IBM

Personal Systems Reference
IBM SCSI Disks and Controllers
1992 to 1999 - Withdrawn

June 2001 - Version 224

IBM SCSI Controllers (Micro Channel) - withdrawn

Controller	✄ **Micro Channel SCSI Adapter with Cache**	✄ **PS/2 SCSI-2 Adapter/A**	✄ **SCSI-2 Fast/Wide Adapter/A**
Implementation	Planar/card - old PS/2's	Adapter in 76s, 77s	Planar in Model 85 433, 466 Adapter in 95 466, 560, 566 Adapter in Serv 500 non-array models
	Option (Options by IBM™)	Option	Option (Options by IBM)
SCSI type	SCSI-1	SCSI-2 Fast	SCSI-2 Fast/Wide
SCSI bus path / speed	8 bit / 5 MB/sec	8 bit / 10 MB/sec	16 bit / 20 MB/sec
I/O Architecture	**Micro Channel®**	**Micro Channel**	**Micro Channel**
I/O bus path / speed	32 bit / 16.6 MB/sec	16 bit / 3 MB/sec	32 bit / 40 MB/sec streaming
I/O features			Streaming data transfer Address parity and data parity
RAID levels	None (use software)	None (use software)	None (use software)
Tagged Command Queuing	No	No	Yes
Processor	80188 at 16 MHz	None (PIO)	80C186 at 20 MHz
Size	Type 3 (long)	Half length - Type 3	Type 3 (short)
Channels	One (internal/external)	One (internal/external)	Two (one internal/one external)
Connectors	One internal; one external	One internal; one external	Two internal for SCSI-1 or SCSI-2 cabling (only one active); one external
Devices supported	7 devices per adapter	7 devices per adapter	7 devices per adapter 15 devices on Server 500 on one or two channels
Cache std / max	512 KB / 512 KB	0 KB / 0 KB (8 KB buffer)	0 KB / 0 KB (128 byte buffer)
Cache method	Two SIMMs	N/A	N/A
Cache configurations	N/A	N/A	N/A
Cache write policy	Write-through	N/A	N/A
Available date	March 1992	June 1994	September 1993
Price (retail USD)	$ 379	$ 233	$ 515
Part number	70G8497 (old 6451133)	82G4868	70G8498 (old 6451280)

Controller	✄ **SCSI-2 RAID Controller**	✄ **SCSI-2 Fast/Wide Streaming RAID Adapter/A**
Code name	Passplay	Cheetah
Implementation	Adapter in Model 95 array models Not available as option	Adapter in PC Server 500 and 720 array models Option
SCSI type	SCSI-2 Fast/Wide	SCSI-2 Fast/Wide
SCSI bus path / speed	16 bit / 20 MB/sec	16 bit / 20 MB/sec
I/O Architecture	**Micro Channel**	**Micro Channel**
I/O bus path / speed	32 bit / 40 MB/sec streaming	32 bit / 40 MB/sec streaming (80 MB/sec on PC Server 720)
I/O features	Streaming data transfer Address parity and data parity	Streaming data transfer Address parity and data parity
RAID levels	RAID 0, 1, Hybrid 1, 5 4 ind (A,B,C,D) / 8 logical arrays	RAID 0, 1, Hybrid 1, 5 4 ind (A,B,C,D) / 8 logical arrays
Tagged Command Queuing	Yes	Yes
Processor	i960 at 25 MHz	i960 at 25 MHz
Size	Type 5 (only fits in Model 85 or 95)	Type 3 (full length)
Channels	Two (both internal)	Two (one internal; one internal or external) See Note 1
Connectors	Two internal only (can not attach external devices)	Three total: Two internal - 16 bit wide (side card included except One external - 16 bit wide PC Server 500 does not include) Can only use two connectors at any one time
Devices supported	7 devices per adapter	14 per adapter (7 per max per channel)
Cache std / max	4 MB / 64 MB (with parity)	4 MB / 4 MB (with parity) 60 ns
Cache method	4 sockets for 30 pin 80ns SIMMs	Soldered on adapter
Cache configurations	4, 16, or 64 MB only	N/A
Cache write policy	Write-through or write-back	Write-through or write-back
Available / withdrawn date	N/A (November 1993 for Servers)	May 1994 / April 1997
Price (retail USD)	N/A	$ 1, 840
Part number	N/A (not available as option)	70G9263

Note1: **SCSI-2 Fast/Wide Streaming RAID Adapter/A**
There are 3 connectors on adapter: one external and two internal.
One internal is the opposite end of the external and can only be used if external is
not used (this is first SCSI bus which has 2 connectors).
The other internal can go to internal devices or go to the standard sidecard (this is
second SCSI bus which has 1 connector).
The sidecard ships standard and uses a Micro Channel slot. It is only used if want
external devices on this bus (sidecard does not ship on PC Server 500 array models).
So only two connectors can be used at one time and can not mix internal and
external devices on the same bus.
It supports 8 drives as part of the same physical array spread across two SCSI buses
The 2 SCSI buses will be either ① both external or ② one internal and one external or ③ both internal.

IBM SCSI Controllers (PCI) - withdrawn

Controller	✂ **SCSI-2 Fast PCI Adapter**	✂ **SCSI-2 Fast PCI Adapter**	✂ **SCSI-2 Fast/Wide PCI Adapter**	✂ **SCSI-2 Fast/Wide Controller**
Code name			Earlybloomer	
Vendor		Adaptec AHA-2940U (has custom BIOS)	IBM	Adaptec®
Implementation	Option (not supported in PC 700) Adapter in IBM PC Server 300 (0PT)	Adapter in IBM PC Server 310	**Option for IBM PC Power Series**	Planar of IBM PC Server 320 (PCI/MCA)
SCSI type	SCSI-2 Fast	SCSI-2 Fast	SCSI-2 Fast/Wide	SCSI-2 Fast/Wide
SCSI bus path / speed	8 bit / 10 MB/sec	8 bit / 10 MB/sec	16 bit / 20 MB/sec	16 bit / 20 MB/sec
I/O Architecture	**PCI**	**PCI**	**PCI**	**PCI**
I/O bus path / speed	32 bit / up to 132 MB/sec	32 bit / up to 132 MB/sec	32 bit / up to 132 MB/sec	32 bit / up to 132 MB/sec
RAID levels	None (use software)	None (use software)	None (use software)	None (use software)
Tagged Command Que	Yes	Yes	Yes	Yes
Processor	Intelligent SCSI processor	Intelligent SCSI processor	Intelligent SCSI processor)	Chip on planar
Size	PCI standard	PCI standard	PCI (smaller than half size)	N/A
Channels	One (internal/external)	One (internal/external)	One (internal and/or external)	One (internal and/or external)
Connectors	One internal; one external	Two total: One internal - 8 bit narrow One external - 8 bit narrow Can use two connectors at any one time	Three total: Two internal - 8 bit narrow - 16 bit wide One external - 16 bit wide Can use only one internal connector at one time; can use external connector at any time	Three total: Two internal - 8 bit narrow - 16 bit wide One external - 16 bit wide Can use only one internal connector at one time; can use external connector at any time
Devices supported	7 devices per adapter	7 devices per adapter	15 devices total on one or both connectors	15 devices total on one or both connectors
Cache std / max	None (32 byte FIFO buffer)	None (32 byte FIFO buffer)	None (FIFO buffer)	None (FIFO buffer)
Cache method	N/A	N/A	N/A	N/A
Cache write policy	N/A	N/A	N/A	N/A
Available / withdra date	May 1994 / October 1996	October 1995 / Feb 1997	June 1995 / March 1996	July 1995/ April 1996
Warranty	3 years	N/A	3 year	Same as PC Server
Price (retail USD)	$ 199	N/A	$ 280	N/A
Part number	32G3100	N/A	12H0823	N/A

Controller	✂ **SCSI-2 Fast/Wide PCI Adapter**	✂ **SCSI-2 Fast/Wide PCI Adapter II**	✂ **SCSI-2 Fast/Wide PCI RAID Adapter**
Code name	Foxtown		Savannah
Vendor / product	Adaptec / modification of AHA-2940W		Mylex / modification of DAC960P
Implementation	Option Adapter in PC Server 320 non-array	Adapter in PC Server 520 & 720 non-array	Option Adapter in PC Server 320 array
SCSI type	SCSI-2 Fast/Wide	*Supports a bootable CD-ROM*	SCSI-2 Fast/Wide
SCSI bus path / speed	16 bit / 20 MB/sec		16 bit / 20 MB/sec
I/O Architecture	**PCI**		**PCI**
I/O bus path / speed	32 bit / 132 MB/sec		32 bit / 132 MB/sec
RAID levels	None (use software)		**RAID 0, 1, Hybrid 1, 5**
Tagged Command Queuing	Yes		4 independent (A,B,C,D) / 8 logical arrays
Processor	None (intelligent SCSI processor)		i960 at 25 MHz
Size	PCI standard		PCI standard
Channels	One (internal and/or external)		Two (one internal; one internal or external)
Connectors	Three total: Two internal - one is 8 bit narrow - one is 16 bit wide One external - 16 bit wide		Three total: (Pigtail cable and side card Two internal - 16 bit wide included except PC Server 320 One external - 16 bit wide does not include) Can only use two connectors at any one time
Devices supported	15 devices total on one or both connectors		14 per adapter (7 max per channel)
Cache std / max	None (FIFO buffer)		4 MB / 4 MB (with parity) 70 ns
Cache method	N/A		One 72 pin socket
Cache write policy	N/A		Write-through or write-back
Available / withdra date	March 95 / Feb 96	October 95 / Jan 97	June 1995 / April 1997
Warranty	1 year	1 year	1 year
Price (retail USD)	$ 299	$ 299	$ 1,840
Part number	94G3771	94G4673	94G2764

