

IBM PC Servers (310 to 330)

IBM® PC Server:		Diskette	CPU(s)	Upgrade	L2 cache	Memory	Total bus	Total	Features	Price ¹	Available
Type-model	Interface	std-max internal	Speed	MHz	in KB;	in MB;	slots	bays			date
					std / max	std/max					
× 310	8639 -0Z0	d open bay, S2fP	Pentium 100/66	Pent 133/66	256 /256	16/192	all: ISA=3	5	/S/E	1655	Feb 96
× 310	" -0ZT	d 1.08G-6.75G S2fP	Pentium 100/66	Pent 133/66	256 /256	16/192	ISA=3	5	/S/E	1999	Feb 96
× 310	" -0D0	d open bay, S2fP	Pentium 133/66	None	256 /256	16/192	PCI/ISA=2	5	/S/E	1873	Feb 96
× 310	" -0DT	d 1.08G-6.75G S2fP	Pentium 133/66	None	256 /256	16/192	Total=5	5	/S/E	2217	Feb 96
310	8639 -0E0	d open bay, Uscsi	Pentium 166/66	Pent 200/66	256 /512	16/160 *	all: ISA=2	5	/S/	2017	Oct 96
310	" -0EV	d 2.16G-6.48G Uscsi	Pentium 166/66	Pent 200/66	256 /512	16/160 *	PCI/ISA=3	5	/S/E	2460	Oct 96
× 320	8640 -0Z0	d open bay, SfwP	1 x Pent 100/66	all:	256 /512	16/256	all: PCI=2	9	/S	3450	Mar 96
× 320	" -0ZV	d 2.25G-27G SfwP	1 x Pent 100/66	SMP via	256 /512	16/256	EISA=5	9	/S	4392	Mar 96
× 320 A	" -1Z0	d open bay, RfwP	1 x Pent 100/66	second Pentium	256 /512	16/256	Shared=1	10 /H	/S	4945	Mar 96
× 320	" -2Z0	d open bay, SfwP	1 x Pent 100/66	100 or 133	256 /512	32/256 □	Total=8	9	/S	4025	Apr 96
× 320 A	" -3Z0	d open bay, RfwP	1 x Pent 100/66		256 /512	32/256 □		10 /H	/S	5520	Apr 96
× 320	" -0D0	d open bay, SfwP	1 x Pent 133/66		256 /512	16/256	"	9	/S	3795	Mar 96
× 320	" -0DV	d 2.25G-27G SfwP	1 x Pent 133/66		256 /512	16/256	"	9	/S	4737	Mar 96
× 320 A	" -1D0	d open bay, RfwP	1 x Pent 133/66		256 /512	16/256	"	10 /H	/S	5290	Mar 96
× 320 A	" -1DS	d 4.5G via 2 x 2.25 GB (max 31.57G) RfwP	1 x Pent 133/66		256 /512	16/256	"	10 /H	/S	7174	Mar 96
× 320	" -2D0	d open bay, SfwP	1 x Pent 133/66		256 /512	32/256 □	"	9	/S	4370	Apr 96
× 320 A	" -3D0	d open bay, RfwP	1 x Pent 133/66		256 /512	32/256 □	"	10 /H	/S	5865	Apr 96
320	8640 -EE0	d open bay, SfwP	1 x Pent 166/66	all:	256 /512	32/256 □	all: PCI=2	9	/S	4715	Aug 96
320	" -EEV	d 2.25G-27G SfwP	1 x Pent 166/66	SMP via	256 /512	32/256 □	EISA=5	9	/S	5450	Aug 96
320 A	" -EE1	d open bay, RfwP	1 x Pent 166/66	second Pentium	256 /512	32/256 □	Shared=1	10 /H	/S	6843	Aug 96
320 A	" -EES	d 4.5G via 2 x 2.25 GB (max 18G) RfwP	1 x Pent 166/66	166 or 200	256 /512	32/256 □	Total=8	10 /H	/S	8542	Aug 96
× 320	8640 -MZ0	d open bay, SfwP	1 x Pent 100/66	all:	256 /512	16/256	all: PCI=2	9 /H	/S	3450	Mar 96
× 320	" -MZV	d 2.25G-29.3G SfwP	1 x Pent 100/66	SMP via	256 /512	16/256	MC=6	9 /H	/S	4392	Mar 96
× 320 A	" -MZ1	d open bay, RfwP	1 x Pent 100/66	second Pentium	256 /512	16/256	Shared=0	9 /H	/S	4945	Mar 96
× 320	" -MZ2	d open bay, SfwP	1 x Pent 100/66	100 or 133	256 /512	32/256 □	Total=8	9 /H	/S	4025	Apr 96
× 320	" -MD0	d open bay, SfwP	1 x Pent 133/66		256 /512	16/256	"	9 /H	/S	3795	Mar 96
× 320	" -MDV	d 2.25G-29.3G SfwP	1 x Pent 133/66		256 /512	16/256	"	9 /H	/S	4737	Mar 96
× 320 A	" -MDS	d 4.5G via 2 x 2.25 GB (max 29.3G) RfwP	1 x Pent 133/66		256 /512	16/256	"	9 /H	/S	7174	Mar 96
× 320	" -MD2	d open bay, SfwP	1 x Pent 133/66		256 /512	32/256 □	"	9 /H	/S	4370	Apr 96
325	8639 -EJ0	d open bay Uscsi	1 x PPro 180/60	all:	256 /512	32/ 1G *	all: PCI=1	7	/S/e	4900	Nov96
325	" -ES0	d open bay Uscsi	1 x PPro 200/66	SMP via	256 /512	32/ 1G *	EISA=1	7	/S/e	4025	Nov96
325	" -ESV	d 2.25G - 13.5G Uscsi	1 x PPro 200/66	2 x Pent Pro	256 /512	32/ 1G *	Shared=4	7	/S/e	4760	Nov96
325	" -RS0	d open bay Uscsi	1 x PPro 200/66	200/66	256 /512	32/ 1G *	Total=6	7	/R /S/e	4485	Nov96
330	8640 -ES0	d open bay Uscsi	1 x PPro 200/66	all:	256 KB	32/ 1G *	all: PCI=1	9	/S/e	5290	Jan 97
330	" -ES2	d open bay Uscsi	1 x PPro 200/66	SMP via	256 KB	32/ 1G *	EISA=4	10 /H	/S/e	5810	Jan 97
330	" -ESS	d 4.5G via 2 x 2.25 GB (max 18GB) RUP	1 x PPro 200/66	2 x Pent Pro	256 KB	32/ 1G *	Shared=4	10 /H	/S/e	9347	Jan 97
330	" -EM2	d open bay Uscsi	1 x PPro 200/66	200/66	512 KB	32/ 1G *	Total=9	10 /H	/S/e	6960	Jan 97

d = 1.44 MB 3.5" diskette drive
 E = 10BaseT ethernet adapter
 e = 10BaseT ethernet controller on motherboard
 H = Hot-swap bays
 R = Rack drawer model (requires rack cabinet)
 S = CD-ROM and ServerGuide
 40 = 40 MB/sec streaming data transfer for MCA
 256 = (italics) write-back L2 cache
 256 = (no italics) write-thru L2 cache

S2fP = 32 bit SCSI-2 fast PCI adapter
 SfwP = 32 bit SCSI-2 fast/wide PCI adapter
 SfwP = 32 bit SCSI-2 fast/wide PCI on planar
 RfwP = RAID 0,1,5 with 4 MB cache 32 bit SCSI-2 fast/wide PCI adapter

RUP = PC ServeRAID 0,1,5 UltraSCSI PCI Adapter
 Uscsi = Adaptec AHA-2940UW UltraSCSI PCI Adapter
 Uscsi = Adaptec 7880 UltraSCSI controller

LOTUS NOTES 4.1

All servers ship standard with Lotus Notes Release 4.1 Server (single processor edition) in a shrink wrapped package and TME 10 NetFinity™

RACK ENCLOSURES

All servers (except 310 and 704) supported in PC Server Rack Enclosures

Note 1: Price (retail USD)

- * ECC - Error Checking & Correcting Memory
- EOS - ECC-on-SIMM memory
- * ECC-P - Error Checking & Correcting-Parity
- ⊕ Products announced January 14, 1997
- × Withdrawn from marketing
- ♣ Price decrease effective February 3 or 6, 1997

No warranties are expressed in this summary

(1SERV) Compiled by Roger Dodson, IBM

PS/2 / PC Server 5x0 / 720 / S/390 WARRANTY SERVICE SUPPORT

- ⊕ 3 year warranty
- ⊕ On site warranty all 3 years
- ⊕ All cities in all states
- ⊕ 24 hour / 7 day service coverage
- ⊕ 4 hour response time
- ⊕ "PC Server Start Up Support"
- ⊕ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (<http://www.pc.ibm.com>) support
- ⊕ IBM or dealer warranty/service

PC SERVER 3xx (all above except)

- ⊕ 8 am - 5 pm Mon - Fri coverage
- ⊕ Next day response time
- ⊕ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response time

Current as of February 6, 1997

IBM PC Servers (520 to 720)

IBM® PC Server:		Diskette Disk: std-max internal Interface	CPU(s) / Upgrade Speed / MHz	L2 cache std / max	Memory in MB; std/max	Total bus slots	Total bays	Features	Price ¹	Available date
Type-model										
× 520	8641-EZ0	d open bay, SfwP	1 x Pent 100/66	all:	512 /512	32/256 □	all:	22 /H	/S	\$4979 Nov 95
× 520	-EZV	d 2.25G-90.2G SfwP	1 x Pent 100/66	SMP via	512 /512	32/256 □	PCI=2	22 /H	/S	6029 Nov 95
× 520 A	" -EZ1	d open bay, RfwP	1 x Pent 100/66	second	512 /512	32/256 □	EISA=5	22 /H	/S	6469 Nov 95
× 520 A	" -EZS	d 4.5 G via 2 x 2.25 GB (max 90.2G) RfwP	1 x Pent 100/66	Pentium 100/66	512 /512	32/256 □	Shared=1 Total=8	22 /H	/S	8579 Nov 95
× 520 A	" -EZE	d 9.0 G via 4 x 2.25 GB (max 90.2G) RfwP	1 x Pent 100/66	or 133/66	512 /512	32/256 □		22 /H	/S	10679 Nov 95
× 520 A	8641-ED2	d open bay, RfwP (max 90.2G)	1 x Pent 133/66	Same as above	512 /512	32/256 □	Same as above	22 /H	/S	6869 Mar 96
× 520 A	8641-EDG	d 9.0 G via 4 x 2.25 GB (max 90.2G) RfwP	1 x Pent 133/66		512 /512	32/256 □		22 /H	/S	1079 Mar 96
× 520	8641-EE0	d open bay, SfwP	1 x Pent 166/66	all:	512 /512	64/256 □	Same as above	22 /H	/S	8625 Aug 96
× 520 A	-EE1	d open bay, RUP	1 x Pent 166/66	SMP via	512 /512	64/256 □		22 /H	/S	10465 Aug 96
× 520 A	" -EEE	d 9.0 G via 2 x 2.25 GB (max 90.2G) RUP	1 x Pent 166/66	second Pentium 166	512 /512	64/256 □		22 /H	/S	13864 Aug 96
× 520 A	" -EEL	d 13.5 G via 6 x 2.25 GB (max 90.2G) RUP	1 x Pent 166/66	or 200	512 /512	64/256 □		22 /H	Q /S	17364 Aug 96
× 520	8641-MZ0	d open bay, S2fw	1 x Pent 100/66	all:	512 /512	32/256 □	all:	22 /H	40 /S	4979 Nov 95
× 520	-MZV	d 2.25G-90.2G S2fw	1 x Pent 100/66	SMP via	512 /512	32/256 □	PCI=2	22 /H	40 /S	6029 Nov 95
× 520 A	" -MZS	d 4.5 G via 2 x 2.25 GB (max 90.2G) RfwP	1 x Pent 100/66	second Pentium	512 /512	32/256 □	MC=6 Shared=0 Total=8	22 /H	40 /S	8579 Nov 95
× 520 A	" -MZE	d 9.0 G via 4 x 2.25 GB (max 90.2G) RfwP	1 x Pent 100/66	100/66	512 /512	32/256 □		22 /H	40 /S	10679 Nov 95
× 520 A	" -MZL	d 13.5 G via 6 x 2.25 GB (max 90.2G) RfwP	1 x Pent 100/66	133/66	512 /512	32/256 □		22 /H	40 /Q/S	14849 Nov 95
× 520	8641-MD0	d open bay, S2fw	1 x Pent 133/66		512 /512	32/256 □	Same as above	22 /H	40 /S	5379 Aug 96
× 520 A	-MD2	d open bay, RfwP (max 90.2G)	1 x Pent 133/66	Same as above	512 /512	32/256 □		22 /H	40 /S	6869 Mar 96
× 520 A	" -MDG	d 9.0 G via 4 x 2.25 GB (max 90.2G) RfwP	1 x Pent 133/66		512 /512	32/256 □		22 /H	40 /S	10271 Mar 96
× 720	8642-0Z0	D open bay, SfwP	1 x Pent 100/66	all:	512 KB	64/1G *	all:	22 /H	80 /S	10415 Oct 95
× 720 A	-1Z0	D open bay, R2fw	1 x Pent 100/66	SMP via	std and max per	64/1G *	PCI=0	22 /H	80 /S	12255 Oct 95
× 720 A	" -2ZS	D 4.5 G via 2 x 2.25 GB (max 49.6G) R2fw	2 x Pent 100/66	6 x Pentium 200/66	w/ 192 byte L3 cache	64/1G *	EISA=0 Shared=7 Total=7	22 /H	80 /S	17810 Oct 95
× 720 A	" -4ZS	D 4.5 G via 2 x 2.25 GB (max 49.6G) R2fw	4 x Pent 100/66			64/1G *		22 /H	80 /S	26800 Oct 95
× 720	" -0D0	D open bay, SfwP	1 x Pent 133/66			64/1G *		22 /H	80 /S	11385 May 96
× 720	" -0DN	D open bay, SfwP	1 x Pent 133/66			64/1G *		22 /H	80 /S	11385 May 96
× 720 A	" -2DS	D 4.5 G via 2 x 2.25 GB (max 49.6G) R2fw	2 x Pent 133/66			64/1G *		22 /H	80 /S	19235 May 96
× 720	" -0E1	D open bay, SfwP	1 x Pent 166/66			128/1G *		22 /H	80 /S	12385 Jun 96
× 720	" -0EN	D open bay, SfwP	1 x Pent 166/66			128/1G *		22 /H	80 /S	12385 Jun 96
× 720 A	" -2E1	D 4.5 G via 2 x 2.25 GB (max 49.6G) R2fw	2 x Pent 166/66			128/1G *		22 /H	80 /S	20289 Jun 96
× 704	8650-4BW	d 4.28 G via 2 x 2.14 GB (max 54G) 2xSfwP	1 x PPro 166/66	all: up to four	512 KB	64/2G *	all: PCI=6	17 /H	E /C	12305 May 96
× 704	" -7AX	d 8.56 G via 4 x 2.14 GB (max 54G) RfwP	2 x PPro 166/66	PPro 200/66	512 KB	128/2G *	EISA=4 Shared=0 Total=10	17 /H	E /C	19235 May 96
☞ 704	" -4M0	d open bay, 2xSfwP	1 x PPro 200/66		512 KB	128/2G *		17 /H	/C	13418 Oct 96

C = 4 x CD-ROM / No ServerGuide
d = 1.44 MB 3.5" diskette drive
D = 2.88 MB 3.5" diskette drive with media sense
E = IBM 100/10 PCI Ethernet PCI Adapter
H = Hot-swap bays
Q = Quad Peermaster Adapter (MC) ethernet switch
Q = Quad Peermaster Adapter (PCI) ethernet switch
S = CD-ROM and ServerGuide
40 = 40 MB/sec streaming data transfer for MCA
80 = 80 MB/sec streaming data transfer for MCA
512 = (italics) write-back L2 cache
S2fw = 32 bit SCSI-2 fast/wide MCA on planar
R2fw = RAID 0, 1, 5 with 4 MB cache (64 MB max)
32 bit SCSI-2 fast/wide MCA adapter
SfwP = 32 bit SCSI-2 fast/wide PCI adapter
SfwP = 32 bit SCSI-2 fast/wide PCI on planar
RfwP = RAID 0,1,5 SCSI-2 fast/wide PCI adapter
RUP = PC ServeRAID 0,1,5 UltraSCSI PCI Adapter

Note 1: Price (retail USD)

Current as of March 1997

LOTUS NOTES 4.1
All servers ship standard with Lotus Notes Release 4.1 Server (single processor edition) in a shrink wrapped package and TME 10 NetFinity™

RACK ENCLOSURE
All servers (except 310 and 704) supported in PC Server Rack Enclosures

* ECC - Error Checking & Correcting Memory
□ EOS - ECC-on-SIMM memory
* ECC-P - Error Checking & Correcting-Parity
Products announced October 1, 1996
☞ Withdrawn from marketing
☛ Price decrease effective Feb 3 or 12, 1997

No warranties are expressed in this summary

(2SERV) Compiled by Roger Dodson, IBM

PS/2 / PC Server 5x0 / 7xx / WARRANTY SERVICE SUPPORT

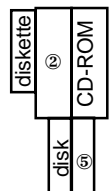
- ☞ 3 year warranty
- ☞ On site warranty all 3 years
- ☞ All cities in all states
- ☞ 24 hour / 7 day service coverage
- ☞ 4 hour response time
- ☞ "PC Server Start Up Support"
- ☞ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (<http://www.pc.ibm.com>) support
- ☞ IBM or dealer warranty/service

PC SERVER 3xx (all above except)

- ☞ 8 am - 5 pm Mon - Fri coverage
- ☞ Next day response time
- ☞ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response time

IBM PC Server 310 - 166 MHz

IBM® PC Server:	Open bay	2.16 GB
Type-model	8639-0E0	8639-0EV
Disk - individual size	None	2.16 GB
Disk - features	N/A	Fast / PFA / 1" high / 8.5 ms / 5400 rpm / SMART
SCSI cable	4 drop Fast cable (one drop to CD-ROM)	4 drop Fast (50 pin) cable (one drop to CD-ROM; one drop to disk)
LAN adapter	None	ISA 10BaseT ethernet adapter / full duplex enabled
LAN adapter part no	N/A	72H2613 (IBM EtherJet ISA Adapter with Wake Up on LAN)
Available date	October 1996	October 1996
Processor / MHz	Pentium - 166/66 MHz (P54CS)	
Processor upgrades	① Pentium 200/66 MHz (P54CS), ② Future Pentium® OverDrive® uniprocessor (P54CTB)	
Upgrade method	Remove CPU from 321 pin Zero Insertion Force (ZIF) socket (Intel® Socket 7) / no Voltage Reduction Module on system	
SMP	None	
L2 cache - std / max	256 KB std / 512 KB max / 8.5 ns data SRAM / 12 ns tag SRAM	
L2 cache - features	Write-back / direct mapped / pipelined burst synchronous	
L2 cache - method	Single gold-plated connector for one 160 pin DIMM (to upgrade 256 KB, replace DIMM with a 512 KB DIMM; part 92G7336)	
Memory - std / max	16 MB / 160 MB (60 ns / ind std)	
Mem - sockets avail	One 168 pin gold-plated DIMM socket and four 72 pin tin-lead SIMM sockets	
Mem - sockets used	One 16 MB DIMM used / fast page	
Mem - type	ECC-P (ECC function with parity S/DIMMs)	
Mem - type (support)	Fast page parity or EDO non-parity (can mix)	
Mem - requirements	SIMMs must be installed in match pairs	
Mem - supports	SIMMs: 8, 16, 32 MB / 1" high / 60 ns	
Mem - supports	DIMMs: 8, 16, 32, 64 MB / 1" high / 60 ns	
SCSI disk controller	UltraSCSI PCI Adapter	
RAID levels	None (use software)	
Transfer rates	132 MB/sec transfer to PCI; 40 MB/sec on SCSI bus (Fast/Wide)	
Adapter vendor	Modifications of Adaptec AHA-2940UW UltraWide (custom firmware)	
Implementation	32 bit busmaster adapter in a PCI slot	
Channels	One (internal and/or external) / supports 15 devices	
Connectors	Two internal (8 bit and 16 bit); 1 external (16 bit) / can use all connectors at same time	
IDE disk controller	Enhanced IDE busmaster on planar / 32 bit PCI 2.1 / PIO 0 to 4 or DMA Modes 1 to 2 / two connectors for optional 2 drop cables	
Architecture	PCI 2.1 (33 MHz) and ISA / IBM planar with Intel Triton II (430HX) chipset / PIIX3 for EIDE, ISA Bridge, USB / National Semiconductor PC87306 Super I/O for diskette, parallel, serial, keyboard, mouse, infrared / code name Flashcat	
CD-ROM	4 x speed CD-ROM (SCSI-2) / bootable, but not enabled by default	
Diskette drive	3.5" 1.44 MB / 2 drop cable (cable supports 3.5" 2.88 MB, 5.25" 1.2 MB, and tape)	
Serial port	One 9 pin / 115 Kbps max speed / 16550A / non-DMA	
Parallel port	One bidirectional (EPP, ECP) / IEEE 1284 / 2 MB/sec max speed	
Universal Serial Bus	Two USB ports / 12 Mbps max speed	
Infrared	Infrared port (on back) requires optional dongle cable (Infrared Transceiver); part number 75H7987 / IrDA 1.0 / 115 Kbps	
Graphics - type	SVGA - 64 bit accelerator / S3 / Trio64V+ (on planar) / 32 bit PCI 2.1 / 64 bit transfers internal	
Graphics - memory	1 MB std / 2 MB max (EDO 60 ns) / upgrade part 76H0238 via two 40 pin SOJ	
Graphics - features	Supports VESA DPMS, DDC2B / Automatic Refresh Rate utility	
Security	Cover key lock / U-Bolt support / Diskette write inhibit / Serial/parallel port inhibit / Power-on password / Administrator password / Boot sequence control / Boot without keyboard/mouse/diskette / Disk disable / Diskette disable / Unattended start-up (network) / Sliding front door lock / Secure removable media / Adm password change authorization (privileged access password) / Mouse disable / Wake-up on LAN (Dual Mode)	
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool including free license for Lotus Notes Release 4.1 Server (single processor edition), IBM AntiVirus, and APC PowerChute Plus	
Systems management	Includes TME 10 NetFinity™ (system hardware mgmt software) and many utilities in ServerGuide / DMI support	
BIOS	256 KB SurePath™ BIOS in flash memory / Plug and Play BIOS	
Keyboard / mouse	101 key (rubber dome) keyboard / IBM Enhanced Mouse (400 dpi)	
Power supply	200 watts / universal / manual switch / integrated temperature sensing fan	
Wake-on-LAN	Not supported	



Bay ①	3.5", SL 1", access, std diskette
Bay ②	5.25", HH 1.6", access, open
Bay ③	5.25", HH 1.6", access, CD-ROM
Bay ④	3.5", SL 1", no access, open or std disk (disk only)
Bay ⑤	3.5", SL 1", no access, open (disk only)
Slot 1:	fullsize, 16 bit ISA or 32 bit PCI 2.1 (3.3v/5v) - used SCSI
Slot 2:	fullsize, 16 bit ISA or 32 bit PCI 2.1 (3.3v/5v)
Slot 3:	fullsize, 16 bit ISA or 32 bit PCI 2.1 (3.3v/5v)
Slot 4:	fullsize, 16 bit ISA - used by EtherJet Adapter
Slot 5:	halfsize, 16 bit ISA

Maximum internal SCSI disk capacity:
6.48 GB (Three x 2.16 GB SCSI-2 disks)
To support three internal disks, all three must be 5400 rpm; only two 7200 rpm disks are supported

