slots on the Super Voyager VLB-III motherboard for a hard disk or floppy controller and serial or parallel ports.

J13 Serial Port 1 (COM1) and **J14 Serial Port 2 (COM2)**

J13 and J14 are 10-pin dual-inline bergs that connect via 10-pin double-row ribbons to male 9-pin D-sub connectors fastened to the chassis to provide an AT-compatible serial port interface. Pin 10 of J134 and J14 should be clipped, as shown below.



Warning

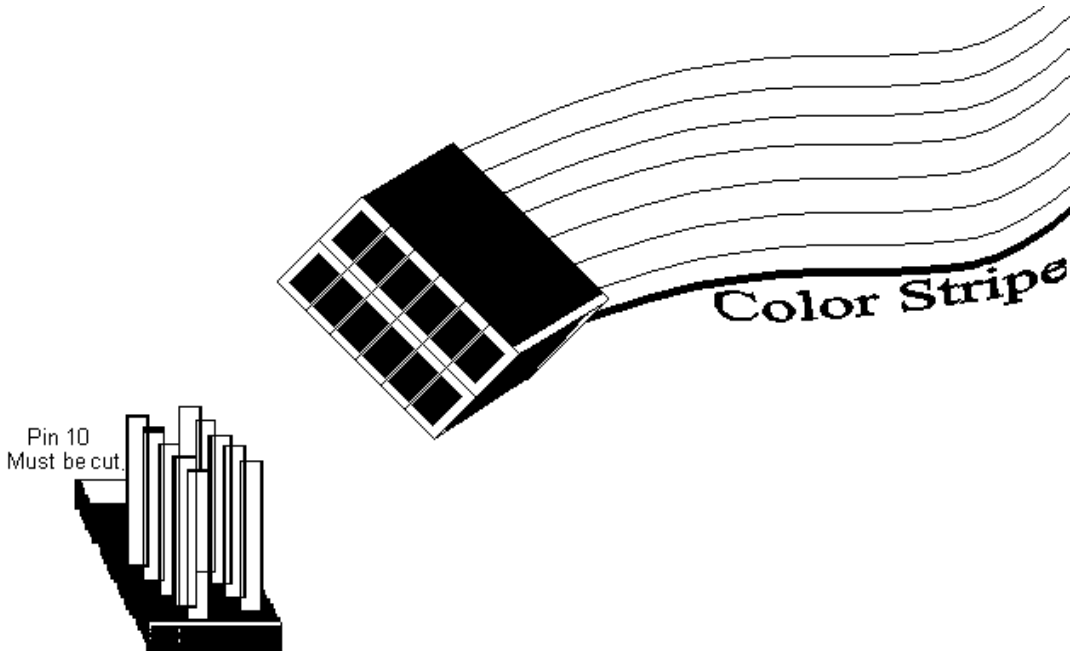
Use only the serial cables provided with the Super Voyager VLB-III motherboard.

The serial port pinout is shown below. Be sure to properly connect the cables to the berg connectors. Pin 1 of each of the bergs is labeled "1". The wire leading to pin 1 on the cable usually has a colored stripe.

Pin	Use	Pin	Use
1	Carrier Detect	6	Data Set Ready
2	Receive Data	7	Request to Send
3	Transmit Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	GND	10	Key (N/C)

Attaching the Serial Port Cables

Two serial port cables are supplied with the motherboard. Attach the cables to J13 and J14 and to the external serial port connectors on the chassis.



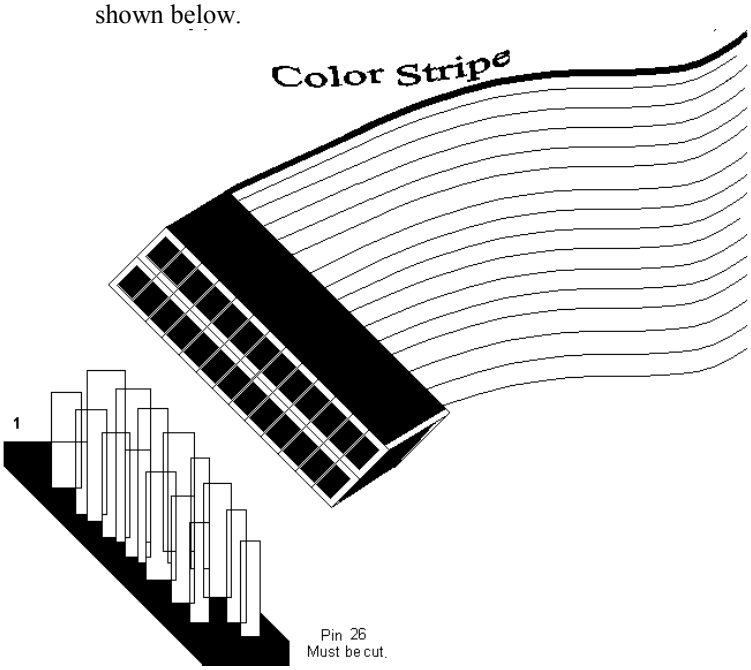
J5 Parallel Port

J5 is a 26-pin dual-inline berg. The parallel port is bidirectional. A 26-pin double-row ribbon cable connects J5 and a female 25-pin D-sub connector on the chassis, as shown on the previous page. The J5 pinout is:

Pin	Use	Pin	Use
1	-STROBE	14	-AUTOFEED
2	PD0	15	-ERROR
3	PD1	16	-INIT
4	PD2	17	-SLCTIN
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	-ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C

Attaching the Parallel Port Cable

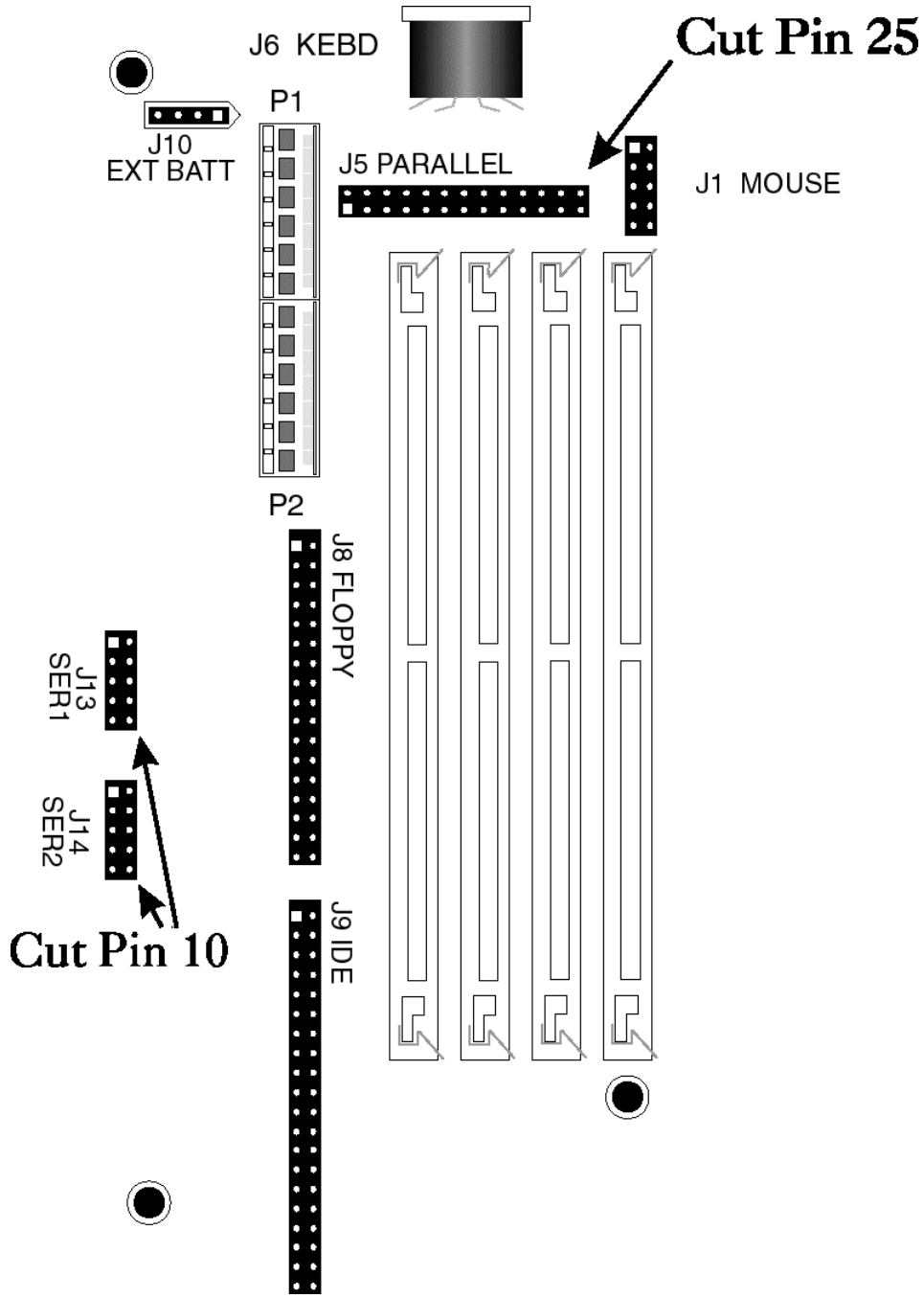
A parallel port cable is supplied with the motherboard to connect the J5 to the external parallel port, as shown below.