IBM UltraSCSI Controllers (RAID PCI) - withdrawn

	✂ **IBM® PC ServeRAID Adapter**	✂ **IBM PC ServeRAID II Ultra SCSI Adapter**
Controller		
Vendor	IBM	IBM
Implementation	Adapter in some PC Server systems	Available as an option for PC Servers
	Available as an option for PC Servers	
SCSI type	Wide Ultra SCSI	
SCSI bus path / speed	16-bit / 40MB/sec	
I/O Architecture	**PCI** / full length adapter / includes PCI-to-PCI bridge	
I/O bus path / speed	32-bit / 132MB/sec	
RAID levels	Raid 0, 1, Hybrid 1, 5	
	8 independent (A,B,C,D,E,F,G,H) / 8 logical arrays / array can span channels	
Chip architecture	PowerPC 403GA RISC processor	PowerPC 403GCX RISC processor
Channels	Three channels (can only use int or ext connctr on Channel 1)	Three channels (can not use both internal Channel and corresponding external Channel at same time)
Connectors	Four total:	Five to six total:
	Three internal - 16-bit Channel 1 (not use if using external)	Three internal - 16-bit Channel 1 - 68-pin
	- 16-bit Channel 2 - 68-pin	- 16-bit Channel 2 - 68-pin
	- 16-bit Channel 3 - 68-pin	- 16-bit Channel 3 - 68-pin
	One external - 16-bit Channel 1 (not use if using internal)	Two external - 16-bit Channel 1 - 0.8 mm VHDCI
		- 16-bit Channel 2 - 0.8 mm VHDCI
		Optional ext Channel 3 (VHDCI) via Third Channel Cable
Devices supported	15 devices on each channel; 3 channels x 15 = 45 dev max	15 devices on each channel; 3 channels x 15 = 45 dev max
	SCSI-1, SCSI-2, UltraSCSI	SCSI-1, SCSI-2, UltraSCSI
Features	Supports a bootable CD-ROM	Supports a bootable CD-ROM
	Busmaster DMA / ASPI compliant	Busmaster DMA / ASPI compliant
	Logical Drive Migration (change from RAID 0 to 5 by adding 1 disk; RAID 1 to 5 by adding 1 disk; increase free space in array; change size of logical drive)	Logical Drive Migration (change from RAID 0 to 5 by adding 1 disk; RAID 1 to 5 by adding 1 disk; *RAID 5 to 0 by removing 1 disk;* increase free space in array; change size of logical drive)
	Configuration stored on (1) NVRAM, (2) EEPROM, (3) disk	Configuration stored on (1) NVRAM, (2) EEPROM, (3) disk
	Local and remote monitoring	Local and remote monitoring
	Auto-Rearrange Drive Configuration	Auto-Rearrange Drive Configuration
		Background Data Scrubbing / Hot Swap Rebuild
		One step init /sync / Resource Ultiization Monitor
Cache std / max	4MB^2 std / 4MB max (with parity) / write-through or write-back / 60ns / EDO	4MB SO-DIMM std / 8MB max (with parity) / write-through or write-back / 60ns / EDO
		SPCI connector for 8MB battery-backup cache (10 day)
Avail / withdrawn date	June 1996 / October 1997	September 1997 / April 1999
Limited warranty	3 years	3 years
Part number	70G8489	76H3584

The following options are listed in the ServeRAID II column:

Option	Part number
ServeRAID-3H 32MB Batt-Backup Cache	28L1003
Same	ServeRAID II 8MB Battery-Backup Cache	76H5401
Same	IBM 1M Ext .8 mm (VHDCI) SCSI Cable	76H3589
Same	IBM 2M Ext .8 mm (VHDCI) SCSI Cable	01K8027
Same	IBM 3M Ext .8 mm (VHDCI) SCSI Cable	01K8028
Same	IBM 4.3M Ext .8 mm (VHDCI) SCSI Cable	01K8029
Same	IBM Third Channel Cable	76H5400
Same	DASD Status Cable (for 320,330,520,720)	76H5399
	IBM .8 mm to 68 pin SCSI Adapter (cable)	01K8017

IBM UltraSCSI Controllers (PCI) - withdrawn

Controller	✂ **PCI Fast/Wide UltraSCSI Adapter**	✂ **PC Server Ultra Wide SCSI PCI Adptr**	✂ **PCI Fast/Wide Ultra Scsi Adapter**
Vendor	Adaptec® AHA-2940UW UltraWide	Adaptec AHA-2940UW UltraWide	Adaptec AHA-2940uW/B UltraWide
Implementation	Option for desktops and servers	Option for servers	Option for desktops and servers
SCSI type	Wide Ultra SCSI	Wide Ultra SCSI	Wide Ultra SCSI
SCSI bus path / speed	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
I/O Architecture	**PCI**	**PCI**	**PCI**
I/O bus path / speed	32-bit / 132MB/sec	32-bit / 132MB/sec	32-bit / 132MB/sec
RAID levels	None (use software)	None (use software)	None (use software)
Chip architecture	AIC-7880 (intelligent SCSI processor)	AIC-7880 (intelligent SCSI processor)	AIC-7880B (intelligent SCSI processor)
Channels	One (internal and/or external)	One (internal and/or external)	One (internal and/or external)
Connectors	Three total: 　　Two internal - one is 8-bit narrow 　　　　　　　　 - one is 16-bit wide 　　One external - 16-bit wide	Three total: 　　Two internal - one is 8-bit narrow 　　　　　　　　 - one is 16-bit wide 　　One external - 16-bit wide	Three total: 　　Two internal - one is 8-bit narrow 　　　　　　　　 - one is 16-bit wide 　　One external - 16-bit wide
Devices supported	15 devices total on one or both conctrs SCSI-1, SCSI-2, UltraSCSI	15 devices total on one or both conctrs SCSI-1, SCSI-2, UltraSCSI	15 devices total on one or both conctrs SCSI-1, SCSI-2, UltraSCSI
Features	Supports a bootable CD-ROM SCAM Level 1 support Busmaster DMA / ASPI compliant Flash BIOS / BIOS level 1.25 Includes internal wide and narrow cables	Supports a bootable CD-ROM No SCAM Level 1 support Busmaster DMA / ASPI compliant Flash BIOS / BIOS level 1.25 Supports scanners and SCO	Supports a bootable CD-ROM PC 98 compliant Busmaster DMA / ASPI compliant Flash BIOS / BIOS level 1.34 Includes internal wide cable
Cache std / max	None (FIFO buffer)	None (FIFO buffer)	None (FIFO buffer)
Avail / withdrawn date	January 1997 / July 1999	January 1997 / October 1998	March 1998 / December 2002
Limited warranty[3]	3 years	3 years	3 years
Part number	76H3579	76H5407	02K3454

Controller	✂ **PCI Wide Ultra SCSI Adapter**	✂ **PCI Wide Ultra2 SCSI Adapter**	
Vendor	Adaptec AHA-2940uW UltraWide	Adaptec AHA-2940U2B	
Implementation	Option for desktops and servers	Option for desktops and servers	
SCSI type	Wide Ultra SCSI	**Wide Ultra2 SCSI**	
SCSI bus path / speed	16-bit / 40MB/sec	16-bit / 80MB/sec	
I/O Architecture	**PCI**	**PCI**	
I/O bus path / speed	32-bit / 132MB/sec	32-bit / 132MB/sec	
RAID levels	None (use software)	None (use software)	
Chip architecture	AIC-7880B (intelligent SCSI processor)	AIC-7890A	
Channels	One (internal and/or external)	One (internal and/or external)	
Connectors	Three total: 　　Two internal - one is 8-bit narrow 　　　　　　　　 - one is 16-bit wide 　　One external - 16-bit wide	Two total: 　　One internal - 68-pin 16-bit 　　One external - 68-pin 16-bit	
Devices supported	15 devices total on one or both 　connectors	15 devices total on one or both 　connectors	
Features	SCSI-1, SCSI-2, UltraSCSI Supports a bootable CD-ROM Busmaster DMA / ASPI compliant Flash BIOS / BIOS level 1.34.03 Includes 4-position, 68-pin internal ribbon cable with active UltraSCSI 　termination	SCSI-1, SCSI-2, UltraSCSI, Ultra2 SCSI (LVDS) Supports a bootable CD-ROM Busmaster DMA / ASPI compliant Flash BIOS Includes Ultra2 5-drop, 68-pin internal ribbon cable 　with active termination Includes adapter to activity LED cable	
Cache std / max	None (FIFO buffer)	None (FIFO buffer)	
Avail / withdrawn date	January 1999 / July 2003	November 1999 / October 2000	
Limited warranty[3]	3 years	3 years	
Part number	33L4999	33L5000	

