

---

---

# ***HOW TO OPTIMIZE THE PERFORMANCE OF WORD 6.0 FOR WINDOWS***

---

---

Information contained herein was compiled primarily from Microsoft Knowledge Base articles. You also have access to the Microsoft Knowledge Base through CompuServe (GO MSKB). For more information on how to use this resource download the file KBUSER.ZIP from the MSWORD forum Lib 2.

The Microsoft Knowledge Base stores files in the Text or ASCII format. In order to preserve spacing and alignment, the article text is formatted with the Courier New fixed-width font.

---

**INFORMATION PROVIDED IN THIS DOCUMENT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE.** The user assumes the entire risk as to the accuracy and the use of this information. This document may be copied and distributed subject to the following conditions: 1) All text must be copied without modification and all pages must be included; 2) This document may not be distributed for profit.

Copyright © 1993 Microsoft Corporation. All Rights Reserved. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation.

---

**Table of Contents**

---

*μHow to Optimize the Performance of Word Under Windows 3.1*\_\_\_\_\_1

# How to Optimize the Performance of Word Under Windows 3.1

**ID: Q108503    CREATED: 13-DEC-1993    MODIFIED: 30-DEC-1993**

## SUMMARY

=====

This article describes how you can optimize the performance speed of Word for Windows running under Windows version 3.1.

Word 6.0 is larger and more robust than previous versions of the application. As a result, performance may be slower simply because your computer is working harder. However, if you optimize the performance of Windows 3.1, you will also optimize Word's performance. In other words, if you want to increase the performance of Word, you must optimize Windows 3.1. This article contains the following sections that describe steps you can take to optimize Word and Windows:

- Change the BitmapMemory and CacheSize WINWORD6.INI Settings
- Hardware Optimization
- Configuring MS-DOS for Optimal Performance
- Maintaining Optimal Hard Disk Performance
- Configuring Windows for Optimal Performance
- 32-Bit Disk Access (FastDisk)
- Steps to Create/Increase a Permanent Swap File

## MORE INFORMATION

=====

Optimizing Windows 3.1 involves both your hardware and software. Hardware factors include the type and speed of the processor, amount of memory, and available hard disk space. Software factors include the type of memory required to run your applications. The remaining sections in this article describe how you can optimize both your hardware and software configurations for Word and other Windows-based applications running under Windows 3.1.

Change the BitmapMemory and CacheSize WINWORD6.INI Settings

-----  
To increase bitmap-redrawing speed and scrolling speed in Word, you can add the following two settings to the [Microsoft Word] section of your WINWORD6.INI file, located in the WINDOWS directory:

1. BitMapMemory= sets the amount of memory (in kilobytes) reserved for cache memory for bitmaps. Increasing this number increases the size of the bitmap cache that Word uses for redrawing pictures quickly. The BitmapMemory setting should not exceed the amount of available free random access memory (RAM). A setting of 1024 should provide enhanced performance in Word (256 is the default setting). You can insert the command anywhere in the [Microsoft Word] section of your WINWORD6.INI file using the following syntax:

```
[Microsoft Word]
BitMapMemory=xxxx
```

2. CacheSize= sets the amount of memory (in kilobytes) reserved for cache memory for Word documents. The default value for the CacheSize command is 64 or 64K. Increasing this setting (in multiples of 64K) improves the speed of scrolling, searching and replacing, the Go To command, and document load and save times. If your system has plenty of memory and you work with many large documents, consider setting the CacheSize to 256K or 512K. You can insert the command anywhere in the [Microsoft Word] section of your WINWORD6.INI file using the following syntax:

```
[Microsoft Word]
CacheSize=xxx
```

## Hardware Optimization

-----

Because Windows 3.1 uses extended memory, the more extended memory available, the better Windows 3.1 performs. Installing additional extended memory helps improve performance.

There is a trade-off between speed and hard disk space, depending on your system's hardware capabilities. In either case, make sure that as much free memory as possible is available.

Because hard disks are often formatted with the incorrect interleave at the factory, setting the optimal hard disk interleave for your system will help to improve performance. Third-party software, such as SpinRite, can be used to set the interleave and some utilities can correct the interleave without

formatting your hard drive.

The interleave is a number that specifies how data is loaded onto the sectors of a hard disk. An interleave of 2 uses every other sector. An interleave of 3 uses one sector, then skips two, then loads one, skips two, and so forth. Slow CPUs require higher interleave numbers if they are to successfully read a hard disk.

If your system has a memory expansion board and the board can be configured as either expanded or extended memory, configure all of this memory as extended memory. You can then use EMM386.EXE to emulate expanded memory only as needed by non-Windows applications that require expanded memory to run. In this case, make sure that the expanded memory driver is placed before the lines that load HIMEM and EMM386. For information on configuring the memory on your add-in board, see its documentation. Some expanded memory boards are incompatible with EMM386.

