

Foundation class

To run Windows efficiently, it is important to have your DOS set up correctly. Tim Nott describes how and why DOS works, and looks at the commands in the Config.sys file.

There are two aspects to consider when looking at Windows in relation to DOS: running Windows from DOS, and running DOS from Windows. With the former we have no choice under Windows 3.1 or 3.11, and even with the most perfectly tuned Control Panel settings and INI files Windows will run badly, or not at all, if the DOS preliminaries have not been set up correctly.

With apologies to the majority of readers who already know this, and in the hope of demystifying the subject for the minority who don't, let me explain: a PC has to go through a fairly lengthy process of preparation when you switch it on.

First, it loads the display-card BIOS (you might see a little message if your monitor warms up quickly enough). If everything squawks loudly and grinds to a halt here, then either something is truly broken or there is an address conflict.

Some S3 and ATI display cards use a memory address that is usually assigned to COM4, and if you try to install a modem or other device to this port, the card won't work.

Next, the motherboard BIOS (Basic Input/Output System) loads, ticks through a memory check — known in impolite circles as the "BIOS fart" — and retrieves settings for things such as the time, date and the types of disk drives on the machine, from a battery-backed chip known as the CMOS (Complementary Metal-Oxide Semiconductor).

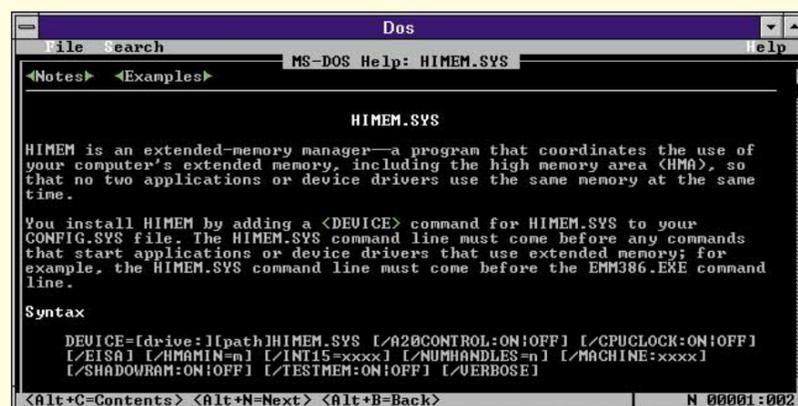
Finally, it goes looking for a boot disk: first in the floppy drive and then the hard disk. Looking first in the floppy drive means that the user can use a floppy boot disk if they don't want the usual configuration (for a game, perhaps), or can rescue the situation if the hard disk boot files have become corrupted. It is easy, and

essential, to make a boot (or system) disk — you can do it from File Manager's Disk menu. If there is a disk in the floppy drive but it isn't a system disk, you'll get an error message and things will grind to a halt. This does no harm in itself — usually you just have to remove the disk and press any key — but it is the most common way of catching a virus, so you should try to avoid leaving floppies (especially those of dubious provenance) in the drive between sessions.

To be recognised as a system disk, and to start DOS, there must be three files present: under MSDOS these are IO.SYS, MSDOS.SYS and COMMAND.COM. The first two are system files and are usually hidden from directory listings, but you can use File Manager's View/By file type.../Show Hidden/System Files option to see them. The third is a small program (the Command Interpreter) that processes your DOS keyboard input and has built-in commands for things such as changing directories and listing their contents. Once all this lot has loaded, DOS takes over from the BIOS and you see the familiar C:> prompt. This process is known as "booting" because in effect the system is pulling itself up by its own bootlaces — if you see what I mean.

However, the fun is only just starting: DOS doesn't know, as yet, what country it's in or where anything is. It won't have