	Netfinity® ServeRAID-3L Ultra2 SCSI Adapter	Netfinity ServeRAID-3H Ultra2 SCSI Adapter
Controller	✂ **Netfinity® ServeRAID-3L Ultra2 SCSI Adapter**	✂ **Netfinity ServeRAID-3H Ultra2 SCSI Adapter**
Positioning	L for "light"small business or departmental applications	H for "high" advanced enterprise applications
Vendor	IBM	IBM
Implementation	PCI adapter / full-length	PCI adapter / full-length
SCSI type	**Low Voltage Differential (LVD) Wide Ultra2 SCSI**	**Low Voltage Differential (LVD) Wide Ultra2 SCSI**
SCSI bus path / speed	16-bit / 80MB/sec	16-bit / 80MB/sec
I/O bus path	**32-bit**	**64/32-bit**
RAID levels	RAID 0, 1, 1E, and 5 (5E with firmware upgrade) 8 independent (A,B,C,D,E,F,G,H) / 8 logical arrays / array can span channels	RAID 0, 1, 1E, and 5 (5E with firmware upgrade) 8 independent (A,B,C,D,E,F,G,H) / 8 logical arrays / array can span channels
Chip architecture	PCI-to-PCI bridge / PowerPC 403GCX RISC processor at 25MHz[1] / Symbios 53C895 controller	PCI-to-PCI bridge / PowerPC 403GCX RISC processor at 40MHz[1] / three Symbios 53C895 controllers
Channels	**One channel** (can not split a channel between internal and external devices)	**Three channels** (can not split a channel between internal and external devices)
Connectors	Two total: One internal - 16-bit Channel 1 - 68-pin One external - 16-bit Channel 1 - 0.8 mm VHDCI	Three total: One internal - 16-bit Channel 3 - 68-pin Two external - 16-bit Channel 1 - 0.8 mm VHDCI - 16-bit Channel 2 - 0.8 mm VHDCI Ships with "Channel 3 Cable Option" to allow internal channel 3 connector to be used with external devices via a VHDCI connector
Devices supported	15 devices on each channel; 1 channel x 15 = 15 dev max	15 devices on each channel; 3 channels x 15 = 45 dev max
Features	**Hot-swap PCI support** **I₂O™ enabled** Supports a bootable CD-ROM Logical Drive Migration (change from RAID 0 to 5 by adding 1 disk; RAID 1 to 5 by adding 1 disk; *RAID 5 to 0 by removing 1 disk;* increase free space in array; change size of logical drive; add up to three physical drives to an array at a time) Configuration stored on (1) NVRAM, (2) EEPROM, (3) disk Local and remote monitoring Auto-Rearrange Drive Configuration Background Data Scrubbing / Hot Swap Rebuild Resource Ultilization Monitor Automatic Synchronization Automatic Initialization ServeRAID software contained on CD-ROM	**Hot-swap PCI support** **I₂O enabled** Supports a bootable CD-ROM Logical Drive Migration (change from RAID 0 to 5 by adding 1 disk; RAID 1 to 5 by adding 1 disk; *RAID 5 to 0 by removing 1 disk;* increase free space in array; change size of logical drive; add up to three physical drives to an array at a time) Configuration stored on (1) NVRAM, (2) EEPROM, (3) disk Local and remote monitoring Auto-Rearrange Drive Configuration Background Data Scrubbing / Hot Swap Rebuild Resource Ultilization Monitor Automatic Synchronization Automatic Initialization ServeRAID software contained on CD-ROM
Cache std / max	**4MB** SO-DIMM std / 4MB max (with parity) / write-through or write-back / 60ns / EDO No battery-backup cache	**32MB** SO-DIMM std / 32MB max (with parity) / write-through or write-back / 60ns / EDO SPCI connector for 32MB battery-backup cache (10 day)
Avail / withdrawn date	September 1998 / May 2000	September 1998 / September 1999
Limited warranty[3]	3 years	3 years
Part number	01K7364	01K7207

OPTIONS

ServeRAID-3H 32MB Battery Backup Cache	28L1003
IBM 1M Ext .8 mm (VHDCI) SCSI Cable	76H3589
IBM 2M Ext .8 mm (VHDCI) SCSI Cable	01K8027
IBM 3M Ext .8 mm (VHDCI) SCSI Cable	01K8028
IBM 4.3M Ext .8 mm (VHDCI) SCSI Cable	01K8029
DASD Status Cable (for 320,330,520,720)	76H5399
IBM .8 mm to 68 pin SCSI Adapter (cable)	01K8017
Netfinity 2 meter Ultra2 SCSI Cable	03K9310
Netfinity 4.2 meter Ultra2 SCSI Cable	03K9311
Netfinity 12 meter Ultra2 SCSI Cable	03K9312

Controller	✂ **Netfinity ServeRAID-3HB Ultra2 SCSI Adapter**
Positioning	H for "high" advanced enterprise applications; B for Battery
Vendor	IBM
Implementation	PCI adapter / full-length
SCSI type	**Low Voltage Differential (LVD) Wide Ultra2 SCSI**
SCSI bus path / speed	16-bit / 80MB/sec
I/O bus path	**64/32-bit** (supports 32-bit or 64-bit PCI slots)
RAID levels	RAID 0, 1, 1E, 5, 5E
	8 independent (A,B,C,D,E,F,G,H) / 8 logical arrays / array can span channels
Chip architecture	PCI-to-PCI bridge / PowerPC 403GCX RISC processor at 80/40MHz[1] / three Symbios 53C895 controllers
Channels	**Three channels** (can not split a channel between internal and external devices)
Connectors	Three total:
	One internal - 16-bit Channel 3 - 68-pin
	Two external - 16-bit Channel 1 - 0.8 mm VHDCI
	- 16-bit Channel 2 - 0.8 mm VHDCI
	Ships with "Channel 3 Cable Option" to allow internal channel 3 connector to be used with external devices via a VHDCI connector
Devices supported	15 devices on each channel; 3 channels x 15 = 45 dev max
Features	**Hot-swap PCI support**
	I$_2$O enabled
	Elimination of SCSI heartbeat cable for clusters
	ServeRAID Manager (graphical Java-based enterprise moniotring program)
	FlashCopy (high availability backup utility)
	Supports a bootable CD-ROM
	Logical Drive Migration (change from RAID 0 to 5 by adding 1 disk; RAID 1 to 5 by adding 1 disk; *RAID 5 to 0 by removing 1 disk;* increase free space in array; change size of logical drive; add up to three physical drives to an array at a time)
	Configuration stored on (1) NVRAM, (2) Flash, (3) disk
	Local and remote monitoring via ServeRAID Manager
	Auto-Rearrange Drive Configuration
	Background Data Scrubbing / Hot Swap Rebuild
	Resource Ultilization Monitor
	Automatic Synchronization
	Automatic Initialization
	ServeRAID ROM Update Program
Cache std / max	**32MB** SO-DIMM std / 32MB max (with parity) / write-through or write-back / 60ns / EDO / adaptive caching / chipkill memory correction technology
Battery	**32MB** of mirrored battery-backup cache (10 day life) / SPCI
Avail / withdrawn date	July 1999 / December 2000
Limited warranty[3]	3 years
Part number	37L6086

OPTIONS

ServeRAID-3H 32MB Battery Backup Cache	28L1003
IBM 1M Ext .8 mm (VHDCI) SCSI Cable	76H3589
IBM 2M Ext .8 mm (VHDCI) SCSI Cable	01K8027
IBM 3M Ext .8 mm (VHDCI) SCSI Cable	01K8028
IBM 4.3M Ext .8 mm (VHDCI) SCSI Cable	01K8029
DASD Status Cable (for 320,330,520,720)	76H5399
IBM .8 mm to 68 pin SCSI Adapter (cable)	01K8017
Netfinity 2 meter Ultra2 SCSI Cable	03K9310
Netfinity 4.2 meter Ultra2 SCSI Cable	03K9311
Netfinity 12 meter Ultra2 SCSI Cable	03K9312

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IBM SCSI Disks (up to 1.08 GB) - withdrawn

	✂ **170 MB**	✂ **270 MB**	✂ **340 MB**	✂ **364 MB**	✂ **540 MB**
Capacity					
Interface	SCSI-2 Fast	SCSI-2 Fast	SCSI-2 Fast	SCSI-2 Fast	SCSI-2 Fast
SCSI data path	8 bit	8 bit	8 bit	8 bit	8 bit
SCSI burst rate	10 MB/sec	10 MB/sec	10 MB/sec	10 MB/sec	10 MB/sec
Buffer size	64 KB	96 KB	64 KB	96 KB	256 KB
Buffer type (no. of segments)	Read ahead (1)	Adaptive	Read ahead (1)	Adaptive	Segmented (4)
Buffer write caching	No (read only)	Yes (read/write)	No (read only)	Yes (read/write)	No (read only)
Average seek time (ms)	13 ms	12 read / 14 wrt	13 ms	12 read / 14 wrt	8.7 ms
Average latency	7.5 ms	6.67 ms	7.5 ms	6.67 ms	4.76 ms
Rotational speed	4011 rpm	4500 rpm	4011 rpm	4500 rpm	6300 rpm
Media transfer rate	3.5 MB/sec	3.8 MB/sec	3.5 MB/sec	3.8 MB/sec	3.8 MB/sec
Sustained transfer rate		2.5 MB/sec		2.5 MB/sec	
Mean Time Between Failure	250,000 hrs	300,000 hrs	250,000 hrs	300,000 hrs	300,000 hrs
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	No	Yes	No	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes	Yes
Predictive Failure Analysis	No	No	No	No	No
Head technology	Metal in gap	Magneto-resistve	Metal in gap	Magneto-resistve	Metal in gap
Vendor	Conner	IBM	Conner	IBM	Maxtor
Code name		Satsuma		Satsuma	
Available date	February 1994	July 1994	February 1994	July 1994	July 1993
Warranty		2 years		2 years	
Withdrawal date	September 1994	January 1995	September 1994	May 1995	September 1994
Part number (old)	N/A	N/A	N/A	N/A	32G4151
Part number (new)	70G8480	94G2439	70G8481	94G2440	70G8491
Part number for 95 A or 3516 with carrier unit/housing	None	None	None	None	70G7163
Price (retail USD)	$ 279	$ 199	$ 455	$ 245	$ 519
Price with carrier unit	N/A	N/A	N/A	N/A	$ 609

