
Winstone[®] 32 Version 1.0 Tester's Handbook



IMPORTANT NOTE!

If you need to interrupt a Winstone 32 test run, or if Winstone 32 halts, stops, or hangs the PC and you must exit Winstone 32 in any way other than clicking the Exit button, **DON'T DELETE WINSTONE 32** without first exiting and restarting Windows. Winstone 32 includes a cleanup program. If there is a problem and Winstone 32 isn't able to clean up at the end of a test run, the cleanup program will automatically run when you restart Windows. You should always let Winstone 32 clean up after a test run.

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- B. Identify the specific Winstone 32 score(s) being reported and in all cases include the Winstone 32 overall score.
- C. Identify the exact name, processor speed and type, number of processors, amount of RAM, amount of secondary RAM cache, if any, hard disk model, type of hard disk controller, and size of hardware hard disk cache, if any, of the PC used for the test (e.g., WXY Corp. Model 466 with single 66-MHz Intel® 486DX2-66 CPU, 8MB of RAM, 64KB RAM cache, 200MB hard disk, IDE controller, and no hardware disk cache);
- D. Identify the exact graphics adapter name, amount and type of RAM on it, graphics driver name and date, graphics resolution and color depth, and refresh rate that produced the result (e.g., XYZ Corp. XYZ Graphics adapter with 2MB VRAM with XYZ.DRV version 1.1 driver, 800 by 600 pixels with 256 colors, and a refresh rate of 72 Hz);
- E. Identify the operating system version and service pack version (if any) (e.g., MS-DOS® 7.0 and Microsoft Windows® 95 or Windows NT™ 3.51 with Service Pack 1);
- F. Identify any other special conditions used to achieve the result (e.g., disk compression utility ABC version 1.0 enabled);
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About this Handbook

This is the tester's handbook for Winstone® 32. This handbook provides the minimum information you need to install Winstone 32, run its tests, and save the results. The handbook also includes some introductory material on how to read and analyze Winstone 96's scores.

For additional information on what happens when you run a test and what can affect a PC's scores, see Chapter 15 in the *Understanding and Using Winstone® 96 Version 1.0* manual.

NOTE: You can use the Winstone 96 reference manual with Winstone 32. However, the Winstone 96 reference manual doesn't contain any Winstone 32-specific material. You can find all Winstone 32-specific material in the Tester's Handbook.

Before you do anything with the software, you need to read the license agreement at the front of this handbook. (The same license agreement appears on the PC's screen the first time you start Winstone 32.)

This section lists the different parts of this handbook, the conventions the handbook uses, and other available Winstone 32 documentation.

Finding the information you need

This handbook includes the following parts:

Part 1: New Features

Lists the changes and new features in this year's benchmark.

Part 2: Part 2: Before You Begin

Provides a list of Winstone 32's minimum requirements, explains what you need to think about before you install or run the benchmark, and gives brief instructions on how to install the program's files.

Part 3: Part 3: Running Winstone 32

Explains how to use the Configuration Information window, run Winstone 32's suites, save results, and run Winstone 32's suites in batch mode.

Part 4: Part 4: Looking at the Results

Explains how to view results and briefly discusses what the results for the main suite mean about a PC's performance.

Part 5: Part 5: Contacting ZDBOp

Tells you how to contact us if you have technical questions or problems with Winstone 32.

This handbook also includes the following appendices:

Appendix A: Basic concepts

Briefly introduces Winstone 32's main concepts. While you don't need to read the appendix to successfully run Winstone 32's suites, you may want to read it for a clearer understanding of how the benchmark works.

Appendix B: Appendix B: The Custom Configuration File

Explains in detail how to build a custom configuration file. For more information on the

custom configuration file, see "When Winstone 32 performs its configuration check, it notes areas where the PC differs from a pre-set list of optimization tips. For example, when you run Winstone 32, the load= entry in the [Windows] section of the PC's WIN.INI file should be empty. So, if load= isn't empty, Winstone 32 lists this difference on the Optimization Tips page." on page 10.

Conventions this handbook uses

This handbook uses a few general conventions. For example, it:

- Uses the pronoun "we" to refer in general to either the Ziff-Davis Benchmark Operation (ZDBOp) or Ziff-Davis.
- Uses bold type face for DOS and Windows® commands, file names, and directory names. For example, you'll see sentences similar to the following:

"The **WS32HBK.DOC** file is in the **\ZDBENCH\DOCS\WS32\HANDBOOK** directory on the CD-ROM."

- Uses a monospace or typewriter font for information you must enter verbatim from the command line. The handbook also displays system responses that appear on the PC's screen in the same font. For example:

D : \ZDBENCH\WS32\SETUP . EXE

- Uses the terms "select" and "choose" in the same way Windows documentation uses these terms. In Windows documentation, the terms "select" and "choose" have different, and specific, meanings. When you *select* an item, you mark it with the selection cursor, and the selection appears as a highlight, a dotted rectangle, or both. You also select check boxes in dialog boxes. Selecting alone doesn't initiate an action.

You *choose* an item to carry out an action. For example, when you choose the Winstone 32 icon, Winstone 32 opens its main window. You can also choose an item from a menu or choose a command button in a dialog box. You often need to select an item before you can choose it.

Available Winstone 32 documentation

This document:	Is located in the:	And contains:
README.TXT	\ZDBENCH\WS32 directory on the CD-ROM.	The license agreement, a list of new features, and a list of known problems as of the CD-ROM's release.
Winstone® 32 Version 1.0 Tester's Handbook (WS32HBK.*)	\ZDBENCH\DOCS\WS32\HANDBOOK directory on the CD-ROM. The CD-ROM may include three different formats of the handbook (.DOC, .TXT, and .RTF).	The minimum information you need to install Winstone 32, run the tests, and analyze the results. (This is the document you're reading now.) You can find all Winstone 32-specific information in the Tester's Handbook. The on-line help also contains most of the information in this tester's handbook.
Understanding and Using Winstone® 96 Version 1.0 (WS96REF.*)	\ZDBENCH\DOCS\WS96\REF directory on the CD-ROM. The CD-ROM may include three different formats of the manual (.DOC, .TXT, and .RTF).	The Winstone 96 reference manual, which also serves as the reference manual for Winstone 32. All Winstone 32-specific information, however, is in the Tester's Handbook and the help file.
On-line help	\ZDBENCH\WS32 directory on the CD-ROM.	Most of the information found in the Tester's Handbook.

End of About this Handbook

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Acknowledgements

Part 1:

New Features

This part of the handbook briefly explains some of Winstone 32's new features.

Winstone 32 uses only 32-bit applications

Winstone 32 is a benchmark that runs test scripts using only Windows-based 32-bit applications. Winstone 32 uses no 16-bit applications for its tests. In developing Winstone 32's scripts, we used leading 32-bit business applications and our research on how typical people use applications. The result of this work is an accurate and repeatable benchmark you can use to determine a PC's overall performance when running today's top-selling Windows-based 32-bit business applications.

If you want a benchmark that can test a 16-bit Windows system, you should use Winstone 96. Winstone 96 uses 16-bit business applications and tests a system in much the same way as Winstone 32.

The following sections describe the two benchmarks' similarities and differences.

How Winstone 32 and Winstone 96 are alike

If you're coming to Winstone 32 from Winstone 96, then you should know your way around. You can run tests and save results in Winstone 32 just as you did in Winstone 96. In looks and operation, they're similar.

Winstone 32 and Winstone 96 also share the same reference manual, *Understanding and Using Winstone® 96 Version 1.0*. The reference manual contains complete information on running the Winstone tests, saving results, using the Winstone results database, the methodology behind the tests, and so on.

How Winstone 32 differs from Winstone 96

Following is a list of differences between Winstone 32 and Winstone 96:

- Winstone 32 runs a different set of applications from Winstone 96. Winstone 32 uses the most popular 32-bit business applications for testing Windows-based, 32-bit operating systems. If you want to test 16-bit environments, then you need to run Winstone 96, which uses the most popular 16-bit business applications. For a list of the applications Winstone 32 runs, see page 2.
- Winstone 32 can run on the following 32-bit operating systems: Windows 95 and Windows NT™ Workstation 3.51 (or later) with Service Pack 1 (or later). Winstone 96 ran its 16-bit applications on Windows 3.x and Windows 95.

