Hard disks

DISK PARADE

Oliver Kluge and Mirko Dôlle introduce 21 current hard disks in three categories: ATA IDE, SCSI and Notebook disks

Looking through the manufacturers' information you notice one thing above all: manufacturers still haven't stopped thinking in terms of billions of bytes instead of actual gigabytes. By now the difference is a hefty seven per cent, which means so-called 100Gb disks actually provide a capacity of just over 93Gb.

The manufacturers have also cranked up the caches. One immediate consequence of this is that write access is almost invariably intercepted successfully. Our test results should therefore be taken only as guidelines rather than cast-iron speed values. All testing was carried out with default cache configurations. For a more reliable indicator of the speed of each medium you need to look to the read rates.

100Gb hard disks

At the top of the 100Gb range, we've placed the brand new disk from Western Digital. Although its 100Gb capacity only equates to 93Gb in real terms, this is still a pretty tidy amount to be getting on with; enough to store over 1,000 CDs in MP3 format (more than most users actually own) or a fair few hours of digital video.

Western Digital's WD1000 disk is not only big, it's also fast. A transfer rate of 38.6 Mb/sec is a good result for an ATA hard disk, which only few achieve. At 48.1 Mb/sec, writing is not exactly slow either. The access time of 14.6 milliseconds (including operating system overhead and latency) is also among the better results in its class.

To wrap things up nicely power usage is low at an average of only 7.5 Watts. All in all, the price of £225 seems perfectly acceptable.

ATA IDE hard disks

IBM is the winner in this category. The IC35L060 disk stands out from the crowd during testing due to several characteristics. For one thing its read rate is good, a very respectable 38.1 Mb/sec. Although its little 40Gb brother IC35L040 is slightly faster, the L060 is more attractively priced. Access times are also well within acceptable limits at 12.7 milliseconds, making this hard disk quite enticing, especially with its low power usage of only 6.3 Watts (on average) and a tolerable noise level of 48.5 dB(A). Overall, this hard disk is an attractive mass storage device at a reasonable price.

Ultra SCSI hard disks

The ST373405LW hard disk from Seagate is

something of a speed demon. Its test result of 53.6 Mb/sec may well make it a record breaker. Include the Ultra SCSI connection into the equation and you cannot help but conclude that this hard disk is almost crying out for database applications, which demand a lot of power from disks. The write rate is also very good at 41.7 Mb/sec, as is the access time at 15.6 milliseconds.

With such a fast disk you'd expect energy usage to be a little higher, but at 9.7 Watts it's hardly excessive, even if the heat given off is starting to be noticeable. There is also perceptible operational noise, which is not exactly loud but somewhat persistent – hardly a problem in a server, however.

