Double spaced

Roger Gann shows you how to make the most of DoubleSpace.

Although FAT32 (and, I guess, dirt-cheap multi-gigabyte hard disks) have put paid to disk compression software, both MS-DOS 6.x and Windows 95 came complete with drive compression software in the shape of DoubleSpace (latterly DriveSpace). It wasn't a total solution, nor as fully featured as its principal rival, Stacker. Some of its shortcomings were relatively easy to overcome, so I've decided to devote this month's column to listing a few DoubleSpace tips, plus a couple of handy floppy-disk related DOS tips prised from the archives.

Defragmenting

Microsoft gives you two ways of defragging a DoubleSpaced drive. Neither is quite the same sort of defragging you get with an ordinary defrag on a non-compressed drive. There are two methods: one is to run DBLSPACE/DEFRAGMENT; the other is to run the normal defragmenter, DEFRAG.EXE. You might think this program would give the best optimisation of DoubleSpace, but you'd be wrong. All it optimises is the contents of the compressed volume file (CVF), not the CVF itself.

Running DBLSPACE/ DEFRAGMENT improves matters slightly. It moves data within the CVF so all the free space is at the end, but it still doesn't defrag the CVF. Files aren't made contiguous, they're placed in one group at the front of the drive, so it doesn't defrag the compressed drive.

Sometimes it's necessary to enter DBLSPACE/DEFRAGMENT /F, as DBLSPACE/DEFRAGMENT fails to make all unused sectors contiguous.

Here's a suggested sequence to properly defrag a DoubleSpaced drive.

- **Run DBLSPACE/DEFRAGMENT** to defragment the CVF.
- **Run DBLSPACE/DEFRAGMENT /F** to move all the sectors to the end of the disk.
- **Run the defragmenter** with the /F parameter, DEFRAG /F, to move all the data to the end of the CVF and then back to the front.

Once both defragmentation types are done, your DoubleSpace drive will be almost fully optimised. Even so, files are contiguous only on the virtual drive (drive C) but not within the CVF. The only way to defrag it "properly" is to buy Norton Utilities.

Changing DoubleSpace ratios

Sometimes, DoubleSpace won't let you reduce the compressed drive size nor lower its estimated compression ratio (ECR). Often this is caused by an entry at the very end of the File Allocation Table (FAT). These could be lost allocation units at the end of the compressed drive, heavily fragmented files on it, or, more likely, a file (with Hidden and/or System attributes set) stored at the end.

The first two can be fixed by judicious use of CHKDSK /F and DEFRAG /F /H. Check for the third by using this convoluted DIR command:

```
dir c /s /as /p <CR>
```

DEVOTED TO DOS

Some great DOS tips are yours for the asking. There are plenty of decent web sites devoted to DOS (and other operating systems) hints and tips. There's Interloper's at www.geocities.com/ResearchTriangle/6701/dostrick.html and Computer Tips at www.computertips.com/windows/windows95/DOS/aheader.htm.

HARD DISK HEALTH WARNING

I am indebted to a couple of eagle-eyed readers who have brought to my attention to a potentially dangerous situation that could occur as a result of something I wrote in my January 1999 column. While the instructions I listed hold true for Windows 95 A, they don't for Windows 95 B, *aka* OSR2 or Windows 98. It seems that if you were running a FAT32 partition and performed some of the hacking I detailed, to install a previous version of MS-DOS 6.2, you could wind up with a severely mangled hard disk. I guess I wasn't thinking straight, as the only caution I raised was that such a hack wouldn't work on 'multi-gigabyte FAT32 partitions' because DOS cannot recognise partitions in excess of 2.1Gb. Of course, it doesn't matter what size the partition is: if you've installed a FAT32 partition, then any operating system based on FAT16, as MS-DOS is, won't be able to see it. So, if you performed the hackery outlined in that column and attempted to dual boot into MS-DOS, it would result in a one-way trip to a non-booting hard disk. The solution to this problem would be to boot from a FAT32 Windows 98 Startup disk, restoring the correct operating system using the SYS command.

Typically, "rescue" programs such as MIRROR.COM, IMAGE.EXE and UNDELETE.EXE write to the end of the FAT. They store key partition data in a safe place, i.e. at the end of the disk. Hidden data files are left in place so you have to delete them before resizing your DoubleSpace drive. Use the ATTRIB command to alter the files' attributes, like this:

```
attrib -r -s -h →
c:\mirorsav.fil <CR>
```

If you're using a delete-tracking program, you may need to disable it before doing this. Then run the defragger on the compressed drive:

```
defrag /f /h →
<CR>
```

You should be able to lower the ECR on the DoubleSpace-compressed drive.

Now reset the file attributes you altered:

```
attrib +r +s +h →
:\mirorsav.fil <CR>
```

Selective DoubleSpace drive use

Sometimes you might want to use DoubleSpace-compressed floppy disks without compressing your hard disk, but when you run DBLSPACE the initial setup screen has no option to do this. If you try and mount an already-compressed floppy disk with DBLSPACE /MOUNT <drive:>, you receive the following message: "There are no more drive letters reserved for DoubleSpace to use. To add more drive letters, choose the Options command from the Tools menu."

The workaround is to create a DBLSPACE.INI file in the root directory of your startup drive, which causes DBLSPACE.BIN to remain in memory after startup.

One way is to create a tiny DoubleSpace drive on your hard disk. Do this by specifying the amount of free space on the host to be a value close to the size of the hard disk. You then use DoubleSpace to delete this new volume:

```
dblspace /delete <drive:> →
<CR>
```

This can be done manually. First, create a DBLSPACE.INI file with EDIT. It should have just two lines:

```
MaxRemovableDrives=2
LastDrive=F
```

Then copy DBLSPACE.BIN from your DOS directory to the root directory of your hard drive. You can now use compressed floppy disks. To compress a floppy disk in drive A:, type:

```
dblspace /compress a: <CR>
```

Some games read directly into video RAM, which isn't guaranteed to be readable

To access an existing compressed floppy in drive A:, type:

```
dblspace /mount a: <CR>
```

Games and DoubleSpace

Some old MS-DOS-based games may not display video output correctly when the DoubleSpace program, DBLSPACE.BIN, is loaded. This is because the DoubleSpace decompression code requires the buffer, into which it's reading, to be readable so it can scan back for expanding repeated strings. Some games read directly into video RAM, which isn't guaranteed to be readable. The only solution is to install your MS-DOS-based games on your uncompressed host drive. Then, when you start MS-DOS, press CTRL+F5 or CTRL+F8 when the "Starting MS-DOS" prompt is displayed, to start your PC without loading DBLSPACE.BIN.

Diskette change-line fix

If you have a 3.5in floppy disk drive attached to an XT-class computer such as the Amstrad PC1640, you might have come across this problem. When you change disks and use the DIR command, you may see the directory from the previous disk. This fault manifests itself during a program install, when it infuriatingly prompts you to insert the second disk even though you already have. It occurs because MS-DOS assumes the 3.5in drive has change-line error detection. Most 3.5in drives do provide change-line support: if you remove a disk, this change should be signalled to DOS via the "change line" hardware on the disk drive. However, due to limitations in the ancient XT architecture, the change-line signal is not passed to MS-DOS.

Adding a DRIVPARM command to the CONFIG.SYS file may help. An example, which modifies a 720Kb Drive B, is:

```
DRIVPARM=/D:1 /F:2
```

Note that I've omitted the /C change-line support switch. When MS-DOS updates the drive parameters, it may remove the change-line support requirement. The ultimate solution is to install a floppy-drive controller and BIOS which fully support change-line error detection.

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