NOTE: Winstone 32 does not run on Windows 3.1 or OS/2® because its 32-bit applications use the 32-bit Windows API.

- Winstone 32 uses the same physical base machine as Winstone 96. The primary differences between the two arise from using Windows 95 as the operating system. Windows 95, for example, by default uses MS-DOS® 7.0 and built-in networking software, so that's what the base machine uses. (The Winstone 96 base machine, by comparison, used MS-DOS 6.2 and a Novell® NetWare® Shell version 3.26.) For Winstone 32's base machine specs, see page 23.

- You shouldn't compare Winstone 32 scores with Winstone 96 scores. Although the benchmarks look and operate similarly, they test different operating systems, employ different applications, use a different base machine configuration, and therefore return results that cannot be compared with each other. For more information on the differences between the benchmarks that prohibit score comparisons, see "Don't compare Winstone 32 scores with Winstone 96 scores" on page 17.
- Winstone 32 creates two new database files, **W32_SYS.DBF** and **W32_DATA.DBF**, to hold saved Winstone 32 scores. These files are similar in structure to Winstone 96's **WST_SYS.DBF** and **WST_DATA.DBF** files. For more information, refer to "You can print the current results, the Chart and Table of Results, and the Disclosure using the Print option from the File menu." page 19.
- You can't view Winstone 96 scores using Winstone 32, nor can you view Winstone 32 scores in Winstone 96.

Language versions

We have tested Winstone 32 on the English, French, and German versions of Windows 95 and Windows NT Workstation 3.51 with Service Pack 3. Winstone 32 may be compatible with other language versions we haven't tested. If you have problems running Winstone 32 on language versions others than the ones just cited, please contact us. The topic **Error: Reference source not found** provides our contact information.

Updated applications

Winstone 32 includes the most current available versions of all the market-leading, 32-bit business applications. Here's a list of Winstone 32's categories, applications, and application version numbers.

Business Graphics/DTP:	Adobe® PageMaker® 6.0 CorelDRAW!™ 6.0 Microsoft® PowerPoint® 7.0
Database:	Borland® Paradox® 7.0 Microsoft Access 7.0
Word Processing/ Spreadsheet:* ¹	Lotus® Word Pro™ 96 Microsoft Word 7.0 Microsoft Excel 7.0

NOTE: Although Winstone 32's applications are 32-bit, Winstone 32's interface is 16-bit. The 16-bit interface doesn't affect how the 32-bit applications run or the scores Winstone 32 returns. All the operations Winstone 32 times and includes in its results are 32-bit.

The Configuration Information window

Winstone 32 checks the PC under test to make sure it meets a minimum set of requirements before a test run begins. If Winstone 32 finds any areas that may cause the test to fail, it reports those areas in the Configuration Information window. (For information on disabling the configuration check, see page 11.)

NOTE: You can open the Configuration Information window from the **Run** menu on the main window menu bar without running a test suite.

¹ * In Winstone 96, the Word Processing and Spreadsheet categories were separate. Winstone 32 instead has a combined Word Processing/Spreadsheet category because few of the leading applications in these categories were available in the 32-bit versions as of the Winstone 32 deadline.

You may also want to use the Configuration Information window to compare the test PC with either a pre-set list of optimization tips or a custom configuration file you create.

The Configuration Information window has three sections:

- **Potential Problems.** Lists any area of the PC's setup and configuration that doesn't meet the minimum test requirements.
- **Optimization Tips.** Compares the PC's setup and configuration to a pre-set list of optimization tips.
- **Custom Configuration File.** Compares the PC's setup and configuration to a custom configuration file. For more information, see page 10.

For information on how to use this window, see page 9 of this handbook or Chapter 8, "Using the Configuration Information Window," in the *Understanding and Using Winstone® 96 Version 1.0* manual.

Cleanup program

As with previous versions of Winstone, when you exit the benchmark program, it restores the test PC to its original state. However, Winstone 32 includes an improved cleanup program that automatically restores the PC to its pretest state even when there are problems with the benchmark's test run.

For example, if you need to interrupt a Winstone 32 test run, or if Winstone 32 halts, stops, or hangs the PC and you must exit Winstone 32 in any way other than clicking the Exit button, all you need to do is restart Windows. Winstone 32's cleanup program will automatically run when you restart Windows and restores the PC's system files.

NOTE: When you restart Windows NT, you need to log on using the username that was active when the failure occurred.

Error messages log file

Winstone 32 logs all error messages in a file named **ERRORS.TXT** in the parent directory where you installed the benchmark (probably **\ZDBENCH**). (Winstone 32 shares this log file with Winstone 96 and WinBench® 96.) The automatic logging feature frees you from having to keep track of any error messages Winstone 32 may display during a test run. You can view the **ERRORS.TXT** file with any text editor.

NOTE: The error message included in Winstone 32's **ERRORS.TXT** file do not include errors from the applications Winstone 32 uses.

End of Part 1

Part 2:

Before You Begin

This part of the handbook lists the minimum requirements a PC must meet to run Winstone 32 and its tests and explains what you need to think about before you install or run Winstone 32. This part also explains how to install Winstone 32's files from the CD-ROM.

Winstone 32 minimum requirements

If the PC doesn't meet Winstone 32's minimum requirements, Winstone 32 won't be able to run the tests properly. The following chart lists the minimum requirements to install and run Winstone 32.*²

Windows 95	Windows NT Workstation 3.51 (or later) with Service Pack 1 (or later)
Microsoft CD Extension software or equivalent	N/A
8MB of RAM	12MB of RAM
130MB of free disk space for a full install (if you're not running Winstone 32 from the CD-ROM or network). Winstone 32 requires 70MB of free space for the base directory, and an additional 30MB (whether you're running Winstone 32 from the CD-ROM, the hard disk, or a network drive) of free space for the working directory.	
80486 (or compatible) or higher processor	
CD-ROM drive (used for copying the application portions to disk; Winstone 32 doesn't test the CD-ROM drive)	
A swap file for Windows at least 6MB in size (the system cache typically uses all available memory)	
A temporary directory with 2MB or more of available space.	
VGA resolution (640x480) or higher graphics adapter	

NOTE: Winstone 32 only runs on the Windows 95 and Windows NT operating systems. If you try to run Winstone 32 on any other operating system, Winstone 32 displays an error message and quits.

Specifying Winstone 32's base and work directories

Winstone 32 measures the performance of a PC by executing actual Windows-based applications. The CD-ROM that includes Winstone 32 in its `\ZDBENCH\WS32` directory also contains all the files and application portions Winstone 32 needs; therefore, you don't need to install any applications to run Winstone 32.

When you run Winstone 32, it copies the files it needs from a base directory to a work directory. The base directory holds all Winstone 32's application files, and the work directory holds the files Winstone 32 creates when you run a suite.

