HEWLETT PACKARD

DiagTools Version 2.2 User's Guide

HP Brio PCs
HP Vectra PCs
HP Kayak PC Workstations

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User's Guide

Who Should Read This Book

This manual is for anyone who wants to:

- Diagnose hardware problems on a Brio PC, Vectra PC or Kayak PC Workstation
- Understand the purpose of DiagTools
- Learn how to use DiagTools
- Know what to do when a test fails
- Provide HP-dedicated Support Agents with more information for solving problems quickly and effectively
- Find out where to get more information and support.

What is DiagTools?

The first step in solving a problem with a PC is *diagnosis*.

HP's DiagTools helps you diagnose hardware-related problems on a Brio PC, Vectra PC or Kayak PC Workstation. It is a series of tools designed to help you to:

- Verify the correct functioning of a Brio PC, Vectra PC or a Kayak PC Workstation
- Diagnose hardware-related problems
- Provide precise information to HP-dedicated Support Agents so that they can solve any problem quickly and effectively.

DiagTools is not a repair tool.

Overview of DiagTools

The hardware diagnostics utility has four parts:

- ❒ Hardware Detection, which automatically detects the complete hardware configuration of a Brio PC, Vectra PC or Kayak PC Workstation. Hardware detection is described in chapter 2.
- ❒ The Basic Tests, which determine the correct functioning of the PC as a whole. The basic test phase is described in chapter 3.
- ❒ The Advanced Tests. These provide complete, in-depth testing and diagnosis of the PC's individual components. The advanced test phase is described in chapter 4.
- ❒ The Support Ticket, which is a complete record of the test results and the PC's configuration. The support ticket can be used to communicate the test results to your local or HP-dedicated Support Agent. This is described in chapter 5.

Compatibility

DiagTools version 2.2 can run on the following HP platforms:

- ❒ Brio BA400
  Brio BA600

Additional models will be supported by this version of DiagTools. For more information refer to the HP Web site:

HP Vectra Support	http://www.hp.com/go/vectrasupport
HP Kayak Support	http://www.hp.com/go/kayaksupport

Other versions of DiagTools are available for older Brio, Vectra and Kayak models.

Specific DiagTools versions are also available for HP Omnibook, HP NetServer and HP Thin Client computers.

More Information

For more information about DiagTools, visit the HP Web site:

`http://www.hp.com/desktops/diagtools`

For more information about the HP Web site and HP Customer Care Service and Support, refer to page 34.

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1

Running DiagTools

This chapter describes how to run the Brio, Vectra and Kayak Hardware Diagnostics.

Overview

This version of HP DiagTools is supplied on the following media:

- ❒ The special partition pre-installed on your hard disk.
- ❒ The HP PC Image Engineer - Image Creation and Recovery CD-ROM (for Vectra and Kayak), or Brio Assist CD-ROM (for Brio) supplied with your new HP PC.
- ❒ The HP DiagTools CD-ROM.

Before Running DiagTools

Before you run DiagTools, ensure that the following are correctly configured in the computer's BIOS Setup program:

- ❒ No operating system is specified, which means that:
  - if the **Main** menu has an item **Running Windows 95** or **Plug and Play OS**, set it to **No**
  - if the **Main** menu has an item to select the operating system, set it to **Other**.
- ❒ All **Hardware Protection** items in the **Security** menu are set to **Enabled** or **Unlocked**.
- ❒ If you are running DiagTools from a CD-ROM, the option to start from the CD-ROM is enabled and the CD-ROM is configured to be the first device to boot from.

  Alternatively, on Vectra and Kayak PCs, you can set the boot device priority by pressing the F8 key when the logo screen is displayed after restarting your computer.

After running DiagTools, restore the original Setup values.

More Information About The PC's Setup Program

Setup is an integrated (ROM-based) program that displays the PC's configuration and allows you to change the configuration parameters.

Setup changes system behavior by modifying the power-on initialization parameters. Setting incorrect values may cause the PC to fail at start-up. If this occurs, press F9 in the Setup program. This will load the Setup default values and allow the PC to recover.

To enter the PC's Setup program, restart the PC and press F2 when the logo screen (or the Summary screen) appears.

Running DiagTools from the Special Partition on your Hard Disk

To run DiagTools from the special partition on your computer's hard disk drive, follow this procedure:

1 Quit all applications, shut down the operating system, and restart your computer.

2 After the initial splash screen with the logo, a message is displayed:

```
Press <F10> to start Hardware Diagnostics ...
or any other key to proceed
```

3 Press the F10 key. DiagTools will start automatically, displaying the Welcome screen (refer to page 6).

NOTE

If this does not work, it probably means that the special partition has been disabled. Try running DiagTools from a CD-ROM instead. Alternatively, if you have not stored any programs or data on your hard disk drive, you can use the Recovery CD-ROM supplied by HP to restore the disk image as it came originally from factory.

Running DiagTools from the HP "Recovery" CD-ROM

To run DiagTools from the HP PC Image Engineer - Image Creation and Recovery CD-ROM (for Vectra and Kayak), or Brio Assist CD-ROM (for Brio) that came with your computer, follow this procedure:

1 Insert the HP CD-ROM in your CD-ROM drive. Shut down the operating system and restart your computer.

2 Ensure that the option to start from the CD-ROM drive is enabled, and that the CD-ROM is configured to be the first device to boot from.

3 The main menu of the HP CD-ROM appears. Select the option to run the hardware diagnostics.

DiagTools will start, displaying the Welcome screen (refer to page 6).

Running DiagTools from the HP DiagTools CD-ROM

To run DiagTools from the HP DiagTools CD-ROM, follow this procedure:

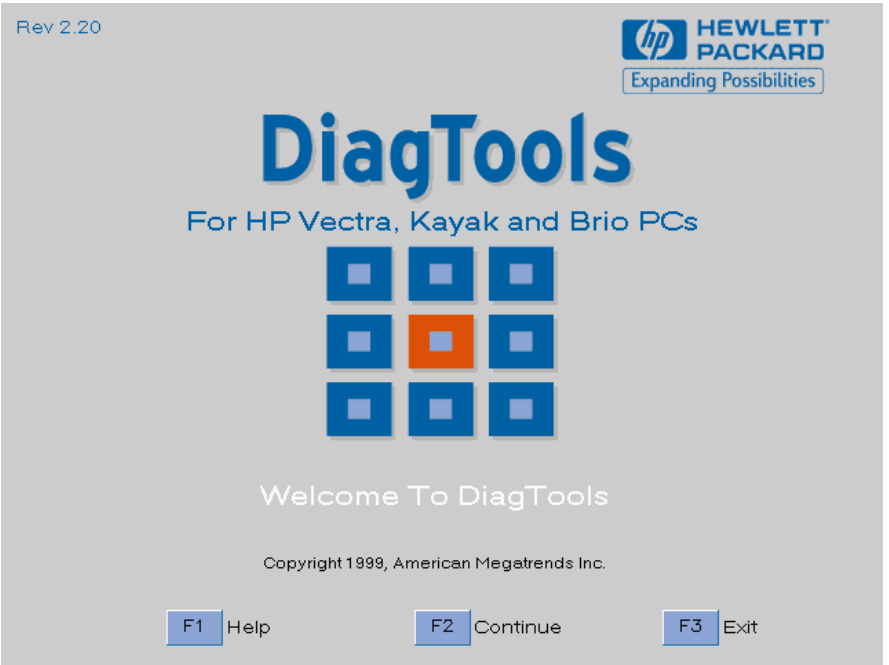
1 Insert the HP DiagTools CD-ROM in your CD-ROM drive. Shut down the operating system and restart your computer.

2 Ensure that the option to start from the CD-ROM drive is enabled and that the CD-ROM is configured to be the first device to boot from.

3 The programs on the CD-ROM will automatically determine the appropriate version of DiagTools to run. DiagTools will start, displaying the Welcome screen (refer to page 6).

The Welcome Screen

When you start DiagTools, you will see the following screen:



Press F2 to continue and follow the instructions on the screen to run the diagnostic tests. You can quit the diagnostic utility at any time, except during the execution of the basic system test which takes several minutes. In general, the progression of each test is displayed on the screen.

2

Hardware Detection

This chapter describes the hardware detection phase of the Brio, Vectra and Kayak version of DiagTools.

