

*Capacity leadership and rugged high performance
provide premium mobile computing*



IBM Travelstar family of 2.5-inch disk drives

2nd Quarter 1999

Highlights

Leading capacities up to 14.1 GB provide storage equal to many high-end desktop systems.

Industry-leading data rates, areal density, fast RPM (4200 and 4900), and a large 512 KB data buffer enhance performance without increasing power consumption.

Ultra DMA provides an interface transfer rate of up to 33.3 MB/sec.

Industry-leading shock ratings of up to 700 G/1 ms (nonoperating) and 150 G/2 ms (operating) improve ruggedness and reliability.

Drive Fitness Test* (DFT), an innovative IBM technology, helps reduce end-user disruption and expensive disk drive replacement.

Enhanced Adaptive Battery Life Extender* 3.0 power management technology selects the appropriate power mode to help minimize power usage and increase battery life.

Leading drive technology

The IBM Travelstar* hard disk drive family provides the exceptional capacity, performance, power management, shock resistance, and reliability required by today's sophisticated mobile computing and beyond PC applications. To provide a high level of performance, IBM Travelstar hard disk drives use field-proven IBM technology. Giant magnetoresistive (GMR) head technology increases areal density up to 5.7 Gbits/sq. inch, significantly reducing the number of disks and heads required to provide each capacity point. In addition, the GMR head technology pico slider enables more disk surface to be read, so more data can be stored on each disk.

IBM offers three z-heights for a range of mobile applications:

- The slim 9.5-mm high IBM Travelstar GN family gives users of ultra-portable notebooks the advantages of industry-leading capacities: performance, power management, shock resistance, and light weight.
- The 12.5-mm high IBM Travelstar GT family meets the high-capacity demands of integrated Internet/intranet, video, and multimedia applications in standard mobile computing environments.
- The feature-rich 17-mm high IBM Travelstar GS family is suited for high-performance, data-intensive computing.

The IBM Travelstar GS provides the industry's fastest spindle speed and largest capacities in the 2.5-inch storage market—making it ideal for leading video, graphics, digital imaging, and data storage applications.

IBM technical service and support

IBM Travelstar hard drives are backed by an array of IBM technical support and services. This support package is designed to help ensure that IBM customers can easily integrate Travelstar drives into their design and quickly develop and manufacture high-quality, cost-effective systems.



The IBM Travelstar 14GS 17-mm high, 14.1 GB hard disk drive—another industry first

IBM Travelstar family specifications, 2nd Quarter 1999

Product family name	Travelstar 4GN	Travelstar 6GN	Travelstar 6GT
Capacity and interface			
Capacity (GB)	4.3, 3.2	6.4, 4.8, 3.2	6.4, 5.4, 4.8
Interface	Ultra-ATA	Ultra-ATA	Ultra-ATA
Data buffer (KB)	512 ¹	512 ²	512 ¹
Rotational speed (RPM)	4200	4200	4200
Latency (average ms)	71	71	71
Media transfer rate (Mbits/sec)	61.5–102.6	69.0–118.0	61.5–102.6
Interface transfer rate (MB/sec)	33.3 MB/sec Ultra DMA mode-2 16.6 MB/sec PIO mode-4	33.3 MB/sec Ultra DMA mode-2 16.6 MB/sec PIO mode-4	33.3 MB/sec Ultra DMA mode-2 16.6 MB/sec PIO mode-4
Seek time (typical)			
Average read	13	13	12
Track-to-track	4	2.5	4
Full track	23	23	23
Configuration			
Sector size (bytes)	512	512	512
Recording zones	8	12	8
User cylinders	9280	11,648	9280
Data heads	4, 3	4, 3, 2	6, 5, 4
Disks	2	2, 2, 1	3, 3, 2
Areal density (max. GB/sq. inch)	4.1	5.7	4.1
Recording density (max. KBPI)	256.4	286.1	256.4
Track density (TPI)	16,000	19,900	16,000
Reliability			
Warranty (years)	3	3	3
Error rates (non-recoverable bits read)	< 1 per 1.0E 13 bits transferred	< 1 per 1.0E 13 bits transferred	< 1 per 1.0E 13 bits transferred
Load/unload cycles	300,000	300,000	300,000
Power			
Requirements	+5 VDC(+/-5%)	+5 VDC(+/-5%)	+5 VDC(+/-5%)
Dissipation (typical)			
Start-up (max. peak) watts	4.7	4.7	4.7
Seek (avg.) watts	2.3	2.3	2.3
Read/write (avg.) watts	2.0/2.1	2.0/2.1	2.1/2.2
Performance idle (avg.) watts	1.85	1.85	1.85
Low power idle (avg.) watts	0.65	0.65	0.65
Standby (avg.) watts	0.3	0.25	0.3
Sleep watts	0.1	0.1	0.1
Power consumption			
Efficiency index (watts/MB)	0.0002	0.0001	0.0001
Environmental (operating/nonoperating)			
Ambient temperature	5 to 55° C/-40 to 65° C	5 to 55° C/-40 to 65° C	5 to 55° C/-40 to 65° C
Relative humidity	8% to 90%/5% to 95%	8% to 90%/5% to 95%	5% to 90%/5% to 95%
Maximum wet bulb (no condensation)	29.4° C/40° C	29.4° C/40° C	29.4° C/40° C
Shock (half sine wave)	150 G/2 ms / 700 G/1 ms	150 G/2 ms / 700 G/1 ms	125 G/2 ms / 600 G/2 ms
Vibration (random [RMS])	0.67 G (5 to 500 Hz)/3.01 G (5 to 500 Hz)	0.67 G (5 to 500 Hz)/3.01 G (5 to 500 Hz)	0.67 G (5 to 500 Hz)/3.01 G (5 to 500 Hz)
Vibration (swept sine)	1.0 G (5 to 500 Hz)/NA	1.0 G (5 to 500 Hz)/NA	1.0 G (5 to 500 Hz)/NA
Physical size (dimensions)			
Height	9.5 mm/.37 in	9.5 mm/.37 in	12.5 mm/.49 in
Width	70 mm/2.75 in	70 mm/2.75 in	70 mm/2.75 in
Depth	100 mm/3.9 in	100 mm/3.9 in	100 mm/3.9 in
Weight (max)	99 g/3.49 oz	99 g/3.49 oz	140 g/4.94 oz
Ordering information			
Model	DKLA-24320 (4.3 GB)	DBCA-206480 (6.4 GB)	DADA-26480 (6.4 GB)
Part number	03L5560	25L2707	03L5640
	DKLA-23240 (3.2 GB)	DBCA-204860 (4.8 GB)	DADA-25400 (5.4 GB)
	03L5550	25L2706	03L5630
		DBCA-203240 (3.2 GB)	DADA-24860 (4.8 GB)
		25L2705	25L2663

