

M400-40

CHARACTERISTICS

Microprocessor	Intel 486DX with 32-bit addressing
Clock	33 MHz
Architecture	AT
Memory	<p>From 4 MB to 52 MB</p> <ul style="list-style-type: none"> - One bank of 4 MB soldered on the system board (8 1M x 4 DRAM chips plus 4 1Mx1 parity DRAM chips) - Three banks, of 4 sockets each, in which the following SIMM modules are installed: <ul style="list-style-type: none"> - SIMM 1M x 9 EXM 26-807 - SIMM 4M x 9 EXM 26-809 <p>SIMMs of different sizes can be installed in the three banks, but not inside the same bank. Banks can be left empty.</p>
Memory access	80 ns
Coprocessor	Integrated in processor i486DX
Floppy disk	<p>1.2 MB Panasonic JU475-3-4-5</p> <p>1.2 MB Toshiba ND08DE</p> <p>1.44 MB Panasonic J-257 A</p> <p>1.44 MB Sony MP-F17 W</p> <p>1.44 MB Mitsubishi MF355 / MITSUMI D359T3</p> <p>1.44 MB YE DATA YD-702B / 702D</p> <p>2.88 MB Sony MP-F40 W</p>
Hard disk	<p>85 MB CONNER CP30084</p> <p>120 MB CONNER CP30126</p> <p>120 MB QUANTUM ELS 127 AT</p> <p>170 MB CONNER CP30174E</p> <p>210 MB QUANTUM LPS 240 AT</p> <p>210 MB CONNER CP30204 / CP30256</p> <p>240 MB CONNER CP30254</p> <p>340 MB CONNER CP3304 / CP3364</p> <p>340 MB SEAGATE ST1401A / W.D. AC2340</p> <p>510 MB CONNER CP3504</p> <p>510 MB CONNER CP3544</p> <p>510 MB CONNER CP30544</p>
Streaming tape	<p>80/120 MB IRWIN 285 500 Mb/s</p> <p>80/120 MB IRWIN 287 1 Mb/s</p> <p>80/120 MB IRWIN 3125 1 Mb/s</p> <p>150 MB WANGTEK SCSI</p> <p>320 MB WANGTEK SCSI</p>
Expansion slots	4 Present 4 Available
Video adapter	Integrated on system board - 82C452A.
Integrated hard disk and floppy disk controller	<p>FDU controller: Intel 82077AA-1</p> <p>HDU controller: Logic gates and MSI Buffer implementing an AT interface for IDE HDUs</p>
Cache controller	Integrated in the CPU with 8 KB
Mouse	PS/2- and AT-compatible
Keyboard	101/102-key, compact ANK 27-101 ANK 27-102

SYSTEM BOARD

Printed Circuit

BA301:

BA314 8 MB

BA315 4 MB

BIOS

The ROM BIOS is a FALSE EPROM. The BIOS code is supplied on diskettes and must be copied into Flash EPROM.

Rel. 2.08

POWER SUPPLY

PS11/A - 220 V
PLESSEY

PS11/A - 115 V
PLESSEY

PS11/A - only 220 V
ASTECC

PS11/AR - 220 V
ASTECC

SCSI PERIPHERALS CONTROLLER

ASC - 1

SYSTEM BOARD

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA315	Lev. Nasc.	553029U	Rev. 2.04	Board with 4 MB soldered.
			Rev. 2.05	New BIOS
	Lev. 01		Rev. 2.05	Cuts and trimmings, in addition to the replacement of the DPGSEL (GL9A) PAL with the DPGSEL12 (GKCL) PAL, to solve the problems with the video controller during the reading of VIDEO RAM. The ROM version of keyboard controller rev. 10.01 is also introduced to cut costs.
	Lev. 02		Rev. 2.05	The floppy disk controller INTEL component 82077-AA1 is replaced by the INTEL component 82077SL-1.
			Rev. 2.06	New BIOS
	Lev. 03		Rev. 2.06	Component 74F224 at location U37 is replaced with component 74F240 to solve the "snow" effect on high resolution monitors.
			Rev. 2.08	New BIOS
BA314	Lev. Nasc.	553034R	Rev. 2.04	This board is identical to BA315 but has 8 MB of memory. 4 SIMM modules have already been installed at the factory.
			Rev. 2.05	New BIOS. The characteristics and problems solved by the different BIOS versions are explained further on in this chapter.
			Rev. 2.06	New BIOS. This board will no longer be produced. The different memory expansion, constituting the difference between BA315 and BA314, will be implemented at system level. Consequently only BA315 will continue to exist
			Rev. 2.08	New BIOS.

