

M4-34

CHARACTERISTICS

| | |
|-------------------------|---|
| Microprocessor | AMD 80386 SX |
| Clock | 40 MHz |
| Architecture | AT |
| Memory | 2 MB to 16 MB on the motherboard, without parity circuitry Bank 0: 2 MB soldered Banks 1 and 2: Four sockets that can host the following SIMMs: EXM 27-820 - 2 MB - Two 1MBx9 SIMMs EXM 27-821 - 8 MB - Two 4MBx9 SIMMs When installing the SIMMs, always begin from Bank 1. |
| Cache memory | 16 KB |
| Memory access | 70 ns |
| Video memory | 512 KB expandible to 1 MB Expansion to 1 MB is obtained through kit VGA-MEM/02 - One VRAM 256x16 chip |
| Coprocessor | 40 MHz CYRIX 80387 SX |
| Floppy Disk | 1.44 MB 3.5" Panasonic JU 257 A 1.44 MB 3.5" Sony MP-F17 W 1.44 MB 3.5" Mitsubishi MF 355 1.44 MB 3.5" Epson SMD 1040-418 1.2 MB 5.25" Panasonic JU475-3 - JU475-4 1.2 MB 5.25" Toshiba ND 08 DE 1.2 MB 5.25" Panasonic JU475-5 |
| Hard Disk | 85 MB CONNER CP30084E 85 MB W.D. Caviar 280 85 MB Quantum ELS 85 AT 170 MB CONNER CP30174E 170 MB Quantum ELS 170 AT 240 MB CONNER CP30254 240 MB Quantum LPS 240 AT |
| Streaming Tape | 80/120 MB Irwin 31250A with floppy disk interface |
| Slots | Two 16-bit connectors on the expansion bus |
| Video controller | Integrated Enhanced VGA CL-GF5422 |
| HDU and FDU controllers | Integrated floppy disk controller: 87310 HDU interface: MSI buffer and logic gates |
| Mouse | PS/2- and AT-compatible |
| Keyboard | 101/102-key ANK 27-101/N, ANK 27-102/N |

MOTHERBOARD

BA2012 2 MB

BIOS

Last Lev. 1.05

EXPANSION BUS

POWER SUPPLY

MINEBA
NMB SPE 1095
LA/11 BNMB 110 V
LA/16 BNMB 220 V

CONSOLE BOARD

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MOTHERBOARD

| | LEVEL | D.R.S. CODE | ROM BIOS | NOTES |
|---------------|--------------|------------------------|-----------------|---|
| BA2012 | Nasc. | 5579 75 Z | Rev. 1.01 | System board with 2 MB of soldered memory |
| | Lev. 01 | | Rev. 1.02 | New BIOS to solve resolution problems when using Windows. |
| | Lev. 01* | | Rev. 1.03 | BIOS revision 1.03 is used on systems which host video memory with an 80 ns. access time. |
| | Lev. 02 | | Rev. 1.04 | This BIOS revision solves the problems encountered when different work sessions run simultaneously under Windows. |
| | Lev. 02* | | Rev. 1.05 | BIOS revision 1.05 is used on systems which host video memory with an 80 ns access time. |

* = Board versions with an 80 ns video RAM instead of a 70 ns memory access.

