HP DiagTools

User's Guide

Notice

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Edition History

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Contents

Who Should Read This Book

This manual is for anyone who wants to:

- Diagnose hardware problems on an HP notebook computer
- 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 an HP notebook computer. It is a series of tools designed to help you to:

- Verify the correct functioning of a notebook computer
- Diagnose hardware-related problems
- Prevent unneeded repair
- 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 DiagTools utility has four parts:

- Hardware Detection, which automatically detects the hardware configuration of a notebook computer. 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.x can run on the following HP notebook computers:

- All HP notebook computers released after February, 1999.
- OmniBook 900.
- OmniBook 2100.
- OmniBook 3100.
- OmniBook 4100 series.
- OmniBook 7100 series.
- OmniBook XE series.
- Pavilion N3100 series.

For other models, find the correct version of DiagTools and documentation on the HP notebook web site, http://www.hp.com/notebooks.

You should verify you use the correct version of DiagTools for the notebook you are testing.

Where to Get the Diagnostics Software

Always use the latest version of DiagTools.

Note

Verify that you are using the correct version of DiagTools for the notebook you are testing.

You can download the latest version of the DiagTools utility from the HP notebook web site in the Technical Support, Software area:

http://www.hp.com/notebooks

For more information about the HP notebook web site and for information about HP Electronic Information Services, refer to page 6-3.

1

Starting DiagTools

Installing and Setting Up DiagTools

There are two ways to run DiagTools – from a floppy diskette or from the hard disk drive (the F10 method). All HP notebook PCs have the capability to run DiagTools from a floppy diskette, and some of these notebook computers have the option to run DiagTools from the hard disk drive.

- **Floppy Diskette Method**

  The PC boots (or starts) from the floppy diskette. However, first you must create a DiagTools floppy diskette from the World Wide Web or locally from your hard disk or Recovery CD.

- **Hard Disk Drive Method (the F10 method)**

  If your computer supports this method, you press F10 during start up. Also, you need a special utility to view and retrieve the support ticket.

Note   DiagTools must not be run directly from your operating system. DiagTools will function correctly only under the DOS operating system and once the correct drivers have been loaded.

Downloading the Latest Version from the Web

You can download the latest version of the DiagTools utility from the HP notebook web site in the Technical Support, Software area:

http://www.hp.com/notebooks

For more information about the HP notebook website and for information about HP Electronic Information Services, refer to page 6-3.

There are two files available for downloading:

- The DiagTools utility. A compressed file (with the extension .EXE) which contains all the files necessary for running DiagTools.
- The User's Guide for DiagTools – the document you are reading. It is a PDF file which can be viewed and printed using Adobe's Acrobat Reader. (The Adobe Acrobat Reader can be downloaded free of charge from HP's World Wide Web site.)

After you have downloaded the DiagTools file, follow the instructions included with the file:

Creating the DiagTools Floppy Diskette Locally

Depending on your notebook computer software, you may be able to create the DiagTools floppy diskette locally. After inserting a formatted floppy diskette in the floppy drive, do one of the following to create an DiagTools floppy diskette:

- On an HP notebook computer with a factory software installation, run **diaginst** if it is present in the \Dmi\Hpdiags directory on the hard disk. To do this in Windows, double-click the file.
  –or–
  For an HP notebook PC with TopTools installed, check whether the DiagTools tab can create the diskette.
- On any computer with a CD-ROM drive, run **diaginst** if it is present in the Drivers\Hputils or Dmi\Hpdiags directory on the Recovery CD that came with the notebook PC. To do this in Windows, double-click the file.

Updating the DiagTools Files
(For Network Administrators)

To know if you have TopTools in Windows 95, Windows NT 4.0, or Windows 98, click the Start button and look for HP DMI or HP TopTools in the Programs menu.

If you are a network administrator, you can update the DiagTools files on remote client PCs.

Using TopTools Integrated Device Manager Ver. 4.1

To update the Diagnostics files on remote PCs, open the TopTools Integrated Device Manager in Internet Explorer (version 4.01 or above). Right-click on Devices, Device Types, and select Personal Computers in the window that appears. Use shift-click or control-click to select the DMI 2.x compliant PCs you want to update and right-click. Select Distribute Diagnostics from the menu that appears and follow the onscreen instructions.

For more information about using TopTools, refer to the TopTools online help in the Help menu and to HP's Web site at http://www.hp.com/toptools.