MAIN COMPONENTS OF THE SYSTEM BOARD

SYSTEM BOARD	PRINTED CIRCUIT	MAIN COMPONENTS
BA315	BA301	<ul style="list-style-type: none"> - 33 MHz Intel 486DX processor - Numeric coprocessor integrated in the i486DX - Performance upgrade processor socket - 82C206: Real time clock 128 Byte Non-Volatile RAM Timer DMA controller Interrupt controller - Keyboard/mouse controller 8742 OPT PLCC - Video controller 82C452A - WD16C551-D: 16C550-compatible serial port AT/PS2-compatible parallel port <p>Floppy disk controller 82077 AA1</p> <ul style="list-style-type: none"> - Buffer for intelligent hard disks - Flash Eprom for the BIOS (1 Mbit) - Chip set consisting of 4 gate arrays: <ul style="list-style-type: none"> - BCUE BUS controller - MCUE memory controller - DPU data flow controller - IOU Input/Output controller - System memory (between 4 and 52 MB) - EYE component GA4Q - 66 MHz oscillator
BA314	BA301	This system board is identical to BA315 but has 8 MB memory

USER DISKETTE / SYSTEM TEST / DRIVERS

LEVEL	COMPATIBILITY / NOTES
USER DISKETTE Rev. 1.00 USER DISKETTE Rev. 2.01	This user diskette has a new user interface and can also be used on the M400-40 and M400-60 Personal Computers
USER DISKETTE Rev. 2.02	Alignment with BIOS 2.05
USER DISKETTE Rev. 2.03 Enhanced video drivers Rev. 5.00	Problems with the keyboard, mouse and high resolution monitor have been solved.
Enhanced video drivers Ver. 7.1 Rev. 2.0	Update of the previous version
USER DISKETTE for Streaming Tape Rev. 1.03 Ver. 1 provided in the STU 26-082/A kit	With this release it is possible to install a Streaming Tape drive when a 2.88 MB floppy disk drive is already installed in the system
USER DISKETTE for Streaming Tape Rev. 1.03 Ver. 1 provided in the STU 26-082/A kit	User diskette version 1.02 was entering into conflict with the second floppy disk drive. This problem has been solved with version 1.03
SYSTEM TEST Rev. 1.00	With this System Test release, a new user interface has been implemented.
SYSTEM TEST Rev. 2.00	This System Test release is also used on Personal Computer M400-10 with PCB 301. This release works properly only with BIOS Rel. 2.02.
SYSTEM TEST Rev. 2.00 Upd. 1	Allows execution of the cache memory tests.
SYSTEM TEST Rev. 2.01	Some bugs of the previous release have been eliminated
SYSTEM TEST Rev. 2.02	This System Test release is used on the M400-10, M400-40 and M400-60 Personal Computers. This release works properly only with BIOS Rel. 2.04
SYSTEM TEST Rev. 2.03	This release supports the i486DX2 CPU tests and works properly only with BIOS Rel. 2.05. Some problems linked to monitors with the 72 Hz vertical refresh frequency have been solved.
USER DISKETTE for EOD Rel. 1.03	Release 1.03 has been replaced by 1.05 that implements the ASPI4DOS.SYS driver that supports multitasking Windows 3.xx V86 and the ASPIDISK.SYSY driver that supports the DOS 3.31 extended partition.

COMPATIBILITY

BOARD / DEVICE	COMPATIBILITY
User Disk 2.01 System Test 2.02	Solves problems concerning management of non- standard and high capacity HDUs (600 MB). It must be used with BIOS 2.04.
EYE1 component	EYE2 is introduced as the alternative of EYE1. The level of the boards does not change.
INTEL component PDL 85C220-7	AMD Component PALCE 16V8-7 (GKCT) is introduced as the alternative of the INTEL component PDL 85C220-7 (GLZX). The level of the boards does not change.

