

M300-05

CHARACTERISTICS

Microprocessor	INTEL 386SX
Clock	16 MHz
Architecture	XT AT addressing 32-bit
Memory	From 1 MB to 11 MB on motherboard Bank 1 1 MB soldered chip 256 Kb x 4 Bank 2 Two sockets, for SIMM modules: 1 Mb x 9 EXM 26-502 or 4 Mb x 9 EXM 26-809 or 1 Mb x 9 EXM 25-532 Bank 3 Same as bank 2
Memory access	100 ns / 80 ns
Coprocessor	16 MHz 80387SX
Floppy Disk	1.2 MB 5.25" Panasonic JU 475-3 1.2 MB 5.25" Panasonic JU 475-4 1.2 MB 5.25" Toshiba ND 08 DE 1.44 MB 3.5" Panasonic J-257 1.44 MB 3.5" Sony MP-F17 1.44 MB Mitsubishi MF355C
Hard Disk	40 MB CONNER CP3046 40 MB Quantum LPS 52 AT 120 MB CONNER CP30126 40 MB W.D. AC 140 120 MB W.D. AC 2120
Streaming Tape	40 MB IRWIN 245 floppy interface 80/120 MB IRWIN 285 floppy interface
Slots	Three 16-bit connectors on expansion board of BUS IN283
Video adapter	PVGA1B integrated on motherboard VGA compatible
Hard Disk and Floppy disk controller	Integrated on motherboard Floppy disk controller: National DP8473 Hard disk interface:MSI buffer and logic ports
Mouse	PS/2- and AT-compatible
Keyboard	101/102-key ANK 26-101, ANK 26-102

MOTHERBOARD

BA 267
Lev. 03 MI

BA 271
Lev. 06 MI

BA 274
Lev. 06 MI

BA 288
Lev. 05 MI

BIOS

Rev. 1.08

EXPANSION BUS

IN283
Lev. 03

IN124
Lev. 01

POWER SUPPLY

PS11 220 V
Lev. 06

PS11 115 V
Lev. 04

PS11 220 V only
ASTEC Lev. 05

MOTHERBOARD

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA267	Nasc.		Rev. 1.03	Board produced in small quantities as replaced immediately by BA 271
	Lev. 01 MI		Rev. 1.06 PZCF	Changes at field level only as board is no longer in production. The changes are: <ul style="list-style-type: none"> - AMD CPU alternative to the INTEL CPU - Component IPC82C206 alternative to the "Texas" component - W.D. 16C551 step C replaced by step D - Keyboard controller changed from Rev. 7.02 to Rev. 10.01 for introduction of the security features. This release functions only with the 1.06 BIOS or subsequent versions - New BIOS 1.06 All these changes update BA267 but do not make it functionally equivalent to BA 288 level 03
	Lev. 01 MI No change of level		Rev. 1.07 PZCK	New BIOS to remedy the slow mouse problem in WINDOWS 3.0 in floppy disk access simultaneous with mouse movement
	Lev. 02 MI		Rev. 1.08 PZCL	New BIOS to remedy problems with the DEPCA board on some monochrome monitors when displaying the 132 column mode. Field change only
	Lev. 03 MI		Rev. 1.08	Component WD 16C551 Rev. C replaced by the WD 16C551 Rev. D component