S3 Trio64V+ GRAPHICS MODES				OTHER STANDARD FEATURES				HELPWARE for PC SERVER 310 WARRANTY SERVICE SUPPORT			
Resolution	Frame Rate Hz (non-interlaced)	Memory required	Max colors	The Setup Utility resides in flash memory; invoked by pressing F1 key during memory POST Plug-and-Play 1.0A; Vital Product Data support 10.2" W x 17.5" D x 18.2" H; 28 lbs Advanced Power Mgmt 1.1; ISO 9241-3 capable Several hardcopy publications Support for DMI technology				3 year warranty (international) On site warranty all 3 years All cities in all states 8 am - 5 pm Mon - Fri coverage Next day response time Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year "PC Server Start Up Support" 24 hour / 7 day telephone, bulletin board, fax, and electronic support IBM or dealer warranty/service 30 day money back guarantee			
640 x 480	60, 72, 75, 85	1 MB	65,536	MEMORY OPTIONS				<ul style="list-style-type: none"> 16 MB DIMM (1 - 2Mx72) 60 ns 92G7338 16 MB DIMM (1 - 4Mx72) 60 ns 92G7339 16 MB SIMM (2 - 2Mx36) 60 ns 92G7310 32 MB SIMM (2 - 4Mx36) 60 ns 92G7312 32 MB SIMM (2 - 4Mx36) 60 ns 92G7317 			
640 x 480	60, 72, 75, 85	2 MB	16.7 mil								
800 x 600	60, 72, 75, 85	1 MB	65,536	Additional features of S3 Trio64V+:				<ul style="list-style-type: none"> - Hardware accelerated DCI and DirectDraw playback - Hardware video scaling and color space conversion (YUV to RGB) - Interpolation in X axis / replication in Y axis - Software MPEG under Windows 3.11 			
800 x 600	60, 72, 75	2 MB	16.7 mil								
1024 x 768	43.5(I), 60, 70/2/5, 85	1 MB	256	<ul style="list-style-type: none"> - Hardware accelerated DCI and DirectDraw playback - Hardware video scaling and color space conversion (YUV to RGB) - Interpolation in X axis / replication in Y axis - Software MPEG under Windows 3.11 							
1024 x 768	43.5(I), 60, 70/2/5, 85	2 MB	65,536								
1280 x 1024	43.5 (I), 60	1 MB	16								
1280 x 1024	43.5 (I), 60, 72, 75	2 MB	256								
1600 x 1200	48.5 (I)	2 MB	256								
Additional features of S3 Trio64V+:											
- Hardware accelerated DCI and DirectDraw playback											
- Hardware video scaling and color space conversion (YUV to RGB)											
- Interpolation in X axis / replication in Y axis											
- Software MPEG under Windows 3.11											

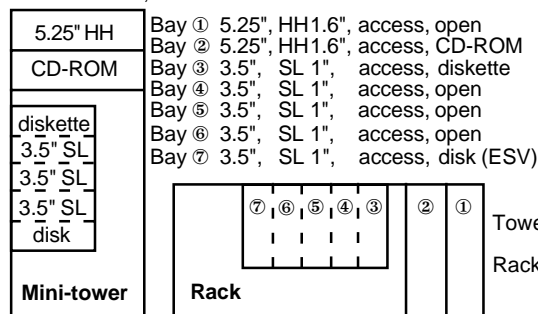
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I = Interlaced

No warranties are expressed or implied in this summary
(S310166) Compiled by Roger Dodson, IBM. October 1996

IBM PC Server 325 (2 way SMP)

IBM® PC Server:	Mini-tower 1 x Pentium Pro 180 / 256 Open bay	Mini-tower 1 x P Pro 200 / 256 Open bay	Mini-tower 1 x Pentium Pro 200 / 256 1 x 2.25 GB	19" rack drawer model 1 x Pentium Pro 200 / 256 Open bay
Type - model	8639-EJ0	8639-ES0	8639-ESV	8639-RS0 <i>Rack model requires 19" x 28" deep drawer rack cabinet</i>
Disk - capacity	None	None	2.25 GB X 1 = 2.25 GB / 1" Fast/Wide / 8 ms / 7200 rpm	None <i>(not supported in IBM 9306 Racks)</i>
Disk - features	N/A	N/A	Same as 8639-EJ0	Same as 8639-EJ0
SCSI cabling	One 16 bit cable w/ 7 drops; 68 to 50 pin conv for CD-ROM	Same as 8639-EJ0	Same as 8639-EJ0	Same as 8639-EJ0
Available date	November 1996	Same as 8639-EJ0 November 1996	Same as 8639-EJ0 November 1996	Same as 8639-EJ0 November 1996
Processor / MHz	1 x Pentium Pro - 180/60	1 x Pentium Pro - 200/66 MHz		
L2 cache	256 KB L2 cache , write-back, 4 way set associative / integrated in Pentium Pro			
Processor upgrades	Up to 2 Pentium Pro 166/66 or 200/66 MHz processors (requires same L2 cache size and speed)			
Features	① 2 x 180/60 MHz 256 KB L2, ② 2 x 200/66 MHz 256 KB L2, ③ 2 x 166/66 MHz 512 KB L2, ④ 2 x 200/66 Hz 512 KB L2 cache			
Implementation	SMP / MESI cache coherency / MPS 1.1 compliant One Processor Complex (same as Serv 330) with two 387 pin ZIF sockets (Intel Socket 8), 4 DIMM sockets, PMC, and DBX			
Memory - std / max	32 MB std / 1 GB max			
Memory - sockets / avail	4 sockets / 3 available (one 32 MB DIMM standard) / can be plugged into DIMM connectors in any order			
Memory - DIMMs	60 ns / 168 pin industry standard DIMMs / 3.3 volt / no memory interleaving / do not have to be installed in pairs or sets			
Memory - type	EDO / Error Checking and Correcting (ECC) memory and memory controller			
SCSI disk controller	Adaptec 7880 UltraSCSI controller / 132 MB/sec transfer to PCI; 40 MB/sec on SCSI bus (Fast/Wide) / plug and play			
Raid levels	None standard			
Implementation	32 bit busmaster chip on planar / on secondary PCI bus / SCAM Level 1			All models: Maximum internal disk capacity: 13.5 GB with five 2.25 GB SCSI-2 disks
Channels	One (internal and/or external) / supports 15 devices			
Connectors	One internal (68 pin / 16 bit); one external (68 pin / 16 bit) / can use both connectors at same time / remove single SCSI knockout on rear to attach standard SCSI cable from motherboard to knockout / only one ext device if int devices used			
IDE disk controller	None			
Architecture / chipsets	Intel Natoma 440FX PCIset / Intel 82375 PCI-EISA Bridge (PCEB) / Intel 82374 ESC / NS PC87308VUL Super I/O (diskette, keyboard, mouse, UARTs, parallel, infrared) / IBM developed and manufactured motherboard / code name Lynx			
PCI implementation	PCI 2.0 and 2.1 / PCI-to-PCI bridge (IBM 27-82352) / 2 slots on primary bus (PCI 2.1) and 3 slots on secondary bus (PCI 2.0)			
32 bit slots / available	6 slots / PCI (1 slot) 33 MHz / PCI/EISA shared slots (4 slots) / EISA (1 slot) / all slots available / see below			
Bays / available	(See diagram below): 7 bays / two 5.25" HH bays (1 used) / five 3.5" SL bay (1 or 2 used) / no hot-swap support			
Rack upgrade	PC Server 325 Rack Upgrade Option converts mini-tower for rack installation (includes slides, cover, bezel, cable arm)			
Status LEDs	Ten status LEDs / includes power, POST, primary processor, secondary processor, ethernet, security, disk, unattended			
Ethernet controller	AMD AM79C970A / on planar on secondary PCI bus / full duplex support / busmaster / RJ-45 and AUI DB-15 connectors			
CD-ROM	Internal CD-ROM / 8 x speed / multisession / SCSI-2 interface / 1.6" high / audio support / bootable if enabled			
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / diskette cable has two open connectors (one edge and one pin connector)			
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed / non-DMA			
Parallel port	One parallel port / supports SPP/ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec maximum speed			
Infrared	Infrared port requiring optional 4 Mbit Infrared Dongle; part number 75H7987 / IrDA 1.1 / 115 Kbps, 1.15 Mbps, or 4 Mbps			
SMART card connector	Connector on planar for interface to optional Adv System Mgmt Adapter (ISA / 94G5570) to power on/off system, read VPD, monitor temperature, and monitor fan rotation / integrated I2C bus			
Graphics controller	SVGA / Cirrus Logic® 5436 on planar on primary PCI bus / 1 MB DRAM / up to 1024 x 768 at 256 colors with 85 Hz			
Security	Front door keylock / power switch behind door / selectable boot / keyboardless and displayless operation / power-on password / administrator password / U bolt support / optional Security Cover / optional Security Cable Kit to enable tamper evident cover with Security Cover and Adv Mgmt Aprt			
Software	ServerGuide™ - CD-based automated network operating system installation and configuration tool including free license for Lotus Notes Release 4.1 Server (single processor edition), IBM AntiVirus, and APC PowerChute Plus Includes TME 10 NetFinity™ (system hardware mgmt software) and many utilities in ServerGuide			
BIOS	256 KB in Flash EEPROM (SurePath™ BIOS)		PC Server SMP 180 MHz/256 KB Proc Upg 94G7082	
Keyboard / mouse	IBM 101 key keyboard / IBM Enh mouse (except rack model)		PC Server SMP 200 MHz/256 KB Proc Upg 94G6175	
Power supply	One 250 watt / auto-restart after momentary loss of power / universal / manual switch		PC Server SMP 166 MHz/512 KB Proc Upg 94G4908	
Other features	Plug and play BIOS / reusable carton with interlocking clips ISO 9241 part 3 enabled / FloThru air flow / DMI support Power-on/standby switch / standby allows power on by unattended sources		PC Server SMP 200 MHz/512 KB Proc Upg 94G6463	
			PC Server 32 MB DIMM 94G6473	
			PC Server 64 MB DIMM 94G6474	
			PC Server 128 MB DIMM 94G6475	
			PC Server 256 MB DIMM 94G7079	
			PC Server 325 Rack Upgrade 94G5695	
			PC Server 325 Security Cable Kit 94G6398	
			PC Server 325 Security Cover 94G6471	
			PC Server Rack Series 300 Mounting Plate 94G4996	

Slot 1: fullsize, 32 bit PCI 2.1 (5.0v), primary PCI bus
 Slot 2: fullsize, 32 bit PCI 2.1 (5.0v) or 32 bit EISA / 16 bit ISA, primary PCI bus
 Slot 3: fullsize, 32 bit PCI 2.0 (5.0v) or 32 bit EISA / 16 bit ISA, secondary PCI bus
 Slot 4: halfsize, 32 bit PCI 2.0 (5.0v) or 32 bit EISA / 16 bit ISA, secondary PCI bus
 Slot 5: halfsize, 32 bit PCI 2.0 (5.0v) or 32 bit EISA / 16 bit ISA, secondary PCI bus
 Slot 6: halfsize, 32 bit EISA / 16 bit ISA



- Configuration/Setup Utility invoked by pressing F1 at startup
 - EISA Configuration Utility program on EISA Configuration Diskette to configure EISA and ISA adapters
 - The Diagnostic Diskette contains QAPlus/PRO™ which is graphical software for diagnostic and testing (not preloaded)
 - SCSISelect near startup by pressing CTRL+A

Tower with pedestal: H 17.9" x W 12.4" x D 18.6"; 43 pounds
 Rack: H 8.5" x W 19.0" x D 18.3"; 43 pounds;
 Requires 19" or 28" rack cabinet meeting EIA-310-D standards

HELPWARE for PC SERVER 325 WARRANTY SERVICE SUPPORT

- 3 year warranty (international)
- On site warranty all 3 years
- All cities in all states
- 8 am - 5 pm Mon - Fri coverage
- Next day response time
- Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year
- "PC Server Start Up Support"
- 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support (<http://www.pc.ibm.com>)
- IBM or dealer warranty/service

IBM PC Server 330 (2 way SMP)

IBM® PC Server:	1 x Pentium Pro 200 / 256 Open bay	1 x Pentium Pro 200 / 256 Open bay / hot-swap	1 x Pentium Pro 200 / 256 2 x 2.25 GB / hot-swap Array	1 x Pent Pro 200 / 512 Open bay / hot-swap
Type - model	8640-ES0	8640-ES2	8640-ESS	8640-EM2
Disk - capacity	None	None	2 x 2.25 GB = 4.5 GB / 1" high	None
Disk - features	N/A	N/A	Fast/Wide / 8 ms / 7200 rpm	N/A
SCSI cabling	One 16 bit cable w/ 7 drops; 68 to 50 pin conv for CD-ROM	One 16 bit cable to hs backplane; plus a 16 bit cable w/ 3 drops	One 16 bit cable to hs backplane; plus a 16 bit cable w/ three drops	Same as 8640-ES2
Available date	January 1997	January 1997	January 1997	January 1997
Proc / MHz / L2 cache	1 x Pentium Pro - 200/66 MHz / 256 KB L2 cache , write-back, 4 way set associative			512 KB L2 cache
Processor upgrades	Up to 2 Pentium Pro 166/66 or 200/66 MHz processors (requires same L2 cache size and speed) ① 2 PPro x 200/66 MHz 256 KB L2, ② 2 PPro x 166/66 MHz 512 KB L2, ③ 2 PPro x 200/66 MHz 512 KB L2 cache			
Features Implementation	SMP / MESI cache coherency / MPS 1.1 compliant One Processor Complex (same as Serv 325) with two 387 pin ZIF sockets (Intel Socket 8), 4 DIMM sockets, PMC, and DBX			
Memory - std / max	32 MB std / 1 GB max / 4 sockets / 3 available (one 32 MB DIMM standard) / plug into DIMM connectors in any order			
Memory - DIMMs	60 ns / 168 pin industry standard DIMMs / 3.3 volt / no memory interleaving / do not have to be installed in pairs or sets			
Memory - type	EDO / Error Checking and Correcting (ECC) memory and memory controller			
SCSI disk controller	All models: Adaptec 7880 UltraSCSI controller None (use software)		Array model: IBM PC ServeRAID Adapter (UltraSCSI)	
Raid levels	32 bit busmaster chip on planar / on secondary PCI bus		RAID 0, 1, 5 (supports 8 indepnt arrays and 8 logical arrays)	
Implementation	32 bit busmaster chip on planar / on secondary PCI bus		32 bit PCI adapter in slot / 3 controllers with PCI bridge	
Channels	One (internal and/or external) / supports 15 devices		Three (two internal and one int/ext); 3 x 15 = 45 devices max	
Connectors	One internal (68 pin / 16 bit); one external (68 pin / 16 bit)		Three internal (68 pin / 16 bit); one external (68 pin / 16 bit)	
Features	Use both connectors at once / only one ext dev if int devs used		4 MB cache / only use int or ext conn on Channel 1 / 70G8489	
Other	No IDE controller / remove single SCSI knockout on rear to attach standard SCSI cable from motherboard to knockout			
Max int disk capacity	Non hot-swap model: 27.0 GB via six 4.51 GB SCSI disks / Hot-swap: 18.0 GB via three 4.51 GB & one 4.51 GB in bottom			
Architecture / chipsets	Intel Natoma 440FX PCiset / Intel 82375 PCI-EISA Bridge (PCEB) / Intel 82374 ESC / NS PC87308VUL Super I/O (diskette, keyboard, mouse, UARTs, parallel, infrared) / IBM developed and manufactured motherboard / code name Leopard			
PCI implementation	PCI 2.0 and 2.1 / PCI-to-PCI bridge (IBM 27-82352) / 2 slots on primary bus (PCI 2.1) and 3 slots on secondary bus (PCI 2.0)			
32 bit slots / available	9 slots / PCI (1 slot) 33 MHz / PCI/EISA shared slots (4 slots) / EISA (4 slot) / all slots available except RAID / see below			
Bays / available	(See diagram below): 9 bays for non hot-swap; 10 bays for hot-swap / 6, 7, or 8 bays available (diskette & CD-ROM use bays)			
Rack support	Supported in IBM 9306 PC Server Rack Enclosures			
Status LEDs	Ten status LEDs / includes power, POST, primary processor, secondary processor, ethernet, security, disk, unattended			
10BaseT ethernet	AMD AM79C970A / on planar on secondary PCI bus / full duplex support / busmaster / RJ-45 and AUI DB-15 connectors			
CD-ROM	Internal CD-ROM / 8 x speed / multisession / SCSI-2 interface / 1.6" high / audio support / bootable if enabled			
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / diskette cable has two open connectors (one edge and one pin connector)			
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed / non-DMA			
Parallel port	One parallel port / supports SPP/ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec maximum speed			
Infrared	Infrared port requiring optional 4 Mbit Infrared Dongle; part number 75H7987 / IrDA 1.1 / 115 Kbps, 1.15 Mbps, or 4 Mbps			
SMART card connector	Connector on planar for interface to optional Adv System Mgmt Adapter (ISA / 94G5570) to read/write clock, update flash BIOS, power on/off system, read VPD, monitor temperature, and monitor fan rotation / integrated I2C bus			
Graphics controller	SVGA / Cirrus Logic® 5436 on planar (primary PCI bus) / 1 MB DRAM std / 2 MB max / to 1024 x 768 at 85 Hz			
Security	Front door keylock / power switch behind door / selectable boot / keyboardless and displayless operation / power-on password / administrator password U bolt support / optional Security Cover / optional Security Cable Kit to enable tamper evident cover with Security Cover and Adv Mgmt Apr			
Software	ServerGuide™ - CD-based automated NOS installation and configuration tool with free license for Lotus Notes Release 4.1 Server (single processor edition), IBM AntiVirus, and APC PowerChute Plus / includes TME 10 NetFinity™ and many utilities		PC Server SMP 200 MHz/256 KB Proc Upg 94G6175 PC Server SMP 166 MHz/512 KB Proc Upg 94G4908 PC Server SMP 200 MHz/512 KB Proc Upg 94G6463 PC Server 32 MB DIMM 94G6473 PC Server 64 MB DIMM 94G6474 PC Server 128 MB DIMM 94G6475 PC Server 256 MB DIMM 94G7079 PC Server Ultra Wide SCSI PCI Adapter 76H5407 PC Server 330 Security Cable Kit 94G6399 PC Server 300 Security Cover II 94G4606 1 MB Graphics Memory 76H0238 PC Server Rack Series 300 Mounting Plate 94G4996	
BIOS	256 KB in Flash EEPROM (SurePath™ BIOS)			
Keyboard / mouse	IBM 101 key keyboard / IBM Enhanced mouse			
Power supply	One 350 watt / auto-restart after momentary loss of power / universal / manual switch			
Other features	Plug and play BIOS / reusable carton with interlocking clips ISO 9241 part 3 enabled / FloThru air flow / DMI support Power-on/standby switch / standby allows power on unattended			

Hot-swap Models ¹	Non hot-swap Model		
• 3.5" SL		5.25" HH (access)	Slot 1: fullsize, 32 bit PCI 2.1 (5.0v), primary PCI bus - used by PC ServeRAID Apt on ESS Slot 2: fullsize, 32 bit PCI 2.1 (5.0v) or 32 bit EISA / 16 bit ISA, primary PCI bus Slot 3: fullsize, 32 bit PCI 2.0 (5.0v) or 32 bit EISA / 16 bit ISA, secondary PCI bus Slot 4: fullsize, 32 bit PCI 2.0 (5.0v) or 32 bit EISA / 16 bit ISA, secondary PCI bus Slot 5: fullsize, 32 bit PCI 2.0 (5.0v) or 32 bit EISA / 16 bit ISA, secondary PCI bus Slot 6: fullsize, 32 bit EISA / 16 bit ISA Slot 7: halfsize, 32 bit EISA / 16 bit ISA Slot 8: halfsize, 32 bit EISA / 16 bit ISA Slot 9: halfsize, 32 bit EISA / 16 bit ISA - Configuration/Setup Utility invoked by pressing F1 at startup - EISA Configuration Utility program on EISA Configuration Diskette to configure EISA and ISA adapters - The Diagnostic Diskette contains QAPLUS/PRO™ which is graphical software for diagnostic and testing (not preloaded) - SCSISelect near startup by pressing CTRL+A Same mechanical as PC Server 300 and 320 Dimensions w/o pedestal: H 24.5" x W 7.5" x D18.6" Dimensions with pedestal: H 25.6" x W 12.4" x D18.6" 43 pounds
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
	CD-ROM	5.25" HH (access)	
	diskette	3.5" SL (access) diskette only	
		3.5" SL (access)	
		3.5" SL (no access)	

HELPWARE for PC SERVER 330 WARRANTY SERVICE SUPPORT

- 3 year warranty (international)
- On site warranty all 3 years
- All cities in all states
- 8 am - 5 pm Mon - Fri coverage
- Next day response time
- Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year
- "PC Server Start Up Support"
- 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support (<http://www.pc.ibm.com>)
- IBM or dealer warranty/service

• = Hot swap carrier on hot-swap models

Note 1: Array model has std disks in hot swap bays in the Hot-Swap Backplane III; 76H2670

Note 2: Non hot-swap models can not be upgraded to a Hot-Swap Backplane

IBM PC Server 704 (4 way SMP)