POWER SUPPLY UNIT

POWER SUPPLY	LEVEL	DESCRIPTION
PS11/A ASTEC 220 V	Lev. 02	This power supply has already been used on other Personal Computer (see earlier chapters). The level shown is that used on this system.
	Lev. 03	Change to solve the problem of system failing to switch on when connected to a device (parallel printer or drive installed on the BUS) that is already on.
	Lev. 04	Inductor L5 has been added and modifications were made to the circuitry in order to solve problems with EMI radio interferences and random voltage drops.
	Lev. 05	New inductor and printed circuit. NOTE: Given the new printed circuit, the power supplies of previous levels cannot be upgraded to this level.
PS11/A Plessey 220 V	Lev. 03	This power supply has already been used on other Personal Computers (see earlier chapters). The level shown is that used on this system.
PS11/A Plessey 110 V	Lev. 03	
PS11/AR ASTEC 220 V	Lev. Nasc.	New alternative power supply to cut costs.

BIOS EVOLUTION

LEVEL	EVOLUTION
Rev. 2.00	<p>This release introduces the following features:</p> <ul style="list-style-type: none"> - Automatic HDU acknowledgement selecting the "standard" function which will be included in the user diskette release 2.02. - Management of the new VESA 72.8 Hz monitors. - Management of 2.88 MB drives
Rev. 2.01	<p>This release has the following variations with respect to the previous:</p> <ul style="list-style-type: none"> - Change at Security level so that the Power-On password is copied on the Keyboard password, only when there is a Power-On and not when there is a Soft-reset (Ctrl-Alt-Del) or a Jump to F000:FFF0. - Banner change for introduction of the new P24 50/66 MHz CPUs - The "ROM checksum error" error on rebooting after the setup has been removed. - Various malfunctionings concerning new HDU management have been corrected. - New corrections made to 2.88 MB floppy drive management. - A new video table has been introduced for the 11h,12h,79h 72Hz modes due to VESA.N.B. timing problems. <p>This release does not yet implement the facility by which the user has the possibility of setting non-standard hard disks and presents HDU faults when working with a disabled shadow (condition not much used).</p>
Rev. 2.02	Corrected the fault with the OLICOM "V24 LPU 2100/2400/3500/3600" board.
Rev. 2.03	Corrected the "Memory Refresh Error" appearing randomly after a Ctrl-Alt-Del reset.
Rev. 2.04	<ul style="list-style-type: none"> - Corrected the "Keyboard Error" appearing randomly during the POD after a Ctrl-Alt-Del. - Corrected problem of failure to Bootstrap from floppy disk when a HD previously installed on other systems is disconnected. - Some corrections made in management of 2.88 MB floppy disks. - Some malfunctionings of the computer with the Shadow memory disabled have been corrected. - Problems concerning management of non-standard Hard Disks with high capacity (600 MB) have been solved.
Rev. 2.05	<p>This release has the following variations with respect to the previous release:</p> <ul style="list-style-type: none"> - Corrected message concerning CPU type 486DX2. - Corrected message concerning Dedicated memory when disabling the memory between 512K and 640K and performing a controlled reset. - Corrected malfunctioning of the interrupt controller and refresh tests caused by the increase in clock frequency of the computer (486DX2 for M400-60). - Correction to eliminate malfunctioning of the floppy disk running Windows 3.0 in standard mode. - Windows release 3.1 does not have this problem. - Change made for management of the 6K between C680 and C7FF as ROM option. <p>This BIOS revision is also extended to the M400-60 personal computer so subsequent BIOS issues will be attributed to all systems of the M400-10, M400-40 and M400-60 family.</p>
Rev. 2.06	<p>This release corrects the following:</p> <ul style="list-style-type: none"> - Bootstrapping delays with CP3304 HDUs or other MASTER HDUs - Spurious characters when the password is entered on slow keyboards - Cache for compatibility with COMPUTONE AT 8/16 boards - Cancelled the message at the end of the POD indicating hidden partitions
Rev. 2.08	Corrected the problem with IBM OS/2 ver. 2.0 in a DOS window.

HARD DISK SELF-ACKNOWLEDGE FEATURE

This system have the hard disk self-acknowledge feature.