Step 10 Connect Onboard I/O, Continued

Cutting Pins

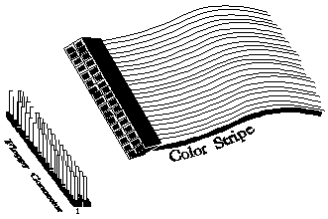
Pins must be cut on the two serial sockets and the parallel socket as shown in the following graphic.


J6 KEBD
Cut Pin 25
P1
J10
EXT BATT
J5 PARALLEL
J1 MOUSE
P2
J8 FLOPPY
J13
SER1
J14
SER2
J9 IDE
Cut Pin 10

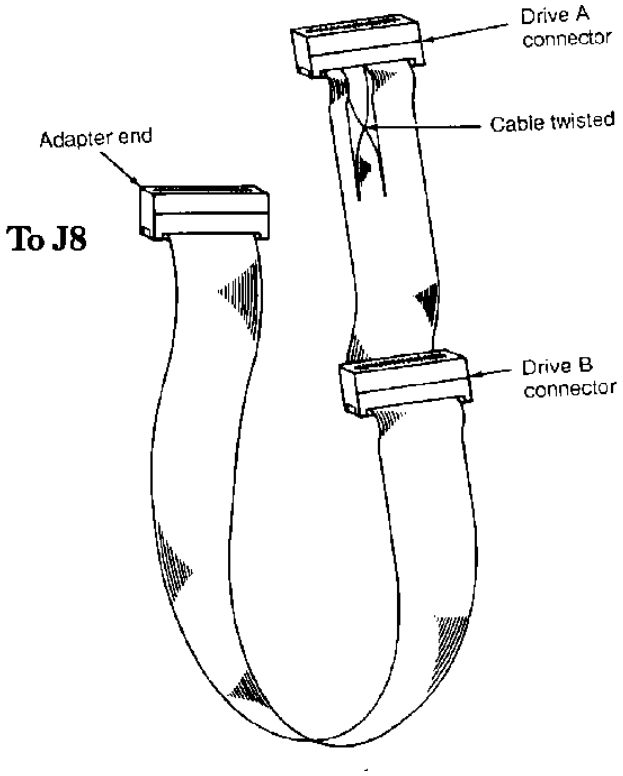
Step 11 Install Floppy Drive

J8 Floppy Disk Drive Connector

J8 is a 34-pin dual-inline berg. Connect the cable from the floppy drive to J8, as shown below. The onboard floppy controller cannot be used if a hard disk adapter card with floppy controller is installed.



The motherboard supports up to two 720 KB, 1.44 MB, or 2.88 MB 3½" drives and 360 KB and 1.2 MB 5¼" drives. The connecting cable is a 34-pin ribbon connector with two 34-pin edge connectors for attaching the floppy disk drives. There is a small twist in the cable between the floppy connectors. The last (end) connector should be connected to floppy drive A: as shown below.



J8 Floppy Connector Pinout

Pin	Use	Pin	Use
1	GND	2	DENSE1
3	GND	4	N/C
5	GND	6	DRATE0
7	GND	8	-INDEX
9	GND	10	-MOTOR0
11	GND	12	-FDSEL1
13	GND	14	-FDSEL0
15	GND	16	-MOTOR1
17	GND	18	DIR
19	GND	20	-STEP
21	GND	22	-WDATA
23	GND	24	-WGATE
25	GND	26	-TRK0
27	GND	28	-WRPROT
29	GND	30	-RDATA
31	GND	32	HDSEL
33	GND	34	DSKCHNG

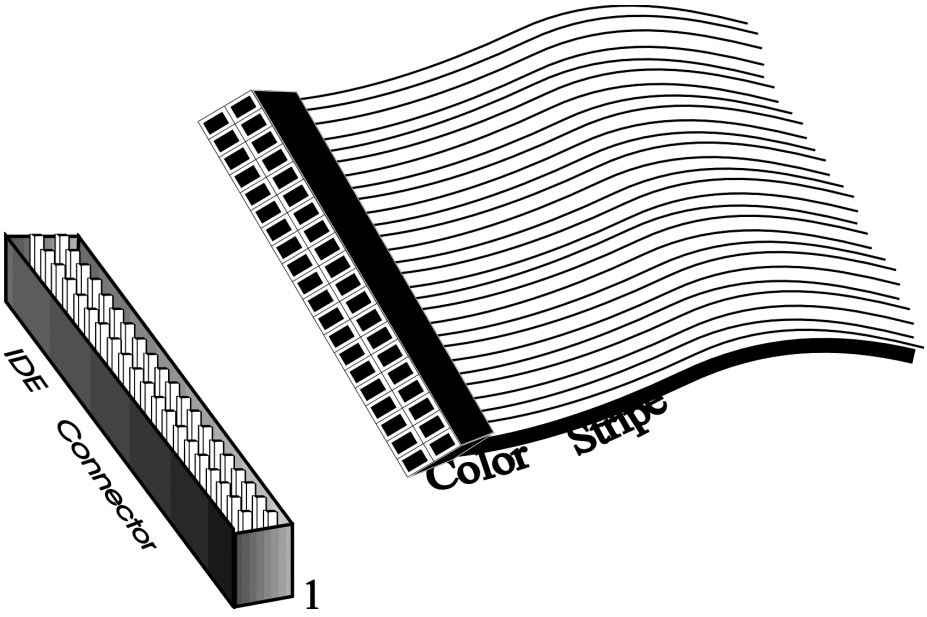
Twist in Floppy Cable

Floppy B to A	Floppy B to A	Floppy B to A	Floppy B to A
10 to 16	12 to 14	14 to 12	16 to 10
11 to 15	13 to 13	15 to 11	

Step 12 Install Hard Disk

Attach IDE Cable to J9

J9 is a 40-pin dual-inline berg that connects an IDE hard disk drive to the onboard IDE Controller. Attach the 40-wire IDE ribbon cable to J9 as shown below.