#### Configuring MS-DOS for Optimal Performance

-----

Upgrade to MS-DOS 6.2 so that you can load MS-DOS into the high memory area (HMA) by setting DOS=HIGH or DOS=HIGH,UMB in your CONFIG.SYS file. In addition, MS-DOS 6.2 allows for proper disk maintenance with the ScanDisk and DeFrag utilities included with MS-DOS 6.2.

Make sure the most recent version of HIMEM.SYS, EMM386.EXE, RAMDRIVE.SYS, and SMARTDRV.EXE are stored in directories specified in the command lines of the CONFIG.SYS and AUTOEXEC.BAT files. (Placing these files in the root directory will not improve performance).

Ensure that the command that loads HIMEM.SYS comes before any commands that load any other applications or drivers that use extended memory.

The SMARTDrive disk-caching driver produces one of the biggest Windows 3.1 performance improvements. For this reason alone, load SMARTDRV in the AUTOEXEC.BAT file and allocate the largest amount of memory as possible. Ensure that the InitCacheSize and WinCacheSize parameters are properly set in accordance with the amount of memory installed on the system. If SMARTDRV is being loaded with no parameters, in some cases (MS-DOS 6.2 and 6 MB or more of RAM), the default settings can use up to 2 MB for a cache size in MS-DOS and 2 MB in Windows.

Set FILES=60 in your CONFIG.SYS file unless you have a software application that requires a higher setting. Set BUFFERS=10 in your CONFIG.SYS file if you use SMARTDRV.EXE. Using a high number of buffers with SMARTDRV will decrease efficiency. If you are not using SMARTDRV, set BUFFERS=30. More

buffers may improve disk access times but will use more conventional memory.

Load EMM386.EXE if you are running non-Windows applications that require expanded memory or if you want to allocate UMBs for loading memory resident TSRs and drivers.

Load only the necessary TSRs, drivers, or software programs. Wherever possible, load TSRs and device drivers into the UMBs.

If the environment space is set by a SHELL statement in the CONFIG.SYS file, you can specify a smaller environment.

Remove any commands for mouse drivers in your AUTOEXEC.BAT and CONFIG.SYS files if you only use the mouse in Windows and don't want mouse support while running non-Windows applications in 386 enhanced mode.

Memory optimization plays a major role in system performance. If only Windows-based applications are run, don't load any drivers, programs, TSRs, or MS-DOS itself into the high memory area. Loading items into the high memory area frees up only conventional memory and if MS-DOS-based applications are not run, then conventional memory can be used to load these items.

#### Maintaining Optimal Hard Disk Performance

-----

Delete unnecessary application and system files, including .BAK and .TMP files. The fewer files your hard disk has to sort through, the quicker the access time. Make sure Windows is not running when you delete .TMP files.

Run ScanDisk or CHKDSK frequently to find lost clusters. If lost chains or clusters are detected, fix them with ScanDisk or run CHKDSK /F and delete the .CHK files it creates.

Use a utility program such as MS-DOS DeFrag to compact your hard disk regularly. A fragmented hard disk greatly impacts the performance of Windows, especially if SMARTDrive is installed or if you're using a temporary swap file. Make sure Windows is not running when you run the disk-compacting utility.

#### Configuring Windows for Optimal Performance

-----

Use a color or a pattern for the desktop background instead of wallpaper if you need to free memory for running applications. Bitmaps consume more

memory.

Choose the lowest-resolution display driver that will meet your needs. In general, use the standard VGA driver to ensure faster display performance (but lower resolution and less color support).

If you run in standard mode, set the application swap file to the fastest hard drive by setting the SwapDisk= entry in the [NonWindowsApp] section of the SYSTEM.INI file.

If you run in 386 enhanced mode, create a permanent swap file on your fastest hard drive by choosing the 386 Enhanced icon in Control Panel and filling in the options in the Virtual Memory dialog box. The only reason not to use a permanent swap file is if hard disk space is at a premium. A permanent swap file, or virtual memory, generally allows the system to run faster because it uses contiguous disk space. A temporary swap file attempts to use contiguous disk space, but because of its dynamic nature, it can't always do so.

Depending on the amount of available extended memory and free disk space, you may be able to increase performance by increasing the size of an existing permanent swap file.

Keep in mind the method that Windows uses to determine the size of a permanent swap file. Windows will create a permanent swap file based on the following calculation:

Four times the available extended memory, rounded to the next 4 megabytes, up to half of the available usable hard drive space (compressed or stacked hard drive space is not considered usable). For example, if you have 3 MB of free/available XMS memory, you can create 16 MB of virtual memory ( $[3 \text{ MB} * 4] + 4\text{MB} = 16\text{MB}$ ).

Again, the recommended size is also limited to the "50 percent free hard drive space" rule (that is, a swap file cannot take more than 50 percent of the available hard drive space). Whichever limit is reached first establishes the maximum size.

If your drive has been DoubleSpaced, or disk compression software has been run to increase the size of your disk, optimizing the system can take much longer than expected. The size of the compressed drive may need to be decreased to increase the size of the uncompressed drive. Remember the 50-percent rule.