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA271	Nasc.		Rev. 1.03 PEQT	Replaces BA267. Components are the same
	Lev. 01 MI		Rev. 1.04 PEQP	New BIOS
	Lev. 02 MI		Rev. 1.04 PEQP	Replace PAL BCONV GLZ5 at location U91 with PAL GLZ8 to eliminate malfunctioning of some boards on the bus during refresh cycles.
	Lev. 03 MI		Rev. 1.05 PUN2	New BIOS and hardware changes to solve problems for Duplicator software and PCTOOLS 6.0
	Lev. 04 MI		Rev. 1.06 PZCF	Changes at field level only as board is no longer being produced. The changes are: <ul style="list-style-type: none"> - AMD CPU alternative to the INTEL CPU - Component IPC82C206 alternative to the "Texas component" - W.D. 16C551 step C replaced by step D - Keyboard controller changed from Rev. 7.02 to Rev. 10.01 for introduction of the security features. This release functions only with the 1.06 BIOS or subsequent versions - New BIOS 1.06 All these changes update BA 271 but do not make it functionally equivalent to BA 288 level 03
	Lev. 04 MI No change of level		Rev. 1.07 PZCK	New BIOS to remedy the slow mouse problem in WINDOWS 3.0 in floppy disk access simultaneous with mouse movement
	Lev. 05 MI		Rev. 1.08 PZCL	New BIOS to remedy problems with the DEPCA board on some monochrome monitors when displaying the 132 column mode. Field change only
	Lev. 06 MI		Rev. 1.08	Cuts, wirings and replacment of PAL GLZB in position U96 with PAL GLWK to solve problem of the QBASIC software when the numeric coprocessor is installed.

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA274	Nasc.	612205 D	Rev. 1.03 PEQP	Replaces BA267. Integrated controllers are the same
	Lev. 01 MI		Rev. 1.04 PEQP	New BIOS
	Lev. 02 MI		Rev. 1.04 PEQP	Replace PAL BCONV GLZ5 at location U91 with PAL GLZ8 to eliminate malfunctioning of some boards on the bus during refresh cycles.
	Lev. 03 MI		Rev. 1.05 PUN2	New BIOS and hardware changes to solve problems for Duplicator software and PCTOOLS 6.0 Field change only.
	Lev. 04 MI		Rev. 1.06 PZCZ	Changes at field level only as board is no longer being produced. The changes are: <ul style="list-style-type: none"> - AMD CPU alternative to the INTEL CPU - Component IPC82C206 alternative to the "Texas" component - W.D. 16C551 step C replaced by step D - Keyboard controller changed from Rev. 7.02 to Rev. 10.01 for introduction of the security features. This release functions only with the 1.06 BIOS or later - New BIOS 1.06 All these changes update BA 274 but do not make it functionally equivalent to BA 288 level 03
	Lev. 04 MI No change of level		Rev. 1.07 PZCK	New BIOS to remedy the slow mouse problem in WINDOWS 3.0 in floppy disk access simultaneous with mouse movement
	Lev. 05 MI		Rev. 1.08 PZCL	New BIOS to remedy problems with the DEPCA board on some monochrome monitors when displaying the 132 column mode. Field change only
	Lev. 06 MI		Rev. 1.08	Cuts, wirings and replacment of PAL GLZB in position U96 with PAL GLWK to solve problem of the QBASIC software when the numeric coprocessor is installed.

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA288	Nasc.	612454 W	Rev. 1.04 PEQP	New board for trimming recovery
	Lev. 01 MI		Rev. 1.05 PUN2	<ul style="list-style-type: none"> - New BIOS - Introduced TEXAS IPC 82C206 component in alternative to the C&T IPC 82C206. - The TEXAS component becomes the primary source and the C&T component the secondary source. - The WD16C551 Rev. C is replaced with WD16C551 Rev. D component. - Introduced AMD CPU in alternative to the Intel CPU
	Lev. 02 MI		Rev. 1.06 PZCF	<ul style="list-style-type: none"> - New BIOS to handle keyboard password and System Password - Introduction of Keyboard Controller Revision 10.01 to handle these passwords. - To correctly handle these passwords use User Diskette Version 1.04
	Lev. 03 MI No change of level		Rev. 1.07 PZCK	New BIOS to remedy the slow mouse problem in WINDOWS 3.0 in floppy disk access simultaneous with mouse movement
	Lev. 04 MI		Rev. 1.08 PZCL	New BIOS to remedy problems with the DEPCA board on some monochrome monitors when displaying the 132 column mode.
	Lev. 05 MI		Rev. 1.08 <u>PZCL</u>	Cuts and wirings to solve problem of the QBASIC software when the numeric coprocessor is installed.