¹ Upper 49 KB used for firmware

² Upper 92 KB used for firmware

³ Upper 53 KB used for firmware

IBM Travelstar family specifications, 2nd Quarter 1999

Product family name	Travelstar 10GT	Travelstar 8GS	Travelstar 14GS
Capacity and interface			
Capacity (GB)	10.0, 8.1	8.1	14.1
Interface	Ultra-ATA	Ultra-ATA	Ultra-ATA
Data buffer (KB)	512 ²	512 ²	512 ²
Rotational speed (RPM)	4200	4900	4900
Latency (average ms)	7.1	6.1	6.1
Media transfer rate (Mbits/sec)	69.0–118.0	64.6–107.6	76.6–125.5
Interface transfer rate (MB/sec)	33.3 MB/sec Ultra DMA mode-2 16.6 MB/sec PIO mode-4	33.3 MB/sec Ultra DMA mode-2 16.6 MB/sec PIO mode-4	33.3 MB/sec Ultra DMA mode-2 16.6 MB/sec PIO mode-4
Seek time (typical)			
Average read	12	12	12
Track-to-track	2.5	4	2.5
Full track	23	23	23
Configuration			
Sector size (bytes)	512	512	512
Recording zones	12	8	12
User cylinders	11,968	8320	11,136
Data heads	6, 5	10	10
Disks	3	5	5
Areal density (max. GB/sq inch)	5.60	3.09	5.00
Recording density (max. KBPI)	283.2	221.0	261.9
Track density (TPI)	19,900	14,000	19,000
Warranty (years)	3	3	3
Error rates (non-recoverable bits read)	< 1 per 1.0E 13 bits transferred	< 1 per 1.0E 13 bits transferred	< 1 per 1.0E 13 bits transferred
Load/unload cycles	300,000	300,000	300,000
Power			
Requirements	+5 VDC(+/-5%)	+5 VDC(+/-5%)	+5 VDC(+/-5%)
Dissipation (typical)			
Start-up (max. peak) watts	4.7	5.0	5.0
Seek (avg.) watts	2.3	2.6	2.6
Read/write (avg.) watts	2.1/2.2	2.5/2.7	2.5/2.7
Performance idle (avg.) watts	1.85	2.0	2.0
Low power idle (avg.) watts	0.65	0.85	0.85
Standby (avg.) watts	0.25	0.3	0.3
Sleep watts	0.1	0.1	0.1
Power consumption			
Efficiency index (watts/MB)	0.00007, 0.00008	0.0001	0.0001
Environmental (operating/nonoperating)			
Ambient temperature	5 to 55° C/-40 to 65° C	5 to 55° C/-40 to 65° C	5 to 55° C/-40 to 65° C
Relative humidity	8% to 90%/5% to 95%	8% to 90%/5% to 95%	8% to 90%/5% to 95%
Maximum wet bulb (no condensation)	29.4° C/40° C	29.4° C/40° C	29.4° C/40° C
Shock (half sine wave)	125 G/2 ms / 600 G/2 ms	125 G/2 ms / 400 G/2 ms	125 G/2 ms / 400 G/2 ms
Vibration (random [RMS])	0.67 G (5 to 500 Hz)/3.01 G (5 to 500 Hz)	0.67 G (5 to 500 Hz)/3.01 G (5 to 500 Hz)	0.67 G (5 to 500 Hz)/3.01 G (5 to 500 Hz)
Vibration (swept sine)	1.0 G (5 to 500 Hz)/NA	1.0 G (5 to 500 Hz)/NA	1.0 G (5 to 500 Hz)/NA
Physical size (dimensions)			
Height	12.5 mm/0.5 in	17 mm/0.7 in	17 mm/0.7 in
Width	70 mm/2.75 in	70 mm/2.75 in	70 mm/2.75 in
Depth	100 mm/3.9 in	100 mm/3.9 in	100 mm/3.9 in
Weight (max)	137 g/4.8 oz	182 g/6.4 oz	182 g/6.4 oz
Ordering information			
Model	DCXA-210000 (10.0 GB)	DYLA-28100 (8.1 GB)	DCYA-214000 (14.1 GB)
Part number	25L2709 DCXA-208100 (8.1 GB) 25L2708	03L5220	25L2710

For more information

Internet and e-mail:

- www.ibm.com/harddrive
- drive@us.ibm.com
- reseller@us.ibm.com

IBM TECHFAX document server:

- 408-256-5418 (requires touch-tone phone)
- International callers must call from a fax machine

IBM hard disk drive product information:

- 1 888-IBM-5214 (United States)
- 507-253-4110 (outside of the United States)



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