American
Megatrends

AMIDiag
User's Guide

Revision History

5/31/96	Initial release of version 5.0.
7/11/96	Updated error codes.
10/9/96	Added USB and APM tests.
4/11/97	Added new batch parameters, CD tests, and modem diagnostics for version 5.2.
7/21/97	Added MMX Test, IDE Boot Sector Test, and SCSI Self Tests.
1/24/98	Added new Serial, SCSI, LS102, and Memory tests for V5.3.
2/26/98	Added tests for Version 5.4.

Preface

AMIDiag performs specialized diagnostic tests on any IBM PC/AT®-
compatible computer. AMIDiag provides comprehensive system configuration
and environment information. AMIDiag can be executed in batch mode. You
can run AMIDiag continuously, for a predetermined number of passes, or for a
predetermined amount of time. All errors can be logged to disk, printer, or
serial port.

Support   If AMIDiag fails to operate as described, call American Megatrends technical
support at 770-246-8645.

Web Site   http://www.ami.com

BBS   The American Megatrends BBS automatically handles all industry-standard
modems. The BBS phone number is 904-246-8780.

1   Overview

AMIDiag is a DOS-based diagnostic program for IBM PC/AT®-compatible computers with Intel® x86-compatible CPUs. AMIDiag has many test routines that examine every system and subsystem in the computer, including all ISA, EISA, PCI, Plug and Play features. AMIDiag detects, diagnoses, and provides system information about PCI, EISA, ISA, PCMCIA, Plug and Play adapter cards and devices. AMIDiag provides comprehensive system information about your computer, including PCI, EISA, ISA, PCMCIA, and Plug and Play information. Detailed information about the network environment, sound cards, CD-ROM drives, SCSI devices, power management features, IDE drives, and all other system data can be displayed. AMIDiag actually tests the existing system memory and cache memory; it does not simply report the information found in the system BIOS. AMIDiag tests system memory up to 4 GB.

Use AMIDiag   AMIDiag can be run when the computer is not operating correctly. You can also run AMIDiag periodically to make sure that system components operate properly.

Requirements

To perform diagnostic tests with AMIDiag, your computer must:

- be an ISA (AT-Compatible), EISA, PCI, VL-Bus, or Plug and Play computer,
- with an Intel x86-compatible CPU,
- a monitor and keyboard,
- at least one 3½ floppy drive or bootable CD-ROM drive, and must be
- running DOS Version 5.0 or later.

AMIDiag Helps Many Types of Users

AMIDiag can be used effectively by:

- computer manufacturers,
- end users,
- technical support personnel,
- repair technicians, and
- design engineers.

Manufacturers AMIDiag is used by many computer manufacturers to test and validate new computers as they are built. AMIDiag diagnostic routines can be configured to run continuously, for a set number of passes, or for a set amount of time. The specific tests to be run can be customized. All results can be logged to disk, serial port, or printer. AMIDiag tests can be automated, reducing manpower costs.

End Users How do you know that you are actually getting what you paid for when you buy a computer? Run the AMIDiag system information option to determine your computer's exact specifications, which you can then compare to the manufacturer's marketing material. When you think your computer may have a problem, you may be able to save the money you would have spent on expensive repairs by running AMIDiag and fixing the problem yourself.

Technical Support If computer manufacturers provided AMIDiag with the computer, most support problems could be solved by the end user or by a single phone call.

Repair Technicians The most difficult repair problems are intermittent failures, which most often occur in system memory and cache memory. AMIDiag's memory test routines are the most sophisticated diagnostics available today. AMIDiag is the most comprehensive software diagnostic tool available for ISA and EISA computers.

Designers Design engineers need exact, detailed information about the performance of each subsystem of the new computer they are working on. AMIDiag provides the most detailed diagnostic and system information available. Most diagnostic product do not support the VL-Bus, PCI, PCMCIA, EISA, SCSI, Plug and Play technologies.

AMIDiag's Superiority

Diagnostic Problem	Why AMIDiag is Superior
cache memory size selection and testing	Many system BIOS do not provide this information. If your computer has 512 KB of L2 secondary cache memory and 256 KB are bad, the system BIOS uses the good cache memory and ignores the bad cache memory. You will never know that cache memory is bad unless you run AMIDiag Version 5.4. AMIDiag also finds intermittent problems when you run the AMIDiag Cache Memory Test.
SCSI device information	If you computer has a SCSI hard disk drive and no IDE drives, the computer does not use IRQ 14. It uses a DMA channel instead. This information is reported in AMIDiag Version 5.4 but not by most other diagnostic programs.
more than 64 MB of system memory detection and testing	AMIDiag Version 5.4 accurately reports and tests all system memory up to 4 GB. Most other diagnostic programs only report the amount of system memory stored in the system BIOS, which is limited to 64 MB.
Reporting potential resource conflicts	Run AMIDiag Version 5.4 to determine exactly how IRQs, I/O ports, DMA channels, and system memory are assigned in your EISA or PCI computer before installing a new adapter card. AMIDiag determines which resources are assigned to which ISA, EISA, PCI, and Plug and Play adapter cards. Since most other diagnostic programs do not support EISA, Plug and Play, and PCI, they will not be able to tell you how system resources have been assigned.

Installing AMIDiag

Run the AMIDiag install utility to install AMIDiag. Insert the AMIDiag diskette in drive A: (or B:). Type

```
A:(or B:) INSTALL
```

and press <Enter>.

Process   Select the type of monitor attached to the computer (color or monochrome) from the first screen

Directories   Select the directory where AMIDiag will be installed. INSTALL displays the source drive. Select *Continue* and press <Enter>. Press <Enter> to complete installation.

Running From Floppy The information that AMIDiag provides is more accurate when AMIDiag runs from a boot diskette. When run from a boot diskette, the programs and device drivers in AUTOEXEC.BAT and CONFIG.SYS are not loaded. To make a DOS boot diskette, insert a floppy diskette in drive A: and type

```
FORMAT A: /S
```

Leave this diskette in drive A: and press <Ctrl> <Alt> <Del> to reset the computer. Remove the DOS boot disk and insert the AMIDiag diskette in drive A:. Type

```
A:AMIDIAG
```

and press <Enter>.

Starting AMIDiag

Some AMIDiag system tests and memory tests cannot be performed if a memory manager such as EMM386 or QEMM® is resident in memory. The AMIDiag memory tests can be executed if the HIMEM.SYS driver is installed and operating.

To display complete system information about the system memory map and EMS environment, you must not load EMM386, QEMM, or any other memory manager. The best method of using AMIDiag is to run AMIDiag from a bootable floppy diskette. Instructions for making a DOS boot disk are provided on the previous screen. You can copy the AMIDiag files from the C: drive to the diskette in the A: drive.

To display system information, including memory manager use, run AMIDiag later from the C: drive after rebooting the computer normally.

AMIDiag automatically disables all tests that conflict with memory manager drivers when running in a computer that has EMS drivers installed in memory. The conflicting diagnostic tests are grayed out on the menu and cannot be selected. If these tests are disabled, an error message is displayed when AMIDiag is loaded. If a test is unavailable because a driver or a device is not detected, the test will be grayed out on the AMIDiag menu.

AMIDiag runs on IBM AT®, EISA, and AT-compatible computers. A basic grasp of the architecture of an AT computer will help you understand how to use AMIDiag.

Every computer has five main parts: processor, memory, input/output (I/O) system, disk storage, and programs.

The central processing unit (CPU) is the brains of the computer. It executes the instructions in the programs loaded into the computer. Programs are nothing more than a list of instructions (such as add, subtract, logically compare, and move information) and data.

The memory unit stores these programs while the computer is powered on. Most kinds of memory instantly lose this information when power is turned off.

The I/O system allows you to interact with the computer. I/O commonly includes a video display unit, a keyboard, a mouse, a serial port (used by modems), and a parallel port (used by the printer).

Storage units commonly include a floppy disk drive and a hard disk drive. Data and programs written to media in a storage unit are not erased when the computer power is turned off.

The AMIDiag menus provide a good basis for discussing AT architecture.

System   The motherboard is a flat printed circuit board that has the basic wiring and integrated circuits. You can build a computer that has only a motherboard. AMIDiag tests the following parts usually mounted on the motherboard:

Part	Description
CPU	The brains of the computer. It executes the instructions in programs. The CPU controls almost all operations performed by the computer. Other systems like the DMA controller reduce CPU processing.
Coprocessor	Intel 486DX and Pentium CPUs contain a math coprocessor that executes programs with a lot of math instructions quickly. An additional math coprocessor can almost always be added to a computer. Some computers do not have a math coprocessor.
DMA controller	DMA is a method for reducing the CPU workload. The DMA (Direct Memory Access) controller manages the flow of information directly to and from system memory and the hard disk drive.
Interrupt controller	AT computers use a series of prioritized signals from peripheral devices or components (interrupt requests or IRQs) to tell the CPU know that the device needs attention. The interrupt controller manages these signals.
Timer	The programmable timer chip produces timing signals that are used to regulate much of the processing in the computer.
Real Time Clock	The real time clock is exactly what its name implies. It is a clock that provides the current day, date, and time to the computer. A small battery is provided to provide power for this clock.
CMOS RAM	Most memory chips lose the information they contain when power is turned off. But CMOS (Complementary Metallic Oxide Semiconductor) chips use very little power and hold information for a long time. Often 128 bytes of CMOS RAM are used. CMOS RAM contains important system configuration information. A small battery is provided to provide CMOS RAM power.
EISA bus	A 32-bit extension to the standard 16-bit AT bus that processes information faster.
PnP	The Plug and Play (PnP) architecture allows the operating system to automatically configure PnP devices and adapter cards.
PCI bus	The PCI (Peripheral Component Interface) bus is an additional 32-bit (or 64-bit) local bus that permits information from devices located on the PCI bus to be processed directly by the CPU without going through other parts of the computer. The PCI bus operates at 25 to 33 MHz while the standard AT bus operates at only 8 MHz.

Memory	Three types of memory are tested by the memory routines: ROM, system memory, and cache memory.
	ROM (Read Only Memory) stores the BIOS (Basic Input Output System). The BIOS is the lowest level of software in an AT computer. The BIOS is an interface between the hardware components and the operating system. If the BIOS ROM is bad, the computer cannot run. You must either replace or update the programs on the ROM chip. The computer also has a video ROM and can have option ROMs.
	System memory is what we commonly mean when we talk about a computer's memory. The operating system and the applications programs are stored in system memory. Microscopic parts of the DRAM (Dynamic Random Access Memory) used for system memory can malfunction. AMIDiag has eight diagnostic tests for system memory.
	Cache memory stores data that is used often. Cache memory uses a small amount of fast SRAM (Static Random Access Memory) so the CPU can obtain often-used data much more quickly than it could if it was accessing system memory.
Hard disk	The hard disk drive can store much more information than system memory. Data written to the hard disk drive is not erased until you erase it, if the drive is operating normally. AMIDiag includes routines that test hard disk drives. There are many types of hard drives. SCSI drives can be tested via the AMIDiag SCSI test functions.
Floppy	While hard disk drives can hold hundreds of megabytes of information, the diskettes used in floppy drives usually hold only 1.44 MB. But a floppy diskette is easily moved from one computer to another.
SCSI	The SCSI bus provides a way to attach up to 7 (or 15 if using Wide SCSI) additional devices to the computer on a high-speed data bus. AMIDiag provides several tests for SCSI hard disk, tape, and CD-ROM drives.
Keyboard	The keyboard is the easiest input device to use. You type in information and get results. But a key on your keyboard could be sending the wrong information to the computer. AMIDiag has five diagnostic routines that test keyboard accuracy.
Video	The video monitor is the most obvious computer output device. Computer video is complex: there are many different video modes, screen resolutions, refresh rates, scan rates, and color combinations. Video has evolved through several standards: monochrome, CGA, EGA, VGA, and Super (VESA™) VGA are the common standards. Super VGA (Video Graphics Array) is almost universally used. This standard supports higher resolutions and more screen colors. AMIDiag provides the most comprehensive set of video diagnostic tests.

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Miscellaneous The serial port, parallel port, mouse, internal PC speaker, and Sound Blaster™–compatible card tests are all on the AMIDiag Miscellaneous menu.

The serial ports communicate with other computers. Data is transferred one bit at a time through the serial ports, but the transfer rate can be up to 115,200 bits per second. AMIDiag tests the serial ports at all transfer rates to ensure proper operation.

The parallel ports transfer data eight bits at a time. It is used to attach a printer. AMIDiag sends a print pattern through the parallel port to make sure the port and the printer work correctly.

The mouse is more important than the keyboard because of graphical user interfaces. The mouse is attached via a special connector, the standard AT bus, or a serial port.

AT computers have always had small speakers that were barely adequate. But now many computers have sound adapter cards and high-quality speakers. Many computers now have sound cards. Sound Blaster is an industry standard that almost all sound cards can emulate. AMIDiag tests Sound Blaster-compatible sound cards.

2   AMIDiag Menus

The AMIDiag main menu is shown below. The main menu options are
described on:

Menu
System
Memory
IDE Devices
Floppy (FDD)
SCSI
Keyboard (KBD)
Video
Miscellaneous (Misc)
User
Options

Select a menu options by pressing the ↑ or ↓ keys and pressing <Enter> when
the menu is highlighted. Press the → or ← keys to display a different AMIDiag
menu.

Using AMIDiag Utility Keys

Key	Description
<Esc>	Halts the current test if a test is running.
	Exits AMIDiag is no test is running.
<Enter>	Run the highlighted AMIDiag test.
F1	Displays Help screens.
F2	Edit batch parameters.
F3	Load batch parameters.
F4	Save batch parameters.
F5	Select or deselect the current test.
F6	Select or deselect the tests on a specific AMIDiag menu.
F7	Select or deselect all AMIDiag tests.
F8	Select or deselect all tests necessary to run a system quick test.
F9	Displays a list of the AMIDiag function keys.
F10	Run the selected test or tests.

Selecting AMIDiag Tests

Problem	AMIDiag test to run
Processor Problems	
Make sure the computer has the proper CPU and it is operating properly.	Run the Basic Functionality test and the CPU Protected Mode on the System menu.
Check the CPU speed.	Run the Processor speed test on the System menu.
Check the math coprocessor.	Run the Coprocessor test on the System menu.
Make sure the computer clock is running properly.	Run the Timer test and the Real Time Clock test on the System menu.
Make sure the system configuration is not corrupted.	Run the CMOS Validity test on the System menu.
Make sure the EISA adapter slots are functioning correctly.	Run the EISA system test on the System menu.
Make sure PnP devices are functioning.	Run the Plug and Play test on the System menu.
Make sure the PCI adapter slots are functioning correctly.	Run the PCI system test on the System menu.
Memory Problems	
Random memory (or performance) problems occur but BIOS POST did not find any memory problems.	Run the Pattern test, the Random Pattern Test and the Cache Memory test on the Memory menu.
The BIOS finds memory errors or memory problems occur constantly.	Run the Walking 1s test on the Memory menu.
Intermittent cache memory problems.	Run the Cache Memory test on the Memory menu.
Identify and report data corruption because of hardware parity problems.	Run the Parity test on the Memory menu.
Identify shorts on data lines and data bits stuck at 0.	Run the Walking 0s test on the Memory menu.
IDE Hard Disk Drive Problems	
Find the data transfer rate and track to track seek time for the hard disk drive.	Run the Performance test on the HDD menu.
Determine the drive Seek capability.	Run the Seek test on the HDD menu.
Verify the hard drive read function.	Run the Read/Verify test on the HDD menu.
Verify that the test cylinder on the hard disk drive is OK.	Run the Check Test Cylinder test on the HDD menu.
Floppy Drive Problems	
Verify that the floppy drive formats disks correctly.	Run the Diskette Format test on the FDD menu.
Verify the floppy drive speed.	Run the Drive Speed test on the FDD menu.
Make sure the floppy drive is reading and writing correctly.	Run the Random R/W test and the Sequential R/W test on the FDD menu.
Make sure the drive seeks correctly.	Run the Elevator Seek test on the FDD menu.
Keyboard Problems	
Make sure the keyboard interface works	Run the Keyboard Controller test on the Keyboard Menu.
Make sure each keyboard key sends the correct signal to the computer.	Run the Scan/ASCII Code test on the Keyboard Menu.
Make sure the keyboard LEDs work.	Run the Keyboard LED test on the Keyboard Menu.
SCSI Drive Problems	
Make sure that the SCSI drive is reading correctly.	Run the SCSI Disk Read test on the SCSI menu.
Make sure that the SCSI drive is writing correctly.	Run the SCSI Disk Write test on the SCSI menu.
Make sure that the SCSI tape drive is reading correctly.	Run the SCSI Tape Read test on the SCSI menu.
Make sure that the SCSI tape drive is writing correctly.	Run the SCSI Tape Write test on the SCSI menu.
Rewind the tape cartridge in the SCSI tape drive.	Run the SCSI Tape Rewind test on the SCSI menu.
CD-ROM Drive Problems	

Problem	AMIDiag test to run
Make sure that the CD-ROM drive is reading correctly.	If the computer has a SCSI CD-ROM drive, run the SCSI CD-ROM Read test on the SCSI menu. If the computer has an ATAPI or IDE CD-ROM drive, run the CD Data test on the IDE menu.
To test the CD-ROM drive tray,	Choose the CD Tray Test on the Misc. menu.
Make sure that the CD-ROM can play audio CDs correctly.	If the computer has a SCSI CD-ROM drive, choose the SCSI CD-ROM Play test on the SCSI menu. If the computer has an ATAPI or IDE CD-ROM drive, choose the CD Audio Test on the IDE menu.
Video Problems	
Video display problems.	Run the Video Memory test on the Memory menu.
Make sure the video display attributes (blinking, bold, and reverse video) memory are operating correctly.	Run the Attribute test on the Memory menu.
Make sure text displays correctly.	Run the 40x25 and 80x25 Display tests on the Video menu.
Make sure graphics display correctly.	Make sure the correct video drivers are loaded. Run the Video 320x200, 640x200, 640x350, 640x480, and Color tests on the Video menu.
Make sure Super VGA graphics display correctly.	Run the VESA Video Mode and VESA Video Memory test on the Video menu.
Serial Port Problems	
A mouse attached to a serial port does not work. A device attached to a serial port does not work.	Run the Serial port test on the Misc. menu.
Parallel Port Problems	
A printer connected to the parallel port does not work.	Run the Parallel port test on the Misc. menu.
Audio Problems	
Make sure the speaker attached to your computer is working correctly.	Run the PC speaker test on the Misc. menu.
Make sure the Sound Blaster adapter card in your computer is working.	Run the Sound Blaster test on the Misc. menu.

Running AMIDiag Tests

To run this test or test group...	Do the Following
Run all AMIDiag tests.	Press <F7>, then <F10>.
Run a complete overall system quick test	Press <F8>, then <F10>.
Run all motherboard diagnostic tests.	Select the System menu. Press <F6>, then <F10>.
Run all memory diagnostic routines.	Select the Memory menu. Press <F6>, then <F10>.
Run all IDE drive diagnostic routines.	Select the IDE menu. Press <F6>, then <F10>.
Run all floppy diagnostic routines.	Select the Floppy menu. Press <F6>, then <F10>.
Run all keyboard diagnostic routines.	Select the Keyboard menu. Press <F6>. Press <F10>.
Run all video diagnostic routines.	Select the Video menu. Press <F6>. Press <F10>.
Run all serial, parallel, and mouse diagnostic routines.	Select the Misc. menu. Press <F6>. Press <F10>.
Print a report about the computer system configuration and test errors.	Select the Options menu. Select Generate Reports. Select the print device.
Return to the DOS prompt.	Select the Options menu. Select DOS shell. Type EXIT to return to AMIDiag.
Exit AMIDiag.	Press <Esc>. Choose *Yes* at the prompt.

Running AMIDiag in Batch Mode

When your computer is experiencing an intermittent problem that no diagnostic software test has been able to identify, run AMIDiag tests over an extended period of time. Many computer problems are not evident (especially memory problems) when a test is run only once. AMIDiag allows you to run diagnostic routines on only a certain part of the computer, a specific part of memory, or a specific part of a disk drive. AMIDiag also allows you to build script (.INI) files that contain test configuration information. After you have created a AMIDiag .INI file, you can run the AMIDiag diagnostic routines listed in the .INI file automatically.

Batch Mode Steps

Step	Action
1	Select the AMIDiag tests to be run.
2	Select the test parameters, such as the drives, the I/O ports, or other parameters. These parameters differ for each test.
3	Run the tests after you configure the test by pressing <F10>.
4	You can save the current AMIDiag test configuration to a .INI file.
5	You can then run this set of AMIDiag tests at any time.

Error Log Viewer

AMIDiag allows you to display the error log while still running AMIDiag. The AMIDiag error log contains all diagnostic errors that AMIDiag has found during the current AMIDiag session.

To display the error log, select Display Error Log File on the AMIDiag Options menu. Enter the name of the error log file. The default error log filename is AMIDIAG.LOG. The AMIDiag error log file will be displayed.

3 System Diagnostics

The System diagnostic routines are:

System Test
Processor test
DMA Controller test
Interrupt Controller test
Timer test
Real Time Clock test
CMOS Validity test
EISA System test
Speaker Test
PCI System test
Plug and Play test
Multi Processor test
I2C Bus test
MMX test

The following screen appears when System is selected from the AMIDiag Main Menu:
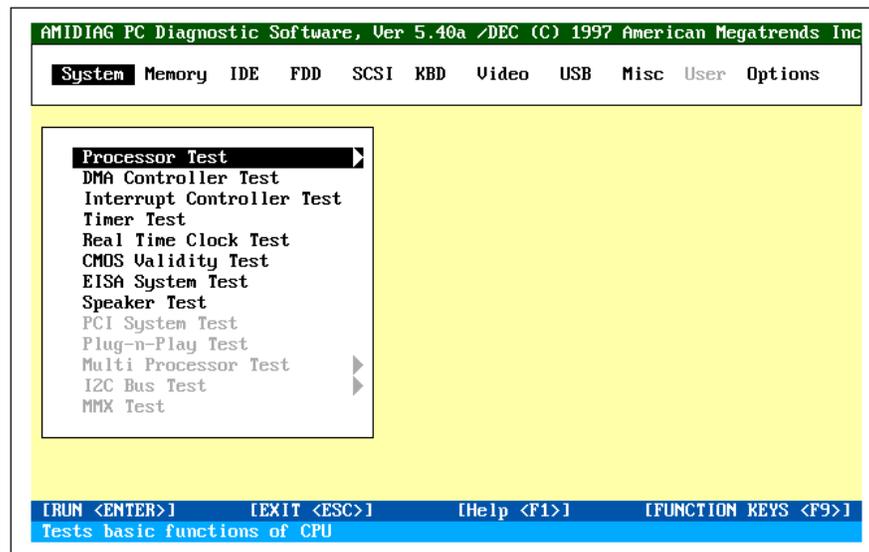
Error Codes   Each test on the System menu can generate error codes.

Processor Test

The Processor test makes sure that the CPU(s) is functioning properly. While AMIDiag is loading, it performs the following functions:

- disables the Protected Mode test if the computer is already in protected mode,
- disables the Coprocessor test if the computer does not have a coprocessor, and
- disables the EISA test if not running in a computer with an EISA bus.

Processor Tests The Processor test includes:

- the Basic Functionality Test,
- the Processor Speed Test,
- the Protected Mode Test, and
- Coprocessor Test.
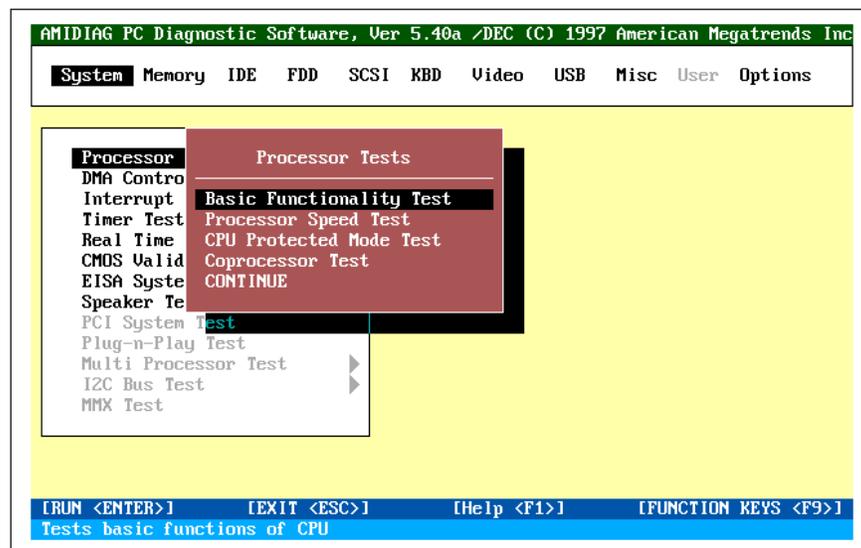
Basic Functionality Test The basic functionality test makes sure that the CPU(s) in the computer are operating correctly and efficiently in all address modes. This test is performed in two modes:

- 16-bit mode tests the 16-bit registers, the 16-bit flags, and special instructions.
- 32-bit mode performed only on 386, 486, and Pentium™-based systems. It tests the special 386 and 486 functions, the 32-bit registers, and the 32-bit flags.

Select *Processor Test* from the System Board menu and press <Enter>. This test checks the functionality of all Intel 386, 486, S-Series, Pentium, Pentium Pro, Pentium II, and Intel x86-compatible CPUs.

Processor Speed Test This test determines and displays the CPU clock speed. This test detects processor speeds up to 400 MHz. The screen displays the expected processor speed and the actual CPU clock speed, not the speed index displayed by many benchmark programs. The CPU speed is determined by measuring the time taken to execute a specific instruction. The time calculation uses a separate clock source with a known frequency. The effects of cache memory and prefetch queues are disregarded in this calculation.

The Expected speed is taken from the DMI information in the computer.

Set the test parameters: Choose YES for the CPU Speed Comparison, Expected CPU Speed, and Run Test parameters.

CPU Protected Mode Test This test tests the protected mode instructions normally used by Microsoft Windows 95, OS/2® and other operating systems for switching to protected mode. This routine tests all Intel 386, 486, S-Series, P24C, 486DX4, Pentium, Pentium Pro, P54-family and Pentium II and all compatible CPUs.

Coprocessor Test This test checks the functionality of the math coprocessor. All 486DX, Pentium, Pentium II, and Pentium Pro CPUs have a math coprocessor. If a math coprocessor is not installed, AMIDiag does not let you choose this test. Select *Coprocessor Test* from the System menu and press <Enter>. This test loads and stores the control and status word, checks data transfer between the CPU and the math coprocessor, and tests exception checking while the data transfer is in progress.

DMA Controller Test

This test is a series of read and write tests on the memory address registers and page registers of DMA controllers 1 and 2. DMA (Direct Memory Access) is a way to transfer data between the hard disk drive and system memory without passing through the CPU. On error, AMIDiag displays the register number, data written, and data read. To perform this test, select *DMA Controller Test* from the System menu and press <Enter>.

Interrupt Controller Test

The Interrupt Controller Test performs a series of read and write tests on interrupt mask registers and checks for stray interrupts after masking off all interrupts. AMIDiag displays the register numbers, the data read, and the data written if there are errors in the read/write test. Select *Interrupt Controller Test* from the System menu and press <Enter>.

Timer Test

This test checks the accuracy of the timer count by calibrating it against the periodic interrupt of the Real Time Clock (RTC). Select *Timer Test* from the System menu and press <Enter>.