MOTHERBOARD INTEGRATED COMPONENTS

| MOTHERBOARD | INTEGRATED COMPONENTS |
|--------------------|---|
| | <p>CPU 40 MHz AMD 80386 SX</p> <p>Math coprocessor socket 40 MHz CYRIX 80387 SX</p> <p>82C390SX Integrates the following functions:</p> <ul style="list-style-type: none"> - RESET signal generator - Clock generator - System and CPU bus controller - Control of the arbitration between Device MAsTers, DMA and memory refresh - Control port B and NMI logic registers - Management of the A20 GATE signal - Cache controller - Memory controller - BIOS shadow control - Memory relocation control - Control of concurrent memory refresh and normal PC refresh - Management of the interface between the three system buses: CPU data bus (16-bit), memory data bus (16-bit), I/O peripheral data bus (16-bit) - Math coprocessor interface - Generation of the system sync signals <p>MCM6264 Components implementing 16 KB cache memory</p> <p>83C206Q Integrates the following functions:</p> <ul style="list-style-type: none"> - 114 bytes of CMOS RAM backed up by a lithium battery to maintain the data stored even after the system is powered off. - Real Time Clock - DMA controller - Interrupt controller <p>27C010 128 Kb x 8 ROM BIOS</p> <p>87310 Integrates the following functions:</p> <ul style="list-style-type: none"> - Floppy disk controller - Interface for two serial ports - Interface for the parallel port - Interface for intelligent hard disk drives <p>8042 Keyboard and mouse controller</p> <p>CL-GD5422 Super VGA controller</p> <p>ICD2027 System programmable clock generator</p> <p>74LS293 Speaker volume control</p> |

38**BOARDS**

| FUNCTION | DESCRIPTION | D.R.S. CODE | CHARACTERISTICS |
|-------------------------|--------------------|--------------------|-------------------------------------|
| Motherboard | 2012 | 557975 Z | 40 MHz i386 SX CPU with 2 MB of RAM |
| LA/16 BNMB power supply | 220 V | 151950 D | |
| LA/11 BNMB power supply | 110 V | 151951 S | |
| BUS Adapter board | | 030099 W | |
| Console board | | 030787 U | |

USER PROGRAM

This program is stored in the system regions of the hard disk drive.

| LEVEL | NOTES |
|-----------|---|
| Rel. 1.00 | <p>Requires BIOS release 1.01 or later.</p> <p>This release has the following restrictions:</p> <ul style="list-style-type: none"> - The Hard Disk parking utility is not present. - The "Monitor Utility" includes the "Video Refresh Rate: 75 Hz" and "High Vertical Refresh" options that the BIOS is not yet capable of supporting correctly - The video tests of release 1.01 do not support the "high resolution graphics" video mode |
| Rel. 1.01 | <p>Requires BIOS release 1.02 or later.</p> <p>The following modifications are made with respect to the previous release:</p> <ul style="list-style-type: none"> - The Setup utility has been modified so as to be able to configure the system board's parallel port and to either enable or disable the second serial port. - The video test has been modified to support the new vertical refresh rates. - The floppy disk test has been modified so that it can work correctly on 1.2 MB drives - The Monitor Utility has been modified to support the new vertical refresh rates. <p>This release has the following restrictions:</p> <ul style="list-style-type: none"> - The graphics accelerator subtests are not supported by this system's video controller. - The TrueColor subtest does not work correctly if video RAM has a capacity of less than 1 MB. |

SYSTEM TEST

| LEVEL | NOTES |
|-----------|---|
| Rel. 1.01 | <p>Requires BIOS release 1.01 or later.</p> <p>This release has the following restrictions:</p> <ul style="list-style-type: none"> - The Hard Disk parking utility is not present. - The "Monitor Utility" includes the "Video Refresh Rate: 75 Hz" and "High Vertical Refresh" options that the BIOS is not yet capable of supporting correctly - The video tests of release 1.01 do not support the "high resolution graphics" video mode |
| Rel. 1.02 | <p>Requires BIOS release 1.02 or later.</p> <p>The following modifications are made with respect to the previous release:</p> <ul style="list-style-type: none"> - The Setup utility has been modified so as to be able to configure the system board's parallel port and to either enable or disable the second serial port. - The video test has been modified to support the new vertical refresh rates. - The floppy disk test has been modified so that it can work correctly on 1.2 MB drives - The Monitor Utility has been modified to support the new vertical refresh rates. <p>This release has the following restrictions:</p> <ul style="list-style-type: none"> - The graphics accelerator subtests are not supported by this system's video controller. - The TrueColor subtest does not work correctly if video RAM has a capacity of less than 1 MB. |