MOTHERBOARD INTEGRATED CONTROLLERS

MOTERBOARD	INTEGRATED CONTROLLERS	
BA267	8742 PVGA1B 82C206 WD16C552 DP8473 MSI buffer NORD Gate Array SUD Gate Array	Keyboard and Mouse controller VGA super video adapter Non-volatile RAM Real Time Clock DMA controller Interrupt controller Serial and parallel port controller Floppy disk controller Intelligent hard disk interface READY signal generation Intel 387SX interface RESET generation BUS addresses control Slow speed work session Memory address control Address map decode Interface for refresh Shadow RAM support DMA controller Data BUS controller Clock generator Parity control BUS controller Read/write logic decode Signal generation A20GATE
BA271 BA274 BA288	These boards have the same controllers as BA267	

BOARDS

FUNCTION	DESCRIPTION	D.R.S. CODE	CHARACTERISTICS
CPU system board	BA267		
CPU system board	BA271		
CPU system board	BA274	612205 D	
CPU system board	BA288	612454 W	
Power supply 220 V	PS11	412957 N	
Power supply 110 V	PS11	412958 X	
BUS Adapter board	IN283	977913 Q	
BUS Adapter board	IN124	978265 P	

USER DISKETTE

LEVEL	COMPATIBILITY
Lev. 1.01 Lev. 1.02 Lev. 1.03 Lev. 1.04	BIOS 1.04 BIOS 1.05 BIOS 1.06 - Keyboard Controller Revision 10.01 This User Diskette allows: <ul style="list-style-type: none"> - Management of Western Digital 40 MB and 120 MB hard disks - Management of keyboard Passwords introduced with new Keyboard controller Revision 10.01 - Management of System Password - Updating of message system

SYSTEM TEST

LEVEL	COMPATIBILITY
Lev. 1.02	BIOS 1.04
Lev. 1.03	New tests organisation, now they can run singly or via a file manager
Lev. 1.06	The MS-DOS 4.01 files have been introduced in this version. The new release also includes: <ul style="list-style-type: none"> - The security features - New Keyboard Controller test to support releases 10.01 and later - Tables for management of W.D.40 MB and 120 MB hard disks

COMPATIBILITY NOTES

BOARD OR HW/SW DEVICE	DESCRIPTION
BUS adapter board IN283 Lev. 01	Solves malfunctioning problems of some boards on the AT bus during refresh cycles
BUS adapter board IN283 Lev. 02	Solves the problems with RETIX board
BUS adapter board IN124 Original Lev.	New printed circuit absorbing cuts and wirings of the IN283
BUS adapter board IN124 Lev. 01	Introduction of terminators on the board
Intel 386SX CPU	Intel will no longer supply the 386SX Step C CPU, it is replaced with Step D that has the same electrical and mechanical characteristics as Step C. Board level does not change
CONNER and QUANTUM hard disks	The following hard disks: 120 MB CONNER CP30126 19 ns 210 MB CONNER CP3206 16 ns 40 MB QUANTUM LPS 52 AT 19 ns can only function with BIOS release 1.05 or later
BIOS 1.05	Solves: <ul style="list-style-type: none"> - Memory problems after POD - Incorrect initialization of POD for an eventual optional ROM - Loading problems of video parameters - Parallel port problems after a reset (CTRL-ALT-DEL) - Management of new hard disks
AMD CPU	The AMD CPU can be used as an alternative to the INTEL CPU.
TEXAS 82C206 Component	The C&T 82C206 component is replaced by the TEXAS 82C206 component. The two components are interchangeable.