Online help is available for all that mysterious DOS stuff



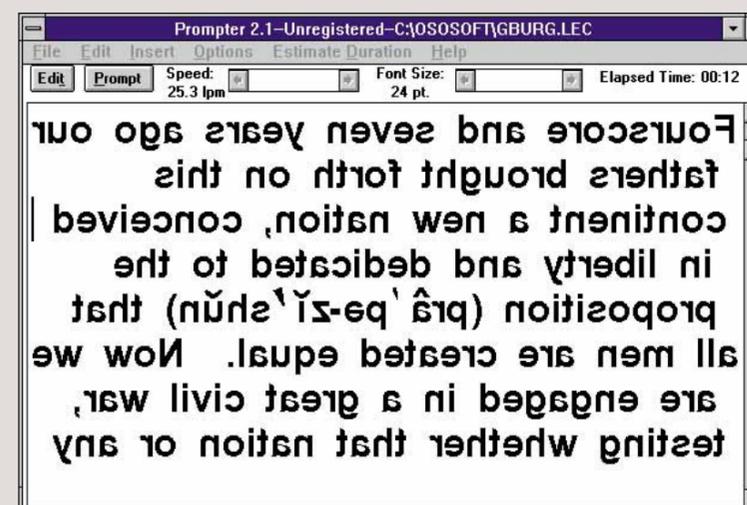
Prompter is right on cue

Following last month's critical acclaim for Bubba (a parody of Microsoft's Bob interface) I've been sent a floppy disk full of other products from Ososoft. Sad to report, they're all extremely sensible. There are small-ad, label and business card designers, clip-art and font management and a multimedia file manager.

The utility that caught my eye, however, was Prompter. This is a variant of the auto-cue machine — the thing that politicians use to make those "impromptu" speeches and Ronald Reagan used to order his breakfast. You import the text of your speech (or edit it in the program), set your notebook PC up on the lectern, set the font size and scroll speed, and spout away. There's a facility to show phonetic pronunciations of difficult words such as "proposition", and the whole display can be set in reversed text so you can view it via one of those semi-mirrored screens that gives the audience the impression that you're still looking at them.

Ideal for nervous presenters and wannabe demagogues alike, Prompter handles speeches of up to an hour's duration (but it doesn't guarantee that your audience will), and there are override controls should you need to pause while the assembly rolls about laughing at your jokes.

Prompter.zip is on this month's cover CD-ROM and needs VBRUN300.DLL to run. If you don't have a CD-ROM drive, but do have a modem and can stand the phone bill, you can dial the Ososoft BBS in the US on (805) 528 3753, 300-14400bps, 8N1, or nearer to home GO OSOSOFT on CompuServe.



You, too, can address the multitude with Ososoft's Prompter

any cacheing or drivers loaded and its default memory configuration won't let it run Windows. Just as the CMOS retains settings such as the type of hard disk so that the BIOS can find DOS, two text files (CONFIG.SYS and AUTOEXC.BAT) store the more changeable aspects of a PC's setup.

Taking CONFIG.SYS first, because DOS does, the very first line (allowing for path variations) should be:

```
DEVICE = C:\DOS\HIMEM.SYS
```

Although your PC has four, eight or more megabytes of RAM, raw DOS only "sees" the first 640 kilobytes. The area between 640Kb and 1Mb is usually known as Upper Memory, the first 64Kb after that as High Memory, and the rest as Extended Memory. HIMEM.SYS is the Extended

Memory Manager that makes all this available to Windows and for loading DOS "high". If you want to find out more about HIMEM.SYS or about any other aspect of DOS, see tip number one in the Ten Top Tips box (page 262).

Next in line is the Expanded Memory Manager, which sounds depressingly similar but is actually quite different. Without going into too much gruesome detail, a program such as Windows sees extended memory as a vast open field, through which it can roam at will. Programs that use expanded memory can also access any part of the field, but not directly — it has to be dug up and placed in a bucket first. Windows doesn't need expanded memory even though some DOS applications do, but the Expanded

Ten Top Tips for Windows

DOS To find out more about a DOS command or topic, open a DOS window and type "help topic".

File Manager The File/Search command has all sorts of uses, as Shane Devenshire, of Walnut Creek, California, points out. If you want to erase all .TMP files, or maybe back up all .DOC files scattered around your hard disk, enter *.TMP into the Search For box, the root directory in the Start From box and check the Search All Subdirectories option. You can then select all the files (Ctrl + I) and copy, move or delete the files in one go.