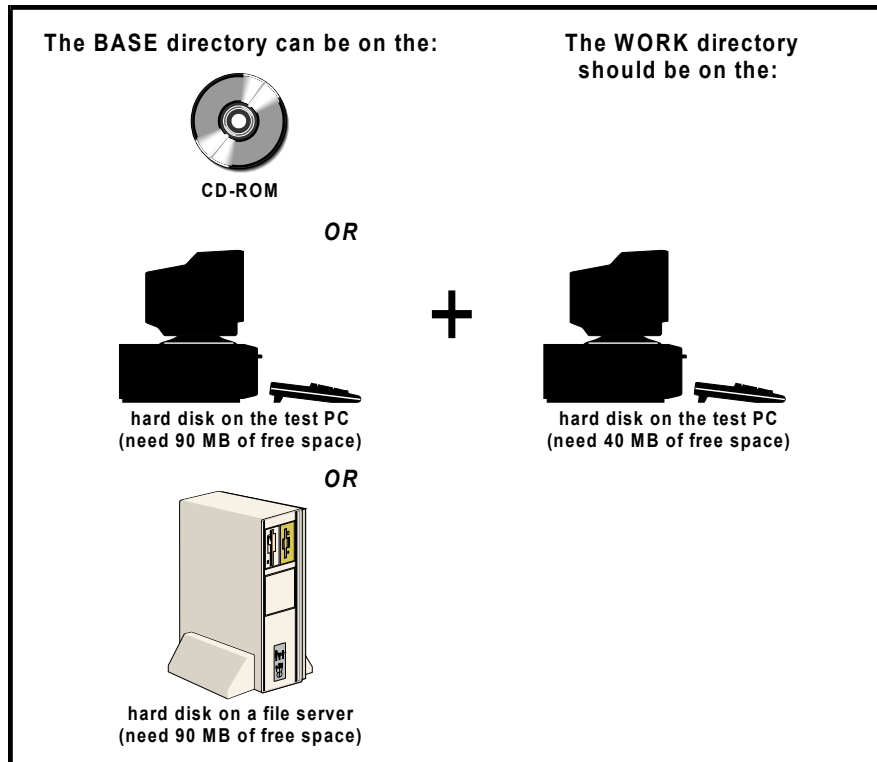
² * The exact software and hardware requirements for a PC depend on how you choose to run Winstone 32. For information on Winstone 32's base and work directories' requirements, see the next section.

You can set these directories to any path you want, but the work directory should be on the hard disk of the PC you plan to test. (For example, the base directory could be on a network drive, **F:\ZDBENCH\WS32**, and the work directory could be on the test PC's hard disk, **C:\ZDBENCH\WS32\WORK**.)

NOTE: The location of the base directory doesn't affect a PC's scores.

The following picture illustrates the different ways you can run Winstone 32 and the amount of free disk space you need for each option.

Figure 1: Options for running Winstone 32



Installing Winstone 32

The Winstone 32 installation process is fully automated. The setup program displays a series of screens and dialog boxes in which you enter information such as the directory where you want Winstone 32 to install its files. Each of these screens contains text explaining what you should do.

To install Winstone 32, execute **SETUP.EXE** from the **\ZDBENCH\WS96** directory on the CD-ROM or from a network file server.

NOTE: If you received Winstone 32 on CD-ROM, that CD-ROM may contain the Ziff-Davis PC Benchmarks Installer program. With this installer program, you can install Winstone 32, Winstone 96, and/or WinBench 96, as well as other programs WinBench 96 requires, at one time. If you're running Windows 95, the installer program starts automatically if the CD-ROM is in the CD-ROM drive. If you need to start the installer program, execute **INSTALL.EXE** from the CD-ROM's root directory using the **File | Run** command under Windows.

NOTE: Although you don't have to install Winstone 32's files to the default directory, **\ZDBENCH\WS32**, you should choose the default directory for compatibility with other Ziff-Davis benchmarks.

While the setup program is installing Winstone 32's files, it displays a status bar. If you want to stop the setup procedure, choose the Cancel button. (It may take a few moments for Winstone 32 to stop the procedure after you've chosen the button.)

After the setup process is complete, Winstone 32 displays a verification box to let you know it has installed the files it needs. Choose the OK button to exit this box.

The setup program also creates a **\ZDBENCH\RESULT96.ZDB** directory for the common results database if it doesn't already exist. If you didn't install Winstone 32 in a **\ZDBENCH** directory, Winstone 32 creates the **RESULT96.ZDB** directory in the directory where you installed the files.

The **RESULT96.ZDB** directory can hold the results database files created by Winstone 32, Winstone 96, and WinBench 96. However, Winstone 32 can't read the '96 benchmarks' results files, and the '96 benchmarks can't read Winstone 32's results files.

NOTE: When specifying the work and base directories, you must provide Winstone 32 with directory names that conform to 8.3 file-naming specifications. Don't use the long file names capability provided by Windows 95 and Windows NT; if you do, Winstone 32 won't be able to access the directory.

End of Part 2

Part 3:

Running Winstone 32

This part of the handbook tells you about the Configuration Information window and steps you through the process of running suites, getting results, and saving those results to the database. This part also explains how to run Winstone 32 in batch mode.

NOTE: Before you run any Winstone 32 tests, you'll need to license and register your copy of the software.

We've written this part of the handbook with the assumption that Winstone 32 is installed and ready to run on the PC and that you understand a little about Winstone 32 and how it works. For more detailed information on using Winstone 32's buttons, menus, and windows, see Chapter 11 in the *Understanding and Using Winstone® 96 Version 1.0* manual.

Using the Configuration Information window

Winstone 32 checks the PC under test to make sure it meets a minimum set of requirements before a test run begins. If Winstone 32 finds any areas that may cause the test to fail, it reports those areas in the new Configuration Information window. (For information on disabling this check, see page 11.)

The Configuration Information window has three sections:

- Potential Problems
- Optimization Tips
- Custom Configuration File

When Winstone 32 displays this window, the section that contains any warnings will be on top. For example, if Winstone 32 doesn't find any potential problems with the PC's setup and configuration, but instead, finds a setting in the PC's system files that differs from the pre-set list of optimization tips, it will display the Optimization Tips section first. (You can look at the other sections if you'd like. Just click on the button at the top of the window that corresponds to the section you wish to view.)

In the top left corner of the Configuration Information window, you'll find the **Options** drop-down menu. You can use this menu to:

- Tell Winstone 32 what areas to check before running tests (for example, you can have Winstone 32 check potential problems and nothing else)
- Load or unload a custom configuration file

The following sections briefly explain each part of the Configuration Information window.

Potential Problems

The following chart explains briefly what to do if Winstone 32 warns you of problems that may cause a test to fail.

Potential Problem:

Solution:

Swap file too small	Winstone 32 requires a total of 14MB of memory, of which at least 8MB must be physical RAM. (On Windows NT, the PC needs 12MB of physical RAM.)
Not enough free disk space	Winstone 32 needs a minimum of 40MB of free disk space for its work directory. You can: <ul style="list-style-type: none"> • Change the work directory to another disk drive on the test PC that has enough free disk space. • Free disk space by deleting files and/or applications from the test PC's hard disk.
Not enough free TEMP space	Winstone 32 needs at least 2MB of available space in a TEMP directory. You can: <ul style="list-style-type: none"> • Make sure the TEMP directory is on the same drive as the Winstone 32 work directory. • Make sure the TEMP directory is empty. • Increase the amount of space for the TEMP directory by putting the directory on a drive that has adequate space or by deleting files and/or applications to increase the available space on the drive where TEMP is located.
Missing display fonts	If the PC is missing any of the fonts Winstone 32 needs to successfully run its tests, the Configuration Information window lists the missing fonts. You'll need to install these fonts before continuing. (To see a list of fonts installed on the test PC, select Fonts from the Windows Control Panel program group.)
Quit other applications	Even though Winstone 32 runs on multi-tasking operating systems, running other tasks still draws resources from the PC and can affect Winstone 32 scores. Winstone 32 lists all other applications that are running, but will not automatically terminate these other applications. You should quit all other applications before running a Winstone 32 test.

Optimization Tips

When Winstone 32 performs its configuration check, it notes areas where the PC differs from a pre-set list of optimization tips. For example, when you run Winstone 32, the `load=` entry in the `[Windows]` section of the PC's **WIN.INI** file should be empty. So, if `load=` isn't empty, Winstone 32 lists this difference on the Optimization Tips page.

For information on why a certain setting may cause problems for Winstone 32, highlight the setting in the Configuration Information window and Winstone 32 displays an explanation at the bottom of the window.

Custom Configuration File

In addition to comparing the PC to a list of pre-set optimization tips, you can also use a custom configuration file. Then, when Winstone 32 performs its configuration check, it will compare the pre-defined settings in the custom configuration file with the settings the test PC uses. If you're testing multiple PCs, you can use a custom configuration file to assure that each PC matches the custom settings.

Winstone 32 includes a sample configuration file (**SAMPLE.CFG**) in the `\ZDBENCH\WS32\UI` directory on the CD-ROM.