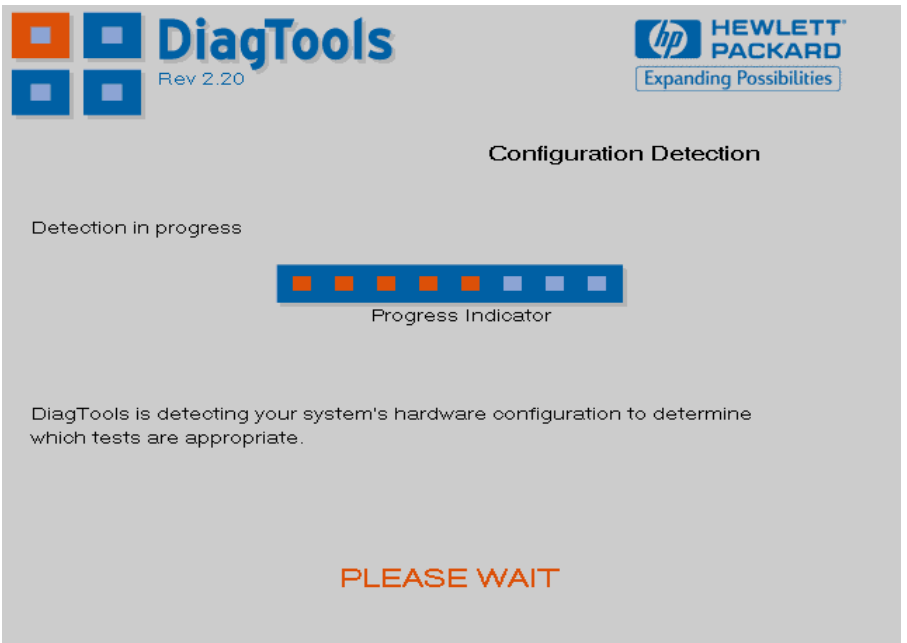
Overview of Hardware Detection

Hardware detection finds and lists the main PC's hardware components. It also determines which tests are appropriate for your PC. For example, if your PC has an IDE or SCSI hard disk drive, the boot sector of the hard disk drive will be checked as part of the basic system test.

In the advanced tests, some functions will be disabled if they are not detected. For example, if you do not have a SCSI controller, the **SCSI** menu in the advanced tests will be disabled.

During Hardware Detection

The following screen appears during hardware detection:

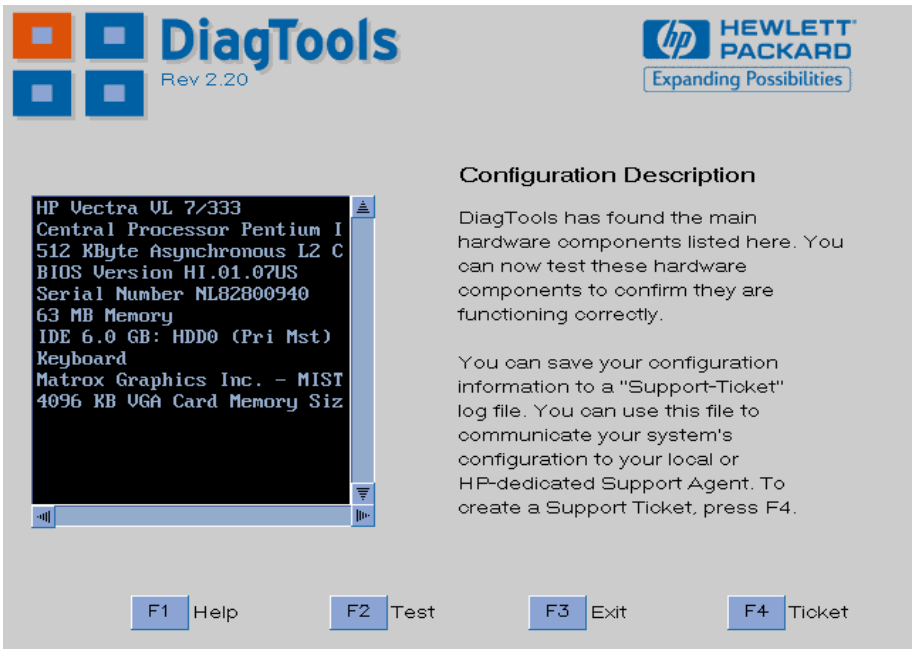


NOTE

Hardware detection may be so fast that this screen simply flickers on and off, without giving you time to read it. This is normal. The time required for hardware detection varies greatly between the different systems and different configurations.

Hardware Detection Results

The following is an example of a screen that will appear after the hardware detection phase:



You can use the mouse or the arrow keys to scroll through the list of detected components.

What is Detected

The following can be detected in the hardware detection phase:

- ❒ Product name and version (such as **`HP Vectra VL600`**)
- ❒ Processor type, version and speed (such as **`Central Processor Pentium II @500 MHz`**)
- ❒ Cache memory type and size
- ❒ BIOS version
- ❒ Serial number
- ❒ Total main memory (such as **`64 MB Memory`**)
- ❒ IDE hard disk list, device type, and capacity
- ❒ SCSI hard disk list, device type, and capacity
- ❒ Active graphics adapter: vendor, product name, memory size
- ❒ Keyboard
- ❒ Sound Blaster compatible audio controller
- ❒ USB Controller.

If your PC has one or more of the above components and it is not detected by DiagTools, then refer to “If a PC Component is Not Detected” on page 11.

If a PC Component is Not Detected

If a component or device in your PC (such as a hard disk drive) is not detected, do the following:

1 Check the list of components that DiagTools should detect (this is on page 10).
If the non-detected component *is not* in this list, then there is no error and the situation is normal.
If the non-detected component *is* in this list, continue to the next step.

2 Check that the PC is correctly configured in the PC's Setup program. (Refer to page 3 for more information about the PC's Setup program.)

3 Refer to the User's Guide that came with the PC for information about troubleshooting the PC.

4 Run the DiagTools and proceed to the basic system test.

NOTE

DiagTools does not test components that have not been detected. However, we recommend that you continue with the basic system test to verify that the underlying components are functioning correctly.

For example: a PC has a PCI SCSI controller card installed and a SCSI hard disk connected to this controller. Even if the SCSI hard disk drive is not detected, running the basic system test will ensure the correct functioning of the PCI system that supports the SCSI controller.

5 If the problem persists, contact your local or HP-dedicated Support Agent for assistance.

If a PC Component is Not Detected

3

Basic System Test

This chapter describes the basic system test performed by DiagTools.

Overview of the Basic System Test

The basic system test is performed after hardware detection. The purpose of the basic system test is to verify the correct operation of the main PC's hardware components. For each detected hardware component, the test will confirm that:

- The component is powered-on
- The component has been initialized for use
- The component is operating correctly under MS-DOS.

Unlike the advanced system tests, the basic system test is done automatically and no user input or guidance is needed. This test phase is suitable for all types of users, including novice and non-technical users.

Most of the PC's components are tested during the basic system test. To test *each* PC's component, use the advanced systems tests.

How to Run the Basic System Test

The basic system test is performed after the hardware detection phase. To do the basic system test, follow these steps:

1 Start DiagTools. To learn how to do this, refer to chapter 1.

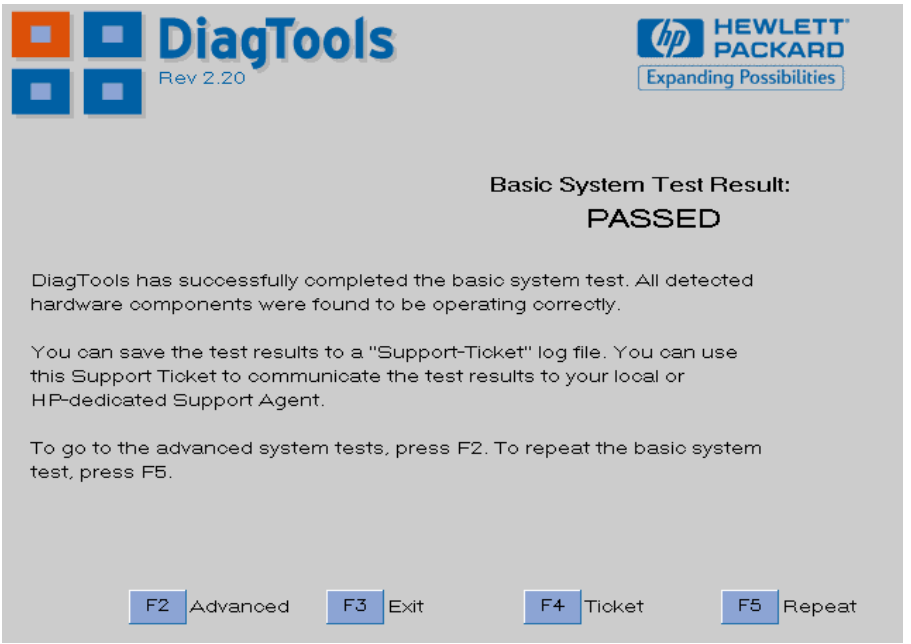
2 Follow the instructions on the screen to proceed with hardware detection. Hardware detection is described in chapter 2.

3 You will then be invited to proceed with the basic system test. Press F2 and follow the instructions on your screen.

NOTE The screen image may become corrupted during the basic system test. This is normal. Do not restart your system. The image will be restored after the test is complete.

Test Result: *PASSED*

If the basic system test is successful, a screen similar to the following will appear:



The following action is recommended:

- If you are running the Hardware Diagnostics for verification purposes only, there is no need to continue with the Advanced Tests or to create a support ticket. Press F3 to exit DiagTools.
- If you are investigating a known hardware problem, press F4 to create a Support Ticket. Although no failure was detected, the Support Ticket will be effective for communicating the test results and PC configuration to your local or HP-dedicated support agent. (To learn more about the Support Ticket, refer to chapter 5.)