	✂ **540 MB**	✂ **728 MB**	✂ **1 GB**	✂ **1.08 GB Deskstar XP™**
Capacity				
Interface	SCSI-2 Fast	SCSI-2 Fast	SCSI-2 Fast	SCSI-2 Fast
SCSI data path	8 bit	8 bit	8 bit	8 bit
SCSI burst rate	10 MB/sec	10 MB/sec	10 MB/sec	10 MB/sec
Buffer size	96 KB	96 KB	512 KB	512 KB
Buffer type (no. of segments)	Adaptive	Adaptive	Segmented (16)	Adaptive
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	12 read / 14 wrt	12 read / 14 wrt	8.6 ms	10.5 ms
Average latency	6.67 ms	6.67 ms	5.56 ms	5.56 ms
Rotational speed	4500 rpm	4500 rpm	5400 rpm	5400 rpm
Media transfer rate	3.8 MB/sec	3.8 MB/sec	4.8 MB/sec	4.97 to 6.88 MB/sec
Sustained transfer rate	2.5 MB/sec	2.5 MB/sec	4.3 MB/sec	3.2 to 4.0 MB/sec
Mean Time Between Failure	300,000 hrs	300,000 hrs	800,000 hrs	500,000 hrs
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	Yes	Yes	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes
Predictive Failure Analysis	No	No	Yes	No
Head technology	Magneto-resistve	Magneto-resistve	Magneto-resistive	Magneto-resistive
Vendor	IBM	IBM	IBM	IBM
Code name	Satsuma	Satsuma	Spitfire	Pegasus
Available date	July 1994	July 1994	June 1993	November 1994
Warranty	2 years	2 years	5 years	3 years
Withdrawal date	March 1996	June 1995	Jan 1996	July 1995
Part number (old)	N/A	N/A	N/A	N/A
Part number (new)	94G2441	94G2442	N/A	94G3187
Part number for 95 A or 3516 with carrier unit/housing	None	None	70G7164	N/A
Price (retail USD)	$ 225	$ 285	$ 899	$ 325

All trademarks are the property of their respective owners (listed on Trademark sheet)
✂ = Withdrawn from marketing

No warranties are expressed or implied in this summary
(3SCSI) Compiled by Roger Dodson, IBM. April 1996

IBM SCSI Disks (up to 1.27 GB) - withdrawn

Capacity	✂ **540 MB Deskstar**	✂ **1 GB**	✂ **1 GB Hot Swap** for 95A or 3516	✂ **1.08 GB** **Deskstar XP™**	✂ **1.12 GB Hot-Swap** **Disk Drive III**
Interface	SCSI-2 Fast	SCSI-2 Fast	**SCSI-2 Fast/Wide**	SCSI-2 Fast	**SCSI-2 Fast/Wide**
SCSI data path	8 bit	8 bit	16 bit	8 bit	16 bit
SCSI burst rate	10 MB/sec	10 MB/sec	20 MB/sec	10 MB/sec	20 MB/sec
Buffer size	128 KB	512 KB	512 KB	512 KB	1 MB
Buffer type (no. of segments)	Adaptive	Segmented (16)	Segmented (16)	Adaptive	Adaptive
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	12 read / 12.7 wrt	8.6 ms	8.6 ms	10.5 ms	8.5 ms
Average latency	6.67 ms	5.56 ms	5.56 ms	5.56 ms	4.17 ms
Rotational speed	4500 rpm	5400 rpm	5400 rpm	5400 rpm	7200 rpm
Media transfer rate	4.03 - 6.09 MB/sec	4.8 MB/sec	4.8 MB/sec	4.87 to 6.88 MB/sec	None available
Sustained transfer rate	2.5 - 3.7 MB/sec	4.3 MB/sec	4.3 MB/sec	2.9 to 4.0 MB/sec	4.9 to 8.2 MB/sec
Mean Time Between Failure	350,000 hrs	800,000 hrs	800,000 hrs	500,000 hrs	800,000
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	Yes	Yes	Yes	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes	Yes
Predictive Failure Analysis	No	Yes	Yes	Lmtd media failures	Yes
Head technology	Magneto-resistve	Magneto-resistive	Magneto-resistive	Magneto-resistive	Unknown
No-ID™ sector format	Yes	No	No	Yes	No
Vendor	IBM	IBM	IBM	IBM	Quantum™
Code name	Aladdin	Spitfire	Spitfire	Pegasus Enhanced	Atlas
Available / withdrawn date	July 95 / Oct 96	June 93 / Feb 97	August 94 / 1996	July 95 / May 96	January 96 / April 97
Warranty	3 years	5 years	N/A	5 years	1 year
Part number (old)	N/A	32G4198	N/A	N/A	70G9861
Part number (new)	06H8558	70G8492	N/A	06H8891	N/A
Part number for 95 A or 3516 with carrier unit/housing	None	None	70G9743	N/A	**Same as 07H0386 except with Hot-Swap Tray III**
Price (retail USD)	$ 225	$ 799	$ 809	$ 325	$ 829

Capacity	✂ **1.12 GB Hot Swap**	✂ **1.12 GB Ultrastar XP™** for PC Server 300, 320	✂ **1.12 GB** for 95, 300, 310, 320	✂ **1.27 GB**
Interface	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	SCSI-2 Fast
SCSI data path	16 bit	16 bit	16 bit	8 bit
SCSI burst rate	20 MB/sec	20 MB/sec	20 MB/sec	10 MB/sec
Buffer size	512 KB	512 KB	1 MB	128 KB
Buffer type (no. of segments)	Adaptive	Adaptive	Adaptive	Adaptive
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	6.9 ms or 8.0 ms	6.9 ms	8.5 ms	11 ms
Average latency	4.17 ms	4.17 ms	4.17 ms	5.56 ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	5400 rpm
Media transfer rate	9.95 to 12.58 or 8.4	9.95 to 12.58 MB/sec	None available	5.8 to 10.4 MB/sec
Sustained transfer rate	5.45 to 7.37 MB/sec	5.45 to 7.37 MB/sec	4.9 to 8.2 MB/sec	Unknown
Mean Time Between Failure	1,000,000 or 800,000	1,000,000 hrs	800,000	500,000
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	Yes	Yes	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes
Predictive Failure Analysis	Yes	Yes	Yes	Yes
Head technology	Magneto-resistive	Magneto-resistive	Unknown	Thin-Film
No-ID™ sector format	No	No	No	No
Vendor	IBM or Quantum	IBM	Quantum™	Quantum™
Code name	Starfire or Atlas	Starfire	Atlas	Parrot 2s
Available / withdrawn date	Oct 94 or Oct 95 / 1/97	March 95 / October 96	October 95 / October 96	May 96 / March 97
Warranty	5 years or 3 years	5 years	5 years	3 years
Part number	N/A	94G3052	07H0386	75H8974
Part number with Hot Swap Drive Tray	94G2649	N/A	N/A	N/A
Price (retail USD)	$ 829	$ 850	$ 850	$ 345

Fast/Wide disks **require a 16 bit Wide SCSI-2** controller.
They will not operate on an 8 bit SCSI-1 controller. SCSI-1 or SCSI-2
devices will work with SCSI-2 16 bit Wide controllers as long as any
16 bit devices are between the SCSI-2 controller and the SCSI-1
devices (SCSI-1 8 bit devices should be at end of the daisy chain).

