

EM-370/B

**Embedded Single Board Computer
with LCD/SVGA/Sound/Lan & Flash Disk
for Pentium® III / Celeron™
Socket 370 Processor**

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The EM-370 is an embedded single board computer with full functionality, LCD/SVGA, LAN, Sound output & a PC/104-plus expansion bus for Intel Pentium III Celeron Processor. It consists of an on-board SVGA & Audio output, a PCI Ethernet Interface and a PC/104 expansion bus. The Intel 440BX establishes a new class of low-cost, high-performance system that offers all the functions of a computer on a single board, and fits in the space of a 5.25-inch floppy drive (only 5.75" x 8"). This design eliminates system conflicts and end-user configuration problems.

For the embedded board market this means more memory, more processing might, and more I/O can be packed tighter. The form factor dispenses with the complexity, cost, and bulk of conventional motherboards, backplanes, and card cages. The embedded single board computer in EM-370 also comes with the most popular PC/104-plus self-stacking bus connector that suits the small form-factor board standards (compact PC/104-plus 3.6 x 3.8-inch self-stacking, modular format.). Today, the basic PC architecture is used in such diverse embedded applications as vending machines, communications devices, portable systems, and medical equipment. Among PC/104-plus standardizes the repackaging of desktop PC functions to satisfy the ruggedness, reliability, and size constraints of embedded systems. PC/104-plus lets you combine special-purpose embedded functions with the basic PC computing core.

Other on-board features include four serial ports (RS-232 and RS-232/422/485), one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller and a keyboard interface and a PS/2 mouse interface. The built-in high speed PCI IDE controller supports both PIO and bus master modes. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives and other IDE devices. Its 6-layer printed circuit board combines with noise-tolerant and low power consumption CMOS technology applied on the board makes EM-370 able to withstand any harsh environments very well.

1.1 SPECIFICATIONS

| | |
|-----------------------------|---|
| ➤ Processor | : Support Intel Pentium III Celeron Processors in the PPGA (Plastic Pin Grid Array) and FCPGA (Flip Chip Pin Grid Array) |
| ➤ Chipset | : Intel 440BX chipsets, CHIPS 69000, Realtek 8139, ESS 1938 sound chip, Winbond 977EF & 877TF I/O compatible chips, Winbond W83783S |
| ➤ System Memory | : One 168-pin DIMM socket that support up 256MB of SDRAM / EDO DRAM |
| ➤ BIOS | : 256KB Licensed Award Flash BIOS |
| ➤ Flash Memory Disk | : Reserved socket for DiskOnChip from M-System, support up to 144 MB flash memory Disk |
| ➤ VGA/LCD Controller | : C&T 69000 LCD/CRT chipset on-die 2MB video memory |
| ➤ Ethernet Controller | : On-board Realtek 8139, support 100 BASE-TX |
| ➤ Sound Output | : On-board ESS 1938 PCI interface |
| ➤ IDE Drive Interface | : TWO PCI IDE ports, support up to four IDE devices Ultra DMA/33 |
| ➤ Floppy Drive Interface | : One FDD port, support up to two floppy devices |
| ➤ Serial Port | : Four COM ports for three RS-232 and one selectable RS-232/422/485 |
| ➤ Parallel Port | : Two multi-mode parallel port (EPP/ECP/SPP) |
| ➤ RTC Battery | : Dallas RTC battery or compatible |
| ➤ DMA | : 8 DMA channels |
| ➤ Interrupts | : 16 levels of hardware interrupts |
| ➤ External Power Connector | : On-board 7-pin & 4-pin external power connector |
| ➤ PC/104-Plus Expansion Bus | : Built-in PC/104-Plus expansion Bus |
| ➤ Watchdog Timer | : 16 level time-out intervals by software program |
| ➤ Universal Serial Bus | : Support two USB ports |
| ➤ IR Interface | : Supports one IrDA header |
| ➤ Health Monitoring | : On-board Winbond W83783S |
| ➤ Operating Temperature | : 0°C~60°C |
| ➤ Humidity | : 10%~90% RH |
| ➤ Dimensions | : 203 mm X 146 mm (8" X 5 ³ / ₄ " inches) |
| ➤ Net weight | : 350 g (0.770 pounds) |
| ➤ GPS Interface | : Reserved Header for GPS Kit |

Notice :

1.Version below 2.0 only supports Intel Celeron in the PPGA (Plastic Pin Grid Array) Package, and one parallel port

2.EM-370B support:

| | |
|---------------------|---|
| ➤VGA/LCD Controller | : C&T 69030 LCD/CRT chipset on-die 4MB video memory |
|---------------------|---|

1.2 PACKING CHECK LIST

Before you begin to install your card, please make sure that you received the following materials as listed below:

✦ Standard Packing :

| <i>Item</i> | <i>Qty</i> | <i>Remark</i> |
|---------------------------------------|------------|-------------------|
| EM-370 Embedded Single Board Computer | 1 pc. | EM-370 SBC |
| VGA/Audio/Lan/h-monitor Drivers | 1 pc. | Drivers of CD-ROM |
| User' s manual | 1 pc. | EM-370 manual |



Note : All Option Kits are to be purchased separately

✦ Option (1) : EM-370CB

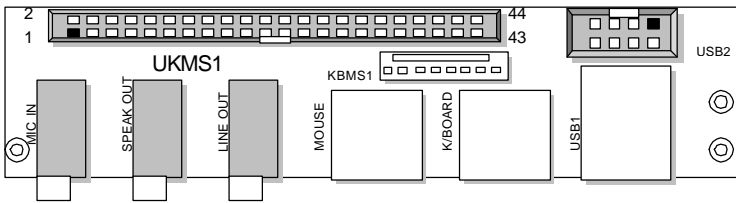
| <i>Item</i> | <i>Qty</i> | <i>Remark</i> |
|--------------------------|------------|--|
| EIDE cable | 1 pc. | 44-pin narrow header to 40-pin standard header |
| Floppy cable | 1 pc. | 34-pin standard header to 34-pin etch connector |
| Printer port cable | 1 pc. | 26-pin standard header to 25-pin female D-Sub (Attached to standard I/O card bracket) |
| CRT-2 cable | 1 pc. | 12-pin standard header to 15-pin/3-rows D-Sub |
| Game port cable | 1 pc. | 16-pin standard header to 15-pin/2-rows D-Sub |
| EBX Power Transfer Cable | 1 pc. | 7-pin+4-pin to P8/P9 12 pin Power Transfer Cable |
| PC/104-plus Mounting kit | 1 set | 4 x brass spacer (25mm) 4 x null 4 x screws (M3 x 6) |

Note : Option (1) is usable by version below 2.0


✦ **Option (2) : EM-UKMS-02 kit**


| Item | Qty | Remark |
|--|-------|--|
|  EM-UKMS-02 (USB/Keyboard/Mouse/Sound cabled kit) | 1 set | 1 x 44-pin to 44-pin thin flat ribbon female cable 1 x U-K-M-S board 92.92 x 27.00 mm (with 3 x Sound phone jack, 1 x 6-pin PS/2 Keyboard connector, 1 x 6-pin PS/2 Mouse and 2 x USB connector) |
|  Keyboard adapter cable | 1 set | 6-pin header to 5-pin AT keyboard connector |

EM-UKMS-02 Kit Top View :

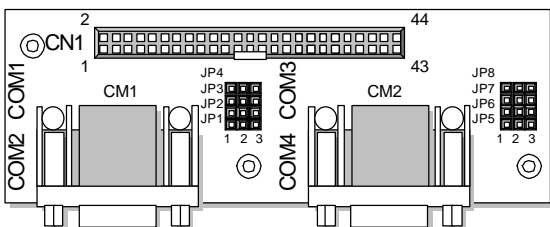


✦ **Option (3) : EM-COM-01 or EM-COM-02 kit**

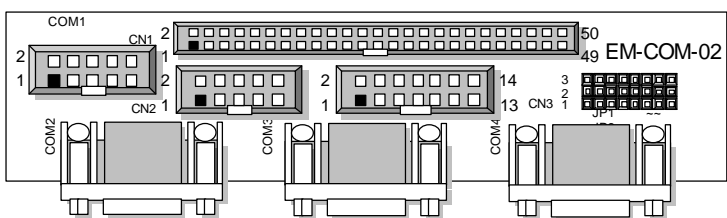
| Item | Qty | Remark |
|--|-------|--|
|  EM-COM-01 (COM cabled kit) | 1 set | 1 x 50-pin to 44-pin thin flat ribbon female cable 1 x Four COM port board 90.00 x 30.00 mm (with 4 x 9-pin COM port female D-sub connector) |

| Item | Qty | Remark |
|--|-------|--|
|  EM-COM-02 (COM cabled kit) | 1 set | 1 x 50-pin to 50-pin thin flat ribbon female cable 1 x Four COM port board 111.58 x 30.00 mm (with 3 x 9-pin COM port female D-sub connector, and 1X10-pin COM port standard header) |

EM-COM-01 Kit Top View :



EM-COM-02 Kit Top View :



✦ **Option (4) : LCD Adapter Kit : [for example : LK-XXX (XXX=001,002,..)]**

| <i>Item</i> | <i>Qty</i> | <i>Remark</i> |
|--|------------|--|
| 🔌 LCD Adapter | 1 pc. | Please check LCD adapter list user' s manual |
| 📖 LCD adapter list user' s manual | 1 pc. | LCD adapter list manual |
| 🔌 LCD/Flat-Panel adapter cable (An Option Kit, please check your requirement with the LCD Adapter List) | 1 set | Please check LCD adapter list user' s manual |

✦ **Option (5) : EM-370CB V2.0**

| <i>Item</i> | <i>Qty</i> | <i>Remark</i> |
|----------------------------|------------|--|
| 🔌 EIDE cable | 1 pc. | 44-pin narrow header to 40-pin standard header |
| 📀 Floppy cable | 1 pc. | 34-pin standard header to 34-pin etch connector |
| 🖨️ Printer port cable | 1 pc. | 26-pin standard header to 25-pin female D-Sub (Attached to standard I/O card bracket) |
| 🖨️ CRT-2 cable | 1 pc. | 12-pin standard header to 15-pin/3-rows D-Sub |
| 🎮 Game port cable | 1 pc. | 16-pin standard header to 15-pin/2-rows D-Sub |
| 🔌 EBX Power Transfer Cable | 1 pc | 7-pin+4-pin to P8/P9 12 pin Power Transfer Cable |
| 🔌 PC/104-plus Mounting kit | 1 set | 4 x brass spacer (25mm) 4 x null 4 x screws (M3 x 6) |
| 🔌 Parallel Port Cable | 1 pc. | 26-pin box header to 25-pin D-sub with bracket |

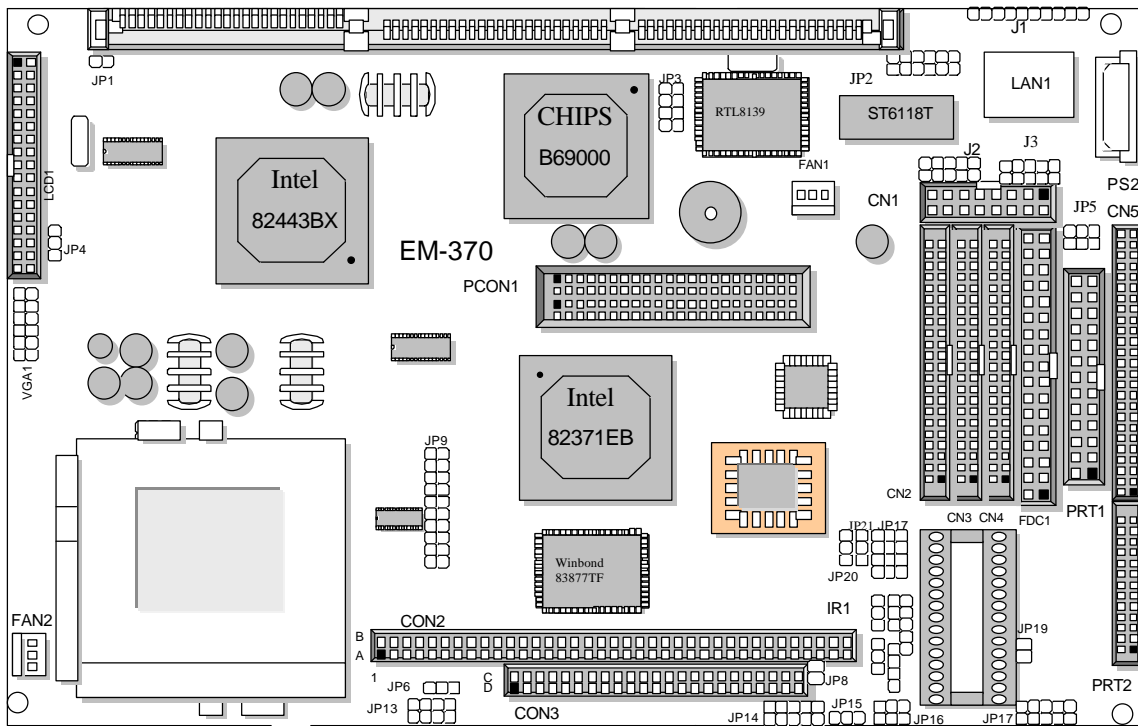
Note : Option (5) is not usable by version below 2.0

CHAPTER 2.

