M486 ESDI

CHARACTERISTICS

Microprocessor	INTEL 80486
Clock	25 MHz
Architecture	32-bit EISA
Memory	2, 4 or 8 MB on system board expandable up to 32 MB by: **EXM 26-482** 2 MB - 2 SIMM 1 Mb x 9 **EXM 26-484** 4 MB - 2 SIMM 512 Kb x 36 **EXM 6108** 8 MB - 2 SIMM 1 Mb x 36 System memory can be expanded up to 64 MB using 8 MB SIMM modules when available
Memory access time	100 ns / 80 ns
Coprocessor	Integrated in INTEL 80486, Weitek 4167
Optional processor	INTEL i860
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	Micropolis 1654-7 ESDI 136 MB Seagate ST 2383E ESDI 330 MB NEC D5655 ESDI 136 MB
Streaming Tape	IRWIN 80/120 MB floppy interface
EISA slots	8 Present - 6 Available
Video adapter	EISA EVC-1 board GO739 EISA OVC board GO481
Hard disk and Floppy disk controller	WD1009-SE2 combo controller
Cache Controller	Integrated in microprocessor
Cache size	8 KB integrated in microprocessor
Mouse	PS/2 and AT compatible
Keyboard	101/102-key ANK 26-101, ANK 26-102

SYSTEM BOARD

BA859 P1.25 2 MB

BA860 P1.25 4 MB

BA868 P1.7 2 MB

BA869 P1.7 4 MB

BIOS

Rev. 2.03

VIDEO ADAPTER

GO734

GO739

GO481

HARD DISK - FLOPPY DISK CONTROLLER

GO740

GO565

POWER SUPPLY

PS20 A 220 V
Level: 01 MI

PS20 A 110 V
Level: 01 MI

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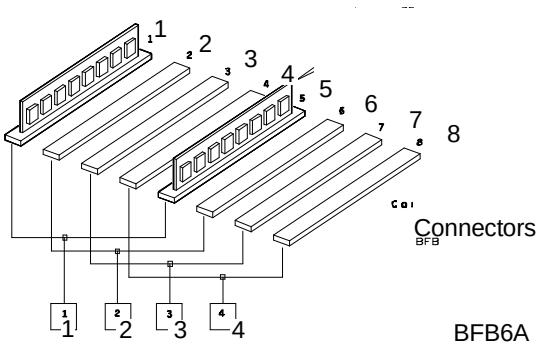
MEMORY EXPANSION

WARNING: It is not essential to fill all the memory banks available. Starting from the basic 4 MB, it is thus possible to obtain the following memory configurations: 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64 MB.

The SIMM modules installable are:
EXM 26-484 4 MB
EXM 26-482 2 MB
EXM 6108 8 MB



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SYSTEM BOARD

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA859	Lev. Nasc.	412930 P	ME8K 497450U Rev. 1.10.1	Board with 2 MB memory These changes are implemented in the field only, and not in the factory
	Lev. 01 MI		PPJ5 Rev. 1.15 498060H	- New BIOS for installation of NETWARE/386 on hard disk
	Lev. 02 MI		Rev. 1.15	- Two PALs replaced to solve the Parity Error problem in UNIX SCO
	Lev. 04 MI		Rev. 1.15	- Cuts and wirings made to solve system hang problem with some TORUS communication boards and the serial port problem
	Lev. 05 MI		PPJF Rev. 2.0 498124J	- New BIOS for implementation of new features - support for more than two HDU - support for several ESC-1 boards - support for PEM - support for telediagnostic board - support for ESDI HDU controller
	Lev. 06 MI		Rev. 2.0	- Cuts and wirings made to solve system lock problem during P.O.D. with several EISA boards on the BUS
	Lev. 07 MI		PPJR Rev. 2.01	- New BIOS for management of 300 MB ESDI Type 3 hard disk and solve the following problems: - Booth with unformatted ESDI - BOOT from diskless - Compatibility
	Lev. 08 MI		Rev. 2.01	- This change solves the problem of noise on the serial port interrupt when there is a non D0 486 microprocessor on the main board
	Lev. 09 MI		Rev. 2.01	- Keyboard Controller Rel. 8.01 introduced to replace Keyboard Controller Rel. 8.0
	Lev. 10		PPJX Rev. 2.03	- New BIOS to solve problems of the previous release: - memory above 16 MB - Boot of 720 KB floppy drives - ADAPTEC EISA Controller
BA860		412932 D		Same as BA859 but with 4 MB memory