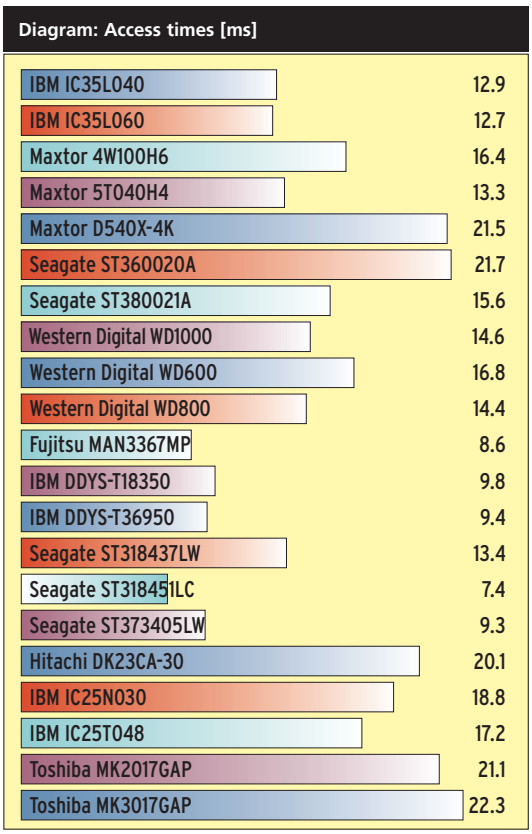
Notebook hard disks

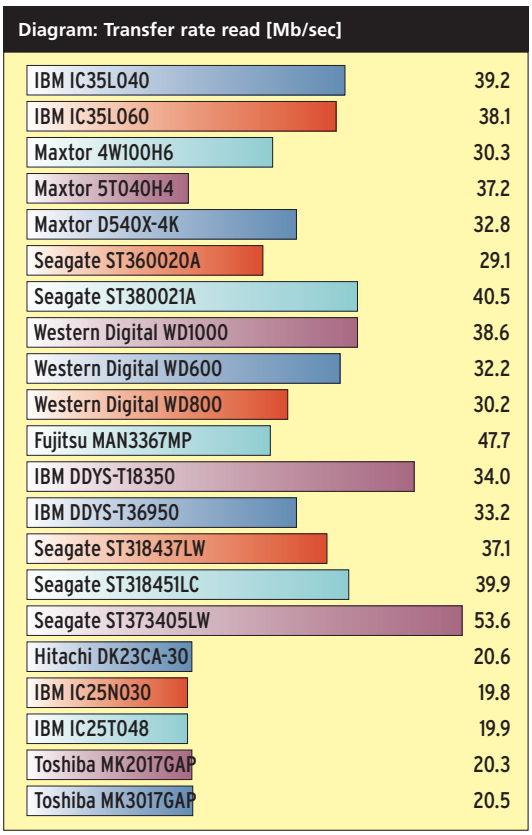
Portable computers make their own demands on hard disks. One of the most important is power usage. At 2.5 Watts IBM's device is a bit hungrier than others in the test. However, this hard disk offers something few others do: more than 45 Gb of storage capacity, which is an awful lot for a notebook. At this sort of size you can fit more on to a machine than just an ample operating system with lots of presentations and videos – you can take almost half a server with you as well. On the other hand, 17.2 milliseconds access time is a rather ordinary result for a hard disk in this category. Considering the performance on offer the price seems justified.

Technical data

	ATA IDE									
Manufacturer	**IBM**	**IBM**	**Maxtor**	**Maxtor**	**Maxtor**	**Seagate**	**Seagate**	**Western Digital**	**Western Digital**	**Western Digital**
Model	IC35L040	IC35L060	4W100H6	5T040H4	D540X-4K	ST360020A	ST380021A	WD1000	WD600	WD800
Web site	www.ibm.com	www.ibm.com	www.maxtor.com	www.maxtor.com	www.maxtor.com	www.seagate.com	www.seagate.com	www.wdc.com	www.wdc.com	www.wdc.com
Price†	£90.00	£135.00	£260.00	£120.00	£175.00	£120.00	£175.00	£225.00	£140.00	£175.00
Capacity (manufacturer)	40Gb	60Gb	100Gb	40Gb	80Gb	60Gb	80Gb	100Gb	60Gb	80Gb
Capacity (laboratory)	38.3 Gb	57.2Gb	93.3Gb	38.1 Gb	74.5Gb	57.2Gb	74.5Gb	93.1Gb	55.8Gb	74.5Gb
Interface	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100
Form factor	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch
Transfer rate read [Mb/sec]	39.2	38.1	30.3	37.2	32.8	29.1	40.5	38.6	32.2	30.2
Transfer rate write [MB/sec] ††	36.8	36.8	15.8	17.8	40.3	37.5	47.9	48.1	38.5	38.7
Access time [ms]	12.9	12.7	16.4	13.3	21.5	21.7	15.6	14.6	16.8	4.4
Power [W]	6.3	6.5	5.0	6.2	4.8	5.2	7.0	7.5	6.1	7.5
Noise [dB(A)]	48.3	48.5	35.0	33.0	36.0	38.1	34.9	35.1	38.8	37.1

(†) Prices are as a guide only and are not inclusive of VAT (††) Write cache with default configuration





	Ultra SCSI						Notebook				
	Fujitsu	**IBM**	**IBM**	**Seagate**	**Seagate**	**Seagate**	**Hitachi**	**IBM**	**IBM**	**Toshiba**	**Toshiba**
	MAN3367MP	DDS-T18350	DDS-T36950	ST318437LW	ST318451LC	ST373405LW	DK23CA-30	IC25N030	IC25T048	MK2017GAP	MK3017GAP
	www.fujitsu.com	www.ibm.com	www.ibm.com	www.seagate.com	www.seagate.com	www.seagate.com	www.hitachi.com	www.ibm.com	www.ibm.com	www.toshiba.com	www.toshiba.com
	£290	£140.00	£290.00	£195.00	£195.00	£550.00	£225.00	£210.00	£340.00	£105.00	£120.00
	36.7Gb	18.4Gb	36.7Gb	18.4Gb	18.4Gb	73.4Gb	30Gb	30Gb	48Gb	20Gb	30Gb
	34.2Gb	17.1Gb	36.7Gb	17.1Gb	17.1Gb	68.3Gb	27.9Gb	27.9Gb	44.7Gb	18.6Gb	27.9Gb
	Ultra 160	Ultra 160	Ultra 160	Ultra 160	Ultra 160	Ultra 160	ATA-100	ATA-100	ATA-100	ATA-100	ATA-100
	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	3.5 inch	2.5 inch	2.5 inch	2.5 inch	2.5 inch	2.5 inch
	47.7	34.0	33.2	37.1	39.9	53.6	20.6	19.8	19.9	20.3	20.5
	64.8	43.6	40.8	46.7	30.0	41.7	23.4	20.6	23.2	23.5	23.7
	8.6	9.8	9.4	13.4	7.4	9.3	20.1	18.8	17.2	21.1	22.3
	9.3	11.6	12.2	6.6	12.0	9.7	2.4	1.9	2.5	2.5	2.5
	36.1	41.1	43.2	36.1	42.2	39.1	27.8	27.1	27.2	28.4	27.0