

*Further defining state-of-the-art for desktop storage*



# IBM Deskstar 60GXP hard disk drive

---

## Highlights

---

**The award-winning IBM Deskstar\* family provides industry-leading performance at 7200 RPM, 494 Mbits/sec internal transfer rates, and 8.5 ms average seek times—enabling sustained data rates of up to 40 MB/sec.**

**Capacities range from 20 to 60 GB.**

**An Ultra ATA/100 interface optimizes system performance.**

**Unique design attributes enable shock protection to 400 G.**

**Reduced acoustics enable extremely quiet operation at 3.1 Bels.**

**Idle power consumes only 6.7 watts.**

## Leading drive technology

The IBM Deskstar 60GXP disk drive combines new and proven technologies to greatly enhance system performance and capacity—handling a wide range of advanced desktop and audio/video applications. Features such as low acoustics, reduced power, and tagged command queuing are ideal for low-cost routers, entry-level servers, and switches.

## Advanced desktop systems

IBM continues to define state-of-the-art for storage. The high capacities and fast speeds of IBM Deskstar drives support higher quality digital audio/video storage, superior digital content creation capabilities, and significantly faster processing for multimedia and Internet applications.

## Technology for performance

Increased track capacity and servo bandwidth combine with enhanced buffer throughput to significantly improve performance over the previous generation IBM drive. A 2 MB buffer uses advanced buffer management and hardware assisted caching to streamline data transfer. In addition, more servo pulses help ensure faster and more accurate head positioning to reduce head settling time. The IBM Deskstar 60GXP also supports Tagged Command Queuing and Rotational Position Optimization to further enhance throughput for data-intensive Windows NT\*\* and UNIX\*\* applications.

## Technology for reliability

The industry's highest areal density increases capacity while reducing

component count to improve reliability. Second-generation load/unload head ramps help protect data from drive mishandling, further enhancing reliability. In addition, glass media provides a smoother disk surface and greater rigidity to reduce the impact of shock.

Ceramic spindle bearings and a tri-laminate top cover reduce acoustics to just 3.1 Bels—a level that matches or improves upon many 5400 RPM models. Circuits and motors are also optimized to save power and reduce system temperature—extending system life and reliability.

Deskstar drives utilize proven IBM technologies such as TrueTrack\* servo and No-ID\* sector formatting, as well as IBM Drive Fitness Test\* (DFT), S.M.A.R.T. Self Test, and error logging.

## IBM quality and service

IBM drives are backed by technical support and services, which may include customer and integration assistance.<sup>1</sup>



*IBM Deskstar 60GXP 3.5-inch 7200 RPM 60, 40, and 20 GB ATA disk drive*

## IBM Deskstar 60GXP at a glance

### Configuration

Interface	ATA
Capacity (GB)	60/40/20
Sector size (bytes)	512
Recording zones	18
Data heads (physical)	6/4/2
Data disks	3/2/1
Max. areal density (Gbits/sq. inch)	15.3
Max. recording density (BPI)	449,000
Track density (TPI)	34,000

### Performance

Data buffer	2 MB <sup>2</sup>
Rotational speed (RPM)	7200
Latency (average ms)	4.17
Media transfer rate (max Mbits/sec)	494
Interface transfer rate (MB/sec)	100
Sustained data rate (MB/sec)	20.9 to 40.8
Seek time (read typical)	
Average (ms)	8.5
Track-to-track (ms)	1.2
Full-track (ms)	15.0

### Reliability

Error rate (nonrecoverable)	1 in 10E13
Start/stop cycles (load/unload at 40° C)	40,000

### Power

Requirement	+5 VDC (± 5%), +12 VDC (+10%/-8%)
Dissipation (typical)	
Startup current (max A)	2.0 (12 V)
Idle (W)	6.7 (3, 2, 1 disks)

### Physical size

Height (mm)	25.4
Width (mm)	101.6
Depth (mm)	146.0
Weight (max g)	590 (3 disks), 575 (2 disks), 560 (1 disk)

### Environmental characteristics

	Operating	Nonoperating
Ambient temperature	5 to 55° C	-40 to 65° C
Relative humidity (noncondensing)	8% to 90%	5% to 95%
Maximum wet bulb (noncondensing)	29.4° C	35.0° C
Shock (half sine wave)	55 G/2 ms	400 G (2, 1 disks) 350 G (3 disks)
Vibration (random [RMS])	0.67 G for horizontal, 0.56 G for vertical	1.04 G
Acoustics (idle) Bels	3.1 (3 disks), 3.0 (2 disks), 2.9 (1 disk)	

### Models

IC35L060AVER07 (60 GB), IC35L040AVER07 (40 GB), and IC35L020AVER07 (20 GB)

<sup>2</sup> Upper 132 KB used for firmware

### For more information

Internet and e-mail:

- [www.ibm.com/harddrive](http://www.ibm.com/harddrive)
- [drive@us.ibm.com](mailto:drive@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)



[www.ibm.com/harddrive](http://www.ibm.com/harddrive)

© Copyright IBM Corporation 2000

IBM Storage Technology Division  
5600 Cottle Road  
San Jose, CA 95193

Produced in the United States  
11-00

All rights reserved

<sup>1</sup> This product data does not constitute a warranty. Questions regarding IBM warranty terms or the methodology used to derive this data should be referred to an IBM representative.

\* IBM is a registered trademark and Deskstar, Drive Fitness Test, TrueTrack, and No-ID are trademarks of International Business Machines Corporation.

\*\* Windows NT is a registered trademark of Microsoft Corporation. UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company limited. Other product names are trademarks or registered trademarks of their respective companies.

Product description data represents design objectives and is provided for comparative purposes; actual results may vary depending on a variety of factors. Product claims are true as of the date of the first printing.

Data subject to change without notice. IBM development plans are subject to change at any time without prior notice.

GB equals one billion bytes when referring to hard drive capacity; accessible capacity may be less.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make them available in all countries in which IBM operates.

**TECHFAX #7011**