POWER SUPPLY UNIT

POWER SUPPLY	LEVEL	DESCRIPTION
PS11 ASTEC 220 V	Nasc. Lev. 01	Only version 220 V Extended magnetic peripheral cables
	Lev. 02	Following problem solved: system fails to switch on if the printer connected is switched on before the system. Problem occurs especially on printers shared with other systems. A zener diode and a resistor have been added to the fan drive circuit to increase the power supply's immunity to external voltages.
	Lev. 03	The box and lid have ben modified
	Lev. 04	A capacitor has been added and a resistor replaced to solve production problems.
	Lev. 05	Inductor L5 has been added near the mains input and changes have been made to the circuitry to eliminate EMI problems and random voltage drops.
PS11 Plessey 220 V	Nasc.	Improved RESET signal
	Lev. 01	Reduced acoustic noise
	Lev. 02	Solves temperature problems
	Lev. 03	Reduced acoustic noise with MITSUBISHI fans
	Lev. 04	Solves temperature problems
	Lev. 05	Extended magnetic peripheral cables
Lev. 06	Replaced printed circuit material to improve transportability	
PS11 Plessey 110 V	Nasc.	This power supply has evolved in the same way as the 220 V model.
	Lev. 01	
	Lev. 02	
	Lev. 03 Lev. 04	