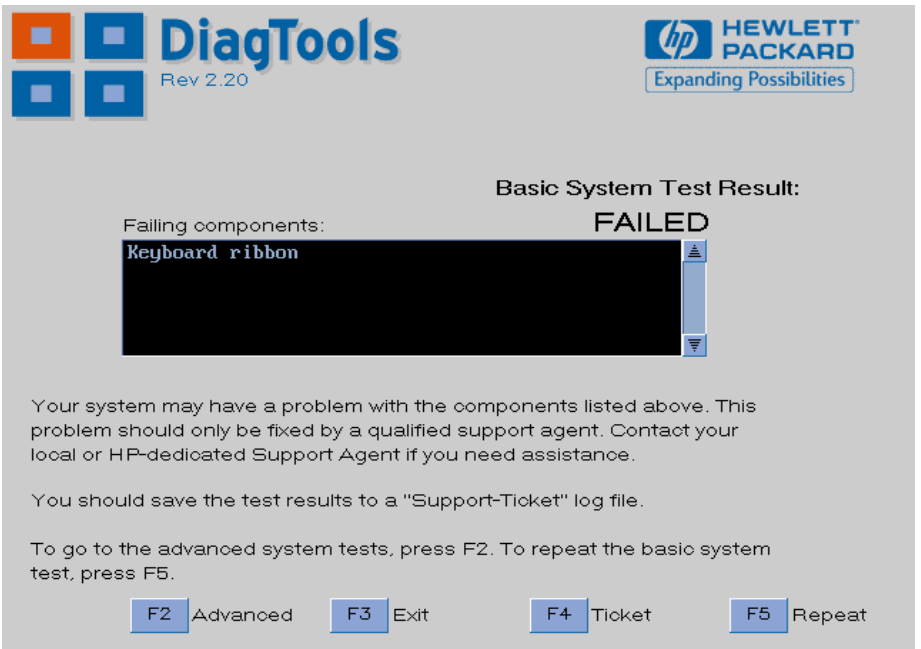
  Intermediate and experienced users should proceed to the Advanced System Tests, since the error was not traced using the basic system test.

If you are a less experienced user, contact your local or HP-dedicated support agent for assistance. You may be asked by your support agent to conduct an advanced system test.

You can repeat the basic system test if desired. To do this, press F5.

Test Result: *FAILED*

If one or more of the basic tests failed, a screen similar to the following will appear:



NOTE

Test failure does not necessarily mean that a component needs replacement. For example, it may simply mean that there is a configuration error or that there is a loose cable.

What to do if the Basic System Test Fails

The following actions are recommended:

- Create a Support Ticket now. The Support Ticket is a complete record of the test results. It is the most effective way to communicate the problem to your local or HP-dedicated support agent. (To learn more about the Support Ticket, refer to chapter 5.)
- If you are a novice user, contact your local or HP-dedicated support agent for assistance. You can e-mail or fax them the Support Ticket. You can also add extra information and your own comments to the Support Ticket (to learn how to do this, refer to page 32).
- If you are an intermediate or experienced user, you can proceed to the Advanced Tests to investigate the error in greater depth if necessary.

At this point, you may have sufficient information to resolve the problem. If so, you can exit DiagTools after creating the Support Ticket.

You can repeat the basic system test if desired. To do this, press F5.

What is Tested

The basic tests include the following:

- ❒ Basic System Tests, to verify the correct functioning of the processor and subsystems:
  - Basic processor functionality
  - DMA controller
  - Interrupt controller
  - Timer
  - Real time clock
  - CMOS Validity
  - PCI system
  - MMX
  - DMI
  - Multi-processor (if appropriate)
- ❒ Memory Tests, to check the correct functioning of main and cache memory:
  - BIOS ROM
  - Parity
  - Address
  - Refresh
  - Data bus
  - Cache memory
  - L2 Cache memory
- ❒ IDE hard disk drive tests, to check the basic functioning of any IDE hard disk drives.
  - Basic IDE HDD functionality
- ❒ SCSI hard disk drive, to check the basic functioning of any SCSI hard disk drives:
  - Basic SCSI HDD functionality

❒ Keyboard tests:

- Keyboard controller
- Keyboard clock line
- Keyboard data line

❒ VESA Video memory test

❒ USB test

❒ Other tests:

- Basic serial port test (does not include data transfer – this is an advanced test)
- Basic parallel port test (does not include actual printing – this is an advanced test)

Each test listed above is performed only if it is appropriate for your PC's configuration. For example, if your PC does not have a SCSI controller, or no SCSI hard disk is connected to the SCSI controller, no SCSI tests will be done.

Furthermore, a component test will only be performed if the component was correctly detected in the hardware detection phase. For example, if you have recently installed an IDE hard disk drive and it was not detected during the hardware detection phase, the hard disk drive will not be tested. (For more information about hardware detection, refer to page 7.)

NOTE

DiagTools does not test components that have not been detected. However, we recommend that you continue with the basic system test to verify that the underlying components are functioning correctly.

4

Advanced System Tests

This chapter describes the advanced system tests. Individual PC components can be thoroughly tested using the advanced system tests.

Overview of the Advanced System Tests

The advanced system tests can be used to test each of the PC's components. These tests are more thorough and cover a wider range of functionality than the basic system tests.

The appearance and operation of this test phase is different from the other parts of the Hardware Diagnostics.

Unlike the basic system test, each advanced test must be selected and initiated by the user through the on-screen menus. Most of the tests are configurable and all can be repeated any number of times.

This advanced test phase is suitable for intermediate and advanced users.

How to Enter the Advanced System Tests

The advanced system tests can only be entered after the basic system tests have been completed. To enter the advanced system tests, do these steps:

1 Start DiagTools. To learn how to do this, refer to chapter 1.

2 Follow the instructions on the screen to proceed with hardware detection. Hardware detection is described in chapter 2.

3 Follow the instructions on the screen to complete the basic system test. The basic system test is described in chapter 3.

4 Press F2 and follow the instructions on your screen to enter the advanced system tests.

Help on Advanced Tests

You can get more information about each available test. There are two ways to get information about a test:

- At the bottom of the screen there is a one-line explanation of the test currently selected in the menu. To get help for any test, simply move the selection bar onto the corresponding menu item.
- Press F1 for more in-depth help on the test currently selected in the menu. To return to the advanced test screen, press Esc.

To move the selection bar between menus and menu items, use the mouse or arrow keys (◁, ▷, △ and ▽).

How to Run an Advanced System Test

Each test must be selected and started by the user. There are two ways of running tests:

- Individually, by selecting the test in the menu
- In a batch, by using the Batch facility. Refer to “Batch Tests” on page 25.

To perform an advanced test, do these steps:

1 At the top menu bar, select the component to test. The following components are available:

- **System**: processor and sub-system tests
- **Memory**: BIOS, main memory, and cache memory tests
- **IDE**: IDE device (such as an IDE hard disk drive) tests
- **FDD**: floppy disk drive tests
- **SCSI**: SCSI device (such as a SCSI hard disk drive) tests
- **KBD**: keyboard tests
- **Video**: graphics system tests
- **USB**: Universal Serial Bus tests
- **Misc**: other tests, such as mouse and serial port tests
- **User**: user defined tests
- **Batch**: to run a pre-defined set of tests.

NOTE

Some menus will be disabled if they are not appropriate for your PC. For example, if you do not have a SCSI controller, the **SCSI** menu in the advanced tests will be disabled.

2 A sub-menu appears, showing the list of tests available for the selected component. Select the desired test by moving the selection bar and pressing Enter.

3 Depending on the test selected, the test may start immediately. Alternatively, a window of test parameters is displayed.

To change a test parameter, select the parameter and press Enter. You can then select between the available values for that parameter. We recommend that you change these configuration values only if you are familiar with their meaning and purpose.

To proceed with the test, select **Continue**.

Press Esc to abort the test while it is running. Some tests are critical and cannot be aborted. If you abort the test, the message **Test Aborted** is displayed.

Once the test has completed, a window appears indicating the result: **`Test Passed`** or **`Test Failed`**. The window also has several command options so that you can select your next action:

- **`Return to Main Menu`**: to return to the main screen, allowing you to run another test.
- **`Browse Current Test Errors`**: to browse the errors produced in the test you have just done.
- **`Browse All Test Errors`**: to browse all the errors that have arisen since you started the advanced system tests (or since you last erased the error list).
- **`Erase Error List`**: to delete the complete list of errors.

CAUTION

Do not use the **`Erase Error List`** command if you want to create a Support Ticket (test report). The error list is used to create the Support Ticket.

To create and view the Support Ticket, press the <T> key.

Batch Tests

You can use the batch test facility to run a pre-defined suite of advanced tests. Each test in the batch is initiated automatically.

Help on Using Batch Tests

For help on how to use the batch facility, select the command **`Batch Help`** in the **`Batch`** menu.

For help on selecting tests, choose the **`Test Selection`** command in the **`Batch`** menu.

Selecting Batch Tests

First, you must configure the batch test. To do this, use the **Edit Batch Parameters** submenu in the **Batch** menu. The **Edit Batch Parameters** submenu has these commands:

- **Batch Parameters**: to configure the test mode, time limit, and number of passes.
- **Repeat Count**: This command allows you to set the number of times each test is run, from 1 (run test once), to 256.
- **Test Parameters**: to set the parameters for the tests included in the batch.

Running the Batch Test

To run the batch test you have configured, select the **Run Batch** command in the **Batch** menu.

The **Batch** menu also contains these commands:

- **Save Batch**: to save the current batch test (with current settings).
- **Load Batch**: to load a previously saved batch test.