IBM® PC Server:	1 x Pentium Pro 166 2 x SCSI-2 F/W 2 x 2.14 GB	2 x Pentium Pro 166 2 x SCSI-2 F/W and SCSI-2 F/W RAID 4 x 2.14 GB	1 x Pentium Pro 200 2 x SCSI-2 F/W open bay
Type - model	>= 8650-4BW	>= 8650-7AX	8650-4M0
Disk - capacity	2.14 GB X 2 = 4.28 GB	2.14 GB X 4 = 8.56 GB	None
Disk - features	Hot-swap / 1" high	Hot-swap / 1" high	N/A
Disk - features	Fast/Wide / 9 ms / 7200 rpm	Fast/Wide / 9 ms / 7200 rpm	N/A
SCSI cabling	- Two 16 bit cables from AIC-7870's to two backplanes - One 8 bit cable w/ 3 drops from top backplane to CD-ROM	- Two 16 bit cables from RAID adapter to two backplanes - 4 drop 8 bit cable from one of two AIC-7870's to CD-ROM	- Two 16 bit cables from AIC-7870's to two backplanes - One 8 bit cable w/ 3 drops from top backplane to CD-ROM
Avail / withdrawn date	May 1996 / February 1997	May 1996 / February 1997	October 1996
Processor(s) / MHz	1 x Pentium Pro - 166/66 MHz	2 x Pentium Pro - 166/66 MHz	1 x Pentium Pro - 200/66 MHz
Processor upgrade(s)	Up to 4 Pentium Pro 166/66 or 200/66 MHz processors (same speed) / SMP / MESI cache coherency / MPS 1.4 compliant Two Processor Cards standard which each have two 387 pin ZIF sockets (Intel Socket 8) / four total ZIF sockets		
L2 cache - features	512 KB std/max integrated in each Pentium Pro / write-back / 4 way set associative		
Memory - std / max	64 MB std / 2 GB max	128 MB std / 2 GB max	128 MB std / 2 GB max
Memory - sockets / avail	16 sockets / 12 avail (16 MB SIMMs)	16 sockets / 8 available (16 MB SIMMs)	16 sockets / 12 available (32 MB SIMMs)
Memory - SIMMs	60 ns / 72 pin industry standard SIMMs / 2 or 4 way memory interleaving		◇ 16 MB Memory Option 94G5877 ◇ 32 MB Memory Option 94G5878 ◇ 64 MB Memory Option 94G5879 ◇ 128 MB Memory Option 94G6682
Memory - card	All memory SIMMs installed into one standard memory card		
Memory - install	Memory must be installed in sets of 4, 8, or 16 identical SIMMs per bank		
Memory - ECC	ECC-P / parity memory with Error Checking and Correcting (ECC) mem cntrlr		
SCSI disk controller	All models: 2 x SCSI-2 Fast/Wide PCI Controllers	RAID model: SCSI-2 Fast/Wide PCI RAID Adapter	
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus	
Raid levels	None (use software)	RAID 0, 1, 5	
Adapter vendor / chip	Adaptec® AIC-7870P compatible	Mylex® DAC960P	
Implementation	Both controllers on planar	32 bit busmaster adapter in a PCI slot	
Channels	Each: one (internal); supports 15 devices maximum	Two (both internal or one int/one ext); 7 devices per channel	
Connectors	Each: 1 internal (16 bit); no external connector	2 int (16 bit); 2 ext (16 bit) / use any two connectors	
Features	Data and address parity support on PCI	4 MB cache / battery backup / data, address parity supp on PCI	
Maximum disk capacity	All models: Maximum internal disk capacity: 54 GB with twelve 4.51 GB SCSI-2 disks	RAID: Maximum internal disk capacity: 54 GB with twelve 4.51 GB SCSI-2 disks	
Architecture	PCI 2.1 - 6 slots (Dual PCI bus: 3 slots on one bus and 3 slots on other bus) / Intel Orion 82450GX PCiset / EISA - 4 slots		
32 bit slots / available	10 slots (all 32 bit) / 4 or 5 PCI slots available (LAN Adapter in one slot; RAID Adapter (some models) in one slot; see below)		
Bays / available	(See diagram below): 17 bays / 12 bays support hot-swap disks / Four 5.25" HH bays (1 used) / One 3.5" SL bay (used)		
LAN Adapter	IBM 100/10 PCI Ethernet Adapter (part 25H4374) / full duplex support / busmaster / plug and play / RJ-45 connector		No ethernet adapter
CD-ROM	Internal CD-ROM / 4 x speed / multisession / SCSI-2 interface / 1.6" high / audio support / bootable		
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / diskette cable has a second drop with card edge connector		
Serial port	Two 9 pin serial port / UART 16550A / 56 Kbps maximum supported speed		
Parallel port	One parallel port / supports ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec maximum speed		
Graphics controller	SVGA / ISA / 16 bit / Cirrus Logic® 5424 (on planar) / 512 KB DRAM (to 1 MB) / up to 1024 x 768 at 16 colors with 72 Hz		
Security	Power-on password / administrator password / one front door key lock (for left and right front door) Hot-swap bay door padlock support / both side covers can be locked with padlock Selectable boot / keyboard and mouse disable / power on and reset button disable / diskette write inhibit		
Software	ServerGuide not included (but statement of direction) TME 10 NetFinity™, Lotus Notes 4.1 Server (single processor ed)	OPTIONS PC Server 704 SCSI-2 F/W PCI RAID Adapter 94G5884 PC Server 704 SMP 166 MHz Proc. Upgrade 94G5881 PC Server 704 SMP 200 MHz Proc. Upgrade 94G6678 PC Server 704 Processor Card (for 200 MHz) 94G6681 IBM PC ServeRAID Adapter 70G8489 PC Server 704 2.14 GB SCSI-2 F/W HDD 94G5882 PC Server 704 4.51 GB SCSI-2 F/W HDD 94G6679 PC Server 4-Drop SCSI Cable 94G5883 PC Server .8mm to 68 Pin HD SCSI Cable 94G6276	
BIOS	512 KB in Flash EEPROM on the planar board (AMI™ BIOS)		
Keyboard / mouse	IBM 101 key keyboard / IBM Enhanced mouse (400 dpi)		
Power supply	Two 420 watt (which operate concurrently) / universal Option: 420 watt Redundant Power Supply (94G5880) / backs up two std supplies / install in a third power supply bay		
Other features	Plug and play BIOS support		

<ul style="list-style-type: none"> Lockable hinged door to access power switch, reset button and removable media Dimensions: H 27.4" x W 18" x D 24.75"; 90 pounds 	<p>8650-4BW model: Disks in A1 and B1 with disks mirrored by two SCSI controllers</p> <p>RAID model: Disks in A1, A2, B1, B2 with disks mirrored by two RAID channels</p> <p>Bank 1: 3 HH 3.5" bays</p> <p>Bank 1: 3 HH 3.5" bays</p> <p>Bank 2: 3 HH 3.5" bays</p> <p>Bank 2: 3 HH 3.5" bays</p>	<p>Slot 1: fullsize, 32 bit PCI Slot 2: fullsize, 32 bit PCI Slot 3: fullsize, 32 bit PCI - <i>Ethernet Adapter</i> Slot 4: fullsize, 32 bit PCI Slot 5: fullsize, 32 bit PCI Slot 6: fullsize, 32 bit PCI - <i>RAID Adapter</i> Slot 7: fullsize, 32 bit EISA or 16 bit ISA Slot 8: fullsize, 32 bit EISA or 16 bit ISA Slot 9: fullsize, 32 bit EISA or 16 bit ISA Slot 10: fullsize, 32 bit EISA or 16 bit ISA</p> <p>System Configuration Utility which can be installed on the hard disk. A setup menu is available by pressing F1 at startup</p> <p>QAPlus/PRO™ is graphical software for diagnostic and testing included on a diskette (not preloaded)</p> <p>SCSISelect near startup by pressing CTRL+A</p>	<p>FloThru air flow design utilizing three fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life</p> <p>WARRANTY SERVICE SUPPORT for PC SERVER 704</p> <ul style="list-style-type: none"> ⇒ 3 year warranty (international) ⇒ On site warranty all 3 years ⇒ All cities in all states ⇒ 24 hour / 7 day service coverage ⇒ 4 hour response time ⇒ "PC Server Start Up Support" ⇒ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support ⇒ IBM or dealer warranty/service
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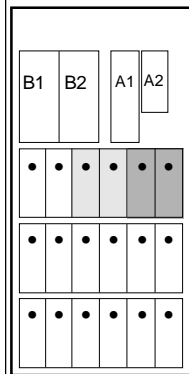
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• = Hot Swap Tray

No warranties are expressed or implied in this summary (S704) Compiled by Roger Dodson, IBM. January 1997

IBM PC Server 720 - 133 to 166 MHz (6 way SMP) - withdrawn

IBM® PC Server:	1 Pentium SCSI-2 F/W open bay	1 Pentium SCSI-2 F/W open bay	2 Pentiums SCSI-2 F/W Array 2 x 2.25 GB = 4.5	1 Pentium SCSI-2 F/W open bay	1 Pentium SCSI-2 F/W open bay	2 Pentiums SCSI-2 F/W Array 2 x 2.25 GB = 4.5 GB
Type - model	➤ 8642-0D0	➤ 8642-0DN	➤ 8642-2DS	➤ 8642-0E1	➤ 8642-0EN	➤ 8642-2E1
Disk - capacity	None	None	2.25 GB X 2 = 4.5 GB	None	None	2.25 GB X 2 = 4.5 GB
Disk - features	N/A	N/A	Hot-swap / 1" high	N/A	N/A	Hot-swap / 1" high
Disk - features	N/A / 4 drop F/W c	N/A / 4 drop F/W	F/W / PFA / 8 ms	N/A / 4 drop F/W c	N/A / 4 drop F/W	F/W / PFA / 8 ms
Avail / withdrawn date	May 1996 / Nov 96	May 1996 / Nov 96	May 1996 / Nov 96	June 1996 / May 97	June 1996 / Oct 96	June 1996 / May 97
Processor(s) / MHz	1 Pent - 133/66	1 Pent - 133/66	2 Pentium - 133/66	1 Pent - 166/66	1 Pent - 166/66	2 Pentium - 166/66
NetWare SMP support	No (94G6055)	Yes (94G6056)	No (94G6055)	Yes (94G6057)	Yes (94G6057)	Yes (94G6057)
Processor upgrade(s)	Up to 6 Pentium 100, 133, 166, 200 MHz Processor Cards (limitations below) / SMP / supports mixed speed Processor Cards					
Standards	MESI cache coherency / MPS 1.1 compliant					
Implementation	Each Pentium is on a Processor Card which includes 512 KB L2 cache and 192 bytes of L3/victim cache Each Processor Card and up to two Memory Cards attach to C-Bus II bus (2 Memory Cards allow only 5 Processor Cards)					
L2 cache - features	512 KB std/max for each Pentium / write-back / organization: 2 way set assoc / 0 wait states / soldered on Processor Card					
L3/victim cache	192 byte for each Pentium (six 32 byte lines) / write-back / fully associative / soldered on Processor Card					
Memory - std / max	64 MB std / 1 GB max / eight x 8 MB SIMMs on one card			128 MB std / 1 GB max / eight x 16 MB SIMMs on one card		
Memory - sockets / avail	Supports 2 memory cards (512 MB max per card) / 60 ns / 72 pin					
Memory - support	Supports 72 pin 60 ns 8, 16, 32 MB ECC SIMMs					
Memory - type	16 sockets / 8 available (on std card) / memory must be installed in sets of 8 identical SIMMs per bank					
	Error Checking and Correcting (ECC) which detects and corrects any single bit errors on the fly; all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system					
Disk controller	Non-array models: SCSI-2 Fast/Wide PCI Adapter 132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus None; modification of Adaptec AHA-2940W 32 bit busmaster adapter in a slot One (internal/external); supports 15 devices max Data and address parity support on PCI			Array models: SCSI-2 Fast/Wide Streaming RAID Adapter 80 MB/sec streaming to MCA; 20 MB/sec on SCSI bus RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays) 32 bit busmaster adapter in a slot (sidecard does not ship std) Two (both internal or one internal/one external); 14 devices max 4 MB cache / data and address parity support on MCA		
Transfer rates	All: 22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard via one Hot-Swap Backplane					
Raid levels	All: Supports 3.5" x 1.0" SL or 1.6" HH SCSI disks					
Implementation	Non-array models: Supports up to 7 SCSI-2 F/W Adapters (7 channels, 105 disks)					
Channels	Non-array maximum disk capacity: 49.61 GB internal + external disks in ext enclosures					
Features	Array mod: Supports up to 4 RAID adptrs (8 channels 53 disks) Array maximum disk capacity: 49.61 GB internal + external disks in ext enclosures					
Bays / available	All: 22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard via one Hot-Swap Backplane					
Disks supported	Opt: Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt aux power supply)					
Architecture	All: 22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard via one Hot-Swap Backplane					
Architecture features	Opt: Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt aux power supply)					
	Array mod: Supports up to 4 RAID adptrs (8 channels 53 disks)					
	Array maximum disk capacity: 49.61 GB internal + external disks in ext enclosures					
Architecture	PCI 2.0 (slots; disk controller) / Micro Channel® (slots; SVGA) / C-Bus™ II 2.0 (multiprocessors; memory)					
Architecture features	Micro Channel: 80 MB/sec streaming data transfer / data and address bus parity					
	PCI: 132 MB/sec data transfer / data and address bus parity / 5.0 volt cards					
	C-Bus II: 8 slots for 1 or 2 memory cards, 5 or 6 processor cards, 1 bridge to PCI card (standard: 1 mem, 1+ proc, 1 bridge)					
32 bit slots / available	400 MB/sec data transfer support / address, data, and control bus ECC / 50 MHz / 64 bit					
CD-ROM	Bootable, internal CD-ROM / double speed and XA / multisession / SCSI-2 interface / 1" high / audio support					
Diskette drive	2.88 MB 3.5" diskette drive / dust cover and media sense / uses 2 drop 18" internal cable for diskette/tape					
Serial ports	Two 9 pin serial ports / DMA support / UART 16550A / 345.6 Kbps maximum supported speed					
Parallel port	One parallel port / DMA support / bidirectional / supports 100 KBps maximum speed					
Graphics controller	SVGA / Cirrus Logic™ GD5428 / Micro Channel / 16 bit (on planar) / 1 MB DRAM / to 1024x726x256 / ISO compliant 72 Hz					
Security	C2 security enabled with LogicLock™					
Security options	Tamper evident cover / Privileged-access password / cover and bay key lock / U Bolt support / power-on password Option: Security Cable Cover / Enhanced 2.88 MB diskette drive with electronic eject and removable media security					
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool					
Systems management	Lotus Notes Release 4.1 Server (single processor edition) in a shrink-wrapped package Includes NetFinity™/PC SystemView (system hardware mgmt software) and many utilities / DMI support					
BIOS	2 x 256 KB in flash memory (SurePath™ BIOS) / upgrades free of charge (via diskette) / remote and timed power on					
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)					
Power supply	470 watt / universal / add 220 watt option required with first optional Backplane / Option: 780 watt Redundant Power supply					
Other features	FloThru™ air flow design / 3 fans for cooling / fast startup mode / selectable boot / Vital Product Data / Unattended Start					

- Built in handle and rolling wheel
- Lockable hinged door to access power switch and removable media
- Dimensions: H 24.5" x W 13.9" x D 29.7"; 69 pounds



Bay A1: std 5.25" CD-ROM
 Bay A2: std 3.5" diskette
 Bay B1: removeable CD "glovebox"
 Bank B: 5.25" FH (or two 5.25 HH)
 Bank C: 2 or 4 disks (shaded)

Bank C Max disk capacity
 Bays 1 - 6 Internal: 49.61 GB
 (11 x 4.51 GB)

Bank D External disks supported
 Bays 1 - 6 Bank C, D, and E
 each holds 6 SL or 3
 HH (or 4 SL/1 HH;
 or 2 SL/2 HH)

SMP Processor Upgrades:

- 100 MHz Processor Option (94G2724)
 - Supports all operating systems except NetWare SMP
 - Only works with "100 MHz Option", "133 MHz Option" and "166 MHz Option II"
- 100 MHz Processor Option II (94G6054)
 - Only for NetWare SMP
 - Works only with "Option II" CPU cards
- 133 MHz Processor Option (94G6055)
 - Supports all operating systems except NetWare SMP
 - Only works with "100 MHz Option", "133 MHz Option" and "166 MHz Option II"
- 133 MHz Processor Option II (94G6056)
 - Works with all operating systems
 - Works only with "Option II CPU" cards
- 166 MHz Processor Option II (94G6057)
 - Works with all operating systems
- 200 MHz Processor Option II (94G5352)
 - Works with all operating systems
 - Includes 2 MB L2 cache

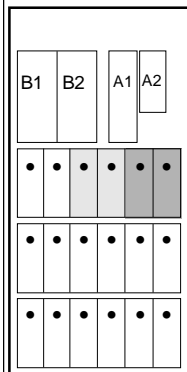
HELPWARE for PC SERVER 720 WARRANTY SERVICE SUPPORT

- 3 year warranty (international)
- On site warranty all 3 years
- All cities in all states
- 24 hour / 7 day service coverage
- 4 hour response time
- "PC Server Start Up Support"
- 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (<http://www.pc.ibm.com>) support
- IBM and dealer warranty/service

IBM PC Server 720 - 100 MHz (6 way SMP) - withdrawn

IBM® PC Server:	1 Pentium SCSI-2 F/W open bay	1 Pentium SCSI-2 F/W Array open bay	2 Pentiums SCSI-2 F/W Array 2 x 2.25 GB	4 Pentiums SCSI-2 F/W Array 4 x 2.25 GB
Type - model	≥ 8642-0Z0	≥ 8642-1Z0	≥ 8642-2ZS	≥ 8642-4ZS
Disk - capacity	None	None	2.25 GB X 2 = 4.5 GB (8 ms)	2.25 GB x 4 = 9 GB (8 ms)
Disk - features	N/A	N/A	Hot-swap / 1" high	Hot-swap / 1" high
Disk - features	N/A / 4 drop F/W cable	N/A / 4 drop F/W cable	Fast/Wide / PFA / 4 drop F/W	Fast/Wide / PFA / 4 drop F/W
Available/withdrawn date	Oct 1995 / Oct 1996	Oct 1995 / Oct 1996	Oct 1995 / Oct 1996	Oct 1995 / Oct 1996
Processor(s) / MHz	1 Pentium - 100/66 MHz	1 Pentium - 100/66 MHz	2 Pentiums - 100/66 MHz	4 Pentiums - 100/66 MHz
Processor upgrade(s)	Up to 6 Pentium 100, 133, 166, 200 MHz Processor Cards (limitations below) / SMP / supports mixed speed Processor Cards			
Standards	MESI cache coherency / MPS 1.1 compliant / Note: all Proc Cards are 94G2724 (see below) with no NetWare SMP sup			
Implementation	Each Pentium is on a Processor Card which includes 512 KB L2 cache and 192 bytes of L3/victim cache Each Processor Card and up to two Memory Cards attach to C-Bus II bus (2 Memory Cards allow only 5 Processor Cards)			
L2 cache - features	512 KB std/max for each Pentium / write-back / organization: 2 way set assoc / 0 wait states / soldered on Processor Card			
L3/victim cache	192 byte for each Pentium (six 32 byte lines) / write-back / fully associative / soldered on Processor Card			
Memory - std / max	64 MB std / 1 GB max (512 MB per card) / 60 ns / 72 pin / eight x 8 MB ECC SIMMs ship std on one card / 2 cards max			
Memory - sockets / avail	16 sockets / 8 available (on std card) ◇ Supports 72 pin 60 ns SIMMs ◇ Supports 8, 16, 32 MB ECC SIMMs			
Memory - support	Memory must be installed in sets of 8 identical SIMMs per bank ◇ 4 way memory interleaving			
Memory - type	Error Checking and Correcting (ECC) which detects and corrects any single bit errors on the fly; all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system			
Disk controller	Non-array models: SCSI-2 Fast/Wide PCI Adapter		Array models: SCSI-2 Fast/Wide Streaming RAID Adapter	
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus		80 MB/sec streaming to MCA; 20 MB/sec on SCSI bus	
Raid levels	None; modification of Adaptec AHA-2940W		RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)	
Implementation	32 bit busmaster adapter in a slot		32 bit busmaster adapter in a slot (sidecard does not ship std)	
Channels	One (internal/external); supports 15 devices max		Two (both internal or one internal/one external); 14 devices max	
Features	Data and address parity support on PCI		4 MB cache / data and address parity support on MCA	
Bays / available	All: 22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard			
Disks supported	All: Supports 3.5" x 1.0" SL or 1.6" HH SCSI disks Different trays required for Fast and F/W disks Non-array models: Supports up to 7 SCSI-2 F/W Adapters (7 channels, 105 disks) Non-array maximum disk capacity: 49.61 GB internal + external disks in ext enclosures		All: Ships with one Hot-Swap Backplane Opt: Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt aux power supply) Array mod: Supports up to 4 RAID adptrs (8 channels 53 disks) Array maximum disk capacity: 49.61 GB internal + external disks in ext enclosures	
Architecture	PCI 2.0 (slots; disk controller) / Micro Channel® (slots; SVGA) / C-Bus™ II 2.0 (multiprocessors; memory)			
Architecture features	Micro Channel: 80 MB/sec streaming data transfer / data and address bus parity PCI: 132 MB/sec data transfer / data and address bus parity / 5.0 volt cards C-Bus II: 8 slots for 1 or 2 memory cards, 5 or 6 processor cards, 1 bridge to PCI card (standard: 1 mem, 1+ proc, 1 bridge) 400 MB/sec data transfer support / address, data, and control bus ECC / 50 MHz / 64 bit			
32 bit slots / available	7 combo PCI/Micro Channel slots (all 32 bit) / 6 slots available (SCSI in one slot)			
CD-ROM	Bootable, internal CD-ROM / double speed and XA / multisession / SCSI-2 interface / 1" high / audio support			
Diskette drive	2.88 MB 3.5" diskette drive / dust cover and media sense / uses 2 drop 18" internal cable for diskette/tape			
Serial ports	Two 9 pin serial ports / DMA support / UART 16550A / 345.6 Kbps maximum supported speed			
Parallel port	One parallel port / DMA support / bidirectional / supports 100 KBps maximum speed			
Graphics controller	SVGA / Cirrus Logic™ GD5428 / Micro Channel / 16 bit (on planar) / 1 MB DRAM / to 1024x726x256 / ISO compliant 72 Hz			
Security	C2 security enabled with LogicLock™			
Security options	Tamper evident cover / Privileged-access password / cover and bay key lock / U Bolt support / power-on password Option: Security Cable Cover / Enhanced 2.88 MB diskette drive with electronic eject and removable media security			
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool			
Systems management	Includes NetFinity™ (system hardware mgmt software) and many utilities / DMI support Option: ServerGuard™ (a Micro Channel adapter and software)			
BIOS	2 x 256 KB in flash memory (SurePath™ BIOS) / upgrades free of charge (via diskette) / remote and timed power on			
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)			
Power supply	470 watt / universal / add 220 watt option required with first optional Backplane / Option: 780 watt Redundant Power supply			
Other features	FloThru™ air flow design / 3 fans for cooling / fast startup mode / selectable boot / Vital Product Data / Unattended Start			

- ◇ Built in handle and rolling wheel
- ◇ Lockable hinged door to access power switch and removable media
- ◇ Dimensions: H 24.5" x W 13.9" x D 29.7"; 69 pounds



Bay A1: std 5.25" CD-ROM
 Bay A2: std 3.5" diskette
 Bay B1: removeable CD "glovebox"
 Bank B: 5.25" FH (or two 5.25 HH)
 Bank C: 2 or 4 disks (shaded)

Bank C Max disk capacity
 Bays 1 - 6 Internal: 49.61 GB
 (11 x 4.51 GB)

Bank D External disks supported
 Bays 1 - 6 Bank C, D, and E
 each holds 6 SL or 3
 HH (or 4 SL/1 HH;
 or 2 SL/2 HH)

SMP Processor Upgrades:

- ◇ 100 MHz Processor Option (94G2724)
 - Supports all operating systems except NetWare SMP
 - Only works with "100 MHz Option", "133 MHz Option" and "166 MHz Option II"
- ◇ 100 MHz Processor Option II (94G6054)
 - Only for NetWare SMP
 - Works only with "Option II" CPU cards
- ◇ 133 MHz Processor Option (94G6055)
 - Supports all operating systems except NetWare SMP
 - Only works with "100 MHz Option", "133 MHz Option" and "166 MHz Option II"
- ◇ 133 MHz Processor Option II (94G6056)
 - Works with all operating systems
 - Works only with "Option II CPU" cards
- ◇ 166 MHz Processor Option II (94G6057)
 - Works with all operating systems
- ◇ 200 MHz Processor Option II (94G5352)
 - Works with all operating systems
 - Includes 2 MB of L2 cache

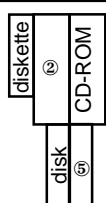
HELPWARE for PC SERVER 720 WARRANTY SERVICE SUPPORT

- ◇ 3 year warranty (international)
- ◇ On site warranty all 3 years
- ◇ All cities in all states
- ◇ 24 hour / 7 day service coverage
- ◇ 4 hour response time
- ◇ "PC Server Start Up Support"
- ◇ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (<http://www.pc.ibm.com>) support
- ◇ IBM and dealer warranty/service