IBM UltraSCSI Disks (2GB) - withdrawn

Capacity	✂ **2.14GB[2] Wide Ultra for PC Server 704**	✂ **2.16GB Ultrastar ES**	✂ **2.16GB Ultrastar ES**	✂ **2.16GB Ultrastar 2ES**
Interface	**Wide Ultra SCSI**	Ultra SCSI	**Wide Ultra SCSI**	Ultra SCSI
SCSI data path	16-bit	8-bit	16-bit	8-bit
SCSI burst rate	40MB/sec	20MB/sec	40MB/sec	20MB/sec
Buffer size	Varies	512KB	512KB	512KB
Buffer type (no. of segments)	Varies	Adaptive	Adaptive	Adaptive
Buffer write caching	Varies	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	8.0ms	8.5ms	8.5ms	8.5ms
Average latency	4.17ms	5.56ms	5.56ms	5.56ms
Rotational speed	7200 rpm	5400 rpm	5400 rpm	5400 rpm
Sustained transfer rate	Varies	3.8 to 5.7MB/sec	3.8 to 5.7MB/sec	5.0 to 8.0MB/sec
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	Yes	Yes	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Varies	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID™ sector format	Varies	Yes	Yes	Yes
Other features	**80-pin SCA-2 connector Includes hot-swap tray**			
Vendor	Varies	IBM	IBM	IBM
Available / withdrawn date	April 1997 / October 1997	April 1996 / July 1997	April 1996 / July 1997	January 1997 / Dec 98
Limited warranty[3]	3 years	5 years	5 years	3 years
Part number	94G7519	07H1126	07H1128	76H5809

Capacity	✂ **2.16GB Ultrastar 2ES**			
Interface	**Wide Ultra SCSI**			
SCSI data path	16-bit			
SCSI burst rate	40MB/sec			
Buffer size	512KB			
Buffer type (no. of segments)	Adaptive			
Buffer write caching	Yes (read/write)			
Average seek time (ms)	8.5ms			
Average latency	5.56ms			
Rotational speed	5400 rpm			
Sustained transfer rate	5.0 to 8.0MB/sec			
Form factor (width x height)	3.5" x 1" SL			
Tagged Command Queueing	Yes			
Automatic Defect Reallocation	Yes			
SMART / PFA	SMART / PFA			
Head technology	Magneto-resistive			
No-ID™ sector format	Yes			
Other features				
Vendor	IBM			
Available / withdrawn date	March 1997 / Dec 98			
Limited warranty	3 years			
Part number	76H5813			

IBM SCSI Disks (2 GB to 2.25 GB) - withdrawn

Capacity	✂ 2 GB	✂ 2 GB	✂ 2.16 GB Ultrastar ES	✂ 2.25 GB Ultrastar XP	✂ 2.14 GB for PC Server 704
Interface	SCSI-2 Fast	**SCSI-2 Fast/Wide**	SCSI-2 Fast	SCSI-2 Fast	**SCSI-2 Fast/Wide**
SCSI data path	8 bit	16 bit	8 bit	8 bit	16 bit
SCSI burst rate	10 MB/sec	20 MB/sec	10 MB/sec	10 MB/sec	20 MB/sec
Buffer size	512 KB	512 KB	512 KB	512 KB	512 KB
Buffer type (no. of segments)	Segmented (16)	Segmented (16)	Adaptive	Adaptive	Segmented (4)
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	9.5 ms	9.5 ms	8.5 ms	7.5 ms	9.0 ms
Average latency	5.56 ms	5.56 ms	5.56 ms	4.17 ms	4.17 ms
Rotational speed	5400 rpm	5400 rpm	5400 rpm	7200 rpm	7200 rpm
Media transfer rate	5.22 MB/sec	5.22 MB/sec	5.9 to 8.9 MB/sec	9.95 to 12.58 MB/sec	6.08 to 10.9 MB/sec
Sustained transfer rate	5.2 MB/sec	5.2 MB/sec	3.8 to 5.7 MB/sec	5.50 to 7.44 MB/sec	4.2 to 8.9 MB/sec
Mean Time Between Failure	750,000 hrs	750,000 hrs	800,000 hrs	1,000,000 hrs	1,000,000 hrs
Form factor (width x height)	3.5" x 1.6" HH	3.5" x 1.6" HH	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	Yes	Yes	Yes	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes	Yes
Predictive Failure Analysis	Yes	Yes	Yes / ind std SMART	Yes	No
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Magneto-resistive	Thin film-TPC
No-ID™ sector format	No	No	Yes	No	No
Other features	None	None	None	None	80 pin SCA connector
Vendor / code name	IBM / Allicat	IBM / Allicat	IBM / Orion	IBM / Starfire	Conner
Available / withdrawn date	April 1993 / Mar 96	Sept 1993 / ?	February 1996 / Mar 97	March 1995 / ?	CFP2107
Warranty	5 years	5 years	5 years	5 years	May 1996 / June 97
Part number (old)	32G4336	32G3796	N/A	N/A	3 years
Part number (new)	70G8493	70G8494	07H1124	94G3054	94G5882
Price (retail USD)	$ 1,199	$ 1,275	$ 369	$ 925	$ 1,125

Capacity	✂ 2.25 GB Ultrastar XP	✂ 2.25 GB Hot-Swap Disk Drive III	✂ 2.25 GB Hot Swap Ultrastar XP for 95 A, 3516	✂ 2.25 GB Hot Swap	✂ 2.25 GB for 95,300,310,320
Interface	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**
SCSI data path	16 bit	16 bit	16 bit	16 bit	16 bit
SCSI burst rate	20 MB/sec	20 MB/sec	20 MB/sec	20 MB/sec	20 MB/sec
Buffer size	512 KB	1 MB	512 KB	512 KB	1 MB
Buffer type (no. of segments)	Adaptive	Adaptive	Adaptive	Adaptive	Adaptive
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	7.5 ms	8.5 ms	7.5 ms	7.5 ms or 8.0 ms	8.5 ms
Average latency	4.17 ms	4.17 ms	4.17 ms	4.17 ms	4.17 ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	7200 rpm	7200 rpm
Media transfer rate	9.95 to 12.58 MB/sec	None available	9.95 to 12.58 MB/s	9.95 to 12.58 or 8.4	None available
Sustained transfer rate	5.50 to 7.44 MB/sec	4.9 to 8.2 MB/sec	5.50 to 7.44 MB/sec	5.50 to 7.44 MB/sec	4.9 to 8.2 MB/sec
Mean Time Between Failure	1,000,000 hrs	800,000	1,000,000 hrs	1,000,000 or 800,000	800,000
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
Tagged Command Queueing	Yes	Yes	Yes	Yes	Yes
Automatic Defect Reallocation	Yes	Yes	Yes	Yes	Yes
Predictive Failure Analysis	Yes	Yes	Yes	Yes	Yes
Head technology	Magneto-resistive	Unknown	Magneto-resistive	Magneto-resistive	Unknown
No-ID™ sector format	No	No	No	No	No
Vendor	IBM	Quantum	IBM	IBM or Quantum™	Quantum
Code name	Starfire	Atlas	Starfire	Starfire or Atlas	Atlas
Available / withdrawn date	March 1995 / July 97	January 1996 / Dec 97	March 1995 / 1996	Oct 94, Oct 95/Oct 97	October 1995 / 1996
Warranty	5 years	1 year	5 years	3 years	5 years
Part number	94G3055	70G9862	**Same as 07H0387**	N/A	07H0387
Part number for 95 A, 3516, or 500 with Hot Swap Drive Tray	N/A	N/A	**except with Hot-Swap**	94G3056	94G2650	N/A
Price (retail USD)	$ 835	$ 850	**Tray III** $ 1,079	$ 850	$ 1,125

Fast/Wide disks **require a 16 bit Wide SCSI-2** controller.
They will not operate on an 8 bit SCSI-1 controller. SCSI-1 or SCSI-2
devices will work with SCSI-2 16 bit Wide controllers as long as any
16 bit devices are between the SCSI-2 controller and the SCSI-1
devices (SCSI-1 8 bit devices should be at end of the daisy chain).

IBM SCSI Disks (4.51 to 5.31 GB) - withdrawn

Capacity	✂ 4.51GB Hot Swap	✂ 4.51 GB Ultrastar XP	✂ 4.51 GB Ultrastar XP	✂ 4.51 GB	✂ 4.51GB Hot Swap Disk Drive III
Interface	**SCSI-2 Fast/Wide**	SCSI-2 Fast	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**
SCSI data path	16 bit	8 bit	16 bit	16 bit	16 bit
SCSI burst rate	20 MB/sec	10 MB/sec	20 MB/sec	20 MB/sec	20 MB/sec
Buffer size	512 KB	512 KB	512 KB	1 MB	1 MB
Buffer type (no. of segments)	Adaptive	Adaptive	Adaptive	Adaptive	Adaptive
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	8.0 ms or 8.5 ms	8.0 ms	8.0 ms	8.5 ms	8.5 ms
Average latency	4.17 ms	4.17 ms	4.17 ms	4.17 ms	4.17 ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	7200 rpm	7200 rpm
Media transfer rate	9.95 to 12.58 or 8.4	9.95 to 12.58 MB/sec	9.95 to 12.58 MB/sec	None available	None available
Sustained transfer rate	5.53 to 7.48 MB/sec	5.53 to 7.48 MB/sec	5.53 to 7.48 MB/sec	4.9 to 8.2 MB/sec	4.9 to 8.2 MB/sec
Mean Time Between Failure	1,000,000 or 800,000	1,000,000 hrs	1,000,000 hrs	800,000	800,000
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**	3.5" x **1.6" HH**	3.5" x **1.6" HH**	3.5" x **1.6" HH**
Predictive Failure Analysis	Yes	Yes	Yes	Yes	Yes
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Unknown	Unknown
Vendor	IBM or Quantum	IBM	IBM	Quantum	Quantum
Code name	Starfire or Atlas	Starfire	Starfire	Atlas	Atlas
Available / withdrawn date	Dec 1994 / May 1998	Mar 1995 / May 1998	March 1995 / July 97	Dec 1995 / Oct 96	Jan 1996 / Apr 97
Warranty	3 years / Apr 97	5 years	5 years	5 years	1 year
Part number	N/A	94G3196	94G3057	07H0834	70G9863
Part number for 95 A, 3516, or 500 with Hot Swap Drive Tray	94G2651	N/A	N/A	N/A	N/A
Price (retail USD)	$ 1,035	$ 839	$ 839	$ 1,499	$ 1,264