If you don't set a permanent swap file for 386 enhanced mode, set your temporary swap file to the fastest hard drive by setting a value for

PagingDrive= or PagingFile= in the [386Enh] section of the SYSTEM.INI file.

If you are using Windows for Workgroups, you can further optimize your Windows performance using the following additional steps:

- To optimize the performance of Windows for Workgroups on a workstation that is sharing resources, do not use a screen saver. Screen savers can degrade performance on a workstation that is sharing resources, so you should not use a screen saver, or you should use a non-CPU-intensive screen saver, such as the Windows Marquee screen saver.
- If your workstation is only sharing resources (that is, it is only used as a dedicated file or print server), you can adjust the Performance Priority slider bar, using the Network icon in the Control Panel, to allocate more CPU time to the sharing of resources. If you are sharing a locally connected printer, Print Manager (considered to be an application), must be running on the workstation. In this case, you must leave some CPU time allocated to applications so Print Manager can run.
- If you are using a separator page for print jobs, use a less-complex separator for faster printing. To modify the separator page, open the Options menu in Print Manager.

### 32-Bit Disk Access (FastDisk)

-----

If there is an option to use 32-bit disk access in the Virtual Memory section of Control Panel, this means that your hard drive controller is, or appears to be, WD1003 compatible and can use this option.

32-bit disk access, or FastDisk, replaces the disk BIOS. It serves as a device driver that talks to the hard drive controller, watching for special calls (INT 13H) and handles them directly, bypassing the BIOS. In 386 enhanced mode, 32-bit access speeds up disk access. On many machines, the disk BIOS is slow and unwieldy. When FastDisk replaces BIOS functions, many systems show impressive performance improvements. In other words, by bypassing the BIOS, Windows "talks" directly with the hard drive. This option will increase performance for the MS-DOS Prompt and the applications that run in it.

There are risks involved when using 32-bit disk access. There are some cases where this can crash the system, usually cases where the hard disk controller appears to be WD1003 compatible, but is not. Also, there can be some problems even on compatible controllers on some portable computers, specifically those that power down the hard disk to conserve power without



telling the running software.

## Steps to Create/Increase a Permanent Swap File

-----

Because of the calculation that Windows uses to set a swap file size, it is imperative that as much contiguous disk space and extended memory as possible is free and available. If a permanent swap file already exists, you may be able to increase the size, taking into consideration the advance planning discussed earlier.

1. In Windows, choose the Control Panel icon in the Program Manager (usually in the Main group).
2. In the Control Panel, choose the 386-Enhanced icon.
3. Choose the Virtual Memory button, and then choose the Change button.
4. Under New Swapfile Settings, in the Type box, select None.
5. Choose OK and choose Yes when asked if you are sure.
6. Choose Continue when asked whether to restart Windows or continue.
7. Choose OK in the Virtual Memory dialog box, then choose Exit from the Settings menu in Control Panel.
8. Open the Startup group and temporarily move any items to another group or rename the Startup group.
9. Quit Windows.
10. At the MS-DOS prompt, run a disk maintenance utility such as CHKDSK, or if you're using MS-DOS 6.2, ScanDisk. If errors are reported, convert the lost clusters or chains to files. After either of these utilities has run, you can check the .CHK files and delete those that are not needed.
11. Next, run a defragmenting utility such as Norton Speeddisk or PC-Tools Compress. If you are using MS-DOS 6.0 or higher, run DEFRAG. This will defragment your hard drive, creating more contiguous disk space.
12. Use a text editor such as MS-DOS Edit to modify the CONFIG.SYS and AUTOEXEC.BAT files to include only those device drivers and TSRs that are needed to run the system and Windows. Do not load MS-DOS or any other items into the high memory area. This will free as much extended

memory as possible the next time you start your computer.

13. Using a text editor, modify your WIN.INI file (located in the Windows directory) and "remark" the LOAD= and RUN= lines by placing a semicolon (;) at the beginning of each of those two lines.
14. Restart your computer and start Windows.
15. Choose Control Panel from Program Manager.
16. Choose the 386 Enhanced icon and then choose the Change button.
17. Select a drive in the New Settings section that will net you the largest maximum recommended swap file (a permanent swap file cannot reside on a compressed or stacked drive).
18. If there is a check box at the bottom-left side of the dialog box labeled 32-Bit Disk Access, select that option. Refer to the above section relating to 32-bit disk access.
19. Choose OK and choose Yes when asked if you are sure.
20. Choose Yes when prompted and informed about using 32-bit disk access.
21. When prompted to restart the computer or continue, choose Restart the Computer.

The SpinRite, Speeddisk, and PC-Tools products included here are manufactured by vendors independent of Microsoft; we make no warranty, implied or otherwise, regarding these products' performance or reliability.

#### REFERENCES

=====

"Microsoft Windows Resource Kit," version 3.1, pages 258-263, 520-523

Additional reference words: 6.00 tshoot virtual memory win31 faster  
too slow quicker wait long time