Real Time Clock Test

This test checks the regularity of the real time clock interrupt by calibrating it against the timer 0 interrupt. On some systems, this test resets the date and time function. Always verify the correct date and time after exiting AMIDiag. To perform this test, select *Real Time Clock Test* from the System menu and press <Enter>.

CMOS Validity Test

This test checks the validity of the data in CMOS RAM and makes sure that the CMOS RAM checksums are correct. This test also makes sure that the battery is in good condition. Select *CMOS Validity Test* from the System menu and press <Enter>.

EISA System Test

Select *EISA System Test* to check the EISA system components, specifically the EISA DMA and interrupt controller registers. This test also checks the software NMI (nonmaskable interrupt) and the EISA fail-safe timer. This test can only be selected if AMIDiag is being executed on an EISA computer. Select *EISA System Test* from the System menu and press <Enter>.

PCI System Test

The PCI System Test makes sure that the PCI bus and all PCI devices in the computer are working properly. The PCI Bus Test includes:

- the PCI Bus Scan,
- the PCI Device Access Test,
- the PCI Configuration Verification Test,
- the PCI Special Cycle Test, and
- the PCI Bus Stress Test.

PCI Bus Scan This test scans for all PCI devices in the computer.

PCI Device Access Test This test accesses all PCI devices in the computer by vendor ID and class code.

PCI Configuration Verification Test This test verifies the transactions across the PCI bus by reading the 256 byte PCI Configuration Space associated with each detected PCI device.

PCI Special Cycle Test This test generates the PCI special cycle to make sure that it can be generated.

PCI Bus Stress Test. This test generates a heavy load of transactions over the PCI bus by transferring large volumes of data from system memory to a PCI device (the PCI VGA controller).

Plug and Play Test

This test checks all Plug and Play devices attached to the computer. This test can only be selected if AMIDiag is being executed on a computer that complies with the Plug and Play specification. To perform this test, select Plug and Play Test and press <Enter>.

Multi Processor Test

Select this test when running AMIDiag in a computer that has more than one CPU. This test performs a variety of diagnostics on both CPUs. To perform this test, select Multi Processor Test from the System menu and press <Enter>. Follow the directions on the screen. The multiprocessor test includes:

- Inter-Processor Communication Test,
- CPU-Processor Test,
- FPU-Processor Test,
- MPI Arbitration, Cache Coherency Test,
- Memory Consistency Test, and
- the I/O Access Test.

I2C Bus Test

The I2C test runs only on computers that have the I2C bus and the Digital 8031 code driving the I2C bus. This test makes sure that system environment is valid. This routine then tests the EPROM devices on the I2C bus. The I2C Bus test includes:

I2C Bus Tests	Description
OCP Display Test	This test tests the OCP display panel. When a system failure occurs, detailed information about the failure is displayed on the OCP display panel. System enclosure information is also displayed during boot up. This test tests the display functionality of this panel by displaying AMIDiag on the panel. Choose OK if the display is correct. If the display is not correct, examine the information on the panel to decide which device should be replaced.
I²C System Verification Test	This test assures that the system is properly configured. This test uses an input file that defines the expected system configuration. This test matches the desired configuration to that received from the I2C device. If a mismatch occurs, reconfigure the system.
I²C Data Write/Read Test	This test makes sure data is written properly to the 8031 system storage area. During normal system operation, data is written and read from this storage area by the system BIOS. If this test fails, the tested storage device must be replaced.
EEPROM Access Test	This test makes sure the EEPROMs can be accessed properly and can retain data properly. This test is an extension of the previous test.
Voltage Validity Test	This test makes sure the voltages of the specified devices are in the acceptable range. A failure indicates a problem with the power supply and/or the interface cards on the I2C bus.
Temperature Validity Test	This test makes sure the temperatures of the specified devices are in the acceptable range. A failure can indicate fan failure and/or a requirement for additional fans for the enclosure.

Cont'd

Test EEPROM Test Parameters The test parameters are shown below. The default values for each parameter are displayed below.

Test Main Board:	Yes
Test CPU Board 1: No	
Test CPU Board 2: No	
Test Memory Board 1:	No
Test Memory Board 2:	No

Read Voltage The test parameters are supplied for each voltage level. Select the proper voltage levels for each voltage parameter. The default values for each parameter are displayed below.

Main Board +12

Read Voltage:	Yes
Voltage Lower Limit:	11.4
Voltage Upper Limit:	12.6

Main Board +5

Read Voltage:	Yes
Voltage Lower Limit:	4.85
Voltage Upper Limit:	5.25

Main Board +3.4

Read Voltage:	Yes
Voltage Lower Limit:	4.85
Voltage Upper Limit:	5.25

Main Board -12

Read Voltage:	Yes
Voltage Lower Limit:	0
Voltage Upper Limit:	20

CPU #1

Read Voltage:	Yes
Voltage Lower Limit:	0
Voltage Upper Limit:	3.01

CPU #2

Read Voltage:	Yes
Voltage Lower Limit:	0
Voltage Upper Limit:	3.01

CPU #3

Read Voltage:	No
Voltage Lower Limit:	0
Voltage Upper Limit:	0

Cont'd

CPU #4

Read Voltage:	No
Voltage Lower Limit:	0
Voltage Upper Limit:	0

CPU Board #1

Read Voltage:	Yes
Voltage Lower Limit:	1.32
Voltage Upper Limit:	1.69

CPU Board #2

Read Voltage:	Yes
Voltage Lower Limit:	4.85
Voltage Upper Limit:	5.25

Read Temperature Parameters

Main Board

Read Temperature:	Yes
Temperature Lower Limit:	0
Temperature Upper Limit:	80

CPU #1

Read Temperature:	Yes
Temperature Lower Limit:	0
Temperature Upper Limit:	85

CPU #2

Read Temperature:	Yes
Temperature Lower Limit:	0
Temperature Upper Limit:	85

CPU #3

Read Temperature:	No
Temperature Lower Limit:	0
Temperature Upper Limit:	80

CPU #4

Read Temperature:	No
Temperature Lower Limit:	0
Temperature Upper Limit:	80

MMX Test

This test only runs on a computer that has a CPU that supports the Intel MMX instruction set extension. MMX CPUs include support for 57 new instructions, 8 new registers, and 4 new 64-bit data types. MMX CPUs also include additional cache memory and the SIMD (Single Instruction Multiple Data) process. The AMIDiag MMX Tests include:

- MMX registers read/write test,
- MMX instruction set test,
- saturation/wraparound arithmetic test, and
- matrix transpose test.

To perform this test, select MMX Test from the System menu and press <Enter>.

System Error Codes

Code	Explanation	Recommended Action
0001h	Cannot load the MSW (Machine Status Word). The MSW is a status register on the Intel CPU. AMIDiag tried to read the MSW from the CPU but failed.	Make sure the CPU is seated properly or replace the CPU.
0002h	Cannot load the GDT (Global Descriptor Table) Register. The GDT Register describes the current memory characteristics of the CPU when performing operations in protected mode. AMIDiag could not load this register.	Make sure the CPU is seated properly or replace the CPU.
0003h	Cannot load the IDT (Interrupt Descriptor Table) Register. The IDT Register describes the current interrupt characteristics of the CPU when performing operations in protected mode. AMIDiag could not load this register.	Make sure the CPU is seated properly or replace the CPU.
0004h	ARPL instruction execution error. The ARPL (Adjust Requested Privilege Level) instruction is used by operating systems to make sure client software does not request more privileges than allowed.	Make sure the CPU is seated properly or replace the CPU.
0005h	LAR (Load Access Rights Byte) instruction execution error. The LAR instruction displays the current operation access privileges.	Make sure the CPU is seated properly or replace the CPU.
0006h	LSL (Load Segment Limit) instruction execution error. The LSL instruction loads the segment limit value.	Make sure the CPU is seated properly or replace the CPU.
0007h	VERR (Verify a Segment for Reading) instruction execution error. The instruction determines if a segment is readable.	Make sure the CPU is seated properly or replace the CPU.
0008h	VERW (Verify a Segment for Writing) instruction execution error. The VERW instruction determines if a segment is writable.	Make sure the CPU is seated properly or replace the CPU.
0009h	Cannot enable the A20 line. The A20 line (address line 20 from the CPU) allows the CPU to access the RAM above the DOS 1 MB boundary. Enabling and disabling this line is accomplished by issuing a specific command to the 8042 Keyboard Controller.	Check the data lines/paths of the 8042 against shorts or breaks. Replace the 8042.
0010h	32-bit register read or write error. An error occurred while performing a read/write operation using a 32-bit CPU register.	Make sure the CPU is seated properly or replace the CPU.
0011h	PUSHA(D) or POPA(D) execution error. The Push All (PUSHA) or Pop All (POPA) instructions failed.	Make sure the CPU is seated properly or replace the CPU.
0012h	Cannot access data through the FS or GS registers. The FS and GS registers are used as segment selector registers. They were not available on Intel CPUs before the 386. An error occurred when these registers were accessed.	Make sure the CPU is seated properly or replace the CPU.
0013h	BSF or BSR execution error. An error occurred when the Bit Scan Forward (BSF) or Bit Scan Reverse (BSR) instruction was issued.	Make sure the CPU is seated properly or replace the CPU.
0014h	FLAG Register Set or Reset error. Instructions that set or reset the FLAG register generated an error.	Make sure the CPU is seated properly or replace the CPU.
0015h	Protected mode instruction execution error. A protected mode instruction other than the instructions mentioned in error codes 04h through 14h generated a CPU exception error.	Make sure the CPU is seated properly or replace the CPU.
0016h	32-bit multiplication error. An error occurred during a 32-bit multiplication instruction. This does not affect the floating point unit (FPU) or numeric data processor (NDP).	Make sure the CPU is seated properly or replace the CPU.

Code	Explanation	Recommended Action
0020h	NDP not ready. The numeric data processor (NDP) did not respond to initialization commands. The NDP is also known as the floating point unit (FPU).	Make sure the NDP is seated properly or replace the NDP.
0021h	Cannot reset the NDP. The numeric data processor is not accepting the reset command.	Make sure the NDP is seated properly or replace the NDP.
0022h - 0025h	NDP control word read or write error. An error occurred when setting or loading the NDP control word to configure the NDP calculation characteristics (such as precision control, rounding control, exception masking).	Make sure the NDP is seated properly or replace the NDP.
0026h	Cannot reset the NDP control word. The command to reset the NDP control word to default values failed.	Make sure the NDP is seated properly or replace the NDP.
0027h	NDP Tag word read or write error. The NDP Tag word is used by the NDP to track the status of its internal registers. Attempts to read or write this Tag word have failed.	Make sure the NDP is seated properly or replace the NDP.
0028h	NDP stack read or write error. Attempts to read or write to the NDP internal stack have failed.	Make sure the NDP is seated properly or replace the NDP.
0029h - 002Ah	NDP operation status handling error. Attempts to manipulate the NDP Status Word have failed.	Make sure the NDP is seated properly or replace the NDP.
002Bh	Integer load or store error. Attempts to load or store an integer value (binary or packed decimal) to the NDP have failed.	Make sure the NDP is seated properly or replace the NDP.
002Ch	NDP Tag word read or write error. The NDP Tag word is used by the NDP to track the status of its internal registers. Attempts to read or write this Tag word have failed.	Make sure the NDP is seated properly or replace the NDP.
002Dh	NDP stack pop error. An attempt to pop a value from the NDP internal stack generated an error.	Make sure the NDP is seated properly or replace the NDP.
002Eh - 002Fh	NDP Tag word read or write error. The NDP Tag word is used by the NDP to track the status of its internal registers. Attempts to read or write this Tag word have failed.	Make sure the NDP is seated properly or replace the NDP.
0030h	Read/Write test on DMA controller 1 failed. Attempts to read or write to DMA controller 1 have failed.	Check DMA controller (8237A-5) circuitry.
0031h	Read/Write test on DMA controller 2 failed. Attempts to read or write to DMA controller 2 have failed.	Check DMA controller (8237A-5) circuitry.
0032h	Read/Write test on page registers failed. Attempts to read or write to the DMA Page Registers have failed.	Check DMA controller (8237A-5) circuitry.
0040h	Read/Write test on PIC ports failed. Attempts to read or write to the Programmable Interrupt Controller (8259A) ports have failed.	Check the PIC (8259A) circuitry.
0041h	Stray or unrecognized interrupts detected. AMIDiag detected interrupts that cannot be accounted for.	Check all interrupt circuitry and make sure interrupts for all peripherals are assigned properly.
0050h	The Timer Periodic Interrupt is not being generated. The system timer (8254-2) should be programmed to generate interrupts at specified time intervals. Interrupts are generated outside of these specified intervals.	Check the 8254 circuitry or replace the 8254.
0051h	The Timer is counting at a slower rate. Compared against the Real Time Clock, the timer counter rate is slower.	Check the 8254 circuitry or replace the 8254.
0052h	The Timer is counting at a faster rate. Compared to the Real Time Clock, the timer counter rate is faster.	Check the 8254 circuitry or replace the 8254.

Code	Explanation	Recommended Action
0060h	The Real Time Clock Periodic Interrupt is not being generated. The Real Time Clock (MC146818) should be programmed to generate interrupts at specified time intervals. Interrupts are generated outside of these specified intervals.	Check the Real Time Clock circuitry or replace it.
0061h	The Real Time Clock is running at a slower rate. Compared to the system timer, the Real Time Clock is running at a slower rate.	Check the Real Time Clock circuitry or replace it.
0062h	The Real Time Clock is running at a faster rate. Compared to the system timer, the Real Time Clock is running at a faster rate.	Check the Real Time Clock circuitry or replace it.
0070h	The battery backup unit that powers CMOS RAM (which contains all system configuration parameter) has no power.	Replace battery.
0071h	Bad CMOS RAM checksum detected. AMIDiag recalculated the CMOS RAM checksum. It is different than the value stored in CMOS RAM.	Reset the system and set BIOS Setup parameters. If the problem persists, replace CMOS RAM and the battery.
0072h	Configuration mismatch in CMOS RAM. When AMIDiag determines the equipment installed in the system, it checks this information against the values written in the CMOS RAM. This error occurs if the equipment is different.	Reset the system and set BIOS Setup parameters. If the problem persists, replace CMOS RAM and the battery.
0073h	CMOS RAM memory size information is invalid. The amount of memory found in the system by AMIDiag is different than the amount value found in the CMOS RAM.	Reset the system and set BIOS Setup parameters. If the problem persists, replace CMOS RAM and the battery.
0074h	CMOS RAM time is invalid. The time and date found in CMOS RAM are beyond the acceptable range of values (for example, the month is 54 when it must be between 1 and 12).	Reset the system and set BIOS Setup parameter. If the problem persists, replace CMOS RAM and the battery.
0075h	Time-base frequency divider set at incorrect value. This error occurs if the Real Time Clock field for the clock divider rate is not set properly (Status Register A, bits 6-4 = 010).	Reset the system and set BIOS Setup parameter. If the problem persists, replace CMOS RAM and the battery. Ask the system BIOS and motherboard manufacturers if this value is configured correctly.
0076h	Divider output frequency set to an incorrect value. The Real Time Clock field for the clock divider output frequency is not set properly (Status Register A, bits 3-0 = 0110).	Reset the system and set BIOS Setup parameter. If the problem persists, replace CMOS RAM and battery. Ask the motherboard manufacturer if this value is configured correctly.
0077h	Periodic time update cycle not occurring. The system should update the time and date values at the proper intervals (the time is updated once per second and the date once every 24 hours). Updating did not occur.	Check the Real Time Clock (MC146818) and associated circuitry. Replace if necessary.
0078h	CMOS RAM checksum error detected. AMIDiag recalculated the CMOS RAM checksum. It is different than the value stored in CMOS RAM.	Reset the system and set BIOS Setup parameters. If the problem persists, replace CMOS RAM and battery.
0079h	CMOS RAM fails to hold data. AMIDiag writes a value to an empty CMOS RAM location and reads it back. The value read differs from the value written.	Replace CMOS RAM and battery.
0080h	This test runs on EISA systems only.	Only run this test in an EISA computer.
0081h	EISA Software NMI test failed.	Replace or repair the motherboard.
0082h	EISA Fail-safe Timer test failed.	Replace or repair the motherboard.
0083h	PCI System Bus scan test failed.	Replace the motherboard or the system BIOS ROM.
0084h	Cannot access PCI devices through the FIND_PCI_DEVICE call.	Replace the motherboard or the system BIOS ROM.
0085h	Read operation of configuration space registers on boundary conditions failed.	Replace the motherboard or the system BIOS ROM.
0086h	Consistency checking of PCI configuration space failed.	Replace the motherboard or the system BIOS ROM.
0087h	GENERATE_SPECIAL_CYCLE check failed.	Replace or repair the motherboard.

Code	Explanation	Recommended Action
0088h	BIOS32 service directory integrity check failed.	Replace the system BIOS ROM.
0089h	PCI bus transfers failed using standard PCI cycles.	PCI bus problem. Replace the motherboard.
008Ah	PCI bus transfer using the PCI bus master cycle failed.	PCI bus problem. Replace the motherboard.
0090h	PnP Function 00 failed.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0091h	PnP Function 01 failed.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0094h	The system device node number is not the same as reported.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0095h	The size of one or more nodes is larger than reported.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0096h	The ISA bus was detected twice.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0097h	No EISA bus system device code.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0098h	The motherboard has no EISA ID.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
0099h	One or more EISA slots are not configured.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
009Ah	PnP Function 40 failed.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
009Bh	Invalid number of PnP adapter cards.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
009Ch	One or more unknown PnP adapter cards.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
009Dh	No PCI system device node found.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
009Eh	Too many PCI buses.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
009Fh	Not enough DOS Applications memory available.	Free up memory space by unloading some device drivers.
00A0h	PnP Function 41 failed.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
00A1h	The NVRAM buffer size is too large.	Replace the motherboard or replace (or upgrade) the system BIOS ROM.
00A2h	ESCD size too small.	Replace the motherboard or the system BIOS.
00A3h	ESCD size too large.	Replace the motherboard or the system BIOS.
00A4h	NVRAM base address invalid.	Replace the system BIOS.
00A5h	PnP Function 42 failed.	Replace the system BIOS.
00A6h	PnP Function 43 failed.	Replace the system BIOS.
00A7h	NVRAM test failed.	Replace the motherboard or the system BIOS.
00C6h	Pack with signed saturation failed.	The CPU MMX instructions are not working correctly. Make sure CPU is properly seated. Rerun MMX Tests. Replace CPU if this error re-occurs.
00C7h	Pack with unsigned saturation failed.	The CPU MMX instructions are not working correctly. Make sure CPU is properly seated. Rerun MMX Tests. Replace CPU if this error re-occurs.
00C8h	Unpack high packed data failed.	The CPU MMX instructions are not working correctly. Make sure CPU is properly seated. Rerun MMX Tests. Replace CPU if this error re-occurs.
00C9h	Unpack low packed data failed.	The CPU MMX instructions are not working correctly. Make sure CPU is properly seated. Rerun MMX Tests. Replace CPU if this error re-occurs.
00CAh	Exit MMX state (EMMS) failed.	The CPU MMX instructions are not working correctly. Make sure CPU is properly seated. Rerun MMX Tests. Replace CPU if this error re-occurs.
00FFh	Out of memory.	Programming error.
1000h	Processors do not have unique IDs.	Check the multiprocessor circuits and ID jumpers.
1001h	Processor x failed to interrupt processor y.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1002h	The IPI physical mode test failed on processor x.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1003h	Processor x failed to interrupt processor y.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1004h	Processor x failed to interrupt processor y.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.

Code	Explanation	Recommended Action
1005h	The IPI physical mode test failed on processor *x*.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1006h	Processor *x* failed to interrupt processor *y*.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1007h	Processor *x* failed to interrupt processor *y*.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1008h	The MP arbitration test failed.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
1009h	The cache coherency test failed.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
100Ah	The memory consistency test failed.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
100Bh	The I/O access test failed on processor *x* at port *y*.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
100Ch	The memory-mapped I/O access test failed on processor *x* at *yyyy*.	Make sure the CPUs are properly seated. Make sure the motherboard jumpers and switches are set properly. If this error code still appears, you may have to replace the motherboard.
100Dh	The application processors were not detected.	Make sure the second CPU is properly seated. Make sure that all motherboard jumpers and switches are set properly.
1010h	32-bit register R/W error.	
1011h	32-bit stack instruction error	
1012h	Cannot access data through FS and GS registers.	
1013h	BSF or BSR instruction execution error	
1014h	Flag register set or reset error.	
1016h	32-bit multiplication error.	
1301h	Cannot find PCI resources.	Replace the system BIOS.
1302h	Register Test failed.	Replace the motherboard.
1303h	Frame Test failed.	Replace the motherboard.
1304h	Status Test failed.	Replace the motherboard.
1305h	Interrupt Tests failed.	Replace the motherboard.
1306h	Transfer Descriptor failed.	Replace the motherboard.
7001h	No response from 8031.	Perform I2C diagnostic tests.
7002h	8031 returns fail. A command package timeout, invalid command package length, checksum error, device timeout, incorrect download address, or incorrect command occurred.	
7003h	Data check-sum error or 8031 returns an invalid control code.	
7004h	OCP Display error.	
7007h	Invalid 8031 system information.	
7008h	The data read from I2C is different that written.	Change the system configuration.
7009h	Cannot access the device EEPROM.	ROM is bad. Replace the ROM chip.
700Ah	Voltage not in the specified range.	
700Bh	Temperature not in the specified range.	A system fan may not be working properly.
7012h	8031 system information file format error.	

4   Memory Diagnostics

All memory tests write to all areas of installed DRAM system memory up to 4 GB. The memory tests determine the size of system memory. HIMEM.SYS, EMM386.EXE, and all other programs that operate in protected mode cannot be loaded when running the AMIDiag memory tests. The memory diagnostics are:

Memory Test
BIOS ROM test
Parity test
Pattern test
Extended Pattern test
Walking 1s test
Walking 0s test
Random Memory test
Address test
Refresh test
Data Bus Test
Cache Memory test
Pentium II L2 Cache Test

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

    System  Memory  IDE   FDD   SCSI  KBD   Video   USB   Misc  User  Options


          BIOS ROM Test
          Parity Test
          Pattern Test
          Extended Pattern Test
          Walking 1's Test
          Walking 0's Test
          Random Memory Test
          Address Test
          Refresh Test
          Data Bus Test
          Cache Memory Test
          Pentium II L2 Cache Test




 [RUN <ENTER>]       [EXIT <ESC>]       [Help <F1>]       [FUNCTION KEYS <F9>]
 Tests the data path and write protection of the BIOS ROM.
```
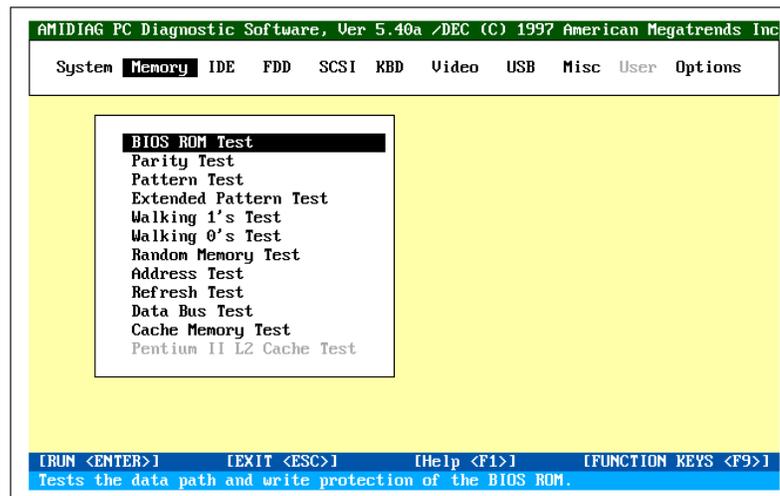
Memory Test Error Codes Each test on the Memory menu can generate error codes.

Aborting Tests Each test on the Memory menu can be aborted by pressing <Esc>.

DMI Memory Fault Isolation

AMIDiag isolates faulty memory modules. AMIDiag displays

```
The faulty memory chip is on SIMM x
```

This facility only works if the system BIOS in your computer has DMI support.

Automatic ECC Monitoring

AMIDiag automatically provides system memory ECC monitoring to isolate memory faults if the computer is based on the Intel 450GX, 440FX, or 440LX chipsets.

BIOS ROM Test

The BIOS ROM Test checks the data path of the BIOS ROM and makes sure the ROM is write-protected. Select *Memory* from the Main Menu, select *BIOS ROM Test*. Press <Enter> to start the BIOS ROM Test.

BIOS 2000 Year Rollover Test This routine tests the ability of the system BIOS in your computer to properly display the correct date and time after midnight December 31, 1999.

Parity Test

Run this test to find bad memory locations. This test finds parity errors in all system memory. This test is the best way to identify and report data corruption because of DRAM system memory hardware problems. This test diagnoses the parity error detection circuitry in DRAM.

Parity   All data is stored in patterns of binary digits (1s and 0s). Each byte has eight binary digits (bits). Parity is either even or odd. The parity of a block of data storage is the sum of all the set binary digits in that unit. If there are eight bits in each unit (a byte), the parity is the sum of all bits that are set to 1. PC system memory is organized into bytes that have even or odd parity. This parity is achieved by adding a bit, called the *parity bit,* which is made even or odd by the hardware circuitry to make sure all data units have the same parity. Most system memory actually has 9 bits (8 data bits and one parity bit). Adding a parity bit is a method of assuring that the data is correct.

Test Description ISA systems include memory parity checking circuitry. When the CPU accesses a memory location that has a parity error, a bit is set in a specific register and an NMI (nonmaskable interrupt) is generated. AMIDiag captures the NMI and checks the specific register for the parity error indicator while accessing different memory regions. If a parity error occurs in the memory area where AMIDiag is located, the system may hang.

Run the Test Select *Memory* from the Main Menu and *Parity Test*. Press <Enter> to start the Parity Test. A list of parameters appears, as shown below:

Test Base Memory	YES
Test EXT Memory	YES
EXT Memory Start	1 MB
EXT Memory End	20 MB
Pattern Size	BYTE
Percentage	100
Continue	

You can test base memory by choosing YES in *Test Base Memory*. You can test extended memory by choosing YES in *EXT Memory Test.* You can specify the beginning and ending extended memory locations when testing extended memory in the *EXT Memory Start* and *EXT Memory End* fields. You can also specify the size of the bit pattern written to memory in this test in the *Pattern Size* field. By changing the bit pattern size, otherwise undetected memory errors will be discovered. You should change this parameter to ALL to perform the most thorough memory error detection test. The bit pattern sizes are BYTE (8 bits), WORD (16 bits), DWORD (32 bits), or ALL (all bit pattern sizes). The default is DWORD.

The amount of memory already tested is displayed as the test runs. If the displayed percentage is less than 100%, the displayed percentage is the amount of system memory between the EXT Memory Start and EXT Memory End values.

Pattern Test

This test is the most exhaustive memory test in AMIDiag. This test consists of seven test routines that write a series of test patterns to memory, then read the patterns back and compare the read results with the pattern that was written. This test uses worst-case bit patterns, such as AA55h. The memory reads and write instructions test every bit of DRAM system memory.

Test Description Each memory chip in your computer is designed to hold 1, 4, or 9 bits of data. If the memory chip does not retain data, there is an inconsistency in the data written to and read from memory. For example, the hexadecimal number 11 can be written to a memory location. If the chip that holds the least significant bit (bit 0) of this number is faulty, 10 hex is read from memory instead of 11 hex. This is called bit dropping. If bit 0 of this location sets a bit instead of dropping it, the system may read 11 hex when the actual data was 10h. If a program is loaded to the faulty memory location, it either fails or produces erroneous results. If data is loaded into this memory area, the data becomes corrupted.

When to Use The Pattern Test is most useful when the computer has random memory (or performance) problems and BIOS POST tests cannot find memory problems. If the system has random problems you cannot identify, run the Pattern Test for several passes or even continuously. This rigorous memory test runs for a long time, but when it is difficult to determine exactly where the error is, the test must be extremely thorough. This test performs a long read and write test of memory space and identifies most memory faults. The diagnostic routines in the pattern test find system memory problems. These tests can run for an hour, depending on the CPU type and the amount of system memory. A picture of memory appears. Test progress is shown by flashing each tested memory segment as the test runs on that segment. The test order is:

Test Name	Description
Bit Stuck High test	Searches for bits stuck high.
Bit Stuck Low test	Searches for bits stuck low.
Checkerboard test	Write bit patterns successively to non-contiguous memory areas.
CAS Line test	Tests the Column Address Strobe signal line.
Incremental test	Tests memory by writing incremental patterns and reading them.
Decremental test	Tests memory by writing decremental patterns and reading them.
Incremental Decremental test	Tests memory by writing incremental and decremental patterns and reading them back.

Run the Test Select *Memory* from the Main Menu, *Pattern Test*, and press <Enter>. A list of parameters appears:

```
Test Base Memory    YES
Test EXT Memory     YES
EXT Memory Start    1 MB
EXT Memory End      20 MB
Pattern Size        BYTE
Percentage          100
Continue
```

Test base memory by choosing YES in the *Test Base Memory* field. Test extended memory by choosing YES in the *EXT Memory Test field.* You can specify the beginning and ending extended memory locations for extended memory in the *EXT Memory Start* and *EXT Memory End* fields. You can also specify the size of the bit pattern written to memory in the *Pattern Size* field. By changing the bit pattern size, otherwise undetected memory errors can be discovered. Change this parameter to ALL to perform the most thorough memory error detection test.

Cont'd

Bit Pattern Sizes The bit pattern sizes are BYTE (8 bits), WORD (16 bits), DWORD (32 bits), or ALL (all bit pattern sizes). The default is DWORD. If the displayed percentage is less than 100%, the specified percentage is the amount of system memory between the EXT Memory Start and EXT Memory End values that has been tested. If no errors occur, select *Return to main menu* when this test finishes. Select *Browse error list* if errors occur.

Extended Pattern Test

This test is composed of two test routines that write data to memory, read the data back and compare the data. The subtests repeat until you press <Esc>. They are:

Test Name	Description
Write/Read Cycle	This subtest runs diagnostics using both read and write instructions.
Read Cycle	This subtest runs diagnostics using read instructions.

Run the Test Select *Memory* from the Main Menu, Extended Pattern Test, and press <Enter>. If no errors occur, select *Return to main menu* when this test finishes. Select *Browse error list* if errors occur. This test cannot access memory above 64 MB if HIMEM.SYS is loaded and does not access memory above 64 MB. If HIMEM.SYS is not loaded, this test accesses all system memory.

Walking 1s Test

This test uses the *Walking 1s Left Test* and the *Walking 1s Right Test* routines to identify shorts on data lines and data bits stuck at 1. Run this test if the BIOS finds memory errors or memory problems constantly occur.

Run the Test   Select *Memory* from the Main Menu, *Walking 1s Test*, and press <Enter>. A list of parameters appears:

```
Test Base Memory    YES
Test EXT Memory     YES
EXT Memory Start    1 MB
EXT Memory End      20 MB
Pattern Size        BYTE
Percentage          100
Continue
```

You can test base memory by choosing YES in the *Test Base Memory* field. You can test extended memory by choosing YES in the *EXT Memory Test field*. You can specify the beginning and ending extended memory locations when testing extended memory in the *EXT Memory Start* and *EXT Memory End* fields. If the displayed percentage is less than 100%, the percentage is the amount of system memory between the EXT Memory Start and EXT Memory End values tested.

You can also specify the size of the bit pattern that is written to memory in this test in the *Pattern Size* field. By changing the bit pattern size, otherwise undetected memory errors will be discovered. You should change this parameter to ALL to perform the most thorough memory error detection test. The bit pattern sizes are BYTE (8 bits), WORD (16 bits), DWORD (32 bits), or ALL (all bit pattern sizes). The default is BYTE. This test sequentially turns on all bits in system memory in a rolling pattern. The pattern is constructed so that only one bit of each byte is 1 at any time.

Walking 0s Test

The Walking 0s test writes shifting patterns to memory to find memory errors. This test uses two test routines to identify open data lines. The two routines are the *Walking 0s Left Test* and the *Walking 0s Right Test*. Run this test if the BIOS POST routines report memory errors or the system has constantly recurring memory problems.

Run the Test

Select *Memory* from the Main Menu and *Walking 0s Test*. Press <Enter> to start the Walking 0s Test. A list of parameters appears, as shown below:

Test Base Memory	YES
Test EXT Memory	YES
EXT Memory Start	1 MB
EXT Memory End	20 MB
Pattern Size	BYTE
Percentage	100
Continue	

You can test base memory by choosing YES in the *Test Base Memory* field. You can test extended memory by choosing YES in the *EXT Memory Test field.* You can specify the beginning and ending extended memory locations when testing extended memory in the *EXT Memory Start* and *EXT Memory End* fields. If the displayed percentage is less than 100%, the percentage is the amount of system memory between the EXT Memory Start and EXT Memory End values tested.

You can also specify the size of the bit pattern that is written to memory in this test in the *Pattern Size* field. The bit pattern sizes are BYTE (8 bits), WORD (16 bits), DWORD (32 bits), or ALL (all bit pattern sizes). The default is BYTE. This test writes a rolling zero pattern to all memory locations. The pattern is constructed so that only one bit of each byte is 0 at any time.

Random Memory Test

The Random Read/Write Test uses five test routines to write a random bit pattern to a randomly-selected DRAM system memory location and read the same memory location, looking for the same bit pattern that was written. The test cycles through each of the five routines. The routines are:

Subtest	Description
Initialize Randomize Test	Begin the random memory test.
Validate Randomize Test	Validate information found in the random memory test.
Initialize Random Increment Test	Begin the incremental random memory test.
Random Increment Read/Write	Begin the incremental random read/write memory test.
Validate Memory	Validate information found in the random read/write memory test.

Running the Test Select *Memory* and *Random Memory Test* and press <Enter>. A list of parameters appears:

```
Percentage          100
Continue
```

This test finds soft errors in memory that are normally hidden by the cache memory algorithms. This test defeats the caching strategy and accesses system memory directly. This test also finds cache loading problems. This test cannot access memory above 64 MB if HIMEM.SYS is loaded and HIMEM.SYS does not access memory above 64 MB. If HIMEM.SYS is not loaded, this test can access all system memory.

Address Test

This test checks for shorts and opens on address lines A0 through A23. The address lines are used to access data at a specified memory location. Data can be written to or read from the wrong memory location if there is a short or malfunction in the address lines because of a hardware problem. If the data is a part of the program being executed, the program itself may malfunction. Select *Memory* from the Main Menu and *Address Test*. Press <Enter> to start the Address Test. This test writes a value in one memory locations and scans the entire range of system memory to find the value.

Refresh Test

The type of memory used in almost all computer system memory is called DRAM (Dynamic Random Access Memory). DRAM uses a small electric charge to store memory. This charge must be refreshed approximately every 15.625 μseconds. Certain programs detect the memory refresh interval and use the refresh rate for delay loops. This AMIDiag test checks the DRAM system memory refresh interval rate.

When to Use   Run the Refresh Test if a program that uses timing loops based on the memory refresh rate does not work properly in your system. Many BIOS routines use such timing loops, specifically routines that access the disk drives. Select *Memory* from the Main Menu and *Refresh Test*. Press <Enter> to start the Refresh Test. If an error occurs in this test, AMIDiag displays the current refresh rate and the ideal refresh rate.

Data Bus Test

This test makes sure that the data bus is working properly. Choose Data Bus test from the Memory menu and press <Enter> to run this test.

Cache Memory Test

This test identifies and tests all internal and secondary cache memory and then performs a random pattern test within the range of the cache memory size to detect cache memory problems. This test does not run if cache memory is not installed or is disabled. This test always display the exact cache memory size. If HIMEM.SYS is loaded, this test cannot be performed. If EMM386 is loaded, this test is disabled.

Cache Memory Most modern systems have cache memory, a small amount of relatively fast SRAM (static RAM) that temporarily stores frequently used data from system memory (relatively slow DRAM). Cache memory is used because it speeds access to data and code in memory.

Caching is a method of speeding access to information in a slower device by temporarily storing the information in a faster device. For example, data stored in 70 ns DRAM can be stored temporarily in 12 – 18 ns SRAM cache memory for quicker access. The system that determines which data is stored in SRAM cache memory is called a caching algorithm.

When to Use This test determines the cache memory size and tests the cache memory chips. *Make sure cache memory is enabled before running this test.* Cache is usually enabled via BIOS Setup. In systems with an AMIBIOS, <Ctrl> <Alt> <Shift> <+> usually enables cache memory.

If an error occurs in this test, AMIDiag displays the current refresh rate and the ideal refresh rate.

Pentium II L2 Cache Test

This test makes sure that the L2 secondary cache memory on the Pentium II is functioning properly. This test directly accesses the Pentium II cache memory through the Pentium II special hardware access instead of indirectly, as is done in the Cache Memory Test.

This test is disabled if AMIDiag does not detect an Intel Pentium II CPU. This test appears in addition to the Cache Memory test.

Memory Test Error Codes

The addresses below are absolute (32-bit) address. These addresses are not in the segment:offset format.

Code	Explanation	Recommended Action
0100h	ROM read error. AMIDiag could not read from a ROM location.	Check the ROM data, control and address lines for shorts or breaks.
0101h	ROM not write-protected. AMIDiag was able to write over data in a ROM location. ROM locations should be write-protected.	Check the ROM data, control and address lines for shorts or breaks. Ask the BIOS or motherboard manufacturer for possible hardware/software bugs in ROM access and Shadow RAM.
0102h	The system BIOS cannot set the year to 2000 after 12/31/99.	Replace the system BIOS.
0120h	Parity error at absolute memory location XXXXXXXXh. AMIDiag found a parity error at xxxxxxxxh.	Make sure the parity circuitry is enabled and functioning properly on the motherboard. Replace the RAM in that area.
0130h	The pattern written at XXXXXXXXh was *qqqq*h. The pattern read back from that address was *pppp*h. AMIDiag wrote a pattern to address *xxxxxxxx*h. A different value was read back.	Replace the system memory DRAM.
0131h	Parity failure at XXXXXXXXh during pattern test. While performing the pattern test to the specified address, AMIDiag received a parity error.	Make sure the parity circuitry is enabled and functioning properly on the motherboard. Replace the RAM in that area.
0132h	Faulty memory chip on SIMMM xxxx	Replace SIMM xxxx.
0135h	ECC correctable error in SIMM sockets xxxx/yyyy	Replace SIMM xxxx or yyyy.
0136h	ECC uncorrectable error in SIMM sockets xxxx/yyyy	Replace SIMM xxxx or yyyy.
0140h	Failure at address XXXXXXXXh, bit position *bb*h. A failure occurred at the specified address.	Replace the system memory DRAM.
0150h	Failure at XXXXXXXXh, bit position *bb*h. A failure occurred at the specified address.	Replace the system memory DRAM.
0160h	There is an address short between bit *xx*h and *yy*h. AMIDiag detected a short in the address lines between the bits specified above. For example, if `Address short found between bit 01h and 02h` appeared, address lines A0 and A1 have a short between them.	Check these lines for possible shorts on the board. Check the CPU for possible shorts for these input pins.
0170h	RAM Refresh is not working. The system RAM refresh signal is either not being generated or the signal is being generated sporadically.	Check the RAM refresh signal generation circuitry. Check channel 1 of the system timer (8254-2).
0171h - 0172h	RAM Refresh is slower or faster than expected. Normally, the system should generate a refresh signal about once every 15 μs. This error occurs if the refresh signal is occurring at a slower or faster rate.	Check the RAM refresh signal generation circuitry. Check channel 1 of the system timer (8254-2).

Code	Explanation	Recommended Action
0180h	The pattern written at address XXXXXXXXh was *qqqq*h. The pattern read back from that address was *pppp*h. AMIDiag wrote a pattern to address *xxxxxxx*h. When reading it back, AMIDiag read a different value from that same address.	Replace the RAM in that area.
0181h	No active external cache memory.	Enable external cache memory through the BIOS Setup utility first.
0182h	No extended memory available from HIMEM.SYS.	Make sure that another application s not using all extended memory allocated by HIMEM.SYS.
0183h	No extended memory detected.	Your computer does not have extended memory, the memory modules are not properly seated, or system memory is bad.
0184h	Data bus short found	Check the data bus.
0190h	Test failed at address *xxxxxxx*h. An unknown memory error occurred at *xxxxxxx*h.	Replace the RAM in that area.
01A0h	The same as code 0130h *(Pattern written at address XXXXXXXXh was qqqqh, read back was pppph).*	Random read/write test error. Replace the system memory DRAM in the affected area.
1030h	Pattern test error.	The L2 secondary cache memory and/or main system memory is bad. Replace system memory and try this test again. If still bad, replace L2 secondary cache memory.
1031h	Parity test error.	The L2 secondary cache memory and/or main system memory is bad. Replace system memory and try this test again. If still bad, replace L2 secondary cache memory.
1081h	No active external cache memory.	L2 secondary (external) cache memory is disabled. Set the External Cache to Enabled in BIOS Setup.
1082h	No extended memory available from HIMEM.SYS.	Change the HIMEM.SYS configuration setting to free a part of extended memory so the timer test can run.
1083h	No extended memory detected.	This test requires at least 1 MB of memory. Free more memory then rerun this test.

5 IDE Device Diagnostics

The IDE hard disk diagnostics test run on IDE hard disk drives. The CD-ROM drive tests work only with CD-ROM drives that use the ATAPI interface. The IDE diagnostic tests include:

IDE Test	Subtest menus
IDE HDD Tests	
	IDE HDD Write test
	IDE HDD Read/Verify test
	IDE HDD Seek test
	IDE HDD Performance test
	IDE HDD Boot Sector test
IDE CD Tests	
	IDE CD Tray test
	IDE CD Data test
	IDE CD Audio test
	IDE CD Data Integrity test
IDE Tape tests	
	IDE Tape Write test
	IDE Tape Read test
	IDE Tape Rewind test

```
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   System  Memory  IDE   FDD   SCSI  KBD   Video   USB   Misc  User  Options



                    IDE HDD Test              ▶
                    IDE CD  Test              ▶
                    IDE Tape Test             ▶










 [RUN <ENTER>]        [EXIT <ESC>]       [Help <F1>]       [FUNCTION KEYS <F9>]
 IDE HDD Tests
```
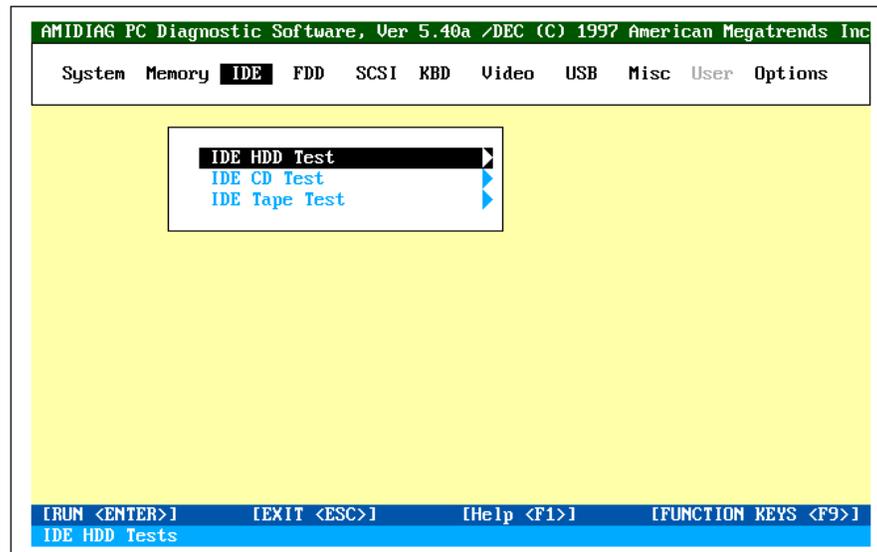
> **Important**
> The AMIDiag IDE hard disk drive test do not run on SCSI hard disk drives. If you have a SCSI hard disk drive, run the AMIDiag diagnostic tests on the SCSI menu.

Hide Destructive Tests Press <Alt> <H> to display the destructive test (Write Test) on the menu. Press <Alt> <H> again to hide the destructive test.

IDE HDD Write Test

This test makes sure that the selected IDE drive is writing data correctly. This test writes a pattern of data to the IDE hard disk drive, then reads the data it has written.

> **Warning**
> This test destroys all data on the tested IDE hard disk drive.

Select Write Test from the IDE menu. Choose the IDE drives to be tested from the first screen:

```
        IDE Write Test

   IDE Drive 0      YES
   IDE Drive 1      YES
   Continue
```

LBA Mode Supported Choose Continue and set the test parameters as follows. If the selected IDE drive supports LBA mode, the following screen appears. Set the start and end LBA addresses or choose a percentage of the drive to be tested. Choose Continue when the test parameters are set.

```
        IDE Write Test
   Test Drive            YES
   Start LBA              0
   End LBA               32
   Percentage to test   100
   Continue
```

No LBA Mode Support If the tested IDE derive does not support LBA mode, the following appears. Set the starting and ending cylinder and heads or choose a percentage of the drive to test. Choose Continue when the parameters are set.

```
        IDE Write Test
   Test Drive            YES
   Start Cylinder         0
   End Cylinder       32768
   Start Head             0
   End Head              32
   Percentage to Test   100
   Continue
```

IDE HDD Read/Verify Test

This test performs sequential and random read operations on the specified part of the IDE drive. Run this test periodically to maintain the health of an IDE disk drive.

Running a Quick Test Press <F2>. Set the Repeat Count parameter to the number of times you want to run the Read test. Choose Quick Test to only test 1% of the drive.

Standard Read Test Select Read/Verify Test from the IDE HDD menu. Choose the IDE drives to be tested from a screen such as the following:

```
         IDE Read Test

    IDE Drive 0      YES
    IDE Drive 1      YES
    Continue
```

LBA Mode Supported If the IDE drive to be tested supports LBA mode, the following set of parameters appears next. Choose the starting and ending LBA addresses or the percentage of the drive to be tested. Choose YES to run the Sequential and Random tests, choose No to not run them. The soft threshold error limit specifies the number of soft errors you will tolerate for the tested drive. You should set this parameter to 0. Choose Continue to run the test.

```
                    Warning
  Choose YES to run the data validation test only if the IDE Write
                Test has already been run.
```

```
        IDE Read Test
  Test Drive            YES
  Start LBA              0
  End LBA               32
  Percentage to test   100
  Sequential Test      YES
  Random Test          YES
  Soft Threshold Err     0
  Data Validation Test  NO
  Continue
```

No LBA Mode Support If the IDE drive to be tested does not support LBA mode, the following set of test parameters appears. Set the starting and ending cylinder and block or specify a percentage of the drive to be tested. Set the rest of parameters as specified in the above paragraph.

```
        IDE Read Test
  Test Drive            YES
  Start Cylinder          0
  End Cylinder        32768
  Start Head              0
  End Head               32
  Percentage to test    100
  Sequential Test       YES
  Random Test           YES
  Soft Threshold Err      0
  Data Validation Test   NO
  Continue
```

IDE HDD Seek Test

The Seek Test determines the head movement ability of the hard disk over the specified cylinder and head range. A sequential seeks is performed, then a series of random seeks. Choose the IDE drives to be tested from the first screen:

```
┌──────────────────────────┐
│   IDE Seek/Verify Test    │
├──────────────────────────┤
│  IDE Drive 0      YES     │
│  IDE Drive 1      YES     │
│  Continue                 │
└──────────────────────────┘
```

LBA Mode Supported If the IDE drive to be tested supports LBA mode, the following parameters appear next. Choose the starting and ending LBA addresses or the percentage of the drive to be tested. Choose YES to run the Sequential and Random tests, choose No to not run them. The soft threshold error limit specifies the number of soft errors you will tolerate for the tested drive. You should set this parameter to 0. Choose Continue to run the test.

```
┌────────────────────────────────────────────────────┐
│                      Warning                        │
│   Choose YES to run the data validation test only   │
│   if the IDE Write Test has already been run.       │
└────────────────────────────────────────────────────┘
```

```
┌──────────────────────────┐
│   IDE Seek/Verify Test    │
├──────────────────────────┤
│  Test Drive         YES   │
│  Start LBA            0    │
│  End LBA             32    │
│  Percentage to test  100  │
│  Sequential Test    YES   │
│  Random Test        YES   │
│  Soft Threshold Err   0   │
│  Continue                 │
└──────────────────────────┘
```

No LBA Mode Support If the IDE drive to be tested does not support LBA mode, the following parameters appear. Set the starting and ending cylinder and block or specify a percentage of the drive to be tested. Set the rest of parameters as specified in the above paragraph.

```
┌──────────────────────────┐
│   IDE Seek/Verify Test    │
├──────────────────────────┤
│  Test Drive         YES   │
│  Start Cylinder       0   │
│  End Cylinder     32768   │
│  Start Head           0   │
│  End Head            32   │
│  Percentage to test  100  │
│  Sequential Test    YES   │
│  Random Test        YES   │
│  Soft Threshold Err   0   │
│  Continue                 │
└──────────────────────────┘
```

IDE HDD Performance Test

The Performance Test determines the data transfer rate, the sequential seek time, and the random seek time based on transfer size, seek count, and data transferred. The CPU reads 64 KB blocks 15 times. Then the CPU reads the number of timer ticks and displays the data. Compare the performance values displayed by AMIDiag to the IDE drive performance values specified in the computer owner's manual.

Transfer Rate The data transfer rate is measured in kilobytes per second. It is (64 KB x 15) x 18.2 times per second ÷ by the number of system timer ticks.

Seek Time The seek time is equal to the number of timer ticks x 1000 divided by 18.2 times per second times the number of Seek instructions. Seek time is measured in milliseconds.

Run the Test Select *Performance Test* on the Hard Disk menu and press <Enter>. Choose the IDE drives to be tested:

```
IDE Performance Test

IDE Drive 0      YES
IDE Drive 1      YES
Continue
```

Choose Continue from the next screen to run the Performance Test.

IDE HDD Boot Sector Test

This test checks the integrity of the partition and boot sector on the IDE drive. Run this test if the computer will not boot from the IDE hard disk drive. You can run AMIDiag from a floppy diskette if a hard disk drive is not available. Select *Boot Sector Test* and press <Enter>. Select the test parameters from the screen. Set Repeat Count to the number of times you want to run this test. Select the drives to be tested:

```
IDE Performance Test

IDE Drive 0      YES
IDE Drive 1      YES
Continue
```

Choose Continue to run this test.

IDE CD Tests

```
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  System  Memory  IDE  FDD   SCSI  KBD   Video   USB   Misc  User  Options


              IDE      IDE CD Tray Test
              IDE      IDE CD Data Test
              IDE      IDE CD Audio Test
                       IDE CD Data Integrity Test












 [RUN <ENTER>]       [EXIT <ESC>]       [Help <F1>]       [FUNCTION KEYS <F9>]
 All test items in this menu are disabled. Press Esc to go up one level.
```
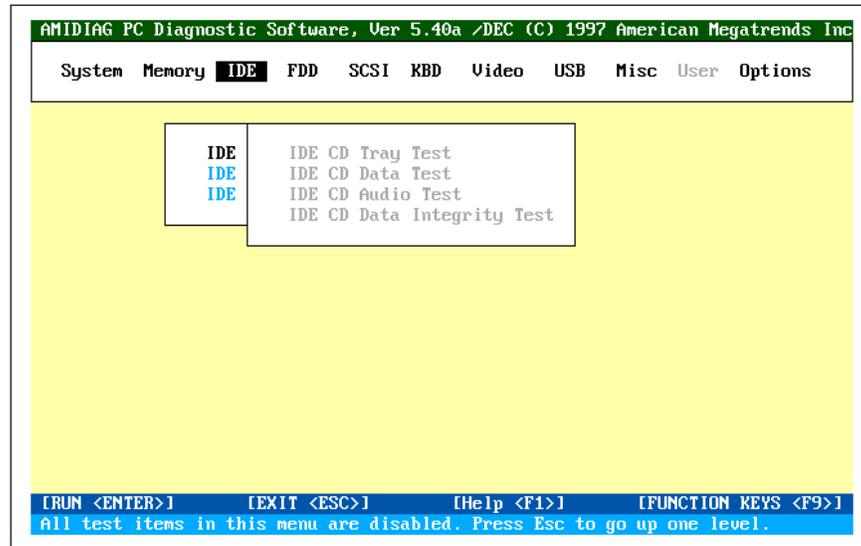
IDE CD Tray Test

This test works only on CD-ROM drives with the ATAPI interface. Select this test to make sure that the CD-ROM drive can eject a CD. The CD tray should open and close. The CD-ROM drive must have an auto-eject feature for this test to work.

IDE CD Data Test

This test works only on CD-ROM drives with the ATAPI interface. This test reads all logical blocks on a CD if the starting and ending block are not specified. Place any CD in the CD-ROM drive before running this test and follow the screen instructions. This test does not play audio CDs.

IDE CD Audio Test

A speaker must be attached to the CD-ROM drive before running this test. This test plays all logical blocks if the starting and ending block are not specified. Place an audio CD in the CD-ROM drive. Follow the instructions.

IDE CD Data Integrity Test

This test verifies the data transferred from the CD to the computer. Unlike the CD Read test, this test requires a definition of the CD that must be provided as an external file. This external file is supplied with AMIDiag, which will specify the filename (CDTEST.INI) when you choose this test.

This test verifies the integrity of data on the CD by comparing it to the data in the external file. Errors are generated if the contents of these two files do not match. Select CD Data Integrity test from the IDE menu and press <Enter>. Follow the instructions on the screen.

IDE Tape Drive Tests

The IDE Tape Drive Test makes sure that any IDE tape drive attached to your computer is working properly. The IDE tape drive test include:

- IDE tape drive write test,
- IDE tape drive read test,
- IDE tape drive rewind test, and the
- IDE tape drive seek test.

When you select IDE Tape Drive test from the ID menu, the following appears:

```
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   System  Memory  IDE  FDD  SCSI  KBD   Video   USB   Misc  User  Options


              IDE      IDE Tape Write Test
              IDE      IDE Tape Read Test
              IDE      IDE Tape Rewind Test