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
BA867	Lev. Nasc	612164 T	PPJ5 498060H Rev. 1.15	New layout level for recovering cutting and trimming and removal of previous board problems. Board with 4 MB of memory
	Lev. 01		PPJF 498124J Rev. 2.0	- New BIOS for implementation of new features: - Support for more than two HDU - Support for several ESC-1 boards - Support for PEM - Support for telediagnostic board - Support for ESDI HDU controller
	Lev. 02		Rev. 2.0	- Cuts and wirings made to solve system lock problem during P.O.D. with several EISA boards on the BUS
	Lev. 03		PPJR 498155Z Rev. 2.01	- New BIOS for management of 300 MB ESDI Type 35 hard disk and solve the following problems: - BOOT with unformatted ESDI HDU - BOOT from diskless system - Compatibility
	Lev. 04		Rev. 2.01	- This change solves the problem of noise on the serial port interrupt when there is a non-step D i486 microprocessor - Signal BCLK improved
	Lev. 06		Rev. 2.01	- Keyboard Controller Rel. 8.01 introduced - Introduced 80486-25-D0 component to replace 80486-25-B6 - Introduced WD 16C552 Mask D component to replace the previous one
	Lev. 07		PPJX Rev. 2.03	- Allows introduction of step A2 of the 82358 EBC component to replace step A1 - EISA BUS BCLK and EBC HCLKCPU signals improved - New BIOS to solve problems of previous release: - Memory above 16 MB - Boot of 720 KB floppy disks - ADAPTEC EISA Controller - MYLEX SCSI Controller
BA868				Same as BA867 but with a 2 MB memory

INTEGRATED CONTROLLERS

CONTROLLER	FUNCTION
82357 ISP	DMA Controller Interrupt Controller 5 Timers I/O Ports
XL2865	EEPROM Configuration
DS1287	Real Time Clock/Timer
8042/8742	Keyboard and Mouse Controller
WD16C552	Serial and Parallel port controller
82358 EBC	EISA BUS controller

BOARDS

FUNCTION	DESCRIPTION	D.R.S. CODE	CHARACTERISTICS
CPU system board	BA859	412930 P	P1.25 2 MB
CPU system board	BA860	412932 D	P1.25 4 MB
CPU system board	BA867	612164 T	P1.7 4 MB
CPU system board	BA868		P1.7 2 MB
Power supply 220 V	PS20	412915 C	
Power supply 110 V	PS20	412914 B	
Console board	IF637	497112 D	
Video adapter	GO481	412444 L	Compatible ISA OVC board

BA859/60 I/O DEVICES

They are the same as those for Personal Computer M486 (see page 16-6).

BA868/69 I/O DEVICES

They are the same as those for Personal Computer M486 (see page 16-7).