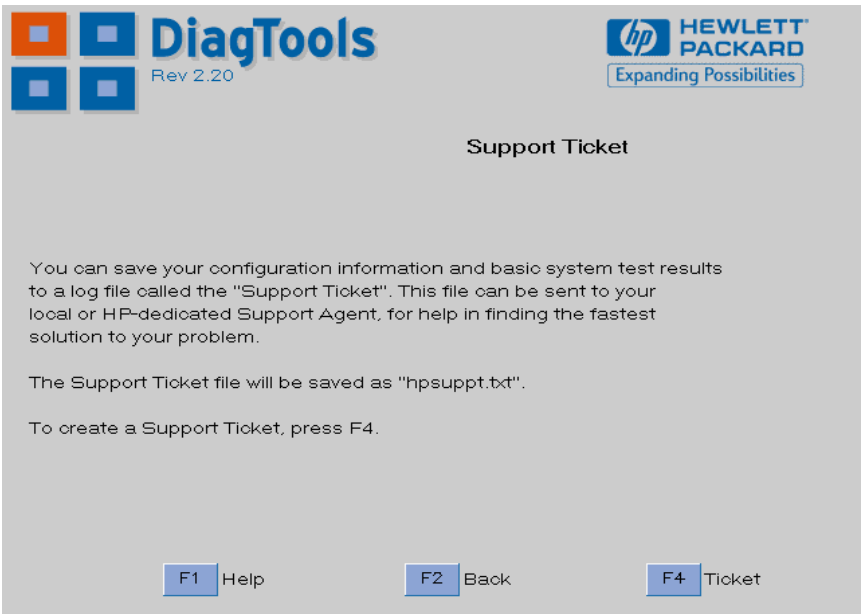
NOTE

You cannot change the order in which the tests are performed.
You can abort a batch test while it is running by pressing Esc.

What to Do if a Test Fails

The following actions are recommended:

1 Press Esc to exit the Advanced System Tests. A screen similar to the following will appear:



2 Press F4 to create a Support Ticket. The Support Ticket is a complete record of the test results. It is the most effective way to communicate the problem to your local or HP-dedicated support agent. (To learn more about the Support Ticket, refer to chapter 5.)

3 If you need assistance, contact your local or HP-dedicated support agent for assistance. You can e-mail or fax them the Support Ticket. You can also add extra information and your own comments to the Support Ticket (to learn how to do this, refer to page 32).

At this point, you may have sufficient information to resolve the problem. If so, you can press F3 to exit DiagTools, or press F2 to return to the Advanced System Tests.

What to Do if You Get an Error Code

Consult the error codes lists in Appendix A. For each error code, the source of the error is given, as well as recommended actions. Note that the listed actions are *not* obligatory, but are suggested actions, provided to help you find the most appropriate solution to the problem.

If the Error Code is Not Listed

If the error code you are looking for is not provided in Appendix A, contact your local or HP-dedicated Support Agent.

Sending Comments and Suggestions to HP

You can email all information about missing error codes, as well as any comments and suggestions to the email address provided in the HP World Wide Web Site, at **`http://www.hp.com`**.

5

The Support Ticket

This chapter describes the Support Ticket, which is a record of the test results and the PC's configuration.

What is the Support Ticket?

The Support Ticket is a text file that contains a complete record of the test results and the PC's configuration. It is the most effective way of communicating this essential information to your local or HP-dedicated Support Agent. If necessary, you can e-mail or fax the Support Ticket to your support agent.

You can also add extra information and your own comments to the Support Ticket.

Creating a Support Ticket

The Support Ticket can be created:

- After the hardware detection phase (refer to chapter 2)
- After the basic system test (refer to chapter 3)
- During the advanced system tests, by pressing the <T> key.
- After you exit the advanced system tests (refer to chapter 4).

DiagTools will ask if you want to create a support ticket. If you choose to create a Support Ticket, it will take several minutes to complete.

The default file name of the Support Ticket is HPSUPPT.TXT. You cannot change this file name, but you can specify a directory where to store this file.

The Support Ticket can be stored on a floppy disk or in a temporary area, and it can be viewed on the screen.

NOTE

If you choose to store the Support Ticket on a floppy disk, ensure that the disk is formatted and has sufficient free space. If you want to keep a Support Ticket, ensure that you copy it to a safe place before creating the new one. You can do this by copying the Support Ticket file to another floppy disk or to a suitable directory on your hard disk drive.

Viewing the Support Ticket

Once the Support Ticket has been successfully created, you can view it in two ways:

- Press F7 after the Support Ticket has been successfully created.
- When you exit DiagTools, open the HPSUPPT.TXT file using a text editor such as Microsoft Windows Notepad.

Adding Comments to the Support Ticket

You can add extra information or your own comments to the Support Ticket. This can help your support agent solve the problem more quickly and effectively.

CAUTION

Do not remove any information from the Support Ticket. The information may be essential to your support agent.

To add your comments to the Support Ticket, follow these steps:

1. Run a text editor. We recommend you use text editor such as Microsoft Windows Notepad to preserve the Support Ticket's layout.
2. Open the Support Ticket file. (The file name and location of the Support Ticket is given when it is created.)
3. Go to the section entitled **`Your Comments`** at the end of the file.
4. Type in your comments, using the headings provided as a guideline. For example, under the heading **`Operating System`**, enter the name of your operating system, such as "Windows NT 4.0".
5. Save the file and exit the text editor.

6

HP Customer Care Service and Support

Your HP Authorized Reseller

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Appendix A

The Error Codes

This appendix lists all error codes produced by the Hardware Diagnostics tests. A description of the error and a recommended action are provided for each error code.

Error Code Overview

The error codes are categorized by component in ascending order:

0000h – 00FFh:	System Error Codes
0100h – 01FFh:	Memory Error Codes
0300h – 03FFh:	Floppy Disk Error Codes
0400h – 04FFh:	Keyboard Error Codes
0500h – 05FFh:	SCSI Error Codes
0600h – 06FFh:	Serial Port Error Codes
0700h – 07FFh:	Parallel Port Error Codes
0800h – 080Fh:	SB (Sound Blaster) Compatible Error Codes
0810h:	Speaker Error Code
0811h – 081Fh:	WSS (Windows Sound System) Compatible Error Codes
0900h – 09FFh:	Video Error Codes
0A00h – 0AFFh:	CD-ROM Error Codes
0C00h – 0CFFh:	IDE Tape Error Codes
0E00h – 0EFFh:	SMBus (System Management Bus) Test Error Codes
0F00h – 0FFFh:	ATAPI Removable Devices Error Codes
1000h – 10FFh:	Multiple Processor Error Codes
1200h – 12FFh:	TI Card Bus Test Error Codes
1300h – 13FFh:	USB Error Codes
1700h – 170Fh:	ACPI Test Error Codes
1900h – 1902h:	DVD Error Codes
8000h:	DiagTools Error Codes
9610h:	Matrox Video Error Codes
9621h:	Crystal Sound Error Codes
9630h:	3Com Lan Error Codes
9640h – 966Ch:	Hard Disk Error Codes

The full list of error codes and the parts to check are provided in the pages that follow.

0000h – 00FFh: System Error Codes

Code	Explanation	Details/Parts to Check
0001h	Cannot load the MSW (Machine Status Word).	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0002h	Cannot load the GDT (Global Descriptor Table) Register.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0003h	Cannot load the IDT (Interrupt Descriptor Table) Register.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0004h	ARPL instruction execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0005h	LAR (Load Access Rights Byte) instruction execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0006h	LSL (Load Segment Limit) instruction execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0007h	VERR (Verify a Segment for Reading) instruction execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0008h	VERW (Verify a Segment for Writing) instruction execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.

Code	Explanation	Details/Parts to Check
0009h	Cannot enable the A20 line.	Keyboard controller error. Check connections to the keyboard controller. If error persists, install new system board.
0010h	32-bit register read or write error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0011h	PUSHA(D) or POPA(D) execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0012h	Cannot access data through the FS or GS registers.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0013h	BSF or BSR execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0014h	FLAG Register Set or Reset error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0015h	Protected mode instruction execution error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0016h	32-bit multiplication error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
001Eh	The detected processor Speed is not the same as specified.	Processor clock error. Check that correct clock speed is selected by system board switches.

Code	Explanation	Details/Parts to Check
0020h	NDP (Numeric Data Processor) is not ready.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0021h	Cannot reset the NDP.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0022h – 0025h	NDP control word read or write error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0026h	Cannot reset the NDP control word.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0027h	NDP Tag word read or write error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0028h	NDP stack read or write error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0029h – 002Ah	NDP operation status has failed.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
002Bh	Integer load or store error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
002Ch	NDP Tag word read or write error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.