   [RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]      [FUNCTION KEYS <F9>]
   All test items in this menu are disabled. Press Esc to go up one level.
```
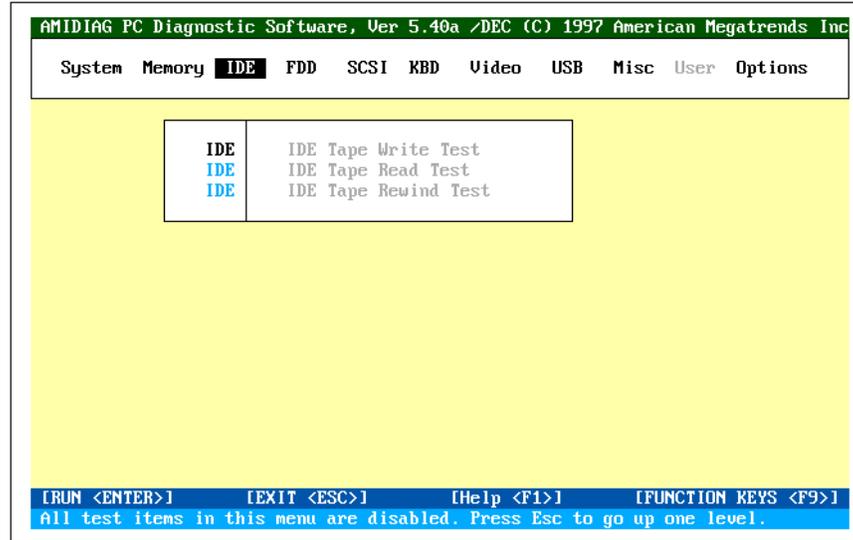
IDE Tape Write Test

This test erases old data and writes new data to the tape cartridge. This test issues ATAPI write commands to the tape drive block by block sequentially.

> *Warning*
> This test destroys all data on the tape cartridge.

The test parameters are Repeat Count (number of times to run this test) and Quick Test (test only 1% of the tape cartridge). Select the tape drive to be tested. Select the starting and ending data block to be tested or the percentage of the tape cartridge to be tested. Choose Continue to run the test.

IDE Tape Read Test

This test issues ATAPI read commands to the tape drive block by block sequentially. Make sure the tape cartridge in the tape drive has data on it.

The test parameters are Repeat Count (number of times to run this test) and Quick Test (test only 1% of the tape cartridge.) Select the tape drive to be tested. Select the starting and ending data block to be tested or the percentage of the tape cartridge to be tested. Choose Continue to run the test.

IDE Tape Rewind Test

This test makes sure that the tape drive can rewind the tape cartridge correctly. The test parameters are Repeat Count (number of times to run this test) and Quick Test (test only 1% of the tape cartridge.) Select the tape drive to be tested. Select the starting and ending data block to be tested or the percentage of the tape cartridge to be tested. Choose Continue to run the test.

Tape Drive Seek Test

This test makes sure that the tape drive performs the Seek command correctly. The test parameters are Repeat Count (number of times to run this test) and Quick Test (test only 1% of the tape cartridge.) Select the tape drive to be tested. Select the starting and ending data block to be tested or the percentage of the tape cartridge to be tested. Choose Continue to run the test.

IDE Test Error Codes

Code	Explanation	Recommended Action
0201h	Undefined or invalid command. AMIDiag issued a command that was not accepted by this hard disk drive or controller. This message sometimes occurs when certain controllers issue the Format command.	Check the controller and drive documentation. Do not run if an error-generating test is not supported. If it is supported and this error occurs, replace the drive or controller.
0202h	Address mark not found. The address or test parameters you specified could not be found.	Rerun the test. If the problem continues, the drive may have to be factory-formatted again.
0204h	Requested sector not found. The sector or test parameters you specified could not be found.	Rerun the test. If the problem continues, the drive may have to be factory-formatted again.
0205h	Reset failed. AMIDiag issued a Reset command that was not accepted or confirmed by the hard disk controller.	Replace the hard disk controller.
0207h	Drive parameter activity failed. BIOS INT 13h Function 08h is issued to find the number of cylinders, heads, and sectors per track in the drive. If these values cannot be retrieved, the drive cannot be tested properly. Either the drive is not properly connected or the hard drive type in CMOS RAM is incorrect.	Reenter the drive parameters. Check the drive connections to power and to the controller. Replace the drive.
0208h	DMA Overrun error. The DMA transfer requested overruns the 64 KB boundary.	Rerun the test.
0209h	A DMA transfer at a 64 KB segment boundary was rejected by the drive controller BIOS.	Rerun the test.
020Ah	Bad sector flag detected. A sector previously marked bad was tested.	Run SCANDISK or a similar program to reorganize the data on the disk drive.
0210h	CRC (Cyclic Redundancy Check) or ECC data error.	Run SCANDISK or a similar program to reorganize the data on the disk drive.
0211h	ECC (Error Checking and Correction)-corrected data error. The data read had a recoverable error corrected by the ECC algorithm. The data is probably good. This error code allows the program to decide what to do with the data.	Run SCANDISK or a similar program to reorganize the data on the disk drive.
0220h	Controller failure. The hard drive controller did not respond.	Replace the controller.
0240h	Seek operation failed. An attempt to perform a seek operation failed.	Read the controller manual to see if the seek function is supported. Replace the controller if it supports the Seek instruction and still generates an error.

Code	Explanation	Recommended Action
0280h	Drive not ready. The hard disk drive did not respond to commands issued by AMIDiag.	Check the drive power connection and controller connection.
0281h	All sectors in test cylinder are bad.	Replace the drive.
0290h	Drive busy	Run the test later.
0291h	Media change detected	Rerun the test. Replace the drive if this error occurs again.
0293h	Aborted	The test could not be ruin because the drive was not available.
0294h	Track 0 not found	The drive may not be formatted or data may be corrupt.
0295h	Data mismatch	Write error. Run the IDE Write Test again. If this error occurs again, replace the IDE drive.
02AAh	Drive not ready. The hard disk drive did not respond to commands issued by AMIDiag.	Check the drive connections to the controller. Replace the drive.
02CCh	Bit 5 (write error bit) of the hard disk controller status register is set on completion of a write operation. The likely causes are improper write precompensation setting (reduced write current) or a problem in the disk write circuitry.	Reenter the drive parameters. Replace the drive or the controller.
02EEh	The Performance test was run on a drive with less than 200 cylinders).	Select a drive type via the BIOS Setup utility that makes more than 200 cylinders available (if possible).
02F1h	Error in partition table	Run the Boot Sector Test again. If this error occurs again, you may have to replace the drive.
02F3h	Boot integrity in partition n error	Run the Boot Sector Test again. If this error occurs again, you may have to replace the drive.
02F4h	Incorrect media descriptor in partition n	Run the Boot Sector Test again. If this error occurs again, you may have to replace the drive.
02F5h	Incorrect number of total sectors in partition n	Run the Boot Sector Test again. If this error occurs again, you may have to replace the drive.
02FFh	Disk data read/write error. The data pattern written to the disk and the data read back from the disk do not match.	Check the drive connections to power and to the controller. Replace the drive. Replace the controller.

IDE CD Tray Test Error Codes

Code	Explanation	Recommended Action
0A00h	No CD in drive.	Insert a CD in the drive.
0A01h	Eject fails on drive x.	The CD-ROM drive eject feature is either not implemented in the software or does not work. Run the test again.
0A02h	Close failed on drive x.	The CD-ROM drive close feature is either not implemented in the software or does not work. Run the test again.

IDE CD Data Test Error Codes

Code	Explanation	Recommended Action
0A00h	No CD in drive.	Insert a CD in the drive.
0A03h	Data test failed, Drive x, Sector Y.	Run the test again. Make sure the drive cables are properly connected. If the test fails repeatedly, replace the CD-ROM drive.
0A05h	No data CD in drive	Insert a computer CD in the CD-ROM drive.

IDE CD Audio Test Error Codes

Code	Explanation	Recommended Action
0A00h	No CD in drive.	Insert a CD in the drive.
0A04h	Play test failed, Drive x, Sector y.	Run the test again. Make sure the drive cables are properly connected. If the test fails repeatedly, replace the CD-ROM drive.
0A06h	No audio CD in drive.	Insert an audio CD in the CD-ROM drive.

IDE Tape Drive Test Error Codes

Code	Explanation	Recommended Action
0C01h	No cartridge in tape drive n	Insert a tape cartridge in the selected tape drive.
0C02h	Medium is write-protected.	Remove the write-protect mechanism from the tape cartridge.
0C03h	Rewind failed.	The tape cartridge cannot be rewound. Cartridge may be bad.
0C04h	Erase failed.	The tape cartridge cannot be erased. The cartridge may be bad. Replace the tape cartridge and rerun the test. If it fails again, the tape drive may be bad.
0C05h	Write failed on tape drive n block b	Could not write to the tape cartridge. The cartridge may be bad. Replace the tape cartridge and rerun the test. If it fails again, the tape drive may be bad.
0C06h	Read failed on tape drive n block b	
0C07h	This test can be done only after the Write test is run.	Run the tape write test.
0C08h	Seek failed on tape drive n block b	

6   Floppy Diagnostic Tests

The floppy (FDD) drive tests are:

Floppy test
Drive Speed Test
Random Read/Write Test
Sequential Read/Write
Elevator Seek Test
Disk Change Line Test

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

    System  Memory  IDE  [FDD]  SCSI  KBD   Video    USB    Misc  User  Options


                          ┌──────────────────────────┐
                          │ Drive Speed Test          │
                          │ Random R/W Test           │
                          │ Sequential R/W Test       │
                          │ Elevator Seek Test        │
                          │ Disk Change Line Test     │
                          └──────────────────────────┘









   [RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]      [FUNCTION KEYS <F9>]
   Checks the speed of rotation of the drive.
```
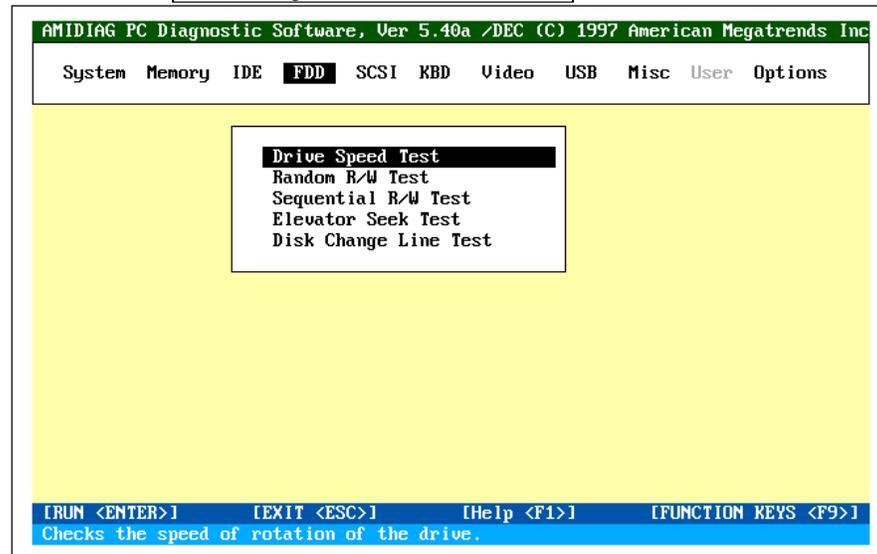
User Input   The Drive Speed, Random Read/Write, and Sequential Read/Write tests require additional information. Enter the required information before performing the tests.

Hide Destructive Tests Press <Alt> <H> to display the destructive test (Diskette Format) on the menu. Press <Alt> <H> again to hide the destructive test.

Drive Speed Test

This test determines the drive rotation speed. The 1.2 MB and 1.44 MB drive speed should be 360 RPM. The 360 KB and 720 KB drive speed should be 300 RPM.

Run the Test   Select *Drive Speed Test* and press <Enter>. Select the drives to be tested. The following appears:

```
Insert an empty formatted or AMIDiag diskette in Drive A:
        CONTINUE          EXIT
```

Insert a formatted floppy disk in the drive and press <Enter>.

About the Read/Write Tests

You can perform the floppy sequential and random read and write tests on the AMIDiag program floppy or on any DOS-formatted floppy that also contains other DOS files. This feature is useful when testing systems with only one floppy drive. Errors can also be logged to the test floppy. Turn error logging off in single execution mode. Place a formatted floppy disk in the test floppy drive.

TESTAREA   TESTAREA is a standard DOS file. All floppy reads and writes occur within the space occupied by this file. AMIDiag looks for the TESTAREA file. If not found, you can test either a small area or the entire floppy disk. If you test a smaller area, TESTAREA is created on the floppy disk on which the test is performed. If you test the entire disk, all data on the floppy disk is destroyed.

Data Saved   The test is non-destructive if error logging is on and the read and write tests are performed on the same drive.

Automatic   AMIDiag automatically creates TESTAREA, allocating half the available space on the floppy to TESTAREA and half for error logging.

> *Warning*
> Data on the floppy used in the Random Read/Write and Sequential
> Read/Write Tests is destroyed unless the TESTAREA file is specified
> when running these tests.

Random Read/Write Test

This test checks the drive's random seek, read, and write ability. The diskette used in this test must be formatted on the operating system currently being used before running the test.

<div style="text-align:center">

Warning
Data on the floppy used in the Random Read/Write and Sequential Read/Write Tests is destroyed unless the TESTAREA file is specified when running these tests.

</div>

Select *Floppy* from the Main Menu and *Random Read/Write Test* and press <Enter>. Type *Y.* Press <Enter> after the following appears:

```
Insert an empty formatted or AMIDiag diskette in Drive A:
         CONTINUE           EXIT
```

Insert a formatted floppy disk in the drive and press <Enter>. *Read, Write,* and *Verify* flash in sequence as these operations are performed. The cylinder numbers, head numbers, and sector numbers are read, written, and verified.

To abort the test, press <Esc>. Press <Enter> to return to the Main Menu when done, unless you have chosen to run this test on both drives A: and B:.

Sequential Read/Write Test

This test checks the sequential seek, read, and write capability of the drive. The floppy disk used in this test must be formatted on the current operating system before running the test.

> ### *Warning*
>
> *Data on the floppy used in the Random Read/Write and Sequential Read/Write Tests is destroyed unless the TESTAREA file is specified when running these tests.*

Select *Floppy* from the Main Menu and *Sequential Read/Write Test* and press <Enter>. The following appears:

```
Select Parameters

Test Drive A     : Yes
Test Drive B     : Yes
 Continue        : Yes
```

Type *Y* and press <Enter>. The following appears. Press <Enter> to continue.

```
Insert an empty formatted or AMIDiag diskette in Drive A:
        CONTINUE            EXIT
```

Press <Enter> to continue. *Write, Read,* and *Verify* flash as these operations are performed. The cylinder numbers, head numbers, and sector numbers are read, written, and verified sequentially by sector number.

Press <Enter> to return to the Main Menu when the test completes, unless drive B: is also being tested.

Elevator Seek Test

This test verifies the track-to-track seeking capability of the floppy drive. This test sends Seek instructions alternately to the outer and inner sections of the floppy drive. Select *Elevator Seek Test* from the Floppy menu and press <Enter>. Select the floppy drives to be tested when prompted. Insert an empty formatted floppy diskette in the floppy drive to be tested and press <Enter>.

The floppy disk used in this test must be formatted on the operating system currently being used. A graphical display of all 80 floppy diskette tracks appears. The tracks where the Seek instructions are being written are pointed to as the Seek instructions are issued.

```
TEST PASSED
```

appears when the test completes. Select *Return to menu.* If the test does not complete correctly, select *Browse error list* to display the AMIDiag errors. You may have to replace the floppy drive or floppy controller if the test does not pass. Type *Y.*

Disk Change Line Test

This test verifies the disk change line capability of the floppy drive. A drive with disk line change capability allows the operating system to recognize that a new floppy disk has been inserted without accessing the File Allocation Table (FAT). The floppy disk used in this test must be formatted on the operating system currently being used before running the test.

Select *Floppy* from the Main Menu and *Disk Change Line Test* and press <Enter>. Type *Y.* If you tested drives A: and B:, the previous screens are repeated for drive B:.

Floppy Disk Drive Test Error Codes

Code	Explanation	Recommended Action
0301h	Undefined or invalid command. A command was not accepted by the floppy drive or controller. This often occurs on some drive controllers when using the Format command.	If the error-generating test is not supported, do not run this test. If it is supported and this error appears, replace the drive or controller.
0302h	Address mark not found. The address or test parameters you specified could not be found on the drive being tested.	Reenter the parameters or replace the drive.
0303h	Disk is write-protected. The floppy diskette being tested is write-protected.	Remove the write protection and reinsert the diskette, or insert another diskette with no write protection.
0304h	Requested sector not found. The sector or test parameters you specified could not be found on the diskette being tested.	Reenter the parameters or replace the drive.
0305h	Reset failed. A reset command was not accepted or confirmed by the floppy disk controller.	Replace the floppy disk controller.
0307h	Drive parameter activity failed. BIOS INT 13h Function 08h is issued to find the number of cylinders, heads, and sectors per track in the drive. If these values cannot be retrieved, the drive cannot be tested. Either the drive is not connected or the drive type is incorrect.	Reenter the drive parameters. Check the drive connections to power and to the controller. Replace the drive.
0308h	DMA Overrun error. The DMA transfer requested overruns the 64 KB boundary.	Rerun the test.
0309h	Attempt to DMA at 64 KB boundary. A DMA transfer at a 64 KB segment boundary was rejected by the floppy BIOS.	Rerun the test.
030Ah	Bad sector flag detected. AMIDiag tested a sector on the diskette that was marked as bad.	Rerun the test with a good diskette. If the problem persists, replace the floppy drive.
0310h	CRC or ECC data error. AMIDiag received either a CRC error or an ECC error.	Rerun the test with a good diskette. If the problem persists, replace the floppy drive.
0311h	ECC-corrected data error. The data read had a recoverable error that was corrected by the ECC algorithm. The data is probably good. The BIOS returns an error so the application program can decide what to do with the data.	Retry the test. Change the diskette.
0321h	Change line not working.	Replace the floppy drive.
0340h	Seek operation failed. An attempt to perform a seek operation failed.	Make sure Seek is supported. If its is, replace the controller if this error occurs.
0380h	Drive not ready. The floppy disk drive did not respond to commands issued by AMIDiag.	Make sure the floppy disk is fully inserted in the drive. Check the drive connections to both power and the controller. Replace the drive.
03AAh	Drive not ready. The floppy disk drive did not respond to commands issued by AMIDiag.	Make sure the diskette is fully inserted in the drive. Check the drive connections to both power and the controller. Replace the drive.
03CCh	Write fault on selected drive. Bit 5 (write error bit) of the floppy controller status register is set on write completion. There is a bad write precompensation parameter (reduced write current) or a problem in the write circuitry.	Re-enter the drive parameters. If that does not work, replace the diskette. If that does not work, replace the floppy drive. If that does not work, replace the floppy controller.
03EEh	Data write/read mismatch.	Check the DMA controllers on the motherboard and the floppy controller.
03FFh	Data write/data read mismatch.	Check the DMA controller on the motherboard or floppy controller.
03FFh	Diskette data read/write error. The data pattern written to the disk and the data read back from the disk do not match.	Check the drive power connections and the controller. Replace the diskette. If that does not work, replace the floppy drive. If that does not work, replace the floppy controller.

7 SCSI Diagnostics

AMIDiag tests all SCSI host adapters installed in your computer. SCSI tests run on all legacy SCSI or Wide and Ultra Wide SCSI controllers and devices. The SCSI tests detect and test a combination of up to 120 SCSI hard disk drives, SCSI CD-ROM drives, and SCSI tape drives.

Test	Subtest
SCSI HDD Tests	
	SCSI Disk Self Test
	SCSI Disk Buffer Test
	SCSI Disk Read Test
	SCSI Disk Boot Test
SCSI CD tests	
	SCSI CD-ROM Self Test
	SCSI CD-ROM Read Test
	SCSI CD-ROM Play Test
	SCSI CD-ROM Data Test
SCSI Tape tests	
	SCSI Tape Self Test
	SCSI Tape Buffer Test
	SCSI Tape Rewind Test
	SCSI Tape Read Test

```
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   System  Memory  IDE  FDD  SCSI  KBD  Video   USB   Misc  User  Options


                        SCSI HDD Test          ▶
                        SCSI CD Test           ▶
                        SCSI Tape Test         ▶












 [RUN <ENTER>]        [EXIT <ESC>]       [Help <F1>]      [FUNCTION KEYS <F9>]
 SCSI HDD Tests.
```
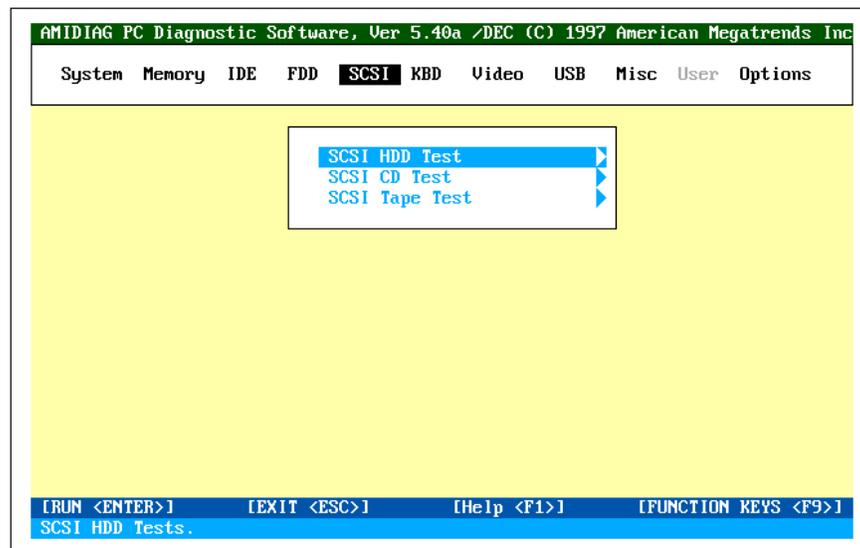
Hide Destructive Tests Press <Alt> <H> to display the destructive tests. Press <Alt> <H> again to hide these tests.

SCSI HDD Tests

The following appears when you select SCSI HDD tests:

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

   System  Memory  IDE   FDD   SCSI  KBD   Video   USB   Misc  User  Options


                        SCSI     SCSI HDD Self Test
                        SCSI     SCSI HDD Buffer Test
                        SCSI     SCSI HDD Read Test
                                 SCSI HDD Boot Test




  [RUN <ENTER>]        [EXIT <ESC>]       [Help <F1>]       [FUNCTION KEYS <F9>]
  All test items in this menu are disabled. Press Esc to go up one level.
```
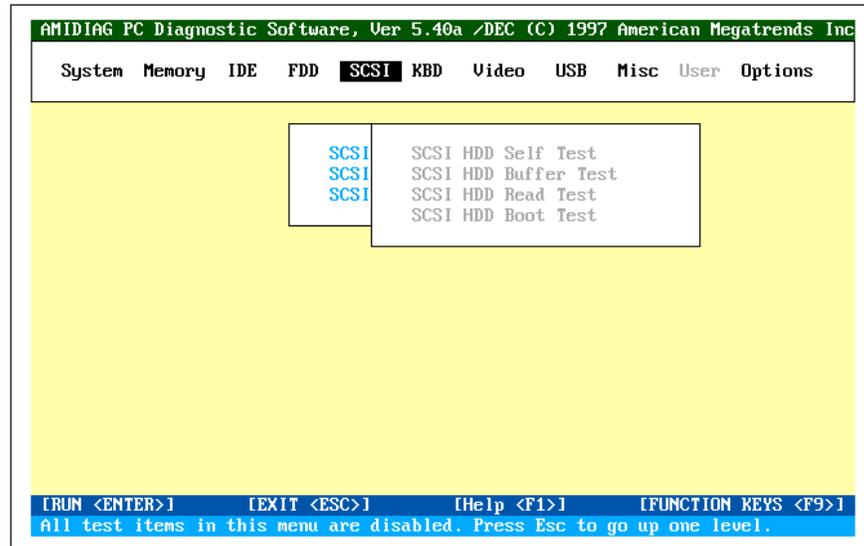
SCSI Disk Self Test

Most SCSI disk drive manufacturers provide a diagnostics test in the firmware on the SCSI drive. Choose this option to execute the diagnostic tests that reside on the SCSI disk drive. If this test is successful, you will be assured that the drive is operating in accordance with the drive manufacturer's specifications.

Run the Test   Select SCSI Disk Self Diagnostic Test and press <Enter>. Choose the parameters on the screen and choose Continue. The SCSI Disk Self diagnostics test cannot be aborted. You must wait until the entire disk self test completes.

SCSI HDD Buffer Test

This test write logical blocks of data to the internal buffer on the disk drive. The same logical blocks of data are then read from the drive buffer and compared to the original data. This test does not alter the data on the disk drive in any way. Disk drive data integrity is not compromised by this test. If the SCSI hard disk drive does not have an internal buffer, this test cannot be selected.

SCSI Disk Read Test

This test sequentially and randomly reads logical blocks from the SCSI hard disk drive. This test uses the SCSI Read command with a 10-byte CDB (Command Data Block). If you do not specify a starting and ending block number, block 0 through the last block are tested. Select *SCSI Disk Read Test* and press <Enter>. A default parameter screen appears:

```
       Select SCSI Disk
Overall % Parameters  100
SCSI Disk 0
CONTINUE
```

Parameter	Description
overall %	Specifies the drivewise:/ or common :/ as set for each drive. If Drivewise is selected, the drive parameters are specified for each drive used. If common is selected, all drive parameters used the % parameters, which are entered in the % for Common fields. This reduces the need to set each drive parameters if the computer has a large number of drives.
Common:	Use the term % to specify all drives
SCSI Disk n	Specify an individual drive parameter.

The following screen appears if you specify a drive:

```
     SCSI Disk Read Test

Test Drive 0          : YES
Start Block           : 000000000
End Block             : 002628000
Sequential Test
Random Test
CONTINUE
```

When you choose Sequential Test or Random Test a prompt for the percent of the drive to be tested appears:

```
     Sequential Test

Sequential Test  : YES
% to test        : 100
CONTINUE
```

Test Parameters The start and end block number fields are 0 and the last block on the disk or the values set the last time this test was run. As the test runs, the current block number, number of blocks tested, and number of blocks left are updated. Also, the block tested is marked with a different character. The random test is performed on the specified percentage of blocks between the specified start and end blocks.

SCSI Disk Boot Test

This test makes sure that you can boot from the selected SCSI disk drive. Select SCSI Disk Boot Test form the SCSI menu and press <Enter>. Follow the instructions on the screen.

SCSI CD Tests

The following appears when you select SCSI CD Tests:

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

   System  Memory  IDE   FDD   SCSI  KBD   Video   USB   Misc  User  Options


                          SCSI    SCSI CD Self Test
                          SCSI    SCSI CD Read Test
                          SCSI    SCSI CD Play Test
                                  SCSI CD Data Test














  [RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]        [FUNCTION KEYS <F9>]
  All test items in this menu are disabled. Press Esc to go up one level.
```
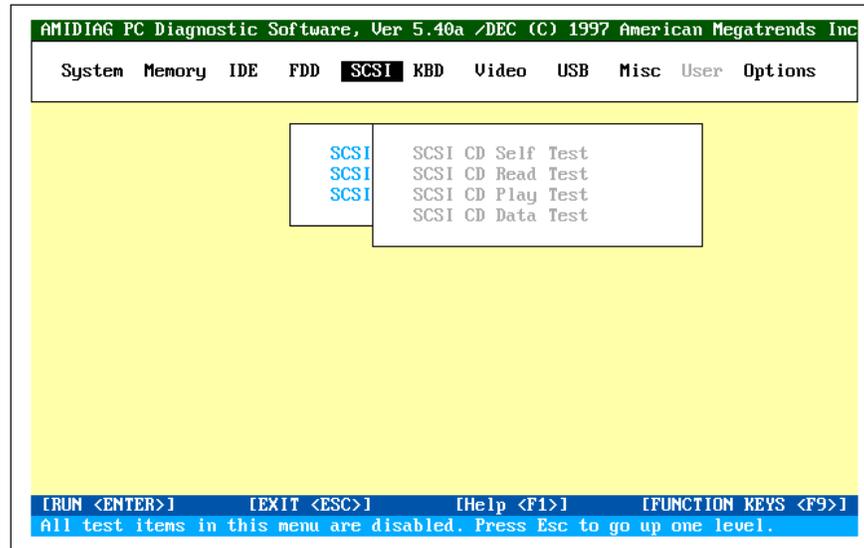
SCSI CD Self Test

Most SCSI CD-ROM drive manufacturers provide a diagnostics test on the drive. Choose this option to execute the diagnostic tests that reside on the drive. If this test is successful, the drive is operating in accordance with the drive manufacturer's specifications.

