M480-40

CHARACTERISTICS

Microprocessor	INTEL 486 DX
Clock	33 MHz
Architecture	MICROCHANNEL
Memory	From 8 to 64 MB on motherboard. 8 sockets available for SIMM modules. The SIMM modules are to be installed in pairs in the following order: 1st pair connectors A1 and B1 (already mounted) 2nd pair connectirs A2 and B2 3rd pair connectors A3 and B3 4th pair connectors A4 and B4 See the figure on page 31-9 for the position of the connectors. The SIMM modules that can be installed are: **EXM 27-004** - 4 MB - 2 512 Kb x 36 SIMMs **EXM 27-998** - 8 MB - 2 1 Mb x 36 SIMMs **EXM 27-016** - 16 MB - 2 2 Mb x 36 SIMMs
Memory access	70 ns
Floppy DIsk	1.2 MB 5.25" Panasonic JU 475-4/5 1.44 MB 3.5" Panasonic JU-257 A - 103P 1.44 MB 3.5" Sony MP-F17 - 85/MITSUMI D359T3 1.44 MB Mitsubishi MF-355C-58ML 1.44 MB 3.5" Y-E Data YD-702B / 702D 2.88 MB Sony MB-F40W-17
Hard Disk	210 MB CONNER CP3200 SCSI 210 MB CONNER CP30200 SCSI 340 MB SEAGATE ST1401N SCSI 340 MB CONNER CP3360 SCSI 525 MB SEAGATE ST1581N SCSI 525 MB CONNER CP3540 SCSI 525 MB CONNER CP30540 SCSI May be single (HDS) or double (HDP Disk Pack)
Streaming Tape	80/120 MB IRWIN 287 with floppy interface 320/525 MB WANGTEK 5525 ES SCSI 150/250 MB WANGTEK 5150 ES SCSI 1.3/2 GB HP 35470A DAT 1300 SCSI
Slots	Eight 32-bit connectors on system board Six available
Video Controller	**XGA board GO589** VGA resolution only **XGA-2 board GO2002** These must be installed in an MCA slot on the system board
FDU controller	Integrated on system board
SCSI HDU controller	SCSI controller GO582 or GO610 to be installed in an MCA slot
Mouse	PS/2- and AT-compatible
Keyboard	101/102-key ANK 26-101/N, ANK 26-102/N

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MOTHERBOARD

BA307

CPU BOARD

UC 117 inserted in a dedicated slot on system board

BIOS

1st part of EPROM code on system board Rev.

2nd part of code in first HDU of the system (IML) Rev.

POWER SUPPLY

PS40 of 400 W

CONSOLE

Hardware module comprising 2 boards:
IF496
Interface circuits with system board

IF497
Display for messagges

NETWORK BOARDS

NCU 9164   GO528
Token Ring 4 Mbit/s
NCU 9174   GO553
Token Ring 4-16 Mbit/s
LCU 3474
WAN line controller
LCU 9216   GO516
Intelligent WAN line controller

FRONT BAYS FOR MAGNETIC AND OPTICAL PERIPHERALS

The M480-40 mechanical structure has 10 half-height, 5.25" bays. These base are subject to the following limitations of use:

- Bay 10 (highest) is always used for a 3.5" floppy disk
- Bay 1 (lowest) is always used for the first hard disk of the system
- Bays 9 to 5 can accomodate removible magnetic peripherals. The number of removible SCSI peripherals is confined to 2.
- Bays 7 to 5 can also accomodate SCSI hard disks
- Bays 4 to 1 must only accomodate SCSI hard disks.

The floppy disk interface peripherals must be installed in the first three bays (10, 9, 8).

All the SCSI peripherals must be installed in the next bays starting from bay 7.

The removible peripherals (floppy disk, streaming tape, CD-ROM, DAT) are to be installed in the high bays.
The fixed disk peripherals are to be installed in the low bays.

CONSOLE

BAY 10	FDU 1.44 MB 3.5" or FDU 2.88 MB 3.5"

BAY 9	FDU 1.44 or 2.88 MB or FDU 1,2 MB or STU 80/120 MB floppy

BAY 8	FDU 1.44 or 2.88 or 1.2 MB or STU 80/120 MB floppy or STU or HDU or SCSI CD-ROM

BAY 7	SCSI STU interface or CD-ROM or SCSI DAT or SCSI Hard disk or hard disk pack

BAY 6	SCSI STU interface or CD-ROM or SCSI DAT or SCSI hard disk or hard disk pack

BAY 5	SCSI STU interface or CD-ROM or SCSI DAT or SCSI hard disk or hard disk pack

BAY 4	SCSI HARD DISK or hard disk pack

BAY 3	SCSI HARD DISK or hard disk pack

BAY 2	SCSI HARD DISK or hard disk pack

BAY 1	SCSI HARD DISK (first hard disk in system)

SCSI CHANNEL CONFIGURATION

The general rule in configuring the SCSI channel is that all the devices connected (at most 8, SCSI controller included) have a different SCSI ID and that the BUS is terminated at one end only.