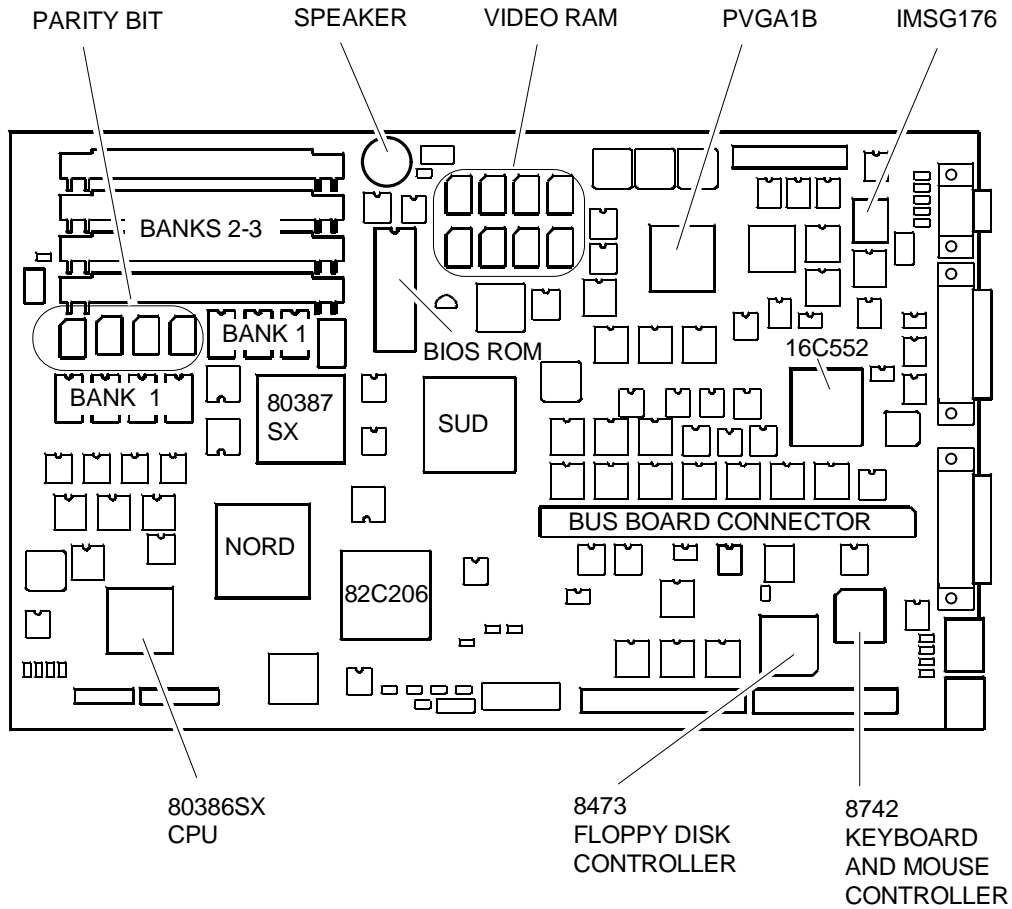
SOFTWARE COMPATIBILITY**18**

OPERATING SYSTEMS	NOTES
IBM DISK Operating System, Ver. 3.30 MS-DOS (Compaq) IBM DISK Operating System, Ver. 4.01 IBM Operating System/2, Ver. 1.10 and 1.20 IBM Operating System/2 Extended Edition, Ver. 1.10/1.20 INTERACTIVE 386/ix, Ver. 2.02 SCO UNIX System V/386, Rev. 3.2 SCO XENIX 386, Rev. 2.3	 During installation on hard disk, a formatted DSDD disk is required. PS/2 mouse not recognised PS/2 mouse not recognised
WINDOWS	
GEM/3 Desktop, IBM-PC Ver. 3.02 MS-WINDOWS /286 Ver. 2.11	MS-WINDOWS /386 Ver. 2.11 MS-WINDOWS 3 Ver. 3.0

HARDWARE COMPATIBILITY

<p>MODEMS</p> <p>Hayes Smartmodem 2400B FAXY PC MAXTER FURY 2400 PC MODEM AT&T 2224 CEO MODEM FURY 2400 MAXTER MODEM FURY 2400 TI/MNP Hayes Smartmodem 1200 B</p>	<p>I/O INTERFACE PRODUCTS</p> <p>IBM PRINTER ADAPTER (1505200) STB 4-ON THE FLOOR</p>
<p>MULTIPOINT</p> <p>CHASE AT 8 COMPUTONE AT 8 COMPUTONE AT 16 INTEL Bell ICC.6 SPECIALIX SI / 8</p>	<p>MOUSE</p> <p>IBM PS/2 Mouse (6450350) IBM PS/2 Mouse Serial Logitech Bus Mouse (PF-3F) Logitech 3 button mouse MS-BUS mouse MS-MOUSE serial</p>
<p>GRAPHICS PRODUCTS</p> <p>AST VGA PLUS FASTWRITE 1024i FASTWRITE VGA HERCULES GRAPHICS CARD IBM VGA Adapter MATROX PG - 1281 MAXON MVGA - 16 Adapter ORCHID PRODESIGNER VGA PLUS HERCULES INCOLOR CARD (GB222) PARADISE VGA PRO CARD</p>	<p>NETWORKING & LAN PRODUCTS</p> <p>10 NET INTERFACE BOARD 200 series 3COM Etherlink adapter 3C501 3COM Etherlink II adapter 3C503 3COM Etherlink plus adapter 3C505 3COM Etherlink plus adapter 3C505 DECNET PCSA adapter IBM PC NETWORK adapter II IBM TOKEN RING 16/4 adapter IBM TOKEN RING adapter II MADGE AT RING NODE adapter MICOM NP1000 adapter NOVELL NE1000 adapter NOVELL NE2000 adapter</p>
<p>DISPLAY UNITS</p>	
<p>IBM enhanced graphics monitor 5151 IBM color graphics monitor 5153 IBM PS/2 Monochrome display 8503 IBM PS/2 color display 8512 IBM PS/2 color display 8513 IBM PS/2 color display 8514 NEC MULTISYNC II</p>	<p>NEC MULTISYNC 2A NEC MULTISYNC 3D NEC MULTISYNC 4D NEC MULTISYNC 5D PHILIPS 7BM749 PHILIPS 9CM082</p>