SYSTEM REGION SET UP

| LEVEL | NOTES |
|-----------|--|
| Rel. 1.00 | <p>This System Region Setup version allows User Disk rel. 1.00 to be automatically installed in the system regions of the hard disk drive.</p> <p>This release requires BIOS release 1.01 or later, and has the following restrictions:</p> <ul style="list-style-type: none"> - The Hard Disk parking utility is not present. - The "Monitor Utility" includes the "Video Refresh Rate: 75 Hz" and "High Vertical Refresh" options that the BIOS is not yet capable of supporting correctly |
| Rel. 1.01 | <p>This System Region Setup version allows User Disk rel. 1.01 to be automatically installed in the system regions of the hard disk drive.</p> <p>This release requires BIOS release 1.02 or later, and incorporates the following modifications with respect to the previous release:</p> <ul style="list-style-type: none"> - The Setup utility has been modified so as to be able to configure the system board's parallel port and to either enable or disable the second serial port. - The video test has been modified to support the new vertical refresh rates. - The floppy disk test has been modified so that it can work correctly on 1.2 MB drives - The Monitor Utility has been modified to support the new vertical refresh rates. <p>This release has the following restrictions:</p> <ul style="list-style-type: none"> - The graphics accelerator subtests are not supported by this system's video controller. - The TrueColor subtest does not work correctly if video RAM has a capacity of less than 1 MB. |

POWER SUPPLY**38**

| POWER SUPPLY | LEVEL | DESCRIPTION |
|-----------------------------------|-------|-------------|
| MINEBA NMB SPE 1095 LA/16 BNMB | Nasc. | 220 V |
| MINEBA NMB SPE 1095 LA/11 BNMB | Nasc. | 110 V |

COMPATIBILITY NOTES

| BOARD OR HW/SW DEVICE | DESCRIPTION |
|--------------------------|-------------|
| | |

SOFTWARE DRIVERS

| DRIVER | NOTES |
|---|-------|
| Enhanced Video Drivers EVD Rel. 1.00 | |

BIOS

| LEVEL | NOTES |
|--------------|--|
| Rev. 1.01 | |
| Rev. 1.02 | <ul style="list-style-type: none"> - This release allows the following video vertical refresh rates to be used: 56, 84, 75, 87 Hz - Solves the problem with Windows in the 800x600 and 256-color 1024x768 video modes. - Introduces the new 16-color 800x600 and 1024x768 video modes. - New ways to configure the parallel and serial ports - Solves the problem of the optional ROM not allowing the correct management of the CPU cache. |
| Rev. 1.03 | This BIOS release supports 80 ns video RAM chips instead of the 70 ns video RAM chips which are no longer available on the market. |