- The SCSI ID as well as assigning a different address to each peripheral also ests the priority. SCSI ID 7 is the highest priority and SCSI ID 0 the lowest.
- In the M480-40, the first hard disk installed must have SCSI ID 6 and must be installed in bay 1. The SCSI controller has SCSI ID 7.
- The other SCSI peripherals must be given decreasing SCSI IDs as they are installed.
- A disk pack, consisting of 2 hard disks, must be given two SCSI IDs.
- The primary SCSI contoller must be installed in MCA slot 1. If there are several SCSI controllers in the system, then first hard disk, which must have a part of the BIOS, must be connected with the SCSI controller installed in MCA slot 1 and have an SCSI ID of 6.
- The SCSI ID on each peripheral is configured through jumpers on the board.
- The SCSI ID of the SCSI controller is configured through the software using the User Diskette or System Test.
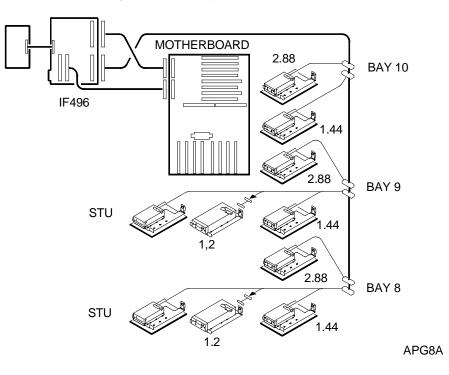
Termination rules

If there are no external SCSI devices, the hard disk or primary disk pack in bay 1 and the SCSI controller must always be terminated. If there are SCSI peripherals connected outside of the system module, the terminator must be removed from the SCSI controller and the last external peripheral connected to the system must be terminated.

WIRING OF PERIPHERALS

The following figures illustrate wiring of the floppy interface peripherals and of the SCSI interface peripherals.

Wiring of floppy disk interface peripherals

To manage the different interface signals bewteen the floppy disks, the floppy disk cable has two connectors for each of the peripherals that it is possible to install. The bottom connector of each pair must be used when installing a 1.44 MB, 1.2 MB floppy disk or streaming tape. The upper connector must be used when installing a 2.88 MB floppy disk.
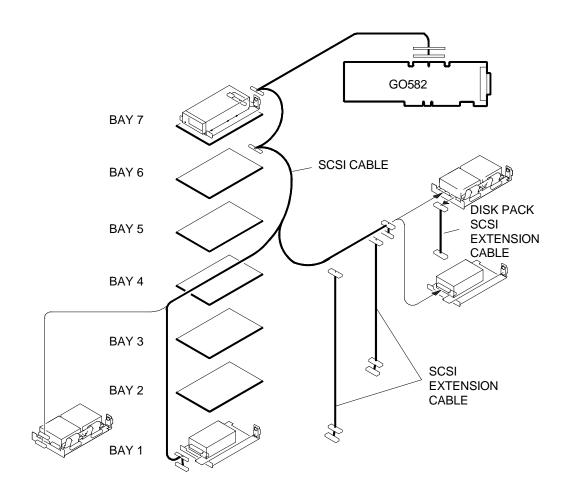

APG8A

Wiring of SCSI interface peripherals

The SCSI cable is a straight cable connecting at one end to the SCSI hard disk controller and with 3 connectors at the oter end for connection of the peripherals. The last connector must be used to connect the first hard disk of the system, whereas the other two must be used to connect SCSI removable type peripherals.
To add a hard disk, you must:

1. Insert it in the bay immediately above the one already occupied
2. Disconnect the connector connected to the hard disk already installed and connect it to the hard disk being added.
3. Between the hard disk being added and the one already installed, connect the extension cable included in the installation kit of the hard disk option being added

GO582

BAY 7

BAY 6

SCSI CABLE

BAY 5

DISK PACK
SCSI
EXTENSION
CABLE

BAY 4

BAY 3

SCSI
EXTENSION
CABLE

BAY 2

BAY 1

APG7A

MOTHERBOARD

	LEVEL	D.R.S. CODE	NOTES
BA307	Nasc.	553035 J	System motherboard integrating: - Connector for insertion of CPU board - Connectors for MCA expansion - Sockets for SIMM modules - CMOS RAM and Real Time Clock - Keyboard and mouse interface - Floppy interface - Serial interface - Parallel interface