For more information on custom configuration files, see "Appendix B: The Custom Configuration File" on page 29.

Creating a custom configuration file

To create a custom configuration file, first copy the CD-ROM's **ZDBENCH\WS32\UISAMPLE.CFG** file to another file name (for example, **CUSTOM.CFG**). Then, edit the custom file so it contains the settings you want. (For information on the different settings the **SAMPLE.CFG** file can contain, see 29.)

Loading a custom configuration file

After you've edited the custom file and before you run any Winstone 32 tests, go to each PC you want to test and follow the steps below:

1. Select **Run | Configuration Information...** from the Winstone 32 main window.
2. Select **Option | Load custom configuration file...** from the Configuration Information window.
3. Enter the directory and file name of the custom file in the Load Custom Configuration File dialog box.
4. Select OK.

Winstone 32 will use the custom configuration file for the current session and for future sessions until you unload the file.

Unloading a custom configuration file

To unload a custom configuration file:

1. Select **Run | Configuration Information...** from the Winstone 32 main window.
2. Select **Options | Unload custom configuration file** from Configuration Information window.

Disabling Winstone 32's configuration check

You may want to disable the configuration check if you're running Winstone 32 on the same PC over and over again without changing that PC's configuration. After Winstone 32 performs the configuration check and you're sure the PC is set up correctly, you can disable the check.

You can also tell Winstone 32 to perform only certain portions of its configuration check. For example, you could have the program check for Potential Problems but not check for Optimization Tips.

NOTE: If you change the PC's configuration at all, you should enable the configuration check. The configuration check is a good way to be certain Winstone 32 will complete the test without problems.

To disable one portion or all of the configuration check:

1. Select **Options | Check before running tests** from the Configuration Information window.
2. From the sub-menu Winstone 32 displays, select those areas you want the program to check.
For example, if you only want Winstone 32 to look for potential problems, select **Potential Problems** from the list. Winstone 32 marks each selection with a check mark.

If you don't select any of the items in this list, Winstone 32 doesn't perform its configuration check.

Until you change these options, Winstone 32 will perform the configuration checks you select for the current session and for future sessions.

Running the Overall Winstone 32 suite

To run the main suite:

1. Choose Winstone 32 from the Ziff-Davis Benchmarks program group to open the main window.

NOTE: If you haven't previously licensed Winstone 32, you'll have to read and agree to the license agreement before you can continue.

If Winstone 32 fails during initialization, you can use three command line options to disable Winstone 32's automatic detection of some disclosure fields.

- The **NOCPUCHECK** option prevents Winstone 32 from detecting the CPU type and speed and the FPU type.
- The **NOVIDCHECK** option prevents Winstone 32 from detecting the display refresh rate, VESA support, and graphics adapter types. The **NOVIDCHECK** option is useful if display corruption occurs after Winstone 32 initializes.
- The **NOREGCHECK** option prevents Winstone 32 from gathering information from the Windows 95 or Windows NT registry.
- The **NOSYSCHECK** option disables nearly all detection.

2. Choose the Run button. (When you open the main window, Winstone 32 displays "Overall Winstone 32" in the list of names to the right of the Run button. So, choosing the Run button runs the main test.)

NOTE: By default, Winstone 32 displays the Configuration Information window if there are problems that may cause the test to fail. If there are problems, you should select Cancel Test in this window and then correct the problems before continuing. (See the section "Using the Configuration Information window" beginning on page 9 for more information.)

The time Winstone 32 takes to run its main suite varies based on the PC's speed and configuration. Here are a few examples to give you an idea of how long it took to run the suite on machines in our research center. We tested these machines under Windows 95, using the standard VGA driver. Faster machines will take less time, while slower machines will take more time.

This machine:	Took approximately this much time:
A typical Pentium™ 133 with 32MB of RAM	18 minutes
A typical Pentium 120 with 16MB of RAM	19 minutes
A typical 486DX2/66 with 16MB of RAM	46 minutes
A typical 486SX/25 with 8MB of RAM	1 hour 10 minutes

While Winstone 32 is running the main suite, you'll see application windows opening and closing on the PC's screen as Winstone 32 executes its application scripts. When the suite finishes, Winstone 32 displays the PC's results in the Chart of Results.

Interrupting a test run

If you need to interrupt a suite, choose the Cancel button when Winstone 32 installs an application's files. If you need to stop a test run immediately, press Ctrl-Alt-Del to quit Winstone 32, and then restart Windows.

IMPORTANT NOTE!

If you halt Winstone 32 using Ctrl-Alt-Del, you should exit Windows, reboot the PC, and restart Windows so Winstone 32's cleanup program can restore the PC's system files to their original state.

NOTE: When you restart Windows NT, you need to log on using the username that was active when the failure occurred..

Saving scores

After Winstone 32 finishes a test suite, it automatically displays that suite's scores in the Chart and Table of Results windows.

To save results:

1. Choose the Save button from the Winstone 32 functions window.

Winstone 32 displays the Save to Database dialog box.

NOTE: You must enter a Description for the test run before you can save results. If you haven't entered a Description, Winstone 32 prompts you for that information before you can continue the save operation. It's also a good idea to check the other fields in the Disclosure Questionnaire for accuracy. After you've entered a Description and verified the other fields, choose the Continue with Save button.

2. Choose the Save button in the Save to Database dialog box.

Winstone 32 saves the results to the current database using the Description you supplied, along with other information in the Disclosure.

NOTE: You can change the destination database by choosing the Database button in this window. Any database you select must have a name that conforms to the 8.3 naming convention.

Running a Category suite

Winstone 32 includes three application category suites, and when you run the main suite, Winstone 32 reports the overall score as well as scores for each of these category suites. In addition to running the main suite, you can also run each of the category suites individually. Each category suite runs just the application scripts for the applications within that category.

The following table tells you which application scripts Winstone 32 runs when you choose a particular category suite.

This suite:	Runs the scripts for:
Business Graphics/DTP	PageMaker, CorelDRAW!, and PowerPoint.
Database	Access and Paradox.
Word Processing/Spreadsheet	Word, Word Pro, and Excel.

To run a category suite:

1. Select the category suite name from the list of names to the right of the Run function button. (To display this list, choose the down arrow to the right of the text box.)
2. Choose the Run button.

After you choose the Run button, if Winstone 32 finds any circumstance that may cause the suite to fail, it displays the Configuration Information window and warns you about the potential problem (see the section "Using the Configuration Information window" on page 9 for more details).

Winstone 32 does basically the same thing when you run an application category suite as when you run its main suite. The differences between a category suite and the main suite are:

- Winstone 32 runs only those application scripts included in that category.
- Winstone 32 computes a score for just that category.

The time Winstone 32 takes to run its category suites varies based on the PC's speed and configuration. Here are a few examples to give you an idea of how long it took to run these suites on machines in our research center. We tested these machines under Windows 95, using the standard VGA driver. Faster machines will take less time, while slower machines will take more time.

- Machine A is a typical 486/DX2/66 with 16MB of RAM.
- Machine B is a typical 486SX/25 with 8MB of RAM (Winstone 32's base machine).

This category suite:	Machine A:	Machine B
Business Graphics/DTP	17 minutes	44 minutes
Database	11 minutes	29 minutes
Word Processing/Spreadsheet	18 minutes	38 minutes

Running Winstone 32 in batch mode

You don't have to sit at the PC and click the buttons to run Winstone 32's suites. To make the best use of your time, you may decide to run Winstone 32 in batch mode. When you run Winstone 32 this way, it gets the information it needs to run the suites from a file called **RUNWS.INI**. This file supplies the environment settings, the names of the tests Winstone 32 will run, and the names for the database files Winstone 32 produces. Winstone 32 includes a prototype **RUNWS.INI** file in the **\ZDBENCH\WS96\UI** directory on the CD-ROM.

NOTE: Winstone 32 and Winstone 96 can share the same **RUNWS.INI** file

To run Winstone 32 in batch mode:

1. Copy the **RUNWS.INI** prototype file to another file name (for example, **MYFILE.INI**).
2. Edit the new file so it contains the information Winstone 32 needs.