Before Running DiagTools

Before you run the DiagTools, consider whether you need to make any changes in the HP BIOS Setup program. Hardware devices that are disabled in Setup cannot be tested by the DiagTools.

- If you want to test the current hardware configuration, do not change any settings in the Setup program.
- If you want to perform a more complete test, you can run the Setup program and enable devices that you want to test.

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, enter the Setup program and use the Restore Defaults command to restore the Setup default values, allowing the PC to recover.

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

Starting DiagTools

Starting DiagTools from a Floppy Diskette

Once you have created the diskette, you can start the DiagTools. To do this:

1. Insert the diskette into the flexible disk drive.
2. Quit all applications, shut down the operating system, and restart your PC. To do this in Windows 95, Windows NT 4.0, or Windows 98, click the Start button then select Shut Down – Restart PC.
3. The PC will then start from the diskette. After loading the system files, it will decompress the necessary files. Then DiagTools will start automatically, displaying the Welcome screen (refer to page 1-8).

You may experience one of the following problems:

PC does not boot (start) from the diskette.

This happens when the PC ignores the diskette and starts from the hard disk drive as normal, running your operating system. The problem could be:

- The BIOS Setup program of your PC may not be correctly configured. Ensure that the option to start from the flexible disk is enabled and that it is the first boot device. (Refer to "More Information About the PC's Setup Program" on page 1-5.)
- There may be problem with the flexible disk drive or the internal cable connections. Contact your local or HP-dedicated support agent.

A message such as "Non-System disk or disk error. Replace and press any key when ready" appears when the PC starts.

This means that the PC cannot find the system files on the diskette. The problem could be:

- The diskette may be damaged or corrupted. Select another diskette and create another DiagTools diskette (refer to page 1-2).

Starting DiagTools from the Hard Disk Drive (the F10 Method)

Note

To run DiagTools from the hard disk drive, you must have an HP notebook PC that displays a prompt to press F10 after the HP logo appears during startup.

To identify whether you have the correct configuration to run DiagTools from the hard disk drive, do the following:

1. Quit all applications, shut down the operating system, and restart your PC. To do this in Windows 95, Windows NT 4.0, or Windows 98, click the Start button then select Shut Down – Restart PC.

2. When the PC starts, after the HP logo appears, you are prompted to press F10 to run the DiagTools. This message appears quickly, so pay attention. Press F10. DiagTools will start automatically, displaying the Welcome screen (refer to page 1-8).

You may experience the following problem:

F10 prompt does not appear after the HP logo appears.

- This happens when the PC is starting from the Hibernate mode. You will need to shut down Windows and restart the computer.

- Your computer may not support this method, or you may have deleted the Hibernate partition from your hard disk. If this happens, you will need to run DiagTools from a floppy diskette (refer to page 1-2).

The Welcome Screen

When you start the DiagTools utility, 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

Overview of Hardware Detection

Hardware detection 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 appropriate for your PC. 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:
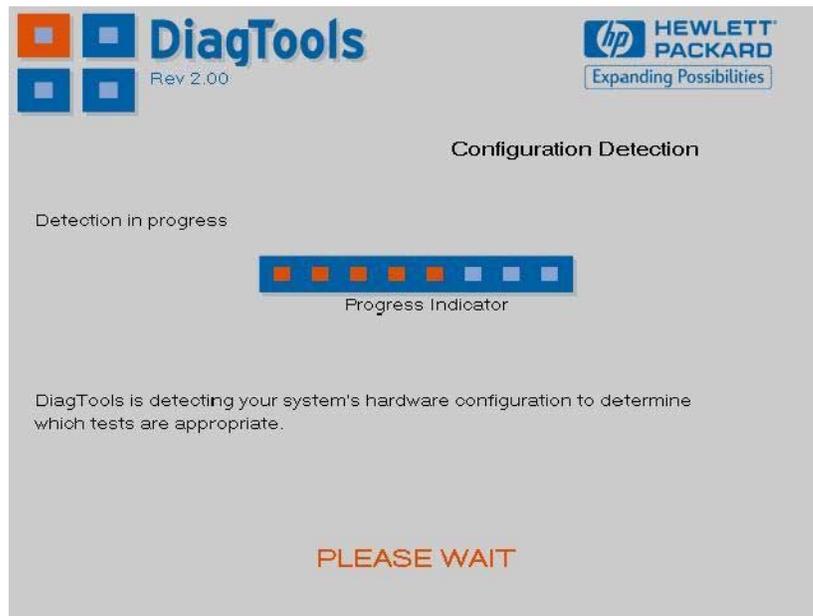
Note

