

Any questions?

If you've got a PC problem or think you could help out other readers, contact **Frank Leonhardt**.

Hewlett-Packard LaserJet 4L — a classic

You've probably heard about Hewlett-Packard's laser printers. They're the ones with which all the other manufacturers have to make sure their offerings are compatible.

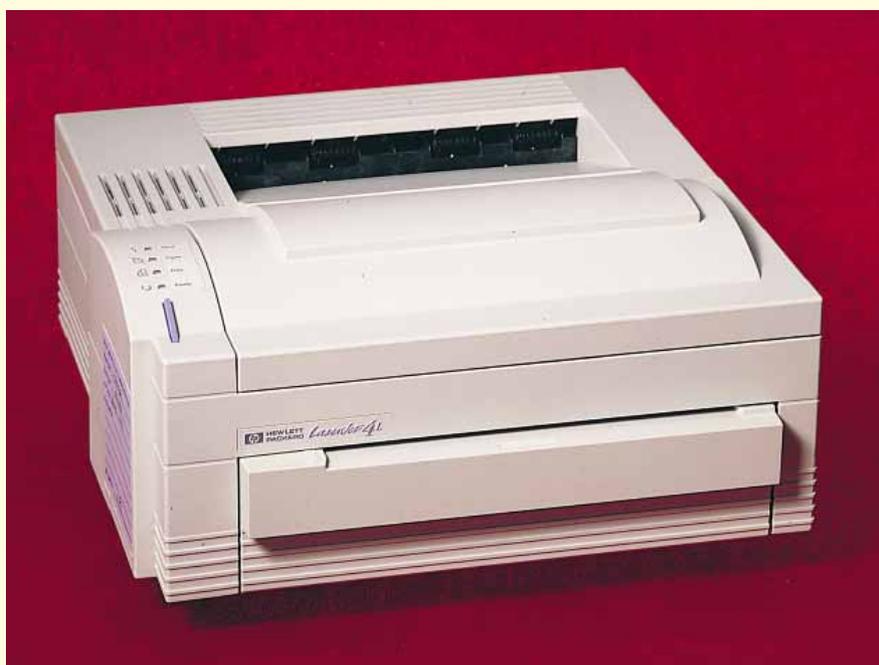
This should not imply that Hewlett-Packard is necessarily the best, but it is generally considered that you can't go too far wrong if you buy the real thing. At the very least, your software is guaranteed to work, and if it doesn't, the supplier has no excuse.

Now that the baby of the range (the LaserJet 4L) has suddenly dropped in street price to around £350 it might seem like a good deal. After all, you can't beat the crisp, clarity of a laser printed page compared to an inkjet.

Now the LaserJet costs about the same as a mid-range inkjet, you don't have to pay extra for the quality. Okay, so it won't do colour and the inkjets will. But colour comes at a price in terms of speed, output quality and running costs. If you're out to impress your bank manager, the near-perfect black-and-white of the laser has something while the slightly smudged, gaudy colours of the inkjet just won't cut it.

But how does the cut-price LaserJet 4L compare to the competition? You can get a Windows GDI laser for less than £300 now. Yes, but that's not LaserJet compatible. PCL5, the LaserJet's language, will be spoken for many years to come but GDI (Windows' language) might be changed with Windows 96? No thanks; I'd personally prefer a printer which will be supported for a long time to come, especially if it only costs an extra £50.

For a few quid more, you can pick up



The HP LaserJet 4L — now it's down to £350, it's a good investment

a Kyocera FS400. These talk PCL5 too and, as Kyocera keeps reminding us, are cheaper to run. They have several nice features including the ability to re-fill with toner without the need to replace the whole drum assembly. You wouldn't be paying Hewlett-Packard £70 per Megabyte for upgrade RAM either.

Whether lower running costs make a difference to you depends on the anticipated printing volume. Many LaserJet 4L users are still on their first cartridge after two years.

If you were suspicious, as I certainly am, you might be wondering why the price of the 4L has suddenly dropped. The answer is simple — at the time of

writing, all other models in the LaserJet 4 range have been superseded by the 5 series. Rumour has it that the LaserJet 5L, when it appears, will support 600dpi printing as opposed to the 300dpi of the 4L.

When the 5L does show up, it will either cost considerably more than the 4L, allowing old 4L stock to be shifted, or the price of the 4L will fall further still. 600dpi may be better, but it's not that much better. The 4L always worked well and has stood the test of time. This could be your last chance to buy a classic.

Start me up, let me down

I currently use a Pentium, running Windows NT and 3.1. I decided to load Windows 95 on the system but because I am a software developer I wanted to keep all three platforms separate. I proceeded to



load Windows 95 into a separate directory.