You can use any text editor to modify this file. You can also use the *StepN* section(s) of this file to refer to files that define suites to run in that step. The **\ZDBENCH\WS32\UI** directory on the CD-ROM that includes Winstone 32 contains the following sample files you can use to refer to in the *StepN* section(s):

This file:	Runs this suite:
OVERALL.WSS	Overall Winstone 32
BG_DTP.WSS	Business Graphics/DTP
DB.WSS	Database
WPSS.WSS	Word Processing/Spreadsheet

For complete information on the different sections of the **RUNWS.INI** file you can modify, see Chapter 10, "Running Winstone 96's Tests," in the *Understanding and Using Winstone® 96 Version 1.0* manual.

3. After you've edited and saved the new file, run Winstone 32 with the AUTO command option and specify the name of the new file.

For example, if **MYFILE.INI** is the edited copy of the prototype file, you'd use the following command line:

```
WS32 AUTO MYFILE.INI
```

How you execute Winstone 32 in batch mode depends on the Windows shell you're using.

- If you're using Program Manager, select **Run** from the Program Manager **File** menu. Use the Browse feature to enter the Winstone 32 command line, and then add the AUTO option and the name of the **.INI** file to that command line.
- If you're using Explorer, select **Run** from the **Start** menu. Use the Browse feature to enter the Winstone 32 command line, and then add the AUTO option and the name of the **.INI** file to that command line.

If you want to automate this process so Winstone 32 runs in batch mode each time Windows starts, you can add the Winstone 32 icon with the AUTO command line option and the name of the **.INI** file to the Windows StartUp group.

End of Part 3

Part 4:

Looking at the Results

This part of the handbook discusses Winstone 32's scores, beginning with an explanation of why you shouldn't compare Winstone 32 scores with Winstone 96 scores. The following sections briefly explain how to view scores, use the results database, change and print Disclosure information, and interpret and analyze the numbers you see.

Don't compare Winstone 32 scores with Winstone 96 scores

It's tempting to run Winstone 32 and Winstone 96 on the same PC and, from the scores, try to find a correlation between the two benchmarks that explains any perceived performance differences.

Unfortunately, that kind of comparison doesn't work with Winstone 32 and Winstone 96. Although they may look and operate the same, there are substantial differences between the two benchmarks. (It is quite reasonable, of course, to use Winstone 96 to gauge a PC's 16-bit Windows performance and to use Winstone 32 to measure the same PC's 32-bit Windows performance; such measurements are the purposes of the benchmarks.)

1. **Each benchmark's base machine is different.** The most significant change in the base machine between Winstone 96 and Winstone 32 is the operating system. Winstone 96's base machine uses Windows 3.1 while Winstone 32's uses Windows 95. This is a significant change because these different operating systems place different demands on the base machine. To see information on Winstone 32 base machine's configuration, see "Using the base machine to compare results" on page 23.
2. **Winstone 32 runs different applications.** Each benchmark contains a set of applications unique to itself. Winstone 32 uses eight 32-bit business applications. Winstone 96 uses thirteen 16-bit business applications. Although some of the applications in both benchmarks share the same publisher and product name, the applications themselves are quite different from each other. To review the list of applications Winstone 32 runs, see "Updated applications" on page 2.
3. **Different applications mean different weights.** Winstone 32's weights are based on 32-bit business applications and those applications' projected market shares for 1996. Winstone 96's weights are based on a set of different 16-bit business applications and those applications' market share. Winstone uses an application's weight as an integral part of the final score calculation. For information on how Winstone 32 calculates its scores, refer to Chapter 19 of the *Understanding and Using Winstone® 96 Version 1.0* manual.

The tremendous difference in each benchmark's application set, combined with the different weights for each application and the different base machine configurations, effectively prohibit comparing scores between Winstone 32 and Winstone 96.

Viewing scores

You can view scores saved to a database from the Chart and Table of Results. After you run a test, Winstone 96 automatically displays the score(s) for that test in the Chart of Results. The Chart of Results shows the name of the suite and the score for that suite in a horizontal bar graph. The Table of Results presents the same data in a column format grouped into sets of results by test.

Adding results to the display

To add results to the Chart and Table of Results windows, choose the Compare... button in the Functions window. Winstone 96 then displays the Comparison Machines dialog box. (You only need to add results to these windows if you want to view results other than the current results.) You can display up to five sets of comparison results in the Chart and Table of Results windows.

From the Comparison Machines dialog box, you can add results from:

- A database by choosing the Add from Database... button.
- An exported file by choosing the Import from File... button.

Changing the display

You can use the **Display** option from the **Edit** drop-down menu to change the way Winstone 32 displays its results.

Choosing this option:	Displays:
All Categories	Scores for the main suite and category suites.
Categories Run	Scores for the suites run during the current session.
Selected Categories	Scores for the suites as specified in the drop-down list of suites to the right of the Run function button. For example, if the drop-down list displays "Database," then Winstone 32 displays the score(s) for its Database suite.

Removing results from the display

To remove a set of results from the Chart and Table of Results:

1. Open the Comparison Machines dialog box by choosing the Compare... button in Winstone 32's Functions window.

This dialog box lists all the results currently displayed in the Chart and Table of Results. (You can display up to four sets of comparison results in the Chart and Table of Results.)

2. Select the set of results you'd like to remove from the display, and then choose Remove.

Winstone 32 removes that set of results from the Chart and Table of Results. It doesn't, however, permanently delete those results from the database. (If you'd like to know how to permanently remove results from the database, see page 20.)

Printing results

You can print the current results, the Chart and Table of Results, and the Disclosure using the **Print** option from the **File** menu.

If you want to print . . .	Then choose . . .
The results and Disclosure information for tests run during the current session.	Current results.
The current contents of the Chart of Results and/or the Table of Results.	Chart of Results and/or Table of Results.
Disclosure information.	Disclosure. (Winstone 32 prints the Disclosure information for the current results. If you want to print Disclosure information for other sets of comparison results, change the Description listed at the top of the Disclosure window before selecting Print from the File menu.)

When you choose one of these options, Winstone 32 prints to the currently selected default printer.

Working with database files

Winstone 32 saves scores and disclosure information in a *database directory*. The database directory name typically has an extension of **.ZDB** and contains many dBASE®-compatible tables and indexes. You use scores saved in the database as comparison machines in the Chart and Table of Results windows.

NOTE: Winstone 32's database files, **W32_SYS.DBF** and **W32_DATA.DBF**, are not compatible with Winstone 96 and WinBench 96's database files. As a result, you can't load a Winstone 32 database into Winstone 96, nor can you load a Winstone 96 database into Winstone 32.

If you installed Winstone 32 in a subdirectory of **\ZDBENCH**, the setup program creates a database directory called **\ZDBENCH\RESULT96.ZDB**. If you didn't install Winstone 32 under a common **\ZDBENCH** directory, it creates the **RESULT96.ZDB** database directory in the directory where you installed the program files. Winstone 32 can't then share the database with WinBench 96.

When you're working with database files:

- Always treat a database directory as a single object.
- Always move, copy, or delete the entire directory.
- Never move, copy, delete, or rename the files in a database directory.
- Never use a dBASE-compatible database management system to edit the database directory. Doing so may break the relationship between the files and the benchmark, and you'll lose the results.

Winstone 32 stores results in a database using a key consisting of the Description, Variant1-5, PIN, and Project fields of the Disclosure. You can store many sets of results using the same key. Winstone 32 distinguishes the results by a unique time stamp.

The following sections explain how to work with Winstone 32's database files.

Merging results into one database

Winstone 32 lets you merge results from one database into another. When you merge two databases, you specify a target database and a source database. The *target* database is the database to which you wish to add results. The *source* database contains the records you wish to add to the target database.

NOTE: You can merge Winstone 32 and Winstone 96 databases into one database; however, you won't be able to view Winstone 32's scores from within Winstone 96, and vice versa.

