

## Special Report

# Jaguar and new G4s boost Power Macs performance again

by Bob Connolly

Apple CEO Steve Jobs recently announced that, beginning in the New Year, new Macintosh computers will no longer be able to start up in System 9—they will still run old applications in Classic mode, but OS X will be the boot system. This is a bold move—just as Apple did away with the internal floppy drive, it is forcing users to adopt OS X.

We have moved most of our computers to OS X, so I'm not that worried. I hope the last stragglers in application development will take the hint and get on with releasing native OS X apps, plug-ins and drivers. (Note to Pinnacle: Please release an OS X driver for my Cinewave digital video capture card. Apple just won an Emmy Award for its revolutionary video editing application Final Cut Pro, and it's about time you let us run uncompressed video on it under OS X!)

## PRINT PUBLISHERS ARE PISS%#! TOO!

Many graphics professionals have put off upgrading their systems, complaining that QuarkXPress is not OS X compatible. Apple has countered by *giving away* Adobe InDesign free with each purchase of a new Power Mac G4 before the end of the year! So if you're thinking about buying a G4 and want to try making the transition to InDesign, now is the time to do it.

Apple has just released a new revamped G4 tower, and although it looks the same on the outside as the previous model, its inner workings are quite different. Let's start with the dual processors.

Apple has had dual processor systems

for several years, but software vendors had to write dual processor support into their applications to take advantage of them. When Apple released Mac OS X—which is designed to take advantage of two processors—users who had dual processor systems raved about the increased performance. So Apple decided to give all Power Mac G4 users dual processing by offering dual configurations across the line. This new lineup features dual 867MHz, 1GHz and 1.25GHz PowerPC G4 processors. You can't buy single processor tower Macs any more.

Cache RAM now features high-speed Double Data Rate memory (DDR SRAM)—and you don't install cache RAM, it comes hardwired right beside the main processor. It has a dedicated path to the processor, providing throughput of up to 4 GBps, so the processor can receive data up to five times faster than from the main memory. Each processor has its own Level 3 cache with up to 2MB of dedicated memory.

## RAM IT HOME

The Power Mac G4 now supports up to two gigabytes of double data rate main memory. Four slots accommodate 256MB or 512MB DDR DIMMs. There is a dedicated AGP 4X slot for the graphics card and four unoccupied 64-bit, 33MHz PCI slots for SCSI devices such as scanners, digital audio and video capture cards, or fast external RAID drives.

But how much faster is it?

The true speed of these new models can only be judged when you look at the whole picture. How well do the drives, RAM, video cards and processors work with each other? Apple claims that the new G4 Power Mac has a balanced design which includes a faster system bus, AGP 4X graphics, a direct PCI bus, integrated high-speed I/O controllers, and dual ATA hard drive controllers.

The faster system bus was first introduced in Apple's Xserve rack mount server version and integrates all the components of the Power Mac G4. It transfers data

among them using a 133MHz system bus or a 167MHz system bus for high-speed performance.

There's a new AGP 4X bus for driving the latest graphic cards. The PCI bus is now connected directly to the internal bus of the system controller for a maximum throughput of 266 MBps. The new Power Mac G4 includes two ATA hard drive controllers, and all standard systems ship with a speedy 7200-rpm hard drive on the

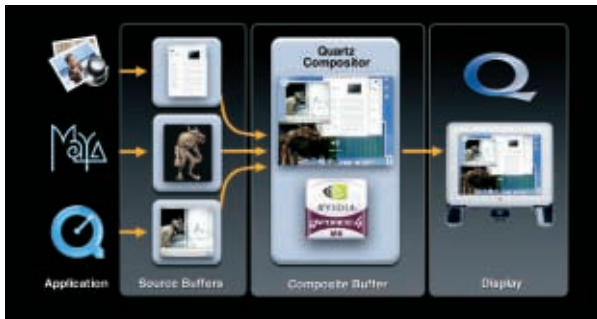


ATA/100 bus. With two drives on the ATA/100 bus and two drives on a second ATA/66 bus, users can install up to 480GB of internal storage.

## JAGUAR AND QUARTZ EXTREME

We've been talking a lot about new hardware, but I'd like to add that all new Power Mac G4 systems include the latest version of Mac OS X—version 10.2, known as Jaguar. The new OS X operating system was designed from the ground up to take advantage of multiprocessor computing and graphics rendering.

The new OS features the "Quartz" graphics engine which integrates OpenGL technology for rendering 2D and 3D graphics, with QuickTime for displaying crisp video content. Quartz Extreme—new in Jaguar—leverages the power of advanced graphics cards, so that on-screen graphics are faster and more responsive than before. Quartz uses the integrated OpenGL technology to convert each window into a texture, then sends it to the graphics card to render on-screen. The



graphics processor focuses on what it does best—graphics—freeing up the main processor to work on other tasks.

You're probably familiar with PDF (Portable Document Format). Well, now everything you see on an OS X screen is the result of millions of calculations by Quartz, which uses PDF as the basis for its imaging model. Quartz combines crisp graphics, anti-aliased fonts, 2D, 3D and QuickTime content together with transparency and drop shadows.

PDF is such an integral part of Quartz that Command-Shift-3 makes a PDF file for screen shots. Technically speaking, Apple's PDF is a superset of the Adobe PDF 1.3 specification, with some 1.4 features built in. Distiller is still required for fine tuned controls, but according to Apple, Quartz screen PDFs are full resolution and print-ready.

Jaguar optimizes Quartz to make the system more responsive. You'll detect a small improvement if you have a Power Mac G3 processor, and you'll notice faster window redraws and scrolling with a G4 processor, especially if you have dual G4 processors. But the real advancements in Jaguar come with Quartz Extreme.