VIDEO ADAPTER BOARD

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
GO734	Lev. Nasc.	412783 Q	PBZ2 Rev. 1.01 497534C	**82C452** super VGA **RAM Video** - VRAM 100 ns 256 Kx4 Dual-ported
	Lev. 01 MI		PPVC Rev. 1.02 497346X	New BIOS
	Lev. 02 MI		PPVC Rev. 1.02 497346X	Performance improvement
	Lev. 03 MI		PPVC Rev. 1.02 497346X	Replaced a component in U36
	Lev. 04 MI		PBZY Rev. 1.03 497461K	New BIOS. This change is implemented at field level only, and not at factory level
GO739	Lev. Nasc.		PBZV Rev. 1.03 497461K	Circuitry improvements
GO481	Lev. Nasc.		PDP5 - PDP7 Rev. 1.06	ISA analog OVC video adapter board

POWER SUPPLY

MODEL	LEVEL	NOTES
PS20 A	Lev. Nasc.	
	01	Complies with insulation safety norms Solves the problem of the fan's minimum speed being too slow.

HARD DISK/FLOPPY DISK CONTROLLER BOARD

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
GO738	Lev. Nasc.		PPUA 497327L PPUB 497328V Rev. 1.10	**0186 CPU** - Local CPU **BIMIC 82355** - EISA Bus Master controller **82077** - Floppy disk controller
	Lev. 01 MI		PPUD 497366T PPUE 497367U Rev. 1.13	- New firmware to enhance performances - Replaced chip 82355 A1 with 82355 A2 - Replaced FDU controller 82077 C3 with 82077 C4
	Lev. 03 MI		Rev. 1.13	- New 82355 chip to solve timing problems.
	Lev. 04 MI		PPKB 497486D PPKC 497487E Rev. 1.22	- New firmware to support Conner HDUs. - Replaced two PALs to solve noise problems in two components. Implemented on 32 MHz BMIC board. It allows use of a 40 MHz oscillator in place of the 32 MHz one.
	Lev. 05 MI		Rev. 1.22	- New firmware to support Conner HDUs. - Replaced two PALs to solve noise problems in two components. Implemented on 40 MHz BMIC board
	Lev. 08 MI		Rev. 1.22	- Modifications of components, cuts and wirings to solve the "Data Compare Error" during HDU's tests.
	Lev. 09 MI		PPKD 497488P PPKE 497489Q Rev. 1.35	- New firmware to manage Olivetti and DEC IDs

	Lev. 10		PPJD 498122Q
			PPJE 498123R
			Rev. 1.42
				- New firmware to solve the following problems:
				  - AT environment NOVELL DOS driver
				  - 200 MB CONNER and 600 MB MAXTOR HDUs problems
				  - PEM support in AT mode

	Lev. 11		PPJP PPJQ Rev. 1.43	- New firmware to solve CONNER HDU problems
	Lev. 12			New floppy disk controller 82077 CSFM replaces 82077 step C.

	LEVEL	D.R.S. CODE	ROM BIOS	INTEGRATED CONTROLLERS / NOTES
GO740	Lev. Nasc.		PPKD 497488P PPKE 497489Q Rev. 1.35	New printed circuit to absorb cuts and wirings of previous one.

	Lev. 01		PPJD 498122Q
			PPJE 498123R
			Rev. 1.42
				- New firmware to solve following problems:
				  - NOVELL DOS driver in AT mode
				  - Problems with 200 MB CONNER and 600 MB MAXTOR hard disks.
				  - Support for PEM in AT mode

	Lev. 02		PPJP PPJQ Rev. 1.43	- New firmware to solve CONNER hard disk problems
	Lev. 03		PPJP PPJQ Rev. 1.43	Introduced new 82355-B0 (BMIC) component to replace 82355-A2. This component can also be installed on the G0378 board
	Lev. 04		PZDS PZDT Rev. 1.45	Solves some of the faults of the previous version
	Lev. 05			New floppy disk controller 82077 CSFM replaces 82077 step C4.
GO565	Lev. Nasc.		Rev. 2.0	ESDI hard disk controller board

USER DISKETTE

LEVEL	COMPATIBILITY
1.20 1.30 upd 1 1.40 upd 1	BIOS 1.15 Introduced in the hard disk table, the specific TYPE for 320 MB ESDI hard disk Corrected error messages for German version