Run the Test   Select SCSI CD-ROM Self Diagnostics Test and press <Enter>. Choose the parameters on the screen and choose Continue. This test cannot be aborted. You must wait until the entire test completes.

SCSI CD Read Test

This test reads logical blocks of data from the CD-ROM drive. This test issues the SCSI Read command with a 10-byte CDB. Select *SCSI CD-ROM Read Test* and press <Enter>. A parameter screen appears:

```
           Select SCSI Disk
   Overall % Parameters  100
   SCSI Disk 0
   CONTINUE
```

Parameter	Description
overall %	Specifies drivewise :/ as set for each drive.
Common:	Use the term % to specify all drives
SCSI CD-ROM n	Specify an individual drive parameter.

```
          SCSI CD-ROM Read Test

   Test CDROM0      : YES
   Start Block      : 000000000
   End Block        : 002028000
   Sequential Test
   Random Test
   CONTINUE
```

If the Sequential Test or Random Test, you are prompted for the percentage of the drive to be tested. Choose a percentage and choose CONTINUE.

```
          Sequential Test

   Sequential Test  : YES
   % to test        : 100
   CONTINUE
```

If the starting and ending block are not specified, this test reads from block 0 to the last block. This test fails if an audio CD is placed in the drive. This test supports multi-format CDs with data and audio tracks. The random test is performed on the specified blocks between the start and end blocks.

SCSI CD Play Test

Before running this test: connect a speaker to the CD-ROM drive and insert an audio CD in the CD-ROM drive.

This test makes sure that the CD-ROM drive can play audio CDs. This test issues the SCSI Play command to the CD-ROM drive. You can select the sequence of tracks played. Follow the screen directions to play an audio CD. A default parameter screen appears when you select SCSI CD-ROM Play Test:

```
        Select SCSI Disk
 Overall % Parameters  100
 SCSI Disk 0
 CONTINUE
```

Parameter	Description
overall %	Specifies drivewise :/ as set for each drive.
Common:	Use the term % to specify all drives
SCSI CD-ROM n	Specify an individual drive parameter.

The following appears is you specify an individual drive:

```
        SCSI CD-ROM Play Test

 Test CDROM0      : YES
 Start Block      : 000000000
 End Block        : 020280000
 CONTINUE
```

SCSI CD-ROM Data Test

This test makes sure that the SCSI CD-ROM drive reads data correctly. Select SCSI CDROM Data test. Set the Test CDROM n parameter to Yes and choose Continue to run this test.

SCSI Tape Tests

The following appears when you select SCSI Tape test:

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

   System   Memory   IDE   FDD   SCSI   KBD   Video   USB   Misc   User   Options


                    SCSI     SCSI Tape Self Test
                    SCSI     SCSI Tape Buffer Test
                    SCSI     SCSI Tape Rewind Test
                             SCSI Tape Read Test








 [RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]        [FUNCTION KEYS <F9>]
 All test items in this menu are disabled. Press Esc to go up one level.
```
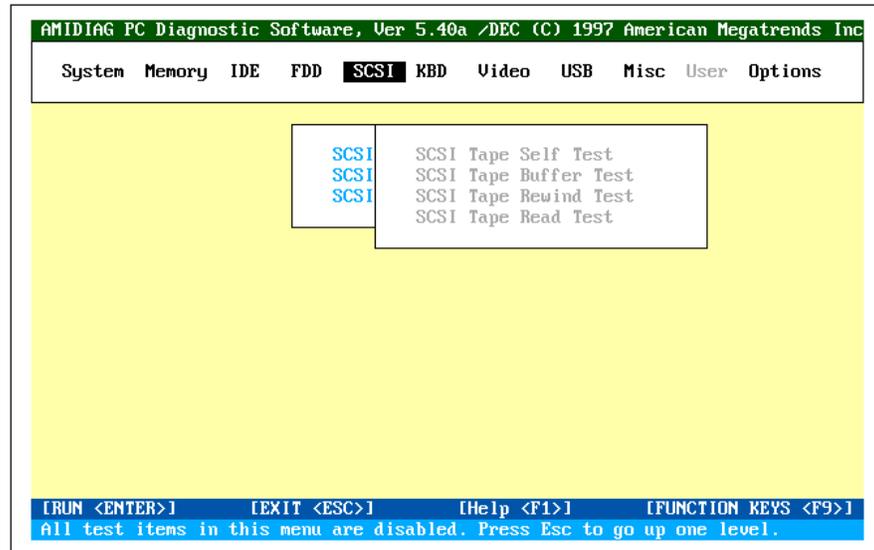
SCSI Tape Self Test

Most SCSI tape drive manufacturers provide a diagnostics test in the firmware on the SCSI tape drive. Choose this option to execute the diagnostic tests that reside on the SCSI tape drive. If this test is successful, you are assured that the tape drive is operating in accordance with the drive manufacturer's specifications.

Run the Test   Select SCSI Tape Self Diagnostics Test and press <Enter>. Choose the parameters on the screen and choose Continue. The SCSI Tape Self diagnostics test cannot be aborted. You must wait until the entire disk self test completes.

SCSI Tape Buffer Test

This test write logical blocks of data to the internal buffer on the tape drive. The same logical blocks of data are then read from the tape drive buffer and compared to the original data. This test does not alter the data on the tape in the tape drive in any way. Data integrity is not compromised by this test. If the tape drive does not have an internal buffer, this test cannot be selected.

SCSI Tape Rewind Test

This test makes sure that the SCSI tape drive can rewind a tape. Select *SCSI Tape Rewind Test* and press <Enter>.

SCSI Tape Read Test

This test reads sequential logical blocks from the SCSI tape. The reading terminates when end of medium marker, end of partition marker, or blank data is encountered. This test issues the SCSI Read command with a 6-byte CDB. Select *SCSI Tape Read Test* and press <Enter>. A default parameter screen appears:

```
    Select SCSI Disk
 Overall % Parameters  100
 SCSI Disk 0
 CONTINUE
```

Parameter	Description
overall %	Specifies drivewise :/ as set for each drive.
Common:	Use the term % to specify all drives
SCSI Tape n	Specify an individual drive parameter.

The following screen appears when you specify an individual drive:

```
     SCSI Tape Read Test

 Test Tape 0    : YES
 Start Block    : 000000000
 End Block      : 002028000
 CONTINUE
```

A prompt for the percent of the drive to be tested appears. Specify the percentage of the drive to be tested and choose CONTINUE.

If the tape is not positioned at the beginning or the starting block, a tape rewind command is issued before the test is performed. The rewind operation may take some time.

SCSI Test Error Codes

Code	Explanation	Recommended Action
0500h	SCSI device not ready	Make sure the SCSI devices are ready. Make sure SCSI termination is properly installed. Make sure all SCSI connectors are properly attached. Run the test again.
0502h	SCSI device read error	Reformat or replace the SCSI disk drive.
0504h	SCSI device write error	Reformat the SCSI drive. If this fails, replace the SCSI drive.
0505h	SCSI disk format failed	Replace the SCSI drive
0507h	SCSI disk buffer error	Replace the SCSI drive
050Ch	Error in partition table	Reformat the drive.
050Dh	Boot sector error	Use a software SCSI disk utility to fix the error.
050Eh	Media error	The media description for a partition is bad. The partition may not be usable.
050Fh	Sector numbers inconsistent	The sector number information in the partition table for partition n is incorrect. The partition can be used, but errors will occur when you access data beyond the number of blocks defined in the table.
0510h	No tape in unit	Make sure a tape cartridge is inserted in the drive.
0511h	Positioning failed on tape drive	Replace the tape cartridge.
0512h	Tape read error	Run the Tape Write test again.
0514h	Tape write error	Replace the tape cartridge and/or the tape drive.
0515h	Self test failed on tape n	Replace the tape cartridge and/or the tape drive.
0516h	Tape buffer error	Replace the tape cartridge and/or the tape drive.
0520h	No CD in drive	Insert a CD in the CD-ROM drive.
0521h	CD-ROM read error	Make sure a computer data CD is in the CD-ROM drive.
0522h	Read timed out, CEROM n, Block nnnn	Make sure a CD is in the CD-ROM drive.
0523h	CD-ROM play error	Make sure an audio CD is in the CD-ROM drive.
0524h	CD self-test error	Insert a CD in the CD-ROM drive.
0525h	CD open error	Rerun the test.
0526h	CD Close error	Make sure that the CSI CD supports the Close operation.
0527h	CD Buffer error	Replace the CD-ROM drive.
0528h	Pattern check failed, CDROM n, Block nnnn	Replace the CD-ROM drive.
0550h	Read timeout	Replace the SCSI device.
0560h	Parameter file not present.	Replace the CD in the CD-ROM drive.
0580h	Cannot allocate memory	Unload device drivers and rerun the test.
0590h	Command not supported	Cannot run this test on this device.

8   Keyboard Diagnostic Tests

The keyboard diagnostics tests are:

Keyboard Test
Keyboard Controller Test
Scan/ASCII Code Test
Keyboard LED Test
Keyboard Clock Line Test
Keyboard Data Line Test

```
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   System  Memory  IDE   FDD   SCSI  KBD   Video   USB   Misc   User   Options


                          Controller Test
                          Scan/ASCII Code Test
                          Keyboard LED Test
                          Keyboard Clock Line Test
                          Keyboard Data line Test









 [RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]        [FUNCTION KEYS <F9>]
 Performs the keyboard controller's basic assurance test.
```
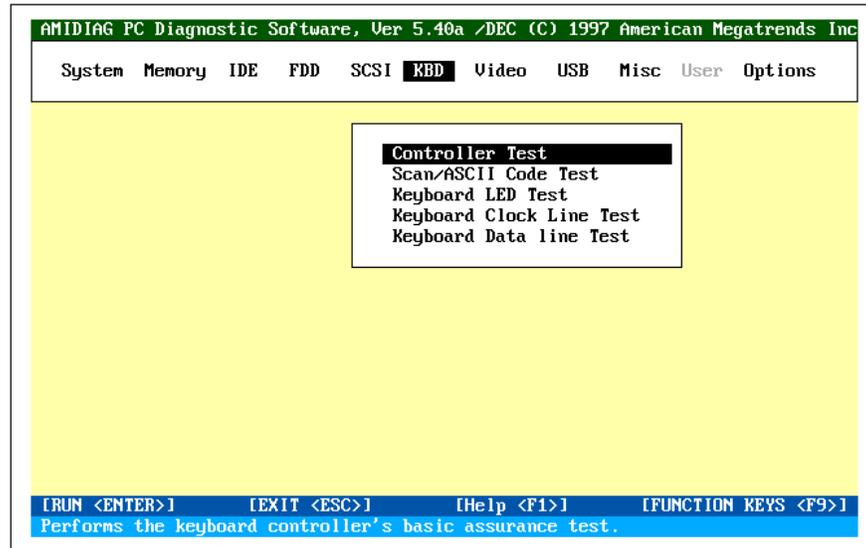
Keyboard Controller Test

The Controller Test issues a Self-Test command to the keyboard controller and makes sure that the response is OK. It then sends the Diagnostic Echo command to the keyboard and waits for a return from the keyboard. Select *Keyboard* from the Main Menu and *Controller Test*.

Scan/ASCII Code Test

The Scan and ASCII Code Test determines if a pressed keys match the Scan and ASCII codes for that key. Every time you press a key to verify its code, both the scan code and ASCII code of the pressed key is displayed. The key symbol is also displayed.

Perform this test to identify faulty keys. Use the tables on the following screens to verify that the displayed scan and ASCII codes are correct.

Run the Test   Select *Keyboard* from the Main Menu and *Scan/ASCII Code Test*. Press <Enter> to display a keyboard layout. *Scan code* and *ASCII Code* appear above the keyboard layout.

Press the keys on the keyboard. The scan codes and ASCII codes display in the appropriate fields for each key as it is pressed. Use this test to verify the codes with their respective keys. Press <Ctrl> <Break> to exit this test.

Lower Case Keyboard Scan/ASCII Codes

Keystroke	Scan Code	ASCII Code	Keystroke	Scan Code	ASCII Code
Esc	01	1B	1	02	31
2	03	32	3	04	33
4	05	34	5	06	35
6	07	36	7	08	37
8	09	38	9	0A	39
0	0B	30	-	0C	2D
=	0D	3D	Backspace	0E	08
Tab	0F	09	q	10	71
w	11	77	e	12	65
r	13	72	t	14	74
y	15	79	u	16	75
i	17	69	o	18	6F
p	19	70	[	1A	5B
]	1B	5D	Return	1C	0D
Ctrl	***	***	a	1E	61
s	1F	73	d	20	64
f	21	66	g	22	67
h	23	68	j	24	6A
k	25	6B	l	26	6C
;	27	3B	'	28	27
`	29	60	Shift	***	***
\	2B	5C	z	2C	7A
x	2D	78	c	2E	63
v	2F	76	b	30	62
n	31	6E	m	32	6D
,	33	2C	.	34	2E
/	35	2F	*	37	2A
Alt	***	***	Space	39	20
Caps Lock	***	***	F1	3B	00
F2	3C	00	F3	3D	00
F4	3E	00	F5	3F	00
F6	40	00	F7	41	00
F8	42	00	F9	43	00
F10	44	00	F11	85	00
F12	86	00	Num Lock	***	***
Scroll Lock	***	***	Home	47	00
↑	48	00	PgUp	49	00
_	4A	2D	←	4B	00
Center key	4C	00	→	4D	00
+	4E	2B	End	4F	00
↓	50	00	PgDn	51	00
Ins	52	00	Del	53	00
SysReq	no key	no key	Key 45	56	5C
Enter	E0	0D	/	E0	2F
Print Screen	***	***	Pause	***	***
Home	47	E0	↑	48	E0
PgUp	49	E0	←	4B	E0

***   No keystroke but perform another action.

Uppercase (Shift) Keyboard Scan/ASCII Codes

Keystroke	Scan Code	ASCII Code	Keystroke	Scan Code	ASCII Code
Shift Esc	01	1B	!	02	21
@	03	40	#	04	23
$	05	24	%	06	25
^	07	5E	&	08	26
*	09	2A	(	0A	28
)	0B	29	_	0C	5F
+	0D	2B	Shift Backspace	0E	08
Shift Tab	0F	00	Q	10	51
W	11	57	E	12	45
R	13	52	T	14	54
Y	15	59	U	16	55
I	17	49	O	18	4F
P	19	50	{	1A	7B
}	1B	7D	Shift Return	1C	0D
Shift Ctrl	***	***	A	1E	41
S	1F	53	D	20	44
F	21	46	G	22	47
H	23	48	J	24	4A
K	25	4B	L	26	4C
:	27	3A	"	28	22
~	29	7e	|	2B	7C
Z	2C	5A	X	2D	58
C	2E	43	V	2F	56
B	30	42	N	31	4E
M	32	4D	<	33	3C
>	34	3E	?	35	3F
*	37	2A	Shift Alt	***	***
Shift Space	39	20	Shift Caps Lock	***	***
Shift F1	54	00	Shift F2	55	00
Shift F3	56	00	Shift F4	57	00
Shift F5	58	00	Shift F6	59	00
Shift F7	5A	00	Shift F8	5B	00
Shift F9	5C	00	Shift F10	5D	00
Shift F11	87	00	Shift F12	88	00
Shift Num Lock	***	***	Shift Scroll Lock	***	***
Shift 7	47	37	Shift 8	48	38
Shift 9	49	39	Shift -	4A	2D
Shift 4	4B	34	Shift 5	4C	35
Shift 6	4D	36	Shift +	4E	2B
Shift 1	4F	31	Shift 2	50	32
Shift 3	51	33	Shift 0	52	30
Shift .	53	2E	Shift Sys Req	no key	no key
Shift key 45	56	7C	Shift Enter	E0	0D
Shift /	E0	2F	Shift Print Screen	***	***
Shift Pause	***	***	Shift Home	47	E0
Shift ↑	48	E0	Shift PgUp	49	E0
Shift ←	4B	E0	Shift →	4D	E0
Shift End	4F	E0	Shift ↓	50	E0
Shift PgDn	51	E0	Shift Ins	52	E0
Shift Del	53	E0			

***   These combinations do not provide a keystroke for the application but perform another action.

Ctrl Keyboard ASCII/Scan Codes

Keystroke	Scan Code	ASCII Code	Keystroke	Scan Code	ASCII Code
Ctrl Esc	01	1B	Ctrl 1	--	--
Ctrl 2 (NUL)	03	00	Ctrl 3	--	--
Ctrl 4	--	--	Ctrl 5	--	--
Ctrl 6 (RS)	07	1E	Ctrl 7	--	--
Ctrl 8	--	--	Ctrl 9	--	--
Ctrl 0	--	--	Ctrl _	0C	1F
Ctrl Backspace (Del)	0E	7F	Ctrl Tab	94	00
Ctrl Tab	0F	00	Q	10	51
Ctrl q (DC1)	10	11	Ctrl w (ETB)	11	17
Ctrl e (ENQ)	12	05	Ctrl r (DC2)	13	12
Ctrl t (DC4)	14	14	Ctrl y (EM)	15	19
Ctrl u (NAK)	16	15	Ctrl i (HT)	17	09
Ctrl o (SI)	18	0F	Ctrl p (DLE)	19	10
Ctrl [(ESC)	1A	1B	Ctrl] (GS)	1B	1D
Ctrl Return	1C	0A	Ctrl a	1E	01
Ctrl s (DC3)	1F	13	Ctrl d (EOT)	20	04
Ctrl f (ACK)	21	06	Ctrl g (BEL)	22	07
Ctrl h (Backspace)	23	08	Ctrl j (LF)	24	0A
Ctrl k (VT)	25	0B	Ctrl l	26	0C
Ctrl ;	--	--	Ctrl '	--	--
Ctrl `	--	--	Ctrl Shift	***	***
Ctrl \ (FS)	2B	1C	Ctrl z (SUB)	2C	1A
Ctrl x (CAN)	2D	18	Ctrl c (ETX)	2E	03
Ctrl v (SYN)	2F	16	Ctrl b (STX)	30	02
Ctrl n (SO)	31	0E	Ctrl m (CR)	32	0D
Ctrl ,	--	--	Ctrl .	--	--
Ctrl /	--	--	Ctrl *	96	00
Ctrl Alt	***	***	Ctrl Space	39	20
Ctrl Caps Lock	--	--	Ctrl F1	5E	00
Ctrl F2	5F	00	Ctrl F3	60	00
Ctrl F4	61	00	Ctrl F5	62	00
Ctrl F6	63	00	Ctrl F7	64	00
Ctrl F8	65	00	Ctrl F9	66	00
Ctrl F10	67	00	Ctrl F11	89	00
Ctrl F12	8A	00	Ctrl Num Lock	--	--
Ctrl Scroll Lock	--	--	Ctrl Home	77	00
Ctrl ↑	8D	00	Ctrl PgUp	84	00
Ctrl Keypad -	8E	00	Ctrl ←	73	00
Ctrl Center	8F	00	Ctrl →	74	00
Ctrl Keypad +	90	00	Ctrl End	75	00
Ctrl ↓	91	00	Ctrl PgDn	76	00
Ctrl Ins	92	00	Ctrl Del	93	00
Ctrl SysReq	(no key)	(no key)	Ctrl Key 45	--	--
Ctrl Enter	E0	0A	Ctrl /	95	00
Ctrl Print Screen	72	00	Ctrl Break	00	00
Ctrl Home	77	E0	Ctrl ↑	8D	E0
Ctrl PgUp	84	E0	Ctrl ←	73	E0
Ctrl →	74	E0	Ctrl End	75	E0
Ctrl ↓	91	E0	Ctrl PgDn	76	E0
Ctrl Ins	92	E0	Ctrl Del	93	E0

*** These combinations do not provide a keystroke but perform another action.
--   No function assigned to this keystroke combination.

Alt Keyboard Scan/ASCII Code

Keystroke	Scan Code	ASCII Code	Keystroke	Scan Code	ASCII Code
Alt Esc	01	00	Alt 1	78	00
Alt 2	79	00	Alt 3	7A	00
Alt 4	7B	00	Alt 5	7C	00
Alt 6	7D	00	Alt 7	7E	00
Alt 8	7F	00	Alt 9	80	00
Alt 0	81	00	Alt -	82	00
Alt =	83	00	Alt Backspace	0E	00
Alt Tab	A5	00	Alt q	10	00
Alt w	11	00	Alt e	12	00
Alt r	13	00	Alt t	14	00
Alt y	15	00	Alt u	16	00
Alt I	17	00	Alt o	18	00
Alt p	19	00	Alt [	1A	00
Alt]	1B	00	Alt Return	1C	00
Alt Ctrl	***	***	Alt a	1E	00
Alt s	1F	00	Alt d	20	00
Alt f	21	00	Alt g	22	00
Alt h	23	00	Alt j	24	00
Alt k	25	00	Alt l	26	00
Alt ;	27	00	Alt '	28	00
Alt `	29	00	Alt Shift	***	***
Alt \	2B	00	Alt z	2C	00
Alt x	2D	00	Alt c	2E	00
Alt v	2F	00	Alt b	30	00
Alt n	31	00	Alt m	32	00
Alt ,	33	00	Alt .	34	00
Alt /	35	00	Alt *	37	00
Alt Space	39	00	Alt Caps Lock	***	***
			Alt F1	68	00
Alt F2	69	00	Alt F3	6A	00
Alt F4	6B	00	Alt F5	6C	00
Alt F6	6D	00	Alt F7	6E	00
Alt F8	6F	00	Alt F9	70	00
Alt F10	71	00	Alt F11	8B	00
Alt F12	8C	00	Alt Num Lock	***	***
Alt Scroll Lock	***	***	Alt Keypad -	4A	00
Alt Keypad +	4E	00	Alt Keypad Numbers	#	#
Alt Del	--	--	Alt SysReq	(no key)	(no key)
Alt key 45	--	--	Alt Enter	A6	00
Alt /	A4	00	Alt Print Screen	***	***
Alt Pause	***	***	Alt Home	97	00
Alt ↑	98	00	Alt PgUp	99	00
Alt ←	9B	00	Alt →	9D	00
Alt End	9F	00	Alt ↓	A0	00
Alt PgDn	A1	00	Alt Ins	A2	00
Alt Del	A3	00			

***   Does not provide a keystroke but performs another action.

–   No function assigned to this keystroke combination.

Keyboard LED Test

This test makes sure that all keyboard LEDs are working. As each LED is turned on, you must report if the LED is lit.

Keyboard Clock Line Test

The Keyboard Clock Line Test makes sure the keyboard clock line is working properly. Select *Keyboard* and *Keyboard Clock Line Test*. Press <Enter> to start the Keyboard Clock Line Test. The Clock Line Test screen should appear when the test completes. The Keyboard clock line test error codes are shown below.

Keyboard Data Line Test

The Keyboard Data Line Test makes sure the keyboard data line is working properly. Select *Keyboard* from the Main Menu and *Keyboard Data Line Test*. Press <Enter> to start the Keyboard Data Line Test. The Keyboard data line test error codes are shown below.

Keyboard Test Error Codes

Code	Explanation	Recommended Action
0400h	AMIDiag found a keyboard controller interface error.	Make sure the keyboard controller (8042) is properly seated. Check the data paths.
0401h	AMIDiag issued commands to the keyboard controller and received improper responses.	Check the keyboard controller (8042) for proper seating. Check the data paths.
0410h - 0411h	Keyboard clock line is stuck low/high. The clock line to the keyboard is stuck either low or high.	Check the keyboard connections and all keyboard connector circuitry. Check the clock line from the 8042 to the connector for shorts or breaks.
0412h - 0413h	Keyboard data line is stuck low/high. The data line to the keyboard is stuck either low or high.	Check the keyboard connections and all keyboard connector circuitry. Check the clock line from the 8042 to the connector for shorts or breaks.
0414h	AMIDiag issued a command to the keyboard and either did not receive a response or received an improper response.	Check the keyboard connections and all circuitry regarding the keyboard connector.
0415h	Keyboard LED could not be turned on.	Change keyboards.
0416h	Keyboard diagnostic echo failed.	Change the keyboard or the keyboard controller.
0417h	Keyboard is not responding to command.	Change the keyboard or the keyboard controller.

9 Video Diagnostic Tests

The video tests are:

Video Test
Video Memory Test
Attribute Test
Page Selection Test
Color Test
Text Mode Tests
80 x 25 Display Test
40 x 25 Display Test
Graphics Mode Tests
320 x 200 Graphics Test
640 x 200 Graphics Test
640 x 350 Graphics Test
640 x 480 Graphics Test
VESA Video Modes Test
Test 640x480 Modes
Test 800x600 Modes
Test 1024x768 Modes
Test 1280x1024 Modes
Test Text Modes
VESA Video Memory Test
Window Memory Test
Linear Frame Buffer Test
VESA Monitor Test
AGP Test
Eclipse Video Card Test
Register Test
Texture Memory Test
Frame Buffer Test
GE-Minus Test
RAMDAC Signature Test
REALimage 1000 2D BilBLT Engine Test
REALimage 1000 3D Rendering Test:
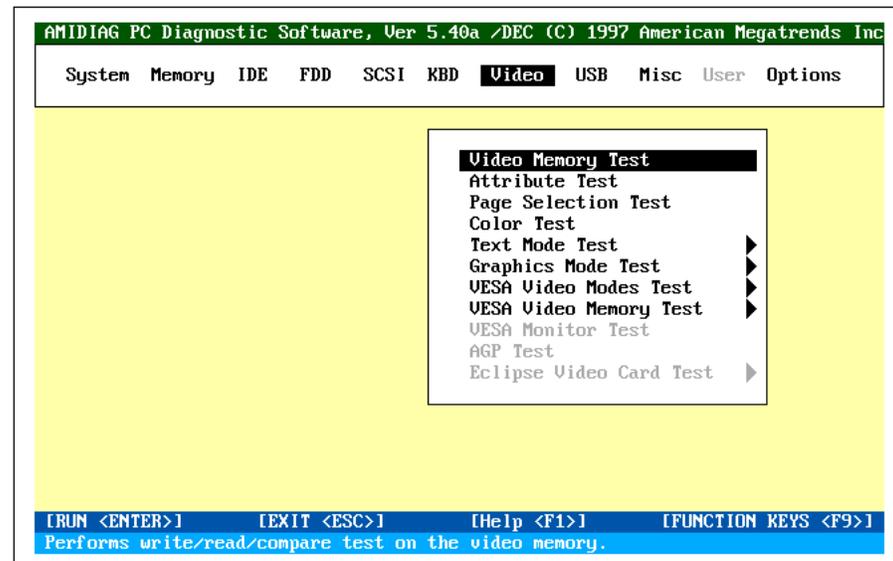
Cont'd

> ### *Important*
>
> ***Do not run the VESA Video Mode Test or the VESA Video Memory Test unless your monitor supports the VESA VGA modes.***
> The VESA video mode test and VESA video memory test are performed on all Super VGA adapter cards that support the VESA video BIOS extensions.
> It does not matter if the video card is located on the ISA, EISA, VESA VL-Bus, or PCI bus. This test works for any Super VGA video card on any bus.

Running Video Tests The video test you run depend on the type of monitor installed on your computer. The type of monitor the test can be run on is specified below.

Video Memory Test

This test tests the base 256 KB of video memory via a memory pattern test. This test can be run on all monochrome and all color monitors.

Adapter Test

This test tests the video display memory at B8000h (monitor) or B0000h (color). This test can be run on all monochrome and all color monitors.

Attribute Test

This test tests the video display attributes. This test displays a screen with a blinking line, reverse video line, high intensity line, and lines in 8 colors in video mode 3 (mode 7 if monochrome).   This test can be run on all monochrome and all color monitors.

Page Selection Test

This test tests all 8 video pages. This test displays a screen of 0s, then 1s, then 2s, then 3s, and so on, in black and white, indicating that each video page is being used correctly. This test only runs on color monitors.

Color Test

This test displays the possible colors in foreground, background, and border. This test can be run on all color monitors.

Text Mode Tests

The text mode tests are: 40 x 25 Display Test

Test Name	Test Description	Type of Monitor
80 x 25 Display Test	Tests the 80 x 25 character set of the display adapter, displaying the entire character set in black and white, then in reverse video in video mode 3 (mode 7 if monochrome).	All monochrome and all color monitors.
40 x 25 Display Test	Tests the 40 x 25 character set of the display adapter in black and white, displaying the entire character set in black and white, then in reverse video.	All monochrome and all color monitors.

Graphics Mode Tests

The following subtests appear in all Graphics Mode Tests (320 x 200, 640 x 200, 640 x 350, 640 x 480):

Subtest	Description
Text and Attribute Test	Makes sure all characters are displayed in the proper color.
Grid Test	Verifies the graphic dot spacing for each mode.
Aspect Ratio and Display Centering	Centers the monitor display.
Circular Pattern Test	Centers the monitor display.
Resolution	Reports the screen resolution.
Animation and Flicker	Reports the video adapter card speed.
Pixel Throughput	Reports the speed at which complex patterns are drawn on the screen.

These video tests may not appear correctly when displaying high resolution VESA video modes on a multisync monitor. The monitor must be adjusted for each individual video mode. After the video mode you will be using appears, you must center the monitor by choosing the **Aspect Ratio and Display Centering** subtest.

The graphics mode tests are:

Test Name	Test Description	Type of Monitor
320 x 200 Graphics Test	Displays a black and white 9 x 13 window and redisplays it in reverse video. Then displays a three-color screen, a screen of random colors, then a black and white screen, and finally 256 colors	All color monitors.
640 x 200 Graphics Test	Displays three black and white boxes, then goes from a black screen to a white screen, and back to a black screen.	All color monitors
640 x 350 Graphics Test	Displays a 16 color screen, then fills the screen with random colors, then returns to a blank screen.	EGA and VGA adapters only.
640 x 480 Graphics Test	Displays a 16 color screen, then fills the screen with random colors, then returns to a blank screen..	Only VGA adapters.

VESA Video Memory Test

This test only works with *Super VGA adapters.* The VESA Video Memory Test checks all VESA video memory. This test may last a few minutes. Select *VESA Video Memory Test* from the Memory menu and press <Enter>. Since this test checks video memory, it is performed in the video mode that uses the greatest amount of video memory. The screen may be blank because this video mode may not be supported by the monitor attached to your computer. If an *x* appears next to this test on the menu, you cannot run this test because your computer does not have the correct video driver. VESA VGA BIOS drivers may be available from the manufacturer of the video adapter card in your computer.

The VESA Video Memory Test includes the:

- Window Memory Test, and the
- Linear Frame Buffer Test.

VESA Video Mode Test

This test only works with *Super VGA adapters.* This test checks all Super VGA (VESA) video modes supported by the installed video adapter. Select *VESA Video Mode Test* from the Memory menu and press <Enter>. A screen such as the following appears. The list varies depending on the VESA screen resolutions that the video adapter in your computer supports.