All PC Server 720 systems supported in PC Server Rack Enclosures

IBM PC Server 310 (PCI/MC or PCI/ISA) - withdrawn

IBM® PC Server:	PCI/MC 1.08 GB	PCI/ISA 1.08 GB	PCI/ISA Open bay	PCI/ISA 1.08 GB	PCI/ISA Open bay	PCI/ISA 1.08 GB
Type-model	≈ 8639-MXT	≈ 8639-0XT	≈ 8639-0Z0	≈ 8639-0ZT	≈ 8639-0D0	≈ 8639-0DT
Part number	8639MXT	86390XT	86390Z0	86390ZT	86390D0	86390DT
Disk - individual size	1.08 GB	1.08 GB	None	1.08 GB	None	1.08 GB
Disk - speed	Fast / 10.5 ms	Fast / 10.5 ms	N/A	Fast / 10.5 ms	N/A	Fast / 10.5 ms
Disk - features	PFA / 1" high	PFA / 1" high	N/A	PFA / 1" high	N/A	PFA / 1" high
SCSI cable	4 drop Fast cable	4 drop Fast cable	4 drop Fast cable	4 drop Fast cable	4 drop Fast cable	4 drop Fast cable
LAN adapter	10BaseT ethernet	10BaseT ethernet	10BaseT ethernet	10BaseT ethernet	10BaseT ethernet	10BaseT ethernet
LAN adapter part number	48G7171 in MC slot	48G7169 in ISA slot	48G7169 in ISA slot	48G7169 in ISA slot	48G7169 in ISA slot	48G7169 in ISA slot
Avail / withdrawn date	Oct 95 / Apr 96	Oct 95 / Apr 96	Feb 96 / Nov 96	Feb 96 / Nov 96	Feb 96 / Feb 97	Feb 96 / Feb 97
Processor / MHz	Pentium - 75/50 MHz (P54C) to Pentium 90/60 MHz (P54C)		Pentium - 100/66 MHz (P54C) to Pentium 133/66 MHz		Pentium - 133/66 MHz (P54CS) None	
Upgrade(s)	Remove CPU from 320 pin Zero Insertion Force (ZIF) socket (Intel® Socket 5)					
Upgrade / method						
Dual processing	None					
L2 cache - std / max	256 KB / 256 KB				<i>Memory controller uses a 64 byte, 8 position FIFO write buffer for all writes to memory to allow performance similar to having a write-back L2 cache</i>	
L2 cache - method	8 SOJ + 1 tag modules = 256 KB					
L2 cache - write policy	Adaptive write-back / direct mapped / 12 ns / asynchronous					
Memory - std / max	16 MB / 192 MB / 70 ns / 72 pin / 1" high				Supports 32 MB ECC-on-SIMM (EOS) Kit (2 x 16 MB SIMMs)	
Mem - total sockets / avail	6 sockets / 4 available / gold connectors					
Mem - supported SIMMs	70 ns (supports 4, 8, 16, 32 MB industry standard parity SIMMs) / fast page mode					
Memory - type	Parity / all memory must be installed in matched pairs / all memory addressable by DMA					
Memory	Matched pairs required due to 64 bit path to memory					
SCSI disk controller	SCSI-2 Fast PCI Adapter				All models: Maximum internal disk capacity: 6.75 GB with three 2.25 GB SCSI-2 disks Maximum internal and external disk capacity: 6.75 GB internal + external disks in external enclosures	
Transfer rates	132 MB/sec transfer to PCI; 10 MB/sec on SCSI bus					
Raid levels	None (use software)					
Adapter vendor	Modifications of Adaptec AHA-2940 (custom firmware)					
Implementation	32 bit busmaster adapter in a PCI slot					
Channels	One (internal/external); supports 7 devices max					
Connectors	1 int (8 bit); 1 ext (8 bit) / can use both at same time					
Features	Data and address parity support on PCI				The IBM 4.5 GB SCSI-2 disk is not supported due to thermal reasons	
IDE disk controller	Enhanced IDE / PCI / supports PIO modes 0, 1, 2, 3 / two connectors on planar for optional 2 drop cables					
Architecture	PCI 2.0 (2 shared slots, SCSI adapter, EIDE, graphics) / 132 MB/sec max transfer rate					
Architecture features	ISA slots: 2 shared slots, 3 dedicated slots	Micro Channel slots: 2 shared slots, 3 dedicated slots				
		40 MB/sec streaming / Power On Error Detect				
		6 MB System Partition / error logging				
CD-ROM	Internal CD-ROM / 4 x speed / multisession / SCSI interface / 1.6" high / audio support					
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)					
Serial port	Two 9 pin serial ports / UART 16550A / 115.2 Kbps maximum supported speed / non-DMA					
Parallel port	One / bidirectional (AT, PS/2 EPP, ECP) / DMA only in ECP mode / IEEE 1284 compliant / 2 MB/sec max speed					
Graph - controller / vendor	SVGA / S3™ Vision864 (on MXT, 0XT) or Vision868 (all others) graphics accelerator (on planar)					
Graph - arch / data path	PCI 2.0 / 32 bit / 1 MB DRAM memory std (2 MB max) / supports VESA DPMS and DDC1 signaling					
Graph - resolution / colors	Supports 640 x 480 x 16.7 mil colors, 800 x 600 x 65,536 colors, 1024 x 768 x 256 colors, 1280 x 1024 x 16 colors					
Security - LogicLock™	Tamper evident cover / Lockable media door (secures all media and power switch) / selectable boot / U bolt support					
	Power-on and Supervisor passwords / Diskette Access (user and supervisor, or supervisor only) / diskette disable					
	Diskette write inhibit / serial and parallel port inhibit / unattended start-up / keyboardless and displayless operation					
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool					
Systems management	Includes NetFinity™/PC SystemView and many utilities in ServerGuide / DMI support					
BIOS	128 KB in Flash EEPROM on the planar board (SurePath™ BIOS) / upgrades free of charge (via diskette)					
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)					
Power supply	200 watt / universal / manual switch setting / built in overload, surge protection					
Other features	Plug and Play BIOS					



- Bay ① 3.5", SL 1", access, std diskette - System Partition entered by pressing F1 during POST
- Bay ② 5.25", HH 1.6", access, open - SCSISelect near startup by pressing Ctrl + A
- Bay ③ 5.25", HH 1.6", access, std SCSI CD-ROM - Includes PC Server Diagnostic Diskette (QAPLUS/PRO graphical software for diagnostics and testing)
- Bay ④ 3.5", SL 1", no access, std disk (disk only) - (MC models only) Includes Reference Diskette and Diagnostic Diskette
- Bay ⑤ 3.5", SL 1", no access, open (disk only)

PCI/ISA models:

- Slot 1: fullsize, 16 bit ISA or 32 bit PCI 2.0 (3.3v/5v) - occupied by SCSI adapter
- Slot 2: fullsize, 16 bit ISA or 32 bit PCI 2.0 (3.3v/5v)
- Slot 3: fullsize, 16 bit ISA
- Slot 4: fullsize, 16 bit ISA
- Slot 5: halfsize, 16 bit ISA - occupied by 10baseT ethernet adapter

PCI/MC models:

- Slot 1: fullsize, 32 bit MCA or 32 bit PCI 2.0 (3.3v/5v) - occupied by SCSI adapter
- Slot 2: fullsize, 32 bit MCA or 32 bit PCI 2.0 (3.3v/5v)
- Slot 3: fullsize, 32 bit MCA
- Slot 4: fullsize, 32 bit MCA
- Slot 5: halfsize, 32 bit MCA - occupied by 10baseT ethernet adapter

Dimensions: H 18.2" x W 10.2" x D 17.5"
28 pounds

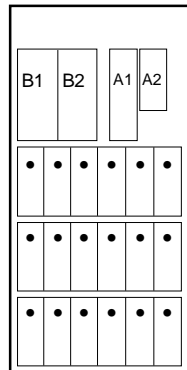
WARRANTY SERVICE SUPPORT for PC SERVER 310

- ⇒ 3 year warranty (international)
- ⇒ On site warranty all 3 years
- ⇒ All cities in all states
- ⇒ 8 am - 5 pm Mon - Fri coverage
- ⇒ Next day response time
- ⇒ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$40 per year
- ⇒ "PC Server Start Up Support"
- ⇒ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support (<http://www.pc.ibm.com>)
- ⇒ IBM or dealer warranty/service

IBM PC Server 520 - 166 MHz (PCI/EISA - 2 way SMP) - withdrawn

IBM® PC Server:	Open bay	Open bay Array	4 x 2.25 GB Array	6 x 2.25 GB Array / Peermaster
Type-model	≧ 8641-EE0	≧ 8641-EE1	≧ 8641-EEE	≧ 8641-EEL
Disk - individual size	None	None	4 x 2.25 = 9 GB	6 x 2.25 = 13.5 GB
Disk - interface	N/A	N/A	Fast/Wide	Fast/Wide
Disk - features	N/A	N/A	8.0 ms / 1" high	8.0 ms / 1" high
Disk - features	N/A	N/A	Hot-swap / PFA	Hot-swap / PFA
Disk - features	N/A	N/A	7200 rpm	7200 rpm
Ethernet Quad Peermaster	Option	Option	Option	Quad Peermaster (PCI Adapter)
Avail / withdrawn date	Aug 96 / Feb 97	Aug 96 / Feb 97	Aug 96 / Feb 97	Sept 96 / Feb 97
Processor / MHz	1 Pentium - 166/66 MHz (P54CS)			
Upgrades	① Supports 2 x Pentium 166/66 MHz, ② 1 x Pentium 200/66 MHz, or ③ 2 x Pentium 200/66 MHz			
Upgrade / method	Add second Pentium to second 320 pin ZIF socket (Intel® Socket 5); part 94G6053 for 166/66 MHz Pentium			
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1 (MPS 1.1)			
L2 cache - std / max	512 KB / 512 KB	Shared L2 cache with full SMP support		Processor upgrade can provide 7% processor subsystem performance improvement
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns) / asynchronous			
Memory - std / max	64 MB / 256 MB			
Mem - total sockets / avail	8 sockets / 6 available / 70 ns / 72 pin			
Mem - supported SIMMs	70 ns speed only (supports 16, 32 MB industry standard parity or EOS SIMMs) / fast page mode			
Memory - type	EOS (ECC-on-SIMM) / all memory must be installed in matched pairs / all memory addressable by DMA			
Memory	Matched pairs required due to 64 bit path to memory			
SCSI disk controller	Non-array models: SCSI-2 Fast/Wide PCI Adapter		Array models: PC ServeRAID Adapter (UltraSCSI); 70G8489	
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus		132 MB/sec transfer to PCI; 40 MB/sec on UltraSCSI bus	
Raid levels	None (use software)		RAID 0, 1, 5 (supports 8 independent arrays and 8 logical arrays)	
Adapter vendor	Modifications of Adaptec AHA-2940W		IBM / adapter has three UltraSCSI controllers with PCI Bridge	
Implementation	32 bit busmaster adapter in a slot		32 bit PCI adapter in a slot	
Channels	One (internal/external); supports 15 devices max		Three (two internal and one int/external); 3 x 15 = 45 devices max	
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / use any two conn		3 int (16 bit); 1 ext (16 bit) / only use int or ext conn on Channel 1	
Features	Data and address parity support on PCI		4 MB cache / data and address parity support on PCI	
Case cut-outs	All PCI/EISA models have one cut out in back to allow cable connection from an internal SCSI connector to ext devices			
Maximum disk capacity	Non-array: Maximum internal disk capacity: 90.2 GB with twenty 4.51 GB SCSI-2 SL disks		Array: Maximum internal disk capacity: 90.2 GB with twenty 4.51 GB SCSI-2 SL disks	
Architecture	PCI 2.0 (2 slots) / PCI/EISA shared slot (1 slot) / EISA (5 slots) / Intel Neptune 82434NX PCI/L2 cache/mem controller			
Architecture features	PCI maximum transfer rate is 132 MB/sec; EISA maximum data transfer rate is 33 MB/sec			
32 bit slots / available	8 slots (all 32 bit) / 5 or 6 slots available (SVGA adapter in one slot; SCSI-2 in one slot; see below)			
Bays / available	22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard (see diagram below)			
	Ships with one Hot-Swap Backplane supporting 6 SL or 3 HH disks (or 4 SL and 1 HH; or 2 SL and 2 HH)			
	Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt auxiliary power supply); part 76H2670			
CD-ROM	Internal CD-ROM / 4 x speed / multisession / SCSI-2 interface / 1.6" high / audio support / bootable on non-array models			
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)			
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed			
Parallel port	One parallel port / DMA support / supports ECP/EPP protocols adhering to IEEE 1284 std / 2 MB/sec max speed			
Graphics - controller	SVGA / ISA / 16 bit (in 32 bit EISA adapter slot) / 1 MB DRAM memory / Supports 800 x 600 & 1024 x 768 w/ 256 colors			
Security	Power-on password / Supervisor password / front cover key lock / U Bolt support / selectable boot			
Security Options	Keyboardless and displayless operation <i>Option:</i> PC Server Security Cable Cover			
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool			
Systems management	Lotus Notes Release 4.1 Server (single processor edition) in a shrink-wrapped package Includes TME 10 NetFinity™ (system hardware mgmt software) and many utilities in ServerGuide / DMI support			
BIOS	128 KB in Flash EEPROM on the planar board (Phoenix™ BIOS) / upgrades free of charge (via diskette)			
Keyboard / mouse	IBM 101 key keyboard / IBM Enhanced mouse (400 dpi)			
Power supply	434 watt / add 220 watt option required with first optional Hot-Swap Backplane / universal <i>Option:</i> 780 watt Redundant Power Option (replaces both 434 and 220 watt power supply)			
Other features	Plug-n-play BIOS support / supported in PC Server Rack Enclosures			

- ⇨ Built in handle and rolling wheel
- ⇨ Two hinged front doors: one for Bank A and B; one for Bank A, B, C; one lock for both doors; 3 position lock
- ⇨ Dimensions: H 24.5" x W 13.9" x D 29.7"; 69 pounds



Bay A1: std 5.25" CD-ROM
 Bay A2: std 3.5" diskette
 Bay B1: removable CD "glovebox"
 Bank B: 5.25" FH (or two 5.25 HH)
 Bank C: std disks
 Bank C Max disk capacity
 Bays 1 - 6 Internal: 49.61 GB
 (11 x 4.51 GB)
 Bank D
 Bays 1 - 6
 Bank E Bank holds 6 SL or
 3 HH (or 4 SL/1
 Bays 1 - 6 HH; or 2 SL/2 HH)

Slot 1: fullsize, 32 bit PCI
 Slot 2: fullsize, 32 bit PCI
 Slot 3: *halfsize, 32 bit PCI or EISA or 16 bit ISA*
 Slot 4: *halfsize, 32 bit EISA or 16 bit ISA*
 Slot 5: *halfsize, 32 bit EISA or 16 bit ISA*
 Slot 6: fullsize, 32 bit EISA or 16 bit ISA
 Slot 7: fullsize, 32 bit EISA or 16 bit ISA
 Slot 8: *fullsize, 32 bit EISA or 16 bit ISA*
 (Slot 3: occupied by PCI SCSI Adapter)
 (Slot 8: occupied by SVGA adapter)

FloThru air flow design utilizing three fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life
 Setup Utility at startup by pressing F2
 SCSISelect near startup by pressing CTRL + A

QAPLUS/PRO™ is graphical software for diagnostic and testing included on a diskette (not preloaded)

- ⇨ Same mechanical as PC Server 500
- ⇨ Similar planar to PC Server 320 PCI/EISA
- ⇨ Reusable carton and interlocking clips
- ⇨ System schematic label inside cover
- EISA Configuration Utility is on the EISA Configuration Diskette

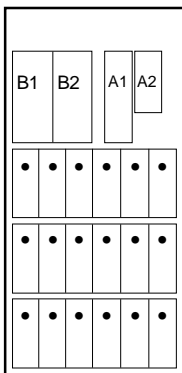
WARRANTY SERVICE SUPPORT for PC SERVER 520

- ⇨ 3 year warranty (international)
- ⇨ On site warranty all 3 years
- ⇨ All cities in all states
- ⇨ 24 hour / 7 day service coverage
- ⇨ 4 hour response time
- ⇨ 24 hour / 7 day telephone, bulletin board, fax, electronic, or internet support
- ⇨ "PC Server Start Up Support"
- ⇨ IBM or dealer warranty/service

IBM PC Server 520 (PCI/MC - 2 way SMP) - withdrawn

IBM® PC Server:	Open bay	1 x 2.25 GB	2 x 2.25 GB Array	4 x 2.25 GB Array	6 x 2.25 GB Array / Peermtr	Open bay	Open bay	4 x 2.25 GB Array
Type-model	≧ 8641-MZ0	≧ 8641-MZV	≧ 8641-MZS	≧ 8641-MZE	≧ 8641-MZL	≧ MD0	≧ MD2	≧ 8641-MDG
Part number	8641MZ0	8641MZV	8641MZS	8641MZE	8641MZL	8641MD0	8641MD2	8641MDG
Disk - individual size	None	2.25 GB	2 x 2.25 = 4.5G	4 x 2.25 = 9 GB	6 x 2.25 = 13.5G	None	None	4 x 2.25 = 9 GB
Disk - interface	N/A	Fast/Wide	Fast/Wide	Fast/Wide	Fast/Wide	N/A	N/A	Fast/Wide
Disk - features	N/A	8.0 ms / 1"	8.0 ms / 1" high	8.0 ms / 1" high	8.0 ms / 1" high	N/A	N/A	8.0 ms / 1" high
Disk - features	N/A	Hot-swap / PFA	Hot-swap / PFA	Hot-swap / PFA	Hot-swap / PFA	N/A	N/A	Hot-swap / PFA
Ethernet Quad Peermaster	Option	Option	Option	Option	Quad Peer (MC)	Option	Option	Option
Available date	Nov 1995	Nov 1995	Nov 1995	Nov 1995	Jan 1996	Aug 1996	Mar 1996	Mar 1996
Processor / MHz	1 Pentium - 100/66 MHz (P54C)					1 Pentium - 133/66 (P54CS)		
Upgrade(s)	1 Pentium 133/66 or 2 Pentium 100/66 MHz or 2 Pentium 133/66 MHz					2 Pentium 133/66		
Upgrade method	Replace or add 100 or 133 MHz Pentium(s) to two 320 pin ZIF sockets (Intel® Socket 5)							
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1 (MPS 1.1)							
L2 cache - std / max	512 KB / 512 KB		Shared L2 cache with full SMP support					
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns) / asynchronous							
Memory - std / max	32 MB / 256 MB / 70 ns / 72 pin					Processor upgrade can provide 7% processor subsystem performance improvement		
Mem - total sockets / avail	8 sockets / 6 available							
Mem - supported SIMMs	70 ns (supports 16, 32 MB industry standard parity or EOS SIMMs) / fast page mode							
Memory - type	EOS (ECC-on-SIMM) / all memory must be installed in matched pairs / all memory addressable by DMA							
Memory	Matched pairs required due to 64 bit path to memory							
SCSI disk controller	All models: SCSI-2 Fast/Wide PCI Controller				Array models: SCSI-2 Fast/Wide PCI RAID Adapter			
Transfer rates	132 MB/sec tranfer to PCI; 20 MB/sec on SCSI bus				132 MB/sec tranfer to PCI; 20 MB/sec on SCSI bus			
Raid levels	None (use software)				RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)			
Adapter vendor	Adaptec AIC7870				Modifications of Mylex DAC960P			
Implementation	32 bit busmaster chip on planar				32 bit busmaster adapter in a slot (sidecard does not ship std)			
Channels	One (internal/external); supports 15 devices max				Two (both internal or one internal/one external); 14 devices max			
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / can use 1 int and ext				2 int (16 bit); 1 ext (16 bit) / use any two connectors			
Features	Data and address parity support on PCI				4 MB cache / data and address parity support on PCI			
Case cut-outs	All PCI/EISA models have one cut out in back to allow cable connection from an internal SCSI connector to ext devices							
Maximum disk capacity	Non-array: Maximum internal disk capacity: 90.2 GB with twenty 4.51 GB SCSI-2 SL disks				Array: Maximum internal disk capacity: 90.2 GB with twenty 4.51 GB SCSI-2 SL disks			
Architecture	PCI 2.0 (2 slots) / Intel® Neptune 82434NX PCI/L2 cache/memory controller / Micro Channel (6 slots)							
Architecture features	PCI maximum transfer rate is 132 MB/sec; Micro Channel maximum data transfer rate is 40 MB/sec (via streaming)							
32 bit slots / available	8 slots (all 32 bit) / 6, 7, or 8 slots available (SCSI PCI RAID in one PCI slot for array models; see below)							
Bays / available	22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard (see diagram below)							
	Ships with one Hot-Swap Backplane supporting 6 SL or 3 HH disks (or 4 SL and 1 HH; or 2 SL and 2 HH)							
	Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt auxilliary power supply)							
CD-ROM	Internal CD-ROM / 4 x speed / multisession / SCSI interface / 1.6" high / audio support / bootable on non-array models							
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)							
Serial port	Two 9 pin serial port / no DMA support / UART 16550A / 345.6 Kbps maximum supported speed							
Parallel port	One parallel port / no DMA support / supports ECP/EPP protocols but not IEEE 1284 standard / 2 MB/sec max speed							
Graphics - controller	SVGA / Cirrus Logic™ 5430 / PCI 2.0 / 32 bit (on planar) / 1 MB DRAM memory							
Security	C2 security enabled with LogicLock™ / tamper evident cover / keyboardless and displayless operation							
Security options	Power-on password / Supervisor password / front cover key lock / U bolt support / selectable boot <i>Option:</i> PC Server Security Cover							
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool							
Systems management	Lotus Notes Release 4.1 Server (single processor edition) in a shrink-wrapped package Includes NetFinity™/PC SystemView (system hardware mgmt software) and many utilities in ServerGuide / DMI support							
BIOS	256 KB in Flash EEPROM on the planar board (SurePath™ BIOS) / upgrades free of charge (via diskette)							
Keyboard / mouse	IBM 101 key keyboard / IBM Enhanced mouse (400 dpi)							
Power supply	434 watt / add 220 watt option required with first optional Hot-Swap Backplane / universal							
Other features	<i>Option:</i> 780 watt Redundant Power Supply (replaces both 434 and 220 watt power supply) / Option for owners name at startup							

- ◊ Built in handle and rolling wheel
- ◊ Lockable hinged door to access power switch and removable media; 69 pounds
- ◊ Dimensions: H 24.5" x W 13.9" x D 29.7"



Bay A1: std 5.25" CD-ROM
 Bay A2: std 3.5" diskette
 Bay B1: removeable CD "glovebox"
 Bank B: 5.25" FH (or two 5.25 HH)
 Bank C: std disks

Bank C Bank holds 6 SL or
 Bays 1 - 6 3 HH (or 4 SL/1 HH;
 or 2 SL/2 HH)

Bank D Model MD0
 Bays 1 - 6 has two hinged
 front doors

Bank E
 Bays 1 - 6

Slot 1: fullsize, 32 bit PCI
 Slot 2: fullsize, 32 bit PCI
 Slot 3: fullsize, 32 bit Micro Channel
 Slot 4: fullsize, 32 bit Micro Channel
 Slot 5: fullsize, 32 bit Micro Channel
 Slot 6: fullsize, 32 bit Micro Channel
 Slot 7: fullsize, 32 bit Micro Channel
 Slot 8: fullsize, 32 bit Micro Channel

(Slot 1: SCSI PCI RAID Adapter in some models)
 (Slot 3: Quad Peermaster in some models)

FloThru air flow design utilizing three fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life

Diskettes included: Reference Diskette (for MCA), Micro Channel Diagnostic Diskette, System Board Diagnostic Diskette (QAPLus/PRO™ graphical software for diagnostic and testing)
 Setup Utility at startup by pressing F1
 SCSISelect near startup by pressing CTRL + A

WARRANTY SERVICE SUPPORT for PC SERVER 520

- 3 year warranty (international)
- On site warranty all 3 years
- All cities in all states
- 24 hour / 7 day service coverage
- 4 hour response time
- 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support
- "PC Server Start Up Support"
- IBM or dealer warranty/service

All trademarks are the property of their respective owners (listed on Trademark sheet)

• = Hot swap carrier;

≧ = Withdrawn effective Oct 1996; MD0, MD2, MDG withdrawn effective February 1997

No warranties are expressed or implied in this summary (S520M) Compiled by Roger Dodson, IBM. January 1997