SOFTWARE COMPATIBILITY

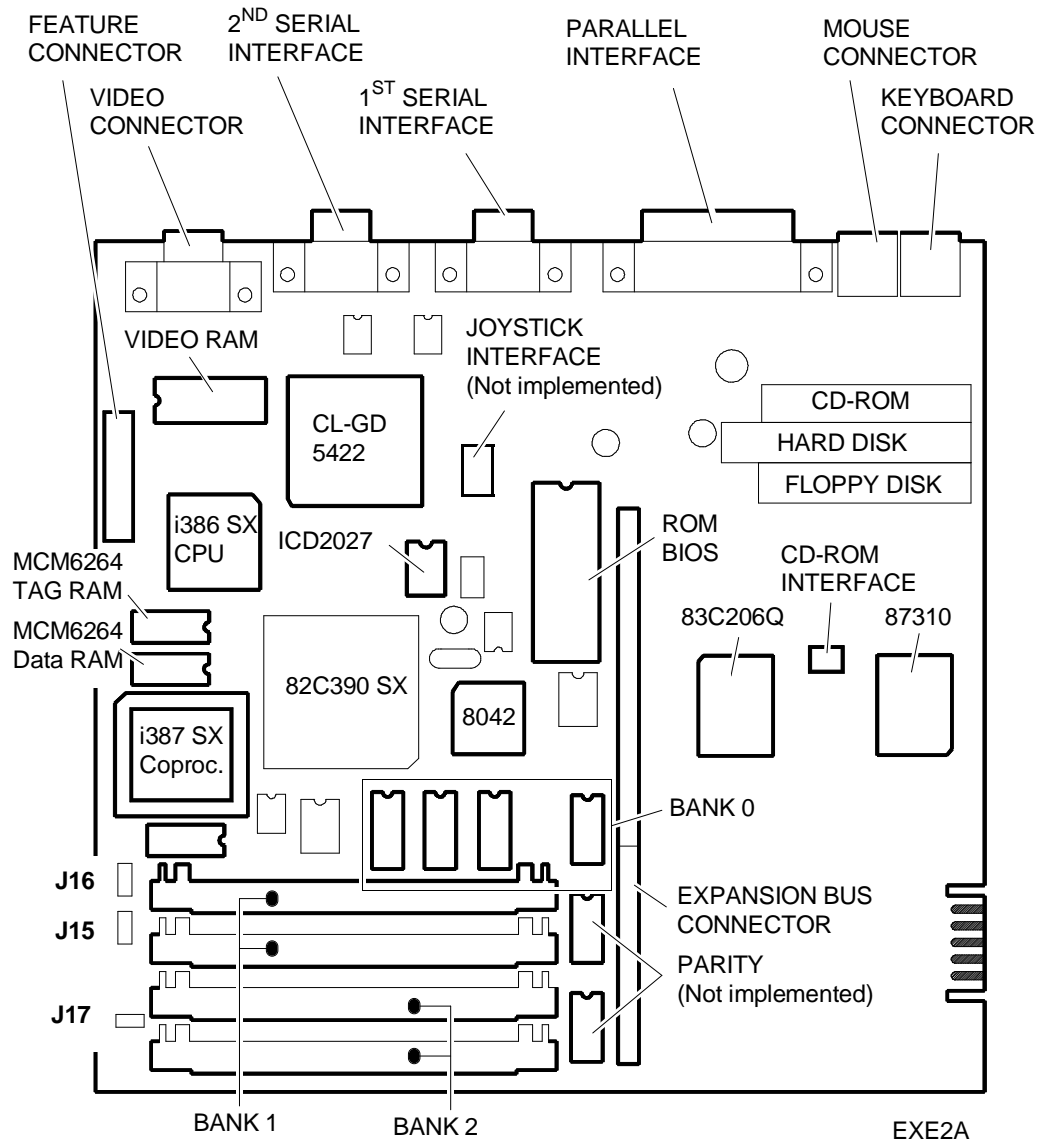
| OPERATING SYSTEMS | NOTES |
|--|--|
| IBM DISK Operating System, Ver. 3.30 MS-DOS (Compaq) IBM DISK Operating System, Ver. 4.01 MS-DOS Release 5.0 OS/2 Release 2.0 OS/2 Release 1.3 SE | Requests for a formatted DSDD diskette during installation on hard disk. |
| IBM Operating System/2, Ver. 1.10 and 1.20 | The PS/2 mouse is not recognized. |
| IBM Operating System/2 Extended Edition, Ver. 1.10 and 1.20 | The PS/2 mouse is not recognized. |
| INTERACTIVE 386/ix, Ver. 2.02 SCO UNIX System V/386, Rev. 3.2.4 SCO XENIX 386, Rev. 2.3 | |
| 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