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CPU BOARD

	LEVEL	D.R.S. CODE	BIOS	NOTES
UC117	Nasc.	553036 K	The EPROM on the CPU board contains only the first part of the BIOS code. The rest is on the first HDU of the system	System CPU board integrating: - i486 DX processor - 128 KB of ROM BIOS - Memory Controller - DMA controller

XGA VIDEO ADAPTER BOARD

	LEVEL	D.R.S. CODE	BIOS	NOTES
GO589	Nasc. Lev. 01			IBM XGA video adapter board. Solves the timing problems within the first MB of video RAM
GO2002	Nasc.			IBM XGA video adapter board replacing the previous version which is no longer being manufactured.

SCSI HARD DISK CONTROLLER

BOARD	D.R.S. CODE	LEVEL	DESCRIPTION
GO582	553004 U	Nasc.	SCSI hard disk controller
		Lev. 01	New board layout
GO610	557933 P	Nasc.	Replaces GO582 These two boards have the following differences: - The termination resistances are incorporated on board GO610 therefore this board does not require an external terminator on the cable as GO582 does. - Different printed circuit board - New BIOS

CONSOLE

	LEVEL	D.R.S CODE	NOTES
IF496	Nasc.	553312 U	This board integrates the circuits for interface with the system board, power supply and the floppy disk interface adapter circuit
IF497	Nasc.	553313 V	This board integrates the display and LEDs of the console

POWER SUPPLY DISTRIBUTION BOARD

	LEVEL	D.R.S. CODE	NOTES
IF484	Nasc.	932957 P	System power distribution board.
	Lev. 01		Component NDP506A is replaced by component NDP606B or IFR234, while component C363 is replaced by component C710. This ensures that power is supplied to bays 3 and 4 when a 340 MB or 525 MB SEAGATE hard disk is installed.
	Lev. 02		Two interruptions are carried out and two 47 Ohm resistors are mounted to ensure that power is supplied to bays 3 and 4 when a 340 MB or 525 MB SEAGATE hard disk is installed.
IF495/R	Nasc.	932986 D	Replaces IF484/R to recover the printed circuit board's cuts and trimmings.
	Lev. 01		To cut production costs, jumpers are not mounted at locations A17LM, A16AM and A083.

USER DISKETTE

LEVEL	COMPATIBILITY
Rev. 1.10 Rev. 1.10 B	With this version the Irwin Streaming tape drive with floppy interface is correctly recognized by the system even when it is installed between two floppy disk drives.
Rev. 1.30	This version allows the management of the XGA-2 board, 2.88 MB floppy disk drive and 1 GB hard disk drive.
Rev. 1.02	
Rev. 1.03.1	Eliminates the conflict between the streaming tape drive and the second floppy.

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SYSTEM TEST

LEVEL	COMPATIBILITY

POWER SUPPLY UNIT

POWER SUPPLY	D.R.S CODE	LEVEL	DESCRIPTION
PS40A 220 V PS40A 110 V Magnetek	553087 P 553088 Y	Nasc. Lev. 01	400 W power supply New printed circuit board to recover trimmings.

COMPATIBILITY NOTES

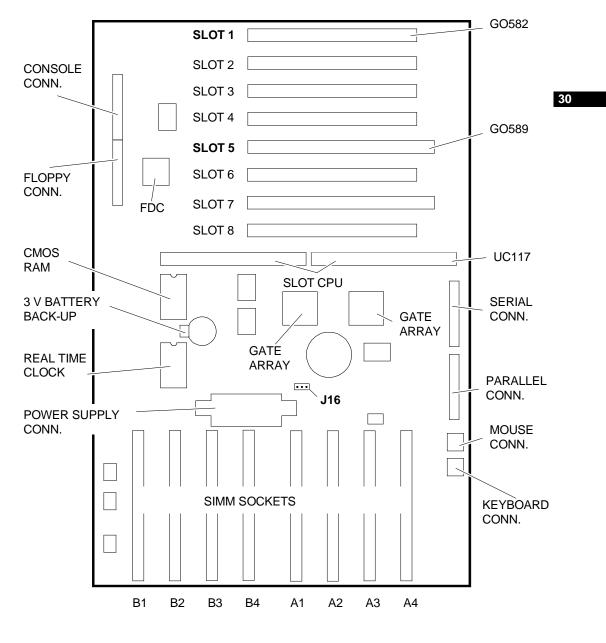| BOARD OR HW/SW DEVICE	DESCRIPTION
SCSI hard disk terminators	A SCSI plug is used to terminate both hard disks and disk packs. This plug replaces the internal terminators of the hard disks. This plug will be introduced at the same time as the new GO610 SCSI controller.
XGA-2 board GO2002	The lastest User Disk version must be used with this board.