Using the SETUP utility of the System Test or Customer Test, the type of hard disk installed in the system can be defined. Having selected the SETUP utility, select the option hard disk #1 and #2.

The following values can be defined in this field:

- Not Present:** If no hard disk is installed.
- Standard** In this case the system automatically acknowledges type and capacity of the hard disk installed. This option can be used for hard disks including the self-acknowledge device and have capacity of less than 528 MB.
- High Capacity** In this case, the system automatically acknowledges type and capacity of the hard disk installed. This option must be used for hard disks with a capacity of more than 528 with the self-acknowledge device and which are to be used with the Olivetti OS/2, IBM OS/2 and MS-DOS operating systems.
- Compatible** This option must be used for hard disks compatible with the system but which do not have the self-acknowledge device, or hard disks which do have this feature but which have previously been used on other systems. If this option is chosen, a list of hard disks with preset parameters will be displayed. Check that the parameters defined match with those on the label of the hard disk being installed. The following table lists these hard disks:

TYPE	CAPACITY	CYLINDERS	HEADS	SECTORS PER TRACK	WPC	LZ	MODEL
01	10 MB	306	4	17	128	305	STANDARD 10 MB, 85 ms
02	40 MB	925	5	17	128	924	WREN II, Full, 35 ms
03	30 MB	697	5	17	128	696	CDC WREN, Full, 35 ms
04	42 MB	981	5	17	-1	980	WREN II Slim
05	53 MB	1024	6	17	-1	1023	Micropolis 1324, Full
06	56 MB	925	7	17	128	924	CDC WREN II, Full
07	71 MB	1024	8	17	-1	1023	Micropolis 1325, Full
08	72 MB	925	9	17	128	924	CDC WREN II, Full
09	44 MB	1024	5	17	-1	1023	Micropolis 1323-A
10	42 MB	820	6	17	-1	819	Seagate ST251, Half
11	104 MB	776	8	33	-1	775	CONNER CP3106 *
12	104 MB	776	8	33	-1	775	QUANTUM LPS 105 AT *
13	121 MB	762	8	39	-1	762	W.D. AC2120 *
14	340 MB	726	15	61	-1	726	CONNER CP3304 *

* These hard disks have the self-acknowledge feature. The values of the table must only be used if a disk formatted on a "previous system" is installed on this system and the data recorded is maintained. If the hard disk is new, the self-acknowledge feature can be used.

Later BIOS versions implement a new hard disks table that does not have hard disks with the self-acknowledge feature and that may have been used previously on other systems.

TYPE	CAPACITY	CYLINDERS	HEADS	SECTORS PER TRACK	WPC	LZ	MODEL
01	10 MB	306	4	17	128	305	STANDARD 10 MB, 85 ms
02	40 MB	925	5	17	128	924	WREN II, Full, 35 ms
03	30 MB	697	5	17	128	696	WREN, Full, 35 ms
04	42 MB	981	5	17	-1	980	WREN II Slim
05	53 MB	1024	6	17	-1	1023	Micropolis 1324, Full
06	56 MB	925	7	17	128	924	CDC WREN II, Full
07	71 MB	1024	8	17	-1	1023	Micropolis 1325, Full
08	72 MB	925	9	17	128	924	CDC WREN II, Full
09	44 MB	1024	5	17	-1	1023	Micropolis 1323-A
10	42 MB	820	6	17	-1	819	Seagate ST251, Half
11	45 MB	872	6	17	-1	871	RODIME RO3055
12	21 MB	612	4	17	128	663	MINISCRIBE M8425
13	65 MB	820	6	26	-1	819	SEAGATE ST277R
14	65 MB	820	6	26	128	819	OPE XM5340/60

Not Standard This option allows the service engineer to personally define the parameters of a hard disk without any self-acknowledge feature and that is not included in the list of compatible hard disks. The following table lists the parameters of the hard disks supported by the system BIOS.