```
Test 640x480 Modes
Test 800x600 Modes
Test 1024x768 Modes
Test 1280x1024 Modes
Test Text Modes
CONTINUE
```

You can then select each resolution. A screen such as the following appears:

```
Test 16 Color (4 bits per pixel) mode   : YES
Test 256 Color (6 bits per pixel) mode  : YES
Test text resolution                    : YES
Continue
```

You can enable or disable the test for each color or text mode.

VESA Monitor Test

This test tests the Display Data Channel (DDC) between the video adapter and the monitor. This test only works with *Plug and Play Monitors.*

AGP Test

This test makes sure that the Accelerated Graphics Port (AGP), the AGP graphics adapter card, and the AGP connectors and circuitry are all working correctly. Select AGP Test from the Video menu and press <Enter>. Follow the directions on the screen.

Eclipse Video Card Test

This test makes sure that the Eclipse video adapter card is working properly. Select Eclipse Video Card Test from the Video menu and press <Enter>. Follow the directions on the screen.

Eclipse Video Card Tests The seven test functions are:

- Register Test: Test all registers of the major video card components.
- Texture Memory Test: Write specific memory patterns to texture memory.
- Frame Buffer Test: Write specific memory patterns to the frame buffer.
- GE-Minus Test: Test DMA access.
- RAMDAC Signature Test: Test the RAMDAC chip.
- REALimage 1000 2D BilBLT Engine Test: Test the raster operation.
- REALimage 1000 3D Rendering Test: Test the rendering operation.

Test Parameters The Eclipse test parameters are grouped in two levels. The first level screen is shown below. Select an item from the list to configure the test parameters for each function.

```
Register Test
Texture Memory Test
Frame Buffer Test
GE-Minus DMA Test
RAMDAC Signature Test
2D BilBLT Engine Test
3D Rendering Test
Continue
```

Register Test Parameters Choose Yes. The select Continue. Follow the instructions on the screen.

```
Test Eclipse Register:        Yes
Continue
```

Texture Test Parameters Choose Yes. The select Continue. Follow the instructions on the screen.

```
Test Texture Memory:        Yes
Set Percentage:             100
Continue
```

Frame Buffer Test Parameters Choose Yes. The select Continue. Follow the instructions on the screen.

```
Test Frame Buffer:          Yes
Set Percentage:             100
Continue
```

GE-Minus DMA Test Choose Yes. The select Continue. Follow the instructions on the screen.

```
Test GE-Minus Test:         Yes
Test:                       Yes
Continue
```

Cont'd

RAMDAC Signature Test Choose Yes. The select Continue. Follow the instructions on the
screen.

```
Test RAMDAC Signature:    Yes
Continue
```

2D BilBLT Engine Test Choose Yes. The select Continue. Follow the instructions on the screen.

```
Test 2D BilBLT Engine:     Yes
Continue
```

3D Rendering Test Choose Yes. The select Continue. Follow the instructions on the screen.

```
Test 3D Rendering:
     Yes
Continue
```

Video Test Error Codes

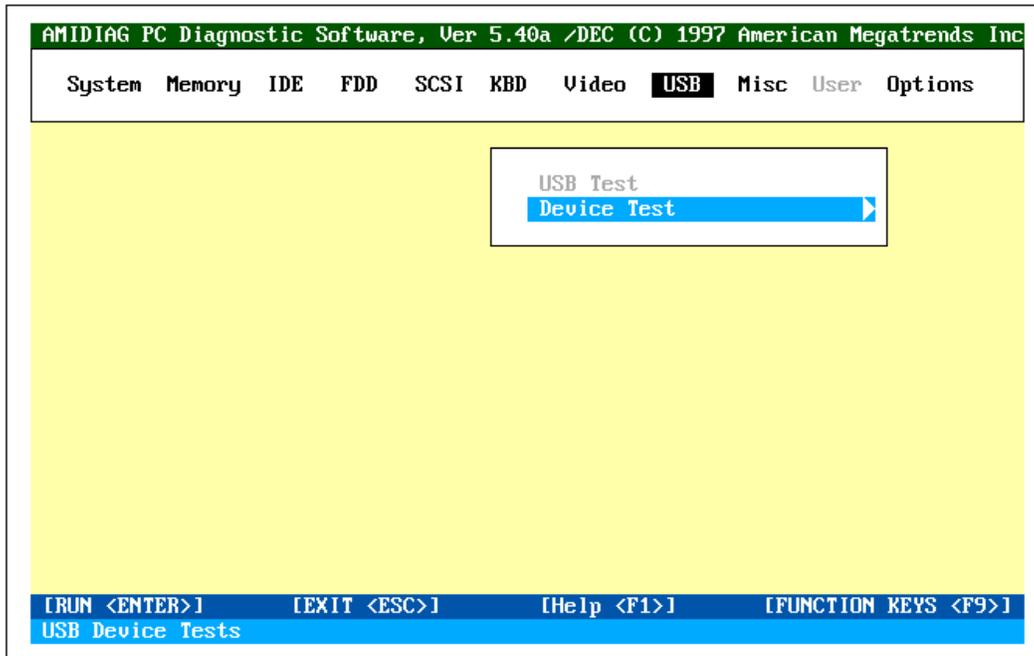| Code	Explanation	Recommended Action
0900h	Video adapter memory read or write test failed. AMIDiag read from or wrote to the video adapter memory but the results were incorrect.	Replace video memory (RAM on video adapter) or replace the video adapter.
0901h	Video adapter attribute test failed. Improper text attributes available to the video adapter.	Replace the video adapter.
0903h	80 x 25 video display test failed. The test patterns shown on the screen in the above mode were found to be improperly or unacceptably displayed.	Replace the video adapter.
0904h	40 x 25 video display test failed. The test patterns displayed in the above mode were improperly or unacceptably displayed.	Replace the video adapter.
0905h	320 x 200 graphics test failed. The test patterns displayed in the above mode were improperly or unacceptably displayed.	Replace the video adapter.
0906h	640 x 200 graphics test failed. The test patterns displayed in the above mode were improperly or unacceptably displayed.	Replace the video adapter.
0907h	Video memory page selection test failed. Attempts to access all available video pages failed.	Replace the video adapter.
0908h	Video adapter color test failed. Attempts to access all available colors failed.	Replace the video adapter.
0909h	640 x 350 graphics test failed. The test patterns displayed in the above mode were improperly or unacceptably displayed.	Replace the video adapter.
090Ah	640 x 480 graphics test failed. The test patterns displayed in the above mode were improperly or unacceptably displayed.	Replace the video adapter.
090Ch	VESA video mode test failed.	The video BIOS does not support all video modes. The mode should be supported. The video card could be bad.
090Dh	VESA video memory test failed.	Video memory is bad or the video card has less than 512 KB for VESA VGA modes.
0D01h	S3 register failed	Replace the Eclipse card.
0D02h	S3 register failed	Replace the Eclipse card.
0D03h	S3 register failed	Replace the Eclipse card.
0D04h	S3 FIFO Read/Write register failed.	Replace the Eclipse card.
0D05h	No option ROM	Replace the Eclipse card.

Code	Explanation	Recommended Action
0900h	Video adapter memory read or write test failed. AMIDiag read from or wrote to the video adapter memory but the results were incorrect.	Replace video memory (RAM on video adapter) or replace the video adapter.
0D06h	Can write to the video ROM.	Replace the ROM chip on the Eclipse card.
0D07h	RealImage register failed.	Replace the Eclipse card.
0D08h	Formatter R/W register failed.	Replace the Eclipse card.
0D09h	RAMDAC ID failed.	Replace the Eclipse card.
0D0Ah	RAMDAC ID failed.	Replace the Eclipse card.
0D0Bh	RAMDAC VRAM mask failed.	Replace the Eclipse card.
0D20h	Incorrect status	Replace the Eclipse card.
0D21h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	Replace the 3D RAM in the affected memory area.
0D22h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	
0D23h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	
0D24h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	
0D30h	No texture memory.	
0D31h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	Replace the 3D RAM in the affected memory area.
0D32h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	Replace the 3D RAM in the affected memory area.
0D34h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	Replace the 3D RAM in the affected memory area.
0D35h	Pattern written to address xxxxxxxh was qqqqh but the pattern read was pppph.	Replace the 3D RAM in the affected memory area.
0D41h	The data at screen space xxxxxxxh should be qqqqqqqqh but is pppppppph.	Replace the Eclipse card.
0D51h	The data at screen space xxxxxxxh should be qqqqqqqqh but is pppppppph.	Replace the Eclipse card.
0D61h	DMA buffer allocation failed.	Replace the Eclipse card.
0D62h	DMA single double word test failed.	Replace the Eclipse card.
0D63h	DMA simple test failed.	Replace the Eclipse card.
0D71h	The signature value in register MISR (Multiple Input Shift Register) is not the expected value. The Param1 bit in the VRAM MASK register is enabled.	Replace the Eclipse card.
0D65h	DMA buffer deallocation failed.	Replace the Eclipse card.

10 USB Tests

The USB tests diagnose problems with USB peripherals. The following appears when you select USB from the AMIDiag main menu:

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

 System  Memory  IDE  FDD  SCSI  KBD  Video  USB   Misc  User  Options


                                  USB Test
                                  Device Test                    ▶








 [RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]        [FUNCTION KEYS <F9>]
 USB Device Tests
```

USB Test

Select USB Test from the USB menu to diagnose problems with USB peripherals and to make sure that USB support is provided in the system BIOS.

USB Device Test

The following appears when you select Device Test from the USB menu. You can diagnose problems with a USB keyboard and a USB mouse pointing device.

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

  System  Memory  IDE  FDD  SCSI  KBD  Video  USB  Misc  User  Options


                              USB     USB Keyboard
                              Devi    USB Mice




[RUN <ENTER>]        [EXIT <ESC>]        [Help <F1>]        [FUNCTION KEYS <F9>]
All test items in this menu are disabled. Press Esc to go up one level.
```

USB Keyboard

This test diagnoses USB keyboard hardware functionality and determines the data transfer rate between the USB host controller and the USB keyboard. The current OHCI does not support legacy systems. This test tests the USB keyboard key codes and keystrokes.

Run the Test Select Device Test from the USB menu. Select USB Keyboard test and press <Enter>. There are four sub tests available for USB keyboard test:

- USB Keyboard Control Test,
- USB Keyboard Code Test,
- USB Keyboard LED Test, and
- USB Keyboard PnP Test.

Test Parameters The following test parameters appear:

Parameter	Action
Test This Device	Select YES to run the USB Keyboard Test. The default is YES if AMIDiag found a USB keyboard.
PnP Test	Select YES to run the USB Keyboard PnP (Plug and Play) Test. The default is YES if AMIDiag found a USB keyboard. This test makes sure that the USB keyboard plug and play feature works properly. The Plug and Play feature automatically configures the USB device when the device is attached to the computer.

USB Mice

This test performs USB Mouse tests on both UHCI and OHCI systems. The current OHCI does not support legacy systems.

Run the Test Select Device Test from the USB menu. Select USB Mice test and press <Enter>. There are three sub tests available for USB mice test:
- USB Mouse Control Test,
- USB Mouse Sensitive Test, and
- USB Mouse PnP Test.

Test Parameters The following test parameters appear:

Parameter	Action
Test This Device	Select YES to run the USB Keyboard Test. The default is YES if AMIDiag found a USB keyboard.
Sensitivity Test	Select YES to run the Sensitivity test.
PnP Test	Select YES to run the USB Mice PnP (Plug and Play) Test. The default is YES if AMIDiag found a USB mouse. This test makes sure that the USB mouse plug and play feature works properly. The Plug and Play feature automatically configures the USB device when the device is attached to the computer.

USB Test Error Codes

Error Code	Description	Action
0B00h	USB mouse set protocol failed.	Replace USB mouse.
0B10h	USB mouse remove or attach tests failed.	Replace USB mouse.
0B20h	USB mouse no present.	Attach the USB mouse and run the USB Mice test.
0B30h	USB keyboard control test failed.	Replace the USB keyboard.
0B40h	USB keyboard LED test failed.	Replace the USB keyboard.
0B50h	USB keyboard PnP test failed.	Replace the USB keyboard.
0B60h	USB keyboard not present.	Attach a USB keyboard and run the USB keyboard test.

11 Miscellaneous Diagnostic Tests

The Miscellaneous Diagnostics include:

DMI Test
Serial Port Test
Parallel Port Test
Modem Diagnostics
Sound Test
Mouse Test
APM Functionality Test
Device APM Test
SMBus Test
Network Diagnostics

```
AMIDIAG PC Diagnostic Software, Ver 5.40a /DEC (C) 1997 American Megatrends Inc

  System  Memory  IDE   FDD   SCSI   KBD   Video   USB   Misc  User  Options


                              DMI Test
                              Serial Port Test
                              Parallel Port Test
                              Modem Diagnostics        ▶
                              Sound Test               ▶
                              Mouse Test
                              APM Functionality Test
                              Device APM Test
                              SMBus Test
                              Network Diagnostics




 [RUN <ENTER>]        [EXIT <ESC>]       [Help <F1>]      [FUNCTION KEYS <F9>]
 Checks data transmission, reception and other functions of serial port.
```
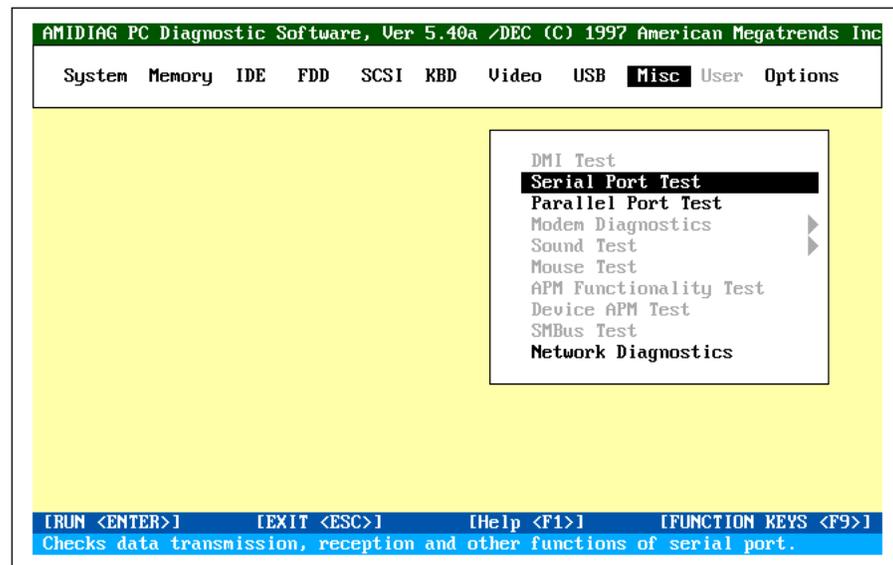
DMI Test

The DMI (Desktop Management Interface) test makes sure that the DMI information in your computer is stored in the proper manner and is essentially correct. The DMI file stores system configuration information, and specification information about your computer and all peripheral devices attached to your computer.

Serial Port Test

Up to four serial ports are tested. All serial ports configured in memory locations 40:0 through 40:7 are tested. The test routines check all COM port controller at speeds from 300 to 115,200 baud (up to 460,800 baud if a 16550 UART is installed). Select the number of data bits, number of stop bits, and parity type for each serial port. This test includes seven subtests. Set the parameters for the ports to be tested. Highlight a field using the ↑ and ↓ keys and set the parameters. Select *Continue* and press <Enter>. Select *Miscellaneous* from the Main Menu, select *Serial Port Test*, and press <Enter>. The tests are:

Subtest	Description
Register test	This test consists of reads and writes to the serial port controller UART (Universal Asynchronous Receiver Transmitter) registers.
Interrupt ID	The Named Interrupt Enable Register on the UART selectively enables the transmit and receive interrupts. When enabled, bits are set in the UART interrupt identification register. This test checks the proper correlation between the interrupt enable register and the interrupt identification register.
Internal Loopback	The UART provides an internal loopback feature that tests most of the UART functionality. This test transmits and receives data at a fixed baud rate. The internal loopback feature is then exhaustively tested in the data transfer test.
Line status	The line status test generates communication fault conditions, such as a data overrun or parity error. It makes sure they have been properly reflected in the line status register
IRQ Activation	The IBM-compatible BIOS Serial Communications Service (INT 14h) does not test data transfer in interrupt driven mode. It polls the status register to determine the availability of received data. The IRQ activation test checks data transfer in interrupt driven mode (when an interrupt is generated when a byte of data is sent or received). This data transfer mode uses IRQ 4 for COM1 and IRQ 3 for COM2. This test fails if the IRQs are not used.
Data transfer	The data transfer test checks data transfer within the UART using the internal loopback. No external cable is necessary for this test. The data transfer test starts transmitting and receiving data at 300 bps. The baud rate is then gradually increased to 460.8 KBs. Received data is immediately displayed.
External Loopback	This test checks data transmission via an external connector. If this connector is not attached, set to *NO* to skip this test.
FIFO	If the serial port has a FIFO buffer, it is automatically tested.
Baud rate	Checks the actual transmission and receiving speed.

Parameters You can edit any of the fields in the serial port tests:

Field	Description
External Loopback	Specifies if an external loopback plug is connected to the serial port. An external loopback plug for a 9-pin connector may be provided. The external loopback routine tests the functionality of control signal paths for the serial port controller. The settings are *Yes* or *No* (the default).
Parity	Specifies the parity in the transmitted or received character. Parity is used for error detection and correction. If even parity character is transmitted and an odd parity character is received, the data bits were modified during transmission. Depending on the protocol used, the receiving side can abort the communication session or request a *RESEND* from the transmitter. Parity can be set to *odd, even,* or *none* (the default). Parity is neither generated nor checked.
Data bits	Specifies the number of bits in the transmitted or received character. The settings are *5, 6, 7*, or *8* bits per character (the default). The significance of *5* or *6* bit characters is not appreciable if ASCII data is being transmitted or sent. Some ASCII terminals cannot display the extended characters in the upper half of the IBM PC character set. These terminals use *7* bits per character in transmission and reception. All other applications require *8* bits per character.
Stop bits	Specifies the number of stop bits in one character. When bit patterns are being transmitted, the stop bits allow the receiver to distinguish between the last bit of one character and first bit of the next character. The settings are *1* or *2* stop bits (the default).
Test	Select YES to run the test. The settings are *YES* (the default) or *NO*. Select *CONTINUE* to start the COM port test. The test results are displayed as they are executed.

Serial Port Test Error Codes

Code	Explanation	Recommended Action
0601h	Data written to port *xxxx*h was *yyyy*h. Data read back from the port was *zzzz*h. AMIDiag wrote a pattern to port *xxxx*h. When read back, the port value was different.	If this error occurs under the external loopback test, make sure the loopback plug is installed properly. If the error occurs under the internal loopback test, replace the serial port controller.
0602h	Interrupt identification register test failed. The interrupt identification register within the serial port controller did not contain proper values.	Replace the serial port controller.
0603h	Data written to port XXXXh was *yyyy*h. Data read back from the port was *zzzz*h. AMIDiag wrote a pattern to port *xxxx*h. When read back, the port value was different.	If this error occurs under the external loopback test, make sure the loopback plug is installed properly. If the error occurs under the internal loopback test, replace the serial port controller.
0604h	Line status register test failed at port XXXXh. The serial port controller line status register did not return a proper value.	Replace the serial port controller.
0605h	Interrupt activation test failed at port XXXXh. The interrupt activation test failed on the above port.	Replace the serial port controller.
0606h	Data transfer test failed at port XXXXh. The serial port shown above failed the data transfer test.	If the external loopback test is running, make sure the loopback plug is installed properly. If the internal loopback test is running, replace the serial port controller.
0607h	Loop back test failed at port XXXXh. The external loop back test failed on the serial port shown above.	Make sure the loopback plug is installed properly. Replace the serial port controller.
0608h	FIFO register test failed.	Reconfigure the COM port with the FIFO buffer disabled. If this error code still occurs or you cannot disable the FIFO buffer and replace the COM port.
0609h	FIFO register test failed.	
0610h	FIFO trigger level error.	
0611h	FIFO test error.	
0612h	Baud rate speed test failed at %x baud rate.	Data is not being transmitted at the proper rate. Make sure all connections are secure.

Parallel Port Test

This routine test all parallel ports found at memory locations 40:8 through 40:D. Up to three parallel ports can be tested. This test checks every part of the parallel port controller and allows you to set parameters for the characteristics of the individual parallel ports for testing.

Parallel Port Subtests The Parallel port subtests are:

Subtest	Description
Register test	The register test is a series of read/write tests on the parallel port data buffer.
IRQ activation test	The BIOS Parallel Port Service (INT 17h) does not send the data to the parallel port in interrupt driven mode. This test checks data transfer in interrupt driven mode (an interrupt is generated when the printer sends the ACK signal). This mode of data transfer uses IRQ 7 for LPT1 and IRQ 5 for LPT2. If these IRQs are already being used, this test may fail.
The following tests print text patterns. If a printer is attached, the output is printed. If an external loopback plug is connected, the status is shown as Passed or Failed and there is no printed output.	
Pattern Print test	Prints a string of text consisting of all numerals, uppercase letters, and lowercase letters. The string is printed several times.
Bold Print test	Prints the same string in bold letters.
Compressed Print test	Prints the same string in compressed letters.
Form Feed test	Sends two form feeds to separate the printed output.
ECP test	Test the parallel port Extended Capabilities Port (ECP) feature.

Parameters When *Parallel Port Test* is selected from *Misc. Menu,* editable test parameters for all parallel ports appear:

Field	Description
Printer Connected	Determines if a printer or an external loopback plug is connected to the parallel port. The settings are *YES* (connected) or *NO* (the default). If no printer or plug is connected, type *NO* to avoid a *Failed* test status.
Run test	Select *Continue* to start the LPT port test. Results for all subtests are displayed when the test completes.

Parallel Port Test Error Codes

Code	Explanation	Recommended Action
0701h	Data written to port xxxxh was yyh. Data read back was zzh.	If running the external loopback test, make sure the loopback plug is installed properly. If running the internal loopback test, replace the parallel port controller.
0702h	The IRQ activation test failed at xxxxh.	Replace the parallel port controller.
0703h	No response from printer.	Disable ECP for the parallel port and rerun this test. If this error code still occurs, replace the parallel port.
0704h	ECP register W/R failed.	
0705h	ECP FIFO test failed.	

Sound Test

This test consists of four subtests that can work with any sound card that uses Sound Blaster emulation mode. AMIDiag automatically detects all Sound Blaster 16-Bit compatible sound cards. If a 16-bit Sound Blaster card is installed in the computer, only the Speaker test requires a response. Select Sound Test and press <Enter>.

Stereo Test   The AMIDiag stereo test diagnoses problems with the stereo capability of the speakers attached to your computer. Select Stereo Test from the Misc menu. AMIDiag displays the following. Follow the instructions:

```
Press a key to playback on left channel.
Press a key to playback on the right channel.
Press a key to playback on both channels.
Did the sound play OK?
```

Volume Test   The AMIDiag volume test diagnoses problems with the volume of the speakers attached to your computer. Select Volume Test from the Misc menu. AMIDiag displays the following messages. Follow the instructions:

```
Press a key to playback at low volume.
Press a key to playback at medium volume.
Press a key to playback at high volume.
Did the sound play OK?
```

Pitch Test   The pitch test diagnoses problems with the pitch of the sounds from the speakers attached to your computer. Select Pitch Test from the Misc menu. AMIDiag displays the following messages. Follow the instructions:

```
Press a key to playback at low pitch.
Press a key to playback at medium pitch.
Press a key to playback at high pitch.
Did the sound play OK?
```

Playback Rate Test This test diagnoses problems with the playback rate of the speakers attached to your computer. Select Playback Rate Test from the Misc menu. AMIDiag displays the following messages. Follow the instructions:

```
Press a key to playback at low rate.
Press a key to playback at medium rate.
Press a key to playback at high rate.
Did the sound play OK?
```

Frequency Test This test diagnoses problems with the frequency of the speakers attached to your computer. Select Frequency Test from the Misc menu. AMIDiag displays the following messages. Follow the instructions:

```
Press a key to playback at low rate.
Press a key to playback at medium rate.
Press a key to playback at high rate.
Did the sound play OK?
```

Mouse Test

A mouse is now essential equipment in desktop and notebook computers. AMIDiag includes a mouse functionality test. The underlying hardware in a mouse differ widely. Some of the popular mouse types include serial, bus, optical, and PS/2-style. The AMIDiag Mouse test can perform diagnostics on all mouse devices.

Differences exist even within the same types of mouse, such as true Microsoft mouse compatibility. The only way to interact with a wide range of pointing devices is through the mouse driver interface. The mouse drivers interact with the hardware and let the operating system or application program interact with the mouse through a uniform set of software interrupt calls.

The AMIDiag mouse test assumes that a mouse driver has already been loaded. Depending on the type of mouse, this driver should either be a resident program in the .COM file format, or a device driver in the .SYS file format. See the mouse manual for the appropriate program.

Although AMIDiag should be run with all device drivers and resident programs removed from the system, the mouse driver has no adverse affect on AMIDiag. You can install the mouse driver before running AMIDiag. The mouse test is fully interactive. AMIDiag asks you to move the mouse and to click the mouse buttons. From the response, AMIDiag determines how the mouse is behaving. You cannot select the mouse test during batch mode testing. The mouse test is a standalone program (MOUSTEST.EXE) executed by AMIDiag. The mouse tests are: single click test, double click test, and graphic cursor tests.

Single click   A picture of the mouse is displayed.

The picture should correspond to the actual physical mouse. If it does not, contact the mouse manufacturer. When you press and hold down a mouse button, that button is highlighted on the mouse picture on the screen. Next, click the mouse in the designated area on the screen. If the test ends, the mouse interface properly reported the mouse click and coordinates. If the test does not terminate, there is a problem in the mouse interface. You can always press <Esc> to terminate the test.

Double click   This test is similar to the **Single click test**. Press the left mouse button twice, as prompted.

Cursor   The next three tests appear only if there is a CGA, EGA, or VGA adapter installed. These tests display a graphic mouse cursor in the shape of an hourglass in these graphics modes:

- Mode 12 (640 x 480 in 16 colors), (VGA only)
- Mode 10 (640 x 350 in 16 colors), (VGA, EGA)
- Mode 6 (640 x 200 in 2 colors). (VGA, EGA, CGA)

Move the mouse pointer, making sure that the movement is smooth. Then click the mouse once. In the mode 10 and 6 tests, the cursor should get bigger with a loss of resolution and clarity and the cursor movement should be much smoother.

Parameters   Since the mouse test is interactive, there are no starting parameters. You must load the mouse driver before loading AMIDiag to run the mouse test.

Modem Diagnostics

This test makes sure the internal or external modem is connected to the system properly. The subtests are:

- IRQ activation test,
- Loopback test, and
- Dial tone test

AMIDiag cannot test PCMCIA PC Card modems unless they have PCM drivers. This test also runs diagnostics on modems attached to the ISA bus, PnP modems, and PCMCIA modems.

APM Functionality Test

This test checks the computer's Advanced Power Management (APM) functions using the APM functions that have been implemented on your computer. This test checks the display, hard disk drive, COM ports, parallel port, and PCMCIA sockets for proper APM operation.

Device APM Test

This test makes sure that power management works for video, hard disk drive, COM ports, parallel port, and PCMCIA sockets (if these devices are under power management). This test puts the device in Standby mode and Off modes.

SMBus Diagnostics

This test makes sure that the System Management Bus (SMBus) is working properly. Select SMBus Test from the Misc. menu and press <Enter>. This test consists of the register test and the SMB status test.

Register Test   This test makes sure that the SMB host registers are holding the read/write data correctly. Data patterns are performed on the:

- slave command register,
- slave shadow port 1,
- slave shadow port 2,
- host command register,
- host address register,
- host data register 0,
- host data register 1,
- block data register, and
- slave event register.

SMB Status Test This test makes sure that the SMB host status is generated correctly in the SMB host status register

Network Diagnostics

This test checks if the network connection is working properly. IPX/SPX or NETBIOS protocol drivers must be loaded for this test. If these drivers are not loaded, this test is disabled on the Misc. menu. This test sends a packet to itself and then receives the packet. It then compares the contents of the received packet to the contents of the packet that was transmitted.

PC Speaker Test Error Codes

Code	Explanation	Recommended Action
0810h	Speaker test failed	Make sure the PC speaker is properly connected. Run the test again. Replace the PC speaker if it fails this test repeatedly.

SMBus Test Error Codes

Code	Explanation	Recommended Action
0E00h	Register test failed	
0E10h	Status test failed	

Sound Test Error Codes

Code	Explanation	Recommended Action
0801h	Stereo test failed	Make sure the sound card and speakers are properly connected. Run the test again. Replace the sound card or PC speaker if it fails this test repeatedly.
0802h	Volume test failed	Make sure the sound card and speakers are properly connected. Run the test again. Replace the sound card or PC speaker if it fails this test repeatedly.
0803h	Pitch test failed	Make sure the sound card and speakers are properly connected. Run the test again. Replace the sound card or PC speaker if it fails this test repeatedly.
0804h	Playback test failed	Make sure the sound card and speakers are properly connected. Run the test again. Replace the sound card or PC speaker if it fails this test repeatedly.
0805h	Speaker test failed	Make sure the sound card and speakers are properly connected. Run the test again. Replace the sound card or PC speaker if it fails this test repeatedly.

APM Functionality Test and Device APM Test Error Codes

Code	Explanation	Recommended Action
1100h	Function error	The APM function for this device did not work. Replace the system BIOS.
1110h	Power state error	The power state for this device is incorrect. Replace the system BIOS.

Network Diagnostics Error Codes

Code	Explanation	Recommended Action
1300h	Send error	Check the network card and cable.
1301h	Receive error	Check the network card and cable.
1302h	Comparison error	Check the network card and cable.
1303h	Socket not connected	Check the network card and cable.
1304h	Socket connected for LED	Check the network card and cable.

Modem Diagnostics Error Codes

Code	Explanation	Recommended Action
1500h	No modem	Could not find a modem. Make sure the modem power is on. If the modem has power, run the test again. If this test fails again, replace the modem.

Code	Explanation	Recommended Action
1501h	IRQ activation failed	See the BIOS Setup options and jumper settings on the modem or motherboard. Make sure the IRQ settings are correct.
1502h	Loopback test failed	Replace the modem.
1503h	Dial tone test failed	Make sure the modem is connected to a live telephone line. Replace the modem if the phone line is OK and the modem is properly connected.

11 User Diagnostics

You can add individual diagnostic routines to AMIDiag. These routines can be executed from the User Menu. A sample User menu screen follows:
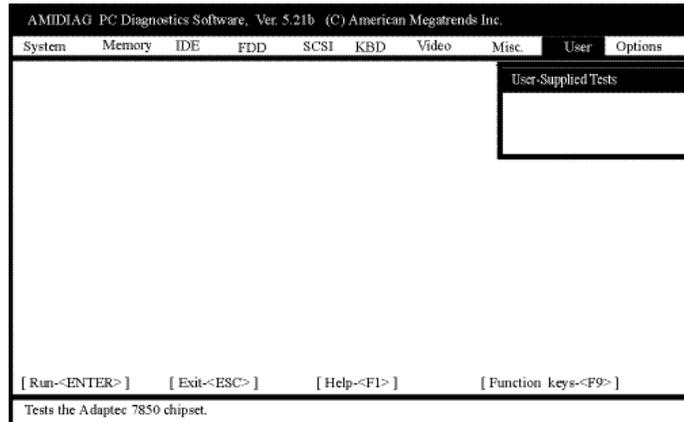
Custom Menus Any item that appears on the User Menu has been added to AMIDiag by a user, OEM, VAR, or system integrator. This menu is entirely customized.

Writing User Programs The American Megatrends AMIDiag API Specification contains all the information you will need to write an AMIDiag user program.

This specification also describes how to modify an existing DOS program, utility, or diagnostic routine so that the program can be included in AMIDiag. Call American Megatrends AMIDiag Sales at 800-828-9264.

12 Options Menu

The Options menu items are:

Menu Item
System Information
Edit Batch Parameters
Load Batch Parameters
Save Batch Parameters
Generate Reports
Display Error Log File
DOS shell
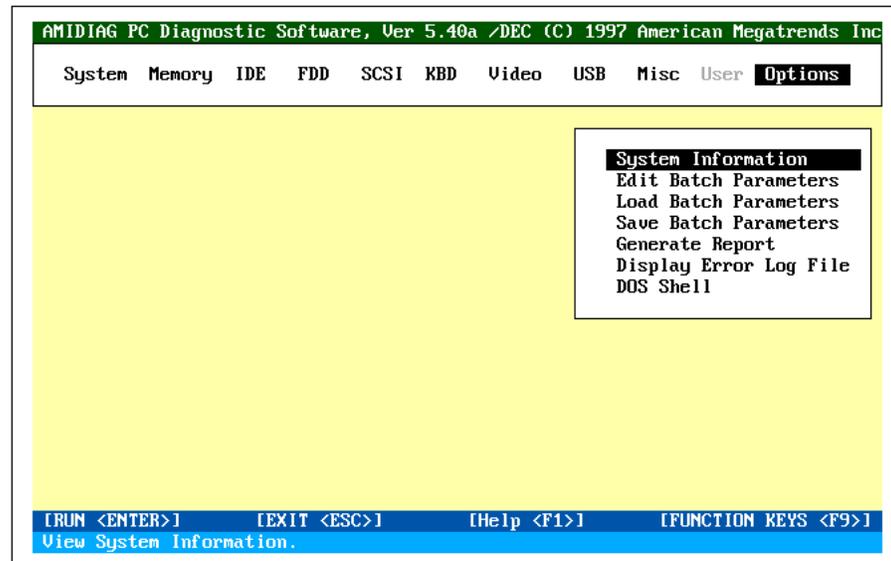
The Sysinfo utility detects and reports sound cards, PCI, Plug and Play, EISA, PCMCIA, and SCSI devices. You can run Sysinfo either from within AMIDiag by selecting System Information from the AMIDiag Options menu or as a standalone DOS program. Insert the AMIDiag diskette in a floppy drive. Type

```
A:(or B:)SYSINFO
```

and press <Enter>.

Sysinfo Requirements Sysinfo requires 400 KB of free DOS memory. Sysinfo may not run from the AMIDiag menu if you do not have enough free DOS memory space. If not, run Sysinfo from the DOS prompt by typing

```
SYSINFO
```

and pressing <Enter>.

When to Use Sysinfo Use Sysinfo to determine the hardware and software environment. The environment may not be what you expect. For example, computer dealers sometimes inadvertently mislabel computers. Does your computer really operate at 133 MHz? Sysinfo can tell you. It recognizes all Intel and Intel x86-compatible CPUs, including the P54C.

This example is just one of many ways that Sysinfo can be very useful.

Accuracy If Sysinfo reports that an attached component or device is not present, verify that the system BIOS supports the device and that the device has been installed through the computer manufacturer or dealer. Make sure the proper device drivers are loaded. Make sure the motherboard in your computer supports the device. Call American Megatrends technical support at 770-246-8645 if you are still having problems with Sysinfo reports.

Sysinfo Limitations Sysinfo gathers system information by directly accessing hardware, using standard APIs (Application Programming Interfaces), and traditional software scanning methods. However, even though a device is present in the computer, the device may not be supported by the system BIOS in the computer or the necessary drivers may not be loaded. For example, your computer may have PCMCIA sockets, but if the appropriate card and socket services device drivers are not loaded and the system BIOS does not support the appropriate version of card and socket services, Sysinfo cannot report PCMCIA sockets.

Reports Press P and select the printer to print any information displayed on a Sysinfo screen.

To print the entire Sysinfo report, press <F4> to select all Sysinfo menus when Sysinfo is running, then select *Execute batch* from the Sysinfo Options menu. Select the printer when prompted. The entire Sysinfo report on your computer will be printed.

System Information, Continued

Finding Information Select an option by pressing the → or ← keys, then press <Enter>.

To display information about	Menu	Menu Option
adapter cards installed in the computer	Hardware	Adapter Information
the AUTOEXEC.BAT file	Environment	List AUTOEXEC.BAT
the basic system configuration	Hardware	System Configuration
BIOS version	Hardware	BIOS Information
computer configuration information	Hardware	CMOS Information
the CONFIG.SYS file	Environment	List CONFIG.SYS
device drivers	Environment	Device Drivers
the display (system monitor)	Setup	Display Setup
DMA channel assignments	Hardware	DMA Assignment
DOS information	Environment	DOS Environment
editing system files	Options	Edit System Files
EISA configuration information	Setup	EISA information
quitting Sysinfo	Options	Exit Sysinfo
hardware interrupt assignments	Hardware	Hardware Interrupts
I/O port assignments	Hardware	I/O Ports
logical drive assignments	Storage	Logical Drives
map of memory	Environment	Memory Map
type and amount of memory	Hardware	Memory
motherboard information	Hardware	Motherboard
multimedia (CD-ROM, sound cards)	Setup	Multimedia information
Multiprocessing information	Hardware	Multiprocessor information
network information	Setup	Network information
PCI information	Setup	PCI information
PCMCIA information	Setup	PCMCIA information
physical drives assigned in the computer	Storage	Physical Drives
Plug and Play information	Setup	P-n-Play Information
power management information	Setup	Power Management Information
printing system configuration information	Options	Print All Information
SCSI device information	Setup	SCSI information
software interrupt assignments	Environment	Software Interrupts
system configuration information	Hardware	System Configuration

Sysinfo Keys

Key	Description
B	Return to the Sysinfo menu.
N	Go to the next screen.
<Enter>	Select a menu option.
V	Return to the previous screen.
P	Prints the screen to LPT1 or to a disk file.
→, ←, ↑, ↓	Scroll through screen items.
<Esc>	Quit this screen or exit Sysinfo and return to AMIDiag.
U	(Network Only) Display the user list.
D	(Network Only) Display detailed server information.
I	(Network Only) Display server volume information.
<F1>	Display a Help screen.
<F3>	Select or deselect a menu option.
<F4>	Select all Sysinfo menu options.
<F5>	Deselect all Sysinfo menu options.
<F6>	Display only the selected Sysinfo options.
<F8>	Select or deselect all Sysinfo menu items.
<F9>	Display a description of the function keys.
<F10>	Change the screen colors.

System Configuration Screen

The first Sysinfo screen displays hardware components. Verify that Sysinfo found all hardware components.

```
System Information Software, Ver 5.14b /DEC (C) 1996 American Megatrends Inc.

     Hardware          Setup        Environment         Storage          Options


                          System Configuration
Intel 486DX2
     Processor                                  - Intel 486DX2
     Speed                                      - 66.00
     Coprocessor                                - Built In
Standard BIOS
     BIOS Manufacturer                          - American Megatrends
     Release Date                               - 11/11/92
Memory below 1 Mb
     Total RAM below 1 Mb                       - 640 KB
Memory above 1 Mb
     Total RAM above 1 Mb                       - 19456 KB
Keyboard
     Keyboard type                              - Enhanced (101-key)
     Keyboard intercept (int 15h, function 4fh)     - supported
     Special typematic function (int 16h, function 9) - not supported



[MENU <ESC>] [SCROLL WINDOW <ARROW KEYS>] [NEXT <N>] [PREVIOUS <P>]
```

Sysinfo Hardware Menu

The Sysinfo Hardware Menu (shown below) options are described below:

```
System Information Software,  Ver. 5.14b /DEC   (C) American Megatrends Inc.

 Hardware              Setup          Environment        Storage        Options


     ┌────────────────────────────────┐
     │    System Configuration        │
     │  System Board                  │
     │  Memory                        │
     │  I/O Port List                 │
     │  Hardware Interrupts           │
     │  DMA Assignments               │
     │  BIOS Information              │
     │  Adapter Information           │
     │  DMI Information               │
     │  Multiprocessor Information    │
     └────────────────────────────────┘




 [INFORMATION <ENTER>]  [ EXIT MENU <ESC>]   [Help <F1>]   [FUNCTION KEYS <F9>]
```
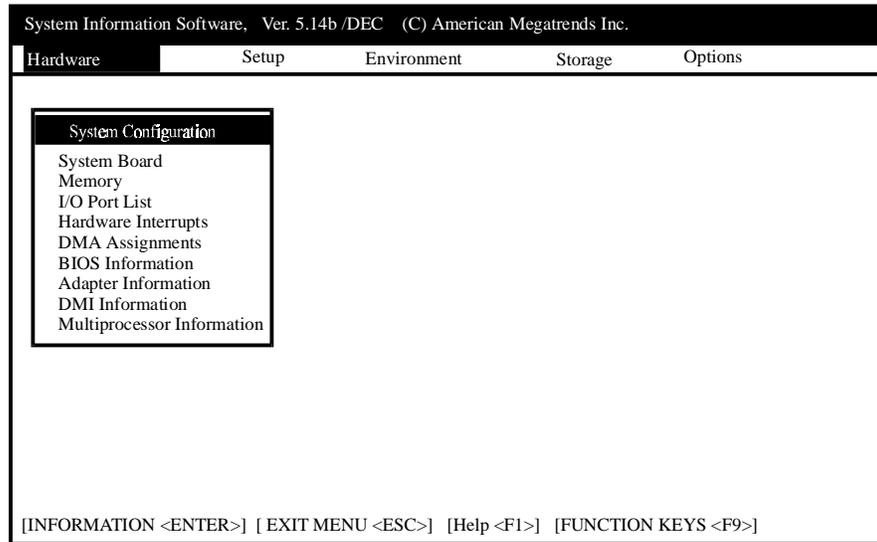
Prerequisites   The system BIOS in your computer must support the PCI and Plug and Play
BIOS extensions to allow Sysinfo to accurately correlate the bus type and the
IRQ, DMA, I/O ports, and adapter cards that it finds. If using an EISA
computer, the EISA Configuration Utility (ECU) must have been executed and
the system must be configured before Sysinfo can accurately report about EISA
devices.

The correct version of card services and socket services must be loaded before
Sysinfo can accurately display information about PCMCIA cards and sockets.

The Novell NetWare IPX, NETX, or a similar network driver must have been
loaded in your computer before Sysinfo can provide accurate network
information.

System Configuration Select this option to display a comprehensive list of information about
your computer. Select The Hardware menu, then select *System Configuration*.

Motherboard   Select this option to display information about the components on the motherboard installed in your computer. Normally, the BIOS ROM, system memory, CPU, cache memory, DMA controllers, timer, and interrupt controller are on the motherboard. Select the Hardware menu, then select *Motherboard*.

Memory   Select this option to display information about the type and amount of memory installed in your computer. The base memory, extended memory, ROM, and system memory are displayed. If your computer does not have an AMIBIOS, memory may be reported incorrectly. Some BIOS do not properly recognize system memory. Select the Hardware menu, then select *Memory*. When adding a new device to your computer that uses system memory, select this Sysinfo menu item to find free memory space.

I/O Ports   Select this option to display information about the I/O ports currently being used in your computer. Sysinfo recognizes all ISA, EISA, PCI, Plug and Play, and PCMCIA I/O ports. Select the Hardware menu, then select *I/O Ports*. When adding a new device to your computer that uses I/O port addresses, select this Sysinfo menu item to find free I/O ports.

Hardware Interrupts Select this option to display information about all current hardware interrupt assignments in your computer. Hardware interrupts are also called IRQs. An IRQ is an actual physical signal from a hardware devices to the CPU or other components. Select the Hardware menu, then select *Hardware Interrupts*. When adding a new device to your computer that uses IRQs, select this item to find free IRQs.

DMA Assignment Select this option to display information about the current DMA channel assignments in your computer. Select the Hardware menu, then select *DMA Assignment*. When adding a new device that uses DMA resources, select this item to find a free DMA resource.

BIOS Information Select this option to display the BIOS name, version number, and features. Select the Hardware menu, then select *BIOS Information*.

Adapter Information Select the Hardware menu, then select *Adapter Information* to display information about all ISA, EISA, PCI, and PnP adapter cards installed in your computer.

If an adapter card is not working, select this Sysinfo menu item to find out if Sysinfo can read the adapter card configuration information. If it cannot, the adapter card is not properly installed or configured.

DMI Information The DMI (Desktop Management Interface) information is stored in the system BIOS. DMI information provides detailed descriptions of system components in 15 categories. Choose this menu option to display detailed information about your computer in text format.

Sysinfo Setup Menu

The Sysinfo Setup menu is shown below:

```
System Information Software,  Ver. 5.14b /DEC   (C) American Megatrends Inc.
 Hardware              Setup            Environment          Storage        Options

                    ┌──────────────────────────┐
                    │ Display Details          │
                    │ Network Information       │
                    │ SCSI Information          │
                    │ PCMCIA Information        │
                    │ Power Management          │
                    │ Modem Information         │
                    │ Multimedia Information    │
                    │ EISA Information          │
                    │ PCI Information           │
                    │ Plug and Play Information │
                    └──────────────────────────┘




 [INFORMATION <ENTER>]  [ EXIT MENU <ESC>]  [Help <F1>]  [FUNCTION KEYS <F9>]
```
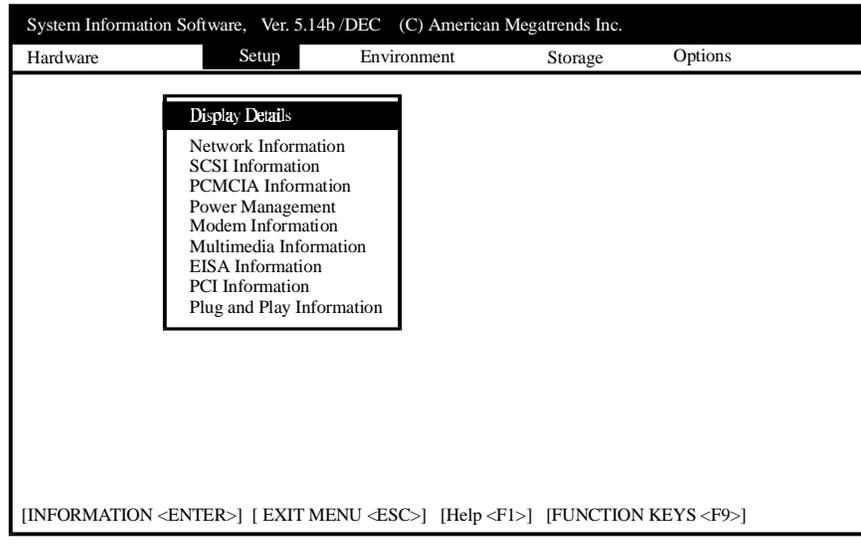
Prerequisites   An ASPI for DOS driver must be loaded before Sysinfo can display SCSI information.

The correct version of the card and services drivers must be loaded before Sysinfo can display information about PCMCIA cards and sockets.

The system BIOS in your computer must support the APM (Advanced Power Management) protocol before Sysinfo can display power management information. The system BIOS in your computer must support the proper PCI interface before Sysinfo can report PCI information. The system BIOS must support the Plug and Play BIOS extensions before Sysinfo can display Plug and Play information. The Novell NetWare IPX, NETX, or a similar network driver must be loaded before Sysinfo can provide network information.

Display Details Select the Setup menu, then select *Display* to display information about the video monitor in your computer.

Select this menu item to display detailed information about the video card in your computer. The VGA chipset, supported video modes, the number of colors supported by this video card, and the amount of video memory.

Sysinfo can identify almost all video cards. Support for some video modes depends on VGA memory size and the video card operating mode. Many companies that sell video cards do not manufacture the VGA chipset on the card.

Network Information Select the Setup menu and select *Network* to display information about the networks that your computer is currently attached to. The first screen displays Novell NetWare servers.

If you only load the IPX, NETX, or equivalent network driver, the amount of information about the default network server that Sysinfo displays is limited.

If you log on to the network, Sysinfo displays additional information about all relevant network servers. You can display additional network information.

SCSI Information First make sure the ASPI driver for DOS is loaded. Sysinfo will not find SCSI device information if this ASPI driver is not loaded. Select the Setup menu, then select *SCSI* to display information about SCSI devices attached to the SCSI bus in your computer.

When adding a new external SCSI device to the SCSI bus, select this Sysinfo option to display the SCSI target IDs so you can correctly configure the Target ID for the new SCSI device.

PCMCIA Information Select this option to display information about PCMCIA sockets and any PCMCIA PC Cards in these sockets. Select the Setup menu, then select *PCMCIA*. Sysinfo automatically identifies and displays the number (up to 4) of PCMCIA sockets and PCMCIA cards in your computer. Sysinfo display the correct PCMCIA information even if you add or remove a PCMCIA card while Sysinfo is running. Follow the directions on the screen to display additional PC Card information.

The proper card and socket services drivers must be loaded and the appropriate system BIOS support must be present or the Sysinfo *PCMCIA Information* option will not work.

Power Management Select this option to display information about how power management is used in your computer, including battery power use and general power use. Select the Setup menu, then select *Power Management*. The appropriate power management software drivers must be loaded or the system BIOS in your computer must support APM before this Sysinfo option can be used. The APM API standards include versions 1.0, 1.1, and 1.2. If the APM implementation in your computer does not adhere to the APM standards, Sysinfo may display incorrect power management information, or may not display any power management information.

Multimedia Information Select this option to display information about any CD-ROM drive and Sound Blaster or Sound Blaster-compatible adapter cards installed in your computer. Select the Setup menu, then select *Multimedia*. You do not have to load Sound Blaster drivers or change system files. Sysinfo finds DSP and Sound Blaster information by directly querying the hardware.

EISA Information Make sure that the ECU (EISA Configuration Utility) has been executed before you select this option and that the EISA system is properly configured.

Select this option to display information about any EISA devices in EISA expansion slots in your computer, as configured by the ECU. Select the Setup menu, then select *EISA*.

PCI Information The system BIOS in your computer must support the PCI BIOS extensions before Sysinfo can display PCI information. Select this option to display information about the characteristics of all PCI devices attached to the PCI bus in your computer. Some "PCI cards" do not have NVRAM for storing configuration data. Sysinfo identifies these cards as ISA cards because they do not conform to the PCI standard. Select the Setup menu, then select *PCI*.
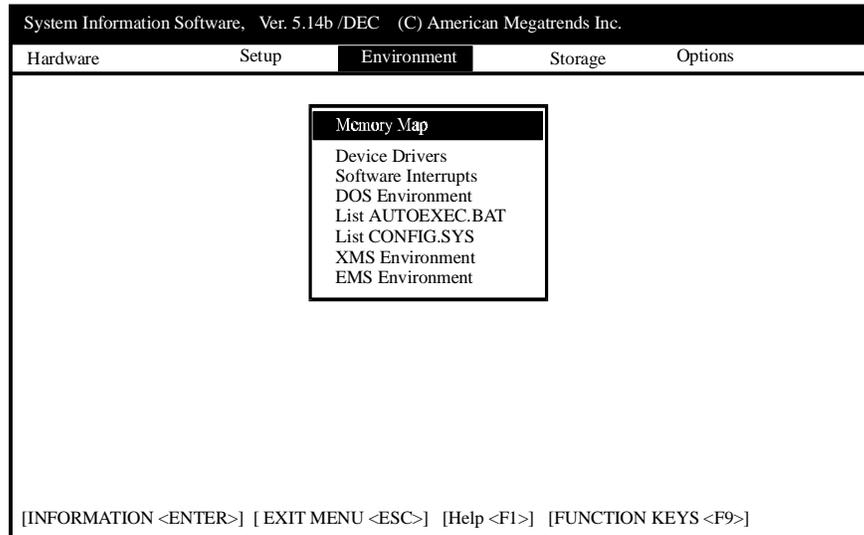
Plug and Play Information The system BIOS in your computer must support the Plug and Play BIOS extensions before Sysinfo can display Plug and Play information. Select this option to display information about any Plug and Play-aware devices attached to your computer. Select the Setup menu, then select *Plug and Play*.

Sysinfo Environment Menu

The Sysinfo Environment menu is shown below.

