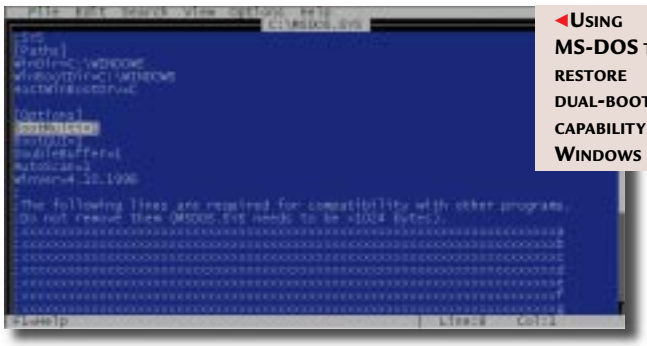
Putting the boot in

With a dual boot system, you can easily switch between operating systems. Roger Gann shows you how to do it in Windows 9x.

Windows 9x introduced the concept of dual booting. This lets you choose, at boot time, which operating system you wish to load; normally the choice is between Windows 9x and an earlier version of MS-DOS. The dual boot option is automatically installed if you upgrade to Windows 9x and you choose to install the new Windows in a directory other than that where the old version resides.

Here's an example. Windows 3.1x is installed in C:\Windows and you opt to install Windows 9x in C:\Win9x. This is not the default option so it involves extra hassle; you'll have to reinstall all your old applications, as they won't automatically be upgraded to Windows 9x.

So why would you want to retain that old clunker, MS-DOS? A number of reasons spring to mind, but the main one would be to play old DOS games like Myst or Seventh Guest. Games developers are notorious for taking outrageous liberties with their coding in order to squeeze every last drop of speed from a PC, and old games just don't run well on a multitasking operating system like Windows 9x. They know nothing of peaceful co-existence with other programs and expect to have the run of the place — that is, have exclusive access to all your hardware. I think the best way to do this is to run them from MS-DOS. OK, you could create a boot floppy, but where's the fun in that? A much more elegant solution is to dual boot from your hard disk.



Using MS-DOS to restore dual-boot capability to Windows 95

With dual boot installed, there are two ways to select the old operating system to load. At boot time, if you press F8 when you see "Loading Windows 95" or hit the Control key when you see the Windows 98 splash screen, you'll see a menu of options, one of which is "load previous operating system". Or, instead of hitting F8, you simply hit F4 to directly load the old OS.

One link that Windows 9x keeps with the dark past is that it uses the same or similar filenames for its system and startup files. With dual boot, this would ordinarily mean that you'd wind up with two sets of almost identically named files in the root directory of your boot drive — an impossible situation. Windows 9x gets around this by dynamically renaming these files, depending on what operating system you choose to boot with. During Setup, Windows 95 preserves the following MS-DOS files by renaming them [Fig 1]. When you press F4 at system startup and select Previous Operating System to start MS-DOS, these files [Fig 1] are renamed as their original MS-DOS filenames and the Windows 95 version files are renamed as shown in Fig 2.

[FIG 1]

Original MS-DOS filename	Renamed file
COMMAND.COM	COMMAND.DOS
CONFIG.SYS	CONFIG.DOS
AUTOEXEC.BAT	AUTOEXEC.DOS

[FIG 2]

Windows 95 filename	Renamed file
COMMAND.COM	COMMAND.W40
CONFIG.SYS	CONFIG.W40
AUTOEXEC.BAT	AUTOEXEC.W40

How to add dual boot

What if you want to add dual boot at a later stage? Maybe you've gone and done what most people do when they install Windows 95 and accepted the defaults and installed it over Windows 3.1x, thus losing the dual boot option? Or maybe you've bought a new PC with Windows 9x cleanly installed on it. This isn't the end of the dual boot issue: it is possible to manually reinstate this useful feature. Bear in mind that *Ye Olde* MS-DOS cannot see partitions larger than 2.1Gb, so dual boot isn't going to work on multigigabyte FAT32 drives.

Here's how to restore the dual-boot capability when Windows 95 was installed without this capability having been configured. The easiest way is if you upgraded an existing DOS/Windows 3.1 installation. In this latter case, we have a head start because as we've already seen, Windows 95 leaves the old DOS system files in place but renamed.

1 **Using a text editor** add a line to the [Options] section of the MSDOS.SYS file.

2 **This is a protected** system file so right-click it, select Properties and uncheck the Read Only box first. Then add this line to it:

```
BOOTMULTI=1
```

3 **Save the file** and don't forget to restore the file's Read Only status.

4 **Reboot** — and this time when you press F8 you'll see an extra entry on the Boot menu, "Previous version of MS-DOS". See p258 for details of how to edit this file.