JUMPER SETTINGS AND CONNECTORS

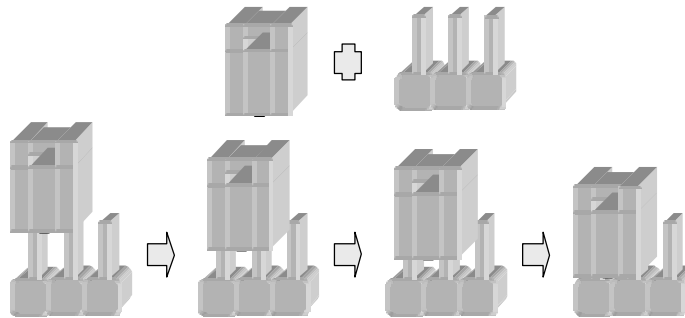
The figure below shows the jumpers and connectors location on the EM-370:

2.1 BOARD OUTLINE OF EM-370



2.2 JUMPER SETTING OVERVIEW

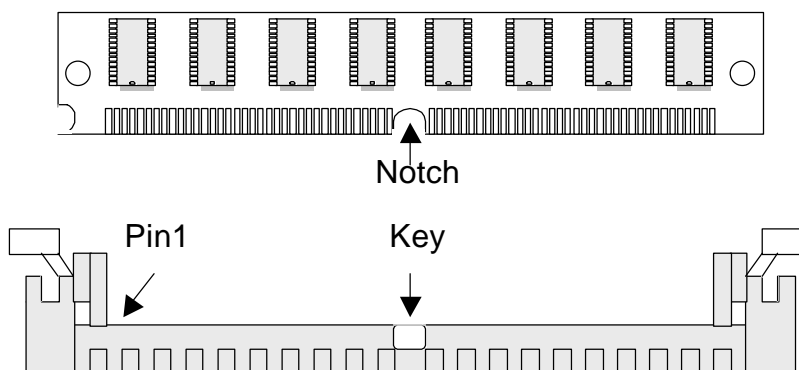
In order to select the operation modes of your system, configure and set the jumpers on the your Embedded SBC to match the need of your application. To set a jumper, a black plastic cap containing metal contacts is placed over the jumper pins as designated by the required configuration as listed in this section. A jumper is said to be “ on ” or “ 1-2 ” when the black cap has been placed on two of its pins, as show in the figure below:



A pair of needle-nose pliers is recommended when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local sales representative before you make any changes. In general, you simply need a standard cable to make most connections.

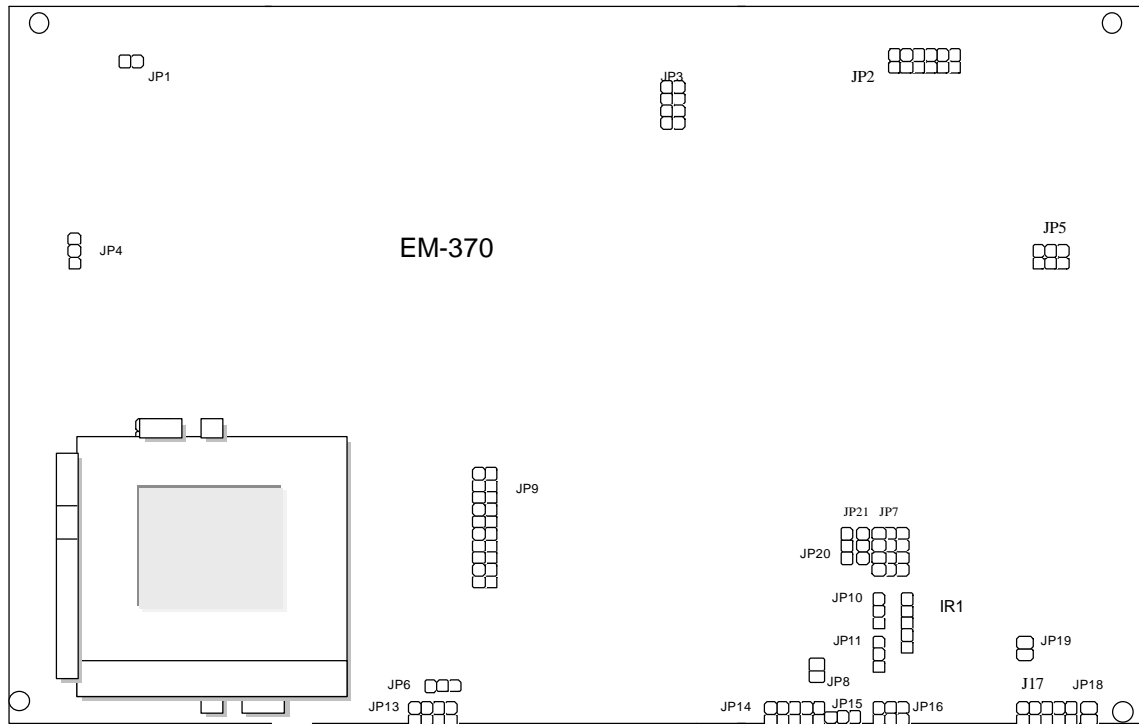
2.3 INSTALLING THE DIMM MODULE:

A DIMM module simply snaps into a socket on the system board. Pin1 of the DIMM module must correspond with Pin1 of the socket.



1. Position the DIMM above the socket with the “notch” in the module aligned with the “key” on the socket.
2. Seat the module at a 90 angle into the bank. Make sure it is completely seated. Tilt the module upright until it locks in place in the socket.

2.4 JUMPER LOCATION FOR EM-370



2.5 JUMPER SETTINGS SUMMARY FOR EM-370

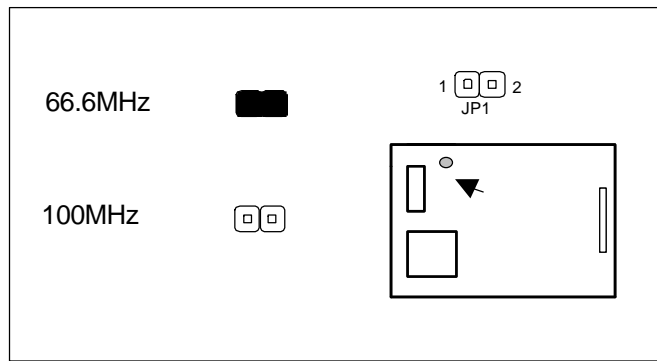
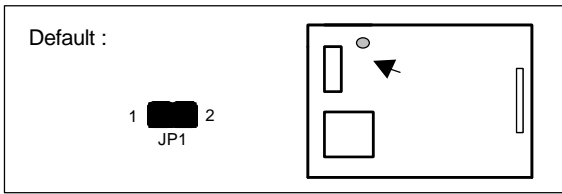
| LOCATION | FUNCTION |
|----------------------|--|
| JP1 | Select CPU External Bus Clock |
| JP2 | Select LAN LED & Sound Switch |
| JP3 | Select Panel Type |
| JP4 | Select Panel Voltage |
| JP5 | Select COM2 Type |
| JP6 | Manufacture Setting |
| JP7 | Select Enable / Disable COM2 |
| JP8 | Manufacture Setting (For Debug) |
| JP9 | GPS Connector |
| JP10 | Select ISP GAL Function (Manufacture Define) |
| JP11 | Select ISP GAL Function (Manufacture Define) |
| JP13 | Select Internal CPU Clock Ratio |
| JP14 | Digital Input / Digital Output Ports |
| JP15 | Clear COMS (Power-On Situation) |
| JP16 | Select M-System or SRAM Type |
| JP17 | Select M-System Address and SRAM Address |
| JP19 | Select M-System or SRAM Type |
| JP20 | Select M-System or SRAM Type |
| JP21 | Select M-System or SRAM Type |
| EM-COM-01 JP5~JP8 | Select COM4 Type (EM-COM-01 JP1~JP4 Manufacturer Setting) |
| EM-COM-02 JP1~JP8 | Select COM4 Type (EM-COM-02 JP1~JP8 Manufacturer Setting) |

Note : The following jumpers are different of version below v2.0

| LOCATION | FUNCTION |
|----------|--------------------------------------|
| JP15 | Manufacture Setting (For NC Battery) |
| JP18 | Clear CMOS (Power-On situation) |

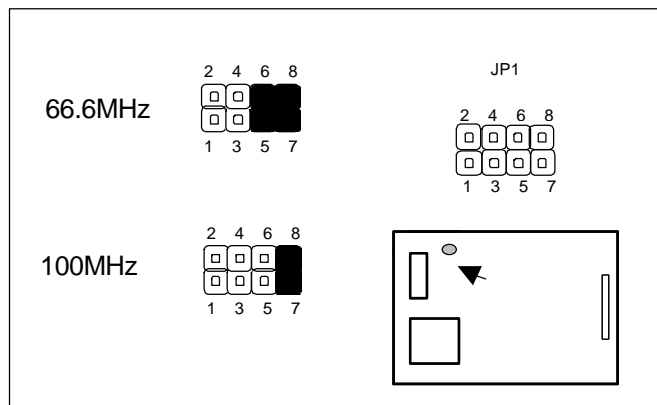
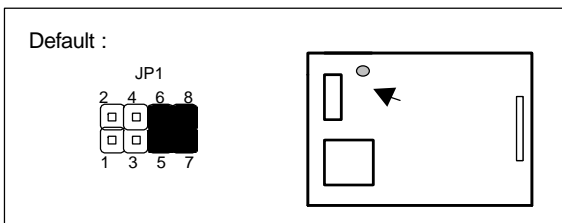
✦ **JP1 : Select CPU External Bus Clock**

| CPU External Bus Clock | JP1 |
|------------------------|-----|
| 66.6 MHz (Default) | ON |
| 100MHz | OFF |



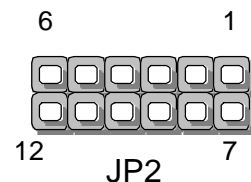
✦ **JP1 (For version below 2.0): Select CPU External Bus Clock**

| CPU External Bus Clock | JP1 |
|------------------------|---------|
| 66.6 MHz (Default) | 5-6,7-8 |
| 100MHz | 7-8 |



✦ **JP2 : LAN LED & Sound Switch**

| JP2 Connector | Description |
|-----------------------|---------------|
| Pin 1 & Pin 7 of JP2 | 10M LED |
| Pin 2 & Pin 8 of JP2 | RX-TX ACT LED |
| Pin 3 & Pin 9 of JP2 | 100M LED |
| Pin 5 & Pin 11 of JP2 | VOL+ SW |
| Pin 6 & Pin 12 of JP2 | VOL- SW |