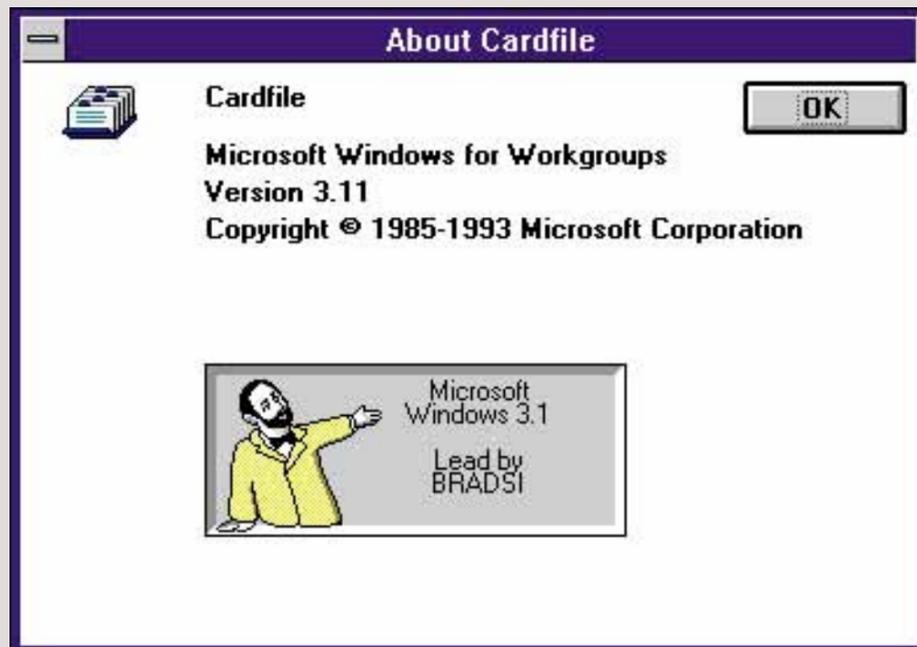
Notepad If you type ".LOG" as the first line of a Notepad file, then Notepad will add a time and date stamp every time you open the file.

Write Write will eat anything — you can load not just text files but program files too, if you're curious. Just be careful not to inadvertently save changes.

Windows Files If you're wondering what's what in your Windows and Windows\System directories, remember that original Windows 3.1 files have a creation date of 1/11/93 and a time of 03.11.00. Windows 3.1 files show 1/03/92 at 03.01.00. Thank you, Jonathan Sandys, for that one.

Help If the Help window has vanished, or its title bar has become unreachably sited off screen, delete the entire [Windows Help] section from WIN.INI. Windows will revert to a sensible default position.

Minesweeper It's sad, but true. You can, if you want, cheat at Minesweeper. When you're stuck, type "xyzyzy", then hold down the Shift key and look at the top left pixel of your desktop. It will light up



● The Windows gang screen, with the bearded Brad Silverberg

when you're over a safe square. You might need to change to a dark background to see this.

Fonts You can drag font files from File Manager and drop them onto the Control Panel/Fonts dialogue. The fonts will be installed and copied to your Windows\System directory without having to touch the Add button.

Cardfile If you want to export the contents of a Cardfile as plain text, first install the Generic/Text Only printer driver on FILE:. Choose this printer from Cardfile's Print Setup dialogue, then Print All. You'll be prompted for a filename.

Gang screen From Program Manager (though this seems to work with other applets) go to Help/About... Hold down Shift + Ctrl and double click on the icon in the top left of the box. Let go of Shift + Ctrl and click OK. Repeat. You should see a fluttering flag and a dedication. Repeat again, and you'll see in turn: cartoon figures of Bill Gates, Steve Ballmer, Brad Silverberg and a bear, together with a scrolling list of credits.

Memory Manager has another use: it gives access to the Upper Memory area. Although some of this area may already be taken up with system and display ROM, there's usually a fair bit free.

By loading

```
DEVICE = C:\DOS\EMM386 NOEMS
```

this upper memory is made available for all the other bits and pieces that are subsequently loaded. (Note that there may be other settings in this line to include or exclude various areas of memory — see the DOS help file.)

The rationale for doing this is to keep as much conventional memory free as

possible. DOS games in particular often need a large amount and even if you've got a 32Mb machine, if only 500Kb of conventional memory is free, they won't run. Despite its seamless view of extended memory, Windows also needs conventional memory.

We covered this ground in September 1994, but to recap briefly, every application needs a small amount (often only 512 bytes) of conventional memory. Other parts of Windows take more, and some applications, such as WinFax version 3.0 and the MS Word Internet Assistant, use a lot more, so it's a good idea to keep as

much as possible free even if you don't run DOS applications or games.