To merge databases:

1. Select **Merge Databases...** from the **File** menu in the main menu bar. Winstone 32 then displays its Merge Databases dialog box.
2. Select the target and source databases.
3. Choose Merge.

Winstone 32 adds all the records from the source database to the target database. To view these records, you need to add them to the display (see page 18).

NOTE: Depending on the number of records in the source database, it may take a while to merge the records from one database to another.

Exporting results

In addition to saving results to a database, you can export results to an ASCII text file (.TXT), a Lotus 1-2-3 spreadsheet (.CSV), an Excel spreadsheet (.XLS), or a Windows Metafile (.WMF) for use in other applications.

To export results:

1. Select **File | Export**.

You can export:	Which contains:	To this format:
Current Results	Results and Disclosure for the tests run in the current session	.TXT, .CSV, or .XLS
Chart of Results	Results currently listed in the Chart of Results	.WMF
Table of Results	Results currently listed in the Table of Results	.TXT
Disclosure	The information currently listed in the Disclosure window	.TXT

Choosing any of the above options from the **Export** submenu displays the Export Results to File dialog box.

2. Enter the name of the file in the File Name dialog box. (You can change the drive and directories using the Drives and Directories portions of this dialog box.)
3. Choose OK.

Winstone 32 saves the results to the file name and format you specified.

Deleting results permanently from the database

You can't delete an entire database from within Winstone 32. However, you can permanently delete selected records from the database:

1. Select **File | Delete...** Winstone 32 displays its Delete Results from Database dialog box.

When you open the Delete Results from Database dialog box, Winstone 32 automatically displays all the records in the current database. (To change the database, choose the Database... button.)

2. Locate the record(s) you want to delete from the list of records.

To select more than one record, hold down the Shift key then click on the additional record name(s).

3. Choose Delete.

Winstone 32 prompts you with a warning asking if you're sure you want to delete the selected record(s).

4. Choose Yes, and Winstone 32 removes the selected record(s) from its database and closes the dialog box.

Working with Disclosure information

When you start Winstone 32, it checks the PC's configuration and stores the information it finds in the Disclosure. When you save a set of scores, Winstone 32 saves the disclosure information for that set of scores. If you publish results, you'll also need to publish the Disclosure information. The license agreement (located at the front of this tester's handbook) tells you specifically what Disclosure information you need to include if you want to publish your scores.

NOTE: If you run and save several suites on the same PC with the exact same configuration, Winstone 32 only stores the PC's configuration information once to conserve disk space.

This section explains how to view, edit, and print Disclosure information.

Viewing Disclosure information for the current displayed scores

To view the disclosure information for each set of scores currently displayed in the Chart and Table of Results, choose **Edit | Disclosure** from Winstone 32's main menu.

By default, Winstone 32 displays the disclosure information for the current set of scores first. Winstone 32 uses a drop-down list to display the Description for each set of scores you're currently displaying.

Disclosure information for a PC will most likely cover more than one page of the Disclosure window. Use the scroll bars to view portions that don't fit within the boundary of the window.

Viewing Disclosure information for other sets of scores

To look at disclosure information for another set of scores:

1. Select the down arrow to the right of Current Results.
2. Select the Description for the set of scores whose Disclosure information you wish to view.

Winstone 32 then changes the display to show the Disclosure information for that test run.

Editing the Disclosure Questionnaire

If you need to add to or change the Disclosure information about the PC, you can edit Winstone 32's Disclosure Questionnaire. There are two ways to edit the questionnaire. You can choose:

- **Edit** button in the Disclosure window.
- The **Disclosure Questionnaire** option from the **Edit** menu in the main window menu bar.

Either of these actions opens the Disclosure Questionnaire window.

To update the Disclosure Questionnaire:

1. Select the group on the left-hand side of the window that corresponds to the area of the Disclosure you wish to edit.

When you select one of these groups, Winstone 32 changes the Disclosure Questionnaire window to display just the information about that group. For example, if you want to edit the Description, select

the button beside Description, and Winstone 32 changes the display in the window to the Description information.

NOTE: Winstone 32 by default displays the first group, Instructions, each time you open the Disclosure Questionnaire.

2. After you have the Disclosure Questionnaire information the way you want it, choose the Update Disclosure button.

If at any point you wish to exit the Disclosure Questionnaire window without saving the changes and updating the disclosure, choose the Cancel button. When you choose either the Update Disclosure or Cancel buttons, Winstone 32 automatically closes the Disclosure Questionnaire window.

Printing Disclosure information

To print Disclosure information:

1. Select **File | Print**.
2. Select the **Disclosure...** option from the **Print** submenu.

When you print the Disclosure information, Winstone 32 prints the information currently displayed in the Disclosure window.

NOTE: If you're displaying results for several different types of machines, you can print disclosure information for each of them. To specify the set of comparison results for which you want to print the Disclosure, change the Description listed above the Disclosure information in the Disclosure window and then select **Print** from the **File** menu.

What the numbers mean

Winstone 32 runs today's top-selling Windows-based 32-bit business applications. For each application, Winstone 32 performs tasks the way typical users would perform tasks in the application. This approach lets Winstone 32 reflect the center of the 32-bit software market.

So, Winstone 32's scores represent how the PC performs these tasks when running these Windows-based business applications. Winstone 32 gives you an accurate and repeatable measurement of how a PC runs those applications under Windows.

This section briefly explains what the score for Winstone 32's main suite can tell you about a PC's performance.

Remember, a PC's configuration will affect its Winstone 32 scores. Comparing scores for two machines with different configurations is at best a potentially confusing experience. For more information on how to make the most accurate comparison possible, see page 27.

Bigger means better: Comparing Winstone 32 scores

When you first look at Winstone 32's Chart of Results, the numbers may seem a little overwhelming. The most important thing to remember, however, is with Winstone 32, bigger numbers mean better performance.

To make it easier to understand a PC's scores, Winstone 32 has a base machine. The base machine receives a score of 10.0 Winstone 32 units on the overall suite. The same base machine receives a score of 1.0 Winstone 32 units on each category suite. (For statistics on the base machine, see page 23.)

So, if a PC scores 20.0 Winstone 32 units on the main suite, it's two times as fast as the base machine at executing the main suite. Or, if a PC scores 5.0 Winstone 32 units on the main suite, the base machine is twice as fast as that PC at executing the main suite.

You can carry this over to Winstone 32 scores for any two machines. For example, if Machine A scores 20.0 Winstone 32 units on the main suite and Machine B scores 40.0 Winstone 32 units on the main suite, then Machine B is twice as fast as Machine A at executing the "Overall Winstone 32" suite.

For the category suites, if a PC scores 2.0 Winstone 32 units on a category suite, it's twice as fast at executing that category suite than the base machine. Likewise, if a PC scores 0.5 on a category suite, that machine is half as fast as the base machine at executing that suite.

The units Winstone 32 uses

Winstone 32 reports its results in arbitrary units. It's a *relative* score: it's only meaningful when you compare it to other Winstone 32 scores. So, the score isn't pixels per second, or bytes per second, or any other type of measurement.

The base machine's overall score is set at 10.0 Winstone 32 units, and each of the category suites is set at 1.0 Winstone 32 units. Winstone 32 sets these scores this way as a basis for comparison.

Just remember, the base machine is a basis for understanding a PC's performance at a glance. Faster PCs have larger numbers than the base machine, while slower PCs have smaller numbers than the base machine.

Using the base machine to compare results

The base machine for Winstone 32 is a Dell® PC with a 25-MHz Intel® 486 SX CPU running Microsoft Windows 95.

Winstone 32 uses the same physical base machine as Winstone 96. The primary differences between the two arise from using Windows 95 as the operating system. For example, Windows 95 by default uses MS-DOS 7.0 and its built-in networking software, so that's what the base machine uses. (The Winstone 96 base machine, by comparison, used MS-DOS 6.2 and a Novell® NetWare® Shell version 3.26.)

The following chart provides the statistics on the base machine.