After loading 95, I booted the system up. The NT startup menu was given, Windows NT or Windows 95 — but my MSDOS selection had vanished. Windows 95 had overwritten MSDOS with Windows 95 DOS.

I selected the Windows 95 option and was launched into Windows 95. The only way to start Windows 3.1 was to launch into Windows 95 then shut 95 down to DOS, change directory to the original Windows 3.1 and type Win. Not the perfect method.

Later I decided to take Windows 95 off the system until I was fully ready to upgrade the installed 3.1. Because Windows 95 had not been installed over 3.1 it did not give the option to backup DOS and 3.1 in case I needed to uninstall them later.

I decided to delete the Windows 95 directory and reinstall DOS 6.2. After deleting the Win 95 DOS directory and the Windows 95 directory I rebooted the system with the DOS 6.2 installation disk in. I selected to install DOS but was given the message "Cannot install over present version of DOS".

I still had the NT platform I could start up. In the end I had to load NT and delete the IO.SYS and MSDOS.SYS files to install DOS (a dirty job but it had to be done). I re-installed DOS 6.2. Finally I had my system back to its former glory.

Is there a way to install Windows 95 and keep MSDOS 6.2? Would there be an easier way of launching 3.1 without having to go through Windows 95? I hope this doesn't happen to anybody else.

Steven Fletcher
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This sort of thing should definitely be tried on a "friend's" machine first. I've had Windows 95, Windows NT, DOS 6.2 and OS/2 all installed on the same hard disk. The tricky one is to get DOS 6.2 and Windows 95 to co-exist.

As you discovered, Windows NT only allows for one DOS partition in its boot selector and if you install Windows 95 on your primary DOS partition — and you have no choice in this — then selecting DOS will take you to Windows 95 instead.

What isn't so obvious is that Windows 95 has its own hidden startup menu. If you press F8 when the message "Starting Windows 95..." appears on the screen you will get eight choices. Most of these are to do with starting Windows 95 in different debugging modes, but option eight will load and run your previous

version of MSDOS — the one you installed Windows 95 over.

Option six — Command prompt only — will take you straight to a DOS 7 command prompt, though it still insists on announcing itself as Windows 95. This DOS-only mode appears to be completely compatible with DOS 6 and, as I mentioned in last month's issue, this includes Windows 3.11.

If you want to get rid of Windows 95 after installing it in a directory on its own, simply use the MSDOS SYS.COM command to put DOS 6 back into the boot sector and then apply DELTREE to any directories it has left behind.

Upgrading on a budget

I have a 386SX 33 with 4Mb RAM and 290Mb total hard disk space. Do you have any suggestions about the best way I should approach upgrading?

I don't have much money to spare. I am thinking about maybe a co-processor, or a CD-ROM or more memory. Which would you recommend? I do a lot of work in Windows and dabble in ray-tracing.

Chris.Roberts@p0.f152.n441.z2.fidonet.org

I wouldn't invest in any more old-style SIMMs. 4Mb should be enough to run all the software a 386SX is capable of handling sensibly. If you want to run the current generation of software, everything will have to be changed.

A CD-ROM drive would be an investment for the future but it would help to have an up-to-date IDE compatible one to work with your next machine.

As you imply, you have more than one hard disk you would have trouble attaching it — the standard IDE adaptors can only handle two drives.

If I had a machine like this I'd save up my pennies for a P75 motherboard. This would be useful if you want to do lots of hard sums like those involved in ray-tracing.

Don't bother with a maths co-processor for the 386SX — it won't deliver nearly the same bang-per-buck ratio as the Pentium.

Here we go hacking DOS again

I am doing some programming and I need to know how Win95 keeps track of the long file names.

As you probably know, DOS directory saves only space for 11 characters and Win95 can have 255-character file names.

I need only technical information; over

here in Yugoslavia we don't have much literature on the subject.

Boris Dragovic
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I'm afraid I don't have an official answer from Microsoft about this, but I got curious and decided to have a look for myself. The extended file name is actually stored in the normal directory space on the disk, where you would expect to find traditional directory entries.

Each standard directory entry takes up 32 bytes. This consists of the actual name, (11 bytes), the file attributes byte, ten bytes of padding, the time/date stamp (4 bytes), the starting cluster number (2 bytes) and the length (4 bytes).

Windows 95 makes use of at least eight of the ten bytes' worth of padding but I haven't figured out what it does with them. The long directory name itself is simply stored in as many of the preceding 32-byte directory slots as required. It appears that 16-bit ASCII is being used as every other byte in the name is a null on my English version of Windows.