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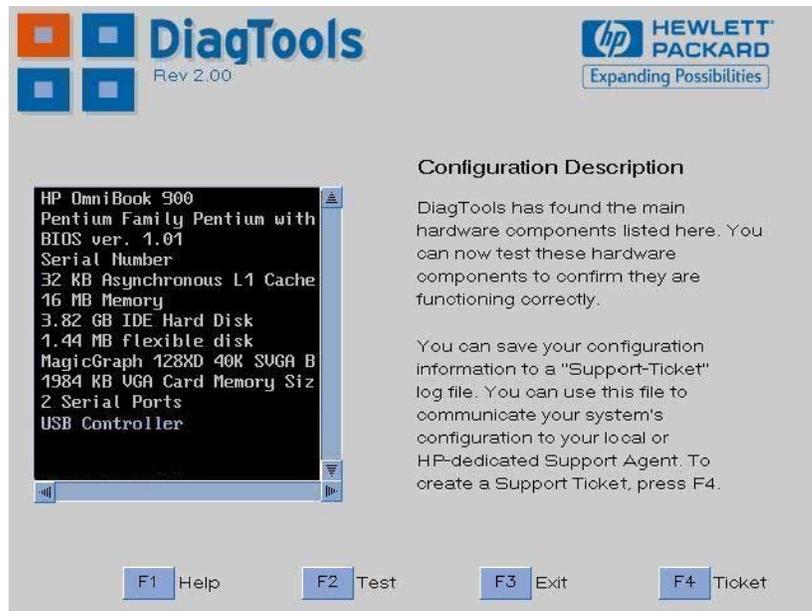
You can use the mouse or the arrow keys to scroll through the list of detected components.

What is Detected

The following are typically detected in the hardware detection phase:

- Product name
- Serial number
- HP BIOS version
- Processor type
- Cache memory type and size
- Total main memory
- Graphics adapter
- Flexible disk drive and capacity
- IDE devices with device type and capacity
- SCSI devices with device type and capacity
- Audio board
- Serial ports
- Parallel port
- USB port

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 2-6.

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 typically detects (this is on page 2-5).

   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 1-5 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 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 CD-ROM drive installed. Even if the CD-ROM drive is not detected, running the basic system test will ensure the correct functioning of the IDE system that supports the drive. We also recommend running the advanced section to verify that the corresponding tests are enabled.

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

3

Basic System Test

Overview of the Basic System Test

The basic system test is performed after hardware detection. The purpose of the basic system tests is to verify the correct operation of the PC's hardware. 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 all of the PC's components, 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, "Starting DiagTools."

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 twice to do the basic system test.

Note   The screen may flicker during the basic system test. This is normal.

Test Result: PASS

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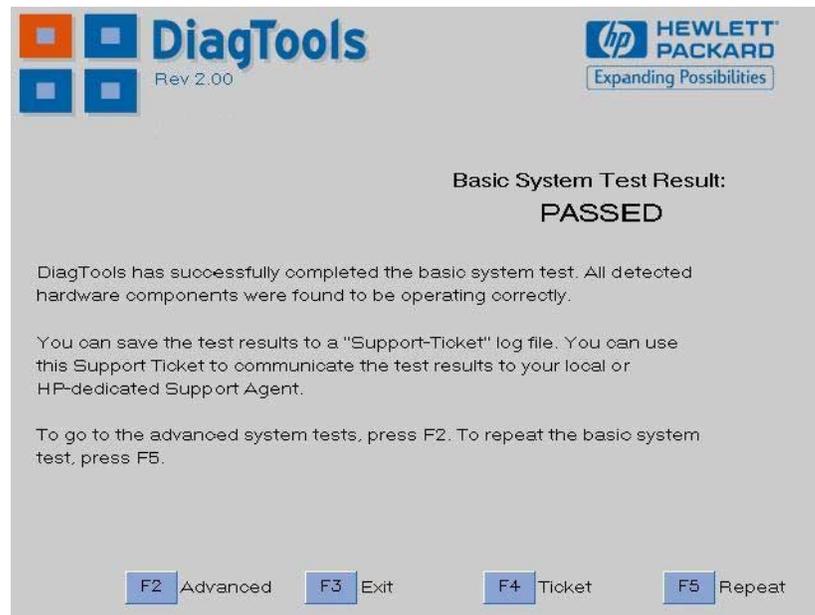
The following action is recommended:

- If you are not investigating a hardware problem, there is no need to continue with the advanced tests or to create a support ticket. Remove the diagnostic diskette from the floppy drive and press F3 to exit DiagTools.