When you use the onboard IDE controller in conjunction with another hard drive controller, you must make sure that there are no conflicts in IRQ and I/O port addresses. The onboard IDE uses IRQ14 and I/O port addresses 01F0h – 01F7h. If there is a conflict, the IDE interface can be disabled via Peripheral Setup (see page 97). The J9 pinout is:

Pin	Use	Pin	Use
1	-RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C
21	N/C	22	GND
23	-IOW	24	GND
25	-IOR	26	GND
27	IOCHRDY	28	ALE
29	N/C	30	GND
31	INT14	32	-IOCS16
33	HA1	34	N/C
35	HA0	36	HA2

37	-CS0	38	-CS1
39	-IDEACT	40	GND

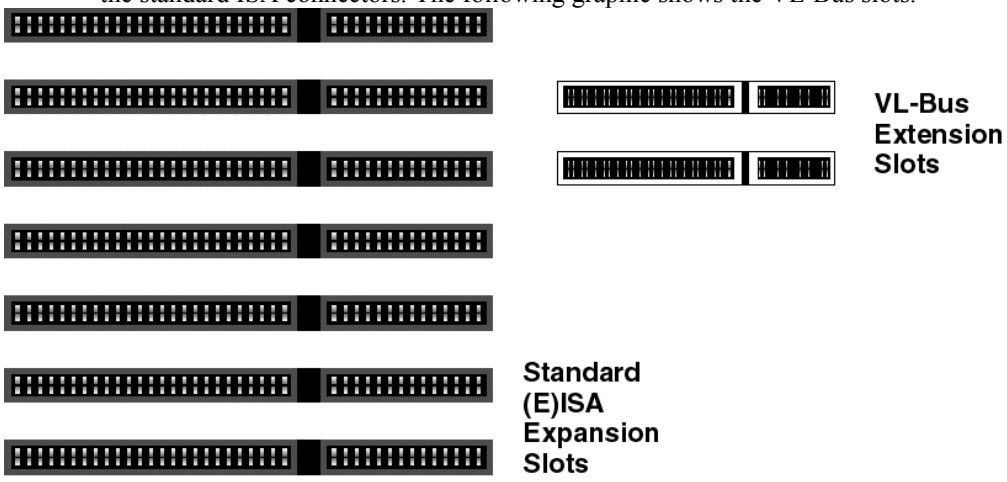
Step 13 Install Adapter Cards

The Super Voyager VLB-III motherboard provides full compatibility with all IBM XT and AT-compatible adapter cards. It has seven ISA (AT-compatible) expansion slots and two VL-Bus expansion slots. The VL-Bus slots can accept ISA or XT adapter cards as well as VL-Bus cards.

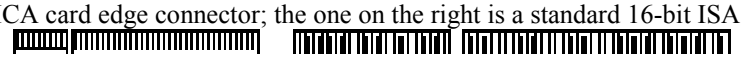
The standard ISA expansion slots accept both 8-bit and 16-bit XT- and AT-compatible adapter cards.

VL-Bus Adapter Cards

Most of the VL-Bus adapter card connectors are AT-compatible, but VL-Bus connectors also have an additional set of connectors. The second set of connectors is a 112-pin MCA®-type connector inline with the standard ISA connectors. The following graphic shows the VL-Bus slots.



The following graphic illustrates a typical VL-Bus Adapter Card edge connector. The connector on the left is a 16-bit MCA card edge connector; the one on the right is a standard 16-bit ISA card connector.



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	D2	IOCS16-
C3	LA22	D3	IRQ10
C4	LA21	D4	IRQ11
C5	LA20	D5	IRQ12
C6	LA19	D6	IRQ15
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

VL-Bus Pinout

The first two expansion slots are for VL-Bus adapter cards. VL-Bus slots include a 112-pin connector inline with the standard ISA connector.

VL-Bus Pinout, cont'd

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
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	LREEQ<>#	B50	IRQ9
A51	GND	B51	BRDY#
A52	LGNT<>#	B52	BLAST#
A53	VCC	B53	ID0
A54	ID2	B54	ID1
A55	ID3	B55	GND
A56	ID4	B56	LCLK
A57	LKEN#	B57	VCC
A58	LEADS#	B58	LBS16#

Step 14 Test and Configure

Review the following points before powering up:

_ make sure that all adapter cards are seated properly,
_ make sure all connectors are properly installed,
_ if the upgrade 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.

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 if there are problems.

BIOS Errors

If the system operates normally, a display should appear on the monitor. The BIOS Power On Self Test (POST) should execute.

If POST does not run successfully, it will beep or display error messages. Beeps indicate a serious problem with the system configuration or hardware. The Beep Code (see page 66) indicates the problem. Make sure the affected part is properly seated and connected. An error message is displayed if the error is less serious. Recheck the system configuration or the connections.

Configure the System

Run WinBIOS Setup. You must enter the requested information and save the configuration data in CMOS RAM. The system will then reset, run POST, and boot the operating system. See page 78 for information on configuring the system via Standard Setup.

Chapter 3

AMIBIOS Power-On Self Test

AMIBIOS provides all IBM-standard POST routines as well as enhanced AMIBIOS POST routines and CPU internal diagnostics. AMIBIOS POST codes can be accessed via the Manufacturing Test Port (I/O Port 80h). AMIBIOS POST checkpoint codes are described in the *AMIBIOS Technical Reference.*

POST Phases

When the system is powered on, the AMIBIOS executes POST, which has two phases:

- *System Test and Initialization* (test and initialize motherboards for normal operations), and
- *System Configuration Verification* (compare defined configuration with there hardware actually installed).

AMIBIOS Error Reporting

The AMIBIOS performs diagnostic when the system is powered up. Error s are reported in one of two ways:

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

Errors may occur during POST (Power On Self Test), performed every time the system is powered on. Fatal errors are communicated through a series of audible beeps.

Beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry on the motherboard is faulty.
2	Parity Error	Parity error in the first 64 KB of memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.
4	Timer Not Operational	Memory failure in the first 64 KB or Timer 1 on the motherboard is not functioning.
5	Processor error	The CPU (Central Processing Unit) on the motherboard has generated an error.
6	8042 - Gate A20 Failure	AMIBIOS cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU on the motherboard generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in AMIBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed.

What to Do If the Computer Beeps

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...	memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS ROM 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.