The first slot prior to the conventional directory entry contains the first 13 characters of the long name, the next slot back contains characters 14 to 26 and so on. The mathematically adept will probably have spotted that each 32-byte slot should have room for 16 letters, but some of the positions are used for other purposes.

The first byte appears to hold a counter to show how far back from the true directory entry we are. Bit six is set to show that this is the earliest slot in the list.

Offsets 12 and 13 are used for some purpose I haven't guessed yet. 26 and 27 seem only to contain nulls. As this is usually a pointer to the first cluster in the FAT for the file in question, they could be left at zero to prevent some disk utilities from doing something unfortunate.

This just leaves offset 11. In a normal directory entry, this is the attribute byte and so it is here. It always contains 0x0F which translates to a hidden, read-only, system volume label which doesn't need backing up. This combination of attributes is what prevents older versions of MSDOS from displaying garbage when it encounters one of these strange directories.

I should stress that this is guesswork on my part. It should allow you to write a DOS 6 utility to read long file names, however, which is jabout the only reason for needing this information. If you're trying to write disk hacking utilities for Windows 95, drop me a line and we'll discuss fees.

Christmas Wishes

Dear Santa,

A year has passed since I last wrote to you — apart from the postcard from Benidorm. So how well did you do? Last year I asked for:

- **More memory and hard disk space:**

Well, I upgraded to 8Mb and fitted a second 540Mb hard drive. Sorry Santa, but as it turned out, this just wasn't enough RAM. It was okay until Windows 95 appeared, together with that enormous new version of Office. Another 8Mb, please.

- **A set of hexagon ball drivers, torx drivers and Bristol Multiple Spline drivers** so I can take these new portables apart:

Got 'em, thanks. Zenith, Dell, TI and HP watch out — your notebooks' little secrets are no longer as safe as you thought!

- **Plug and Play** (retrofitted to the whole world's PCs)

This was a tough one and I didn't expect too much. As it turned out, Windows 95 and Windows NT seem to handle hardware management quite well using old non-P&P machines.

On the other hand, the P&P machines I've come up against don't appear to be that good at configuring themselves automatically. So far so good, but you could do better.

- **A paper-less office**

Nought out of ten for that one, I'm afraid. Back to the drawing board.



- **Something to re-attach the pins** which snap off ICs when you remove them from their sockets.

Very funny — switch everything to surface mount so that there are no more pins to break off.

This wasn't quite what I had in mind, and you know it.

I want:

Two and a half out of five isn't bad, but see if you can do better with this year's requests:

1. A version of Windows 95 which works as well as Windows NT or as fast as Windows 3.11.
2. A good enough excuse to justify the purchase of a Hewlett-Packard 4020 CD-ROM writer. At around £750 it may be excellent value, but it's still too expensive to get away with buying it on impulse.
3. An electronic stills camera which can realistically replace a good quality 35mm SLR, priced so that an amateur can afford it. It would be a distinct advantage if it worked with my existing collection of outrageously expensive lenses, while you're designing it.
4. A floppy-disk substitute which holds at least 100Mb per disk. Sorry Yamaha, Iomega et al. Any drive with media costing more than a couple of quid doesn't count. Perhaps Sony could be persuaded to develop the audio Minidisk?

Christmas may be the only excuse to justify buying the HP 4020 CD-ROM writer



5. A colour printer which produces output as good as a laser and is as cheap as an inkjet.

6. Some way to let a room full of people see what is on a PC screen without it costing an arm and a leg. Projection monitors are far too expensive, not to mention heavy. Flat LCD panels for overhead projectors aren't cheap and the OHP itself is bulky. What would be nice is a small, low cost LCD display which can fit into a standard 2in slide projector. How about it, Santa?

I don't want:

And while you're listening, how did you do at keeping last year's nightmares away? — you know, the things I didn't want to find in my stocking:

- **A Pentium PC** — let some other mug find out which expansion boards work with Pentiums and which don't.

I was right, wasn't I? You remember what happened just after I wrote, but I'm pleased to say that these are off my most unwanted list at last. Even that "good value" Escrom P60 which turned up for review a few months later with a dodgy configuration and detached floppy drive has been purring away quite happily every since. No, I'm not going to risk a P6.

- **A SoundBlaster "compatible" audio card** Unless these beasts use the same hardware as a SoundBlaster, they never turn out to be 100 percent compatible in practice. No change there!

- **An upgrade** to the latest version of any application.

Let someone else find the bugs. I think I'll include operating systems this year.

- **Anything written in Visual Basic** (real programmers use C or assembler)

You cheated. Now the dabblers are using MFC or OWL to produce colossal, badly designed applications with C++ too.

**Yours,
Frank.**

PCW Contacts

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