TYPE	MODEL	CAPACITY	CYL	T	WPC	LZ	SET
1	NEC-D5146H half size	40 MB	615	8	128	664	17
2	Miniscribe M8425 68 ms 3,5"	20 MB	612	4	128	663	17
3	Seagate ST277R	62 MB	820	6	-1	819	26
4	NEC D5147H	62 MB	615	8	384	664	26
5	NEC D5652 ES	136 MB	820	10	-1	822	34
6	MICROPOLIS 1355 ESDI	135 MB	1021	8	-1	1023	34
7	MICROPOLIS 1353 ESDI	67 MB	1021	4	-1	1023	34
8	NEC D5452	68 MB	823	10	512	822	17
9	Fujitsu M2227D	40 MB	615	8	512	614	17
10	Fujitsu M2227D RLL	62 MB	615	8	512	614	26
11	ESDI	304 MB	814	15	-1	1	51
11*	CONNER CP3106	100 MB	776	8	-1	775	33
12	ESDI	81 MB	977	5	-1	1	34
12*	Quantum LPS 105 AT	100 MB	776	8	-1	775	33
13		136 MB	820	10	-1	1	34
13*	W.D. AC 2120	116 MB	762	8	-1	762	39
14	CONNER CP3206	202 MB	683	16	-1	682	38
14 *	CONNER CP3304	324 MB	726	15	-1	726	61
15	RESERVED						

Where: CYL: No. of disk cylinders
 LZ: Head parking cylinder number
 WPC: Precompensation cylinder number
 SET: No. of disk sectors
 T: No. of disk heads

* These hard disks have the self-acknowledge feature. The values in the table must only be used if a hard disk formatted on a previous system is going to be installed on this system while maintaining the data stored.