If there is no "previous operating system", it's not quite as easy. First you have to find a bootable system floppy disk that has MS-DOS 5.0 or better. Remove the system attributes from its system files, IO.SYS and MSDOS.SYS, otherwise you won't be able to perform this trick. This is done with the ATTRIB utility (you'll find it in the \Windows\

Command folder). The files in question will be marked with the Hidden, System, and Read Only attributes, so to clear them from IO.SYS you'd type:

```
ATTRIB -H -S -R IO.SYS
```

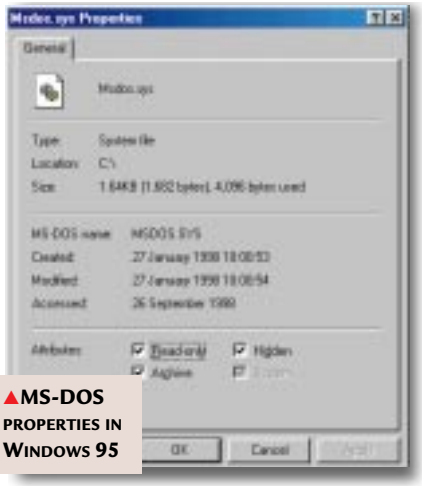
Having done this, you can rename the IO.SYS and MSDOS.SYS files on the floppy to IO.DOS and MSDOS.DOS.

ALLOWED ENTRIES IN MSDOS.SYS

Windows 95 Setup creates a hidden, Read Only system file in the root of the computer's boot drive, named MSDOS.SYS. Confusingly, this is the same name as the key MS-DOS system file but that was a binary, program file, not a text file as is the Windows 95 MSDOS.SYS. If anything, MSDOS.SYS is more related to another Startup file of yore, C.SYS. The [Options] section allows you to tailor the startup process to your specific needs.

Here's a list of some of the allowed entries in MSDOS.SYS. The default value for each of the above options is 1 — that is, enabled. So set the entry to 0 to disable it.

Entry	Description
BootGUI=0	Disables the automatic graphical startup. This has an effect similar to adding shell=/D /K autoexec.bat to CONFIG.SYS, and is easier to use.
BootKeys=0	This prevents any of the special startup option keys (that is, F5, F6, and F8) from functioning. Use this setting to prevent users "tinkering".
BootMenu=1	Displays the Windows Startup menu by default, eliminating the need to press F8 to see the menu.
BootMenuDefault=#	Sets the default menu item on the Windows Startup menu; the default is 1 or 4, as appropriate.
BootMenuDelay=#	Sets the number of seconds to display the Windows Startup menu before running the default menu item.
BootMulti=0	Disables dual-boot capabilities (for example, the ability to start MS-DOS by pressing F4).
BootWin=0	Disables Windows 9x as the default operating system; useful only with a version of MS-DOS 5 or 6.x on the computer — similar to pressing F4 at system startup.
LoadTop=0	Specifies not to load COMMAND.COM or DRVSPACE.BIN at the top of conventional memory. Set to 0 if you have compatibility problems with some DOS software.
Logo=0	Prevents the animated logo from being displayed and, as a consequence, avoids hooking a variety of interrupts that can create incompatibilities with certain third-party memory managers. You can also temporarily kill the "clouds" splash screen by hitting the ESC key.



▲**MS-DOS PROPERTIES IN WINDOWS 95**

1 Copy both files to the root directory of your boot drive (usually drive C). There are no restrictions on where these files should be placed as long as they are from MS-DOS version 5.0 or later.

2 If you're using disk compression software such as DoubleSpace or Stacker, don't forget to copy IO.DOS, MSDOS.DOS, COMMAND.DOS, CONFIG.DOS and AUTOEXEC.BAT to your host drive, as well. Do the renaming before copying the files across to the hard disk, otherwise you'll overwrite the Windows 95 versions of these files.

3 Copy the COMMAND.COM file from the MS-DOS floppy disk to the root directory of your boot drive (usually drive C) and rename it COMMAND.DOS. Do it in one go, thus (*all on one line*):

```
COPY A:\COMMAND.COM C:\
COMMAND.DOS
```

4 Create CONFIG.DOS and AUTOEXEC.DOS files which are appropriate for the MS-DOS version you are using. You can start by looking at your old CONFIG.SYS and AUTOEXEC.BAT files and renaming them. For gaming, make sure that you have your real mode drivers for the CD-ROM and sound card loaded. Also, check that MSDOS.SYS has the required MultiBoot=1 entry and if it hasn't, add it.

Dual boot is now restored and you can start the computer using Windows 9x or the earlier version of MS-DOS.

PCW CONTACTS

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