| MODEM | I/O INTERFACE PRODUCTS |
|---|--|
| Hayes Smart modem 2400B FAXY PC MAXTER FURY 2400 PC MODEM AT&T 2224 CEO MODEM FURY 2400 MAXTER MODEM FURY 2400 TI/MNP Hayes Smart modem 1200 B | IBM PRINTER ADAPTER (1505200) STB 4-ON THE FLOOR |
| MULTIPOINT | MOUSE |
| CHASE AT8 COMPUTONE AT 8 COMPUTONE AT 16 INTEL Bell ICC.6 SPECIALIX SI / 8 | 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 |
| GRAPHICS PRODUCTS | NETWORKING AND LAN PRODUCTS |
| 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 | 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 |
| DISPLAY UNITS | |
| 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 | NEC MULTISYNC 2A NEC MULTISYNC 3D NEC MULTISYNC 4D NEC MULTISYNC 5D PHILIPS 7BM749 PHILIPS 9CM082 |

MOTHERBOARD COMPONENTS AND JUMPERS

Components on Side A



Jumper J16

Position 2-3: The system can be bootstrapped from the serial port.

Position 1-2: The system cannot be bootstrapped from the serial ports.

Jumper J17 IN:

The User Program that allows the system to be configured and which is stored in the system region of the hard disk drive, is not launched. If the configuration of the system has been changed, the only way to reconfigure the system is by using the System Test diskette. If this security feature was enabled, the following message is displayed at the end of the POD: *POD Warning*

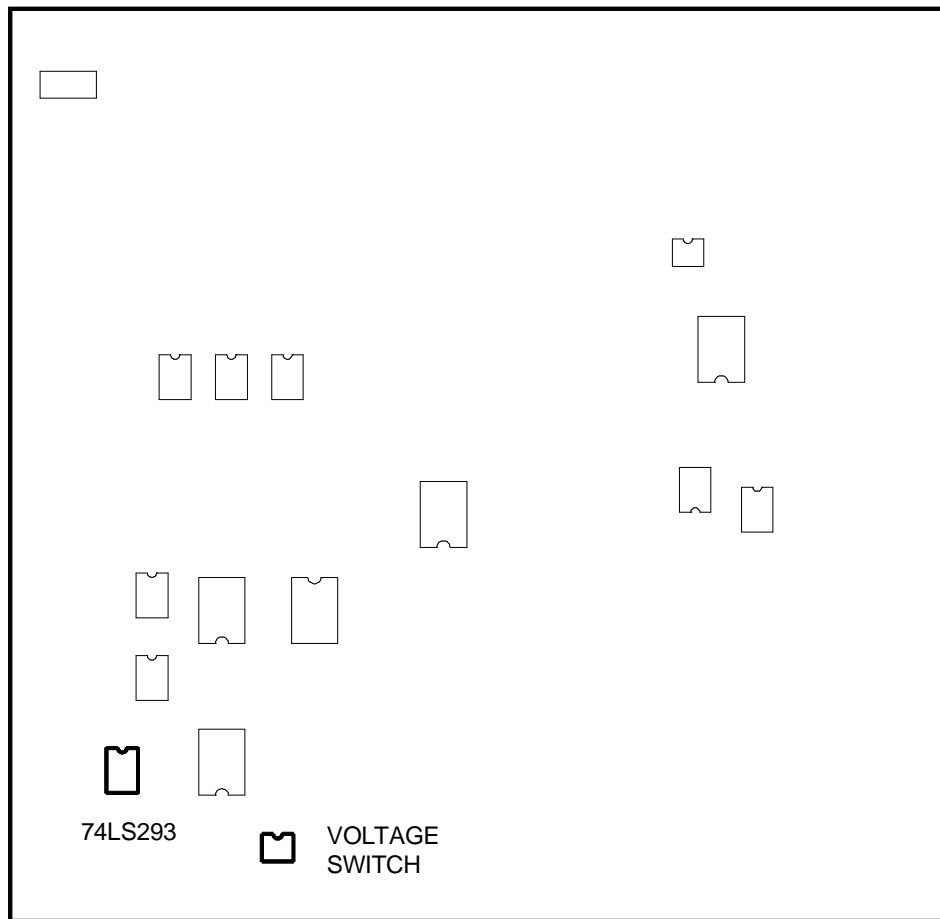
OUT: If the configuration of the system has been changed, the POD will automatically access the User Program so that the system can be reconfigured.