If POST initializes the system video monitor, errors can be displayed on the screen. These errors usually allow the system to continue. They are listed on Page 68. Error message are displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to RESUME
```

Press <F1> to continue the boot process. The system does not halt if *Wait for <F1> If Any Error* in Advanced 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	No response from drive C:. Run the Hard Disk Utility. Check the C: hard disk type in Standard Setup.
C: Drive Failure	No response from drive C:. It may be necessary to replace the hard disk.
Cache Memory Bad, Do Not Enable Cache!	Cache memory on the motherboard is defective. Consult the cache memory manufacturer.
CH-2 Timer Error	Most AT motherboards include two timers. An error occurred with 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 values are saved, a checksum value is generated for error checking. This message appears if the previous value is different from the current value. Run AMIBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run AMIBIOS Setup.

Error Message	Explanation
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected by AMIBIOS. 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 Setup to set the date and time in CMOS RAM.
D: Drive Error	No response from drive D:. Run the Hard Disk Utility. Check the D: hard disk type in Standard Setup.
D: drive failure	No response from drive D:. It may be necessary to replace the hard disk.
Diskette Boot Failure	The boot diskette in floppy drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch Not Proper	Some systems require 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	AMIBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	AMIBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR #1	Interrupt channel 1 failed the

Error Message	Explanation
Error	POST diagnostic test.
INTR #2 Error	Interrupt channel 2 failed the POST diagnostic test.
Invalid Boot Diskette	AMIBIOS 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. Make sure a keyboard controller AMIBIOS is installed. Set the *Keyboard* option in Standard 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 diskette drive A: or hard disk drive C:. Use a bootable disk.
Off Board Parity Error	Parity error in offboard memory. The format is: OFF BOARD PARITY ERROR ADDR (HEX) = (XXXX) *XXXX* is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Onboard Parity Error	Parity error in motherboard memory. The format is: Onboard PARITY ERROR ADDR (HEX) = (XXXX) *XXXX* is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.

Error Message	Explanation
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

ISA NMI Message	Explanation
Memory Parity Error at *xxxxx*	Memory failed. If the memory location can be determined, 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 can be determined, it is displayed as *xxxxx*. If not, the message is *I/O Card Parity Error ????*.
DMA Bus Time-out	A device other than the CPU has driven the bus signal for more than 7.8 microseconds.

AMIBIOS Configuration Summary Screen

The AMIBIOS displays the following screen when the POST routines are successfully completed.

AMIBIOS System Configuration (C) Copyright 1985-1994 American Megatrends Inc.			
Main Processor	: 80486DX	Base Memory Size	: 640 KB
Numeric Coprocessor	: Present	Ext. Memory Size	: 7808 KB
Floppy Drive A:	: 1.2 MB ½	Hard Disk C: Type	: 44 : None
Floppy Drive B:	: 1.44 MB ¼	Hard Disk D: Type	: 3F8 : 378
Display Type:	: VGA/PGA /EGA	Serial Port(s)	
AMIBIOS Date:	: 11/11/92	Parallel Port(s)	

256 KB CACHE
80486DX4 33/100MHz CPU

Normally, the only visible POST routine is the memory test. The screen that appears when the system is powered on is shown below.