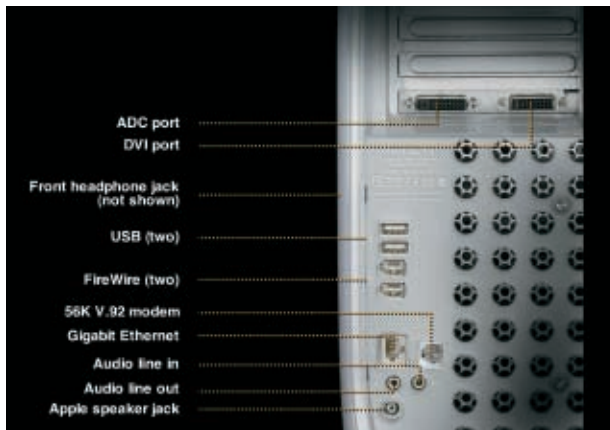
If you have a graphics card which is supported, Quartz Extreme will tell the card to perform the on-screen calculations. I definitely found a dramatic improvement in system performance.

The latest Power Mac line delivers ad-

vanced graphics cards from ATI and NVIDIA. Included with the dual 867 MHz system is the NVIDIA GeForce4 MX card with 32MB of fast DDR SDRAM. This card was offered as the high-end graphics solution in the previous Power Mac line. The dual 1GHz and dual 1.25GHz systems include the ATI Radeon 9000

Pro graphics engine. It supports programmable graphic effects that allow application developers to invent new effects which are rendered in real-time using the graphics processor instead of the main system CPU.

And for those of you who want the highest performance, you can choose the NVIDIA GeForce4 Ti graphics card that



features a large 128MB DDR SDRAM frame buffer to accelerate sophisticated game and design applications. It's also programmable and delivers advanced capabilities that developers can tap into to create life-like imagery and graphics.

Dual display capabilities are now built into every Power Mac G4—yes, that's right, one card will run two monitors. In extended desktop mode you can work across two displays. Desktop publishers could have their InDesign documents open in double-page display set up on one monitor and on the other they could be editing Photoshop images. The graphics cards are equipped with an ADC port for connecting an Apple display or a DVI port for a second digital display. DVI to ADC

and DVI to VGA adapters are available to connect almost any type of display you currently have.

**A HEADPHONE JACK AT THE FRONT OF THE COMPUTER — IT'S ABOUT TIME!**

My hat is off to whomever made the suggestion to Steve to put in a front headphone jack for easy access to attach headphones. Crawling behind the computer with a light and a magnifying glass was a real pain. But while you're behind your computer, you'll be pleased to find dedicated stereo audio line in and line out ports for connecting professional devices such as tape decks, mixers and amplifiers. It's also equipped with a separate Apple speaker minijack for attaching Apple Pro Speakers and powering them with a built-in 10-watt-per-channel digital amplifier. Apple is finally thinking about pro audio without added PCI cards.

A new 56K modem supports V.92 modem functionality, such as "Modem on Hold", to answer incoming telephone calls.

Ethernet operates at 10, 100, or 1000 Mbps, and automatically senses and adjusts to the user's network type. Now users can even connect directly to another computer with a standard Ethernet cable to share files; the system will automatically adjust for the other signal without the need for a crossover cable.

Apple's AirPort networking system is gaining acceptance, especially with people who have portable computers. An AirPort antenna and card slot are built into the Power Mac G4 so users can surf the web without wires just by installing an AirPort card and connecting an AirPort base station to a phone jack or Ethernet network.

Apple also added more expansion bays for up to half a terabyte of storage via four internal hard drive bays with dual ATA buses. By using all four drive bays, you can have up to 480GB of internal storage. With an Ultra160 SCSI PCI card, these could also be fast SCSI drives—perfect for uncompressed video editing.

With the addition of the new ATA/100 bus and higher performance drives, both read and write performance has increased by 45%. This is mainly because of the additional write caches in the new generation of drives. Write performance has increased in line with read performance.

If you really want to make your drives perform, Mac OS X RAID is included with every Power Mac G4 system as a standard feature of OS X. You can use multiple hard drives for increased drive performance, known as striping. When you stripe your drives, data is written (and read) to alternating drives, allowing faster reads and writes.

You can also set up the drives for data redundancy, known as mirroring. In this case, both drives have the exact same data, so if one drive should fail, the other can replace it immediately. It's a good thing to think about if you are a little lazy about backing up your projects on CD or DVD.

But my absolute favorite feature in the

new G4 is still the SuperDrive—a drive that really “rips and burns”. This has been a real winner for Apple because it allows you to read, author and burn not just CDs but also DVDs that can play in consumer DVD video players.

And now that Apple has added a second optical bay, you can add a Combo drive that has CD-R and DVD playback. If you backup your projects to CD or DVD, you can now duplicate them directly from your backup disk. If you're running OS X, you can do all of this while working on other projects because OS X allows multi-tasking.

#### **BUT WHAT ABOUT THE G5?**

With all these new features, a stable OS, and almost all major applications now written for OS X, it's hard to find an excuse not to fork out the bucks and get the computer that you've been waiting for.

Oh, yeah—I can just hear you—QuarkXPress isn't OS X, or you can't af-

ford to upgrade to the latest native versions, or you'll wait for the G5, or there might be a war with Iraq, or you simply don't want to learn a new operating system and your wife is saying, “What's wrong with the computer you just bought last year?”

All may be valid points—but, hey, I know a lot of people who have switched from PC to Mac, and they're starting with OS X and a brand new Mac. They know nothing about a Chooser or bombs or extensions. Do you want these ex-PC people teaching you how to work a new Mac a couple years from now? You'll hear comments like, “You're still using only one processor?”

Have you lost your “Mac” head? 🍌

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