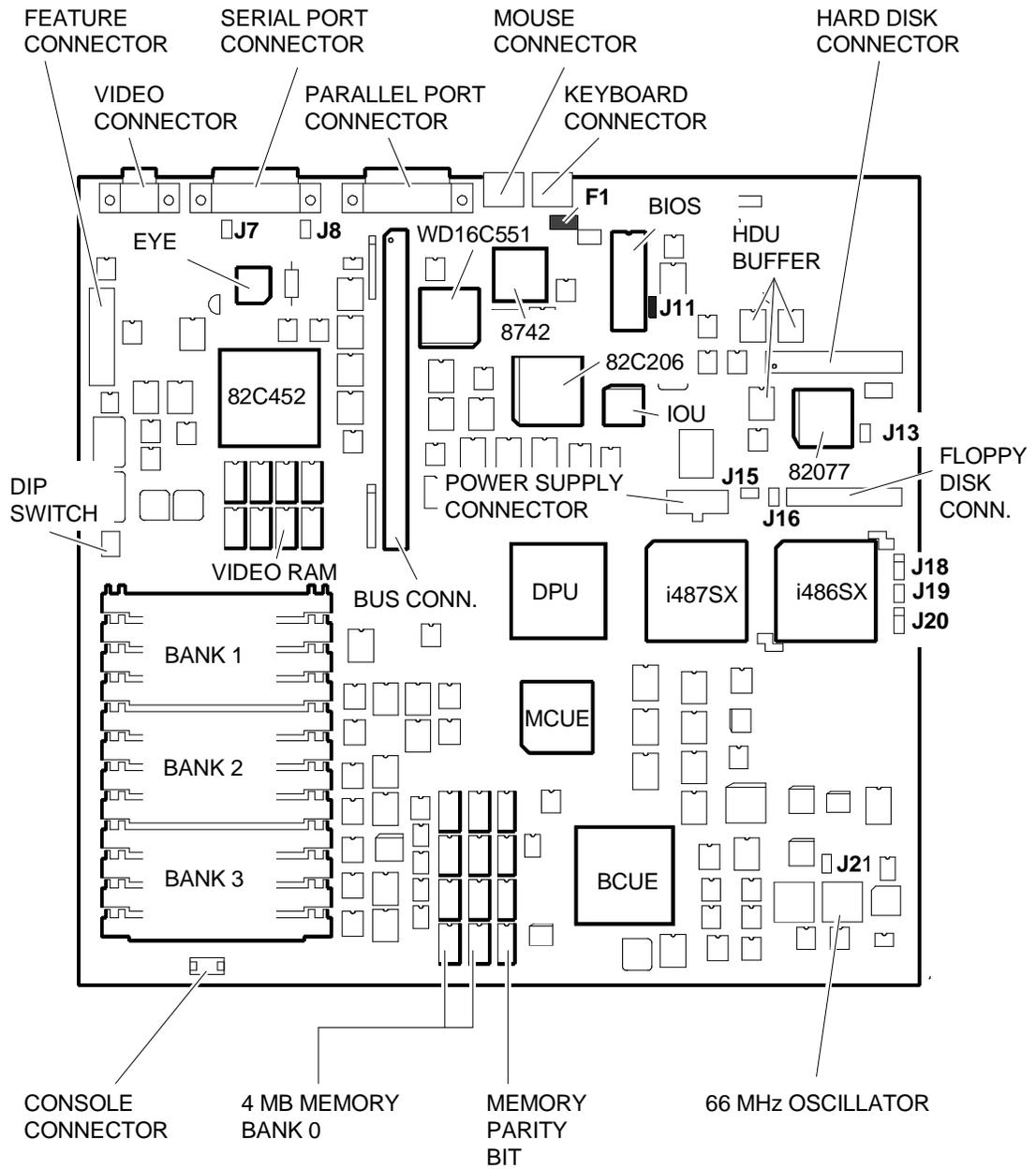
SOFTWARE COMPATIBILITY

OPERATING SYSTEMS	NOTES
IBM DISK Operating System, Ver. 3.30 IBM DISK Operating System, Ver. 4.01 Olivetti's Microsoft Disk Operating System. 3.30a Olivetti's Microsoft Disk Operating System, Ver. 4.01 Olivetti's Microsoft Disk Operating System, Ver. 5.00 Olivetti's Microsoft OS/2, Ver. 1.10 and 1.20 IBM OS/2 version 2.0 IBM OS/2 extended edition Version 1.10, 1.20, 1.30 IBM OS/2 standard edition Versione 1.10, 1.20, 1.30 SCO UNIX System V Rev. 4.0, Rev. 2.1 SCO XENIX Rev. 3.2	A formatted DSDD diskette is required during installation.
WINDOWS	
DESQ-VIEW 386 Ver. 2.31 GEM/3 Desktop, IBM-PC Ver. 3.13 MS-WINDOWS /286 Ver. 2.11	MS-WINDOWS /386 Ver. 2.11 MS-WINDOWS 3 Ver. 3.0

HARDWARE COMPATIBILITY

MODEMS	I/O INTERFACE PRODUCTS
Hayes Smartmodem 2400B / 1200 B DR: NEUHAUS FAXY PC MASTER FERRARI Fax Card Fury 2400 PC modem / Fury 2400 master AT&T 2224 CEO modem	IBM PRINTER ADAPTER (1505200) IBM SERIAL/PARALLEL
MULTIPOINT	MOUSE
Anvil Stallion Intelligent 16 Port Controller Chase AT16 / Chase AT8 Computone System Intelliport 16 Port AT16 Computone System Intelliport 8 Port AT8 Corollary 8 x 4 MUX Digiboard Digichannel COM/xi Intelligent 8 Port Specialix Si Intelligent I/O Controller Intel-Bell ACE 8 / Intel (Bell) ICC.6 Wyse WY-995	IBM PS/2 Mouse (6450350) Logitech Bus Mouse (PF-3F) Logitech 3 button mouse MS-BUS mouse MS-Mouse serial Olivetti Bus Mouse (GRD 25-019) Olivetti New Advanced Mouse (GRD 25-025)
GRAPHIC PRODUCTS	NETWORK & LAN PRODUCTS
AST RESEARCH AST - VGA PLUS FASTWRITE 1024I FASTWRITE VGA HERCULES GRAPHICS CARD IBM EGA ADAPTER IBM VGA ADAPTER HERCULES GRAPHICS STATION CARD Olivetti AGC Olivetti HGC Olivetti XGC ORCHID PRODESIGNER VGA PLUS PARADISE VGA PRO CARD	IBM PC Network ADAPTER II IBM Token Ring PC ADAPTER IBM Token Ring 16/4 ADAPTER MADGE Token-Ring Network 10 NET INTERFACE BOARD (200 SERIES) 3COM ETHERLINK 16 ADAPTER 3COM ETHERLINK ADAPTER (3C501 - 3C503) 3COM ETHERLINK PLUS (3C505 - 3C605) DEPCA DE100 - DEPCA DE200 - DEPCA MICOM NP600A NOVELL NE1000 NOVELL NE2000
DISPLAY UNITS	OTHER PRODUCTS
IBM 8514 IBM COLOR GRAPHIC MONITOR 5153 IBM ENHANCED GRAPHIC MONITOR 5151 IBM ENHANCED GRAPHIC MONITOR 5154 IBM PS/2 COLOR DISPLAY 8512 IBM PS/2 COLOR DISPLAY 8513 IBM PS/2 MONOCHROME DISPLAY 8503 NEC MULTISYNC 2A NEC MULTISYNC 3D NEC MULTISYNC 4D NEC MULTISYNC 5D NEC MULTISYNC II PHILIPS 7BM749 PHILIPS 9CM82	ADAPTEC 1542A SCSI HOST ADAPTER ADAPTEC 1542B SCSI HOST ADAPTER ADAPTEC 2322B-10 ESDI ADAPTER IRWIN STREAMER MODEL 285 IRWIN STREAMER MODEL 287 JETSCRIPT QMS POSTSCRIPT CONTROLLER OMTI 8627 ESDI ADAPTER OMTI 8627 RLL ADAPTER SCANMAN PLUS WD1007A ADAPTER WD1007V ADAPTER WD1007V-SE2 ADAPTER

