Quick on the upgrade

Do you need to buy a new G3 or would it be better to upgrade? Cliff Joseph compares and advises.

Whenever Apple comes out with a new range of desktop machines, owners of older models face the quandary of whether to upgrade their existing Mac or splash out on a new machine.The question's even trickier with the latest batch of G3 PowerMacs because they're not only faster than previous models, they're cheaper and they offer new features such as FireWire and USB.

USB is dead useful, no doubt about it, but it's not a good enough reason to buy a new Macintosh. FireWire, on the other hand, affords the Macintosh entirely new capabilities. Whether your work involves digital video editing, or if you just want to muck about with a DV camcorder, you should take the plunge and buy one of the new G3s.

Not everyone is interested in digital video, though. Most of Apple's core users are in the area of printing and publishing and are more interested in speeding up Photoshop than in doing fancy things with video. There are also plenty of home users who cannot afford to buy a new Mac whenever a new model is produced.

The new G3s may be fast but they don't have SCSI interfaces

For these people, upgrading their existing Mac might make good financial sense. The new G3s may be fast but they don't have SCSI interfaces, which means that you'll need to buy an adaptor to use existing SCSI peripherals like scanners and removable hard disks. Photoshop work needs a lot of RAM, too, but you won't be able to transfer RAM from a pre-G3 machine into a new G3 Power Mac, so you could find yourself having to spend some extra money on RAM. So, if all you want is to give your existing Mac a speed boost it might be cheaper to upgrade it with a new processor card than to buy an entirely new Macintosh.

Most Macs released over the past few years have their processor on a removable card which just slots onto the motherboard. This means you can easily upgrade them by removing the old card and slotting in a new one.

There are three or four companies which produce upgrade cards and competition is pretty intense, so prices are coming down all the time. As a result you can get some very fast upgrade cards for a lot less than the cost of a new G3.

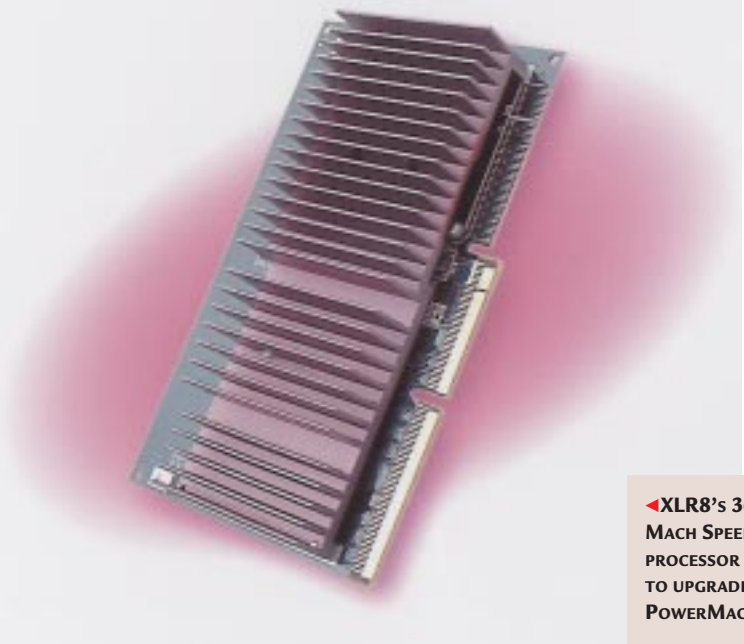
As an example, we took an old PowerMac 7600 with a 200MHz PowerPC 604 processor in it. The 7600 has 128Mb RAM (for Photoshop), an ATI Rage Pro graphics chip and a motley assortment of SCSI peripherals attached to it. We then upgraded it with a 366MHz Mach Speed G3 processor card from XLR8. This card costs £800 (ex VAT). We could have used cards from other companies like Newer Technology, Maccelerate or Sonnet, but the XLR8 cards have a useful option known as Multiple Variable Processor which allows you to fine tune the card for optimum performance.

The 366MHz upgrade card puts the PowerMac 7600 almost head-to-head with the mid-range 350MHz model in the new G3 line-up. A brand new 350MHz G3 PowerMac with 128Mb RAM and a SCSI adaptor would cost about £1,500 (ex VAT) — this is almost twice the price of the upgrade card. Of course, everything depends on the performance of the upgrade card, so the next step was to run some benchmark tests on the two systems.