Code	Explanation	Details/Parts to Check
002Dh	NDP stack pop error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
002Eh – 002Fh	NDP Tag word read or write error.	Processor error. Check that the processor is correctly installed. If the error persists, install new processor.
0030h	Read/Write test on DMA controller 1 failed.	Direct Memory Access (DMA) controller error. Install new system board.
0031h	Read/Write test on DMA controller 2 failed.	Direct Memory Access (DMA) controller error. Install new system board.
0032h	Read/Write test on page registers failed.	Direct Memory Access (DMA) controller error. Install new system board.
0040h	Read/Write test on PIC ports failed.	Programmable Interrupt Controller (PIC) error. Install new system board.
0041h	Stray or unrecognized interrupts detected.	Primary Interrupt Controller (PIC) error. Install new system board.
0050h	The Timer Periodic Interrupt is not being generated.	Real Time Clock (RTC) error. Install new system board.
0051h	The Timer is counting at a slower rate.	Real Time Clock (RTC) error. Install new system board.
0052h	The Timer is counting at a faster rate.	Real Time Clock (RTC) error. Install new system board.
0060h	The Real Time Clock Periodic Interrupt is not being generated.	Real Time Clock (RTC) error. Install new system board.
0061h	The Real Time Clock is running at a slower rate.	Real Time Clock (RTC) error. Install new system board.

Code	Explanation	Details/Parts to Check
0062h	The Real Time Clock is running at a faster rate.	Real Time Clock (RTC) error. Install new system board.
0063h	The date and time read from Real Time Clock CMOS RAM are different from that of written.	CMOS RAM error. Install new system board.
0070h	The battery backup unit that powers CMOS RAM has no power.	Install new system board battery.
0071h	Bad CMOS RAM checksum detected.	CMOS RAM error. Install new system board battery. If error persists, install new system board.
0072h	Configuration mismatch in CMOS RAM.	CMOS RAM error. Install new system board battery. If error persists, install new system board.
0073h	CMOS RAM memory size.	CMOS RAM error. Install new system board battery. If error persists, install new system board.
0074h	CMOS RAM time is invalid.	CMOS RAM error. Install new system board battery. If error persists, install new system board.
0075h	Time-base frequency divider set at incorrect value.	CMOS RAM error. Re-start system and check BIOS setup parameters. Install new system board battery. If error persists install new system board.
0076h	Divider output frequency set to an incorrect value.	CMOS RAM error. Re-start system and check BIOS setup parameters. Install new system board battery. If error persists install new system board.

Code	Explanation	Details/Parts to Check
0077h	Periodic time update cycle not occurring.	Real Time Clock (RTC) error. Install new system board.
0078h	CMOS RAM checksum error detected.	CMOS RAM error. Install new system board battery. If error persists, install new system board.
0079h	CMOS RAM fails to hold data.	CMOS RAM error. Install new system board battery. If error persists, install new system board.
0080h	This test runs on EISA systems only	You attempted to run this test on a system that does not have an EISA architecture.
0081h	EISA software NMI test failed	Install new system board.
0082h	EISA fail-safe timer test failed	Install new system board.
0083h	PCI System Bus scan test failed.	BIOS or system board error. Install new system BIOS. If error persists, install new system board.
0084h	Cannot access PCI devices through the FIND_PCI_DEVICE call.	Install new BIOS or system board.
0085h	Reading configuration space registers on boundary conditions failed.	Install new BIOS or system board.
0086h	Consistency checking of PCI configuration space failed.	Install new BIOS or system board.
0087h	GENERATE_SPECIAL_CYCLE check failed.	Install new system board.
0088h	BIOS32 service directory integrity check failed.	BIOS error. Install new system BIOS.
008Ah	PCI stress test failed. Buffer data mismatch.	Check that the SCSI controller is correctly installed.

Code	Explanation	Details/Parts to Check
0090h	PnP function 00 failed.	Install new system BIOS.
0091h	PnP function 01 failed.	Install new system BIOS.
0094h	Number of system device nodes is not the same as reported.	Install new system BIOS. If error persists, install new system board.
0095h	One or more nodes have larger than reported size.	Check all PnP devices.
0096h	ISA bus detected twice.	Install new system BIOS.
0097h	No EISA bus system device node	Install new system BIOS.
0098h	Motherboard has no EISA ID	Install new system BIOS.
0099h	One or more EISA slots are not configured.	Run the ECU, and then re-run DiagTools. If error persists, install new system BIOS.
009Ah	PnP function 40 failed.	Install new system BIOS.
009Bh	Invalid number of PnP cards.	Check all PnP devices.
009Ch	One or more unknown PnP cards.	Install new system BIOS.
009Dh	No PCI bus system device node.	Install new system BIOS.
009Eh	Too many PCI buses.	Install new system BIOS.
009Fh	Insufficient memory.	Delete drivers before running DiagTools.
00A0h	PnP function 41 failed.	Install new system BIOS.
00A1h	NVRam buffer size too big.	Install new system BIOS. If error persists, install new system board.
00A2h	ESCD size is too small.	Install new system BIOS. If error persists, install new system board.
00A3h	ESCD size is too big.	Install new system BIOS. If error persists, install new system board.

Code	Explanation	Details/Parts to Check
00A4h	NVRam base address is invalid.	Install new system BIOS.
00A5h	PnP function 42 failed.	Install new system BIOS.
00A6h	PnP function 43 failed.	Install new system BIOS.
00A7h	NVRam test failed.	Install new system BIOS. If error persists, install new system board.
00C0h	Non-Intel processor.	Install Intel processor.
00C1h	Non-Pentium processor.	Install Pentium processor.
00C2h	Non-MMX processor.	Install MMX processor.
00C3h	MMX Registers Read/Write failed.	Install new processor.
00C4h	Wraparound Arithmetic test failed.	Install new processor.
00C5h	Saturation Arithmetic test failed.	Install new processor.
00C6h	Pack with signed saturation failed.	Install new processor.
00C7h	Pack with unsigned saturation failed.	Install new processor.
00C8h	Unpack high packed data failed.	Install new processor.
00C9h	Unpack low packed data failed.	Install new processor.
00CAh	Exit MMX state instruction (EMMS) failed.	Install new processor.
00CBh	Matrix transpose test failed.	Install new processor.
00CCh	MMX performance failed.	Install new processor.
00FFh	Out of memory.	Re-run DiagTools using keyboard only.

0100h – 01FFh: Memory Error Codes

Code	Explanation	Details/Parts to Check
0100h	ROM read error. DiagTools was not able to read from a ROM location.	System board error. Install new system board.
0101h	ROM not write-protected.	System board error. Install new system board.
0102h	BIOS cannot set the year to 2000 after 1999 midnight.	BIOS error. Install new system BIOS.
0120h	Parity error at absolute memory location XXXXXXXXh.	Memory error. Replace appropriate memory module.
0130h	The pattern written at XXXXXXXXh was qqqqh. The pattern read back from that address was pppph.	Memory error. Replace appropriate memory module.
0131h	Parity failure at XXXXXXXXh during pattern test.	Memory error. Replace appropriate memory module.
0132h	Faulty memory chip in SIMM XXXX.	Install new SIMM XXXX.
0135h	ECC correctable error in SIMM/DIMM socket XXXX/YYYY	Memory error. Replace appropriate memory module.
0136h	ECC can not be corrected. Error in SIMM/DIMM socket XXXX/YYYY.	Memory error. Replace appropriate memory module.
0137h	Error occurred on bank XXXX interleave YYYY	Memory error. Replace appropriate memory module.
0140h	Failure at address XXXXXXXXh, bit position bbh.	Memory error. Replace appropriate memory module.

Code	Explanation	Details/Parts to Check
0150h	Failure at XXXXXXXXh, bit position bbh.	Memory error. Replace appropriate memory module.
0160h	There is an address short between bit xxh and yyh.	Processor or system board error. Check that the processor is correctly installed. If error persists, install new processor.
0170h	RAM Refresh is not working.	System timer error. Install new system board.
0171h – 0172h	RAM Refresh is slower or faster than expected.	System timer error. Install new system board.
0180h	The pattern written at address XXXXXXXXh was qqqqh. The pattern read back from that address was pppph.	Memory error. Replace appropriate memory module.
0181h	No Active External Cache Memory.	Cache memory error. Enable external cache memory from BIOS setup.
0182h	No extended memory available from HIMEM.SYS	Memory error. Replace appropriate memory module.
0183h	No extended memory detected.	Memory error. Replace appropriate memory module.
0184h	Data bus test failed	Install new system board.
0190h	Test failed at address xxxxxxxxh.	Memory error. Replace appropriate memory module.
01A0h	The pattern written at XXXXXXXXh was qqqqh. The pattern read back from that address was pppph.	Memory error. Replace appropriate memory module.
01A1h	Configuration access mechanism test failed.	Install new processor.
01A2h	TagRAM control register test failed.	Install new processor.

Code	Explanation	Details/Parts to Check
01A3h	L2 cache commands test failed.	Cache memory error. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
01A4h	L2 cache read/write test failed.	Cache memory error. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
01B0h	The pattern written at XXXXXXXX YYYYYYYYh was qqqqh. The pattern read back from that address was ppppph.	Memory error. Run the test disabling the cache. If problem persists, install new memory module. If problem persists, install new system board.
01B1h	Parity failure at XXXXXXXX YYYYYYYYh during pattern test.	Memory error. Replace appropriate memory module.
01B2h	The pattern written at XXXXXXXX YYYYYYYYh was qqqqh. The pattern read back from that address was ppppph.	Memory error. Replace appropriate memory module.
01B3h	Data bus test failed.	Replace memory module.