SOFTWARE COMPATIBILITY

OPERATING SYSTEMS	NOTES
IBM DISK Operating System, DOS 3.3X, 4.XX, 5.XX and later. Olivetti OS/2, from Version 1.3 upd 2, 20.0 IBM Operating System/2 standard edition, Ver. 1.1, 1.2, 1.3 and later IBM Operating System/2 Extended Edition, Ver. 1.1, 1.3 and later OS/2 Presentation Manager Standard and extended edition SCO OSF/Motif presentation manager IBM AIX 1.1 SCO UNIX System V/386 3.2 Ver. 2 for MCA IBM OS/2 LAN Server and Requestor Olinet LAN Manager 1.1, 2.0 Novell Netware 386, Novell advanced netware Windows 3.0 and later IBM PC LAN Program	It will only be possible to handle up to seven SCSI HDUs from release 5.xx onwards.

HARDWARE COMPATIBILITY

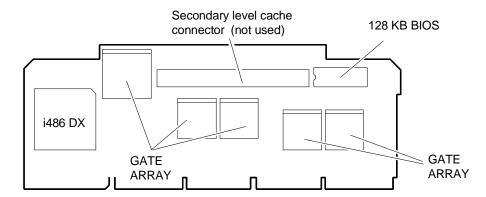| MODEMS	I/O INTERFACE PRODUCTS
Hayes Smartmodem 1200P Hayes Smartmodem 2400P IBM PS/2 300/1200 Internal Modem/A (6450349)	FUTURE DOMAIN HOST ADAPTER (MCS-350) IBM PS/2 Dual Async Adapter/A (6450347)
EXPANSION MEMORIES	**MOUSE**
IBM PS/2 80386 2-6 MB Exp. Memory Option IBM PS/2 80386 2-8 MB Exp. Memory Option Olivetti Memory Expansion board MEM 26-503 Profit System Elite 16/2	IBM PS/2 Mouse (6450350) Microsoft Serial Mouse MSC PC Mouse PS/2 Olivetti New Advanced Mouse (GRD 25-025)
DISPLAY UNITS	**NETWORKING & LAN PRODUCTS**
IBM PS/2 Monochrome Display 8503 IBM PS/2 Color Display 8512 IBM PS/2 Color Display 8513 IBM PS/2 Color Display 8514	IBM PC Network IBM PC Network (Baseband Adapter) IBM Token Ring Network Novell Advanced netware Ver.2.12 3COM Network (Ethernet) 10NET Network
GRAPHICS PRODUCTS	**OTHER PRODUCTS**
IBM PS/2 Display Adapter 8514/A MATROX PG2 - 1281 HI-RES Graphics Controller	SOFTWARE SECURITY Parallel Port Block

MOTHERBOARD COMPONENTS AND JUMPERS

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SLOT 1 — GO582

CONSOLE CONN.

SLOT 2

SLOT 3

SLOT 4

FLOPPY CONN.

SLOT 5 — GO589

SLOT 6

SLOT 7

FDC

SLOT 8

CMOS RAM — UC117

SLOT CPU

3 V BATTERY BACK-UP

SERIAL CONN.

GATE ARRAY

REAL TIME CLOCK

GATE ARRAY

J16

PARALLEL CONN.

POWER SUPPLY CONN.

MOUSE CONN.

SIMM SOCKETS

KEYBOARD CONN.

B1   B2   B3   B4   A1   A2   A3   A4

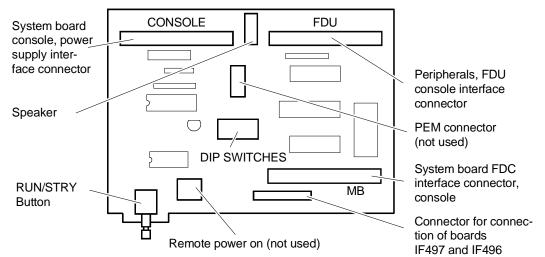**JUMPER J16**   Password erase

To erase the password, position of jumper J16 must be changed. When the password has been erased, the jumper need not be put back in its initial position.