Next in the CONFIG.SYS line-up should be:

```
DOS=UMB
```

This enables DOS to load device drivers and programs high — it won't work without HIMEM and EMM386 loaded.

```
DOS=HIGH
```

forces DOS to load as much of itself as possible in the High Memory area. You can combine these two commands as

```
DOS=HIGH,UMB.
```

If you're using Windows 3.11, then to take advantage of the 32-bit file access

you need

```
DEVICE=C:\DOS\IFSHLP.SYS
```

Again, the path may vary, but this is the real-mode "stub" for the Windows 32-bit file and caching systems.

```
DEVICE=C:\DOS\SETVER.EXE
```

is a kludge. It stops programs written for previous versions of DOS panicking when they detect a later version. If you type "SETVER" at the DOS prompt, you'll see a table of these programs and the versions they expect. Oddly, this includes Word for Windows and Excel, but it doesn't say what versions. You could try disabling this by putting REM at the beginning of the line and seeing if anything complains, but as it only takes a few hundred bytes it probably isn't worth the trouble.

```
BUFFERS=(number)
```

is another blast from the past, designed to provide a temporary holding area for data being read or written to disk. If you're using Smartdrv or Windows 3.11 Vcache you don't need this line at all — each buffer wastes about half a kilobyte of memory.

```
FILES=(number)
```

If you get error messages such as "insufficient file handles" in DOS sessions, try increasing this. The magic number, according to Microsoft, is 45.

```
STACKS=(number, number)
```

Windows 3.1 sets this to 9,256 on installation. It helps prevent Stack overflow which is actually as nasty as it sounds, so leave it alone. Conversely, if you have a different value, or no value, and everything works fine, don't worry.

```
COUNTRY=044, ,c:\dos\country.sys
```

(for the UK). Windows doesn't need this, but if you want DOS to use UK date styles, leave it in. It doesn't use any memory.

```
SHELL=C:\DOS\COMMAND.COM C:\DOS\
```

```
/E:800 /p
```

(a typical value) has two purposes. First it points DOS at the command interpreter, COMMAND.COM, if this is not in the root directory. Secondly, the /E: switch can be used to increase the size of the Environment. This is a small part of memory that holds environmental variables assigned with the SET or PATH commands in Autoexec.bat. It defaults to 256, but if you have a long PATH statement or lots of SET commands you may need more.

```
LASTDRIVE=(letter)
```

You only really need this for networking or doing things such as cable-connecting two PCs via Interlink, for instance. If omitted, the value defaults to the letter after the last existing drive — more just wastes memory.

After that it's a free-for-all with specific hardware and disk compression drivers

Flannel panel

The flattery-will-get-you-almost-anywhere correspondent of the month award goes to Grahame Giddings, who has written a Visual Basic application called Cricket Statistics for Windows.

I declined his kind offer of a review copy, because, I explained: "My knowledge of cricket is minimal, and I would be talking out of my (*expletive deleted*) were I to feature it in the column. And I do quite enough of that already." Undaunted, Grahame replied: "Sounds like the ideal qualifications for an England selector", which I think deserves a plug. So, sight unseen, Cricket Statistics does all sorts of statistical crickety things ranging from batting averages to tea rotas; it's shareware and all the profits go to the Ottershaw Colts team. It's in the CIX Filepool as CRI-STAT.EXE (approximately 1.2Mb in size) and the author's email address is ggiddings@cix.compulink.co.uk.

loaded to suit your set-up. If you have a CD-ROM drive, for example, you might have

```
DEVICE= lines
```

to load its controller. Scanners, soundcards and other hardware might need drivers loaded, but read the manuals carefully and check that you're not loading these unnecessarily — the popular SoundBlaster Pro 16 comes with specific Windows drivers and doesn't need the real-mode *.SYS files loaded to work under Windows.

Windows doesn't need any mouse drivers loaded either, but there's a catch here: if you want to use a mouse in a DOS window, the driver must be loaded before Windows starts.

And that just about wraps up CONFIG.SYS for the moment. Next month we'll take a look at the other half of the celebrated comedy act, AUTOEXEC.BAT, and how you go about loading device drivers and programs into upper memory.

PCW contacts

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