SYSTEM TEST

LEVEL	COMPATIBILITY
Lev. 2.10	BIOS 2.01 on system board Firmware 2.0 on GO565 board Firmware 1.03 on GO739 board Firmware 1.06 on GO481 board

COMPATIBILITY NOTES

BOARD OR HW/SW DEVICE	DESCRIPTION
OEMM386	Level 4.06 does not acknowledge this Personal Computer. For M486 use version 4.08 rev. 1.40
ROM BIOS 1.06	Solves: 300 MB hard disk problems NVRAM SET UP problem 1.2 and 1.44 MB floppy disk problem
ROM BIOS 1.08.2	Solves: 600 MB hard disk problem
Board GO734 (EVC - 1)	When the EVC-1 board operates with direct video access, a VGA compatible controller can be installed on the BUS.
Board GO738 (ESC - 1)	Can work with a 40 or 32 MHz oscillator.
EVC driver 4.0 1.3	Driver to support ACAD10 and ACAD11, changed DAM driver for OS/2 P.M.
i860 coprocessor	Can be installed on BA867/BA868 boards only.
EVD Version 5.0	Version 5.0 of EVD allows supporting in DAM mode (1024 x 768 x 256) Windows 3.0, AutoCAD 386 Rev. 10.0 and AutoCAD 386 Rev. 11.0.
486 microprocessor	486 B6 microprocessor is no longer produced. It is replaced by 486 D0 microprocessor that has the same functionalities. On BA859 and BA860 motherboards, use of a microprocessor different from version D0, causes problems on the parallel port that were solved with level 08.
Component WD16C552 step D	Possible to introduce step D of the WD16C552 component on boards BA859 and BA860. Board level does not change.
Component 82358 EBC	Possible to introduce step A2 of the 82358 EBC component on boards BA859 and BA860 to replace step A1. Board level does not change
Component 82355	Component 82355-A2 is replaced by component 82355-B1.