- If you are investigating a potential 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.)

  Also, for a potential hardware problem, you can proceed to the advanced system tests, since no error was traced using the basic system test. However, if you want assistance finding the problem or running the advanced tests, contact your local or HP-dedicated support agent.

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

Test Result: FAIL

If one or more of the basic tests failed, a screen similar to the following will appear:
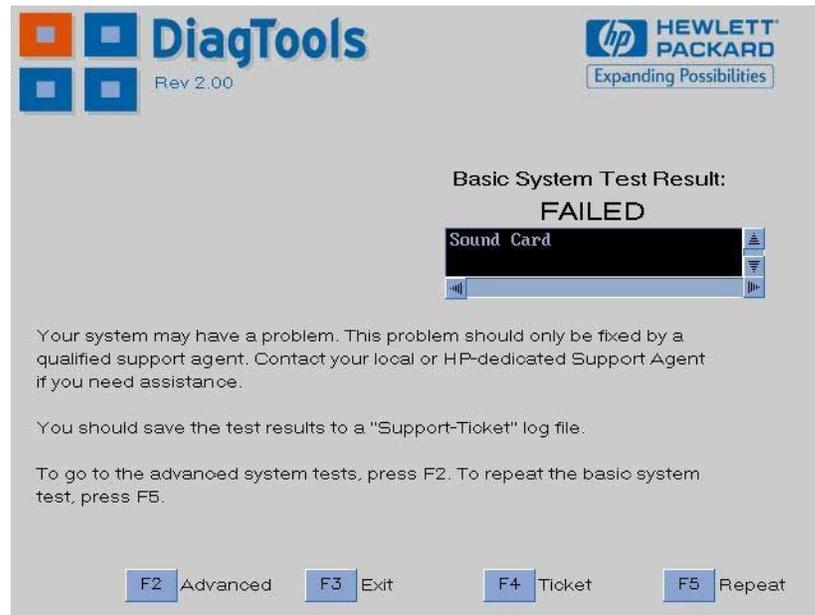
Note   Test failure does not necessarily mean that a component needs replacement. For example, it may simply mean that there is a configuration error or that there is a loose connection.

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.)

- Run the advanced tests (refer to chapter 4). This enables you to investigate the error in greater depth. However, if you want assistance investigating the error or running the advanced tests, contact your local or HP-dedicated support agent.

  If you contact a support agent, you can e-mail or fax 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 5-4).

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

Although the following list varies slightly for different HP notebook products, the basic tests typically include the following:

- Basic Functionality Tests, to verify the correct functioning of the processor and subsystems:
  - □ Basic processor functionality
  - □ Processor speed
  - □ Coprocessor
  - □ DMA controller
  - □ Interrupt controller
  - □ Timer and real time clock
  - □ CMOS
  - □ PCI system
  - □ USB
- Memory Tests, to check the correct functioning of main and cache memory:
  - □ BIOS ROM
  - □ Pattern Test
  - □ Address
  - □ Refresh
  - □ Cache memory
- IDE hard disk drive, to check the basic functioning of any IDE hard disk drives:
  - □ Quick random read-verify/seek
  - □ Boot sector
- SCSI hard disk drive, to check the basic functioning of any SCSI hard disk drives:
  - □ Quick random read-verify/seek
  - □ Boot sector
- Keyboard tests:
  - □ Keyboard controller
  - □ Keyboard clock line
  - □ Keyboard data line
- Other tests:
  - □ Basic serial port test (does not include data transfer – this is an advanced test)
  - □ Basic parallel port test

Each test listed above is performed only if it is appropriate for your PC configuration. For example, if your PC does not have a SCSI controller, no SCSI tests will be done.

Furthermore, a component test will be performed only 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 chapter 2.)

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

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 DiagTools.

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, "Starting DiagTools."

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 twice 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 come back from the Help screen to the advanced test screen, press the "ESC" key.

To move the selection bar between menus and menu items, use the arrow keys.

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 4-6.