*Same as **07H0834** except with **Hot-Swap Tray III***

Capacity	✂ 4.51 GB for PC Server 704	✂ 4.51 GB Ultrastar 2XP	✂ 4.51 GB F/W SCSI-2 SL Hot-Swap	✂ 4.51 GB F/W SCSI-2 SL Hot-Swap Disk III
Interface	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**	**SCSI-2 Fast/Wide**
SCSI data path / burst rate	16 bit / 20 MB/sec	16 bit / 20 MB/sec	16 bit / 20 MB/sec	16 bit / 20 MB/sec
Buffer size	512 KB	512 KB	512 KB	512 KB
Buffer type	Adaptive	Segmented (16)	Segmented (16)	Segmented (16)
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Yes (read/write)
Average seek time (ms)	8.2 ms	7.5 ms	8.0 ms	8.0 ms
Average latency	4.17 ms	4.17 ms	4.17 ms	4.17 ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	7200 rpm
Media transfer rate	9.95 to 12.58 MB/sec	10.28 to 15.43 MB/sec	10.28 to 15.43 MB/sec	10.28 to 15.43 MB/sec
Sustained transfer rate	5.53 to 7.48 MB/sec	6.7 to 10.3 MB/sec	6.7 to 10.3 MB/sec	6.7 to 10.3 MB/sec
Mean Time Between Failure	1,000,000 hrs	Not published	Not published	Not published
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.0" SL**	3.5" x **1.0" SL**	3.5" x **1.0" SL**
Predictive Failure Analysis	Yes	Yes (SMART)	Yes (SMART)	Yes (SMART)
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID™ sector format	No	No-ID™ sector format	No-ID™ sector format	No-ID™ sector format
Other features	**80 pin SCA-2 connector**		**Includes hot swap trays**	**Includes hot swap trays**
Vendor	IBM	IBM	IBM	IBM
Code name	Starfire	Scorpion	Scorpion	Scorpion
Available / withdrawn date	October 1996 / June 1997	Dec 1996 / May 1998	December 1996 / Oct 97	Dec 1996 / Dec 1997
Warranty	3 years	5 years	3 years	3 years
Part number	94G6679 (704 has trays)	76H0945	94G6489	94G6494
Price (retail USD)	$ 1,035	$ 799	$ 1,035	$ 799

Capacity	✂ 5.31 GB Ultrastar	✂ 5.31 GB Ultrastar	
Interface	**SCSI-2 Fast**	**SCSI-2 Fast/Wide**	Fast/Wide disks **require a 16 bit Wide SCSI-2** controller. They will not operate on an 8 bit SCSI controller. SCSI-1 or SCSI-2 devices will work with SCSI-2 16 bit Wide controllers as long as any 16 bit devices are between the SCSI-2 controller and the SCSI-1 devices (SCSI-1 8 bit devices should be at end of the daisy chain).
SCSI data path / burst rate	8 bit / 10 MB/sec	16 bit / 20 MB/sec	
Buffer size / type	512 KB / adaptive	512 KB / adaptive	
Buffer write caching	Yes (read/write)	Yes (read/write)	
Average seek time (ms)	8.0 ms	8.0 ms	
Average latency	5.55 ms	5.55 ms	
Rotational speed	5400 rpm	5400 rpm	
Media transfer rate	7.6 to 12.5 MB/sec	7.6 to 12.5 MB/sec	
Sustained transfer rate	4.4 to 7.6 MB/sec	4.4 to 7.6 MB/sec	
Mean Time Between Failure	1,000,000 hrs	1,000,000 hrs	
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**	
Predictive Failure Analysis	Yes	Yes	
Head technology	Magneto-resistive	Magneto-resistive	
Vendor / code name	IBM / Starfire	IBM / Starfire	
Available / withdrawn date	May 1995 / March 1996	May 1995 / March 1996	
Warranty	5 years	5 years	
Part number	94G3787	94G3059	
Price (retail USD)	$ 1,499	$ 1,569	

	✄ **4.33GB[2] Ultrastar 2ES**	✄ **4.33GB Ultrastar 2ES**	✄ **4.51GB Ultrastar 2XP**	✄ **4.51GB Wide Ultra SCSI for PC Server 704**
Capacity				
Interface	Ultra SCSI	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**
SCSI data path / burst rate	8-bit / 20MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Buffer size	512KB	512KB	512KB	Varies
Buffer type (no. of segments)	Adaptive	Adaptive	Adaptive	Varies
Buffer write caching	Yes (read/write)	Yes (read/write)	Yes (read/write)	Varies
Average seek time (ms)	8.5ms	8.5ms	7.5ms	9.0ms or less
Average latency	5.56ms	5.56ms	4.17ms	4.17ms
Rotational speed	5400 rpm	5400 rpm	7200 rpm	7200 rpm
Sustained transfer rate	5.0 to 8.0MB/sec	5.0 to 8.0MB/sec	6.5 to 10.0MB/sec	Varies
Mean Time Between Failure	Not published	Not published	Not published	Varies
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Varies
No-ID™ sector format	Yes	Yes	Yes	Varies
Other features				**80-pin SCA-2 connector Includes hot-swap tray**
Vendor	IBM	IBM	IBM	Varies
Available / withdrawn date	January 1997 / Dec 98	February 1997 / Dec 98	February 1997 / Oct 1998	April 1997 / August 1999
Limited warranty	5 years	5 years	5 years	3 years
Part number	76H5811	76H5815	76H2687	94G7098

	✄ **4.5GB Wide Ultra SCSI HDD for 310, 315, 325, 330, N3000, N3500, others**	✄ **4.51GB Wide Ultra SCSI Hot Swap for PC Server 330, 520, and 3518, 3519**	✄ **4.51GB Wide Ultra SCSI Netfinity SCA-2 Hot Swap for Netfinity 7000**	✄ **4.51GB 10K Wide Ultra SCSI SCA-2 Hot Swap for Netfinity 7000**
Capacity				
Interface	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Buffer size	512KB	Varies	Varies	Varies
Average seek time (ms)	7.5ms	9.0ms or less	9.0ms or less	8.5ms or less
Average latency	4.2ms	4.17ms	4.17ms	2.99ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	**10000 rpm**
Sustained transfer rate	8 to 13MB/sec	Varies	Varies	15.2 to 21.1MB/sec
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID™ sector format	Yes	Yes	Yes	Yes
Other features		**Includes hot-swap tray** (wide body Type III tray)	**80 pin SCA-2 connector Includes hot-swap tray**	**80 pin SCA-2 connector Includes hot-swap tray**
Available / withdrawn date	May 1998	May 1997 / August 1999	October 1997 / Aug 1999	February 1998 / July 1999
Limited warranty[3]	3 years	3 years	3 years	3 years
Part number	01K1327	94G7491	94G7429	01K8009

	✄ **4.51GB Wide Ultra SCSI Netfinity EXP10/ 15 Hot Swap (for EXP10/15 exp unit)**	✄ **4.51GB Wide Ultra SCSI Netfinity EXP Hot Swap 10K (for EXP10/15 exp unit)**	✄ **4.51GB Fast Wide SCSI-2 Hot-Swap SL for PC Server 320, 500, 520, 720**
Capacity			
Interface	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**SCSI-2 Fast Wide**
SCSI data path / burst rate	16- bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 20MB/sec
Buffer size	Varies	Varies	Varies
Average seek time (ms)	9.0ms or less	7.5ms or less	7.5ms or less
Average latency	4.17ms	2.99ms	4.17ms
Rotational speed	7200 rpm	**10000 rpm**	7200 rpm
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID™ sector format	Yes	Yes	Yes
Other features	**80-pin SCA-2 connector Includes hot-swap tray**	**80-pin SCA-2 connector Includes hot-swap tray**	**Includes hot-swap tray** (Type II tray)
Available / withdrawn date	Nov 1997 / Aug 1999	Dec 1997 / July 1999	December 1998 / Aug 1999
Limited warranty	3 years	3 years	3 years
Part number	01K7956	01K7960	36L9802

IBM UltraSCSI Disks (9.1GB) - withdrawn

Capacity	✂ 9.1GB[2] Ultrastar 2XP	✂ 9.1GB Wide Ultra SCSI for PC Server 704	✂ 9.1GB Wide Ultra SCSI Hot Swap for PC Server 330, 520, and 3518, 3519	✂ 9.1GB Wide Ultra SCSI SL Hot Swap for PC Server 330
Interface	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**
SCSI data path	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Buffer size	512KB	Varies	Varies	Varies
Buffer type (no. of segments)	Adaptive	Varies	Varies	Varies
Buffer write caching	Yes (read/write)	Varies	Varies	Varies
Average seek time (ms)	8.5ms	9.0ms or less	9.0ms or less	7.5ms or less
Average latency	4.17ms	4.17ms	4.17ms	4.17ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	7200 rpm
Sustained transfer rate	6.5 to 10.0MB/sec	Varies	Varies	Varies
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**	3.5" x **1.6" HH**	3.5" x 1.0" SL
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Varies	Magneto-resistive	Magneto-resistive
No-ID™ sector format	Yes	Varies	Yes	Yes
Other features		**80-pin SCA-2 connector Includes hot-swap tray**	**Includes hot-swap tray** (wide body Type III tray)	**Includes hot-swap tray** (wide body Type III tray)
Vendor	IBM	Varies	Varies	Varies
Avail / withdrawn date	February 1997 / Dec 98	April 1997 / Dec 2000	May 1997 / October 1998	April 1998 / December 2000
Limited warranty[3]	5 years	3 years	3 years	3 years
Part number	76H2689	94G7099	94G7492	02K0477