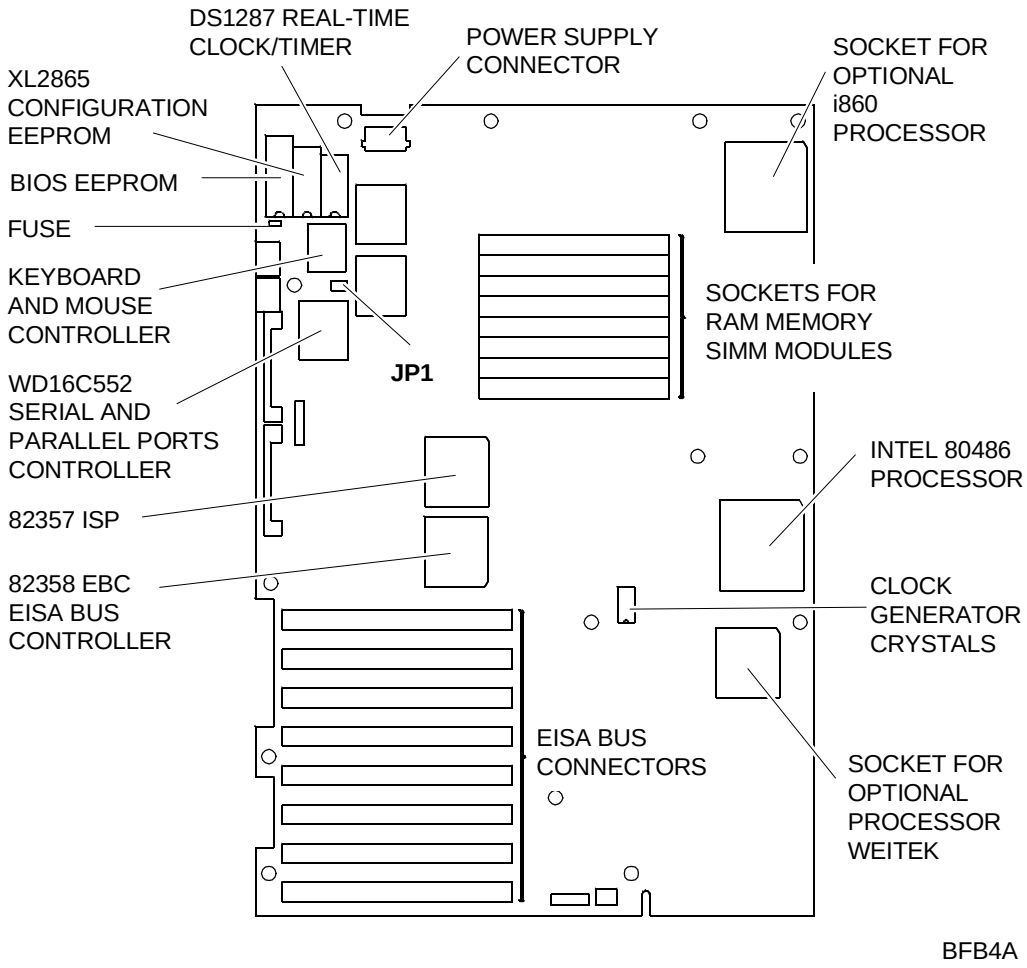
SOFTWARE COMPATIBILITY

OPERATING SYSTEMS	NOTES
IBM DISK Operating System, Ver. 3.30	
IBM DISK Operating System, Ver. 4.01	During installation on hard disk, a formatted DSDD disk is required.
IBM Operating System/2, Ver. 1.10 and 1.20	PS/2 type mouse not recognised
IBM Operating System/2 Extended Edition, Ver. 1.10	
INTERACTIVE 386/ix, Ver. 2.02	PS/2 type mouse not recognised
Olivetti's Microsoft Disk Operating System, Ver. 3.30a	
Olivetti's Microsoft Disk Operating System, Ver. 4.01	
Olivetti's Microsoft OS/2, Ver. 1.10 and 1.20	
SCO UNIX System V/386, Rev. 3.2	
SCO XENIX 386, Rev. 2.3	

HARDWARE COMPATIBILITY

MODEMS	I/O INTERFACE PRODUCTS
Hayes Smartmodem 1200B	FUTURE DOMAIN HOST ADAPTER (TMC-830)
Hayes Smartmodem 2400B	IBM Asynchronous COM. CARD (1502074)
Telenetics Expressdata 24i (24i-12i)	IBM PRINTER ADAPTER (1505200)
Ven-tel PC Modem Half-Card (PCM-XT)	IBM SERIAL/PARALLEL
Hayes Smartmodem 1200	
MULTIPORT	**MOUSE**
Anvil Stallion Intelligent 16 Port Controller	IBM PS/2 Mouse (6450350)
Chase MSC Connect/AT8 Intelligent 8 Port	Logitech Bus Mouse (PF-3F)
Computone System Intelliport 16 Port AT16	Microsoft Bus Mouse, Rev. C
Computone System Intelliport 16 Port EISA ECC	Microsoft Serial-PS2 Mouse
Consensys Powerports 8 Port Intelligent Ctr.	Microsoft Serial Mouse
Digiboard Digichannel COM/xi Intelligent 8 Port	MSC PC Mouse PS/2
Specialix Si Intelligent I/O Controller	Olivetti Bus Mouse (GRD 25-019)
	Olivetti New Advanced Mouse (GRD 25-025)
GRAPHICS ADAPTERS	**NETWORKS & LAN PRODUCTS**
AST RESEARCH AST - 3G PLUS	CARD (6450215)
AST RESEARCH AST - VGA PLUS	AT&T Starlan Network
ATI EGA WONDER	IBM OS/2 Lan Server/Requester
HERCULES GRAPHICS CARD (GB102)	IBM PC Network
HERCULES INCOLOR CARD (GB222)	IBM Token Ring Network
IBM MONO Display/Printer Adapter (1504900)	MADGE Token-Ring Network
MATROX PG - 1281	MS OS/2 Lan Manager
ORCHID PRODESIGNER VGA PLUS	Novell Advanced netware Ver.2.15
PARADISE EGA 480	Novell Netware 386 with ISA Adapter
PARADISE VGA PRO CARD	Novell Netware 386 with EISA Adapter
QUADRAM QUAD EGA PLUS (QC 8601)	PROTEON Token Ring Network
TECMAR VGA AD	3COM 3 + Network /Ethernet)
VIDEO - 7 VEGA DELUXE	3COM 3 + Open Lan Manager
	IONET Network
DISPLAY UNITS	**OTHER PRODUCTS**
JVC QUAD-SYNC Color (GD-H6116VFW)	OLIVETTI OD-810 WORM (WRM 25-810)
NEC Multisync Monitor (APC-H431)	PLUS Development 20MB Hardcard
OLIVETTI HIRES Color (DSM 26-115)	SOFTWARE SECURITY Parallel Port Block
PRINCETON RGB Monitor (HX-12)	WELCH-ALLYN Barcode Reader
ZENITH RGB/COMPOSITE Monitor (ZVM-135)	(HBD-100, R. A)