Jumper J15

Position 1-2: Floppy drive write disabled.

Position 2-3: Floppy drive write enabled.

Components on Side B



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EXE5A

INTERRUPT LEVELS

| LEVEL | NAME | CONTROLLER | FUNCTION |
|-----------|-------|------------|---|
| 1 | IRQ0 | 1 | Channel 0 timer OUT |
| 2 | IRQ1 | 1 | Keyboard |
| 3 to 10 * | IRQ2 | 1 | Interrupt from Controller 1 to Controller 2 |
| 3 | IRQ8 | 2 | Real time clock |
| 4 | IRQ9 | 2 | Available |
| 5 | IRQ10 | 2 | Available |
| 6 | IRQ11 | 2 | Available |
| 7 | IRQ12 | 2 | Mouse |
| 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 - parallel port 3 |
| 14 | IRQ6 | 1 | Floppy disk controller |
| 15 | IRQ7 | 1 | Parallel port 1 |

* The priority level depends on the selected interrupt. For example, if interrupt IRQ11 is selected, the priority level is 6; if interrupt IRQ15 is selected, the priority level is 10.

DMA CHANNELS

| CHANNEL | NO. OF BITS | FUNCTION |
|---------|-------------|--|
| 0 | 8 | Reserved |
| 1 | 8 | Available |
| 2 | 8 | Floppy disk transfers |
| 3 | 8 | Video |
| 4 | 16 | Used for the cascade connection of DMA 1 |
| 5 | 16 | Available |
| 6 | 16 | Available |
| 7 | 16 | Available |

I/O ADDRESS MAP

| ADDRESS | FUNCTION | ADDRESS | FUNCTION |
|----------------|---|----------------|--|
| 000-01F h | 8237A-5 DMA controller 1 | 2F8-2FF h | Serial port 2 (COM2) |
| 020-03F h | 8259A interrupt controller 1 | 300-31F h | Reserved |
| 040-05F h | 8254 timer | 340-347 h | AT CD-ROM interface |
| 060-06F h | 8742 data keyboard controller | 360-36F h | Reserved |
| 61 h | System Control Port B | 378-37F h | Parallel port 2 (LPT2) |
| 64 h | 8742 commands keyboard controller | 380-38F h | Reserved for SDLC connections, bisynchronous 2 |
| 070-07F h | Real time clock, NMI Mask, CMOS RAM (write registers) | 3A0-3AF h | Reserved for bisynchronous 1 |
| 080-09F h | DMA page registers | 3B0-3BF h | Reserved |
| 0A0-0BF h | 8259 interrupt controller 2 | 3BC h | Parallel port 1 (LPT1) |
| 0F0 h | Cancel NPX (80487) busy | 3C0-3CF h | Reserved |
| 0F1 h | Reset NPX, 80487 | 3D0-3DF h | Video controller |
| 0F8-0FF | 80487 math coprocessor | 3E8-3EF h | Serial port 3 (COM3) |
| 1F0-1F8 h | Hard disk controller | 3F0-3F7 h | Floppy disk controller |
| 200-207 h | Reserved | 3F8-3FF h | Serial port (COM1) |
| 278-27F h | Parallel port 3 (LPT 3) | | |

SYSTEM MEMORY MAP

| | | |
|---------|------------------------------------|----------|
| 000 KB | USER DATA AREA | 00000 h |
| 512 KB | BUS BOARDS WITH ON-BOARD MEMORY | 80000 h |
| 640 KB | VIDEO RAM | A0000 h |
| 768 KB | VIDEO BIOS SHADOW | C0000 h |
| 800 KB | AVAILABLE | C8000 h |
| 960 KB | SYSTEM BIOS SHADOW | F0000 h |
| 1024 KB | SYSTEM MEMORY | 100000 h |