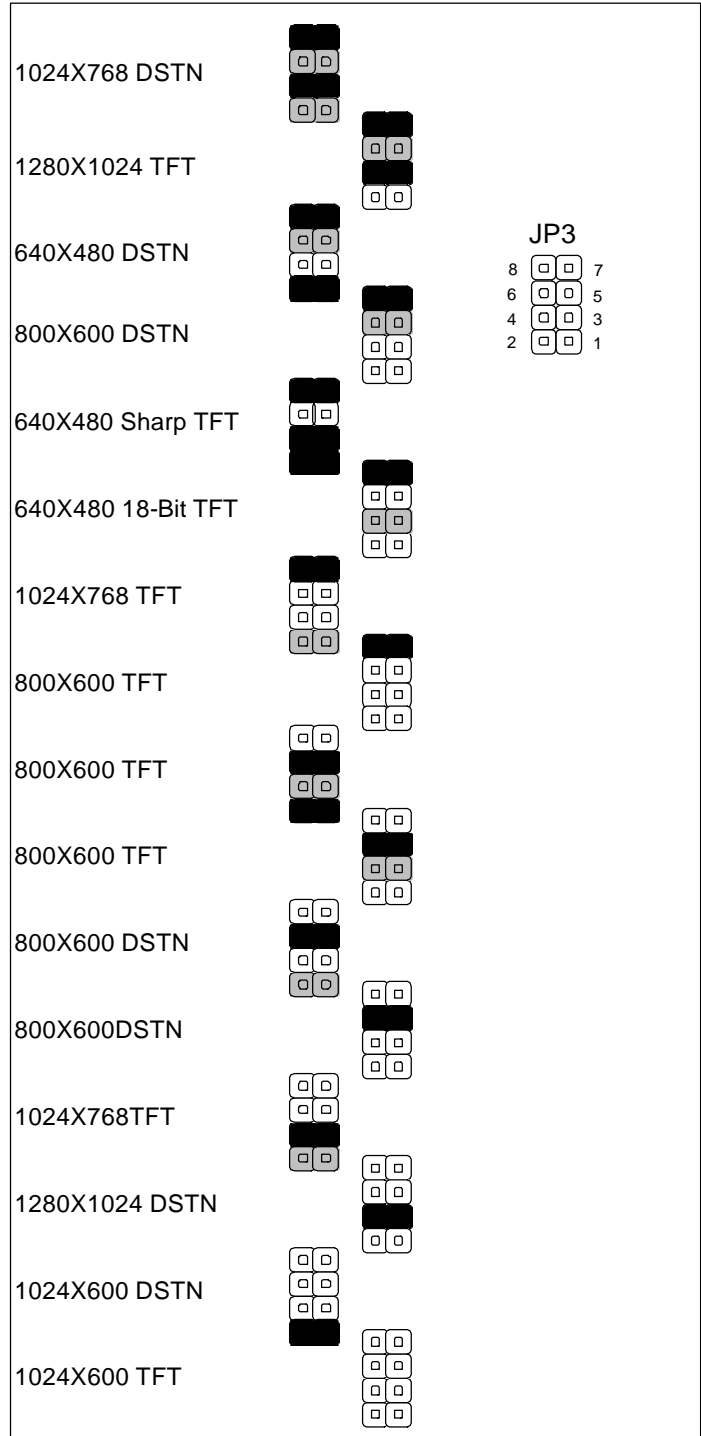
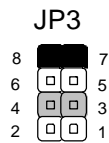
| JP2 Pin No. | Signal | JP2 Pin No. | Signal |
|-------------|--------|-------------|--------|
| 1 | 10M | 7 | VCC |
| 2 | RX-TX | 8 | VCC |
| 3 | 100M | 9 | VCC |
| 4 | Ground | 10 | NC |
| 5 | Ground | 11 | VOL+ |
| 6 | Ground | 12 | VOL- |

✦ **JP3 : Select Panel Type**

| Panel Type | JP3 |
|----------------------|-----------------|
| 1024 X 768 DSTN | 1-2,3-4,5-6,7-8 |
| 1280 X 1024 TFT | 3-4,5-6,7-8 |
| 640 X 480 DSTN | 1-2,5-6,7-8 |
| 800 X 600 DSTN | 5-6,7-8 |
| 640 X 480 Sharp TFT | 1-2,3-4,7-8 |
| 640 X 480 18-Bit TFT | 3-4,7-8 |
| 1024 X 768 TFT | 1-2,7-8 |
| 800 X 600 TFT | 7-8 |
| 800 X 600 TFT | 1-2,3-4,5-6 |
| 800 X 600TFT | 3-4,5-6 |
| 800 X 600 DSTN | 1-2,5-6 |
| 800 X 600 DSTN | 5-6 |
| 1024 X 768 TFT | 1-2,3-4 |
| 1280 X 1024 DSTN | 3-4 |
| 1024 X 600 DSTN | 1-2 |
| 1024 X 600 TFT | OFF |

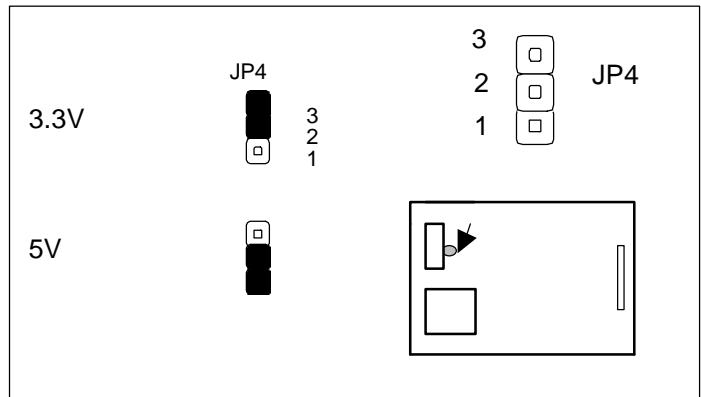
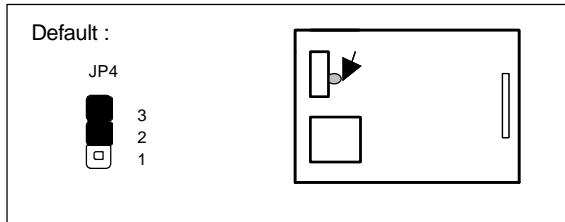
Note: Different type of LCD panel with the same resolution will have different jumper setting for selection.

Default :



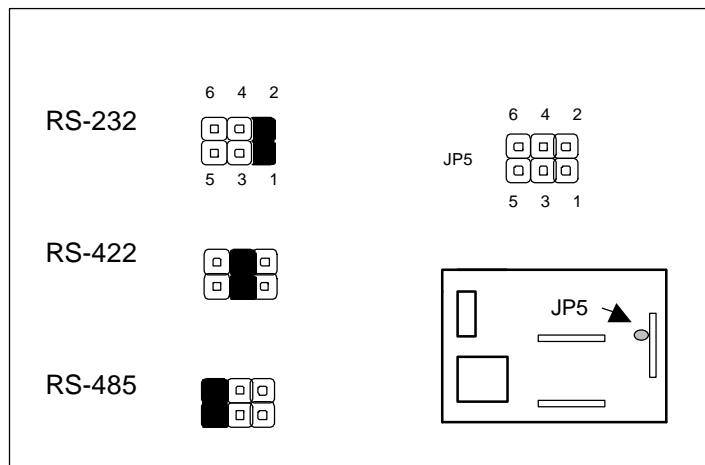
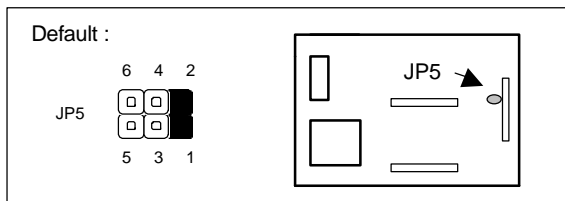
✦ **JP4 : Select Panel Voltage**

| Panel Voltage | JP4 |
|------------------|-----|
| 3.3V (Default) | 2-3 |
| 5V | 1-2 |



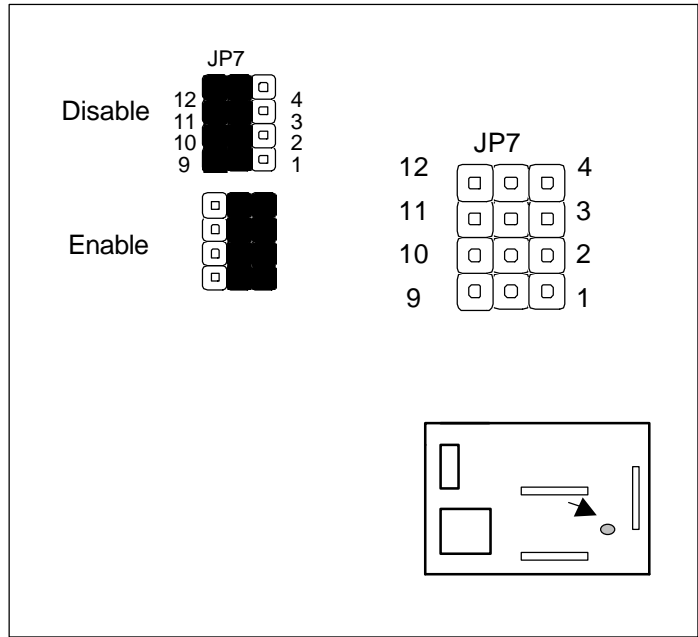
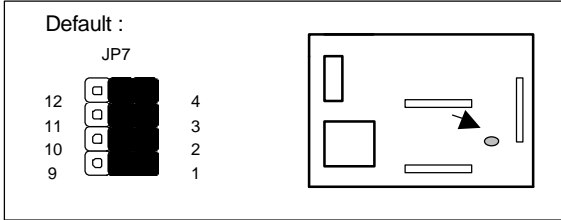
✦ **JP5 : Select COM2 Type**

| COM2 Type | JP5 |
|------------------|-----|
| RS-232 (Default) | 1-2 |
| RS-422 | 3-4 |
| RS-485 | 5-6 |



✦ **JP7 : Select Disable or Enable COM2**

| Disable/Enable COM2 | JP7 |
|---------------------|------------------------|
| Disable (For GPS) | 1-5,2-6,3-7,4-8 |
| Enable (Default) | 5-9,6-10, 7-11,8-12 |

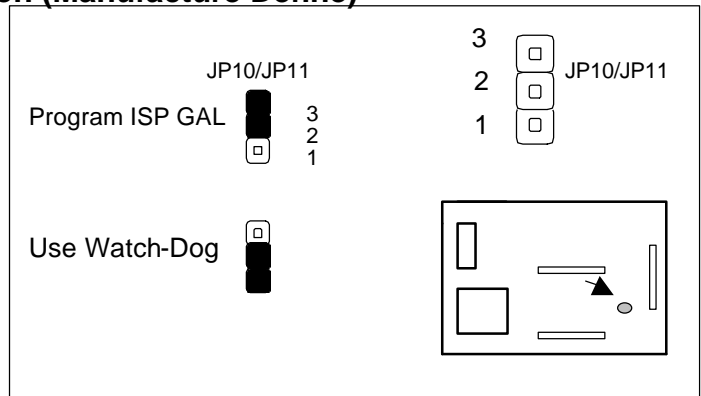
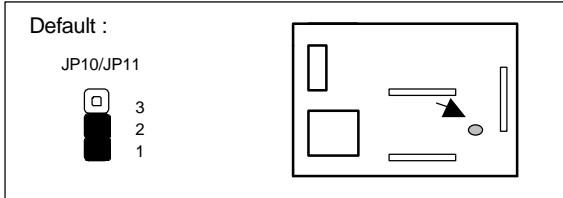


✦ **JP9 : GPS Connector**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | VCC | 2 | VCC |
| 3 | NC | 4 | NC |
| 5 | RESET | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | NC | 10 | GND |
| 11 | RX | 12 | TX |
| 13 | GND | 14 | NC |
| 15 | NC | 16 | GND |
| 17 | GND | 18 | GND |
| 19 | NC | 20 | NC |