SYSTEM BOARD COMPONENTS



BKG1A

INTERRUPT LEVELS

LEVEL	NAME	CONTROLLER	FUNCTION
1	IRQ0	1	Channel 0 timer OUT
2	IRQ1	1	Keyboard
3-10	IRQ2	1	Interrupt to Controller 1 from Controller 2
3	IRQ8	2	Real time clock
4	IRQ9	2	Available
5	IRQ10	2	Available
6	IRQ11	2	Available
7	IRQ12	2	Available
8	IRQ13	2	Coprocessor
9	IRQ14	2	Hard Disk controller
10	IRQ15	2	Available
11	IRQ3	1	Serial port 2
12	IRQ4	1	Serial port 1
13	IRQ5	1	Parallel port 2
14	IRQ6	1	Floppy Disk Controller
15	IRQ7	1	Parallel port 1

I/O ADDRESS MAP

ADDRESS	FUNCTION	ADDRESS	FUNCTION
000-01F h	DMA controller (all channels)	2F8-2FF h	Serial port COM2 (alternate)
020-021F h	Interrupt controller 1	378-37B h	Parallel port 1
040-043 h	Timer	3B4-3B5 h	Video adapter
60 h	Data keyboard controller	3BA h	Video adapter
61 h	System Controller Port B	3C0-3CF h	Video adapter
64 h	Commands keyboard controller	3D4-3D5 h	Video adapter
70-71 h	Real time clock, NMI Mask, CMOS RAM	3DA h	Video adapter
081-08F h	DMA page registers	3F0-3F7 h	Floppy disk controller
0A0-0A1 h	Interrupt controller 2	3F8-3FF h	Serial port com1
0C0-0DF h	DMA channels 4-7	46E8 h	VGA control registers
1F0-1F8 h	Hard disk drive	8000F0-8000FF	Coprocessor
278-27B h	Parallel port 2 (alternate)	–	

SYSTEM MEMORY MAP

AT standard has a basic memory of 512 KB, expandable up to 640 KB, in which remapping of physical memory areas is not requested.

With a basic memory expansion beyond 640 KB, a logic addressing conflict arises because the physical memory between 640 KB and 1 MB occupies the logic addressing space reserved for BIOS ROM addressing. This addressing space between 640 KB and 1 MB is called *AT compatibility gap*.

In order not to lose this memory space, in these systems a remapping function has been introduced which makes it possible to have this memory portion available by addressing it beyond the MB.

This memory remapping function also includes a *Shadow RAM* function that allows BIOS ROM to be recopied by the system into the system memory at the same logic address locations in order to speed up the system.

These operation generates adjacent physical address space (physical memory map) from which a logic address space can be configured, these logic addresses may be not adjacent (logic memory map). In this case, for instance, it is possible to intercalate portions of memory resident on boards installed on BUS with portions of memory of system board.

LIMITATIONS FOR MEMORY CONFIGURATION

There are some limitations when using these system memory configuration function.

Limitations are as follows:

AT Compatibility Gap - system needs this GAP

External memory can not be mapped in the logic address area reserved for this gap (0A000h to 0FFFFF h).

128 KB memory segment size - this function works only for memory segments of 128 KB.

The first 258 KB is always used by system internal memory - this 256 KB is reserved for BIOS during Power-On procedure. This memory space requires that the physical address be equal to logic address. This means that the first two memory segments of 128 KB must belong to system memory.

If these limitations are violated, automatically the system gives priority to physical memory map, ignoring the logic memory map. As a result, the external memory installed is ignored.

Another case is to be taken into consideration: when the **maximum memory is installed, i.e. 16 MB**.

In this case there is logic addressing space to remap the AT compatibility Gap which, therefore, will be a usual read/write RAM memory. In this situation, the user memory available depends on how the Shadow RAM option is used.

18

Shadow RAM disabled

512 KB of AT compatibility Gap is ignored by the system and is lost.

System total memory is therefore 15.872 KB ($16.384 - 512 = 15.872$).

Therefore, system loses 512 KB.