Facts about the base machine	
PC Manufacturer	DELL
Model	NETPLEX 425s/P (25-MHz 486SX)
BIOS manufacturer	Phoenix Technologies Ltd.
BIOS version	1.10 A01
Bus type	ISA
DMA Controller	yes
Memory	8MB
Video	Super VGA (800x600, 16 colors)
Controller	on motherboard
Video Manufacturer	Cirrus Logic

Video BIOS	CL-GD540 x 1542 x VGA BIOS version 1.20
Hard Disk	162MB
Controller type	IDE
Hardware caching	no
Software caching	System Cache; write caching enabled (all available RAM)
Swap file for Windows	Minimum size: 4MB; Maximum size: None
Mouse	Genius Mouse Systems, model: Jx mouse
LPT ports	LPT1: (I/O address = 03BC)
COM ports	COM1: (I/O address = 03F8), COM2: (I/O address = 02F8)
MS-DOS	Version 7.00
Windows	Windows 95 Enhanced Mode with Paging
Network	Microsoft Client for NetWare® Networks

End of Part 4

Part 5:

Contacting ZDBOp

This part explains how to contact us if you have problems with Winstone 32 and tells you how to request benchmarks from ZDBOp.

Getting technical support

If you have problems with Winstone 32, you can report those problems to us using the Problem Report Form. You can find the Problem Report Form at the back of this handbook, at the back of the *Understanding and Using Winstone® 96 Version 1.0* manual, and on ZD Net™/CompuServe® Edition in the ZD Benchmark forum (GO ZDBENCH).

To submit a problem report, you can:

- Post a message about the problem on the ZD Benchmark (GO ZDBENCH) forum on ZD Net/CompuServe Edition. Access to CompuServe is available for a fee.
- Fax the form directly to Winstone 32 Technical Support (919-380-2879).
- You can send an on-line version of the Problem Report Form via e-mail to: zdbopwebmaster@zd.com

Mail the form to us at the following address:

Ziff-Davis Benchmark Operation
1001 Aviation Parkway, Suite 400
Morrisville, North Carolina 27560
Attn.: Winstone 32 Technical Support

Requesting a benchmark

If you'd like to request copies of Winstone 32 or other Ziff-Davis benchmarks, fill out a Benchmark Request Form and then:

- Fax it to our dedicated benchmark request fax number (919-380-2879)
- Mail it to us at:

Ziff-Davis Benchmark Operation
1001 Aviation Parkway, Suite 400
Morrisville, North Carolina 27560
Attn.: Distribution Coordinator

End of Part 5

Appendix A:

Basic concepts

This section gives a brief introduction to some basic Winstone 32 concepts. For more information on Winstone 32's design concepts and testing procedures, see Part 5, "Looking Under the Hood—How Winstone 96 Works," in the *Understanding and Using Winstone® 96 Version 1.0* manual. The concepts discussed there apply also to Winstone 32.

Winstone 32: A brief definition

Winstone 32 produces an overall measure of a PC's performance as it runs 32-bit applications under either Windows 95 or Windows NT 3.51 (or higher). It runs real 32-bit business applications through a series of scripted activities and uses the time a PC requires to complete those activities to produce its performance scores.

Winstone 32 uses no 16-bit applications for its tests.

In developing Winstone 32's scripts, we used leading 32-bit business applications and our research on how typical people use applications. The result of this work is an accurate and repeatable benchmark you can use to determine a PC's overall performance when running today's top-selling Windows-based 32-bit business applications.

You can compare a PC's score with the scores of other PCs—higher scores mean faster overall performance.

Making sure a comparison is valid

After you've run Winstone 32, you'll want to use its scores to judge a PC's performance. You should, however, remember a few very important details before you begin making any comparisons:

1. **IMPORTANT!** You can't meaningfully compare the most current release's scores with scores from previous versions of Winstone. Each new version of Winstone includes substantial changes, and those changes affect scores. So, you should always compare scores from the same version of Winstone. This means, for example, that you can't compare Winstone 32 scores to Winstone 96 scores for the same machine.
2. Winstone 32's scores are *relative* scores. A Winstone 32 score means something only when you compare it to another Winstone 32 score. So, a Winstone 32 Unit Score of 40.0 means that the PC is four times faster than the base machine on the same test. Similarly, a Winstone Unit Score of 80.0 means a PC is twice as fast as a machine that receives a Unit Score of 40.0 on the same test. (For more details, see the section "The units Winstone 32 uses" on page 23.)
3. If you're trying to determine which of two PCs outperforms the other, keep in mind that a PC's hardware and software setup affects its performance. To find out about a PC's system information at the time you ran Winstone 32, you can view its Disclosure information (for more details, see page 21).

End of Appendix A

Appendix B:

The Custom Configuration File

You can use Winstone 32's configuration check to compare the test PC's setup and configuration to pre-defined settings in a custom configuration file.

The custom configuration file is especially useful if you're testing a large number of PCs. By ensuring each PC has the same custom configuration file, you can determine which PCs may need to be reconfigured to match your custom configuration. Ensuring a stable configuration across a set of machines can yield useful benchmarking results.

While a custom configuration file won't change a PC's setting for you, it will make Winstone 32 alert you if a PC's configuration differs from the custom settings.

This appendix explains how to create a custom configuration file, how Winstone 32 uses a custom configuration file, and summarizes the command set you can use to build the file. Following the list of available commands, you'll find examples you can modify for a custom file.

Creating a custom configuration file

Winstone 32 includes a prototype configuration file, **SAMPLE.CFG**, in the `\ZDBENCH\WS32\UI` directory on the CD-ROM.

To create a custom configuration file:

1. Copy the **SAMPLE.CFG** file to another file name, such as **CUSTOM.CFG**.
2. Edit the new file so it contains the configuration information you want Winstone 32 to check. (The section "Functions" beginning on page 31 provides details on the list of available commands. For a few examples to use as guidelines when you edit the file, see page 33.)

After you've edited and saved the custom file, you'll need to load the file during the Winstone 32 session for Winstone 32 to use it during its configuration check (see page 10 for more information).

How Winstone 32 uses a custom file

After you load a custom file, Winstone 32 compares the test PC's system configuration with the settings in the custom file before each test run.

To increase the speed of execution, Winstone 32 parses the custom configuration file entirely within memory. Thus, a custom configuration file must be less than 64KB in size.

Winstone 32 executes the custom configuration file one line at a time. The file contains five elements:

- Comments
- *entry* = lines
- [*section*] lines
- Functions
- Expressions

The remainder of this appendix describes each of these elements.

Comments

Comments in a custom configuration file explain what each command in the file does. You enter comments in the file using two adjacent slashes (//) at the beginning of the line. The comment can start anywhere on a line and extends until the next new line. Winstone 32 treats double slashes enclosed within quotation marks (“ ”) as part of a literal string and not a comment.

Comments are for your use only; Winstone 32 ignores all text within a comment.

entry = lines

Winstone 32 uses *entry* = lines to retrieve information from the test PC's environment variables, the benchmark's disclosure fields, or the PC's .INI files. You can specify where the *entry* = line looks for information by using the #**focus**() function described on page 31.

All *entry* = lines have the following general syntax:

```
entry = [FormatString,] VariableList
```

Where:

- *entry* is the name of the environment variable, disclosure field, or .INI file entry whose value you want to retrieve. Winstone 32 scans the value of *entry* as a series of input fields.
- *FormatString* defines a format specifier (similar to the C **scanf**() function). The *FormatString* option recognizes three format specifiers:

- **%d**, which formats integers (from -2,147,483,684 to 2,147,483,687)
- **%f**, which formats floating point numbers (from 1.7×10^{-308} to 1.7×10^{308})
- **%s**, which formats strings

You don't have to specify a *FormatString* option. If the *FormatString* is missing, Winstone 32 stores the contents of *entry* in the one variable you specify. This is useful for reading entire strings, rather than formatting them one token at a time.

- *VariableList* defines where you want Winstone 32 to store the formatted input.

The *VariableList* option can contain up to 32 variables, separated by commas. Variable names must be unique within the first 31 characters and must follow C rules for naming variables.