IBM PC Server 520 - 100 to 133 MHz (PCI/EISA - 2 way SMP) - withdrawn

IBM® PC Server:	Open bay	1 x 2.25 GB	Open bay Array	2 x 2.25 GB Array	4 x 2.25 GB Array	Open bay Array	4 x 2.25 GB Array
Type-model	≥ 8641-EZ0	≥ 8641-EZV	≥ 8641-EZ1	≥ 8641-EZS	≥ 8641-EZE	≥ 8641-ED2	≥ 8641-EDG
Part number	8641EZ0	8641EZV	8641EZ1	8641EZS	8641EZE	8641ED2	8641EDG
Disk - individual size	None	2.25 GB	None	2 x 2.25 = 4.5 GB	4 x 2.25 = 9 GB	None	4 x 2.25 = 9 GB
Disk - interface	N/A	Fast/Wide	N/A	Fast/Wide	Fast/Wide	N/A	Fast/Wide
Disk - features	N/A	8.0 ms / 1" high	N/A	8.0 ms / 1" high	8.0 ms / 1" high	N/A	8.0 ms / 1" high
Disk - features	N/A	PFA	N/A	Hot-swap / PFA	Hot-swap / PFA	N/A	Hot-swap / PFA
Available date	Nov 1995	Nov 1995	Nov 1995	Nov 1995	Nov 1995	Mar 1996	Mar 1996
Processor / MHz	1 Pentium - 100/66 MHz (P54C)					1 Pentium - 133/66 MHz (P54CS)	
Upgrade(s)	1 Pentium 133/66 MHz or 2 Pentium 100/66 MHz or 2 Pentium 133/66 MHz						
Upgrade/method	Replace or add 100 or 133 MHz Pentium(s) to two 320 pin ZIF sockets (Intel® Socket 5)						
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1 (MPS 1.1)						
L2 cache - std / max	512 KB / 512 KB Shared L2 cache with full SMP support						
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns) / asynchronous						
Memory - std / max	32 MB / 256 MB / 70 ns / 72 pin				Processor upgrade can provide 7% processor subsystem performance improvement		
Mem - total sockets / avail	8 sockets / 6 available						
Mem - supported SIMMs	70 ns speed only (supports 16, 32 MB industry standard parity or EOS SIMMs) / fast page mode						
Memory - type	EOS (ECC-on-SIMM) / all memory must be installed in matched pairs / all memory addressable by DMA						
Memory	Matched pairs required due to 64 bit path to memory						
SCSI disk controller	Non-array models: SCSI-2 Fast/Wide PCI Adapter				Array models: SCSI-2 Fast/Wide PCI RAID Adapter		
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus				132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus		
Raid levels	None (use software)				RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)		
Adapter vendor	Modifications of Adaptec AHA-2940W				Modifications of Mylex DAC960P		
Implementation	32 bit busmaster adapter in a slot				32 bit busmaster adapter in a slot (sidecard does not ship std)		
Channels	One (internal/external); supports 15 devices max				Two (both internal or one internal/one external); 14 devices max		
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / use any two conn				2 int (16 bit); 1 ext (16 bit) / use any two connectors		
Features	Data and address parity support on PCI				4 MB cache / data and address parity support on PCI		
Maximum disk capacity	Non-array: Maximum internal disk capacity: 90.2 GB with twenty 4.51 GB SCSI-2 SL disks				Array: Maximum internal disk capacity: 90.2 GB with twenty 4.51 GB SCSI-2 SL disks		
Architecture	PCI 2.0 (2 slots) / PCI/EISA shared slot (1 slot) / EISA (5 slots) / Intel Neptune 82434NX PCI/L2 cache/mem controller						
Architecture features	PCI maximum transfer rate is 132 MB/sec; EISA maximum data transfer rate is 33 MB/sec						
32 bit slots / available	8 slots (all 32 bit) / 5 or 6 slots available (SVGA adapter in one slot; SCSI-2 in one slot; see below)						
Bays / available	22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard (see diagram below)						
	Ships with one Hot-Swap Backplane supporting 6 SL or 3 HH disks (or 4 SL and 1 HH; or 2 SL and 2 HH)						
	Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt auxiliary power supply)						
CD-ROM	Internal CD-ROM / 4 x speed / multisession / SCSI-2 interface / 1.6" high / audio support / bootable on non-array models						
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)						
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed						
Parallel port	One parallel port / DMA support / supports ECP/EPP protocols adhering to IEEE 1284 std / 2 MB/sec max speed						
Graphics - controller	SVGA / ISA / 16 bit (in 32 bit EISA adapter slot) / 1 MB DRAM memory / Supports 800 x 600 & 1024 x 768 w/ 256 colors						
Security	Power-on password / Supervisor password / front cover key lock / U Bolt support / selectable boot						
Security Options	Keyboards and displayless operation <i>Option:</i> PC Server Security Cable Cover						
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool						
Systems management	Lotus Notes Release 4.1 Server (single processor edition) in a shrink-wrapped package Includes NetFinity™/PC SystemView (system hardware mgmt software) and many utilities in ServerGuide / DMI support						
BIOS	128 KB in Flash EEPROM on the planar board (Phoenix™ BIOS) / upgrades free of charge (via diskette)						
Keyboard / mouse	IBM 101 key keyboard / IBM Enhanced mouse (400 dpi)						
Power supply	434 watt / add 220 watt option required with first optional Hot-Swap Backplane / universal <i>Option:</i> 780 watt Redundant Power Option (replaces both 434 and 220 watt power supply)						
Other features	Plug-n-play BIOS support						
<ul style="list-style-type: none"> ⇨ Built in handle and rolling wheel ⇨ Lockable hinged door to access power switch and removable media; 69 pounds ⇨ Dimensions: H 24.5" x W 13.9" x D 29.7" 		Slot 1: fullsize, 32 bit PCI Slot 2: fullsize, 32 bit PCI Slot 3: <i>halfsize, 32 bit PCI or EISA or 16 bit ISA</i> Slot 4: halfsize, 32 bit EISA or 16 bit ISA Slot 5: halfsize, 32 bit EISA or 16 bit ISA Slot 6: fullsize, 32 bit EISA or 16 bit ISA Slot 7: fullsize, 32 bit EISA or 16 bit ISA Slot 8: <i>fullsize, 32 bit EISA or 16 bit ISA</i> (Slot 3: occupied by PCI SCSI Adapter) (Slot 8: occupied by SVGA adapter)		<ul style="list-style-type: none"> ⇨ Same mechanical as PC Server 500 ⇨ Similar planar to PC Server 320 PCI/EISA ⇨ Reusable carton and interlocking clips ⇨ System schematic label inside cover EISA Configuration Utility is on the EISA Configuration Diskette			
 <p>Bay A1: std 5.25" CD-ROM Bay A2: std 3.5" diskette Bay B1: removable CD "glovebox" Bank B: 5.25" FH (or two 5.25 HH) Bank C: std disks</p> <p>Bank C Max disk capacity Bays 1 - 6 Internal: 49.61 GB (11 x 4.51 GB)</p> <p>Bank D Bays 1 - 6 Bank holds 6 SL or</p> <p>Bank E Bays 1 - 6 3 HH (or 4 SL/1 HH; or 2 SL/2 HH)</p>		FloThru air flow design utilizing three fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life		WARRANTY SERVICE SUPPORT for PC SERVER 520 <ul style="list-style-type: none"> ⇨ 3 year warranty (international) ⇨ On site warranty all 3 years ⇨ All cities in all states ⇨ 24 hour / 7 day service coverage ⇨ 4 hour response time ⇨ 24 hour / 7 day telephone, bulletin board, fax, electronic, or Internet support ⇨ "PC Server Start Up Support" ⇨ IBM or dealer warranty/service 			
Setup Utility at startup by pressing F2 SCSISelect near startup by pressing CTRL + A		QAPlus/PRO™ is graphical software for diagnostic and testing included on a diskette (not preloaded)					

All trademarks are the property of their respective owners (listed on Trademark sheet)

• = Hot swap carrier; ≥ = withdrawn effective Oct 1996; models ED2, EDG effective Nov 1996

No warranties are expressed or implied in this summary

(S520) Compiled by Roger Dodson, IBM. January 1997

IBM PC Server 320 - 100 to 133 MHz (PCI/MC - 2 way SMP) - withdrawn

IBM® PC Server:	Open bay	1 x 2.25 GB	Open bay Array	Open bay	Open bay	1 x 2.25 GB	2 x 2.25 GB Array	Open bay	
Type-model	all 8640	≧ MZ0	≧ MZV	≧ MZ1	≧ MZ2	≧ MDO	≧ MDV	≧ MDS	≧ MD2
Disk - individual size	None	2.25 GB	None	None	None	2.25 GB	2 x 2.25 = 4.5 GB	None	None
Disk - interface	N/A	Fast/Wide	N/A	N/A	N/A	Fast/Wide	Fast/Wide	N/A	N/A
Disk - features	N/A	8.0 ms / 1" high	N/A	N/A	N/A	8.0 ms / 1" high	8.0 ms / 1" high	N/A	N/A
Disk - features	N/A	Hot-Swap / PFA	N/A	N/A	N/A	Hot-Swap / PFA	Hot-swap / PFA	N/A	N/A
Available date	March 1996	March 1996	March 1996	April 1996	March 1996	March 1996	March 1996	March 1996	April 1996
Processor / MHz	1 Pentium - 100/66 MHz (P54C)				1 Pentium - 133/66 MHz (P54CS)				
Upgrade(s)	① 1 x Pentium 100/66 MHz ② 1 x 133/66 ③ 2 x 133/66				① 2 x Pentium 133/66 MHz				
Upgrade / method	SMP via second Pentium / add second same speed (100 or 133) Pentium to open 320 pin ZIF socket (Intel® Socket 5)								
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1								
L2 cache - std / max	256 KB / 512 KB		Shared L2 cache with full SMP support				Processor and L2 cache upgrade can provide 15% processor subsystem performance improvement		
L2 cache - method	Replace 256 KB SIMM with 512 KB SIMM								
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns) / asynchronous								
Memory - type	Parity	Parity	Parity	EOS	Parity	Parity	Parity	EOS	
Memory - std/ 256MB max	16 MB	16 MB	16 MB	32 MB	16 MB	16 MB	16 MB	32 MB	
Mem - total sockets / avail	8 sockets / 6 available 70 ns / 72 pin / gold connectors / fast-page mode					All models support 32 MB ECC-on-SIMM (EOS) Kit (2 x 16 MB SIMMs) for PC Server			
Mem - supported SIMMs	70 ns (supports 8, 16, 32 MB industry standard parity or EOS SIMMs)					520 and 64 MB ECC-on-SIMM (EOS) Kit (2 x 32 MB SIMMs) for PC Server 520 / 70 ns			
Memory - pairs	All memory must be installed in matched pairs								
Memory	Matched pairs required due to 64 bit path to memory								
SCSI disk controller	All models: SCSI-2 Fast/Wide PCI Controller				Array models: SCSI-2 Fast/Wide PCI RAID Adapter				
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus				132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus				
Raid levels	None (use software)				RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)				
Adapter vendor	Adaptec AIC7870				Modifications of Mylex DAC960P				
Implementation	32 bit busmaster chip on planar				32 bit busmaster adapter in a slot (sidecard does not ship std)				
Channels	One (internal/external); supports 15 devices max				Two (both internal or one internal/one external); 14 devices max				
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / can use 1 int and ext				2 int (16 bit); 1 ext (16 bit) / use any two connectors				
Features	Data and address parity support on PCI				4 MB cache / data and address parity support on PCI				
Maximum disk capacity	Maximum internal disk capacity: 29.31 GB with six 4.51 GB and one 2.25 GB in bottom Maximum internal and external disk capacity: 29.31 GB internal + external disks in ext enclosures								
Architecture	PCI 2.0 (2 slots) 33 MHz / Intel® Neptune 82434NX PCMC / Micro Channel (6 slots)								
Architecture features	PCI maximum transfer rate is 132 MB/sec; Micro Channel maximum data transfer rate is 40 MB/sec (via streaming)								
32 bit slots / available	8 slots (all 32 bit) / 7 or 8 slots available (SCSI PCI RAID in one PCI slot for array models; see below)								
Bays / available	9 bays / 5 or 6 available (see diagram below) / bays occupied by diskette drive, CD-ROM drive, and 0,1, or 2 disks								
CD-ROM	Internal CD-ROM / 4 x speed / multisession / SCSI interface								
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)								
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed								
Parallel port	One parallel port / supports ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec max speed								
Graph - controller / vendor	SVGA / Cirrus Logic™ 5430				Supports 800 x 600 x 65,536 colors, 1024 x 768				
Graph - arch / data path	PCI 2.0 / 32 bit (on planar) / 1 MB DRAM memory				x 256 colors, 1280 x 1024 x 16 colors				
Security	Lockable media door (secures all media and power switch) / selectable boot / keyboardless and displayless operation Power-on and Supervisor passwords / Diskette Access (user and supervisor, or supervisor only) U bolt support / Security Cover optional / C2 Security Kit optional								
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool / Lotus Notes 4.1								
Systems management	Includes NetFinity™ and many utilities in ServerGuide CD Library / DMI support								
BIOS	256 KB in Flash EEPROM on the planar board (SurePath™ BIOS) / upgrades free of charge (via diskette)								
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)								
Power supply	300 watt / universal / manual switch setting / built in overload, surge protection								
Other features	Option for owners name at startup / all systems supported in PC Server Rack Enclosures								

<p>All Models</p>	5.25" HH (access)	or Full Height	Slot 1: fullsize, 32 bit PCI	Same mechanical as PC Server 300 Dimensions: H 24.5" x W 7.5" x D 18.6" 43 pounds
	5.25" HH (access)		Slot 2: fullsize, 32 bit PCI	
5.25" HH (access)	or Full Height	Slot 3: halfsize, 32 bit Micro Channel	FloThru air flow design utilizing two fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life	
5.25" HH (access)		Slot 4: halfsize, 32 bit Micro Channel		
5.25" HH (access)	or Full Height	Slot 5: fullsize, 32 bit Micro Channel	Diskettes included: Reference Diskette (for MCA), Micro Channel Diagnostic Diskette, System Board Diagnostic Diskette (QAPLUS/PRO™ graphical software for diagnostic and testing)	
5.25" HH (access)		Slot 6: fullsize, 32 bit Micro Channel		
CD-ROM	or Full Height	Slot 7: fullsize, 32 bit Micro Channel	- Setup Utility at startup by pressing F1 - SCSISelect near startup by pressing CTRL+A	
diskette		Slot 8: fullsize, 32 bit Micro Channel		
diskette	3.5" SL (access) diskette only			
diskette	3.5" SL (access)			

WARRANTY SERVICE SUPPORT for PC SERVER 320

- ⇒ 3 year warranty (international)
- ⇒ On site warranty all 3 years
- ⇒ All cities in all states
- ⇒ 8 am - 5 pm Mon - Fri coverage
- ⇒ Next day response time
- ⇒ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year
- ⇒ "PC Server Start Up Support"
- ⇒ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support (<http://www.pc.ibm.com>)
- ⇒ IBM or dealer warranty/service

IBM PC Server 320 - 100 to 133 MHz (PCI/EISA - 2 way SMP) - withdrawn

IBM® PC Server:	Open	1 x 2.25 G	Open Array	Open	Open Array	Open bay	1 x 2.25 G	Open bay Array	2 x 2.25 GB Array	Open	Open Array	
Type-model	all 8640	≧ 0Z0	≧ 0ZV	≧ 1Z0	≧ 2Z0	≧ 3Z0	≧ 0D0	≧ 0DV	≧ 1D0	≧ 1DS	≧ 2D0	≧ 3D0
Disk - individual size	None	2.25 GB	None	None	None	None	None	2.25 GB	None	2 x 2.25 = 4.5G	None	None
Disk - interface	N/A	Fast/Wide	N/A	N/A	N/A	N/A	N/A	Fast/Wide	N/A	Fast/Wide	N/A	N/A
Disk - features	N/A	8.0 ms / 1"	N/A	N/A	N/A	N/A	N/A	8.0 ms / 1"	N/A	8.0 ms / 1" high	N/A	N/A
Disk - features	N/A	PFA	N/A	N/A	N/A	N/A	N/A	PFA	N/A	Hot-swap / PFA	N/A	N/A
Available date	Mar 96	Mar 96	Mar 96	Apr 96	Apr 96	Mar 96	Mar 96	Mar 96	Mar 96	Mar 96	Apr 96	Apr 96
Processor / MHz	1 Pentium - 100/66 MHz (P54C)						1 Pentium - 133/66 MHz (P54CS)					
Upgrade(s)	① 2 x 100/66 MHz ② 1 x 133/66 ③ 2 x 133/66						① 2 x Pentium 133/66 MHz					
Upgrade / method	SMP via second Pentium / add second same speed (100 or 133) Pentium to open 320 pin ZIF socket (Intel® Socket 5)											
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1											
L2 cache - std / max	256 KB / 512 KB			Shared L2 cache with full SMP support						Processor and L2 cache upgrade can provide 15% processor subsystem performance improvement		
L2 cache - method	Upgrade to 512 KB via 8 DIP modules											
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns)											
Memory - type	Parity	Parity	Parity	EOS	EOS	Parity	Parity	Parity	Parity	EOS	EOS	
Mem - std/ 256 MB max	16 MB	16 MB	16 MB	32 MB	32 MB	16 MB	16 MB	16 MB	16 MB	32 MB	32 MB	
Mem - supported SIMMs	70 ns speed only (supports 8, 16, 32 MB industry standard parity or EOS SIMMs) / 70 ns / 72 pin / 8 sockets / 6 available											
Memory - pairs	Parity / all memory must be installed in matched pairs / fast-page mode											
Memory	Matched pairs required due to 64 bit path to memory / gold connectors											
IDE disk controller	All: Enhanced IDE on ISA bus / optional 2 drop IDE cable required / PIO modes 0, 1, 2, 3 / Mode 3 = 11.1 MB/sec											
SCSI disk controller	Non-array models: SCSI-2 Fast/Wide PCI Adapter						Array models: SCSI-2 Fast/Wide PCI RAID Adapter					
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus						132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus					
Raid levels	None (use software)						RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)					
Adapter vendor	Modifications of Adaptec AHA-2940W						Modifications of Mylex DAC960P					
Implementation	32 bit busmaster adapter in a slot						32 bit busmaster adapter in a slot (sidecard does not ship std)					
Channels	One (internal/external); supports 15 devices max						Two (both internal or one internal/one external); 14 devices max					
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / use any two conn						2 int (16 bit); 1 ext (16 bit) / use any two connectors					
Features	Data and address parity support on PCI						4 MB cache / data and address parity support on PCI					
Maximum disk capacity	Non-array: Maximum internal disk capacity: 27.0 GB with six 4.51 GB SCSI-2 disks Maximum internal and external disk capacity: 27.0 GB internal + external disks in ext enclosures						Array: Maximum internal disk capacity: 31.57 GB with six 4.51 GB and one 4.51 GB in bottom Maximum internal and external disk capacity: 31.57 GB internal + external disks in ext enclosures					
Architecture	PCI (2 slots) 33 MHz / PCI/EISA shared slot (1 slot) / EISA (5 slots) / Intel® Neptune 82434NX PCMC											
Architecture features	PCI maximum transfer rate is 132 MB/sec; EISA maximum data transfer rate is 33 MB/sec											
32 bit slots / available	8 slots (all 32 bit) / 6 slots available (SVGA adapter in one slot; SCSI-2 Adapter in one slot; see below)											
Bays / available	9 bays for non array; 10 bays for array / 6, 7, or 8 available (see diagram below)											
CD-ROM	Internal CD-ROM / 4 x speed / multisection / SCSI-2 interface											
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)											
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed											
Parallel port	One parallel port / supports ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec max speed											
Graph - controller / vendor	SVGA / Boca Research™ or other vendor									Supports 800 x 600 and 1024 x 768 with 256 colors		
Graph - arch / data path	ISA / 16 bit (in 32 bit EISA adapter slot) / 1 MB DRAM memory											
Security	Power switch behind door / selectable boot / keyboardless and displayless operation / Security Cover optional Power-on and Supervisor passwords / Diskette Access (user and supervisor, or supervisor only) Front door keylock / U bolt support / Fixed Disk Boot Sector (write protect)											
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool / Lotus Notes 4.1											
Systems management	Includes NetFinity™ and many utilities in ServerGuide CD Library / DMI support											
BIOS	128 KB in Flash EEPROM on the planar board (Phoenix™ BIOS) / upgrades free of charge (via diskette)											
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)											
Power supply	300 watt / universal / manual switch setting / built in overload, surge protection											
Other features	All systems supported in PC Server Rack Enclosures											
Array Models	Non-array Models¹	Slot 1: fullsize, 32 bit PCI Slot 2: fullsize, 32 bit PCI Slot 3: halfsize, 32 bit PCI or EISA or 16 bit ISA Slot 4: halfsize, 32 bit EISA or 16 bit ISA Slot 5: halfsize, 32 bit EISA or 16 bit ISA Slot 6: fullsize, 32 bit EISA or 16 bit ISA Slot 7: fullsize, 32 bit EISA or 16 bit ISA Slot 8: fullsize, 32 bit EISA or 16 bit ISA								Same mechanical as PC Server 300 Dimensions: H 24.5" x W 7.5" x D 18.6" 43 pounds Plug-n-play BIOS support		
• 3.5" SL		5.25" HH (access)								or Full Height		
• 3.5" SL		5.25" HH (access)										
• 3.5" SL		5.25" HH (access)										
• 3.5" SL		5.25" HH (access)										
• 3.5" SL		5.25" HH (access)										
• 3.5" SL		5.25" HH (access)								or Half Height		
	CD-ROM	5.25" HH (access)										
	diskette	3.5" SL (access) diskette only										
	Optional diskette/tape	3.5" SL (access)								or Half Height		
	disk ²	3.5" SL (no access)										
<p>• = Hot swap carrier on Array models</p> <p>Note 1: Non-array models can be upgraded to 6 bay "Hot-Swap Bay Option"</p> <p>Note 2: Array model has std disks in hot swap bays</p>												
						<p>FloThru™ air flow design utilizing two fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life</p> <p>EISA Configuration Utility is on the EISA Configuration Diskette</p> <ul style="list-style-type: none"> - Setup Utility at startup by pressing F2 - SCSISelect near startup by pressing CTRL+A - QAPIus/PRO™ is graphical software for diagnostic and testing included on a diskette (not preloaded) 						
<p>WARRANTY SERVICE SUPPORT for PC SERVER 320</p> <ul style="list-style-type: none"> ⇒ 3 year warranty (international) ⇒ On site warranty all 3 years ⇒ All cities in all states ⇒ 8 am - 5 pm Mon - Fri coverage ⇒ Next day response time ⇒ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year ⇒ "PC Server Start Up Support" ⇒ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet support (http://www.pc.ibm.com) ⇒ IBM or dealer warranty/service 												

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 ≧ 0ZV, 1Z0, 1D0, 1DS withdrawn from marketing effective July 1996; 0Z0, 2Z0, 3Z0, 0D0, 0DV withdrawn November 1996; 2D0, 3D0 withdrawn February 1997

No warranties are expressed or implied in this summary (S320E) Compiled by Roger Dodson, IBM. January 1997