Only video BIOS in shadow RAM

64 KB of AT compatibility gap is recovered because it is remapped.

64 KB of video BIOS are set in shadow RAM. System total memory is therefore 16.000 KB ($16.384 - 512 + 64$ recovered $+64$ in shadow = 16.000).

Therefore, system loses 384 KB.

System BIOS and video BIOS in shadow RAM

32 KB of AT compatibility gap is recovered because it is remapped. 96 KB of system BIOS and video BIOS are set in shadow RAM. System total memory, therefore, is 16.000

($16.384 - 512 + 32$ recovered $+ 96$ in shadow = 16.000). Therefore, system loses 384 KB.

COMPATIBLE HARD DISKS

TYPE	MODEL	CAPACITY	CYL	T	WPC	LZ	SET
1	Standard 85 ms	10 MB	306	4	128	305	17
2	OPE XM5221 half size	20 MB	615	4	256	700	17
3	WREN 2 full size	38 MB	925	5	128	924	17
4	CDC WREN 1	28 MB	697	5	128	696	17
5	ST4096	76 MB	1024	9	-1	1023	17
6	OPE XM5340	40 MB	820	6	256	819	17
7	NEC D5146H	40 MB	615	8	128	664	17
8	TM755 slim size	40 MB	981	5	-1	980	17
9	CDC WREN II slim size	40 MB	981	5	128	980	17
10	Micropolis 1324 full size	51 MB	1024	6	128	980	17
11	CDC WREN II full size	53 MB	925	7	128	924	17
12	Micropolis 1325 full size	68 MB	1024	8	-1	1023	17
13	CDC WREN II full size	69 MB	925	9	128	924	17
14	Micropolis 1323-A full size	42 MB	1024	5	-1	1023	17
15	RESERVED						
16	OPE XM5220 85 ms	20 MB	612	4	128	656	17
17	TANDON TM 362 85 ms	20 MB	612	4	-1	663	17
18	Seagate ST251 40 ms	40 MB	820	6	-1	819	17
19	Rodime RO3055 40 ms	43 MB	872	6	0	871	17
20	Miniscribe M8425 68 ms	20 MB	612	4	0	663	17
21	Seagate ST277TR	62 MB	820	6	-1	819	26
22	OPE XM5340/60	62 MB	820	6	128	819	26
23	NEC D5147H	62 MB	615	8	384	664	26
24	NEC D5652 Fujitsu M2246	136 MB	820	10	-1	822	34
25	Micropolis 1355 ESDI	135 MB	1021	8	-1	1023	34
26	Micropolis 1353 ESDI	67 MB	1021	4	-1	1023	34
27	NEC D5452	68 MB	823	10	512	822	17
28	Fujitsu M2227D	40 MB	615	8	512	614	17
29	Fujitsu M2227D RLL	60 MB	615	8	512	614	26
30	CDC 94205-77	62 MB	981	5	-1	980	26
31	CONNER CP3142	40 MB	635	4	-1	639	33
32	CONNER CP3022	20 MB	615	4	-1	614	17
33	CONNER CP3106	100 MB	776	8	-1	775	33
34	Quantum P40 AT	40 MB	745	4	-1	744	28
35	Miniscribe 8051A	40 MB	965	5	-1	964	17
36	CONNER CP346	40 MB	805	4	-1	804	26
37	Quantum LPS105 AT	100 MB	776	8	-1	775	33
38	Quantum LPD210 AT	199 MB	873	13	-1	872	36
39	CONNER CP30064	58 MB	762	4	-1	761	39
40	CONNER CP30124	116 MB	762	8	-1	761	39
41	CONNER CP3206	202 MB	683	16	-1	682	38
42	W.D. AC-140	40 MB	980	5	-1	980	17
43	W.D. AC -2120	116 MB	762	8	-1	762	39

Where: CYL: No. of disk cylinders

T: No. of disk heads

WPC: Precompensation cylinder number

LZ: Head parking cylinder number

SET: No. of disk sectors.