▲ THE G3 POWERMAC IS A COLOURFUL BUT COSTLY ALTERNATIVE TO UPGRADING

Not surprisingly, the 366MHz upgrade card ran slightly faster than the 350MHz processor in the new G3. But processor speed is not the whole story. The Rage 128 graphics card built into the current G3 range is much faster than the older Rage Pro in the PowerMac 7600. Hard disk performance on the new G3 machine is also a bit better than on the 7600 but this won't affect performance in programs such as Photoshop too much, as long as you have enough RAM.

The combination of processor and video performance means that in overall terms the new G3 is still about 10-15 percent faster than the upgraded 7600. So, if you want all the speed you can get you're better off going for a brand new Mac. But if your budget won't stretch



◄XLR8's 366MHz Mach Speed G3 processor we used to upgrade our old PowerMac 7600

that far you'll find that a good upgrade card can give you almost the same performance as a new G3 PowerMac, at a considerably lower price. Remember, though, there are things that an upgrade card cannot give you. As well as having two FireWire ports built into it, the 350MHz PowerMac G3 also has a DVD-ROM drive. Adding these features to an older Mac would negate the cost advantages of the upgrade card.

There are also technical issues affecting older machines, which limit the speed you can get out of an upgrade card. We tried to test a 400MHz Mach Speed card in our 7600 machine but it simply wouldn't run with it installed. This is because the system bus — the circuitry connecting the main processor to the rest of the system — is limited to about 45MHz. The 400MHz card needs a bus speed of at least 50MHz and many older Macs just cannot handle this. The current range of PowerMacs all have a system bus which runs at 100MHz, so they can easily handle future generations of processor which run at speeds of 500-600MHz. And, of course, they look a lot nicer than the old, beige Macs.

Power Mac 7600 vs Power Mac G3

Benchmark Scores* (higher is better)	Processor Performance	Video Performance
Power Mac 7600 with XLR8 Mach Speed 366MHz	941	219
Power Mac G3/350	903	325

** Tests run using System Info utility from Norton Utilities for the Mac.*

Upgrade cards won't be the ideal solution for all users. The new G3s are so competitively priced that it makes sense to buy one if you can afford it. But if your budget, or your boss, simply won't stretch to a new Macintosh, you will find that an upgrade card really can give your old machine a new lease of life.

FireWire

If you are unfamiliar with FireWire, just think of it as a super-fast version of USB, or of the old serial ports that the Mac would use to connect to printers and modems. Like USB, FireWire is 'hot-swappable', which means that you can plug and unplug devices like digital cameras into the FireWire port without having to restart your Macintosh. When you plug the device in, your machine automatically detects its presence. If the device needs any special software to run, the Mac will ask you to load the software. If it is already installed then you can just plug the device in and use it straight away.

You may soon find Firewire sneaking into your front room

The great advantage of FireWire is its sheer speed. Old serial ports can handle a data transfer rate of about 230Kbits/sec, while USB ports can handle a maximum of 12Mbits/sec. But FireWire provides a maximum data transfer rate of 400Mbits/sec. That's more than 30 times faster than USB and 1,500 times faster than a conventional serial port.

That kind of speed makes FireWire an ideal method for handling digital video and a number of camera manufacturers already use it in their cameras. Apple hopes that FireWire, also known as international standard IEEE-1394, is adopted not just in the field of digital video but also in devices such as colour printers and hard disks which would benefit from the speed of the FireWire interface.

Under its IEEE-1394 name, FireWire has also been adopted as part of HAVI (home audio/video interoperability). This is a system which is being put forward by a number of consumer electronics companies as a method for networking audio and video devices such as VCRs, TVs and CD players. So, even if you don't buy a Macintosh with FireWire, you may soon find FireWire sneaking into your front room as part of your home-entertainment system.

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XLR Mach Speed G3/366 £940 (£800 ex VAT)

XLR8 Mach Speed G3/400 £1,032.83 (£879 ex VAT) UK distributor: Promedia 01923 266400

- *Other processor upgrade options:*

Maccelerate G3 from Gordon Harwood 01773 836781

Newer Technology MaxPower G3 from A.M. Micro 01392 426473

Sonnet Crescendo G3 from MacRapide 0181 931 1177