

# Macworld

## The Mac Product Experts

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### Internal ATA Hard Drives

## Easy-to-Install Drives Provide Large Capacities and Good Performance

By Roman Loyola

You can easily fill up 10GB with MP3 files, digital images, and multimedia projects. So if you haven't yet upgraded your hard drive, now might be the time. These days, you can get a whole lot of drive for your dollar, as large-capacity drives -- 40GB to 80GB -- cost less than \$350

For this roundup, Macworld Lab tested seven internal ATA hard drives with capacities greater than 30GB: APS/IBM's Deskstar 75GXP (45GB) Maxtor's DiamondMax 80 (80GB) and DiamondMax Plus 45 (45GB), Quantum's Fireball Plus LM (30.4GB), Seagate's Barracuda ATA III (40GB) and U Series 5 (40GB), and Western Digital's Caviar WD400BB (40GB). Each has an ATA bus rated at 100 MBps (or *ATA100*), except for the Fireball Plus, with a rating 66 MBps (or *ATA66*).

Installing any of these drives is very straightforward. If you have a G4, just pop open the door, attach the drive with a mounting bracket, plug in a cable, and initialize the drive, and then you're ready to go (see "[Starving for Storage?](#)" *How-to*, January 2001).

### The Bus Factor

We measured the amount of time it took to copy a 100MB file and to copy a folder that contained 100MB in small files. We also timed how long it took to optimize a disk using Speed Disk from Norton Utilities 5.0.3, a test that measures a drive's ability to seek data.

Our test system, a Power Mac G4/500, uses an ATA bus rated at 66 MBps -- a speed bottleneck that can restrict the overall speed of ATA100 drives. As the results show, the performance of the Quantum Fireball Plus LM, with its 66-Mbps bus, was comparable to that of its 100-Mbps counterparts in our tests. Its speed, combined with its price (it's the least-expensive drive in our roundup) make the Fireball an ideal upgrade for budget-conscious users who need the extra disk space.

So are ATA100 drives a waste of money? No. You can bet that Mac hardware in the not-so-distant future will have an ATA100 bus, and if you sell your old Mac, you'll be able to keep the ATA100 drive and use it in your new machine.

The fastest drive in our tests was the Seagate Barracuda ATA III, a 40GB drive rated at 7,200 rotations per minute (rpm). It was considerably faster than the other 40GB, 7,200-rpm drive, the Western Digital Caviar WD400BB. Seagate's other 40GB drive, the U Series 5, has a slower rotation speed of 5,400 rpm, which explains its slow performance (compared with the other two 40GB drives) in the disk-optimization test.

The drive with the largest capacity in our roundup, the Maxtor DiamondMax 80, posted some of the slower results, due to its 5,400-rpm rotation speed. But with its relatively low price, the DiamondMax 80 is an excellent deal if you really need the space.

### Drive Safely

*Reference systems in italics.*

**Best results in bold.**

**Lower** number is better.

	Duplicate 100MB File	Duplicate 100MB Folder	Optimize Disk
APS/IBM Deskstar 75GXP (45GB)	11	<b>13</b>	70
Maxtor DiamondMax 80 (80GB)	14	21	81
Maxtor DiamondMax Plus 45 (45GB)	15	25	107
Quantum Fireball Plus LM (30.4GB)	12	17	73

Seagate Barracuda ATA III (40GB)	10	14	62
Seagate U Series 5 (40GB)	12	17	74
Western Digital Caviar WD400BB (40GB)	11	17	69
G4/500 27GB internal drive	11	16	70
VST 20GB Full Height (external FireWire drive)	14	18	91

All results are in seconds. We tested each hard drive in a Power Macintosh G4/500 with Mac OS 9.0.4, 128MB of RAM, a default system disk cache of 4MB, and virtual memory disabled. The baseline internal drive that shipped with the G4/500 was a 27GB Quantum Fireball Plus LM. For the disk-optimization test, we used Speed Disk from Norton Utilities 5.0.3's Speed Disk test with the Verify Media option disabled.--**Macworld Lab testing supervised by James Galbraith**

Since these are internal hard drives, you don't get much in terms of bundled extras. In fact, with all but the APS/IBM Deskstar 75GXP, you don't get anything at all. The Deskstar comes with APS's formatting software and utilities, but these tools don't offer a significant advantage over the Mac OS utilities.

We also ran our benchmarks on an external VST 20GB Full Height drive connected to the Mac via FireWire. Because the VST drive has a data-transfer rate of 15 MBps, and the FireWire bus has a maximum throughput of 50 MBps, we expected the ATA drives to be much faster -- and they were, except for the Maxtor drives, which lagged a bit behind the VST drive.

If you're looking to supplement your current hard drive, you might want to add an ATA drive as a secondary drive on the internal ATA bus instead of adding an external FireWire drive. You'll get faster speeds, and you'll save some cash -- external 40GB FireWire drives cost around \$650, about \$300 more than the most expensive drive in our roundup.

COMPANY	PRODUCT	MOUSE RATING	COMPANY'S ESTIMATED PRICE	CAPACITY	ROTATION SPEED	ATA BUS	PROS	CONS
<a href="#">APS/IBM</a> 503/844-4600	Deskstar 75GXP	3.0 mice	\$350	46.1GB	7,200 rpm	100 MBps	Good write speed; easy to install.	Expensive.
<a href="#">Maxtor</a> 408/432-1700	DiamondMax 80	3.0 mice	\$300	80.0GB	5,400 rpm	100 MBps	Easy to install.	Slow rotation speed.
	DiamondMax Plus 45	2.5 mice	\$180	45.0GB	7,200 rpm	100 MBps	Easy to install.	Pricy; slow seek speed.
<a href="#">Quantum</a> 408/894-4000	Fireball Plus LM	3.0 mice	\$135	30.4GB	7,200 rpm	66 MBps	Inexpensive; easy to install.	Slow bus speed.
<a href="#">Seagate</a> 405/936-1200	Barracuda ATA III	3.5 mice	\$190	40.0GB	7,200 rpm	100 MBps	Very fast; easy to install.	None.
	U Series 5	3.0 mice	\$155	40.0GB	5,400 rpm	100 MBps	Inexpensive; easy to install.	Slow rotation speed.
<a href="#">Western Digital</a> 949/932-5000	Caviar WD400BB	3.0 mice	\$169	40.0GB	7,200 rpm	100 MBps	Fast; easy to install	None.