SYSTEM BOARD COMPONENTS, JUMPERS



JUMPER JP1	- Disables the system password - Cancels the configuration
(only for boards BA859 BA860)	If the system is badly configured take the following action: 1) Switch off the PC. 2) Move jumper JP1. 3) Switch PC on again. This is the default configuration. 4) Switch off the PC. 5) Put jumper JP1 back to its initial position. 6) Switch the system on and reconfigure with the User Diskette.

FUSE F1	Keyboard and Mouse Fuse 2 A 5 V.

INTERRUPT LEVELS

LEV.	NAME	CTRL	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
60 h	Keyboard	03F8 - 03FF	COM1 Serial port
70 h	Real time clock. Bit 7 of the real time clock is in the 82357 for NMI	02F8 - 02FF	COM2 Serial port
		0C00 - 0C05	Configuration registers
71 h	Real time clock read/write register		
92 h	Port A20	0C20 - 0C3F	EEPROM addressing
278 - 2FF	LPT3 Parallel port	0C80 - 0C84	System ID codes
378 - 3FF	LPT2 Parallel port	0CF8 - 0CFF	Console interface
3BC - 3BF	LPT1 Parallel port	0100 - 03FF	Address space for ISA expansion boards

SYSTEM MEMORY MAP

ADDRESS	SIZE	FUNCTION	CACHE
0000 0000 - 000A 0000	640 KB	System RAM	YES
0000 000A - 000C 0000	128 KB	Video memory	NO
000C 0000 - 000E 0000	128 KB	EISA/ISA BUS ROM	YES
000E 0000 - 0010 0000	128 KB	ROM BIOS (copied into shadow RAM)	YES
00E0 0000 - 0100 0000	13 MB	System RAM	YES
0010 0000 - 00E0 0000	2 MB	Direct video buffer access (location 2)	NO
0100 0000 - 0400 0000	48 MB	System RAM (Maximum memory on system board)	YES
0400 0000 - 1000 0000	192 MB	System RAM (Maximum memory that can be fitted in cache)	YES
1000 0000 - C000 0000	32 MB	System RAM	YES
C000 0000 - C200 0000	32 MB	Weitek Coprocessor	NO
C200 0000 - D000 0000	224 MB	System RAM	YES
D000 0000 - E000 0000	256 MB	Direct video buffer access (location 1)	NO
E000 0000 - F000 0000	286 MB	SRAM	NO
F000 0000 - FFFE 0000	268 MB	System RAM	YES
FFFE 0000 - 10000 0000	128 KB	ROM BIOS	YES

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