IBM PC Server 320 - 75 to 90 MHz (PCI/EISA - 2 way SMP) - withdrawn

IBM® PC Server:	SCSI-2 F/W open bay	SCSI-2 F/W 1.08 GB	SCSI-2 F/W open bay	SCSI-2 F/W 1.12 GB	SCSI-2 F/W Array open bay	SCSI-2 F/W Array 2 x 1.12 GB
Type-model	≧ 8640-0X0	≧ 8640-0XT	≧ 8640-0Y0	≧ 8640-0YT	≧ 8640-1Y0	≧ 8640-1YT
Disk - individual size	None	1.08 GB	None	1.12 GB	None	1.12 GB X 2 = 2.25 GB
Disk - speed	N/A	Fast / 10.5 ms	N/A	Fast/Wide / 8.0 ms	N/A	Fast/Wide / 6.9 ms
Disk - features	N/A	PFA / 1" high	N/A	PFA / 1" high	N/A	Hot-swap / PFA / 1" high
SCSI cable	4 drop Fast	4 drop Fast	4 drop Fast	7 drop F/W cable	2 drop F/W	2 drop F/W cable
Available date	October 1995	October 1995	March 1995	March 1995	June 1995	June 1995
Processor / MHz	1 Pentium - 75/50 MHz (P54C)			1 Pentium - 90/60 MHz (P54C)		
Upgrade(s)	① P 90 ② 2 x P75 ③ 2 x P90			① dual Pentium 90/60 MHz		
Upgrade / method	SMP via second Pentium / add second same speed (75 or 90) Pentium to open 320 pin ZIF socket (Intel® Socket 5)					
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1					
L2 cache - std / max	256 KB / 512 KB		Shared L2 cache with full SMP support			Processor upgrade can provide
L2 cache - method	Upgrade to 512 KB via 8 DIP modules					15% processor subsystem
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns)					performance improvement
Memory - std/max/sockets	16 MB / 256 MB / 70 ns / 72 pin / 8 sockets / 6 available			Supports 4, 8, 16, 32 MB EOS		
Mem - supported SIMMs	70 ns speed only (supports 4, 8, 16, 32 MB industry standard parity SIMMs)			(ECC-on-SIMM) 70ns memory		
Memory - type	Parity / all memory must be installed in matched pairs / all memory addressable by DMA / fast-page mode					
Memory	Matched pairs required due to 64 bit path to memory / gold connectors					
IDE disk controller	All: Enhanced IDE on ISA bus / optional 2 drop IDE cable required / PIO modes 0, 1, 2, 3 / Mode 3 = 11.1 MB/sec					
SCSI disk controller	Non-array models: SCSI-2 Fast/Wide PCI Adapter			Array models: SCSI-2 Fast/Wide PCI RAID Adapter		
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus			132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus		
Raid levels	None (use software)			RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)		
Adapter vendor	Modifications of Adaptec AHA-2940W			Modifications of Mylex DAC960P		
Implementation	32 bit busmaster adapter in a slot			32 bit busmaster adapter in a slot (sidecard does not ship std)		
Channels	One (internal/external); supports 15 devices max			Two (both internal or one internal/one external); 14 devices max		
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / use any two conn			2 int (16 bit); 1 ext (16 bit) / use any two connectors		
Features	Data and address parity support on PCI			4 MB cache / data and address parity support on PCI		
Maximum disk capacity	Non-array: Maximum internal disk capacity: 27.0 GB with six 4.51 GB SCSI-2 disks Maximum internal and external disk capacity: 27.0 GB internal + external disks in ext enclosures			Array: Maximum internal disk capacity: 18.0 GB with three 4.51 GB and one 4.51 GB in bottom Maximum internal and external disk capacity: 18.0 GB internal + external disks in ext enclosures		
Architecture	PCI (2 slots) / PCI/EISA shared slot (1 slot) / EISA (5 slots) / Intel® Neptune 82434NX PCMC					
Architecture features	PCI maximum transfer rate is 132 MB/sec; EISA maximum data transfer rate is 33 MB/sec					
32 bit slots / available	8 slots (all 32 bit) / 6 slots available (SVGA adapter in one slot; SCSI-2 in one slot; see below)					
Bays / available	9 bays for non array; 10 bays for array / 6, 7, or 8 available (see diagram below)					
CD-ROM	Internal CD-ROM / double speed (or 4 x speed on 75 MHz) / multisession / SCSI-2 interface / 1.6" high / audio support					
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)					
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed					
Parallel port	One parallel port / supports ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec max speed					
Graph - controller / vendor	SVGA / Boca Research™ (adapter is a dumb frame buffer)				Supports 800 x 600 and	
Graph - arch / data path	ISA / 16 bit (in 32 bit EISA adapter slot) / 1 MB DRAM memory				1024 x 768 with 256 colors	
Security	Power switch behind door / selectable boot / keyboardless and displayless operation / Security Cover optional Power-on and Supervisor passwords / Diskette Access (user and supervisor, or supervisor only) Front door keylock / U bolt support / Fixed Disk Boot Sector (write protect)					
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool					
Systems management	Includes NetFinity™ (system hardware mgmt software) and many utilities in ServerGuide / DMI support					
BIOS	128 KB in Flash EEPROM on the planar board (Phoenix™ BIOS) / upgrades free of charge (via diskette)					
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)					
Power supply	300 watt / universal / manual switch setting / built in overload, surge protection					
Other features	Plug-n-play BIOS support					

Array Models	Non-array Models ¹			
• 3.5" SL		5.25" HH (access)] or Full Height	Slot 1: fullsize, 32 bit PCI
• 3.5" SL		5.25" HH (access)		Slot 2: fullsize, 32 bit PCI
• 3.5" SL		5.25" HH (access)		Slot 3: halfsize, 32 bit PCI or EISA or 16 bit ISA
• 3.5" SL		5.25" HH (access)		Slot 4: halfsize, 32 bit EISA or 16 bit ISA
• 3.5" SL		5.25" HH (access)		Slot 5: halfsize, 32 bit EISA or 16 bit ISA
• 3.5" SL		5.25" HH (access)		Slot 6: fullsize, 32 bit EISA or 16 bit ISA
		5.25" HH (access)] or Half Height	Slot 7: fullsize, 32 bit EISA or 16 bit ISA
	CD-ROM	5.25" HH (access)		Slot 8: fullsize, 32 bit EISA or 16 bit ISA
	diskette	3.5" SL (access) diskette only		(Slot 3: occupied by PCI SCSI Adapter) (Slot 8: occupied by SVGA adapter)
	Optional diskette/tape	3.5" SL (access)		FloThru™ air flow design utilizing two fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life
	std disk	3.5" SL (no access)		EISA Configuration Utility is on the EISA Configuration Diskette
<ul style="list-style-type: none"> • = Hot swap carrier on Array models 				
Note 1: Non-array models can be upgraded to 6 bay "Hot-Swap Bay Option"				
<p>Same mechanical as PC Server 300 Dimensions: H 24.5" x W 7.5" x D 18.6" 43 pounds</p> <p>HELPWARE for PC SERVER 320 WARRANTY SERVICE SUPPORT</p> <ul style="list-style-type: none"> ⇒ 3 year warranty (international) ⇒ On site warranty all 3 years ⇒ All cities in all states ⇒ 8 am - 5 pm Mon - Fri coverage ⇒ Next day response time ⇒ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year ⇒ "PC Server Start Up Support" ⇒ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (http://www.pc.ibm.com) support ⇒ IBM or dealer warranty/service 				

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≧ All withdrawn effective June 1996

No warranties are expressed or implied in this summary (S320) Compiled by Roger Dodson, IBM. May 1996

IBM PC Server 320 - 75 to 90 MHz (PCI/MC - 2 way SMP) - withdrawn

IBM® PC Server:	SCSI-2 F/W open bay	SCSI-2 F/W 1.08 GB	SCSI-2 F/W open bay	SCSI-2 F/W 1.12 GB	SCSI-2 F/W Array 2 x 1.12 GB
Type-model	≧ 8640-MXO	≧ 8640-MXT	≧ 8640-MYO	≧ 8640-MYT	≧ 8640-MYR
Disk - individual size	None	1.08 GB	None	1.12 GB	1.12 GB X 2 = 2.25 GB
Disk - speed	N/A	Fast / 10.5 ms	N/A	Fast/Wide / 8 ms	Fast/Wide / 8.0 ms
Disk - features	N/A	PFA / 1" high	Hot-swap (empty)	Hot-swap / PFA / 1"	Hot-swap / PFA / 1" high
SCSI cable	4 drop Fast cable		2 drop F/W cable w/ conv for CD		2 drop F/W cable w/ converter for CD-ROM
Available date	July 1995		July 1995		July 1995
Processor / MHz	1 Pentium - 75/50 MHz (P54C)		1 Pentium - 90/60 MHz (P54C)		1 Pentium - 90/60 MHz (P54C)
Upgrade(s)	① Pentium 90 ② dual Pentium 75/50 ③ dual Pentium 90/60 MHz		① dual Pentium 90/60 MHz		① dual Pentium 90/60 MHz
Upgrade / method	SMP via second Pentium / add second same speed (75 or 90) Pentium to open 320 pin ZIF socket (Intel® Socket 5)				
Dual processing	Symmetrical Multiprocessing (SMP) / Compatible with MultiProcessor Specification 1.1				
L2 cache - std / max	256 KB / 512 KB Shared L2 cache with full SMP support				
L2 cache - method	Replace 256 KB SIMM with 512 KB SIMM				
L2 cache - write policy	Write-back (organization: direct mapped; 15 ns) / asynchronous				
Memory - std / max	16 MB / 256 MB / 70 ns / 72 pin / gold connectors / fast-page mode				Supports 4, 8, 16, 32 MB EOS
Mem - total sockets / avail	8 sockets / 6 available				(ECC-on-SIMM) 70ns memory
Mem - supported SIMMs	70 ns (supports 4, 8, 16, 32 MB industry standard parity SIMMs) / fast page mode				
Memory - type	Parity / all memory must be installed in matched pairs				
Memory	Matched pairs required due to 64 bit path to memory / all memory addressable by DMA				
SCSI disk controller	All models: SCSI-2 Fast/Wide PCI Controller			Array models: SCSI-2 Fast/Wide PCI RAID Adapter	
Transfer rates	132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus			132 MB/sec transfer to PCI; 20 MB/sec on SCSI bus	
Raid levels	None (use software)			RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)	
Adapter vendor	Adaptec AIC7870			Modifications of Mylex DAC960P	
Implementation	32 bit busmaster chip on planar			32 bit busmaster adapter in a slot (sidecard does not ship std)	
Channels	One (internal/external); supports 15 devices max			Two (both internal or one internal/one external); 14 devices max	
Connectors	2 int (8 and 16 bit); 1 ext (16 bit) / can use 1 int and ext			2 int (16 bit); 1 ext (16 bit) / use any two connectors	
Features	Data and address parity support on PCI			4 MB cache / data and address parity support on PCI	
Maximum disk capacity	75/50 MHz: Maximum internal disk capacity: 24.8 GB with five 4.51 GB SCSI-2 disks + one 2.25 GB Maximum internal and external disk capacity: 24.8 GB internal + external disks in ext enclosures			90/60 MHz: Maximum internal disk capacity: 15.7 GB with three 4.51 GB and one 2.25 GB in bottom Maximum internal and external disk capacity: 15.7 GB internal + external disks in ext enclosures	
Architecture	PCI 2.0 (2 slots) / Intel® Neptune 82434NX PCMC / Micro Channel (6 slots)				
Architecture features	PCI maximum transfer rate is 132 MB/sec; Micro Channel maximum data transfer rate is 40 MB/sec (via streaming)				
32 bit slots / available	8 slots (all 32 bit) / 7 or 8 slots available (SCSI PCI RAID in one PCI slot for array models; see below)				
Bays / available	8 bays for 75/50 MHz; 9 bays for 90/60 MHz / 5 or 6 available (see diagram below)				
CD-ROM	Internal CD-ROM / double speed / multisession / SCSI interface / 1.6" high / no audio support				
Diskette drive	3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 drop cable)				
Serial port	Two 9 pin serial port / UART 16550A / 115.2 Kbps maximum supported speed				
Parallel port	One parallel port / supports ECP/EPP protocols adhering to IEEE 1284 standard / 2 MB/sec max speed				
Graph - controller / vendor	SVGA / Cirrus Logic™ 5430			Supports 800 x 600 x 65,536 colors, 1024 x 768	
Graph - arch / data path	PCI 2.0 / 32 bit (on planar) / 1 MB DRAM memory			x 256 colors, 1280 x 1024 x 16 colors	
Security	Lockable media door (secures all media and power switch) / selectable boot / keyboardless and displayless operation Power-on and Supervisor passwords / Diskette Access (user and supervisor, or supervisor only) U bolt support / Security Cover optional / C2 Security Kit optional				
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool				
Systems management	Includes NetFinity™ 3.0 (system hardware mgmt software) and many utilities in ServerGuide 2.21 / DMI support				
BIOS	256 KB in Flash EEPROM on the planar board (SurePath™ BIOS) / upgrades free of charge (via diskette)				
Keyboard / mouse	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)				
Power supply	300 watt / universal / manual switch setting / built in overload, surge protection				
Other features	Option for owners name at startup				
90/60 MHz Models¹	75/50 MHz Models²		Slot 1: fullsize, 32 bit PCI		Same mechanical as PC Server 300 Dimensions: H 24.5" x W 7.5" x D 18.6" 43 pounds HELPWARE for PC SERVER 320 WARRANTY SERVICE SUPPORT ⇒ 3 year warranty (international) ⇒ On site warranty all 3 years ⇒ All cities in all states ⇒ 8 am - 5 pm Mon - Fri coverage ⇒ Next day response time ⇒ Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$55 per year ⇒ "PC Server Start Up Support" ⇒ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (http://www.pc.ibm.com) support ⇒ IBM or dealer warranty/service
• 3.5" SL		5.25" HH (access)	Slot 2: fullsize, 32 bit PCI		
• 3.5" SL		5.25" HH (access)	Slot 3: halfsize, 32 bit Micro Channel		
• 3.5" SL		5.25" HH (access)	Slot 4: halfsize, 32 bit Micro Channel		
• 3.5" SL		5.25" HH (access)	Slot 5: fullsize, 32 bit Micro Channel		
• 3.5" SL		5.25" HH (access)	Slot 6: fullsize, 32 bit Micro Channel		
• 3.5" SL		5.25" HH (access)	Slot 7: fullsize, 32 bit Micro Channel		
• 3.5" SL		5.25" HH (access)	Slot 8: fullsize, 32 bit Micro Channel		
		5.25" HH (access)	(Slot 1: occupied by SCSI PCI RAID Adapter in some models)		
	CD-ROM	5.25" HH (access)	FloThru air flow design utilizing two fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life		
	diskette	3.5" SL (access) diskette only	Diskettes included: Reference Diskette (for MCA), Micro Channel Diagnostic Diskette, System Board Diagnostic Diskette (QAPlus/PRO™ graphical software for diagnostic and testing)		
	std disk	3.5" SL (access)	- Setup Utility at startup by pressing F1 - SCSISelect near startup by pressing CTRL+A		

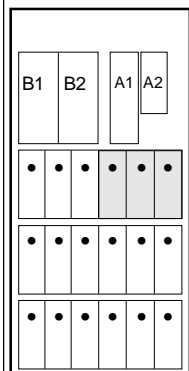
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 ≧ All withdrawn effective June 1996

No warranties are expressed or implied in this summary (S320M) Compiled by Roger Dodson, IBM. May 1996

IBM PC Server 500 - withdrawn

IBM® PC Server:	SCSI-2 F/W open bay	SCSI-2 F/W Array open bay	SCSI-2 F/W 1.12 GB	SCSI-2 F/W 2.25 GB	SCSI-2 F/W Array 3 x 1.12 GB	SCSI-2 F/W Array 3 x 2.25 GB
Type - model	≥ 8641-0Y0	≥ 8641-1Y0	≥ 8641-0YT	≥ 8641-0YV	≥ 8641-0YR	≥ 8641-0YS
Disk - individual size	None	None	1.12 GB (6.9 ms)	2.25 GB (7.5 ms)	1.12G X 3 (6.9 ms)	2.25G x 3 (7.5 ms)
Disk - total size	N/A	N/A	Same	Same	= 3.36 GB	= 6.75 GB
Disk - features	N/A	N/A	Hot-swap / 1" high	Hot-swap / 1" high	Hot-swap / 1" high	Hot-swap / 1" high
Disk - features	N/A	N/A	Fast/Wide / PFA	Fast/Wide / PFA	Fast/Wide / PFA	Fast/Wide / PFA
Available/withdrawn date	Nov 94 / Jun 96	Nov 94 / Jun 96	Oct 94 / Jun 96	Oct 94 / Jun 96	Oct 94 / Jun 96	Oct 94 / Jun 96
Processor / MHz	Pentium - 90/60 MHz (in LIF on Base 4 Processor Complex; similar Processor Complex used in PS/2 Model 95)					
Processor upgrade(s)	None Processor Complex incorporates processor(s), L2 cache and controller, memory contrllr, MCA contrllr, and DMA contrllr					
L2 cache - std / max	256 KB std / 256 KB max (soldered on Processor Complex)					
L2 cache - write policy	Write-back (organization: 2 way set associative) / 0 wait states and 64 bit transfer between Pentium and L2 cache					
Memory - std / max	32 MB std / 256 MB max		<ul style="list-style-type: none"> ◇ Four 8 MB ECC SIMMs ship standard ◇ Can not mix parity and ECC SIMMs ◇ Max is 64 MB if parity SIMMs (not ECC) ◇ Supports 4, 8 MB parity or 4, 8, 16, 32 MB ECC 		<ul style="list-style-type: none"> ◇ 64 bit path to memory ◇ Memory must be installed in matched pairs of same capacity 	
Memory - speed / pins	70 ns / 72 pin					
Memory - sockets / avail	8 sockets / 4 available					
Memory - supported	SIMMs 70 ns speed only					
Memory - type	Error Checking and Correcting (ECC) which detects and corrects any single bit errors on the fly; all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system					
Disk controller	Non-array models: SCSI-2 Fast/Wide Adapter			Array models: SCSI-2 Fast/Wide Streaming RAID Adapter		
Controller transfer rates	40 MB/sec streaming to MCA; 20 MB/sec on SCSI bus			40 MB/sec streaming to MCA; 20 MB/sec on SCSI bus		
Raid levels in controller	None (use software)			RAID 0, 1, 5 (supports 4 independnt arrays and 8 logical arrays)		
Ctrlr implementation	32 bit busmaster adapter in a slot			32 bit busmaster adapter in a slot (sidecard does not ship std)		
Controller channels	Two (internal/external); supports 15 devices max			Two (both internal or one internal/one external); 14 devices max		
Ctrlr cache / features	128 byte buffer / data parity support on MCA			4 MB cache / data parity support on MCA; i960 at 25 MHz		
Bays / available	All: 22 bays / 18 bays support hot-swap disks / 6 bays for hot-swap disks ship standard					
Disks supported	All: Supports 3.5" x 1.0" SL or 1.5" HH SCSI disks including 5.31 GB SCSI-2 disk			All: Ships with one Hot-Swap Backplane supporting 6 SL or 3 HH disks (or 4 SL and 1 HH; or 2 SL and 2 HH)		
	All: Different trays required for Fast and F/W disks			Opt: Supports two optional 6 connector Hot-Swap Backplanes (first requires 220 watt aux power supply)		
	Non-array models: Supports up to 7 SCSI-2 F/W Adapters (10 channels, 60 disks)			Array models: Supports up to 4 RAID adapters (8 channels, 53 disks)		
Architecture	Micro Channel® / SynchroStream™ / Base 4 Processor Complex					
Architecture features	40 MB/sec streaming data transfer / Dual bus / 32 bit, 20 MHz DMA / Subsystem Control Block enabled / Synchronous Channel Check support / Data bus parity / Parity checking between all controllers on complex					
32 bit slots / available	8 Micro Channel slots (all 32 bit) / 6 slots available (SCSI in one slot and SVGA adapter in another slot)					
CD-ROM	Bootable, internal CD-ROM / double speed and XA / multisession / SCSI-2 interface / 1" high / audio support					
Diskette drive	2.88 MB 3.5" diskette drive / dust cover and media sense / uses 2 drop 18" internal cable for diskette/tape					
Serial ports	Two 9 pin serial ports / DMA support / UART 16550A / 345.6 Kbps maximum supported speed					
Parallel port	Two parallel ports / DMA support / bidirectional / port A supports 2 MB/sec max speed (IEEE 1284) / port B 100 KBps					
Graphics controller	SVGA / Cirrus Logic™ GD5428 / Micro Channel / 16 bit (in 32 bit slot) / 1 MB DRAM memory / up to 1280 x 1024					
Security	C2 security enabled with LogicLock™					
Security options	Tamper evident cover / Privileged-access password / cover key lock / U Bolt support / power-on password Option: Security Cable Cover / Enhanced 2.88 MB diskette drive with electronic eject and removable media security					
Software	ServerGuide™ - CD based automated network operating system installation and configuration tool					
Systems management	Includes NetFinity™/PC SystemView (system hardware mgmt software) and many utilities in ServerGuide (see list below) Option: PS/2 ServerGuard™ (a Micro Channel adapter and software)					
3 MB System Partition BIOS	Non-array: Yes / Array models: No (since all three disks preconfigured as one RAID 5 array)					
Keyboard / mouse	256 KB in flash memory on the Processor Complex (SurePath™ BIOS) / remote and timed power on					
Power supply	IBM Quiet (rubber dome) 101 key / IBM Enhanced mouse (400 dpi)					
Other features	434 watt / add 220 watt option required with first optional Hot-Swap Backplane / Option: 780 Watt Redundant Power Supply FloThru™ air flow design / 3 fans for cooling / fast startup mode / selectable boot / Vital Product Data / Unattended Start					

- ◇ Built in handle and rolling wheel
- ◇ Lockable hinged door to access power switch and removable media
- ◇ Dimensions: H 24.5" x W 13.9" x D 29.7"



Bay A1: std 5.25" CD-ROM
 Bay A2: std 3.5" diskette
 Bay B1: removeable CD "glovebox"
 Bank B: 5.25" FH (or two 5.25 HH)
 Bank C: 0, 1, or 3 disks (shaded)

Bank C Max disk capacity
 Bays 1 - 6 Internal: 49.61 GB
 (11 x 4.51 GB)

Bank D
 Bays 1 - 6 Bank holds 6 SL or
 3 HH (or 4 SL/1 HH;

Bank E
 Bays 1 - 6 or 2 SL/2 HH)

ServerGuide CD Library includes:

- Key protected for purchase:
- ◇ OS/2 SMP and OS/2 Warp Connect
 - ◇ NetWare 3.12 and 4.01
 - ◇ LAN Server 4.0 Entry and Advanced
 - ◇ TCP/IP 2.0 for OS/2
 - ◇ System Performance Monitor/2
- (Software detects hardware configuration and does unique, performance tuning during installation of software)
- Free:
- ◇ NetFinity (1 Manager, 2 Services)
 - ◇ Power mgmt software (PowerChute™ Plus for optional UPS)
 - ◇ LAN Server Integration Guide
 - ◇ NetWare Integration Guide
 - ◇ LAN Server Tuning Tool
 - ◇ System documentation and pubs
 - ◇ Device drivers
 - ◇ NLM utilities

Optional UPS for IBM PC Servers:
 American Power Convn Smart-UPS 700
 American Power Convn Smart-UPS 1000
 American Power Convn Smart-UPS 1400

HELPWARE for PC SERVER 500 WARRANTY SERVICE SUPPORT

- ◇ 3 year warranty (international)
- ◇ On site warranty all 3 years
- ◇ All cities in all states
- ◇ 24 hour / 7 day service coverage
- ◇ 4 hour response time
- ◇ 24 hour / 7 day telephone, bulletin board, fax, electronic, and Internet (http://www.pc.ibm.com) support
- ◇ "IBM PC Server Start Up Support"
- ◇ IBM or dealer warranty/service