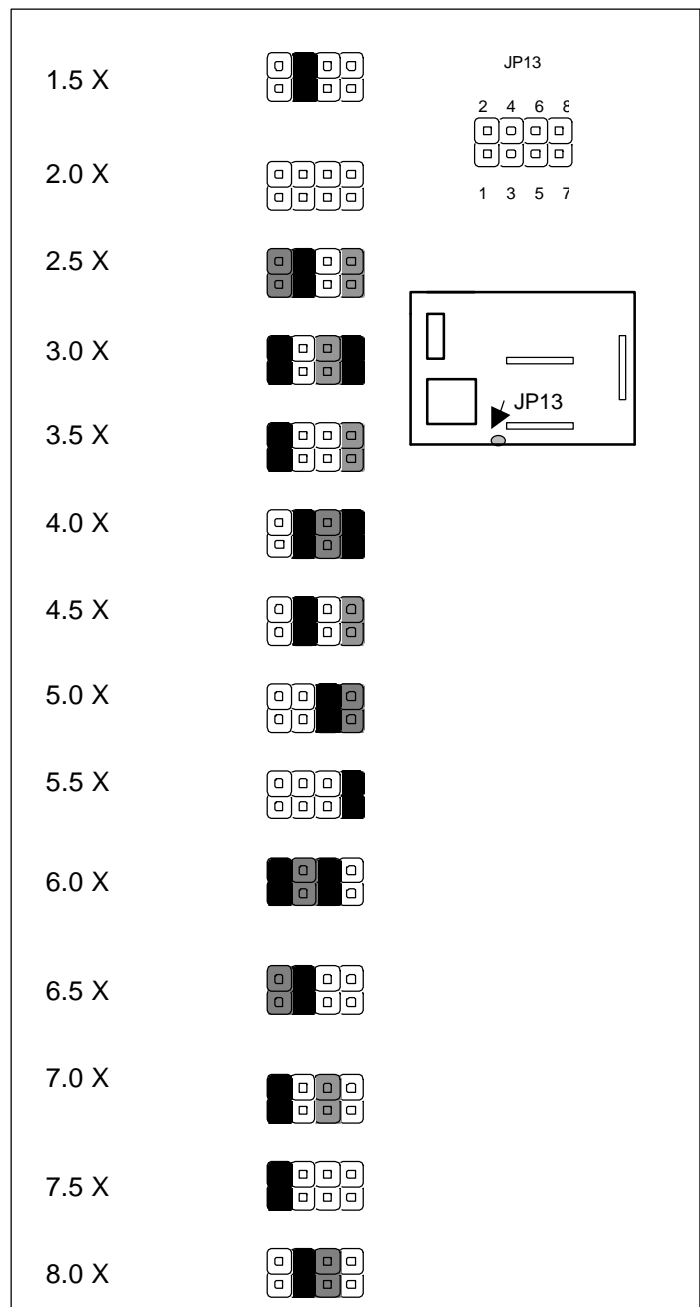
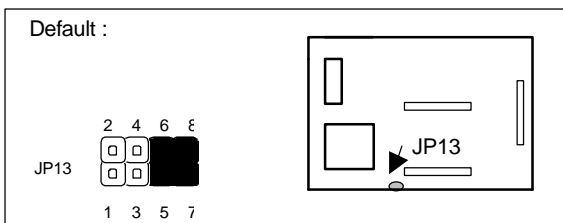
✦ **JP10/JP11 : Select ISP GAL Function (Manufacture Define)**

| | JP10 | JP11 |
|-----------------|------|------|
| Program ISP GAL | 2-3 | 2-3 |
| Use Watch-Dog | 1-2 | 1-2 |



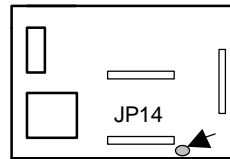
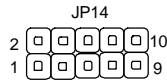
✦ **JP13 : Select Internal CPU Clock Ratio**

| Internal CPU Clock Ratio | JP13 |
|--------------------------|-------------|
| 1.5 X | 3-4 |
| 2.0 X | OFF |
| 2.5 X | 1-2,3-4,7-8 |
| 3.0 X | 1-2,5-6,7-8 |
| 3.5 X | 1-2,7-8 |
| 4.0 X | 3-4,5-6,7-8 |
| 4.5 X | 3-4,7-8 |
| 5.0 X (Default) | 5-6,7-8 |
| 5.5 X | 7-8 |
| 6.0X | 1-2,3-4,5-6 |
| 6.5X | 1-2,3-4 |
| 7.0X | 1-2,5-6 |
| 7.5X | 1-2 |
| 8.0X | 3-4,5-6 |



✦ **JP14 : Digital Input / Digital Output Ports (Header)**

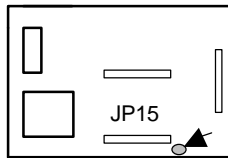
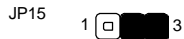
| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | IN0 | 2 | OUT0 |
| 3 | IN1 | 4 | OUT1 |
| 5 | IN2 | 6 | OUT2 |
| 7 | IN3 | 8 | OUT3 |
| 9 | Ground | 10 | Ground |



✦ **JP15 : Clear CMOS (Power-On Situation)**

| Clear CMOS Jumper | JP15 |
|-------------------|------|
| Normal | 2-3 |
| Clear CMOS | 1-2 |

Default :



Normal

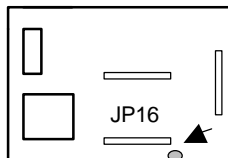
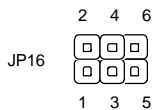
JP15

Clear CMOS

✦ **JP16 : Select M-System or SRAM Type**

| Select Type | JP16 |
|---------------------|---------|
| DiskOnChip | OFF |
| 32K X 8 SRAM 28 Pin | 1-3,2-4 |

Default :



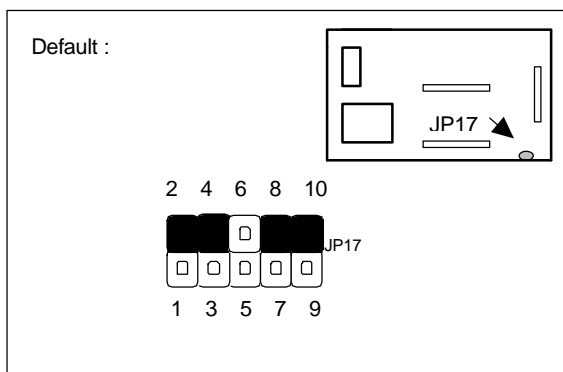
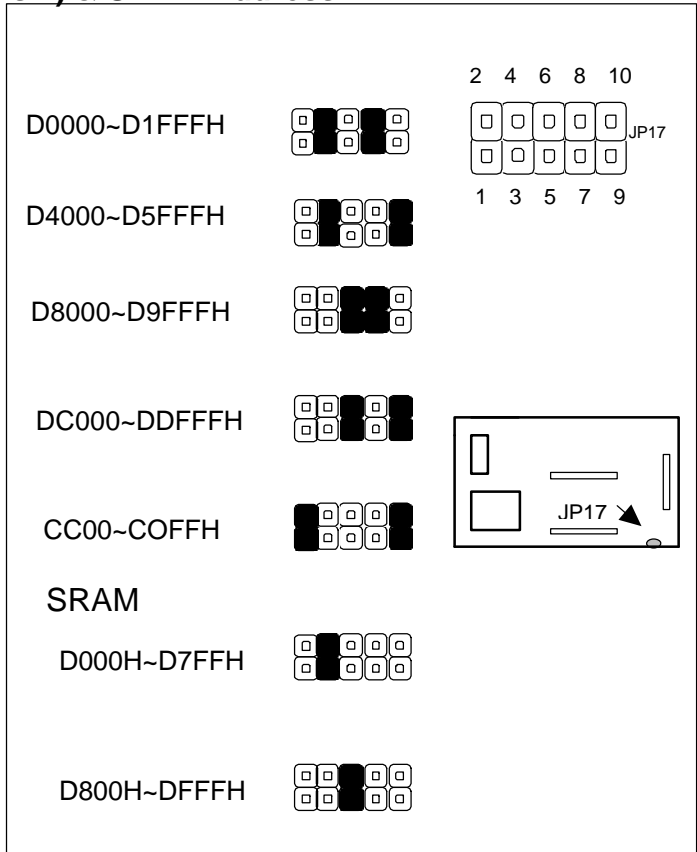
DiskOnChip

JP16

32KX8 SRAM
28 Pin

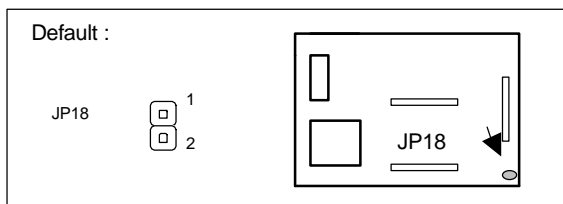
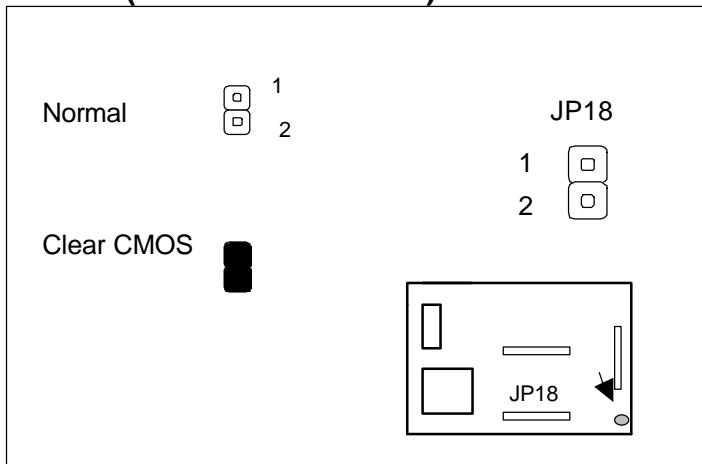
✦ **JP17 : Select DiskOnChip (Flash Disk) & SRAM Address**

| Flash Disk Address | JP17 |
|--------------------|----------|
| D0000~D1FFFH | 3-4,7-8 |
| D4000~D5FFFH | 3-4,9-10 |
| D8000~D9FFFH | 5-6,7-8 |
| DC000~DDFFFH | 5-6,9-10 |
| CC00~COFFH | 1-2,9-10 |
| SRAM Address | JP17 |
| D000H~D7FFH | 3-4 |
| D800H~DFFFH | 5-6 |



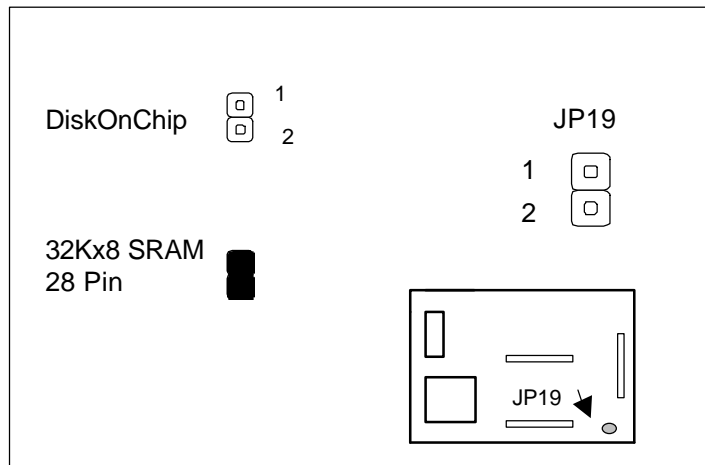
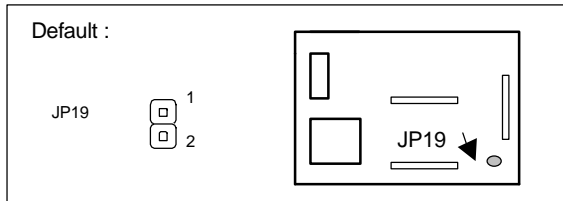
✦ **JP18 (For version below 2.0) : Clear CMOS (Power-On situation)**

| Clear CMOS Jumper | JP18 |
|-------------------|------|
| Normal | OFF |
| Clear CMOS | 1-2 |



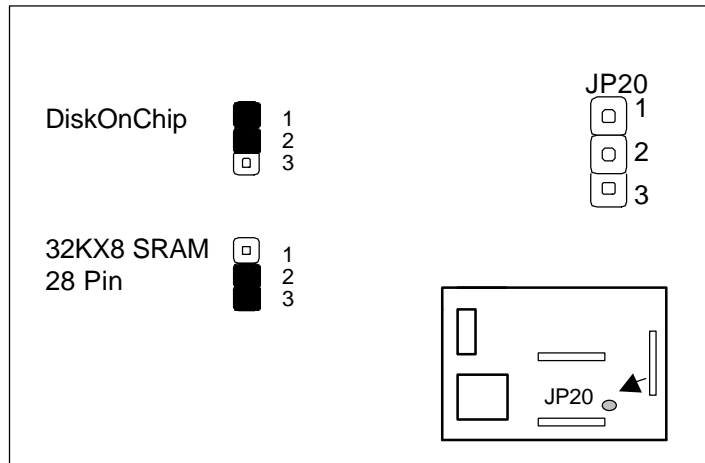
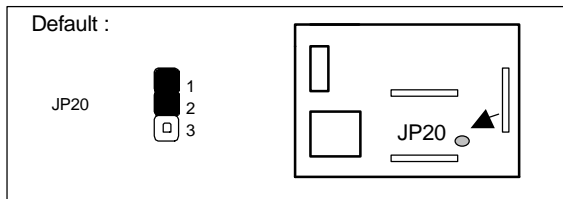
JP19 : Select M-System or SRAM Type

| Select Type | JP19 |
|---------------------|------|
| DISKOnChip | OFF |
| 32K X 8 SRAM 28 Pin | 1-2 |