COMPONENTS, JUMPERS ON SYSTEM BOARD BA315 BA314 (PCB BA301)



AJA2A

FUSE F1

2 A 5 V keyboard and mouse fuse.

JUMPERS AND FUSE ON SYSTEM BOARD BA315 BA314 (PCB BA301)

JUMPERS J18, J19 AND J20 FOR PROCESSOR SELECTION

JUMPER	POSITION	FUNCTION
J18 3-way jumper	1-2 * 2-3 OUT	Processor i486DX installed in the system Processor i487SX (floating point unit) installed in the system Processor i486SX installed in the system
J19	IN * OUT	Processor i486DX or i487SX installed in the system Processor i486SX installed in the system
J20 3-way jumper	1-2 * 2-3	Processor i486DX or i487SX installed in the system Processor i486SX installed in the system
J21 3-way jumper	1-2 * 2-3	33 MHz processor clock 25 MHz processor clock

JUMPERS J7, J8, J11, J13, J15, J16

JUMPER	POSITION	FUNCTION
J 7	OUT * IN	RING Indicator signal (RS232 threshold voltage) FAIL-SAFE disabled RING Indicator signal (RS232 threshold voltage) FAIL-SAFE enabled
J 8	OUT * IN	Input signals (RS232 threshold voltage) FAIL-SAFE disabled Input signals (RS232 threshold voltage) FAIL-SAFE enabled
J11	OUT IN *	ROM BIOS disabled ROM BIOS enabled
J 13	IN * OUT	Floppy disk oscillator enabled Floppy disk oscillator disabled
J15	OUT * IN	Normal operation Erases the CMOS RAM
J16	IN * OUT	Only one hard disk installed Two hard disks installed
F1		Keyboard protection fuse

DIP-SWITCHES

SWITCH	POSITION	FUNCTION
1	ON * OFF	Serial port enabled Serial port disabled
2	ON * OFF	NOT USED
3	ON * OFF	Normal operation Disables the floppy disk write operations
4	ON OFF	NOT USED

IN: Jumper installed

OUT: Jumper not installed

The asterisk indicates the default setting.

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 controller
60 h	Keyboard data controller	3BA h	Video controller
61 h	System Control Port B	3C0-3CF h	Video controller
64 h	Keyboard commands controller	3D4-3D5 h	Video controller
70-71 h	Real time clock, NMI Mask, CMOS RAM	3DA h	Video controller
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	4E8 h	VGA control registers
1F0-1F8 h	Hard disk drive	8000F0-8000FF	Coprocessor
278-27B h	Parallel port 2 (alternate)		

INTERRUPT LEVELS

LEVEL	NAME	CONTROLLER	FUNCTION
1	IRQ0	1	Channel 0 timer OUT
2	IRQ1	1	Keyboard
3 - 10	IRQ2	1	Interrupt to Controller1 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

SYSTEM MEMORY MAP

The system memory map will vary according to the configurations given the system through the User Diskette or System Test. Consequently an example only of configuration of the first MegaByte of memory is given below.