Capacity	✂ 9.1GB Wide Ultra SCSI HDD for 310, 315, 325, 330 N3000, N3500, others	✂ 9.1GB Wide Ultra SCSI Netfinity SCA-2 Hot Swap for Netfinity 7000	✂ 9.1GB Wide Ultra SCSI SCA-2 SL Hot Swap for Netfinity 5500/7000	✂ 9.1GB 10K Wide Ultra SCSI SCA-2 Hot Swap for Netfinity 5500/7000
Interface	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Buffer size	512KB	Varies	Varies	Varies
Average seek time (ms)	7.5ms	9.0ms or less	7.5ms or less	8.5ms or less
Average latency	4.2ms	4.17ms	4.17ms	2.99ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm	**10000 rpm**
Sustained transfer rate	8 to 13MB/sec	Varies	Varies	15.2 to 21.1MB/sec
Form factor (width x height)	3.5" x 1" SL	3.5" x **1.6" HH**	3.5" x 1" SL	3.5" x **1.6" HH**
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID sector format	Yes	Yes	Yes	Yes
Other features		**80-pin SCA-2 connector Includes hot-swap tray**	**80-pin SCA-2 connector Includes hot-swap tray**	**80-pin SCA-2 connector Includes hot-swap tray**
Vendor		Varies	Varies	Varies
Avail / withdrawn date	May 1998 / July 1999	October 1997 / October 1998	April 1998 / Aug 2001	February 1998 / October 1998
Limited warranty	3 years	3 years	3 years	3 years
Part number	01K1328	94G7430	01K8053	01K8010

Capacity	✂ 9.1GB Wide Ultra SCSI Netfinity EXP10/15 SCA-2 Hot Swap (for EXP10/15 unit)	✂ 9.1GB 10K Wide Ultra Netfinity EXP10/15 SCA-2 Hot Swap (for EXP10/15 exp unit)	✂ 9.1GB 10K Wide Ultra SCSI SCA-2 SL Hot Swap (for 5500/7000)	✂ 9.1GB 10K Wide Ultra Netfinity EXP10/15 SCA-2 SL Hot Swap (for EXP10/15 exp unit)
Interface	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**	**Wide Ultra SCSI**
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Average seek time (ms)	9.0ms or less	8.5ms or less	6.0ms or less	6.0ms or less
Average latency	4.17ms	2.99ms	2.99ms	2.99ms
Rotational speed	7200 rpm	**10000 rpm**	**10000 rpm**	**10000 rpm**
Sustained transfer rate	Varies	15.2 to 21.1MB/sec	19 to 28.8MB/sec	19 to 28.8MB/sec
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**	3.5" x 1" SL	3.5" x 1" SL
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID sector format	Yes	Yes	Yes	Yes
Other features	**80-pin SCA-2 connector Includes hot-swap tray**	**80-pin SCA-2 connector Includes hot-swap tray**	**80-pin SCA-2 connector Includes hot-swap tray**	**80-pin SCA-2 connector Includes hot-swap tray**
Avail / withdrawn date	Nov 1997 / Dec 2000	February 1998 / October 1998	July 1998 / August 1999	July 1998 / August 1999
Limited warranty	3 years	3 years	3 years	3 years
Part number	01K7959	01K7968	01K8054	01K8499

IBM UltraSCSI Disks (9.1GB) - withdrawn

Capacity	✂ **9.1GB[2] 10K**	✂ **9.1GB Fast Wide SCSI-2 Hot Swap SL HDD**	✂ **9.1GB Wide Ultra2 SCSI HDD**
Connector	68-pin	Connector in hot-swap tray	68-pin
Hot-swap	No	Hot-Swap (Type II tray)	No
Systems supported	IntelliStation M Pro 6889, 6898 Netfinity 3500	PC Server 320, 500, 520, 720	Most IntelliStation, 300GL, 300PL Netfinity 3000, 3500, PC Server 3xx
Interface	Wide Ultra2 SCSI	SCSI-2 Fast Wide	Wide Ultra2 SCSI
SCSI data path	16-bit / 80MB/sec	16-bit / 20MB/sec	16-bit / 80MB/sec
Buffer size	1MB (multisegmented)		1MB (multisegmented)
Average read seek time	5.4ms	7.5ms or less	7.5ms
Average latency	2.99ms	4.17ms	4.17ms
Rotational speed	10000 rpm	7200 rpm	7200 rpm
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
SMART	SMART / PFA	SMART / PFA	SMART / PFA
Other features	Ultra2 LVD Smaller than 3.5" disks		Ultra2 LVD 12-20MB/sec sustained data transfer rate
Avail /withdrawn date	August 1998 / November 1999	December 1998 / December 2000	March 1999 / September 2000
Limited warranty[3]	3 years	3 years	3 years
Part number	20L0539	36L9803	20L0553

Capacity	✂ **9.1GB 10K-3 Wide Ultra SCSI Hot-Swap SL HDD**	✂ **EXP 9.1GB 10K-3 Wide Ultra SCSI Hot-Swap HDD**	✂ **9.1GB 10000 rpm Ultra160 SCSI HDD**
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector	68-pin
Hot-swap	Includes hot-swap tray	Includes hot-swap tray	No
Systems supported	Netfinity 5000, 5500, 7000	EXP10, EXP15	IntelliStation 6867, 6893, 6868, 6889, 6865, 6866; Netfinity 3500 M10
Interface	Wide Ultra SCSI	Wide Ultra SCSI	Ultra160
SCSI data path	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 160MB/sec
Buffer size			2MB
Average read seek time	5.4ms	5.4ms	5.0ms
Average latency	2.99ms	2.99ms	3.0ms
Rotational speed	10000 rpm	10000 rpm	10000 rpm
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	3.5" x 1" SL
SMART	SMART / PFA	SMART / PFA	SMART / PFA
Other features			14-25MB/sec sustained data transfer rate
Avail / withdrawn date	July 1999 / January 2002	July 1999 / December 2000	September 1999 / June 2000
Limited warranty[3]	3 years	3 years	3 years
Part number	36L9806	36L9809	00N8071

Capacity	✂ **Netfinity 9.1GB Wide Ultra2 SCSI Hot-Swap SL HDD**	✂ **Netfinity 9.1GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD**	
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector	
Hot-swap	Includes hot-swap tray	Includes hot-swap tray	
Systems supported	Netfinity 5600, 8500R, EXP200	Netfinity 5600, 8500R, EXP200	
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI	
SCSI data path	16-bit / 80MB/sec	16-bit / 80MB/sec	
Buffer size			
Average read seek time	7.5ms or less	5.4ms or less	
Average latency	4.17ms	2.99ms	
Rotational speed	7200 rpm	10000 rpm	
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL	
SMART	SMART / PFA	SMART / PFA	
Other features			
Avail / withdrawn date	September 1999 / Dec 2000	September 1999 / December 2000	
Limited warranty[3]	3 years	3 years	
Part number	36L9744	36L9748	

	✂ 18.2GB[2] Wide Ultra SCSI Hot Swap for PC Server 330	✂ 18.2GB Wide Ultra SCSI Hot Swap SL for PC Server 330	✂ Netfinity 18.2GB Wide Ultra SCSI Hot Swap SL for Netfinity 5000/5500/7000
Capacity			
Interface	Wide Ultra SCSI	Wide Ultra SCSI	Wide Ultra SCSI
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Buffer size	Varies	Varies	
Average seek time (ms)	8.5ms or less	7.5ms or less	7.5ms or less
Average latency	4.17ms	4.17ms	4.17ms
Rotational speed	7200 rpm	7200 rpm	7200 rpm
Sustained transfer rate			
Form factor (width x height)	3.5" x 1.6" HH	3.5" x 1.0" SL	3.5" x 1.0" SL
SMART / PFA	SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive	Magneto-resistive
No-ID™ sector format	Yes	Yes	Yes
Other features	Includes hot-swap tray (wide body Type III tray)	Includes hot-swap tray (wide body Type III tray)	80-pin SCA-2 connector Includes hot-swap tray
Available / withdrawn date	March 1998 / July 1999	February 1999 / December 2000	February 1999 / August 2001
Limited warranty[3]	3 years	3 years	3 years
Part number	02K0478	02K0439	02K0440