0300h – 03FFh: Floppy Disk Error Codes

Code	Explanation	Details/Parts to Check
0301h	Undefined or invalid command in sequential test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Install new floppy disk drive. If error persists install new system board.
0302h	Address mark not found in sequential test.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
0303h	Disk is write-protected.	Diskette error. Remove write protection from diskette. If error persists, replace diskette.
0304h	Requested sector not found in sequential test.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
0305h	Reset failed in sequential test.	Floppy disk controller error. Check your floppy disk drive is installed correctly. If error persists, install new system board.
0307h	Drive parameter activity failed in sequential test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Install new floppy disk drive. If error persists, install new system board.
0308h	DMA Overrun error in sequential test.	Diagnostic test error. Re-run the diagnostic tests.
0309h	Attempt to DMA at 64 KB boundary in sequential test.	Diagnostic test error. Re-run the diagnostic tests.

Code	Explanation	Details/Parts to Check
030Ah	Bad sector flag detected.	Diagnostic test error. Re-run the diagnostic tests.
0310h	CRC or ECC data error in sequential test.	Diagnostic test error. Re-run the diagnostic tests.
0311h	ECC-corrected data error.	Diskette error. Replace diskette.
0321h	Change line not working.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
0322h	Floppy Speed Error Drive.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
0340h	Seek operation failed in sequential test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Install new floppy disk drive. If error persists, install new system board.
0341h	Undefined or invalid command in random test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Install new floppy disk drive. If error persists install new system board.
0342h	Address mark not found in random test.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
0344h	Requested sector not found in random test.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.

Code	Explanation	Details/Parts to Check
0345h	Reset failed in random test.	Floppy disk controller error. Check your floppy disk drive is installed correctly. If error persists, install new system board.
0347h	Drive parameter activity failed in random test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Install new floppy disk drive. If error persists, install new system board.
0348h	DMA overrun error in random test.	Diagnostic test error. Re-run the diagnostic tests.
0349h	Attempt to DMA in 64 KB boundary in random test.	Diagnostic test error. Re-run the diagnostic tests.
0350h	CRC or ECC data error in random test.	Diagnostic test error. Re-run the diagnostic tests.
0360h	Seek operation failed in random test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Install new floppy disk drive. If error persists, install new system board.
0380h	Drive not ready.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
03AAh	Drive not ready.	Floppy disk drive error. Check your floppy disk drive is installed correctly. If error persists, install new floppy disk drive.
03CCh	Write fault on selected drive.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Replace diskette. Install new floppy disk drive. If error persists, install new system board.

Code	Explanation	Details/Parts to Check
03EEh	Data write/data read mismatch.	Floppy disk controller error. Check your floppy disk drive is installed correctly. If error persists, install new system board.
03FEh	Diskette data read/write error in sequential test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Replace diskette. Install new floppy disk drive. If error persists, install new system board.
03FFh	Diskette data read/write error in random test.	Floppy disk drive or floppy disk controller error. Check your floppy disk drive is installed correctly. Replace diskette. Install new floppy disk drive. If error persists, install new system board.

0400h – 04FFh: Keyboard Error Codes

Code	Explanation	Details/Parts to Check
0400h	The HP Hardware Diagnostics utility received a keyboard controller interface error.	Keyboard controller error. Install new system board.
0401h	The HP Hardware Diagnostics utility issued commands to keyboard controller and received improper responses.	Keyboard controller error. Install new system board.
0410h – 0411h	Keyboard clock line is stuck low/high.	Keyboard or keyboard controller error. Check that keyboard is connected correctly. If error persists, install new system board.
0412h – 0413h	Keyboard data line is stuck low/high.	Keyboard or keyboard controller error. Check that keyboard is connected correctly. If error persists, install new system board.
0414h	The HP Hardware Diagnostics utility issued a command to the keyboard and either did not receive a response or received an improper response.	Keyboard or keyboard controller error. Check that keyboard is connected correctly. If error persists, install new system board.
0415h	Keyboard LED could not be turned on.	Keyboard error. Replace the keyboard.
0416h	Keyboard diagnostic echo failed.	Keyboard or keyboard controller error. Replace the keyboard. If error persists, install new system board.
0417h	Keyboard is not responding to command.	Keyboard or keyboard controller error. Replace the keyboard. If error persists, install new system board.

0500h – 05FFh: SCSI Error Codes

Code	Explanation	Details/Parts to Check
0500h	Error in SCSI device.	SCSI device error. Check the selected SCSI device is connected and configured correctly. If error persists, replace SCSI device.
0502h	SCSI device read error.	Re-format the SCSI hard disk drive. If error persists, replace the SCSI hard disk drive.
0503h	SCSI disk read timeout.	Re-format the SCSI hard disk drive. If error persists, replace the SCSI hard disk drive.
0504h	SCSI device write error.	Re-format the SCSI hard disk drive. If error persists, replace the SCSI hard disk drive.
0505h	SCSI disk format failed.	SCSI hard disk drive error. Install new SCSI hard disk drive.
0507h	SCSI disk buffer error.	SCSI hard disk drive error. Install new SCSI hard disk drive.
0508h	SCSI disk random read error.	Re-format the SCSI hard disk drive. If error persists, replace the SCSI hard disk drive.
0509h	SCSI disk random write error.	Re-format the SCSI hard disk drive. If error persists, replace the SCSI hard disk drive.
050Ah	SCSI disk block repair failed.	Format, or re-format, the partition. If error persists, install new hard disk drive.
050Bh	SCSI spin down test failed.	SCSI device error. Check the selected SCSI device is connected and configured correctly. If error persists, replace SCSI device.

Code	Explanation	Details/Parts to Check
050Ch	Error in Partition Table.	Read error in disk partition table area.
050Dh	Boot sector error.	Boot partition is defined incorrectly. Run disk utilities.
050Eh	Media error.	Media description of partition is incorrect. Partition may not be useable.
050Fh	Inconsistent sector numbers.	Sector number information in Partition Table is incorrect. Partition is useable, but error will occur when data accessed exceeds the number of blocks defined in table.
0510h	Cannot allocate memory.	Diagnostic test error. Remove any installed device drivers and restart the PC or PC Workstation. Re-run the diagnostic tests.
0511h	Positioning failed on tape drive.	SCSI tape drive error. Check the tape drive is connected and configured correctly. If error persists, install new SCSI tape drive.
0512h	Tape read error.	SCSI tape drive error. Install new SCSI tape drive.
0514h	Tape write error.	SCSI tape drive error. Install new SCSI tape drive.
0515h	Tape Selftest error.	SCSI tape drive error. Install new SCSI tape drive.
0516h	Tape buffer error.	Replace tape. If error persists, install new tape drive.
0520h	No CD in drive.	SCSI CD-ROM error. Insert a CD into the CD-ROM drive.

Code	Explanation	Details/Parts to Check
0521h	CD-ROM read error.	SCSI CD-ROM error. Insert a CD-ROM into the CD-ROM drive.
0523h	CD-ROM play error.	SCSI CD-ROM error. Insert an audio CD into the CD-ROM drive.
0524h	CD Selftest error.	SCSI CD-ROM error. Insert a CD-ROM into the CD-ROM drive.
0525h	CD Open error.	SCSI CD-ROM error. Check if SCSI CD drive supports the Open command. If error persists, install new SCSI CD-ROM drive.
0526h	CD Close error.	SCSI CD-ROM error. Check if SCSI CD drive supports the Close command. If error persists, install new SCSI CD-ROM drive.
0527h	CD buffer error.	Install new CD-ROM drive.
0528h	Pattern compare failed.	Data read from sector is incorrect.
0550h	Read timeout.	SCSI device error Check the selected SCSI device is connected and configured correctly. If error persists, replace SCSI device.
0560h	File not found.	Check that the referenced file exists.
0580h	Cannot allocate memory.	Diagnostic test error. Remove any installed device drivers and restart the PC or PC Workstation. Re-run the diagnostic tests.
0590h	Command not supported.	The command is not supported by the device. No action needed.

0600h – 06FFh: Serial Port Error Codes

Code	Explanation	Details/Parts to Check
0601h	Data written to port xxxxh was yyyyh. Data read back from the port was zzzzh.	Serial port or serial port controller error. Check that external loopback (test) connector is correctly installed. If error persists install new system board.
0602h	Interrupt identification register test failed.	Serial port controller error. Install new system board.
0603h	Data written to port XXXXh was yyyyh. Data read back from the port was zzzzh.	Serial port or serial port controller error. Check that external loopback (test) connector is correctly installed. If error persists install new system board.
0604h	Line status register test failed at port XXXXh.	Serial port controller error. Install new system board.
0605h	Interrupt activation test failed at port XXXXh.	Serial port controller error. Install new system board.
0606h	Data transfer test failed at port XXXXh.	Serial port or serial port controller error. Check that external loopback (test) connector is correctly installed. If error persists install new system board.
0607h	Loop back test failed at port XXXXh.	Serial port or serial port controller error. Check that external loopback (test) connector is correctly installed. If error persists install new system board.
0608h	FIFO register test failed at port XXXXh.	Serial port controller error. Install new system board.