```
AMIBIOS (C) 1994 American Megatrends
Inc.
XXXXX KB OK

      BIOS Release 707032194


      Press <DEL> if you want to run
      SETUP









40-0100-0046707-00111111-121593-
AMIS707-H
```

The AMIBIOS Identification string appears in the left bottom corner of the screen. Press <Ins> during system boot to display two additional BIOS Identification strings. These strings contain system information. The AMIBIOS Identification String are described in the *ISA and EISA Hi-Flex AMIBIOS Technical Reference*.

When a problem occurs, freeze the screen by powering on the system and holding a key down, which causes a *Keyboard Error* message. Copy the BIOS Identification Strings and report this information to American Megatrends Technical Support. Press <F1> to continue.

Enable the *Wait for <F1> If any Error* option in Advanced Setup before using this method to freeze the screen.

The following message is displayed after POST is completed:

Hit <DEL> if you want to run SETUP

Press <Del> to access AMIBIOS Setup.

Chapter 4

WinBIOS Setup

In ISA and EISA computers, the system parameters (such as amount of memory, type of disk drives and video displays, and many other elements) are stored in CMOS RAM. Unlike the DRAM (dynamic random access memory) that is used for standard system memory, CMOS RAM requires very little power. When the computer is turned off, a back-up battery provides power to CMOS RAM, which retains the system parameters. Every time the computer is powered-on, the computer is configured with the values stored in CMOS RAM by the system BIOS, which gains control when the computer is powered on.

The system parameters are configured by a system BIOS Setup utility. Historically, BIOS Setup utilities have been character-based, required keyboard input, and has user interfaces that were not very intuitive.

A New Type of System BIOS Setup Utility

American Megatrends has now made available a new type of system BIOS Setup utility. WinBIOS Setup has a graphical user interface that permits mouse access, and is so compact that it can reside on the same ROM as the system BIOS. The system configuration parameters are set via WinBIOS Setup. Since WinBIOS Setup resides in the ROM BIOS, it is available each time the computer is turned on.

Starting WinBIOS Setup

As POST executes, the following appears:

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

Press <Del> to run WinBIOS Setup.

Using a Mouse with WinBIOS Setup

WinBIOS Setup has a built-in mouse driver and can be accessed by either a serial mouse or PS/2-style mouses. WinBIOS Setup supports Microsoft-Compatible serial mouses and all PS/2-type mouses.

The mouse click functions are: single click to change or select both global and current fields and double clock to perform an operation in the selected field.

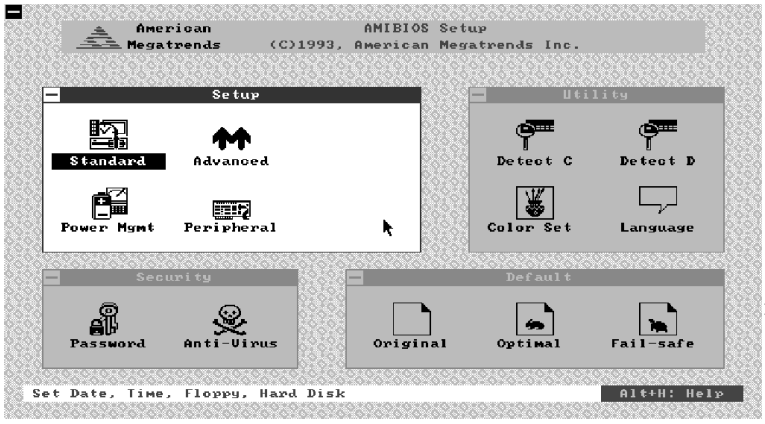
Using the Keyboard with WinBIOS Setup

WinBIOS has a built-in keyboard driver that uses simple keystroke combinations:

<Tab>	Change or select a global field.
→, ←, ↑, ↓	Change or select the current field.
<Enter>	Performs an operation in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Aborts any window function.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt>	Used with certain key function, as in <Alt> <key>.

Press <Ctrl> <Alt> <+> to change to High speed. Press <Ctrl> <Alt> <-> to change to Low speed.

The WinBIOS Setup main menu, shown below, is organized into four sections. Each of these sections corresponds to a section in this chapter.



Each section contains several icons. Clicking on each icon activates a specific AMIBIOS WinBIOS function. The windows Setup main functions and related on the are described next page.

WinBIOS Setup Main Windows

The WinBIOS Setup main windows are:

Setup — described in Section 1 on page 78, this section has five icons that permit you to set system configuration options such as date, time, hard disk type, floppy type, and many others,

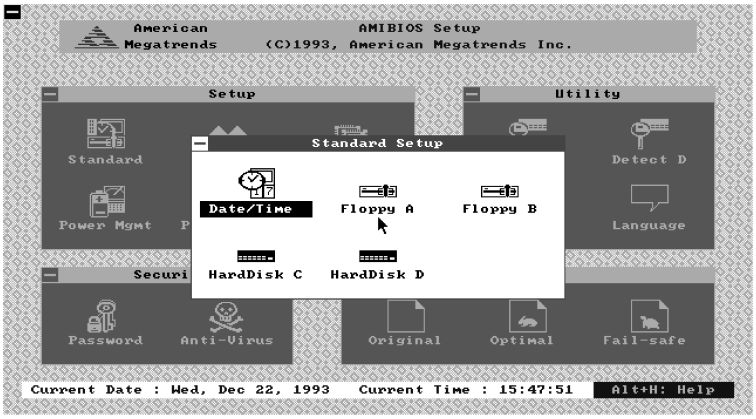
Utilities — described in Section 2 beginning on page 99, has four icons that perform system functions,

Security — described in Section 3 beginning on page 101, has two icons that control AMIBIOS security features, and

Default — described in Section 4 beginning on page 105, this section has three icons that permit you to select a group of settings for all AMIBIOS WinBIOS Setup options.

Standard Setup

Standard Setup options are displayed by choosing the Standard icon from the WinBIOS Setup main menu (see page 76). All Standard Setup options are described in this section. The Standard Setup screen follows.



Date, Day and Time Configuration

Select the Standard option. Select the Date and Time icon. The current values for each category are displayed. Enter new values through the keyboard.

Hard Disk C: Type
Hard Disk D: Type

Select one of these hard disk drive icons to configure the drive named in the option. A scrollable screen that lists all valid disk drive types is displayed. Select the correct type and press <Enter>. If the hard disk drive is an IDE drive, select Detect C: or Detect D: from the Utility section of the WinBIOS Setup main menu to have AMIBIOS automatically detect the IDE drive parameters and report them to this screen.

Entering Drive Parameters

You can also enter the hard disk drive parameters. The drive parameters are:

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
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 hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads will normally park when the system is shut down.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drive may have even more sectors per track.
Capacity	The formatted capacity of the

Parameter	Description
	drive is (Number of heads) x (Number of cylinders) x (Number of sectors per track) x (512 bytes per sector)

Hard Disk Drive Types

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
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

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
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

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
						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	USER-DEFINED HARD DRIVE - Enter user-supplied parameters.					

Using Auto Detect Hard Disk (Only for IDE Drives)

If you select Detect C: or Detect D: from the Utility section of the WinBIOS Setup main menu, AMIBIOS automatically finds all IDE hard disk drive parameters. AMIBIOS places the hard disk drive parameters that it finds in the Drive C: Type or Drive D: Type fields in Standard Setup.

Floppy Drive A:
Floppy Drive A:
Floppy Drive B:

Move the cursor to these fields via ↑ and ↓ and select the floppy type. The settings are *360 KB 5¼ inch*, *1.2 MB 5¼ inch*, *720 KB 3½ inch*, *1.44 MB 3½ inch*, or *2.88 MB 3½ inch*.

Advanced Setup options are displayed by choosing the Advanced icon from the WinBIOS Setup main menu (see page 76). All Advanced Setup options are described in this section.

Typematic Rate (Chars/Sec)

Typematic Rate sets the rate at which characters on the screen repeat when a key is pressed and held down. The settings are *15, 20, 24,* or *30* characters per second. The Optimal default setting is *30.* The Fail-Safe default setting is *Disabled.*

System Keyboard

This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboards. The settings are *Absent* or *Present.* The Optimal and Fail-Safe default settings are *Present.*

Primary Display

Select this icon to configure the type of monitor attached to the computer. The settings are *Mono, CGA40x25, CGA80x25, VGA/EGA,* or *Absent*. The Optimal and Fail-Safe default settings are *VGA/EGA.*

Mouse Support

When this option is enabled, AMIBIOS supports a PS/2-type mouse. Pins 1-2 of J30 on the motherboard must be shorted together to enable PS/2 mouse support. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Above 1 MB Memory Test

When this option is enabled, the BIOS memory test is performed on all system memory. When this option is disabled, the memory test is done only on the first 1 MB of system memory. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Enabled.*

Memory Test Tick Sound

This option enables (turns on) or disables (turns off) the ticking sound during the memory test. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Memory Parity Error Check

This option enables or disables parity error checking for system RAM. The settings are *Enabled* (all system RAM parity is checked) or *Disabled* (parity is checked only on the first 1 MB of system RAM). The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Hit <DEL> Message Display

Disabling this option prevents

Hit <DEL> if you want to run Setup

from appearing when the system boots. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Extended BIOS RAM Area

Specify in this option if the top 1 KB of the system programming area beginning at 639K or 0:300 in the BIOS area in low memory will be used to store hard disk information. The settings are *Top 1K* or *0:300.* The Optimal and Fail-Safe default settings are *0:300.*

Wait for <F1> If Any Error

AMIBIOS POST runs system diagnostic tests that can generate a message followed by:

Press <F1> to continue

If this option is enabled, AMIBIOS waits for the end user to press <F1> before continuing. If this option is disabled, AMIBIOS continues the boot process without waiting for <F1> to be pressed. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

System Boot Up Num Lock

When *On,* this option turns off *Num Lock* when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off.* The Optimal default setting is *Off.* The Fail-Safe default setting is *On.*

Floppy Drive Seek At Boot

When this option is enabled, AMIBIOS performs a Seek command on floppy drive A: before booting the system. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Enabled.*

System Boot Up Sequence

This option sets the sequence of boot drives (either floppy drive A: or hard disk drive C:) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:* or *A:,C:*. The Optimal default setting is *C:,A:*. The Fail-Safe default setting is *A:,C:*.

System Boot Up CPU Speed

This option sets the speed of the CPU at system boot time. The settings are *High* or *Low*. The Optimal default setting is *High*. The Fail-Safe default setting is *Low*.

External Cache

This option enables secondary cache memory. If *Disabled* is chosen, all secondary cache memory is disabled. The settings are *Disabled* or *Enabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

Internal Cache

This option enables internal cache memory on the CPU. If *Disabled* is chosen, the internal cache memory on the CPU is disabled. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

Password Checking

This option enables the password check option every time the system boots or the end user runs Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WinBIOS is executed. See page 101 for instructions on changing a password. The Optimal and Power-On defaults are *Setup*.

Video ROM Shadow C000,32K

When this option is set to *Enabled,* the video ROM area from C0000h - C7FFFh is copied (shadowed) to RAM for faster execution. If *Cached* is selected, the contents of the RAM area (C0000h - C7FFFh) where the video ROM has been copied can be read from or written to secondary cache memory. The settings are *Enabled, Disabled,* or *Cached.* The Optimal default setting is *Cached.* The Fail-Safe default setting is *Disabled.*

Shadow C800,32K
Shadow D000,32K
Shadow D800,32K
Shadow DC00,32K
Shadow E000,64K

These options enable shadowing of the contents of the ROM area named in the option title. The settings are *Enabled, Disabled,* or *Cached.* If *Cached* is selected, the contents of the RAM area where the Adaptor ROM has been copied can be read from or written to secondary cache memory. The Optimal and Fail-Safe default settings are *Disabled.*