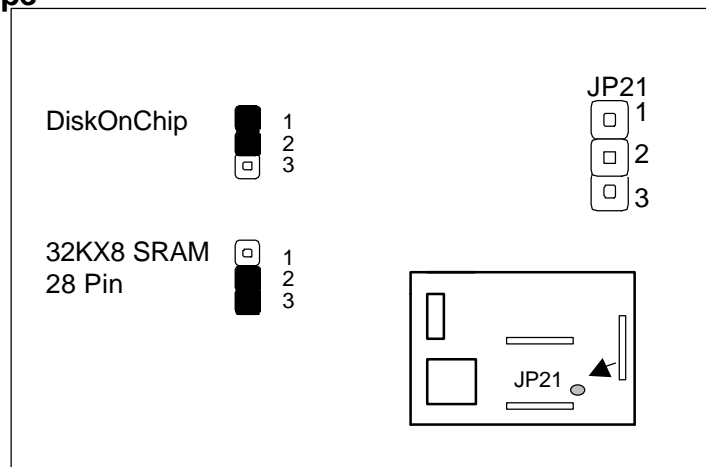
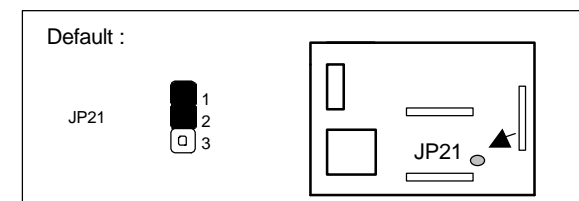
JP20 : Select M-System or SRAM Type

| Select Type | JP20 |
|---------------------|------|
| DiskOnChip | 1-2 |
| 32K X 8 SRAM 28 Pin | 2-3 |



✦ JP21 : Select M-System or SRAM Type

| Select Type | JP21 |
|---------------------|------|
| DiskOnChip | 1-2 |
| 32K X 8 SRAM 28 Pin | 2-3 |

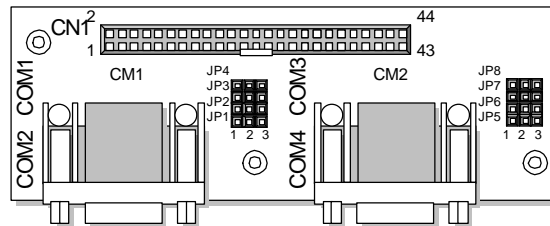


✦ **EM-COM-01 Jumper Setting :**

1. JP1~JP4 : Manufacturer Setting
2. JP5~JP8 : Select COM4 Type

| COM4 Type | JP5 | JP6 | JP7 | JP8 |
|------------------|-----|-----|-----|-----|
| RS-232 (Default) | 1-2 | 1-2 | 1-2 | 1-2 |
| RS-422 | 2-3 | 2-3 | 2-3 | 2-3 |
| RS-485 | 2-3 | 2-3 | 2-3 | 2-3 |

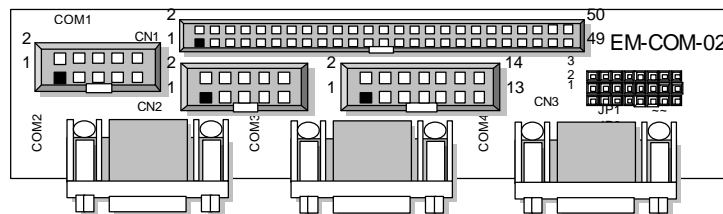
EM-COM-01 Kit Top View :



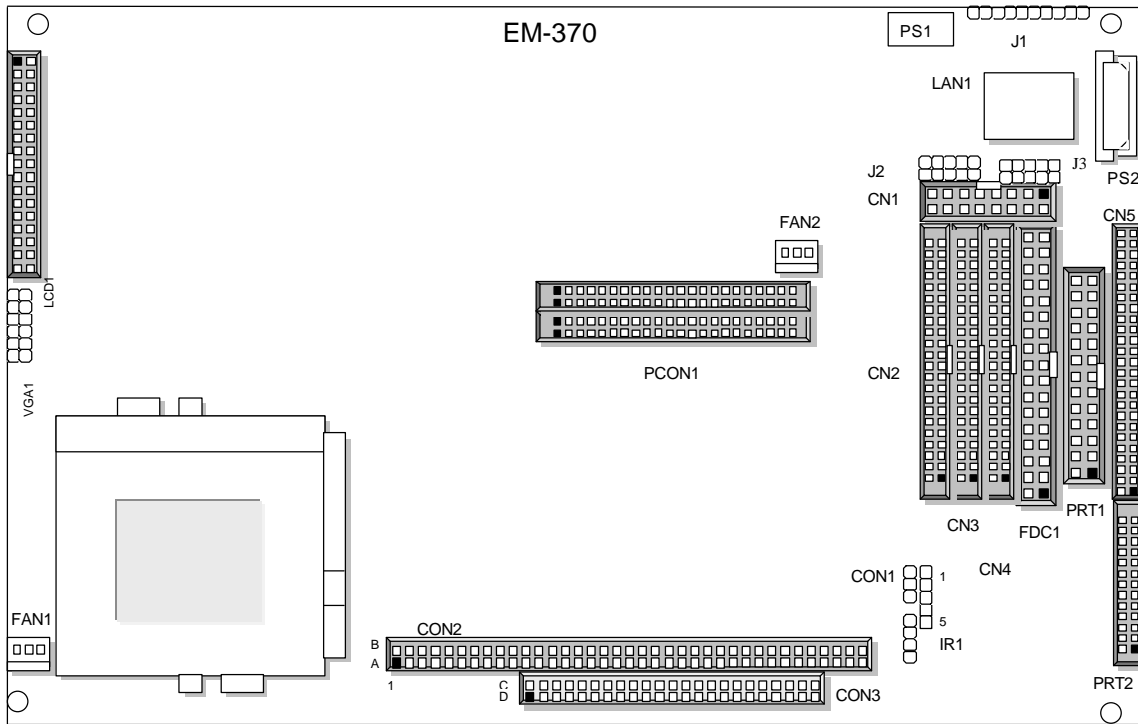
✦ **EM-COM-02 Jumper Setting :**

1. JP1~JP8 : Manufacturer Setting

EM-COM-02 Kit Top View :



2.6 I/O Connector Location for EM-370



2.7 I/O Connector Summary of EM-370

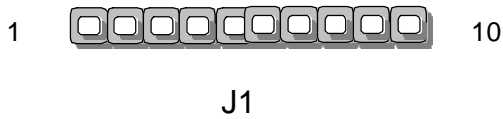
| LOCATION | FUNCTION |
|------------|--|
| J1 | Reset SW, LED & Speaker |
| J2 | LAN Connector (Header) |
| J3 | Reset SW, LED & Speaker |
| IR1 | Alternate IrDA |
| FAN1 | FAN1 Connector |
| FAN2 | FAN2 Connector |
| PS1 | -5V&-12V Power Connector |
| PS2 | EBX Power Connector |
| CN5 | COM1~COM4 Connector (Header) |
| CN2 | CD_IN, MIC_IN, LIN_IN, Mouse, Keyboard, USB1, USB2 Connector |
| LCD1 | Panel LCD Connector (Header) |
| FDC1 | Floppy Interface Connector (Header) |
| PRT1 | Parallel #1 Port Connector (Header) |
| PRT2 | Parallel #2 Port Connector (Header) |
| CN3,CN4 | EIDE Interface Connector (Header) |
| VGA1 | External VGA Connector (Header) |
| LAN1 | LAN Connector (RJ45) |
| CN1 | GAME Port Connector (Header) |
| CON2、 CON3 | PC/104 Connector |
| PCON1 | PC/104-Plus Connector |
| CON1 | Manufacturer Setting (For Pre-Load Watch-Dog on Factory) |

Note:PRT2 (Parallel #2 Port Connector) are not available of version below v2.0

2.8 I/O CONNECTORS DESCRIPTION

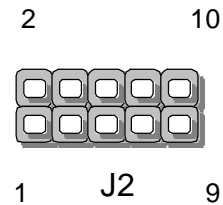
✦ J1 : Reset SW, LED & Speaker

| J4 Connector | Description |
|----------------------|----------------------|
| Pin 1 ~ Pin 2 of J1 | Power LED |
| Pin 3 ~ Pin 4 of J1 | HDD LED |
| Pin 5 ~ Pin 6 of J1 | Reset SW |
| Pin 7 ~ Pin 8 of J1 | Used Internal Buzzer |
| Pin 7 ~ Pin 10 of J1 | External Speaker |



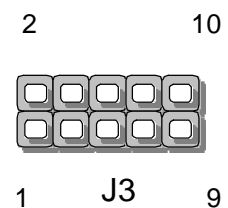
✦ J2 : LAN Connector (Header)

| Pin No. | Description |
|---------|-------------|
| 1 | TX+ |
| 2 | TX- |
| 3 | RX+ |
| 4 | T78 |
| 5 | T78 |
| 6 | RX- |
| 7 | T45 |
| 8 | T45 |
| 9 | LGND |
| 10 | LGND |



✦ J3 : Reset SW, LED & Speaker

| J4 Connector | Description |
|----------------------|----------------------|
| Pin 1 ~ Pin 2 of J3 | Power LED |
| Pin 3 ~ Pin 4 of J3 | HDD LED |
| Pin 5 ~ Pin 6 of J3 | Reset SW |
| Pin 7 ~ Pin 8 of J3 | Used Internal Buzzer |
| Pin 7 ~ Pin 10 of J3 | External Speaker |



✦ **IR1 : Alternate IrDa**

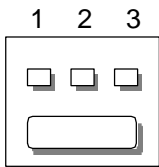
| Pin No. | Description |
|---------|-------------|
| 1 | VCC |
| 2 | FIRRX |
| 3 | IRRX |
| 4 | GND |
| 5 | IRTX |



IR1

✦ **FAN1 : FAN1 Connector**

| Pin No. | Description |
|---------|-------------|
| 1 | Ground |
| 2 | +12V |
| 3 | FAN Status |



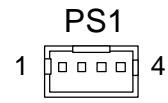
FAN1

✦ **FAN2 : FAN2 Connector**

| Pin No. | Description |
|---------|-------------|
| 1 | Ground |
| 2 | +12V |
| 3 | FAN Status |

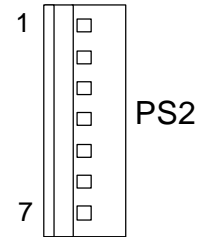
✦ **PS1 : -5V & -12V Power Connector**

| Pin No. | PS1 |
|---------|------|
| 1 | GND |
| 2 | -5V |
| 3 | GND |
| 4 | -12V |