Code	Explanation	Details/Parts to Check
0609h	FIFO trigger level test failed at port XXXXh.	Serial port controller error. Install new system board.
0610h	FIFO character timeout indication test failed at port XXXXh.	Serial port controller error. Install new system board.
0611h	FIFO data transfer test failed at port XXXXh.	Serial port controller error. Install new system board.
0612h	Baud rate speed test failed.	If the test is running on a 16650 UART, check the frequency selected in the test menu matches the jumper settings on the card. Re-run the diagnostic test.
0613h	Infrared register test failed at port XXXXh.	Serial port controller error. Install new system board.
0614h	Infrared interrupt ID test failed at port XXXXh.	Serial port controller error. Install new system board.
0615h	Infrared internal loopback test failed at port XXXXh.	Serial port controller error. Install new system board.
0616h	Infrared line status test failed at port XXXXh.	Serial port controller error. Install new system board.
0617h	Infrared data transfer test failed at port XXXXh.	Serial port controller error. Install new system board.

0700h – 07FFh: Parallel Port Error Codes

Code	Explanation	Details/Parts to Check
0701h	Data written to port XXXXh was yyh. Data read back was zzh.	Parallel port or parallel port controller error. Check that external loopback (test) connector is correctly installed. If error persists install new system board.
0702h	IRQ Activation test failed at port XXXXh.	Parallel port controller error. Install new system board.
0704h	ECP register W/R test failed at port XXXXh.	Parallel port controller error. Install new system board.
0705h	ECP FIFO test failed at port XXXXh.	Parallel port controller error. Install new system board.
0706h	Loopback test failed at XXXXh port.	Install new parallel port controller.
0707h	Loopback test failed at XXXXh port.	Loopback connector missing. Connect loopback connector.
0708h	Loopback test failed at XXXXh port.	Un expected data in the loopback circuit. Install new parallel port controller.

0800h – 080Fh: Sound Blaster Compatible Error Codes

Code	Explanation	Details/Parts to Check
0801h	Stereo test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0802h	Pitch test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0803h	Volume test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0804h	Playback rate test failed.	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0805h	Frequency test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0806h	Speaker test failed	Speaker error. Check the PC speaker is connected correctly. Install new PC speaker.

0810h: Speaker Error Code

Code	Explanation	Details/Parts to Check
0810h	Speaker test failed	Speaker error. Check the PC speaker is connected correctly. Install new PC speaker.

0811h – 081Fh: Windows Sound System Compatible Error Codes

Code	Explanation	Details/Parts to Check
0811h	Stereo test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0812h	Pitch test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0813h	Volume test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0814h	Playback rate test failed.	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).

Code	Explanation	Details/Parts to Check
0815h	Frequency test failed	Sound board error. If problem persists, install new: • sound board (if installed in accessory slot), or • system board (if integrated on system board).
0816h	Speaker test failed	Speaker error. Check the PC speaker is connected correctly. Install new PC speaker.

0900h – 09FFh: Video Error Codes

Code	Explanation	Details/Parts to Check
0900h	Video adapter memory read or write test failed.	Video memory error. Install new video memory. If problem persists, install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0901h	Video adapter attribute test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0903h	80x25 mode test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).

Code	Explanation	Details/Parts to Check
0904h	40x25 mode test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0905h	320x200 mode test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0906h	640x200 mode test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0907h	Video page selection test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0908h	Video adapter color test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0909h	640x350 mode test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
090Ah	640 x 480 graphics test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).

Code	Explanation	Details/Parts to Check
090Ch	VESA video mode test failed.	Video memory error. Install new video memory. If problem persists, replace: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
090Dh	VESA video memory test failed.	Video memory error. Install new video memory. If problem persists, replace: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
090Eh	DDC1 protocol failed.	DDC Error. Check the DDC display interface.
090Fh	DDC2 protocol failed.	DDC Error. Check the DDC display interface.
0911h	VESA mode video memory error.	Video memory error. Install new video memory. If problem persists, replace: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0912h	VESA mode video memory error.	Video memory error. Install new video memory. If problem persists, replace: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0915h	VESA mode video memory error.	Video memory error. Install new video memory. If problem persists, replace: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).
0920h	Wave pattern test failed.	Video controller error. Install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).

0A00h – 0AFFh: CD-ROM Error Codes

Code	Explanation	Details/Parts to Check
0A00h	No CD in drive.	CD-ROM error. Insert a CD in the CD-ROM drive.
0A01h	Eject fails on drive x.	Diagnostic test error. Re-run the diagnostic test.
0A02h	Close failed on drive x.	Diagnostic test error. Re-run the diagnostic test.
0A03h	Sequential data test failed, Drive x, Sector Y.	Diagnostic test error. Re-run the diagnostic test.
0A04h	Sequential data test failed. No data in Drive x.	CD-ROM error. Insert a data CD in the CD-ROM drive and re-run the diagnostic test.
0A05h	Random data test failed, Drive x, Sector Y.	Diagnostic test error. Re-run the diagnostic test.
0A06h	Random data test failed. No data in Drive x.	CD-ROM error. Insert a data CD in the CD-ROM drive and re-run the diagnostic test.
0A07h	Sequential play test failed, Drive x, Sector y.	Diagnostic test error. Re-run the diagnostic test.
0A08h	Sequential play test failed. No data in Drive x.	CD-ROM error. Insert an audio CD in the CD-ROM drive and re-run the diagnostic test.
0A09h	Random play test failed, Drive x, Sector y.	Diagnostic test error. Re-run the diagnostic test.

Code	Explanation	Details/Parts to Check
0A10h	Random play test failed. No data in Drive x.	CD-ROM error. Insert an audio CD in the CD-ROM drive and re-run the diagnostic test.
0A11h	No audio tracks in the multisession CD in drive x	CD-ROM error. Insert an audio CD in the CD-ROM drive and re-run the diagnostic test.
0A12h	Number of audio tracks inadequate for the test.	CD-ROM error. Insert another multisession CD in the CD-ROM drive and re-run the diagnostic test.

0C00h – 0CFFh: IDE Tape Error Codes

Code	Explanation	Details/Parts to Check
0C01h	No medium in tape drive n.	Insert a tape cartridge in the tape drive and re-run the test.
0C02h	Medium write protected.	Tape's record switch is in write-protect position. Move the switch to record position.
0C03h	Rewind failed.	Change the tape in the tape drive and re-run the diagnostic test.
0C04h	Erase failed.	Change the tape in the tape drive and re-run the diagnostic test.
0C05h	Write failed.	Re-run the diagnostic test.
0C06h	Read failed.	Re-run the diagnostic test.
0C07h	Signature failed.	This message is displayed when the signature is not found. The write test writes a signature on the tape. First run the write test, and then the read test.

0E00h – 0EFFh: SMBus (System Management Bus) Error Codes

Code	Explanation	Details/Parts to Check
0E00h	Register test failed.	Function not supported or system board error.
0E10h	Status test failed.	Function not supported or system board error.
0E20h	<test name> <read/write type> test failed.	Function not supported or system board error.
0E30h	LM75 register test failed.	Function not supported or system board error.
0E31h	LM75 temperature test failed.	Function not supported or system board error.
0E32h	LM75 test failed.	Function not supported or system board error.
0E40h	LM80 register test failed.	Function not supported or system board error.
0E41h	LM80 (voltage | temperature | fan speed) measurement test error.	Function not supported or system board error.
0E42h	LM80 test failed.	Function not supported or system board error.
0E50h	16LC63 register test failed.	Function not supported or system board error.
0E51h	16LC63 (temperature | 3.3 Volt | 5 Volt | 12 Volt | CPU Core Volt | CPU I/O Volt) measurement failed.	Function not supported or system board error.
0E52h	16LC63 register test failed.	Function not supported or system board error.

Code	Explanation	Details/Parts to Check
0E53h	16LC63 (5V on board | 12V on board | 3.3V on board | 2.5V on board | CPU0 core voltage | CPU1 core voltage | CPU0 thermal | CPU1 thermal | slot thermal | disk bay thermal | 5V on slot | 12V on slot | fan power voltage | 3.3V on slot | -5V on slot | -12V on slot) measurement test failed.	Function not supported or system board error.
0E54h	16LC63 (5V on board | 12V on board | 3.3V on board | 2.5V on board | CPU0 core voltage | CPU1 core voltage | CPU0 thermal | CPU1 thermal | slot thermal | disk bay thermal | 5V on slot | 12V on slot | fan power voltage | 3.3V on slot | -5V on slot | -12V on slot) measurement test failed.	Function not supported or system board error.
0E5Fh	16LC63 test failed.	Function not supported or system board error.

0F00h – 0FFFh: ATAPI Removable Devices Error Codes

Code	Explanation	Details/Parts to Check
0F01h	No ATAPI removable device present.	Attach an ATAPI removable device and re-run the test.
0F02h	Write failed.	Re-run the diagnostic test.
0F03h	Read failed.	Re-run the diagnostic test.
0F04h	Seek operation failed.	If the seek function is supported by the device controller, replace the controller.
0F05h	Eject fails on drive x.	The eject feature is not supported or does not work. Re-run the diagnostic test.
0F06h	Sequential read verify failed.	Re-run the diagnostic test.
0F07h	Random read operation failed.	Change media and re-run the diagnostic test. If error persists, replace the motherboard.
0F08h	Random read verify failed.	Re-run the diagnostic test.
0F09h	Random seek operation failed.	Change media and re-run the diagnostic test. If error persists, replace the motherboard.