The ROM area that is not used by ISA adapter cards will be allocated to VL-Bus adapter cards.

System BIOS Cacheable

When this option is set to *Enabled,* the contents of the F0000h system memory segment can be read from or written to secondary cache memory. This memory is always copied from the BIOS ROM to system RAM for faster execution. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Shadow RAM Write-Protection

When this option is set to *Enabled,* the system memory locations that have been copied from ROM for faster execution cannot be written to. Setting this option to *Enabled* prevents key areas such as the system BIOS and Video BIOS from inadvertent destruction. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

External Cache Write Mode

This option specifies the type of caching algorithm. The settings are *Write-Bk* (write-back) or *Write-Th* (write-through). The Optimal default setting is *Write-Bk.* The Fail-Safe default setting is *Write-Th.*

Non-Cacheable Block

This option specifies how the non-cacheable block of system memory can be used. The settings are *DRAM* or *ATBus.* The Optimal and Fail-Safe default settings are *DRAM.*

If *DRAM* is selected, the contents of the area of memory specified in the **Non-Cacheable Block Size** and **Non-Cacheable Block Base** options cannot be read from or written to either internal or secondary cache memory.

If **ATBus** is selected, the area of memory specified in the **Non-Cacheable Block Size** and **Non-Cacheable Block Base** options is treated as if it were not there.

Non-Cacheable Block Size

This option specifies the size of the Non-Cacheable area of memory. The settings are Disabled, *128 KB, 256 KB, 512 KB, 1 MB, 2 MB,* or *4 MB.* The Optimal and Fail-Safe default settings are *Disabled.*

Non-Cacheable Block Base

This option specifies the starting address of the Non-Cacheable area of memory. The settings are *64 KB, 128 KB, 256 KB, 512 KB 1 MB, 2 MB, 4 MB,* or *8 MB.* The Optimal and Fail-Safe default settings are *64 KB.*

8/16 Bit I/O Recovery

This option specifies the length of the delay that is added to the CPU cycle after an 8-bit or 16-bit I/O operation. The length of the delay is related to the CPU type and frequency. The recommended settings are:

Setting	CPU Type and Frequency
4/2 CLK	25 or 33 MHz 486
4/2 CLK	50 MHz 486
7/3 CLK	50 MHz 486DX2
11/5 CLK	66 MHz 486DX2
11/5 CLK	75 MHz 486DX4
11/5 CLK	100 MHz 486DX4
16/8 CLK	???

The Optimal default setting is *4/2 CLK.* The Fail-Safe default setting is *16/8 CLK.*

External Clock for 100MHz DX4

This option specifies the external clock speed for a 100 MHz 486DX4 CPU. The settings are *50MHz* or *33 MHz*. The Optimal and Fail-Safe default settings are *50MHz*.

Important
You must select the proper voltage for the 486DX4 CPU. Short Pins 1-2, 3-4, and 5-6 on J56.

A 100 MHz 486DX4 CPU can be configured in two ways:

This option	CPU Speed	External Speed	Motherboard Jumper Settings
50 MHz	100 MHz	50 MHz	Pins 1-2 of J37 must be shorted. J11, J12, and J15 should all be OPEN.
33 MHz	100 MHz	33.33 MHz	J37, J11, and J15 must be OPEN. A shorting bridge must be installed on J12.

Power Management Setup options are displayed by choosing the Power Mgmt icon from the WinBIOS Setup main menu (see page 76). All Power Management Setup options are described in this section.

Display Timeout

Power to the system monitor can be controlled when this option is set to *Enabled* and an American Megatrends CBL-SUB-12-10 cable is connected between J47 on the motherboard and the feature connector on a VGA adapter card. The setting of the **System Event Timer** option specifies the timeout period before the system monitor power is turned off. The settings for this option are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Both the system monitor and the VGA adapter card must be VESA DPMS (Display Power Management Specification)-aware. The VGA feature connector on the VGA adapter card must be able to go into Input Mode. If using a standard VGA monitor that is not DPMS-aware, you can achieve the same type of power savings by setting the **Power Supply Timeout** option (see page 95).

This option is only supported if an S-Series Intel CPU is installed on the motherboard.

Before this option can be set to *Enabled,* the **System Event Timer** option setting must be a value between *1 Min* and *15 Min.* and the **Stop Clock Mode** option must be set to *Enabled.*

Low Speed Timeout

The clock on the motherboard can be switched to 8 MHz (after the timeout period specified in the **System Event Timer** option expires) when this option is set to *Enabled.* The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Do not set this option to *Enabled* when any VL-Bus adapter cards are installed. Some VL-Bus adapter cards do not work when the computer runs at 8 MHz.

Before this option can be set to *Enabled,* the **System Event Timer** option setting must be a value between *1 Min* and *15 Min.* and the **Stop Clock Mode** option must be set to *Enabled.*

This option is only supported if an S-Series Intel CPU is installed on the motherboard.

Power Supply Timeout

This option can be used to control a Green PC-capable power supply (such as the SENSTRON GP2-4200F power supply). When this option is set to Enabled, the power supply can be placed in Green PC poser savings mode when the timeout period specified in the **System Event Timer** option expires via the J3 output. The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Before this option is set to *Enabled,* the **System Event Timer** option setting should be a value between *1 Min* and *15 Min.* and the **Stop Clock Mode** option should be set to *Enabled.*

Power supplies that support a timeout feature provide a cable with a two-pin berg header, often called the Auxiliary Power Connector. Usually, the black wire is Ground and the Green wire is the active signal. Connect the black wire to Pin 1 of J3. Connect the Green wire to Pin 2 of J3 on the motherboard.

If the VGA adapter card and monitor do not support DPMS (the VESA Display Power Management Specification), you can connect the VGA monitor to the auxiliary output of a Green PC power supply. When the length of time specified in the **System Event Timer** option time period has expired, AMIBIOS turns off any device connected to the auxiliary connector.

Green PC power supplies usually identify the power connectors that can be turned off in Green PC mode.

This option is only supported if an S-Series Intel CPU is installed on the motherboard.

Stop Clock Mode

When this option is set to *Enabled,* the CPU stop clock is programmed through the *system event timer.* The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

This option is only supported if an S-Series Intel CPU is installed on the motherboard.

System Event Timer

When this option is set to *Disabled,* the CPU stop clock is not generated to the CPU. Otherwise, the selected length of time specifies the period of system inactivity that must expire before the stop clock signal is generated. The following events reset this timer:

- any activity in the C0000h - C7FFFh video BIOS,
- any activity in A0000h - BFFFFh video memory,
- any I/O activity in I/O ports addresses 0001h - 3FFFh,
- any DMA activity,
- an LBM (local bus master) signal on the VL-Bus,
- IRQ 3, 4, 5, 7, 9, 10, 11, 12, or 15 activity (if the **Timer Reset by IRQ** option is set to *Enabled)*,

The **Stop Clock Mode** option must be set to *Enabled* before this option can be set to any setting from *1 Min* through *15 Min.*

The settings are *Disabled, 1 Min, 2 Min, 3 Min, 4 Min, 5 Min, 6 Min, 7 Min, 8 Min, 9 Min, 10 Min, 11 Min, 12 Min, 13 Min, 14 Min,* or *15 Min.* The Optimal and Fail-Safe default settings are *Disabled.*

This option is only supported if an S-Series Intel CPU is installed on the motherboard.

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the WinBIOS Setup main menu (see page 76). All Peripheral Setup options are described in this section.

On-Board Floppy

This option enables the use of the floppy drive controller on the motherboard (if installed). The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

On-Board IDE

This option enables the use of the IDE controller on the motherboard (if installed). The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

IDE Block Mode

Set this option to *Enabled* to achieve higher data transfer rates when using IDE drives that support IDE Block Mode. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

IDE Drive 0 Mode
IDE Drive 1 Mode

These options specify the IDE mode that the respective IDE hard disk drive (0 or 1) will operate in. The settings are *Mode 0, Mode 1,* or *Mode 2. Mode 2* is the fastest. The Optimal and Fail-Safe default settings are *Disabled.*

Make sure you read the IDE drive technical documentation to determine the IDE modes that the hard disk drive in your computer supports. Selecting a fast mode on a slower IDE drive will result in data loss.

IDE Read Ahead

When this option is set to *Enabled,* the data transfer rate from the IDE drive is improved because sequential accesses to the IDE drive are anticipated. The settings are *Enabled* or *Disabled.*

> ***Warning***
> This option must be set to *Disabled* if using Windows NT.

First Serial Port Address

IRQ4 is used for the first serial port (COM1). This option enables serial port 1 on the motherboard (if installed). The settings are *3E8h, 3F8h,* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Second Serial Port Address

IRQ3 is used for the second serial port (COM2). This option enables serial port 2 on the motherboard, if installed. The settings are *2F8h, 2E8h,* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

First Serial Port FIFO

This option enables the FIFO buffer for the first serial port. The settings are *Enabled* or *Disabled.* The BIOS Setup default is *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Second Serial Port FIFO

This option enables the FIFO buffer for the second serial port. The settings are *Enabled* or *Disabled.* The BIOS Setup default is *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Parallel Port Address

IRQ7 is used for the parallel port (LPT1). The IRQ can be changed to IRQ5. This option enables the parallel port on the motherboard, if installed. The settings are *378h, 278h,* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Section 2

Utility

The following icons appear in this section:

Detect C: if drive C: is an IDE drive, the hard disk drive parameters for drive C: are automatically detected and reported to the Hard Disk Drive C: screen in Standard Setup, so you can easily configure drive C:.

Detect D: if drive D: is an IDE drive, the hard disk drive parameters for drive D: are automatically detected and reported to the Hard Disk Drive D: screen in Standard Setup, so you can easily configure drive D:.

Color Set sets the WinBIOS Setup screen colors.

Section 3

Security

AMIBIOS Password Support

WinBIOS 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 WinBIOS Setup is executed.

Setting a Password

The password check option is enabled in Advanced Setup (see page 88) by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WinBIOS 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.

Select the *Password* icon from the Security section of the WinBIOS 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 WinBIOS Main Menu. The password is stored in CMOS RAM after WinBIOS completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, remove the computer cover, set switch 1-2 (the DIAG switch) to ON, power on the computer. AMIBIOS will erase the password.

When this icon is selected from the Security section of the WinBIOS Setup main menu, AMIBIOS 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 appears when a write is attempted 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 after any attempt 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)? _
```

