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|      0664 MODELS M1H AND N1H      |
|                                  |
| 3.5 INCH 2 GB HIGH-PERFORMANCE SCSI DISK DRIVES |
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AN OEM OFFERING FROM IBM

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0664 MODELS M1H AND N1H

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The 0664 Models M1H and N1H provide an industry-leading 2 GB of direct access storage in a 3 1/2-inch form factor device. This drive builds on the tradition of IBM 3 1/2-inch high-capacity drives begun in 1989 with the 0661 (320 MB) and enhanced in 1991 with the 0663 devices (1.0 GB). The 0664 is downward compatible with the previous models, while providing the latest industry-standard mounting.

Along with the increase in capacity, the 0664 offers improvements in performance, reliability, and function. In the area of performance, both sequential and random reads/writes are improved via faster processors, a higher bandwidth parallel channel, a higher bandwidth SCSI chip set, faster spindle speed, and a larger data buffer. For reliability, the 0664 has the addition of Longitudinal Redundancy Code (LRC) between the host and the drive, and improvements in the drive's self-tests. Predictive Failure Analysis capabilities, and Defect Recovery Procedures.

The 0664 offers 5.22 MB/sec media data rate across the entire disk, with 4 MB/sec sustained throughput. For higher performance, a 68-pin (16-bit) option is provided with support for 16 SCSI addresses, and 16-bit data transfer widths.

Performance is tuned for multi-user applications in which short block sequential reads and writes dominate. This 2 GB, 3 1/2-inch drive should prove attractive to manufacturers of arrays and other storage subsystems, high-end RISC-based workstations, and servers.

HIGHLIGHTS

- Fast SCSI-2 interface (model M1H-50-pin interface)
- Fast & Wide SCSI-2 interface (Model N1H - 68-pin P Cable)

- Predictive Failure Analysis for increased reliability
- PRDF data channel (PRML with Digital Filter)
- Drive-supported SCSI term power
- LED driver supported
- 512 KB, multi-segmented, data buffer
- Industry-standard mounting
- Low command overhead
- Longitudinal Redundancy Code
- ECC on the fly
- Command reordering
- Back-to-back writes
- Self-optimizing buffer ratios
- Read Ahead caching
- Write caching
- Automatic sector reallocation
- Spindle synchronization
- Automatic power management
- Differential SCSI adapter option

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## PRODUCT DESCRIPTION

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3 1/2" 2 GB High-Performance      0664-Models M1H  
 SCSI Disk Drive                      and N1H

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### Disk Drive Configuration

Formatted Capacity (512 bytes)	2013.7 MB
Number of Disks	8
Number of Heads	16
Recording Surfaces	15
Tracks per Surface	2870
Track Density	3168 TPI
Areal Density	259 Mb/in (2)
Recording Density	81,913 BPI
Bytes per Sector	Variable
Disk Type	Thin Film
Channel	PRDF
Actuator Type	Rotary VCM
Head Type	Magneto-resistive (MR)

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### Performance

Media Data Rate

Non-Banded	5.22 MB/sec
Access Time	
Average Read	9.4 ms
Average Write	11.4 ms
Track to Track Read	.6 ms
Full Stroke Read	18.5 ms
Rotational Speed	5400 RPM
Command Overhead (Read)	
Random	0.28 ms
Sequential w/Read Ahead	0.4 ms

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Data Transfer Rate (maximum)	M1H	N1H
	(Byte Wide Model)	(2 Byte Wide Model)
Synchronous	10 MB/sec	20 MB/sec
Asynchronous	5 MB/sec	10 MB/sec
Buffer Size	512 K	

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Reliability	
MTBF (Hours)	750,000 hours
Recoverable Read Errors	
Population Average	< 10 in 10 to the 11th
Non-Recoverable Read Errors	
Population Average	< 10 in 10 to the 15th
Seek Errors	< 10 in 10 to the 8th
Predictive Failure Analysis	Yes
Buffer Memory Parity	Yes
Longitudinal Redundancy Code (LRC)	Yes
Preventive Maintenance	None

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Power Requirements	
+5 VDC Idle	1.10 Amps
+5 VDC Standby	0.87 Amps
+12 VDC Idle	0.60 Amps
+12 VDC Start-up	2.7 Amps
Power	12.7 Watts

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Physical Size	
Dimensions	
Length (excluding connector)	146.0 mm
Length (including connector)	153.2 mm
Height	41.3 mm

Width	101.6 mm
Weight	0.8 kg
Mounting	Industry Standard/All Orientations

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Environmental Characteristics	Operating	Non-Operating
Temperature	5 to 55 degrees C	1 to 65 degrees C
Relative Humidity		
Non-Condensing	8% to 90%	5% to 95%
Shock (11 ms)	10 G	60 G
Vibration	1 G (1)	2 G
Audible Noise (Population Average)		
(Idle)	<34 dba @ 1 M	NA

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(1) 1 G swept sine vibration is for frequencies between 5 and 180 Hz. Levels above 180 Hz vary with frequency and orientation, and are available upon request.

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