	✂ 18.2GB Wide Ultra SCSI SCA-2 Hot Swap for Netfinity 5500/7000	✂ 18.2GB 10K Wide Ultra SCSI SCA-2 Hot Swap for Netfinity 5500/7000	✂ 18.2GB Wide Ultra SCSI for IntelliStation M Pro 6898, 6889
Capacity			
Interface	Wide Ultra SCSI	Wide Ultra SCSI	Wide Ultra SCSI
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 40MB/sec
Average seek time (ms)	8.5ms or less	7.0ms or less	1MB (multi-segmented)
Average latency	4.17ms	2.99ms	7.5ms or less
Rotational speed	7200 rpm	10000 rpm	4.17ms
Sustained transfer rate		19 to 28.8MB/sec	7200 rpm
Form factor (width x height)	3.5" x 1.6" HH	3.5" x 1.6" HH	7.7 to 12.6MB/sec
SMART / PFA	SMART / PFA	SMART / PFA	3.5" x 1.6" HH
Head technology	Magneto-resistive	Magneto-resistive	SMART / PFA
No-ID™ sector format	Yes	Yes	Magneto-resistive
Other features	80-pin SCA-2 connector Includes hot-swap tray	80-pin SCA-2 connector Includes hot-swap tray	Yes 68-pin connector
Available / withdrawn date	March 1998 / July 1999	July 1998 / August 1999	July 1998
Limited warranty	3 years	3 years	3 years
Part number	01K8055	01K8503	01K1323

	✂ 18.2GB Wide Ultra SCSI SCA-2 Hot Swap (for EXP10/15 unit)	✂ 18.2GB 10K Wide Ultra SCSI SCA-2 Hot Swap (for EXP10/15 exp unit)	✂ 18.2GB 10K Wide Ultra2 SCSI for IntelliStation M Pro 6898, 6889
Capacity			
Interface	Wide Ultra SCSI	Wide Ultra SCSI	Wide Ultra2 SCSI
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec	16-bit / 80MB/sec
Average seek time (ms)	8.5ms or less	7.0ms or less	6.2ms
Average latency	4.17ms	2.99ms	2.99ms
Rotational speed	7200 rpm	10000 rpm	10000 rpm
Sustained transfer rate		19 to 28.8MB/sec	
Form factor (width x height)	3.5" x 1.6" HH	3.5" x 1.6" HH	3.5" x 1.6" HH
SMART / PFA	SMART / PFA	SMART / PFA	SMART
Head technology	Magneto-resistive	Magneto-resistive	
No-ID™ sector format	Yes	Yes	
Other features	80-pin SCA-2 connector Includes hot-swap tray	80-pin SCA-2 connector Includes hot-swap tray	68-pin connector 1MB (multi-segmented) Ultra2 LVD
Available / withdrawn date	March 1998 / Aug 2001	July 1998 / August 1999	September 1998 / November 1999
Limited warranty	3 years	3 years	3 years
Part number	01K8501	01K8500	20L0540

IBM UltraSCSI Disks (18.2GB) - withdrawn

Capacity	✂ **18.2GB Wide Ultra2 SCSI HDD**	✂ **18.2GB 10000 rpm Ultra160 SCSI HDD**
Connector	68-pin	68-pin
Hot-swap	No	No
Systems supported	Most IntelliStation, 300GL, 300PL, Netfinity 3000, 3500, PC Server 3xx	IntelliStation 6867, 6893, 6868, 6889, 6865, 6866 Netfinity 3500 M10
Interface	Wide Ultra2 SCSI	Ultra160 SCSI
SCSI data path	16-bit / 80MB/sec	16-bit / 160MB/sec
Buffer size	1MB (multisegmented)	2MB
Average read seek time	7.5ms	5.0ms
Average latency	4.17ms	3.0ms
Rotational speed	7200 rpm	10000 rpm
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL
SMART	SMART	SMART
Other features	Ultra2 LVD 12-20MB/sec sustained data transfer rate	Ultra2 LVD 14-25MB/sec sustained data transfer rate
Avail / withdrawn date	March 1999 / September 2000	September 1999 / June 2000
Limited warranty[3]	3 years	3 years
Part number	20L0554	00N8072

Capacity	✂ **18.2GB 10K-3 Wide Ultra SCSI Hot-Swap SL HDD**	✂ **EXP 18.2GB 10K-3 Wide Ultra SCSI Hot-Swap HDD**
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector
Hot-swap	Includes hot-swap tray	Includes hot-swap tray
Systems supported	Netfinity 5000, 5500, 7000	EXP10, EXP15
Interface	Wide Ultra SCSI	Wide Ultra SCSI
SCSI data path	16-bit / 40MB/sec	16-bit / 40MB/sec
Average read seek time	5.4ms	5.4ms
Average latency	2.99ms	2.99ms
Rotational speed	10000 rpm	10000 rpm
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL
SMART	SMART / PFA	SMART / PFA
Other features		
Avail / withdrawn date	July 1999	July 1999 / December 2000
Limited warranty[3]	3 years	3 years
Part number	36L9807	36L9810

Capacity	✂ **Netfinity 18.2GB Wide Ultra2 SCSI Hot-Swap SL HDD**	✂ **Netfinity 18.2GB 10K-3 Wide Ultra2 SCSI Hot-Swap SL HDD**
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector
Hot-swap	Includes hot-swap tray	Includes hot-swap tray
Systems supported	Netfinity 5600, 8500R, EXP200	Netfinity 5600, 8500R, EXP200
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI
SCSI data path	16-bit / 80MB/sec	16-bit / 80MB/sec
Average read seek time	7.5ms or less	5.4ms or less
Average latency	4.17ms	2.99ms
Rotational speed	7200 rpm	10000 rpm
Form factor (width x height)	3.5" x 1" SL	3.5" x 1" SL
SMART	SMART / PFA	SMART / PFA
Other features		
Avail / withdrawn date	September 1999 / December 2000	September 1999 / December 2000
Limited warranty[3]	3 years	3 years
Part number	36L9745	36L9749

IBM UltraSCSI Disks (36.4GB) - withdrawn

Capacity	✂ **Netfinity 36.4GB[2] Wide Ultra SCSI Hot Swap HDD**	✂ **Netfinity EXP 36.4GB Wide Ultra SCSI Hot Swap HDD**
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector
Hot-swap	Includes hot-swap tray	Includes hot-swap tray
Systems supported	Netfinity 5000, 5500, 7000	EXP10, EXP15
Interface	Wide Ultra SCSI	Wide Ultra SCSI
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec
Average seek time (ms)	8.0ms or less	8.0ms or less
Average latency	4.17ms	4.17ms
Rotational speed	7200 rpm	7200 rpm
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**
SMART / PFA	SMART / PFA	SMART / PFA
Head technology	Magneto-resistive	Magneto-resistive
No-ID™ sector format	Yes	Yes
Other features		
Available / withdrawn date	March 1999 / September 2000	March 1999 / December 2000
Limited warranty[3]	3 years	3 years
Part number	02K0441	02K0442

Capacity	✂ **36.4GB 10K-3 Wide Ultra SCSI Hot-Swap HDD**	✂ **EXP 36.4GB 10K-3 Wide Ultra SCSI Hot-Swap HDD**
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector
Hot-swap	Includes hot-swap tray	Includes hot-swap tray
Systems supported	Netfinity 5000, 5500, 7000	EXP10, EXP 15
Interface	Wide Ultra SCSI	Wide Ultra SCSI
SCSI data path / burst rate	16-bit / 40MB/sec	16-bit / 40MB/sec
Average seek time (ms)	6.0ms or less	6.0ms or less
Average latency	2.99ms	2.99ms
Rotational speed	10000 rpm	10000 rpm
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**
SMART / PFA	SMART / PFA	SMART / PFA
Other features		
Available / withdrawn date	Third quarter 1999 / Sept 2000	Third quarter 1999 / December 2000
Limited warranty[3]	3 years	3 years
Part number	36L9808	36L9811

Capacity	✂ **Netfinity 36.4GB Wide Ultra2 SCSI Hot-Swap HDD**	✂ **Netfinity 36.4GB 10K-3 Wide Ultra2 SCSI Hot-Swap HDD**
Connector	80-pin SCA-2 connector	80-pin SCA-2 connector
Hot-swap	Includes hot-swap tray	Includes hot-swap tray
Systems supported	Netfinity 5600, 8500R, EXP200	Netfinity 5600, 8500R, EXP200
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI
SCSI data path / burst rate	16-bit / 80MB/sec	16-bit / 80MB/sec
Average seek time (ms)	8.0ms or less	6.0ms or less
Average latency	4.17ms	2.99ms
Rotational speed	7200 rpm	10200 rpm
Form factor (width x height)	3.5" x **1.6" HH**	3.5" x **1.6" HH**
SMART / PFA	SMART / PFA	SMART / PFA
Other features		
Available / withdrawn date	October 1999 / December 2000	October 1999 / December 2000
Limited warranty[3]	3 years	3 years
Part number	36L9746	36L9750

[1] MHz only measures internal clock speed (or bus speed where indicated), not application performance. Many factors affect application performance.

[2] When referring to hard drive capacity, MB equals one million bytes, GB equals one billion bytes, and TB equals one trillion bytes. Total user-accessible capacity depends on operating environment.

[3] For terms and conditions or a copy of IBM's limited warranty, call 1 800 772-2227 in the U.S. or 1 800 465-7999 in Canada. Limited warranty includes International Warranty Service in those countries where this product is offered.

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