IBM PC Server 300 (PC/EISA Server) - withdrawn

IBM® PC Server:	✕ PC Server 300		✕ PC Server 300	
Type	8640-0Nx		8640-0Px	
Models	0NO	0NJ	0P0	0PT
Disk - individual size	None		None	
Disk - speed	N/A		N/A	
	728 MB IDE 12 ms		1 GB SCSI-2 Fast 8.6 ms	
Available / withdrawn date	Jun 1994 / Feb 1996		Jun 1994 / Feb 1996	
Processor / MHz	486DX2 - 66/33 MHz		Pentium - 60 MHz	
Processor upgrade(s)	① IntelDX4 at 100/33 MHz ② P24T (Intel® Pentium™ OverDrive™)		① P5T (Pentium OverDrive)	
Upgrade method	Remove standard CPU from 237 pin ZIF socket (Intel® Socket 3)		Remove standard CPU from 273 pin ZIF socket	
L2 cache - std / max	256 KB / 256 KB		256 KB / 512 KB	
L2 cache - method	Soldered DIP modules		Upgrade to 512 KB via 8 DIP modules	
L2 cache - write policy	All: Write-back (organization: direct mapped; 15 ns)			
Memory - std / max	8 MB / 128 MB		16 MB / 192 MB	
Mem - total sockets / avail	4 sockets / 2 available		6 sockets / 4 available	
Memory - speed / pins	All: 70 ns / 72 pin		Supports 4, 8, 16, 32 MB EOS (ECC-on-SIMM) 70 ns memory	
Mem - supported SIMMs	All: 70 ns speed only (supports 4, 8, 16, 32 MB parity SIMMs)			
Memory - type	All: Parity / all memory must be installed in matched pairs / all memory addressable by DMA			
Memory	Matched pairs reqd due to interleaved memory		Matched pairs required due to 64 bit path to memory	
Disk controllers	① Enhanced IDE on PCI bus (2 drops) PIO modes 0, 1, 2, 3 ② Enhanced IDE on ISA bus (2 drops) PIO modes 0, 1, 2		① Enhanced IDE on ISA (2 drops) PIO modes 0, 1, 2 ② Enhanced IDE on ISA (2 drops) PIO modes 0, 1, 2	
Controller transfer rates	All: 11 MB/sec across Enhanced IDE interface (16 bit) if used with Mode 3 disks Mode 0 = 3.3 MB/sec / Mode 1 = 5.2 MB/sec / Mode 2 = 8.3 MB/sec / Mode 3 = 11.1 MB/sec All: Disks greater than 528 MB only support PIO Mode 0 on ISA based IDE controller			
Controller implementation	All: Enhanced IDE controller(s) on planar / SCSI-2 Fast Adapter in PCI slot			
SCSI controller channels	SCSI model: One (maximum of 7 SCSI devices internal or external)			
Cntrlr cache - std / max	All: IDE has no cache / SCSI-2 Fast PCI has no cache (32 byte FIFO buffer)			
RAID options	All: SCSI-2 F/W PCI Raid Adapter / Hot-Swap Bay Option converts top five 5.25" HH bays into six 3.5" hot-swap bays			
Architecture	All: PCI (2 slots) / PC/EISA shared slot (1 slot) / EISA (5 slots)			
Architecture features	All: PCI maximum transfer rate is 132 MB/sec; EISA maximum data transfer rate is 33 MB/sec			
32 bit slots / available	All: 8 slots (all 32 bit) / 6 or 7 slots available (VGA adapter in one slot; OPT has SCSI-2 in one slot; see below)			
Bays / available	All: 9 bays / 7 or 8 available (one used for diskette; one used for disk; see diagram below)			
Diskette drive	All: 3.5" 1.44 MB diskette drive / dust cover / media sense / supports 3.5" 2.88 MB and 5.25" 1.2 MB (2 diskette max)			
Serial port	All: Two 9 pin serial port / DMA support / UART 16550A / 115.2 Kbps maximum supported speed			
Parallel port	All: One parallel port / DMA support / bidirectional / supports ECP/EPP protocols adhering to IEEE 1284 standard			
Video - controller / vendor	All: VGA / Cirrus Logic™ (adapter is a dumb frame buffer)		Supports 640 x 480 with 256 colors or 800 x 600 with 16 colors	
Video - arch / data path	All: ISA / 16 bit (in 32 bit EISA adapter slot) / 512 KB DRAM memory			
Security	All: Power switch behind door / selectable boot (A: and C: only) / keyboardless and displayless operation			
Power-on password	All: No (because power switch behind locked door)			
Cover key lock	All: Front door keylock			
U Bolt support	All: Yes			
Preloaded software	All: None (no operating system ships standard) / fast startup mode			
BIOS	All: 128 KB in Flash EEPROM on the planar board (Phoenix™ BIOS) / upgrades free of charge (via diskette)			
Keyboard / mouse	All: IBM Quiet (rubber dome) 101 key / no mouse ships standard			
Power supply	All: 300 watt / universal / manual switch setting / built in overload, surge protection			
Systems management	All: QAPLus/PRO ships standard / Optional NetFinity™ software			

Array Option	Non-Array Models		
• 3.5" SL		5.25" HH (access)	Slot 1: fullsize, 32 bit PCI Slot 2: fullsize, 32 bit PCI Slot 3: fullsize, 32 bit PCI or EISA or 16 bit ISA Slot 4: fullsize, 32 bit EISA or 16 bit ISA Slot 5: fullsize, 32 bit EISA or 16 bit ISA Slot 6: fullsize, 32 bit EISA or 16 bit ISA Slot 7: fullsize*, 32 bit EISA or 16 bit ISA Slot 8: fullsize*, 32 bit EISA or 16 bit ISA (Slot 3: occupied by PCI SCSI-2 Adapter in model OPT) (Slot 4: occupied by VGA adapter) (* = Pentium models support halfsize adapters)
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
• 3.5" SL		5.25" HH (access)	
	diskette	3.5" SL (access) diskette only	FloThru™ air flow design utilizing two fans, a heat sensing speed control, and full length front venting to allow electronics and drive components to run cooler for longer life EISA Configuration Utility is on the EISA Configuration Diskette CTRL+ALT+S = Setup Utility at startup or within any application
	Optional diskette/tape	3.5" SL (access)	
	std disk	3.5" SL (no access)	

QAPLus/PRO™ is graphical software for diagnostic and testing included with PC Server

HELPWARE for PC SERVER 300 WARRANTY SERVICE SUPPORT

- 3 year warranty (international)
- On site warranty all 3 years
- All cities in all states
- 8 am - 5 pm Mon - Fri coverage
- Next day response time
- Option to upgrade warranty to: 24 hr / 7 day coverage, 4 hr response for \$40 per year
- "PC Server Startup Support"
- 24 hour / 7 day telephone, bulletin board, fax, and electronic support
- IBM or dealer warranty/service

The IBM PS/2 Server 295 is a **high performance, fault tolerant** computing platform to support mission critical, client/server applications. It supports an unprecedented number of network users generating intense workloads due to its **multi-processor, multiple bus** architecture that permits system resources to be scaled to match workload requirements. It allows **complete management of geographically remote servers** with mainframe-like administration (for monitoring, control, tuning, and recovery without human intervention).

STANDARD FEATURES OF PS/2 SERVER 295

Processor/Memory:

- ◆ **8600-001** – Two 486DX's: ① 33MHz, with 128KB L2 cache
② 50MHz, with 256KB L2 cache.
- ◆ **8600-002** – Two 486DX's: ① 50MHz, with 256KB L2 cache
② 50MHz, with 256KB L2 cache.
- ◆ Asymmetric multiprocessing for OS/2 (one 486 for operating system, apps; one 486 for file system and protocols).
- ◆ 32 MB ECC memory, 70 ns; ◆ Upgradeable to 64, 96, 128 MB.
- ◆ All memory ECC; ◆ Each 32 MB has own memory controller.

Bus Architecture:

- ◆ 64 bit 200 MB/sec Interprocessor Bus; hierarchical design to interconnect the processor(s), memory, SCSI controllers, and Remote Maintenance Processor (RMP); 6 slots.
- ◆ Parity protection on data, address, and control buses (IP-Bus).
- ◆ Each 486 has independent 20 MB/sec Micro Channel bus (8 slots on 1st 486 + 4 slots on 2nd 486 = 12 total slots).

Disk/Controllers/Bays:

- ◆ Two independent (dual channel) RISC-based SCSI I/II controllers on single card; 64 bit interface to IP-Bus.
- ◆ Option: 2 additional SCSI controllers (same as above, on 1 card).
- ◆ Supports IBM 400 MB (11.5 ms) and 1 GB (11ms) SCSI disks.
- ◆ Supports 1 to 28 hot insertion/extraction disks (all hot pluggable).
- ◆ Max of 9 GB internally (9 bays x 1 GB disk).
- ◆ Max of 28 GB total (4 SCSI x 7 disks (1GB)) with Exp Cabinets.
- ◆ Ten 3.5" half height bays internally (diskette uses one).
- ◆ Supports 1 to 3 optional External Expansion Cabinets each with ten 5.25" half height or five 5.25" full height bays.
- ◆ OS/2 preload includes FTUTIL: allows disk pairs to be striped, mirrored, or duplexed. Also allows hot spare pooling, hot insertion/extraction, automatic data rebuild, and hot fix.

Security:

- ◆ Locking cabinet (can separately lock cable area, disk area, or Micro Channel area); ◆ Power on password.
- ◆ Keylock to protect power supply(s); ◆ Sealed peripheral doors.
- ◆ Cable dress option to protect LAN cables extended from back.
- ◆ Screw on plate to lock power cord into system (prevent accidental unplug).

Other:

- ◆ IBM 7855 modem (up to 19.2 Kbps); used with MASS/2 and RMP.
- ◆ 1.44 MB 3.5" diskette drive; ◆ 1 serial port, 1 parallel port.
- ◆ IBM mouse and keyboard.
- ◆ VGA controller (16 bit).
- ◆ 750 watt universal power supply.
- ◆ Opt redundant 750 watt pow supply.
- ◆ Rolling wheels on bottom.
- ◆ LCD status display.
- ◆ BIOS in flash memory.

Software:

- ◆ MASS/2 preinstalled (prerequisite).
- ◆ Multi-Processor Extensions/2 preinstalled (prereq): enables dual processor operation.
- ◆ OS/2 LAN Server or NetWare preinstalled.
- ◆ OS/2 preload includes FTUTIL.
- ◆ See "Software Supported" box .

Support:

- ◆ Configured and tested before ship.
- ◆ **3 year on site warranty.**
- ◆ **4 hour response time** (24 hr/7 day)
- ◆ 24 hr phone, fax, bull board support.

MASS/2 FEATURES

(Maximum Availability and Support System/2)

- Integrated software allowing monitoring, controlling, tuning, and recovery of 295. Allows 295 to be geographically distributed while permitting comprehensive, centralized control with mainframe-like remote administration. Features:
- ◆ **Failure recovery without human intervention** (most cases).
 - ◆ Operation even when 295 powered down (RMP with battery).
 - ◆ Concurrent access by **multiple users**.
 - ◆ Access via console, across LAN (**local**), via modem (**remote**).
 - ◆ **Continual monitoring** of CPU, memory, disk, network, and swapping level utilization via realtime bar graph, and 1 hour history in RMP RAM, and historic logs on disk.
 - ◆ **Continual monitoring** of temperature, power supply voltage, single bit memory errors, network errors.
 - ◆ **Comprehensive configuration details** (processors, memory, SCSI, arrays, spares, RMP, UPS status, adapters).
 - ◆ **Alarm and threshold selection** with automatic dial out capability for easy prompt administration (such as disk failure, disk full, reboots, shut downs, memory errors, over temperature, power low/high, and network errors).
 - ◆ Scheduled power down and power up; **remote rebooting**.
 - ◆ SAA-compliant graphical user interface (hierarchical).
 - ◆ Access to network operating system logs and server logs.
 - ◆ Multilevel password based security; ◆ File transfer capability.
 - ◆ **Preinstalled on Server 295.**

SOFTWARE SUPPORTED

- ➔ NetWare 3.11
- ➔ NetWare 3.12, 4.01 (limited availability)
- ➔ IBM OS/2 1.3, 2.1 ➔ IBM OS/2 LAN Server 2.0, 3.0
- ➔ Microsoft LAN Manager 2.0C, 2.1, 2.2
- ➔ MASS/2 for NetWare or OS/2 (features listed above)
- ➔ Multi-Processor Extensions/2 (MP/2) for NetWare 3.11 or OS/2
- ➔ Parallel Network Array/2 (PNA) for NetWare 3.11 (not OS/2)
- ➔ Orthogonal RAID-5 Disk Array/2 for NetWare or OS/2

PS/2 SERVER 295 ADVANTAGES

- ➔ **Multi-processing support with OS/2 or NetWare.**
- ➔ 64 bit 200 MB/sec Interprocessor Bus.
- ➔ Parity checking on data, address, and control buses.
- ➔ RISC-based SCSI I/II controllers with 64 bit transfer to IP Bus.
- ➔ Up to 26 GB of RAID-5 protected data (2 GB used for parity).
- ➔ **Hot pluggable drives with hot spare pooling.**
- ➔ Use of dissimilar drive spares (with auto rebuild).
- ➔ **Dual Micro Channel buses** (8 + 4 = 12 total slots).
- ➔ Remote Maintenance Processor and MASS/2.
- ➔ Optional Orthogonal (perpendicular) RAID-5 capability.
- ➔ Optional Parallel Network Array (PNA) with NetWare.
- ➔ NetWare or OS/2 LAN Server preinstalled and configured.
- ➔ **3 years on site warranty** with 4 hour response (24 hr / 7 day).
- ➔ Support by the largest PC company in the world.

FAULT TOLERANT FEATURES

Type of failure	Operation after failure	Prerequisites
Processor	Reboots as uniprocessor vs multiprocessor.	Two 486's, MASS/2, MP/2.
Memory (single bit)	Automatically corrected, no interruption.	Standard (logging requires MASS/2).
Memory (multiple bit)	Reboots with reduced memory (less 32 MB bank).	64 MB or more, MASS/2.
Disk	System continues, no interruption.	2 or more disks configured with mirroring, duplexing or RAID-5.
SCSI controller	System continues, no interruption.	Orthogonal RAID-5 in 4 disk array.
Disk or controller (disk auto rebuild)	System continues; spare disk automatically inserted into array and rebuilt.	Spare disk; Orthogonal RAID-5 or OS/2 preload.
Micro Channel bus	Reboots, redundant adapters can take over on 2nd bus.	Two 486's, MASS/2, MP/2.
Network adapter (NetWare)	Backup adapter on same or different bus takes over, no interruption.	2 adapters on same segment, PNA, MASS/2.
Network adapter (OS/2)	Reboots, redundant adapter on same or different bus takes over.	2 adapters on same segment, MASS/2.
Power supply	System continues, no interruption.	Redundant power supply.
Power outage	System continues, no interruption.	UPS; MASS/2 if remote UPS monitoring desired.

IBM PS/2 Server 195 - withdrawn

The Server 195 is a **high performance** server designed with **comprehensive fault tolerance** for NetWare and OS/2 client/server applications. The Server 195 is fully upgradeable to a Server 295 with dual processors and advanced local/remote network management. Available options improve the fault tolerance, supportability and scalability to differentiate the Server 195 from competing servers.

PS/2 SERVER 195 Type-model: 8600-003

Same physical box and features of Server 295 except:

	195	295
Processors	One 486	Two 486
Remote Maintenance Processor and modem	Optional	Standard
MASS/2	Optional	Standard
Multi-Processor Ext/2	Optional	Standard
Available slots	8	12

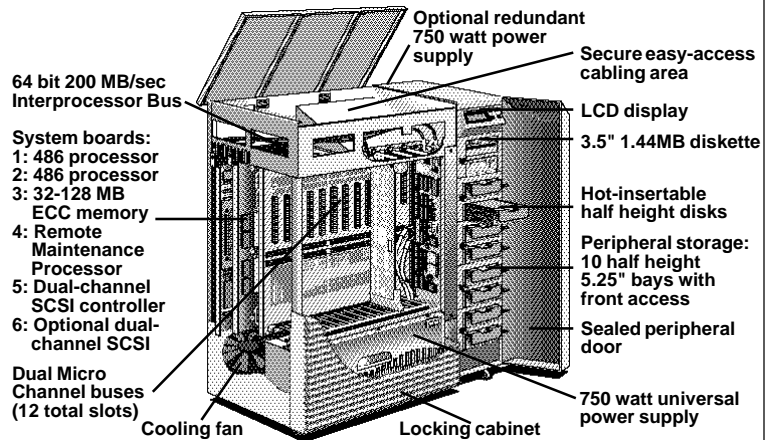
- PS/2 Server 195 is fully upgradeable to PS/2 Server 295 with addition of second 486, RMP, MASS/2, and MP/2.
- Competitive entry point; ➤ Continuous availability; ➤ Performance

SOFTWARE SUPPORTED

- NetWare 3.11
 - ◇ front panel LCD message support
 - ◇ high performance multithreaded disk driver
- NetWare 3.12, 4.01 (limited availability)
- IBM OS/2 1.3, 2.1 ➤ IBM OS/2 LAN Server 2.0, 3.0
- Microsoft LAN Manager 2.0C, 2.1, 2.2
- **MASS/2** for NetWare or OS/2 (specs on 295 sheet)
- **Multi-Processor Extensions/2 (MP/2)** for NetWare 3.11 or OS/2
 - ◇ Required for dual processor operation.
- **Parallel Network Array/2 (PNA)** for NetWare 3.11 (not OS/2)
 - ◇ Detects failed Token-Ring or Ethernet adapter and immediately switches to a backup on same or different Micro Channels without losing any client connections.
- **Orthogonal RAID-5 Disk Array/2** for NetWare or OS/2
 - ◇ Permits multiple arrays of 2 to 16 disks.
 - ◇ Supports striping (RAID-0), mirroring, duplexing (RAID-1), RAID-5, and Orthogonal (perpendicular) arrays.
 - ◇ Exclusive in allowing SCSI controller or SCSI channel/cable failure while system remains operational.
 - ◇ Allows hot spare pooling, automatic data rebuild, and hot fix.

PS/2 SERVER 195 ADVANTAGES

- Multi-processing support with OS/2 or NetWare.
- A true multi-processing implementation of NetWare to insure the best performance and automatic recovery in case of a single processor failure.**
- 64 bit 200 MB/sec Interprocessor Bus for high performance.
- Parity checking on data, address, and control buses (IP-Bus).
- RISC-based SCSI I/II controllers with 64 bit transfer to IP Bus.
- Up to 26 GB of RAID-5 protected data (2G of 28G used for parity).
- Hot pluggable drives with hot spare pooling.
- Use of dissimilar drive spares (with disk auto rebuild).
- Optional dual Micro Channel buses (8 + 4 = 12 total slots).
- Optional Remote Maintenance Processor (RMP) and MASS/2.
- With MASS/2 for NetWare, you get state-of-the-art, user-friendly, extensive systems management from either local or remote locations with the ability to manage multiple file server from a single location.**
- Optional Orthogonal RAID-5 capability.
- Optional Parallel Network Array (PNA) with NetWare.
- Full recovery from a Network Interface Card failure means uninterrupted service to NetWare user population.**
- NetWare or OS/2 LAN Server preinstalled and configured.
- **3 years on site warranty with 4 hour response** (24 hour / 7 day).
- Support by the largest PC company in the world.



STANDARD FEATURES OF PS/2 SERVER 195

Processor/Memory:

- ◇ 486DX - 50 MHz; ◇ Upgradeable to a second 486DX (33 or 50).
- ◇ 256 KB L2 cache (direct mapped, write-through).
- ◇ 32 MB ECC memory, 70 ns; ◇ Upgradeable to 64, 96, 128 MB.
- ◇ All memory ECC; ◇ Each 32 MB has own memory controller.

Bus Architecture:

- ◇ 64 bit 200 MB/sec Interprocessor Bus; hierarchical design to interconnect the processor(s), memory, SCSI controllers, and optional Remote Maintenance Processor (RMP); 6 slots.
- ◇ Parity protection on data, address, and control buses (IP-Bus).
- ◇ Each 486 has independent 20 MB/sec Micro Channel bus (8 slots on 1st 486 + 4 slots on opt 2nd 486 = 12 total slots).

Disk/Controllers/Bays:

- ◇ Two independent (dual channel) RISC-based SCSI I/II controllers on single card; 64 bit interface to IP-Bus.
- ◇ Option: 2 additional SCSI controllers (same as above, on 1 card).
- ◇ Supports IBM 400 MB (11.5 ms) and 1 GB (11ms) SCSI disks.
- ◇ Supports 1 to 28 hot insertion/extraction disks (all hot pluggable).
- ◇ Max of 9 GB internally (9 bays x 1 GB disk).
- ◇ Max of 28 GB total (4 SCSI x 7 disks (1GB)) with Exp Cabinets.
- ◇ Ten 3.5" half height bays internally (diskette uses one).
- ◇ Supports 1 to 3 optional External Expansion Cabinets each with ten 5.25" half height or five 5.25" full height bays.
- ◇ OS/2 preload includes FTUTIL: allows disk pairs to be striped, mirrored, or duplexed. Also allows hot spare pooling, hot insertion/extraction, automatic data rebuild, and hot fix.

Security:

- ◇ Locking cabinet (can separately lock cable area, disk area, or Micro Channel area); ◇ Power on password.
- ◇ Keylock to protect power supply(s); ◇ Sealed peripheral doors.
- ◇ Cable dress option to protect LAN cables extended from back.
- ◇ Screw on plate to lock power cord into system (prevent accidental unplug).

Other:

- ◇ 1.44 MB 3.5" diskette drive; ◇ 1 serial port, 1 parallel port.
- ◇ IBM mouse and IBM 101 keyboard; ◇ VGA controller (16 bit).
- ◇ 750 watt universal power supply; ◇ Opt redundant pow supply.
- ◇ LCD status display; ◇ BIOS in flash memory.
- ◇ Operation without console or keyboard/mouse.
- ◇ Modular design allows removal/replace of most components in 5 minutes without tools; ◇ Rolling wheels on bottom.

Software:

- ◇ OS/2 / OS/2 LAN Server or NetWare preinstalled.
- ◇ Supports optional software in "Software Supported" box on left.
- ◇ OS/2 preload includes FTUTIL (description above).

Support:

- ◇ Configured with all software and arrays and tested before ship.
- ◇ 3 year on site warranty; ◇ 4 hour response time (24 hour/7 day).
- ◇ 24 hour phone, fax, bulletin board support.

IBM Model 90/95 and PC Server 500 Processor Complexes - withdrawn

The IBM® Model 90, and Model 95, and PC Server 500 are unique in providing a Processor Complex (adapter) that integrates the (1) processor, (2) memory cache controller and L2 cache, (3) memory controller, (4) DMA controller, and (5) I/O bus controller. This provides the capability to upgrade to new technology by only replacing the Processor Complex.

Upgrading a processor **along with the memory and I/O controller** have a significant effect on PERFORMANCE via a balanced, tuned system. Vendors that do NOT change memory and I/O controllers run the risk of having an unbalanced system that is not as efficient.

There are four types of Processor Complexes for these systems: Base or Type 1, 2, 3, and 4.

Base 1	"G"	486SX	20 MHz	(announced Oct 1990)
Type 1	"J"	486DX	25 MHz	(announced Oct 1990)
	"K"	486DX	33 MHz	(announced Oct 1990)
	Upgrade	486DX	50 MHz	(announced June 1991)
	Upgrade	486DX2	66/33	(announced Aug 1992)

- ❖ Level 2 memory cache socket for optional 128 KB write-through memory cache (256 KB write-thru standard with 486DX 50 MHz).
- ❖ No math coprocessor socket ("J", "K", and "Upgrade" models already have a math coprocessor as part of 486DX).
- ❖ 24 bit DMA; 10-12 MHz.
- ❖ Dual path memory design (**Dual Bus Interleave**). Allows both the processor and busmasters to access memory concurrently through two paths.
- ❖ **20 MB per second data transfer** support (for MCA bus).