CPU BOARD COMPONENTS
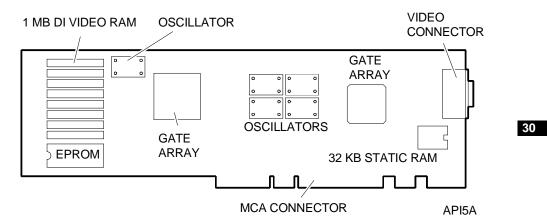

COMPONENTS AND JUMPERS ON CONSOLE BOARD IF496

DIP-SWITCHES Configuration of floppy disk interface peripherals

BAY	FDU/STU	CONNEC-TOR	DIP-SWITCH						
			1	3	4	5	6	7	8
FIRST FLOPPY DISK INTERFACE PERIPHERAL (ALWAYS PRESENT)									
10	1.44 MB FDU	Lower	**ON**	OFF	OFF	OFF	OFF	OFF	OFF
	2.88 MB FDU	Upper	**OFF**	OFF	OFF	OFF	OFF	OFF	OFF
SECOND FLOPPY DISK INTERFACE PERIPHERAL									
9	1.44 MB FDU	Lower	#	**ON**	**ON**	OFF	OFF	OFF	OFF
	2.88 MB FDU	Upper	#	**OFF**	**ON**	OFF	OFF	OFF	OFF
	1.2 MB FDU (with cable)	Lower	#	**ON**	**OFF**	OFF	OFF	OFF	OFF
	80/120 MB STU	Lower	#	**OFF**	**OFF**	OFF	OFF	OFF	OFF
THIRD FLOPPY DISK INTERFACE PERIPHERAL									
8	1.44 MB FDU	Lower	#	#	#	**ON**	**ON**	OFF	OFF
	2.88 MB FDU	Upper	#	#	#	**OFF**	**ON**	OFF	OFF
	1.2 MB FDU (with cable)	Lower	#	#	#	**ON**	**OFF**	OFF	OFF
	80/120 MB STU	Lower	#	#	#	**OFF**	**OFF**	OFF	OFF

DIP-SWITCH 2 is not used. # = same as the settings for the drives already installed.

XGA VIDEO CONTROLLER COMPONENTS

INTERRUPT LEVELS

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

I/O ADDRESS MAP

ADDRESS	FUNCTION	ADDRESS	FUNCTION
0020, 0021h	Interrupt controller (master)	03F0-03F7	Floppy disk controller
0040, 0042 0044, 0047	Timer	03F8-03FF	Serial port 1
0060	Keyboard data controller	1278-127D	Parallel port 1 (DMA mode)
0061	System Control Port B	1378-137D	Parallel port 4
0064	Keyboard commands controller	3220-3227	Serial port 3
0070, 0071	Real time clock, NMI Mask, CMOS RAM	3228-322F	Serial port 4
0091	Card Selected feedback register	4220-4227	Serial port 5
0092	System Control Port A	4338-422F	Serial port 6
0094	System Board Enable / Setup	5220-5227	Serial port 7
0096	Registro Adapter Enable / Setup	5228-522F	Serial port 8
00A0-00A1	Interrupt controller (slave)	83F8-83FF	Serial port 1 (DMA mode)
0100-0107	POS registers	82F8-82FF	Serial port 2 (DMA mode)
0108-010F	Console	B220-B22F	Serial port 3 (DMA mode)
0278-027D	Parallel port 3	C220-C227	Serial port 4 (DMA mode)
02F8-02FF	Serial port 2	C228-C22F	Serial port 5 (DMA mode)
0378-037D	Parallel port 2	C220-C22F	Serial port 6 (DMA mode)
03BC-03BF	Parallel port 1	D220-D227	Serial port 7 (DMA mode)
		D228-D22F	Serial port 8 (DMA mode)

SYSTEM MEMORY MAP

ADDRESS	SIZE	FUNCTION
00000000 - 0007FFFF	512 KB	System DRAM
00080000 - 0009FFFF	128 KB	I/O RAM
000A0000 - 000BFFFF	128 KB	Video adapter RAM
000C0000 - 000DFFFF	128 KB	I/O ROM
000E0000 - 000FFFFF	128 KB	BIOS
00100000 - 007FFFFF		System RAM
00800000 - 00FFFFFF		System RAM
01000000 - BFFFFFFF		System RAM
C0000000 - C1FFFFFF		Coprocessor
C2000000 - DFFFFFFF		System RAM
E0000000 - FFFDFFFF		System RAM
FFFE0000 - FFFFFFFF	128 KB	System ROM BIOS

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