Section 4

Default

The icons in this section permit you to select a group of settings for all WinBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

Original

Choose the Original icon to return to the system configuration values present in WinBIOS Setup when you first began this WinBIOS Setup session.

Optimal

You can load the optimal default settings for the WinBIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

Fail-Safe

You can load the Fail-Safe WinBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WinBIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

Appendix A

Flash EPROM Programming

Some versions of the American Megatrends Super Voyager VLB-III ISA motherboard use Flash EPROM to store the system BIOS. This Addendum applies only to Super Voyager VLB-III ISA motherboards use a Flash EPROM.

The advantage of using a Flash EPROM is that the EPROM chip does not have to be replaced to update the BIOS. The end user can actually reprogram the BIOS, using a ROM file supplied by American Megatrends.

There are two methods for programming the Flash EPROM:

- program from system boot,
- run the AMIFlash utility.

Programming Flash from System Boot

Insert the floppy disk with the new BIOS file in drive A:, press and hold down the <Ctrl> and <Home> keys to reprogram the Super Voyager VLB-III motherboard Flash EPROM-based AMIBIOS before DOS boots.

Using AMIFlash

AMIFlash is a DOS utility that is executed from the DOS command line. You can reprogram the Super Voyager VLB-III motherboard Flash EPROM-based AMIBIOS from the DOS command prompt using AMIFlash.

When you reprogram from system boot, the American Megatrends Flash utility:

1. reads S707P.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 bootblock part of the Flash EPROM is not programmed. Should the user inadvertently open the disk drive door or turn power off to the computer while programming the Flash EPROM, the bootblock will be unaffected. Simply turn power back on and begin the Flash ROM programming process again. The bootblock code immediately reads the A: drive, looking for the new BIOS information.

S707P.ROM

S707P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the AMIBIOS for the Super Voyager VLB-III ISA motherboard must be updated.

S707P.ROM 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 S707P.ROM.

Programming the Flash EPROM

Step	Action
1	Turn system power off.
2	Place the floppy disk that has the latest S707P.ROM BIOS file in floppy drive A:.
3	Make sure that the system has a speaker that is connected.
4	Turn system power on while pressing and holding down the <Ctrl> and <Home> keys.

Sequence of Operation

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

Step	Expected behavior
1 Look for floppy disk.	The system beeps one time before the BIOS attempts to read from floppy drive A:.
2 Look for S707P.ROM on the floppy disk.	S707P.ROM must be in the root directory of the floppy disk in drive A:. There is no beep if successful.
3 Read the floppy disk.	The floppy disk is read. There is no beep if this step is successful.
4 Check for BIOS file size.	The BIOS file size is checked. There is no beep if this step is successful.
5 Check for Flash EPROM.	The BIOS looks for an Intel i28F001BX-T Flash EPROM. It does not beep if this step is successful.
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 AMIFlash Code begins reprogramming the Flash EPROM.
8 Continue programming the Flash EPROM.	Four beeps sound when reprogramming has been successfully completed.
9 AMIFlash does a reset.	A CPU reset is generated (the system reboots).
10 Reboot	Reboot the system.

Beep Codes

During normal operation, the Flash utility produces a series of beeps to:

- signify completion of a step (as shown on the previous page), or to
- signal an error.

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	S707P.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.

Code	Description
02h	Verify the AMIFlash 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 and 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 AMIFlash Floppy Disk in drive A:.
E4h	Floppy read error.
E5h	Begin the search for the S707P.ROM file in the floppy root directory.
E6h	The S707P.ROM file not present in the floppy disk root directory.
E7h	Begin reading the File Allocation Table.
E8h	Begin reading S707P.ROM, sector by

Code	Description
	sector.
E9h	S707P.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.

Starting AMIFlash

Type

AMIFlash

and press <Enter> at the DOS prompt. AMIFlash will prompt for the filename. Type

S707P.ROM

and press <Enter>. Pressing <Esc> exits AMIFlash any time before Flash EPROM reprogramming begins.

General Operation

If Flash EPROM is present, AMIFlash asks if you want to save the existing BIOS file. If you choose to save the BIOS, enter the filename where the existing BIOS will be saved.

Enter the filename with which Flash EPROM will be reprogrammed (S707P.ROM). AMIFlash reads the file and displays a startup message. Press any key to continue. After Flash programming starts, programming activity is indicated by a rotating / character. AMIFlash informs you when Flash programming is successful. Press any key to reboot the system.

Errors During Flash Programming

If an error occurs during programming, an error messages is displayed and the system halts. Turn power off and replace the Flash EPROM with a new programmed Flash EPROM to make the system usable.

AMIFlash Messages

Message	Explanation
Save Existing BIOS ?	Press Y to save the existing BIOS.
Enter Filename:	Enter the filename in which the existing BIOS will be saved in the following format: Drive:\Pathname\Filename.Ext and press <Enter>.
Enter BIOS Filename:	Enter the filename with which the Flash EPROM will be programmed in the following format: Drive:\Pathname\Filename.Ext and press <Enter>.
Programming Flash EPROM	Displayed when the Flash EPROM is being programmed.
Saving BIOS File in Disk	Displayed when the existing BIOS is saved to disk.
Reading BIOS File from Disk	Displayed when the file with which Flash EPROM will be programmed is being read from the disk.
Press <ESC> to Exit	When this message is displayed, you can exit AMIFlash by pressing <Esc>.
Press Any	Usually displayed below another

Message	Explanation
Key to Exit	message when a fatal error occurs, for example, no Flash EPROM present in system or the hardware is not accessible.
Press Any Key to ReBoot	Displayed after successful Flash EPROM programming.
Want to Continue?	Displayed after an error message.
Want to Exit (Y/N)?	Displayed when you press <Esc>.
Please Wait..	Displayed when Flash programming is occurring.
Put Off System Power	Displayed if there is an error during Flash programming. Replace the Flash EPROM with a new programmed Flash EPROM.
No Flash EPROM present	Displayed if no Flash EPROM is present in the system.
Memory Allocation Error	Displayed when scratch memory is not available.
File Creation Error	Displayed when the specified BIOS save file could not be created.
File Does Not Exist	Displayed when the Flash EPROM program file could not be found.
File I/O Error	Displayed during a read or write error.
Disk Full	Displayed when the disk where the existing BIOS was to be saved has no space.
Flash EPROM Programming Error.	Displayed if an error occurs during Flash programming. The system is not usable unless the existing Flash EPROM is replaced with the new Programmed Flash EPROM.
BIOS File Not Of Proper Size	Displayed when the file size of the new program does not match the Flash EPROM size.
Flash EPROM Programming	The system is not usable until Flash EPROM programming is

Message	Explanation
is going to start	completed successfully. If an error occurs, the existing Flash EPROM must be replaced by a new programmed Flash EPROM. The system must not be turned off during programming. The system reboots if programming is completed successfully.