```
System Information Software,  Ver. 5.14b /DEC   (C) American Megatrends Inc.

  Hardware             Setup          Environment        Storage        Options


                            ┌─────────────────────────┐
                            │  Memory Map             │
                            │                         │
                            │  Device Drivers         │
                            │  Software Interrupts     │
                            │  DOS Environment        │
                            │  List AUTOEXEC.BAT      │
                            │  List CONFIG.SYS        │
                            │  XMS Environment        │
                            │  EMS Environment        │
                            └─────────────────────────┘







  [INFORMATION <ENTER>]  [ EXIT MENU <ESC>]  [Help <F1>]  [FUNCTION KEYS <F9>]
```

Memory Map   Select this option to display a map of all of system memory. Select the Environment menu, then select *Memory Map*.

Select this option to see how memory is being used. This map shows where each TSR (Terminate-and-Stay-Resident) program, DOS program, and device driver is located and how much memory each program is using.

Device Drivers   Select this option to display a list of all of device drivers installed in your computer. Select the Environment menu, then select *Device Drivers*. Sysinfo tries to identify the function of each device driver.

Software Interrupts   Select this option to display a list of all of software interrupt assignments in your computer. Select the Environment menu, then select *Software Interrupts*.

DOS Environment   Select this option to display a list of the DOS environment your computer is running in. Select the Environment menu, then select *DOS Environment*.

List AUTOEXEC.BAT   Select this option to display the AUTOEXEC.BAT file in your computer. Select the Environment menu, then select *List AUTOEXEC.BAT*.

List CONFIG.SYS   Select this option to display the CONFIG.SYS file in your computer. Select the Environment menu, then select *List CONFIG.SYS*.

XMS Environment   Select this option to display a complete description of extended memory usage in your computer.

EMS Environment   Select this option to display a complete description of enhanced memory (EMS) usage in your computer.

Sysinfo Storage Menu

The Sysinfo Storage Menu is shown below.

```
System Information Software,  Ver. 5.14b /DEC   (C) American Megatrends Inc.
Hardware            Setup         Environment        Storage        Options

                                             ┌──────────────────────┐
                                             │ Physical Drives      │
                                             │ Logical Drives       │
                                             └──────────────────────┘













[INFORMATION <ENTER>]  [ EXIT MENU <ESC>]  [Help <F1>]  [FUNCTION KEYS <F9>]
```
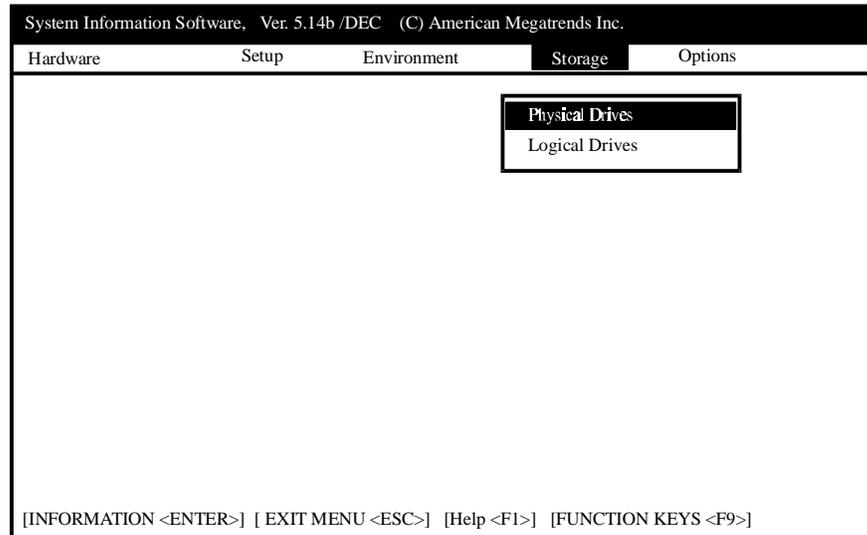
Physical Drives Select this option to display a list of all physical (actual) drives in your computer. Select the Environment menu, then select *Physical Drives*.

Logical Drives Select this option to display a list of all logical drive assignments in your computer. Select the Environment menu, then select *Physical Drives*. Sysinfo also displays if the drive is local, network, RAM drive, or assigned.

Sysinfo Options Menu

The Sysinfo Options menu is shown below.

```
System Information Software,  Ver. 5.14b /DEC   (C) American Megatrends Inc.

Hardware           Setup          Environment          Storage          Options

                                                    ┌─────────────────────────┐
                                                    │ View System Files        │
                                                    │ Edit Report Paramaters   │
                                                    │ Load Report Parameters   │
                                                    │ Save Report Parameters   │
                                                    │ About                    │
                                                    │ Exit Sysinfo             │
                                                    └─────────────────────────┘










[INFORMATION <ENTER>]  [ EXIT MENU <ESC>]   [Help <F1>]   [FUNCTION KEYS <F9>]
```
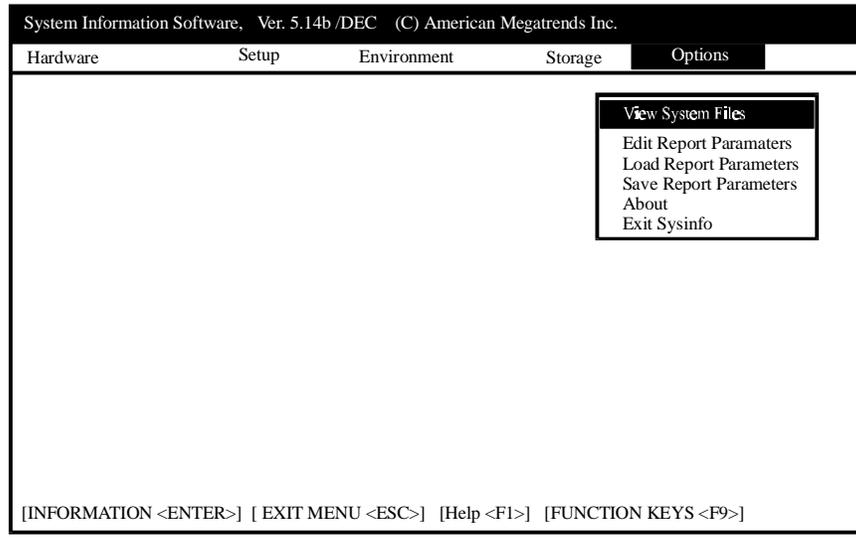
View System Files Select this option to display system files. You can change the default
directory before viewing the files.

System Filename	Directory
AUTOEXEC.BAT	Boot
CONFIG.SYS	Boot
WIN.INI	Directory path defined for Windows
SYSTEM.INI	Directory path defined for Windows
user-specified	User-defined

Function Keys   You can execute several Sysinfo menu items and send the Sysinfo results to a
DOS file or to the printer. To use this option, you must first select the Sysinfo
menu items that you want information on. Highlight a menu item and press
<F5> to select an item. Or you can press <F6> to select all Sysinfo menu items.
You can press <F7> to deselect all Sysinfo menu items. Press <F7> to select or
deselect all menu items on a specific Sysinfo menu.

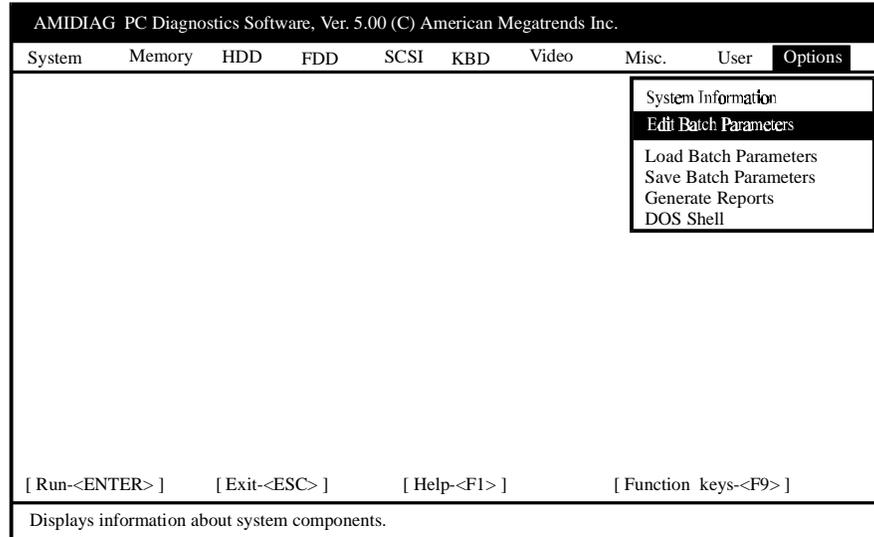**About**   Select Option menu and *About* to see the version number.

Exit Sysinfo   Select the Options menu and *Exit Sysinfo* to return to AMIDiag.

Edit Batch Parameters

You can customize a set of AMIDiag diagnostic routines to run on your computer. You can save this customized set of diagnostic tests as a batch file to be run later.

To set or display AMIDiag runtime parameters, select Edit Batch Parameters from the AMIDiag Options menu. The following appears:

```
AMIDIAG  PC Diagnostics Software, Ver. 5.00 (C) American Megatrends Inc.

 System      Memory    HDD     FDD     SCSI    KBD    Video     Misc.     User    Options

                                                        System Information
                                                        Edit Batch Parameters
                                                        Load Batch Parameters
                                                        Save Batch Parameters
                                                        Generate Reports
                                                        DOS Shell




 [ Run-<ENTER> ]        [ Exit-<ESC> ]        [ Help-<F1> ]          [ Function  keys-<F9> ]

  Displays information about system components.
```

You can set:

- the type of AMIDiag test to be run,
- the number of times each test is run, and
- the test parameters. For example, you can specify the starting and ending hard disk drive heads and cylinders to be tested.

Edit Batch Parameters Menu The following box appears when you select Edit Batch Parameters.

```
Batch Parameter
Repeat Count
Quick Test
Interactive Test
Continue
```
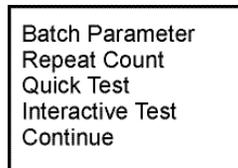
Batch Parameters

Choose Batch Parameters and press <Enter>. The following appears. Each field is explained below.

```
        Batch Parameters

Test Mode          : PASSBOUND
Time Limit Hrs     : 1
Time Limit Min     : 1
Number of Passes   : 1
Test Order         : Default
Wait On Error      : NO
Break On Error     : NO
Quick Test         : NO
Interactive Test   : NO
CONTINUE
```

Test Mode The test modes are:

Mode	Description
Continuous	The specified tests are executed until <Esc> or <Ctrl> <Break> is pressed.
Timebound	Specify how long the test is to run. Type the hours in the *Time Limit Hrs* field and the minutes in the *Time Limit Min* and press <Enter>. The maximum hours is 999. The maximum minutes is 59.
Passbound	Set the number of passes (up to 9,999) for the selected AMIDiag tests in the *Number of Passes* field. You can press <Enter> to accept the default (run each selected diagnostic test once).

Test Order The test order parameters are:

Parameter	Description
Default	The selected AMIDiag tests are executed in exactly the same order they were selected in.
Random	The selected AMIDiag tests are executed in a random manner.
Testwise	The selected AMIDiag tests are executed in the order they appear on the AMIDiag menus.

Test Order Example Assume that you want to run Test A three times, Test B two times, and Test C just one time. The AMIDiag tests would be run in the following manner, depending on the Test Order parameter:

Test Order Parameter	Actual order of tests as they are run
Default	A, B, C, A, B, A
Testwise	A, A, A, B, B, C
Random	A, B, B, A, C, A

Wait on Error This field can be set to *YES* or *NO*. If set to *YES,* AMIDiag waits for you to press any key after finding every error.

Break On Error This field can be set to *YES* or *NO*. If set to *YES,* AMIDiag stops running after it finds an error.

Batch Parameters, Continued

Quick Test   This parameter specifies that tests must be run in quick test mode. Abbreviated versions of the diagnostic tests are executed in quick test mode. The selected test are run in quick test mode if the test supports quick mode. You can use the quick test parameter in two ways:

Quick Test Use	Description
Complete a system test in a shorter time.	Select the diagnostic tests you want to run or you can press <F7> to select all diagnostic tests on an AMIDiag menu. Set the Quick Test parameter to Yes. If you press <F10> to run the tests, all tests except the tests that support quick test will run normally. The tests that support quick tests run in quick mode. If your computer has several IDE and SCSI hard disk and CD-ROM drives, testing all drives will take a long time. When you select quick test, the IDE and SCSI devices will be tested quickly, saving lots of time.
Use quick test mode for fast system verification	Press <F8> when the AMIDiag main menu is displayed to set this parameter to Yes and to select the tests defines as System Quick Test Components. You can either script this test by pressing <F4> or running the tests in batch mode by pressing <F10>.

Interactive Test Select Interactive Test parameter to run the interactive tests in interactive mode. Your input is required in an interactive test. The default value for this parameter is always No. The actions are:

Interactive Test Setting	Description
No	For all AMIDiag diagnostic tests hat support the interactive flag: if the test cannot be executed without your input, the test will not run. A message such as: `This test does not run in batch mode` appears. If the test can be run without your input but it is impossible to decide if the test has passed or failed without your input, the test will execute, but it will always pass.
Yes	If the test cannot be run without your input, it will run now and will wait for your input as appropriate. If the test can be run without your input, but it is impossible to decide if the test has passed or failed without your input, the test will execute and it will wait for your decision whether the test passed.

Repeat Count

The following appears when you select Repeat Count from the Edit Batch Parameters box. Choose the number of times that you want to run the AMIDiag tests on the associated AMIDiag menus. You can run each test 1 - 999 times. If you have set the Passbound parameters (see the previous screen) to 5 and you set the repeat count to 5, the test will be run a total of 25 times.

```
┌─────────────────────────────┐
│      Repeat Count           │
│                             │
│  System        : 1          │
│  Memory        : 1          │
│  HDD           : 1          │
│  FDD           : 1          │
│  SCSI          : 1          │
│  KBD           : 1          │
│  Video         : 1          │
│  Misc          : 1          │
│  User          : 1          │
│  CONTINUE                   │
└─────────────────────────────┘
```

Quick Test

Choose Quick Test. The screen that appears is similar to the Repeat Count screen, as shown below:

```
System
Memory
HDD
FDD
SCSI
KBD
Video
Misc
User
CONTINUE
```

Select the test group. A list of all tests appears. Tests that support quick test have Yes beside them. Highlight the tests to be run and press <Enter>.

```
CPU Protected Mode Test    Yes
Processor Speed Test       Yes
Coprocessor Test           Yes
DMA Controller Test        Yes
Interrupt Controller Test  Yes
Timer Test                 Yes
Real Time Clock Test       Yes
CMOS Validity Test         Yes
EISA System Test           Yes
PCI System Test            Yes
Plug-n-Play Test           Yes
USB Test                   Yes
Multi Processor Test       Yes
I2C Test                   Yes
```

Interactive Test

Choose Interactive Test. The screen that appears is similar to the Repeat Count screen, as shown below:

```
System
Memory
HDD
FDD
SCSI
KBD
Video
Misc
User
CONTINUE
```

Select the test group. A list of all tests appears. Tests that support interactive test have Yes beside them. Highlight the tests to be run and press <Enter>.

Aborting Tests Press <Esc> or <Ctrl> <Break> to abort the testing process. Testing stops after any test in progress has been completed.

Test Parameters

The following box appears when you select Test Parameters from the Edit Batch Parameters box. Each item in this box is the name of an AMIDiag menu. When you select an AMIDiag menu name from this menu and press <Enter>, all AMIDiag tests on the menu are listed. Choose the tests to be run in batch mode by highlighting the test and pressing <Enter>.

```
Test Parameters

System
Memory
HDD
FDD
SCSI
KBD
Video
Misc
User
CONTINUE
```

For example, if you select System, the following screen appears. If you highlight a test, such as Basic Functionality Test, the test parameters for that test are displayed. Set the parameters and select another diagnostic test. Select CONTINUE when you have set all test parameters for the AMIDiag test to be run in batch mode.

```
Test Parameters

Diskette Format
Drive Speed Test
Random R/W Test
Sequential R/W Test
Elevator Seek Test
Disk Change Line Test
```

Load Batch Parameters

You can load previously saved AMIDiag batch diagnostic test parameters by choosing this option. The following appears when you select this option:

```
Name of Script File to Load From
  C:\AMIDIAG5|AMIDIAG.INI
```

Press <Enter> to accept the default batch parameter file (AMIDIAG.INI) or type the appropriate AMIDiag batch parameter filename. You can use any valid DOS filename. The filename extension does not have to be .INI. You can then run the AMIDiag diagnostic tests that are specified in this file by pressing <F10>.

Save Batch Parameters

You can save all batch mode parameters, selected tests, selected devices, and error logging information to an AMIDiag batch parameter file via this option. You can then load this ASCII file later and use the same saved options to run another AMIDiag test session later. This option allows you to use the same test parameters every time you perform an AMIDiag session. The following appears when you select this option:

```
Name of Script File to Save To
  C:\AMIDIAG5|AMIDIAG.INI
```

Press <Enter> to accept the default batch parameter file (AMIDIAG.INI) or type the appropriate AMIDiag batch parameter filename.

Automatically Run Tests If you add the /R parameter when starting AMIDiag, AMIDiag automatically executes the batch parameters, then returns to the DOS command line when AMIDiag has completed running the batch parameters. You can then run the AMIDiag diagnostic tests that are specified in this file at a later date. Type

```
AMIDIAG /R AMIDIAG.INI
```

at the DOS prompt and press <Enter>.

Configuration Files

Test Configuration Files The structure of the test configuration files is similar to Microsoft Windows .INI files. The test configuration files must conform to the following guidelines:

- No spaces are permitted in the section name or entry name.
- The value string corresponding to an entry can be any text string.
- If there is no match found for an entry, a default value string is assumed.
- Strings are not case-sensitive.
- Invalid entries are ignored.
- Script file comment lines start with ';'. The ; does not have to be in the first column.

Type of Files The types of test configuration files are:

- AMITESTS.INI, and
- USRTESTS.INI (optional).

AMITESTS.INI This file contains information about the test configuration at the time AMIDiag was shipped. Since most AMIDiag tests are implemented as external .EXE programs to enhance AMIDiag's ability to run in a limited memory environment, information about the manner in which these tests is integrated into AMIDiag menus is stored in this file. You must not modify or delete this file.

USRTESTS.INI This optional script file must be in the same directory as AMIDIAG.EXE. USRTESTS.INI specifies the external user-generated AMIDiag tests and their properties.

USRTESTS.INI must have a TestInfo section. The information in this file can be written to your specifications. The TestInfo entries are:

Entry	Description
[TestInfo]	Information about new tests to be added. TestCount = Number of new tests. Test1 = Section Header for Test1 Test2 = Section Header for Test2 There must be a separate section for each test.

[{TestSectionHeader}]	Information about a test module.
	
	Group One of the group names.
	ID If tests have the same EXE file, this parameter identifies the
	            test.
	Description A 1-80 character test description displayed at the bottom of
	            the screen.
	ExePath The full pathname for the .EXE file.

Test Parameter Script File

This file describes the test parameters, both batch mode parameters and individual test parameters. This file can be created by AMIDiag. It can be edited by any text editor. This sections and entries in this file are:

Section	Entries	
[Cycles]	Count	Specifies the number of test cycles.
[CYCLEn:BatchParams]	Specifies batch mode parameters for cycle n.	
	Mode	Passbound, Timebound, or Continuous
	Passes	Specify the number of passes.
	Hours	Specify the hour part of time period if in Timebound mode.
	Minutes	Specify the minute part of the time if in Timebound mode.
	Order	Default, Random, or Testwise
	WaitOnError	YES or NO
	BreakOnError	YES or NO
[CYCLEn:ErrorLog]	Error Log parameters	
	LogErrors	YES or NO
	LogActivity	YES or NO
	StartTimeStamp	YES or NO
	EndTimeStamp	YES or NO
	Device	NONE, FILE, COMn, or LPTn
	File	Full pathname of log file.
	Heading	Title of the log.
[CYCLEn:TestName]	Individual test parameters	
	Repeat	Number of times to repeat the test in one pass of a cycle.
	Other parameters	Parameters specific to a test.

Sample AMIDIAG.INI File

```
[Cycles]                          Specifies the number of times to execute tests.
Count = 1

[Cycle1:BatchParams]
Mode = CONTINUOUS                 Specifies that these test will run until you press
    <Ctrl><Break>.
Order = Random                    Specifies that the test are executed in a random order.
Passes = 1
Hours = 1
Minutes = 0
WaitOnError = NO
BreakOnError = NO

[Cycle1:ErrorLog]
LogErrors = YES
LogActivity = YES
StartTimeStamp = YES
EndTimeStamp = YES
Device = None
File = AMIDIAG.LOG
Heading =

[Cycle1:BasicFunctionalityTest]
Repeat = 1

[Cycle1:ProcessorSpeedTest]
Repeat = 1

[Cycle1:CoprocessorTest]
Repeat = 1

[Cycle1:DMAControllerTest]
Repeat = 1

[Cycle1:InterruptControllerTest]
Repeat = 1
```

Cont'd

[Cycle1:TimerTest]
Repeat = 1

[Cycle1:RealTimeClockTest]
Repeat = 1

[Cycle1:CMOSValidityTest]
Repeat = 1

[Cycle1:PCISystemTest]
Repeat = 1

[Cycle1:Plug-n-PlayTest]
Repeat = 1

[Cycle1:BIOSROMTest]
Repeat = 1

[Cycle1:ParityTest]
Repeat = 1
StartAddress = 0
EndAddress = 1

[Cycle1:Walking1'sTest]
Repeat = 1
StartAddress = 0
EndAddress = 1

[Cycle1:Walking0'sTest]
Repeat = 1
StartAddress = 0
EndAddress = 1
[Cycle1:RefreshTest]
Repeat = 1
[Cycle1:PerformanceTest]
Repeat = 1
TestDriveC = Yes
[Cycle1:SeekTest]
Repeat = 1
StartCylinderC = 0
EndCylinderC = 1001
StartHeadC = 0
EndHeadC = 15
PercentageC = 100
TestDriveC = Yes

[Cycle1:Read/VerifyTest]
Repeat = 1
StartCylinderC = 0
EndCylinderC = 1001
StartHeadC = 0
EndHeadC = 15
PercentageC = 100
TestDriveC = Yes

[Cycle1:CheckTestCyl]
Repeat = 1
TestDriveC = Yes

[Cycle1:DisketteFormat]
Repeat = 1
RunTestOnFlp_A = YES
RunTestOnFlp_B = NO

[Cycle1:DriveSpeedTest]
Repeat = 1
RunTestOnFlp_A = YES
RunTestOnFlp_B = NO

[Cycle1:RandomR/WTest]
Repeat = 1
RunTestOnFlp_A = YES
RunTestOnFlp_B = NO

[Cycle1:SequentialR/WTest]
Repeat = 1
RunTestOnFlp_A = YES
RunTestOnFlp_B = NO

[Cycle1:ElevatorSeekTest]
Repeat = 1
RunTestOnFlp_A = YES
RunTestOnFlp_B = NO

[Cycle1:DiskChangeLineTest]
Repeat = 1
RunTestOnFlp_A = YES
RunTestOnFlp_B = NO

[Cycle1:ControllerTest]
Repeat = 1

[Cycle1:Scan/ASCIICodeTest]
Repeat = 1

[Cycle1:KeyboardLEDTest]
Repeat = 1

[Cycle1:KeyboardClockLineTest]
Repeat = 1

[Cycle1:KeyboardDatalineTest]
Repeat = 1

[Cycle1:VideoMemoryTest]
Repeat = 1

[Cycle1:AttributeTest]
Repeat = 1

[Cycle1:PageSelectionTest]
Repeat = 1

[Cycle1:ColorTest]
Repeat = 1

[Cycle1:SerialPortTest]
Repeat = 1
ParityCOM1 = None
StopBitsCOM1 = 2
DataBitsCOM1 = 8
LoopbackOnCOM1 = No
BaudStartCOM1 = 300
BaudEndCOM1 = 115200
RunTestOnCOM1 = Yes
ParityCOM2 = None
StopBitsCOM2 = 2
DataBitsCOM2 = 8
LoopbackOnCOM2 = No
BaudStartCOM2 = 300
BaudEndCOM2 = 115200
RunTestOnCOM2 = Yes

[Cycle1:ParallelPortTest]
Repeat = 1
PrinterOnLPT1 = No
RunTestOnLPT1 = Yes
PrinterOnLPT2 = No
RunTestOnLPT2 = Yes

Generate Reports

Select *Generate Report* to specify the output device:

```
┌─────────────────────────────────────┐
│  Report Generation                   │
│                                      │
│  Report Destination  :  NONE         │
│  Log Errors          :  YES          │
│  Log Test Activities  :  YES         │
│  Log Test Start Time :  YES          │
│  Log Test End Time   :  YES          │
│  CONTINUE                            │
└─────────────────────────────────────┘
```

Choose CONTINUE after setting report parameters.

Report Destination Choose where the report is sent. Select NONE, File, COM1, or LPT1. If you select File, enter a valid DOS filename when prompted.

Log Errors Select YES to direct AMIDiag to write all errors to the selected output device. The settings are YES or NO.

Log Test Activities Select YES to log all test activities (the test, how many times) to the output device. The settings are YES or NO.

Log Test Start Time Select YES to write the time that a test starts to the error logging device. The settings are YES or NO.

Log Test End Time Select YES to write the time that a test ends to the error logging device. The settings are YES or NO.

Error Logging Messages If a system error occurs while AMIDiag logs an error, one of the following may appear:

- Printer port not present,
- Serial port not present,
- Error in printer status,
- Error in serial port status
- *Abort, Retry* prompts are displayed for drive errors

Display Error Log File

AMIDiag allows you to display the error log while still running AMIDiag. The AMIDiag error log contains all diagnostic errors that AMIDiag has found during the current AMIDiag session.

To display the error log, select Display Error Log File from the AMIDiag Options menu. Enter the name of the error log file. The default filename is AMIDIAG.LOG. The AMIDiag error log file will be displayed.

DOS Shell

Select this option for the DOS prompt. You can run DOS programs and then return to AMIDiag by typing Exit at the DOS prompt.