1000h – 10FFh: Multiple Processor Error Codes

Code	Explanation	Details/Parts to Check
1000h	Processors don't have unique IDs.	Processor ID error. Check that the processor is correctly configured.
1001h	Processor X failed to interrupt processor Y.	Processor error. Install a new processor.
1002h	IPI physical mode test failed on processor X.	Processor error. Install a new processor.
1008h	MPI arbitration test failed.	Processor error. Check that the processor is correctly configured. If the error persists, install new processor.
1009h	Cache coherency test failed.	Processor error. Check that the processor is correctly configured. If the error persists, install new processor.
100Ah	Memory consistency test failed.	Processor error. Check that processor is Install a new processor.
100Bh	I/O access test failed on processor X at port XXXXh.	Processor error. Install a new processor.
100Ch	Memory map I/O access test failed on processor X at address XXXXXXXXh.	Processor error. Install a new processor.
100Dh	Application processors were not detected.	Processor error. Check that the processor is correctly configured. If the error persists, install new processor.

Code	Explanation	Details/Parts to Check
100Eh	CPU speed error.	Processor speed error. Check processor Speed stamp and clocks. If the error persists, install new processor.
100Fh	CPU count error.	Processor error. Check number of processors present.
1010h	Configuration access mechanism test failed.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1011h	TagRAM control register read failed.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1012h	TagRAM control register write failed.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1013h	Value read back from TagRAM control register is not the same as the value written.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1014h	L2 cache commands test failed.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).

Code	Explanation	Details/Parts to Check
1015h	The pattern read back from the cache is not the same as the pattern written.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1016h	Tag Write with Data Read command failed.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1017h	Tag Read with Data Read command failed.	Check processor, L2 cache and main memory are correctly installed. If problem persists, install new: • L2 memory (if installed in accessory slot), or • processor (if integrated on the processor card).
1030h	L2 Cache Pattern error.	Cache memory error. Check processor, L2 cache and main memory are correctly installed. Run memory tests to confirm correct function of main memory and any external L2 cache memory. If error persists, replace processor.
1031h	L2 Cache Parity error.	Cache memory error. Check processor, L2 cache and main memory are correctly installed. Run memory tests to confirm correct function of main memory and any external L2 cache memory. If error persists, replace processor.
1081h	No active external cache memory.	Cache memory error. Enable external cache memory from BIOS setup.

Code	Explanation	Details/Parts to Check
1082h	No extended memory available from HIMEM.SYS.	Unload HIMEM.SYS or programs using HIMEM.SYS.
1083h	No extended memory detected.	Install the extended memory to be tested.

1200h – 12FFh: TI Card Bus Test Error Codes

Code	Explanation	Details/Parts to check
1201h	Unable to assign memory space.	Try removing some ISA/PCI cards and re-run the diagnostic test.
1202h	Register read write failed.	Replace the controller. If it is integrated on the system board, replace the system board.
1203h	Power down failed.	Replace the controller. If it is integrated on the system board, replace the system board.
1205h	Unable to apply correct Vcc to the card.	Try changing PC Card.
1206h	Card detect pins not functioning.	Try changing PC Card.
1207h	Unable to configure the card.	Check if the PCI Card bus bridge has been initialized properly.

1300h – 13FFh: USB Error Codes

Code	Explanation	Details/Parts to check
1301h	Cannot find PCI resource.	Install new system BIOS.
1302h	Register test failed.	Replace the system board.
1303h	Frame test failed.	Replace the system board.
1304h	Status test failed.	Replace the system board.
1305h	Interrupt test failed.	Replace the system board.
1312h	OHCI Register test failed.	Replace the system board.
1313h	OHCI Frame test failed.	Replace the system board.
1314h	OHCI Status test failed.	Replace the system board.
1315h	OHCI Interrupt test failed.	Replace the system board.
1316h	OHCI Transfer desc. failed.	Replace the system board.

1700h – 170Fh: ACPI Error Codes

Code	Explanation	Details/Parts to Check
1701h	Invalid system memory address map.	Install new system BIOS.
1702h	Invalid ACPI tables.	Install new system BIOS.

1900h – 1902h: DVD Error Codes

Code	Explanation	Details/Parts to Check
1900h	Critical or command error.	Place a valid DVD media and re-run the diagnostic test. If error persists, replace the DVD drive.
1901h	DVD seek test failed.	Check and replace the DVD media or the DVD drive.
1902h	DVD read test failed.	Check and replace the DVD media or the DVD drive.

8000h: DiagTools Error Codes

Code	Explanation	Details/Parts to Check
8000h	Fails in executing an external program.	Make sure the external program is in the DiagTools directory.

9610h: Matrox Video Error Codes

Code	Explanation	Details/Parts to check
9610h	Matrox video chip test failed.	Video controller error. If problem persists, install new: • video adapter (if installed in accessory slot), or • system board (if integrated on system board).

9621h: Crystal Sound Error Codes

Code	Explanation	Details/Parts to check
9621h	Crystal sound test failed.	Sound controller error. Install new system board.

9630h: 3Com LAN Error Codes

Code	Explanation	Details/Parts to check
9630h	LAN card test failed.	LAN controller error. If problem persists, install new: • LAN card (if installed in accessory slot), or • system board (if integrated on system board).

9640h – 966Ch: Hard Disk Error Codes

Code	Explanation	Details/Parts to check
9640h	SMART error detected in BST (Basic System Test).	Manufacturer diagnostics error. Failure may occur in a time frame from immediate to several days. Back up your data and replace the HDD.
9641h	Drive is defective (BST).	HDD error. Replace the hard disk drive.
9642h	Run media confirmation test (BST).	Run Advanced System Test for in-depth media diagnosis.

Code	Explanation	Details/Parts to check
9643h	SMART error detected in AST (Advanced System Test).	Manufacturer diagnostics error. Failure may occur in a time frame from immediate to several days. Back up your data and replace the HDD.
9644h	Drive is defective (AST).	HDD error. Replace the hard disk drive.
9645h	Invalid boot sector (BST).	Hard disk error. Logical information held on the disk appears to be incorrect. This does not necessarily mean that a hardware error has been detected. This error will appear if you are using a boot utility or non-standard OS boot loader. Run the Advanced Tests on this hard disk drive to fully test the media. If no error occurs and you experience problems during boot or while accessing files, it is likely that there is a logical problem on the disk. Reformat the disk and reinstall the operating system and applications.
9646h	No bootable partition (BST).	Hard disk error. Logical information held on the disk appears to be incorrect. This does not necessarily mean that a hardware error has been detected. This error will appear if you are using a boot utility or non-standard OS boot loader. Run the Advanced Tests on this hard disk drive to fully test the media. If no error occurs and you experience problems during boot or while accessing files, it is likely that there is a logical problem on the disk. Reformat the disk and reinstall the operating system and applications.
9647h	Bad cable detected (BST).	Check that the IDE cable is connected correctly.
9648h	Bad cable detected (AST).	Check that the IDE cable is connected correctly.

Code	Explanation	Details/Parts to check
964Ah	Password protected hard disk (BST).	Hard disk error. The hard disk drive is password protected. The test cannot be run. To test the hard disk drive, remove the password protection.
964Bh	Hard disk damaged by shock (BST).	Hard disk error. The hard disk drive needs replacement.
964Ch	Hard disk damaged by shock (AST).	Hard disk error. The hard disk drive needs replacement.
9660h	Drive is defective (BST).	HDD error. Replace the hard disk drive.
9661h	Run media confirmation test (BST).	Run Advanced System Test for in-depth media diagnosis.
9662h	Drive is defective (AST).	HDD error. Replace the hard disk drive.
9663h	Auto test error (BST).	HDD auto test error. Replace the hard disk drive.
9664h	Invalid boot sector (BST).	Hard disk error. Logical information held on the disk appears to be incorrect. This does not necessarily mean that a hardware error has been detected. This error will appear if you are using a boot utility or non-standard OS boot loader. Run the Advanced Tests on this hard disk drive to fully test the media. If no error occurs and you experience problems during boot or while accessing files, it is likely that there is a logical problem on the disk. Reformat the disk and reinstall the operating system and applications.

Code	Explanation	Details/Parts to check
9665h	No bootable partition (BST).	Hard disk error. Logical information held on the disk appears to be incorrect. This does not necessarily mean that a hardware error has been detected. This error will appear if you are using a boot utility or non-standard OS boot loader. Run the Advanced Tests on this hard disk drive to fully test the media. If no error occurs and you experience problems during boot or while accessing files, it is likely that there is a logical problem on the disk. Reformat the disk and reinstall the operating system and applications.
9666h	Bad cable detected (BST).	Check that the IDE cable is connected correctly.
9667h	Bad cable detected (AST).	Check that the IDE cable is connected correctly.
9669h	Password protected hard disk (BST).	Hard disk error. The hard disk drive is password protected. The test cannot be run. To test the hard disk drive, remove the password protection.
964Ah	Hard disk damaged by shock (BST).	Hard disk error. The hard disk drive needs replacement.
964Bh	Hard disk damaged by shock (AST).	Hard disk error. The hard disk drive needs replacement.
964Ch	Bad low-level format (BST).	Hard disk error. Low level formatting (from SCSI utilities) has not been completed. The hard disk is unusable. Run the SCSI utilities from the SCSI boot menu and re-format the HDD. Wait for completion. Do not interrupt. Do not turn off your computer. It may last several hours depending on your PC and the hard disk size. When low level formatting is finished, create the partition(s), format the HDD and install OS and applications.

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