Appendix B

Upgrading Cache Memory

Cache memory American Megatrends Super Voyager VLB-III motherboard can be upgraded from 64 KB to 256 KB. Eight 32 KB x 8 15 ns SRAMs are required.

Recommended Parts

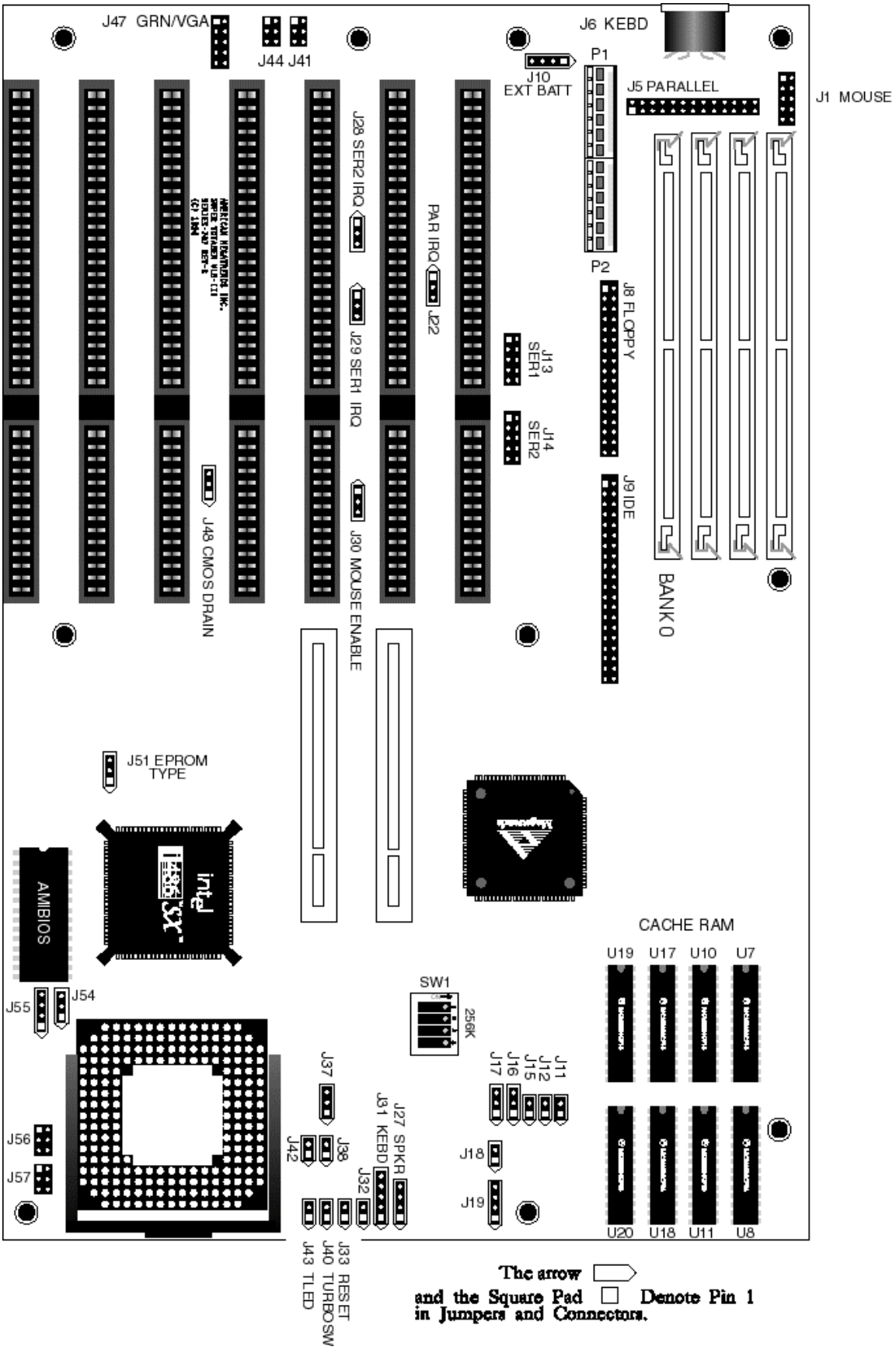
Manufacturers of the 32 KB x 8 15 ns SRAMs are:

Manufacturer	Part Number
Paradigm	PDM41256SA15P
WINBOND	W24257AK-15
Motorola	MCM6206CNP15

Upgrading Cache Memory

Step	Action
1	Turn the system off. If the motherboard is already installed in a computer case, remove the cover and expose the motherboard.
2	Make sure you are properly grounded to prevent electrostatic discharge.
3	Remove the 8 KB x 8 SRAMs located in sockets U2, U3, U11, U12, U16, U17, U19, U20, and U35. See the motherboard graphic on the following page for the locations of these sockets.
4	Install the new 32 KB x 8 SRAM in sockets U2, U3, U11, U12, U16, U17, U19, U20, and U35. Make sure that Pin 1 of the socket matches Pin 1 of the SRAM.
5	Turn all switches on SW1 ON.

Turn system power on. The system should report 256 KB of cache memory now. If it does not, repeat the cache memory installation procedure.



The arrow ⇨ and the Square Pad □ Denote Pin 1 in Jumpers and Connectors.

Appendix C

Heat and Power Consumption

Temperature Ranges

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

Frequency	Heat Sink	Airflow over CPU	Airflow over other components	Maximum Ambient Temperature
20 or 25 MHz	NO	400 feet per minute	Not critical	47 ° C.
33 MHz	NO	400 feet per minute	Not critical	36 ° C.
50 MHz 66 MHz	YES	200 feet per minute	Not critical	50 ° C.
75 MHz 486DX4	YES	200 feet per minute	Not critical	65 ° C.
100 MHz 486DX4	YES	200 feet per minute	Not critical	65 ° C.

Humidity

The recommended humidity range for operation of the American Megatrends Super Voyager VLB-III motherboard is 20% to 80% non-condensing.

The American Megatrends Super Voyager VLB-III motherboard requires +5V and 7A. The +12V supply current to the ISA Bus is limited by the power connector.

Power Supply Requirements

The Super Voyager VLB-III ISA motherboard requires +5V, -5V, +12V, -12V, and about 44 Amps maximum.

Power Consumption

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

Each ISA expansion slot is gated at 3.0 Amps maximum. Each VL-Bus expansion slot is gated at 4.5 Amps maximum. There are six ISA-only expansion slots and two VL-Bus slots, so the total maximum power consumption for the expansion slots is 27 Amps. The total maximum power consumption is 35 Amps at +5V with a 220 Watt power supply.

Power Source

Two power connectors (P1 and P2) are provided on the Super Voyager VLB-III motherboard.

Conclusion

The minimum rating of the power supply should be 220 Watts for a fully loaded motherboard, including a 12V power source.

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