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: flexible disk drive tests
    - SCSI: SCSI device (such as an SCSI hard disk drive) tests
    - KBD: keyboard tests
    - Video: graphics system tests
    - USB: USB tests
    - Misc: other tests, such as mouse and serial port tests.
    - User: special tests for unique HP notebook devices.

Note   Some menus will be disabled if they are not appropriate for your PC or if devices are disabled in the PC's Setup program. 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.

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 Edit Batch – Test Selection commands in the Batch menu.

How to Run a Batch Test

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

- Test Selection: for help on how to select the tests for the batch.
- Test Parameters: to configure the test parameters.
- Repeat Count: to set the number of times each test is run, from 0 (do not run test), to 1 (run test once), or more.

Hint To select or deselect any test from the current batch test, use the spacebar or F5 to check or uncheck it.

To run the batch test you have configured, press F10 or 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.
- Batch Help: for help on using the batch facility.

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 5-4).

At this point, you may have sufficient information to resolve the problem. If so, you can remove the diagnostic diskette from the floppy drive and press F3 to exit DiagTools, or press F2 to return to the advanced system tests.

5

The Support Ticket

What is the Support Ticket?

The support ticket is 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 reseller or HP-dedicated support agent. If necessary, you can e-mail or fax the support ticket to your support agent. You should attach a copy of the support ticket if you send your computer for repair.

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)
- 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.

C A U T I O N

Whenever you create a support ticket, the previous one will be overwritten.

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 diskette or to a suitable directory on your hard disk drive.

If you created the support ticket while running the diagnostics on a floppy diskette, you can view the support ticket by opening the support ticket file A:\HPSUPPT.TXT using a text editor such as Microsoft Windows Notepad.

Note

If you created the support ticket while running the diagnostic from the hard drive (the F10 method), the support ticket is stored in an inaccessible area of the hard drive. Before you can view the support ticket, you will need to retrieve it—see the next topic.

Retrieving a Support Ticket

How you retrieve the support ticket is determined by how you ran the diagnostics.

Floppy Diskette Method

If you ran the diagnostics from a floppy disk, the support ticket is stored on the DiagTools diskette.

1. Start up 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, A:\HPSUPPT.TXT.

Hard Disk Method (F10 Method)

If you ran the diagnostics from the hard drive by pressing F10, the support ticket is stored in an inaccessible area of the hard drive. To view and modify the support ticket, you will need a special utility, HPSUPPT.EXE. If this utility is not on your hard disk drive in the C:\DMI\HPDIAGS directory, you can download it from the HP notebook web site, http://www.hp.com/notebooks.

- In Windows Explorer, double-click C:\DMI\HPDIAGS\HPSUPPT.EXE. This stores the support ticket, HPSUPPT.TXT, in the C:\DMI\HPDIAGS directory and opens the file in Microsoft Windows Notepad.

If you've already retrieved the support ticket, you can use Windows Notepad to open the retrieved file, C:\DMI\HPDIAGS\HPSUPPT.TXT.

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.

C A U T I O N   **Do not remove any information from the support ticket. The information may be essential to your support agent.**

If you ran DiagTools using the F10 method from the hard disk drive, you must retrieve the support ticket file before you can add comments—see the previous topic.

Since the support ticket uses Notepad format, follow these steps to add your comments:

1. Start up 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, HPSUPPT.TXT. The file is saved on the DiagTools diskette or retrieved to the C:\DMI\HPDIAGS directory.
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

Hewlett-Packard Support and
Information Services

Your HP Authorized Reseller

HP Authorized Resellers have been trained on HP notebook equipment and are familiar with its configuration and environment. Authorized Resellers can also answer questions regarding non-HP hardware, software and systems as well as answer queries about usage not intended for, or not commonly used with the HP notebook computer.

Authorized HP Resellers can also offer consulting services tailored to your specific needs regarding product development or custom installations, as will third party support services, or the HP Customer Support organization in your country.

Hewlett-Packard Information Services

Hewlett-Packard Electronic Information Services ensure that the most up-to-date information is always available.

HP Notebook World Wide Web

Access the HP notebook World Wide Web server to get the latest information about technical support, including e-mail and telephone support, plus information about warranty and support programs.

Point your WWW browser at **http://www.hp.com/notebooks**.

HP Customer Care World Wide Web

Access the HP Customer Care World Wide Web server for e-mail support, technical information, and software updates.

Point your WWW browser at **http://www.hp.com/cposupport/eschome.html**.