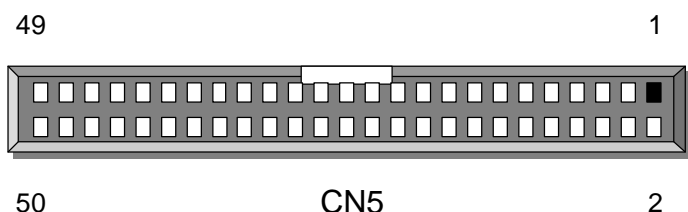
✦ **PS2 : EBX Power Connector**

| Pin No. | PS1 |
|---------|------|
| 1 | +5V |
| 2 | GND |
| 3 | GND |
| 4 | +12V |
| 5 | NC |
| 6 | GND |
| 7 | +5V |



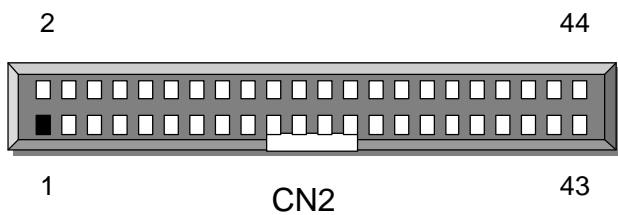
✦ **CN5 : COM1 ~ COM4 Connector**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | DCD1# | 2 | DSR1# |
| 3 | SIN1 | 4 | RTS1# |
| 5 | SOUT1# | 6 | CTS1# |
| 7 | DTR1# | 8 | RI1# |
| 9 | COMGND | 10 | COMGND |
| 11 | DCD4# | 12 | DSR4# |
| 13 | SIN4 | 14 | RTS4# |
| 15 | SOUT4# | 16 | CTS4# |
| 17 | DTR4# | 18 | RI4# |
| 19 | COMGND | 20 | COMGND |
| 21 | DCD3# | 22 | DSR3# |
| 23 | SIN3 | 24 | RTS3# |
| 25 | SOUT3# | 26 | CTS3# |
| 27 | DTR3# | 28 | RI3# |
| 29 | COMGND | 30 | COMGND |
| 31 | NC | 32 | NC |
| 33 | NC | 34 | NC |
| 35 | COMGND | 36 | COMGND |
| 37 | DCD2# | 38 | DSR2# |
| 39 | SIN2 | 40 | RTS2# |
| 41 | SOUT2# | 42 | CTS2# |
| 43 | DTR2# | 44 | RI2# |
| 45 | COMGND | 46 | COMGND |
| 47 | 485TXD+ | 48 | 485TXD- |
| 49 | 485RXD+ | 50 | 485RXD- |



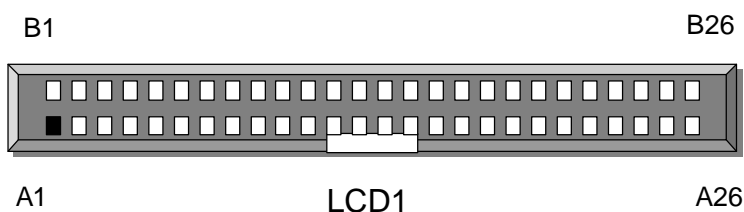
✦ **CN2 : CD_IN, MIC_IN, LIN_IN, Mouse, Keyboard, USB1, USB2 Connector**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | R-CDI | 2 | AGND1 |
| 3 | L-CDI | 4 | AGND1 |
| 5 | MIC-IN | 6 | AGND1 |
| 7 | AGND1 | 8 | LINER |
| 9 | LIN-L | 10 | AGND1 |
| 11 | LINEL | 12 | LIN-R |
| 13 | AGND1 | 14 | AGND1 |
| 15 | AGND1 | 16 | HO-L |
| 17 | AGND1 | 18 | AGND1 |
| 19 | HO-R | 20 | AGND1 |
| 21 | AGND1 | 22 | LO-R |
| 23 | AGND1 | 24 | AGND1 |
| 25 | LO-L | 26 | AGND1 |
| 27 | KB_GND | 28 | VCCF |
| 29 | MSDATA | 30 | MSCLK |
| 31 | KB_GND | 32 | VCCF |
| 33 | KBDATA | 34 | KBCLK |
| 35 | Ground | 36 | Ground |
| 37 | VUSB1 | 38 | VUSB2 |
| 39 | USB1- | 40 | USB2- |
| 41 | USB1+ | 42 | USB2+ |
| 43 | USGND | 44 | USGND |



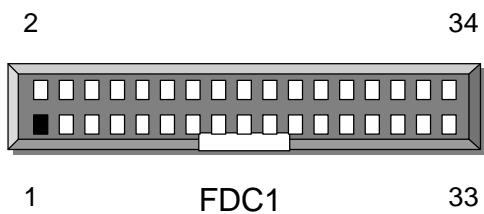
✦ **LCD1 : Panel LCD Connector (Header)**

| PIN | SIGNAL | PIN | SIGNAL |
|------------|---------------|------------|---------------|
| A1 | P0 | B1 | P15 |
| A2 | P1 | B2 | P31 |
| A3 | P2 | B3 | P16 |
| A4 | P24 | B4 | P17 |
| A5 | P3 | B5 | P18 |
| A6 | P4 | B6 | P32 |
| A7 | P25 | B7 | GND |
| A8 | GND | B8 | SCLK |
| A9 | P5 | B9 | GND |
| A10 | P6 | B10 | DE |
| A11 | P26 | B11 | FLM |
| A12 | P7 | B12 | LP |
| A13 | P8 | B13 | GND |
| A14 | GND | B14 | P19 |
| A15 | P27 | B15 | P20 |
| A16 | P9 | B16 | GND |
| A17 | P10 | B17 | P21 |
| A18 | P28 | B18 | P22 |
| A19 | P11 | B19 | P33 |
| A20 | GND | B20 | P23 |
| A21 | P12 | B21 | P34 |
| A22 | P29 | B22 | ENBKL |
| A23 | P13 | B23 | P35 |
| A24 | P30 | B24 | ENAVEE |
| A25 | P14 | B25 | VCC |
| A26 | ENAVEE | B26 | VCC |



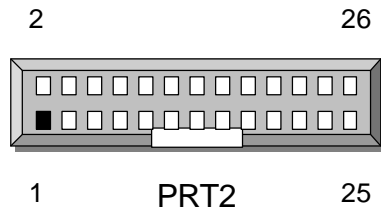
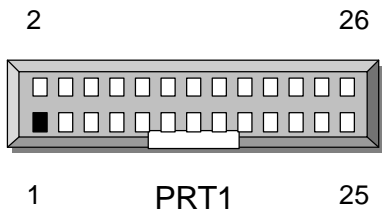
✦ **FDC1 : Floppy Interface Connector (Header)**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|--------------------|
| 1 | Ground | 2 | Density Select |
| 3 | Ground | 4 | NC |
| 5 | Ground | 6 | DS1 |
| 7 | Ground | 8 | Index # |
| 9 | Ground | 10 | Motor Enable A # |
| 11 | Ground | 12 | Drive Select B # |
| 13 | Ground | 14 | Drive Select A # |
| 15 | Ground | 16 | Motor Enable B # |
| 17 | Ground | 18 | Direction # |
| 19 | Ground | 20 | Step # |
| 21 | Ground | 22 | Write Data # |
| 23 | Ground | 24 | Write Gate # |
| 25 | Ground | 26 | Track 0 # |
| 27 | Ground | 28 | Write Protect # |
| 29 | NC | 30 | Read Data # |
| 31 | Ground | 32 | Head Side Select # |
| 33 | NC | 34 | Disk Change # |



✦ **PRT1 : Parallel #1 Port Connector (Header)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|----------------|---------|---------------------|
| 1 | Strobe # | 2 | Auto Form Feed |
| 3 | Data0 | 4 | Error # |
| 5 | Data1 | 6 | Initialize # |
| 7 | Data2 | 8 | Printer Select IN # |
| 9 | Data3 | 10 | Ground |
| 11 | Data4 | 12 | Ground |
| 13 | Data5 | 14 | Ground |
| 15 | Data6 | 16 | Ground |
| 17 | Data7 | 18 | Ground |
| 19 | Acknowledge # | 20 | Ground |
| 21 | Busy | 22 | Ground |
| 23 | Paper Empty | 24 | Ground |
| 25 | Printer Select | 26 | Ground |

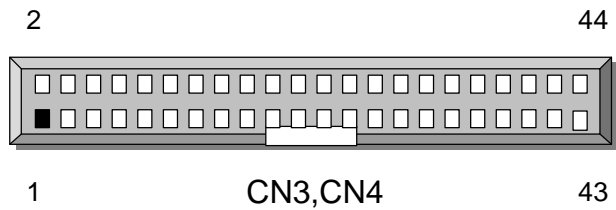


✦ **PRT2 : Parallel #2 Port Connector (Header)**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|----------------|---------|---------------------|
| 1 | Strobe # | 2 | Auto Form Feed |
| 3 | Data0 | 4 | Error # |
| 5 | Data1 | 6 | Initialize # |
| 7 | Data2 | 8 | Printer Select IN # |
| 9 | Data3 | 10 | Ground |
| 11 | Data4 | 12 | Ground |
| 13 | Data5 | 14 | Ground |
| 15 | Data6 | 16 | Ground |
| 17 | Data7 | 18 | Ground |
| 19 | Acknowledge # | 20 | Ground |
| 21 | Busy | 22 | Ground |
| 23 | Paper Empty | 24 | Ground |
| 25 | Printer Select | 26 | Ground |

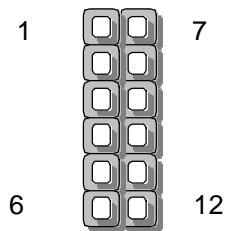
✦ **CN3,CN4 : IDE Interface Connector (Header)**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | Reset # | 2 | Ground |
| 3 | Data 7 | 4 | Data 8 |
| 5 | Data 6 | 6 | Data 9 |
| 7 | Data 5 | 8 | Data 10 |
| 9 | Data 4 | 10 | Data 11 |
| 11 | Data 3 | 12 | Data 12 |
| 13 | Data 2 | 14 | Data 13 |
| 15 | Data 1 | 16 | Data 14 |
| 17 | Data 0 | 18 | Data 15 |
| 19 | Ground | 20 | NC |
| 21 | DMA REQ # | 22 | Ground |
| 23 | IOW # | 24 | Ground |
| 25 | IOR # | 26 | Ground |
| 27 | IOCHRDY | 28 | Ground |
| 29 | DMA ACK # | 30 | Ground |
| 31 | Interrupt | 32 | NC |
| 33 | SA 1 | 34 | NC |
| 35 | SA 0 | 36 | SA 2 |
| 37 | HDC CS 0# | 38 | HDC CS 1# |
| 39 | HDD Active | 40 | Ground |
| 41 | VCC | 42 | VCC |
| 43 | Ground | 44 | NC |



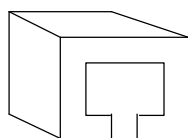
✦ **VGA1 : External VGA Connector (Header)**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | R | 7 | Ground |
| 2 | G | 8 | Ground |
| 3 | B | 9 | Ground |
| 4 | H-SYNC | 10 | Ground |
| 5 | V-SYNC | 11 | Ground |
| 6 | DDDA | 12 | DDCK |



✦ **LAN1 : LAN Connector (RJ-45)**

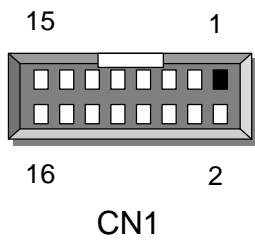
| Pin No. | Description |
|---------|-------------|
| 1 | TX+ |
| 2 | TX- |
| 3 | RX+ |
| 4 | T78 |
| 5 | T78 |
| 6 | RX- |
| 7 | T45 |
| 8 | T45 |



LAN1

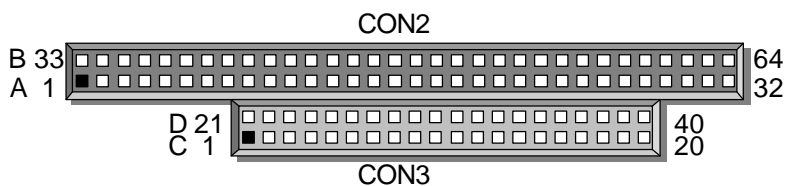
✦ **CN1 : GAME Port Connector (Header)**

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | VCC | 2 | VCC |
| 3 | SWA | 4 | SWC |
| 5 | OA | 6 | OC |
| 7 | Ground | 8 | MIDI_OUT |
| 9 | Ground | 10 | OD |
| 11 | OB | 12 | SWD |
| 13 | SWB | 14 | MIDI_IN |
| 15 | VCC | 16 | Ground |