Base 2	"H" / Upgrade	486SX	25 MHz	(ann Oct 1991)
Type 2	"L" / Upgrade	486DX2	50/25	(ann April 1992)

- ❖ No Level 2 cache socket on complex.
- ❖ **Math coprocessor socket** on "H" model only to add 80487 math coprocessor or to add a 486DX2 50/25 MHz upgrade chip which has an integrated math coprocessor.
- ❖ High speed **25 MHz DMA** so that it is now synchronous with the 486; 24 bit DMA.
- ❖ **Faster bus arbitration** (than Base 1) for busmasters to increase performance.
- ❖ Memory controller to support both **interleaved** (higher performance - pairs of SIMMs) and **non-interleaved** memory (allows single SIMMs).
- ❖ **20 MB per second data transfer** support (for MCA bus).

Base 3	"M" / Upgrade	486DX	50 MHz	(ann April 1992)
Type 3				

- ❖ **40 MB per second streaming data transfer** support. This is an advanced Micro Channel I/O controller that provides faster data transfer rates to increase performance.
- ❖ **Error Checking and Correcting (ECC)** memory controller which will automatically correct any single bit errors on the fly (98% of memory errors are single bit); all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system; single bit errors are logged with optional software (NetFinity™) and multiple bit errors are logged in NVRAM.
- ❖ **256KB Level 2 memory cache** (write-through) is standard.
- ❖ High speed 20 MHz DCM; **32 bit DMA** so it can use DMA to directly address all memory; DMA supports Subsystem Control Block.
- ❖ **Faster bus arbitration** (than Base 1) for busmaster performance.
- ❖ **Enhanced dual path memory design (Dual Bus Interleave)**. Although Base 1 allows both the processor and busmasters to access memory concurrently through two paths, the Base 3 and 4 has buffers at both paths to provide better performance. Also the buffer on the adapter side (I/O buffer) uses packet data transfers for writes. This means 16 bytes are collected and this packet is written in one cycle to memory as opposed to writing for every 4 bytes received (as with unbuffered systems).
- ❖ **Subsystem Control Block** enabled (see definition).
- ❖ **Vital Product Data** support. Allows software (LAN Network Manager, LAN Mgmt Utilities/2) to obtain a unique serial number (identifier) on the processor complex which is in ROM.
- ❖ **Synchronous Channel Check** support (see definition).
- ❖ **Data bus parity** support (see definition).
- ❖ A **logging facility** is provided (for ECC or system errors).

➤ *Processor Complexes are interchangeable among Model 90's, Model 95's, and the PC Server 500.*

➤ *Any existing Model 90, Model 95, or PC Server 500 can be upgraded to a new Processor Complex. For example, Base 1 to Base 2 or Base 3 or Base 4; Base 2 to Base 4, etc. If "Upgrade" is listed above, then an upgrade option is available.*

All Processor Complexes withdrawn as of June 1996

Base 4	"N" / Upgrade	486DX2	66/33 MHz	(ann Sept 1993)
Type 4	"P" / Upgrade	Pentium	60 MHz	(ann Aug 1993)
	"Q" / Upgrade	Pentium	66 MHz	(ann Sept 1993)
	"Y" / Upgrade	Pentium	90/60 MHz	(ann Oct 1994)

- ❖ **SynchroStream™** controller which uses IBM's most advanced technology packaging to integrate 5 major chips (memory, I/O, DMA controllers, FIFO buffers, ECC logic) into one chip. This technology allows the high-speed interconnects and large streaming pipes that form the SynchroStream engine to provide state-of-the-art performance. The SynchroStream controller synchronizes data traveling between major subsystems and allows it to stream in parallel, at full bandwidth, to each subsystem concurrently.
- ❖ **40 MB per second streaming data transfer** support.
- ❖ **Error Checking and Correcting (ECC)** memory controller which will automatically correct any single bit errors on the fly (98% of memory errors are single bit); all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system; single bit errors are logged with optional software (NetFinity™) and multiple bit errors are logged in NVRAM.
- ❖ **256 MB memory addressability** (Base 1, 2, and 3 is 64 MB memory addressability).
- ❖ **256 KB Level 2 memory cache (write-back)** is standard on Pentium models. **128 KB Level 2 memory cache (write-back)** is standard on 486DX2 models.
- ❖ High speed 20 MHz DMA; **32 bit DMA** so it can use DMA to directly address all memory; DMA supports Subsystem Control Block.
- ❖ **Faster bus arbitration** (than Base 1) for busmaster performance. **Enhanced dual path memory design (Dual Bus Interleave)**.
- ❖ Although Base 1 allows both the processor and busmasters to access memory concurrently through two paths, the Base 3 and 4 has buffers at both paths to provide better performance. Also the buffer on the adapter side (I/O buffer) uses packet data transfers for writes. This means 16 Bytes are collected and this packet is written in one cycle to memory as opposed to writing for every 4 bytes received (as with unbuffered systems).
- ❖ **Subsystem Control Block** enabled (see definition)
- ❖ **Enhanced Vital Product Data** support. Allows software (LAN Network Manager, LAN Mgmt Utilities/2) to obtain a unique serial number (identifier) on the processor complex which is in ROM (like Base 3). Also provides unique ID (model/submodel), type/model/serial number, manufacturing ID, planar FRU number, and planar part number.
- ❖ **Synchronous Channel Check** support (see definition).
- ❖ **Data bus parity** support (definition below).
- ❖ A **logging facility** is provided (for ECC or system errors).

DEFINITIONS

Subsystem Control Block provides for the enhanced transfer of command, data, and status information between busmasters (and between busmasters and the system processor) to give increased performance. Capabilities such as command chaining, data chaining, and block data moves frees the processor from waiting for command completion before issuing the next command and frees the processor for other tasks while a busmaster operates in parallel. Adapters and device drivers must support this feature (many do today).

Synchronous Channel Check support provides for the signaling of errors synchronously with the transfer in progress. Adapters and device drivers must be designed to support this feature (none do today).

Data bus parity support provides for the verification of correct data as it is transferred between the processor and memory and over the Micro Channel. All data moved between individual components on the Processor Complex use this feature (processor, memory controller DMA, Micro Channel controller). IBM's Token-Ring LANStreamer MC 32, Auto LANStreamer MC 32, Dual LANStreamer MC 32, EtherStreamer MC 32, Dual EtherStreamer MC 32, SCSI-2 Fast/Wide Adapter/A, SCSI-2 RAID Controller, SCSI-2 RAID Adapter/A, and TURBOWAYS 100 ATM Adapter support this feature.

IBM 32 bit MCA busmasters that support **40 MB/sec streaming**:

- ☞ Token-Ring LANStreamer MC 32, Auto LANStreamer MC 32, Dual LANStreamer MC 32
- ☞ EtherStreamer MC 32, Dual EtherStreamer MC 32
- ☞ SCSI-2 Fast/Wide Adapter/A
- ☞ SCSI-2 RAID Controller (in 95 A), SCSI-2 F/W Strm RAID Adapter/A
- ☞ All FDDI Micro Channel adapters
- ☞ 3515 Adapter/A (actually supports 80 MB/sec if bus supports it)
- ☞ 3514 Array Adapter (for external 3514 RAID 5 Array)
- ☞ ARTIC960 Co-processor Adapter (actually supports 80 MB/sec)
- ☞ TURBOWAYS 100 ATM Adapter
- ☞ Ethernet Quad PeerMaster Server Adapters (80 MB/sec)

IBM Server 95 (Base 4 models) - withdrawn

IBM® PS/2® Server:	≈ 95 466	≈ 95 560	≈ 95 566	≈ 95 Array 466	≈ 95 Array 560	≈ 95 Array 566
Type	9595-xNx	9595-xPx	9595-xQx	9595-xNx	9595-xPx	9595-xQx
Models	1NG 1NT	0PT	0QT	3NG 3NT	3PG 3PT	3QG 3QT
Disk - individual size	540 MB 1 GB	1 GB	1 GB	540M X 3 1G X 3	540M X 3 1G x 3	540M x 3 1G X 3
Disk - total size	Same	Same	Same	= 1.62 GB = 3.0 GB	= 1.62 GB = 3.0 GB	= 1.62 GB = 3.0 GB
Disk - speed	8.7 ms 8.6 ms	8.6 ms	8.6 ms	8.7 ms 8.6 ms	8.7 ms 8.6 ms	8.7 ms 8.6 ms
Price (retail USD)	\$5,940 \$6,406	\$7,983	\$8,647	\$7,029♣ \$7,679♣	\$7,725♣ \$8,729♣	\$8,225♣ \$9,229♣
Available date	Oct 93 Oct 93	Sept 93	Feb 94	Nov 93 Nov 93	Nov 93 Nov 93	Feb 94 Nov 93
Processor / MHz	486DX2 - 66/33	Pentium™ - 60	Pentium - 66	486DX2 - 66/33 MHz	Pentium - 60 MHz	Pentium - 66 MHz
Processor upgrade(s)	Pentium - 60, 66					
Upgrade method	All: Processor Complex design allows faster processors and/or newer functions to be implemented in future All: Replace Processor Complex (return old one to IBM)					
L2 cache - std / max	128 KB / 128 KB	256 / 256 KB	256 / 256 KB	128 KB / 128 KB	256 KB / 256 KB	256 KB / 256 KB
L2 cache - write policy	All: Write-back (organization: 2 way set associative) / 0 wait states and 64 bit transfer between Pentium and L2 cache					
L2 cache - method	All: Soldered on Processor Complex so can not add or remove capacity					
Memory - std / max	All: 16 / 256 MB (if parity SIMMs are used (not ECC), then maximum is 64 MB) / 64 bit path to memory					
Memory - speed / pins	All: 70 ns / 72 pin (memory must be installed in matched pairs of the same capacity)					
Mem - supported SIMMs	All: 70 ns speed only (supports 2, 4, 8 MB parity or 2, 4, 8, 16, 32 MB ECC; can not mix parity and ECC SIMMs)					
Mem - total sockets / avail	All: 8 sockets / 6 available (so two 8 MB ECC SIMMs are standard)					
Memory - type	All: Error Checking and Correcting (ECC) which detects and corrects any single bit errors on the fly; all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system					
Disk controller	SCSI-2 Fast/Wide (with streaming, data parity)			SCSI-2 RAID Fast/Wide (with streaming and data parity)		
Controller transfer rates	40 MB/sec to MCA; 20 MB/sec on SCSI bus			40 MB/sec to MCA; 20 MB/sec on SCSI bus		
Raid levels in controller	None (use software)			RAID 0, 1, 5 (supports 4 independent arrays and 8 logical arrays)		
Controller implementation	32 bit busmaster adapter in a slot			32 bit busmaster adapter in a slot		
Controller channels	Two (internal/external); supports 7 devices max			Two (both internal - can not add external disks as no ext connector)		
Cntrlr cache - std / max	None / none			4 MB / 64 MB 80 ns (30 pin memory; 4, 16, 64 MB config only)		
Architecture	All: Micro Channel® / SynchroStream™ / Base 4 Processor Complex					
Architecture features	All: 40 MB/sec streaming data transfer / Dual bus / 32 bit, 20 MHz DMA / Subsystem Control Block enabled / Synchronous Channel Check support / Data bus parity / Parity checking between all controllers on complex					
32 bit slots / available	All: 8 slots (all 32 bit) / 6 slots available (SCSI in one slot and SVGA adapter in another slot)					
Bays / available	7 bays / 5 avail (one for diskette; one for disk)			9 bays / 5 avail (one for diskette; three for 3 disks; disks must be 1")		
CD-ROM	Bootable, internal CD-ROM / double speed and XA / multisession / SCSI-2 interface / 1.6" HH (models after 10/17/94)					
Diskette drive	All: 2.88 MB 3.5" diskette drive / dust cover / media sense / uses 3 drop cable for diskette/tape					
Serial ports	All: Two 9 pin serial ports / DMA support / UART 16550A / 345.6 Kbps maximum supported speed					
Parallel port	All: Two parallel ports / DMA support / bidirectional / port A supports 2 MB/sec max speed / port B supports 100 KBps					
Video - controller / vendor	All: SVGA / IBM (adapter is a dumb frame buffer)			All: Vital Product Data (VPD) enabled for unique ID (model/submodel); Type/model/serial number; Planar serial number; Manufacturing ID; Planar FRU number; Planar part number.		
Video - arch / data path	All: Micro Channel / 16 bit (in 32 bit adapter slot)					
Video - memory std/max	All: 512 KB / 512 KB (DRAM memory)					
Security	C2 security enabled with LogicLock™ (LogicLock is a term for all security features)					
Security options	Tamper evident cover / Privileged-access passwd / cover key lock / U Bolt support / power-on password Option: Cable Cover 4 / Enhanced 2.88 MB diskette drive with electronic eject and removable media security					
Software	ServerGuide™ - CD based automated network oper system installation and configuration tool (models after 10/17/94)					
Systems management	Includes NetFinity™ (system hardware mgmt software) and many utilities in ServerGuide (see list on S500 sheet) Option: PS/2 ServerGuard™ (a Micro Channel adapter and software)					
3 MB System Partition	Yes (diagnostics, Reference Diskette on disk)			No (since all three disks preconfigured as one RAID 5 array)		
BIOS	All: 256 KB in Flash EEPROM on the Complex (SurePath™ BIOS) / upgrades free of charge (via diskette)					
Keyboard / mouse	All: Choice of three keyboards (Enhanced 101 key, 84 key, host 122 key) / IBM Enhanced mouse (after 10/17/94)					
Power supply	All: 400 watt / universal / automatic voltage sensing / built in overload, surge protection / remote and timed power on					
Other features	All: Fast startup mode / selectable boot / Vital Product Data / Unattended start / UPS cable					

Array models have the standard 3 disks configured as one RAID 5 array at shipment. Array models have **seven hot swap carriers** to remove disks on the fly (hot swappable). Front bezel must first be removed due to security issues. **Online spares** are also supported.

FH: Full Height bay (up to 3.2")
HH: Half Height bay (up to 1.6")
SL: Slim Line bay (up to 1")
The Array models have converted each Full Height bay into 3 Slim Line bays which only hold 1" high disks. Since the IBM 2.0 GB SCSI-2 disk is HH (1.6" high), it will not fit into these SL (1" high) bays. The IBM 540 MB SCSI-2 and IBM 1 GB SCSI-2 disks fit since they are SL (1" high).

Optional UPS for IBM PC Servers:
American Power Convn Smart-UPS 700
American Power Convn Smart-UPS 1000
American Power Convn Smart-UPS 1400

95 non-array models (all 9595's)

diskette	3.5" HH (access)	Max internal: 10 GB Max int/ext: 56 GB
	3.5" HH (access)	
CD-ROM	5.25" HH (access)] or Full Height
	5.25" HH (access)	
	5.25" HH (access)	
	5.25" HH (no access)	
std disk	5.25" HH (no access)] or Full Height

95 Array "A" models

diskette	3.5" HH (access)	Max internal: 7 GB Max int/ext: 49 GB
	3.5" HH (access)	
CD-ROM	5.25" HH (access)] or Full Height
	5.25" SL (no access)	
	5.25" SL (no access)	
	5.25" SL (no access)	
std disk	5.25" SL (no access)	
std disk	5.25" SL (no access)	
std disk	5.25" SL (no access)	

PS/2 WARRANTY SERVICE SUPPORT

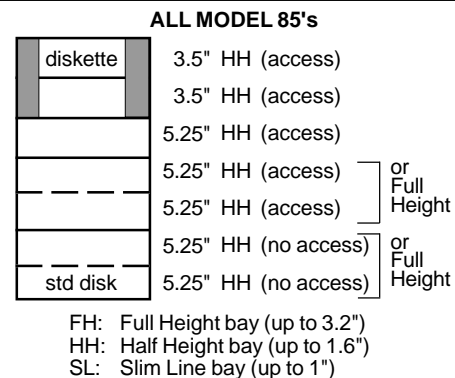
- ⇒ 3 year warranty (international)
- ⇒ On site warranty all 3 years
- ⇒ All cities in all states
- ⇒ 24 hour / 7 day service coverage
- ⇒ 4 hour response time
- ⇒ 24 hour / 7 day telephone, bulletin board, fax, and electronic support
- ⇒ IBM or dealer warranty/service
- ⇒ 30 day money back guarantee

All trademarks are the property of their respective owners (listed on Trademark sheet)
• = Hot swap carrier ♣ Price decrease July 13, 1995 ≈ Withdrawn effective July 27, 1995

No warranties are expressed or implied in this summary
(95) Compiled by Roger Dodson, IBM, August 1995

IBM Server 85 - withdrawn

IBM® PS/2®:	➤ Server 85 433	➤ Server 85 466
Type	9585-xKx	9585-xNx
Models	0KG 0KT	0NG 0NT
Disk - individual size	540 MB 1 GB	540M 1 GB
Disk - speed	8.7 ms 8.6 ms	8.7 ms 8.6 ms
Price (retail USD)	\$ 4,260 ➤ \$ 4,725 ➤	\$ 4,925 ➤ \$ 5,390 ➤
Available / withdrawn date	November 1993 / March 1995	November 1993 / March 1995
Processor / MHz	486DX - 33 MHz	486DX2 - 66/33 MHz
Processor upgrade(s)	<i>All:</i> ① 486DX2 at 66/33 MHz ② P24T (Intel® Pentium™ OverDrive™ processor expected in 1994)	
Upgrade method	<i>All:</i> Remove standard CPU from 238 pin ZIF or LIF socket	
L2 cache - std / max	128 KB / 256 KB	256 KB / 256 KB
L2 cache - write policy	<i>All:</i> Write-back (organization: 2 way set associative)	
L2 cache - method	<i>All:</i> One SIMM socket (already occupied by standard L2 cache)	
Memory - std / max	<i>All:</i> 8 / 256 MB / 64 bit path to memory	
Memory - speed / pins	<i>All:</i> 70 ns / 72 pin	
Mem - supported SIMMs	<i>All:</i> 70 ns speed only (supports 2, 4, 8, 16, 32 MB parity SIMMs; does NOT support ECC SIMMs)	
Mem - total sockets / avail	<i>All:</i> 8 sockets / 6 available (so two 4 MB parity SIMMs are standard)	
Memory - type	<i>All:</i> ECC-P / parity memory with Error Checking and Correction memory controller (see explanation below)	
Disk controller	<i>All:</i> SCSI-2 Fast/Wide (with streaming)	<i>All:</i> Maximum disk capacity:
Controller transfer rates	<i>All:</i> 40 MB/sec to MCA (32 bit); 20 MB/sec on SCSI bus (16 bit)	Internal: 10 GB with five 2 GB SCSI-2 disks
Raid levels in controller	<i>All:</i> None (use software)	Internal and external: 56 GB
Controller implementation	<i>All:</i> 32 bit busmaster controller on planar	
Controller channels	<i>All:</i> Two (one channel internal for 5 devices since 5 SCSI bays; one channel external. Maximum of 7 SCSI devices total either mixed on both channels or on one channel.	
Cntrlr cache - std / max	<i>All:</i> None / none	
Architecture	<i>All:</i> Micro Channel®	
Architecture features	<i>All:</i> 40 MB/sec streaming data transfer / 32 bit, 16.5 MHz DMA / Subsystem Control Block enabled / Synchronous Channel Check support	
32 bit slots / available	<i>All:</i> 8 slots (all 32 bit) / 7 slots available (SVGA adapter in one slot)	
Bays / available	<i>All:</i> 7 bays / 5 available (one used for diskette; one used for disk; see diagram above)	
Diskette drive	<i>All:</i> 2.88 MB 3.5" diskette drive / dust cover / media sense to correctly format, read, write 1, 2, and 4 MB diskettes	
Serial port	<i>All:</i> One 9 pin serial port / DMA support / UART 16550A / 345.6 KBps maximum supported speed	
Parallel port	<i>All:</i> One parallel port / DMA support / bidirectional / supports 100 KBps maximum supported speed	
Video - controller / vendor	<i>All:</i> SVGA / IBM (adapter is a dumb frame buffer)	<i>All:</i> Vital Product Data (VPD) enabled for unique ID (model/submodel); Type/model/serial number; Planar serial number; Manufacturing ID; Planar FRU number; Planar part number.
Video - arch / data path	<i>All:</i> Micro Channel / 16 bit (in 32 bit adapter slot)	
Video - memory std/max	<i>All:</i> 512 KB / 512 KB (DRAM memory)	
Security	<i>All:</i> C2 security enabled with LogicLock™ (LogicLock is a term for all security features)	
Tamper evident cover	<i>All:</i> Yes Tamper evident cover: an attempted break in or attempting to short out power-on password without cover key prevents booting until privileged-access password is entered.	Privileged-access password: ① restricts access to system programs; ② stops system after a POST error also restricting access to system programs; ③ prohibits unauthorized modifications to hardware; ④ works with tamper evident cover switches to prevent unauthorized operation after a forced entry.
Privileged-access passwrd	<i>All:</i> Yes	
Power-on password	<i>All:</i> Yes	
Cover key lock	<i>All:</i> Yes	
U Bolt support	<i>All:</i> Yes	
Security options	<i>All:</i> Cable Cover 4 / Enhanced 2.88 MB diskette drive with electronic eject and removable media security	
3 MB System Partition	<i>All:</i> Yes (diagnostics, Reference Diskette on disk)	
Preloaded software	<i>All:</i> None (no operating system or mouse ships standard) / fast startup mode / selectable boot	
BIOS	<i>All:</i> 256 KB in Flash EEPROM on the planar board (SurePath™ BIOS) / upgrades free of charge (via diskette)	
Keyboard	<i>All:</i> Choice of three keyboards (Enhanced 101 key, 84 key, host 122 key)	
Power supply	<i>All:</i> 288 watt / universal / manual switch setting / built in overload, surge protection / remote and timed power on	
Systems management	<i>All:</i> Optional PS/2 ServerGuard™ (a Micro Channel adapter) to locally or remotely control, tune, and recover a NetWare 3.11 server; works on system console, any LAN PC, or modem anywhere in world	



MODEL 85 MEMORY CONTROLLER

- Error Checking and Correcting (ECC) memory controller is standard.
- This automatically corrects any single bit errors on the fly (98% of memory errors are single bit); all 2 bit errors are found which halt system; some 3 and 4 bit errors are found which halt system; single bit errors are not logged (call provided for future logging by operating system), but multiple bit errors are logged in Non Volatile Random Access Memory (NVRAM).
- Uses normal parity SIMMs; hence in ECC-P, the "P" means Parity. So the additional cost of ECC memory SIMMs is not needed.
- ECC-P detection and correction takes place in the memory controller rather than in the memory SIMM as on the Base 3 and 4 Processor Complex of the Model 95. If the ECC is enabled, it will cause up to a 14% performance degradation compared to the more efficient Base 3 and 4 Processor Complex (Model 95) which is only 3%. This performance degradation is only for the memory subsystem, not for the total throughput.
- ECC capability can be turned on or off without changing any hardware, memory, switches, or opening the cover; enabled or disabled via menus on the System Partition (Ref Diskette).
- 64 bit memory transfer (Two Way Banked Memory Interleave) for increased performance (when SIMMs installed in pairs); 32 bits go into the 486 and 32 bits go into memory buffer latch. The 64 bit path uses 8 bit correction information for ECC function.
- Memory SIMMs must be installed in pairs of the same size, speed and type. (Older Model 85 with 486SX allowed use of single SIMM).

SVGA ADAPTER VIDEO MODES

Resolution	Frame Rate (Hz)	Max colors/gray shades
640 x 480	60, 72, 75 (NI)	256 / 256
800 x 600	56, 60 (NI)	256 / 256
1024 x 768	43.5 (I)	16 / 16

PS/2 WARRANTY SERVICE SUPPORT

- 3 year warranty
- On site warranty all 3 years
- All cities in all states
- 24 hour / 7 day service coverage
- 4 hour response time
- 24 hour / 7 day telephone support
- 24 hour / 7 day bulletin board
- 24 hour / 7 day fax support
- IBM or dealer warranty/service
- 30 day money back guarantee