Variables are only valid until the next *entry* = line. The *VariableList* for each *entry* = line replaces the *VariableList* from the previous *entry* = line.

[*section*] lines

A [*section*] line specifies the section Winstone 32 uses when retrieving entries from an **.INI** file. You can use [*section*] lines only if the current focus is an **.INI** file; otherwise, Winstone 32 will issue an error message because it cannot find the **.INI** file. You can set the focus using the **#focus()** function (see page 31).

Functions

The following sections discuss the functions you can use to build a custom configuration file.

#if(expression)

You can use the **#if(expression)** function to check if certain conditions exist on the test PC. The **#if** function requires a corresponding **#endif** function to mark the end of the **#if** expression.

You can use the following BOOL operators in the **#if** function:

&&	numbers only
 	numbers only
==	numbers and strings
!=	numbers and strings
in	strings only
<	numbers and strings
<=	numbers and strings
>	numbers and strings
>=	numbers and strings

For information on variables you can use in the (**expression**) see the section “Expressions” on page 32.

#else

The **#else** function tells the benchmark what to do if the **#if** function is not true. The **#else** function is optional.

#endif

The **#endif** function marks the end of the **#if** function. The **#endif** function is required.

#focus(FOCUS)

The **#focus(FOCUS)** function sets the system location where the benchmark retrieves configuration information.

Valid values for **FOCUS** are:

Disclosure	benchmark disclosure fields
Environment	environment variables
<i>infile</i>	.INI file name

#text(*FormatString*[,*VariableList*])

The **#text(*FormatString*[,*VariableList*])** function overrides the default text for the previous *entry* = line. Winstone 32 displays this text in the top portion of the Configuration Information window. The syntax rules for this function are the same as the C **printf()** function except that **%d**, **%f**, and **%s** are the only allowable format specifiers.

#note(*FormatString*[,*VariableList*])

The **#note(*FormatString*[,*VariableList*])** function links a note to the previous *entry* = line. Winstone 32 displays this note in the Note section of the Configuration Information window when the tester selects the corresponding text message in top portion of that window.

The syntax rules for this function are the same as the C **printf()** function except that **%d**, **%f**, and **%s** are the only allowable format specifiers.

#notify(void)

The **#notify(void)** function notifies the benchmark of a conflict. When the benchmark receives a **#notify** function, it displays either a default text message or text specified in the **#text** function in the Configuration Information window. If the tester supplies a note, the benchmark displays this note in the Note text box.

Expressions

The general syntax for an expression is:

A operator B

A and *B* can be any of the following:

- A variable name.
- A string or numeric constant.
- One of the following pre-defined constants:

TRUE	1
FALSE	0
WIN16	TRUE if OS is 16-bit Windows.
WFWG	TRUE if OS is Windows for Workgroups.
WIN95	TRUE if OS is Windows 95.
WINNT	TRUE if OS is Windows NT.
DISKSPACE	Amount of free space on the working drive.
FREEMEM	Amount of free memory.
SYSTEMRAM	Amount of processor RAM.
- Another expression.

The *operator* can be any one of the following:

<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to
==	equal to

!=	not equal to
&&	logical AND
	logical OR
in	tests if <i>A</i> is a substring of <i>B</i>

Examples

This section provides examples you can build upon for a custom configuration file (see the **SAMPLE.CFG** file in the **\ZDBENCH\WS32\UI** directory).

Checking DOS environment variables

If you want Winstone 32 to verify DOS environment variables before running a test, you'd use settings similar to the following in the custom configuration file. (Lines beginning with double slashes, “//,” are comment lines.)

```
// Set the focus to the DOS environment variables.
#focus(Environment)
// Read the "TEMP" variable as a string and store the value
// in ENVVAR.
TEMP = envvar
// If ENVVAR is empty, set NOTE and call NOTIFY to update
// the Configuration Information Window.
#if (envvar != "")
#else
    #note("You need to set the TEMP environment variable in the
AUTOEXEC.BAT file. For example, 'TEMP=C:\DOS'."
    #notify()
#endif
```

Checking entries in WIN.INI

If you want Winstone 32's system to check to verify entries in the PC's **WIN.INI** file before it runs a test, you'd use settings similar to the following in the custom configuration file. (Lines beginning with double slashes, “//,” are comment lines.)

```
// Set the focus to the WIN.INI file.
#focus("win.ini")
// Set the topic to the [windows] section of the WIN.INI file.
[windows]
// Read the "run" entry in the [windows] section as a
// string and store the value in RUNVAR.
run = runvar
// If RUNVAR is not empty, set NOTE and call NOTIFY to
// update the Configuration Information Window.
#if (runvar != "")
    #note ("The 'run =' line in the WIN.INI file should be empty.")
    #notify()
#endif
// Read the "load" entry in the [windows] section as a
// string and store the value in LOADVAR.
load = loadvar
```

```
// If LOADVAR is not empty, set NOTE and call NOTIFY to
// update the Configuration Information Window.
#if (loadvar != "")
    #note ("The 'load =' line in the WIN.INI file should be empty.")
    #notify()
#endif
```

Checking entries in SYSTEM.INI

If you want Winstone 32's system to check to verify entries in the PC's **SYSTEM.INI** file before it runs a test, you'd use settings similar to the following in the custom configuration file. (Lines beginning with double slashes, "//," are comment lines.)

```
// Set the focus to the SYSTEM.INI file.
#focus("system.ini")
// Set the topic to the [boot] section of the SYSTEM.INI
// file.
[boot]
// Read the "shell" entry in the [boot] section as a string
//and store the value in SHELLVAR.
shell = "%s", shellvar
// If SHELLVAR is not equal to "PROGMAN.EXE", set NOTE and
// call NOTIFY.
#if (shellvar != "progman.exe")
    #note("We've only tested Winstone 32 on systems running Windows
    PROGMAN.EXE as the shell program.")
    #notify()
#endif
```

End of Appendix B

BENCHMARK REQUEST FORM

Please check the boxes of the products you want:

PC Benchmarks CD-ROM containing **Winstone**®, **WinBench**® and **Winstone 32**® for desktop PCs running 16-bit and 32-bit operating systems.

Server Benchmarks CD-ROM containing **NetBench**® for file servers and **ServerBench**® for client/servers (for x86-compatible processors).

Macintosh Benchmark CD-ROM containing **MacBench**® for Mac™ OS Systems.

Please send these products to:

Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Country: _____

Telephone: _____ FAX: _____

We answer requests in the order we receive them. We ship all benchmarks via 3rd-class U.S. Please allow 4-6 weeks for delivery. For faster shipment, provide your Federal Express account information below:

Your Federal Express account number: _____

Check one: priority overnight standard overnight

Please return this form:

Fax to: **(919) 380-2879**

or Mail to: Ziff-Davis Benchmark Operation
1001 Aviation Parkway, Suite 400
Morrisville, NC 27560

Problem Report Form

Information about you:

Name: _____

Address: _____

Company: _____

E-mail address: _____

Phone: _____

Fax: _____

Benchmark you're using: _____

A description of the PC:

Example: WXY Corp. Model 486DX-66 with 8MB of RAM, 64 KB RAM cache, 200MB hard disk, IDE controller, no hardware disk cache, running Windows 95

Details of the problem:

What is the problem, and what did the benchmark do just before the problem occurred?

What message was in the status bar at the bottom of the benchmark's main window _____

Can you reproduce the problem? _____

Could you please attach the contents of the benchmark's Disclosure and the **ERRORS.TXT** file? (You can find the **ERRORS.TXT** file in the benchmark's main directory.)

Other comments: _____

Please return this form:

Fax to: **(919) 380-2879** or E-mail to: **zdbopwebmaster@Ziff-Davis.com**

or Mail to: Ziff-Davis Benchmark Operation
1001 Aviation Parkway, Suite 400
Morrisville, NC 27560

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Michael E. Brown	Technical Writer
Allyn Vogel	Development Team Leader
John Upchurch	Developer
J. Michael McGarrah	Developer

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Dave Morey

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Lotus Development Corporation
Microsoft Corporation

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