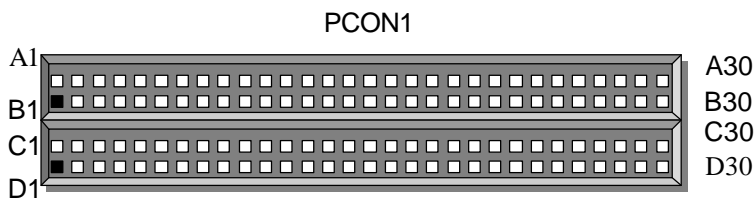
✦ **CON2 , CON3 : PC/104 Connector**

| Pin No. | Description | | | |
|---------|-------------|----------|--------|----------|
| | CON2 | | CON3 | |
| | Row A | Row B | Row C | Row D |
| 1 | IOCHCK# | Ground | Ground | Ground |
| 2 | SD7 | RSTDRV | SBHE# | MEMCS16# |
| 3 | SD6 | +5V | LA23 | IOCS16# |
| 4 | SD5 | IRQ9 | LA22 | IRQ10 |
| 5 | SD4 | -5V | LA21 | IRQ11 |
| 6 | SD3 | DRQ2 | LA20 | IRQ12 |
| 7 | SD2 | -12V | LA19 | IRQ15 |
| 8 | SD1 | 0 WS# | LA18 | IRQ14 |
| 9 | SD0 | +12V | LA17 | DACK0# |
| 10 | IOCHRDY | NC | MEMR# | DRQ0 |
| 11 | AEN | SMEMW# | MEMW# | DACK5# |
| 12 | SA19 | SMEMR# | SD8 | DRQ5 |
| 13 | SA18 | IOW# | SD9 | DACK6# |
| 14 | SA17 | IOR# | SD10 | DRQ6 |
| 15 | SA16 | DACK3# | SD11 | DACK7# |
| 16 | SA15 | DRQ3 | SD12 | DRQ7 |
| 17 | SA14 | DACK1# | SD13 | +5V |
| 18 | SA13 | DRQ1 | SD14 | MASTER# |
| 19 | SA12 | REFRESH# | SD15 | Ground |
| 20 | SA11 | SYSCLK | NC | Ground |
| 21 | SA10 | IRQ7 | --- | --- |
| 22 | SA9 | IRQ6 | --- | --- |
| 23 | SA8 | IRQ5 | --- | --- |
| 24 | SA7 | IRQ4 | --- | --- |
| 25 | SA6 | IRQ3 | --- | --- |
| 26 | SA5 | DACK2# | --- | --- |
| 27 | SA4 | TC | --- | --- |
| 28 | SA3 | BALE | --- | --- |
| 29 | SA2 | +5V | --- | --- |
| 30 | SA1 | OSC | --- | --- |
| 31 | SA0 | Ground | --- | --- |
| 32 | Ground | Ground | --- | --- |



✦ **PCON 1 : PC/104-Plus Connector**

| Pin No. | Description | Pin No. | Description | Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| A1 | KEY2 | B1 | NC | C1 | VCC | D1 | AD0 |
| A2 | VCC | B2 | AD2 | C2 | AD1 | D2 | VCC |
| A3 | AD5 | B3 | GND | C3 | AD4 | D3 | AD3 |
| A4 | C/BE-0 | B4 | AD7 | C4 | GND | D4 | AD6 |
| A5 | GND | B5 | AD9 | C5 | AD8 | D5 | GND |
| A6 | AD11 | B6 | VCC | C6 | AD10 | D6 | M66EN |
| A7 | AD14 | B7 | AD13 | C7 | GND | D7 | AD12 |
| A8 | VCC3 | B8 | C/BE-1 | C8 | AD15 | D8 | VCC3 |
| A9 | SERR- | B9 | GND | C9 | SBO- | D9 | PAR |
| A10 | GND | B10 | PERR- | C10 | VCC3 | D10 | SDONE |
| A11 | STOP- | B11 | VCC3 | C11 | LOCK- | D11 | GND |
| A12 | VCC3 | B12 | TRDY- | C12 | GND | D12 | DEVSEL- |
| A13 | FRAME- | B13 | GND | C13 | IRDY- | D13 | VCC3 |
| A14 | GND | B14 | AD16 | C14 | VCC3 | D14 | C/BE-2 |
| A15 | AD18 | B15 | VCC3 | C15 | AD17 | D15 | GND |
| A16 | AD21 | B16 | AD20 | C16 | GND | D16 | AD19 |
| A17 | VCC3 | B17 | AD23 | C17 | AD22 | D17 | VCC3 |
| A18 | IDSL0 | B18 | GND | C18 | IDSL1 | D18 | IDSL2 |
| A19 | AD24 | B19 | C/BE-3 | C19 | VCC | D19 | IDSL3 |
| A20 | GND | B20 | AD26 | C20 | AD25 | D20 | GND |
| A21 | AD29 | B21 | VCC | C21 | AD28 | D21 | AD27 |
| A22 | VCC | B22 | AD30 | C22 | GND | D22 | AD31 |
| A23 | REQ-0 | B23 | GND | C23 | REQ-1 | D23 | VCC |
| A24 | GND | B24 | REQ-2 | C24 | VCC | D24 | GNT-0 |
| A25 | GNT-1 | B25 | VCC | C25 | GNT-2 | D25 | GND |
| A26 | VCC | B26 | PCICLK0 | C26 | GND | D26 | PCICLK1 |
| A27 | PCICLK2 | B27 | VCC | C27 | PCICLK3 | D27 | GND |
| A28 | GND | B28 | PIRQ-D | C28 | VCC | D28 | PCIRST- |
| A29 | +12V | B29 | PIRQ-A | C29 | PIRQ-B | D29 | PIRQ-C |
| A30 | -12V | B30 | NC | C30 | NC | D30 | KEY1 |



CHAPTER 3.

AWARD BIOS SETUP

Award's ROM BIOS provides a built-in Setup program that allows user to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that these data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stay unchanged unless there is configuration change in the system, such as hard drive replacement or new equipment is installed.

3.1 RUNNING AWARD BIOS

The Setup Utility is stored in the BIOS ROM. When the power of the computer system is turned on, a screen message appears to give you an opportunity to call up the Setup Utility; while the BIOS will enter the Power On Self Test (POST) routines. The POST routines perform various diagnostic checks while initializing the board hardware. If the routines encounter an error during the tests, the error will be reported in either of the two different ways, hear a series of short beeps or see an error message on the screen display. There are two kinds of error: fatal or non-fatal. The system can usually continue to boot up sequence with the non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

“ Press <F1> to RESUME ”

Write down the message and press the F1 key to continue the bootup sequence. After the POST routines are completed, the following message appears:

“ Press DEL to enter SETUP ”


Entering Setup

Turn on the power of the computer system and press immediately. If you don't have the chance to respond, reset the system by simultaneously typing the <Ctrl>, <Alt> and <Delete> keys, or by pushing the ' Reset ' button on the system cabinet. You can also restart by turning the system OFF then ON.

3.2 CMOS SETUP UTILITY

To access the AWARD BIOS SETUP program, press the key. The screen display will appear as :

Main Program Screen

| | |
|---|--|
| ROM PCI / ISA BIOS (2A69KL7G) CMOS SETUP UTILITY AWARD SOFTWARE, INC. | |
| STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP / PCI CONFIGURATION LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS | INTEGRATED PERIPHERALS SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING |
| ESC : Quit |  : Select Item |
| F10 : Save & Exit Setup | (Shift) F2 : Change Color |
| Time, Date, Hard Disk Type.... | |

This screen provides access to the utility's various functions.

Listed below are explanation of the keys displayed at the bottom of the screen:

<ESC> : Exit the utility.

<  > : Use arrow keys  to move cursor to your desired selection.

<F10> : Saves all changes made to Setup and exits program.

<Shift> <F2> : Changes background and foreground colors.

3.3 STANDARD CMOS SETUP

When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appear as :

Standard CMOS Setup Screen

| | | | | | | | | | |
|---|------------------|------|---------------------------|------|-----------------|--------------------------|----------|------|--|
| ROM PCI / ISA BIOS(2A69KL7G) STANDARD CMOS SETUP AWARD SOFTWARE, INC. | | | | | | | | | |
| Date (mm : dd : yy) : Tue, Jul 27 1999 | | | | | | | | | |
| Time (hh : mm : ss) : 16 : 29 : 11 | | | | | | | | | |
| HARD DISKS | TYPE | SIZE | CYLS | HEAD | PRECOMP | LANDZ | SECTOR | MODE | |
| Primary Master | : Auto | 0 | 0 | 0 | 0 | 0 | 0 | AUTO | |
| Primary Slave | : Auto | 0 | 0 | 0 | 0 | 0 | 0 | AUTO | |
| Secondary Master | : Auto | 0 | 0 | 0 | 0 | 0 | 0 | AUTO | |
| Secondary Slave | : Auto | 0 | 0 | 0 | 0 | 0 | 0 | AUTO | |
| Drive A | : 1.44M, 3.5 in. | | | | | | | | |
| Drive B | : None | | | | | | | | |
| Video | : EGA/VGA | | | | | | | | |
| Halt On | : All Errors | | | | | | | | |
| | | | | | Base Memory | | : 640K | | |
| | | | | | Extended Memory | | : 64512K | | |
| | | | | | Other Memory | | : 384K | | |
| | | | | | Total Memory | | : 65536K | | |
| ESC : Quit | | | : Select Item | | | PU / PD / + / - : Modify | | | |
| F1 : Help | | | (Shift) F2 : Change Color | | | | | | |

The Standard CMOS Setup utility is used to configure the following components such as date, time, hard disk drive, floppy drive, display and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

Set Date : Month, Date, Year.

Set Time : Hour, Minute and Second. Use 24-hour clock format (for p.m. time, add 12 to the hour number, you would enter 4:30 p.m. as 16:30). When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appear as:

Hard Disks : There are four hard disks listed: "Primary Master", "Primary Slave", "Secondary Master" and "Secondary Slave". For each IDE channel, the first device is

the "Master" and the second device is "Slave". Hard disk types from 1 to 45 are the standard ones. To select or change the configuration, move the cursor to the desired position and press <Page Up> or <Page Down> to change the option : (1) Press "Auto" for IDE HDD auto detection, (2) Press "User" for user definable, and Press "None" for not installed (e.g. SCSI). There are six categories of information that you must enter for a HDD: "CYLS." for (number of cylinders), "HEADS" for (number of heads), "PRECOMP" for (write pre-compensation), "LANDZ" for (landing zone), "SECTOR" for (number of sectors) and "MODE" for (Normal, LBA, LARGE and AUTO). The hard disk vendor's or system manufacturer's documentation should provide you with the drive specifications. For an IDE hard drive, you can set "TYPE" to "Auto" or use the "IDE HDD AUTO DETECTION" utility in the main program screen to enter the drive specifications.

Here is a brief explanation of drive specifications:

- ✦ Type : The BIOS contains a table of pre-defined drive types. Each defined drive type has specified number of cylinders, number of heads, write compensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.
- ✦ Size : Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a diskchecking program.
- ✦ Cyls : Number of cylinders.
- ✦ Head : Number of heads.
- ✦ Precomp : Write precompensation cylinder
- ✦ Landz : Landing zone.
- ✦ Sector : Number of sectors.
- ✦ Mode : Auto, Normal, Large, or LBA.
 - Auto: The BIOS automatically determines the optimal mode.
 - Normal: Maximum number of cylinders, heads, and sectors supported are 1024, 16, and 63.
 - Large: For drives that do not support LBA and have more than 1024 cylinders.
 - LBA (Logical Block Addressing): During drive accesses, the IDE controller transforms that data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater 1024 cylinders.

The AWARD BIOS supports three HDD modes: NORMAL, LBA and LARGE.

NORMAL mode : This is a Generic Access mode in which neither the BIOS nor the IDE controller will make any transformation during the accession. The maximum HDD size is supported by the NORMAL mode that is 528 Megabytes.

LBA mode : This is a Logical Block Addressing mode which is a HDD accessing method to overcome the 528 Megabytes restriction. The number of cylinders, heads and sectors that are shown in setup may not be the physical number contained in the HDD.

During the HDD accessing, the IDE controller will transform the logical address that is described by the cylinder, head and sector numbers into its own physical address as contained inside the HDD. The maximum HDD size that is supported by the LBA mode is 8.4 Gigabytes.

LARGE mode : Some IDE HDD contains more than 1024 cylinders without the LBA support. This access mode tricks DOS (or other OS) with the number of cylinders that is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT13H in order to access to the right HDD address. The maximum HDD size that is supported by the LARGE mode is 1 Gigabytes.

- Note :
1. To support LBA or LARGE mode, there are softwares located in the AWARD HD Service Routine“INT13H”. It may fail to access a HDD with LBA or LARGE modes selected if you are running under an Operating System that replaces the whole INT13H service routine.
 2. Entering incorrect drive specifications will result in a hard disk drive that will function improperly or no function at all.

Drive A and Drive B : Select the correct specifications for the diskette drive(s) installed in the computer.

| | |
|---------------|--|
| None | No diskette drive installed |
| 360K, 5.25 in | 5-1/4 inch PC-type standard drive; 360 kilobyte capacity |
| 1.2M, 5.25 in | 5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity |
| 720K, 3.5in | 3 1-2 inch double-sided drive; 720 kilobyte capacity |
| 1.44M, 3.5 in | 3 1-2 inch double-sided drive; 1.44 megabyte capacity |
| 2.88M, 3.5 in | 3 1-2 inch double-sided drive; 2.88 megabyte capacity |

- Note :
1. Not Installed could be used as an option for diskless workstations..
 2. Highlight the listing after each drive name and select the appropriate entry.

Video : Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

| | |
|---------|--|
| EGA/VGA | Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters. |
| CGA 40 | Color Graphics Adapter, power up in 40 column mode |
| CGA 80 | Color Graphics Adapter, power up in 80 column mode |
| MONO | Monochrome adapter, includes high resolution monochrome adapters |





Halt On : During the power-on-self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors POST and continue the boot-up process. These are the selections:

| | |
|-------------------|---|
| No errors | Whenever the BIOS detects a non-fatal error the system will not be stopped and you will be prompted |
| All errors | The system boot will be stopped for any error that may be detected. |
| All, But Keyboard | The system boot will not stop for a keyboard error ; it will stop for all Other errors. |
| All, But Diskette | The system boot will not stop for a disk error ; it will stop for all other Errors. |
| All, But Disk/Key | The system boot will not stop for a keyboard or disk error ; it will stop for all other errors. |

3.4 BIOS Features Setup

When you select the “BIOS FEATURES SETUP” on the main program, the screen display will appears as:

BIOS Features Setup Screen

| ROM PCI / ISA BIOS (2A69KL7G) | |
|-------------------------------|--|
| BIOS FEATURES SETUP | |
| AWARD SOFTWARE, INC | |
| Virus Warning | : Disabled |
| CPU Internal Cache | : Enabled |
| External Cache | : Enabled |
| CPU L2 Cache ECC Checking | : Disabled |
| Quick Power On Self Test | : Enabled |
| Boot Sequence | : A,C,SCSI |
| Swap Floppy Drive | : Disabled |
| Boot Up Floppy Seek | : Enabled |
| Boot Up NumLock Status | : On |
| Gate A20 Option | : Fast |
| Typematic Rate Setting | : Disabled |
| Typematic Rate (Chars Sec.) | : 6 |
| Typematic Delay (M/Sec) | : 250 |
| Security Option | : Setup |
| PS/2 mouse function control | : Enabled |
| PCI/VGA Palette Snoop | : Disabled |
| Assign IRQ For VGA | : Disabled |
| OS Select For DRAM | : Non-OS/2 |
| >64MB | |
| Report No FDD For WIN 95 | : Yes |
| Video BIOS Shadow | : Enabled |
| C8000 -CBFFF Shadow | : Enabled |
| CC000 -CFFFF Shadow | : Disabled |
| D0000 -D3FFF Shadow | : Disabled |
| D4000 -D7FFF Shadow | : Disabled |
| D8000 -DBFFF Shadow | : Disabled |
| DC000 -DFFFF Shadow | : Disabled |
| ESC | : Quit     : Select Item |
| F1 | : Help PU /PD +/- : Modify |
| F5 | : Old Values (Shift) F2 : Color |
| F6 | : Load BIOS Defaults |
| F7 | : Load Setup Defaults |

The following explains the options for each of the features as listed in the above menu:

Virus Warning : The default setting of the Virus Warning is “Disabled”. When it is enabled, any attempt to write the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility

on a virus free, bootable floppy diskette to reboot, to clean and to investigate your system.

CPU Internal Cache : The default setting is "Enabled". This setting enables the CPU internal cache .

External Cache : The default setting is "Enabled". This setting enables the external cache.

CPU L2 Cache ECC Checking : When you select Enabled, memory checking is enable when the external cache contains ECC.

Quick Power On Self Test : The default setting is "Enabled". This speeds up the Power On Self Test (POST) by skipping some items that are normally checked during the full POST. If your system is functioning normally, you can choose this feature to speed the booting process.

Boot Sequence : The default setting is "C:,A:"; the other options are "CDROM, C, A" and "A, C" and "C, CDROM, A". This setting determines where the computer looks first for an operating system, the hard disk, or the floppy disk, ...or other. The BIOS will load the operating system from the disk drives in the sequence as selected here.

Swap Floppy Drive : The default setting is "Disabled". This setting gives you an option to swap A and B floppy disks. Normally, the floppy drive A is the one at the end of the cable and drive B is at the other end. If you set this option to "Enabled", the Drive A will function as Drive B, and vice-versa under the DOS.

Boot Up Floppy Seek : The defaults setting is "Disabled". When enabled, the BIOS will check whether there is a floppy disk drive installed.

Boot Up Numlock Status : The default setting is "On". If set "Off", the cursor controls will function on the numeric keypad.

Gate A20 Option : The default setting is "Fast". This is the optimal setting for the CPU card. The other option is "Normal".

Typematic Rate Setting : The default setting is "Disabled". If enabled, you can set the typematic rate and typematic delay.

Typematic Rate (Chars/Sec) : This setting controls the speed at which the system registers the repeated keystrokes. The choices range from 6 to 30 Chars/Sec. The default setting is “6” Chars/Sec.

Typematic Delay (Msec) : This setting controls the time between the display of the first and second characters. There are four delay choices: 250ms, 500ms, 750ms and 1000ms. The default setting is “250” ms.

Security Option : This setting controls the password in the main screen. The options are “Setup” and “System”. Select “Setup” and it will protect the Setup Utility settings from being tampered with. Select “System” if you want to use password feature every time the system boots up. The default setting is “Setup”. You can create your password by using the “SUPERVISOR/USER PASSWORD” utility on the main program screen.

PS/2 Mouse Function Control : If your system has a PS/2 mouse port and install a serial pointing device, select Disabled.

PCI/VGA Palette Snoop : The default setting is “Disabled”. Set to “Enable” if any ISA adapter card installed requires VGA palette snooping.

Assign IRQ for VGA : Select Enabled only if your VGA card requires an assigned IRQ. Most ordinary cards do not; some high-end cards with video capture function do. Consult the information that comes with your VGA card to determine whether it needs an assigned IRQ.

OS Select For DRAM > 64MB : The default setting is “Non-OS2”. Set to “OS2” if the system memory size is greater than 64MB and the operating system is OS/2.

Video BIOS Shadow : The default setting is “Enabled” which will copy the VGA display card BIOS into system DRAM to improve performance.

C8000-CBFFF Shadow to DC000-DFFFF Shadow : The default setting for the shadow feature is “Disabled”. When enabled, the ROM with the specific address is copied into system DRAM. It will also reduce the size of memory available to the system. After you have made your selection in the BIOS FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.5 CHIPSET FEATURES SETUP

When you select the “CHIPSET FEATURES SETUP” on the main program, the screen display will appears as:

Chipset Features Setup Screen

| ROM PCI / ISA BIOS (2A59IL7G) CHIPSET FEATURES SETUP AWARD SOFTWARE, INC. | | | |
|---|------------|--------------------------|----------------------|
| AUTO Configuration | : Enabled | Auto Detect DIMM/PCI Clk | Enabled |
| EDO DRAM Speed Selection | : 60 ns | Spread Spectrum | Disabled |
| EDO CASx# MA Wait State | : 2 | CPU Host Clock (CPU/PCI) | Default |
| EDO RASx# Wait State | : 2 | CPU Warning Temperature | : Disabled |
| SDRAM RAS-to-CAS Delay | : 3 | Current System Temp. | : 32 C/ 89 F |
| SDRAM RAS Precharge Time | : 3 | Current CPU1 Temp | : 32 C/ 89 F |
| SDRAM CAS latency Time | : Auto | Current CPUFAN1 Speed | : 0 RPM |
| SDRAM Precharge Control | : Disabled | Current CPUFAN2 Speed | : 0 RPM |
| DRAM Data Integrity Mode | : Non-ECC | Vcore : 2.01 V +3.3 V | : 3.31V |
| System BIOS Cacheable | : Disabled | + 5 V : 4.94 V +12 V | : 12.09 V |
| Video BIOS Cacheable | : Disabled | | |
| Video RAM Cacheable | : Disabled | | |
| 8 Bit I /O Recovery Time | : 1 | | |
| 16 Bit I /O Recovery Time | : 1 | | |
| Memory Hole At 15M-16M | : Disabled | | |
| Passive Release | : Enabled | ESC : Quit | : Select Item |
| Delayed Transaction | : Disable | F1 : Help | PU /PD /+/- : Modify |
| AGP Aperture Size (MB) | : 64 | F5 : Old Values (Shift) | F2 : Color |
| | | F6 : Load BIOS Defaults | |
| | | F7 : Load Setup Defaults | |

Auto Configuration : The default setting is “Enabled” which will optimize DRAM timing automatically depending on whether the DRAM used is either 70ns or 60ns. The other option is “Disabled” which allows you to change DRAM timing manually.

EDO DRAM Speed Selection : The value in this field must correspond to the speed of the EDO DRAM installed in you system.DO not change the default setting of this field, as determined by the system board manufacturer for the installed DRAM. This vaule is access speed,so a lower value means a fast system.

EDO CAS# MA Wait State : The board designer may select to insert one additional wait state before the assertion of the first CAS# for page hit cycles, thus allowing one additional clock of MA setup time to the CASx# for the leadoff page hit cycle. Do not change from the manufacturer' s default unless you are getting memory addressing errors.

EDO RAS# Wait State : The board designer may elect to insert one additional wait state before RAS# is asserted for row misses, thus allowing one additional MAX{13;} setup time to RAS# assertion. This field applies only if EDO DRAM is installed the system.

SDRAM RAS-to-CAS Delay : This field lets you control the number of DCLKs between a Row Activate command and a read or write command.

SDRAM RAS Precharge Time : The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowd, refresh may be incomplete and the DRAM may fail to retain data. This field applies only if synchronous DRAM is installed in the system.

SDRAM CAS Latency Time : When synchronous DRAM is installed, you can control the number of CLKs between when the SDRAMs sample a read command and when the controller samples read data from the SDRAMs. Do not reset this field from the default value specified by the system designer.

SDRAM Precharge Control : When Enabled, all CPU cycles to SDRAM result in an All Banks Precharge Command on the SDRAM interface.

DRAM Date Integrity Mode : Select Non-ECC or ECC (error-correcting code), according to the type of installed DRAM.

System BIOS Cacheable : Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable : Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable : Selecting Enabled allows caching of the video memory (RAM) at A0000h to AFFFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result.

8/16 Bit I/O Recovery Time : The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole At 15M-16M : You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Passive Release : When Enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

Delayed Transaction : The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enable to support compliance with PCI specification version 2.1.

Auto Detect DIMM/PCI Clk : The default setting is "Enabled". To reduce the occurrence of electromagnetic interference (EMI), the BIOS detects the presence or absence of components of DIMM and PCI slots and turns off system clock generator pulses to empty slots.

Spread Spectrum : When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device

CPU Warning Temperature : Select the combination of lower and upper limits for the CPU temperature. If your computer contains an environmental monitoring system. If the CPU temperature extends beyond either limit, any warning mechanism programmed into your system will be activated.

Current CPU1 Temperature : This field displays the current CPU temperature, if your computer contains an environmental monitoring system.

Current CPUFAN1/CPUFAN2 Speed : This field displays the current speed of the SYS FAN1/CPUFAN2, if your computer contains a monitoring system.

Vcore : This field display the current voltage of input line, if your computer contains a monitoring system





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After you have made your selections in the CHIPSET FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.6 POWER MANAGEMENT SETUP

The “Power Management Setup” controls the CPU card’s “Green” features. When you select the “POWER MANAGEMENT SETUP” on the main program, the screen display will appear as:

Power Management Setup Screen

| | | |
|---|---|---|
| ROM PCI / ISA BIOS (2A69KL7G) POWER MANAGEMENT SETUP AWARD SOFTWARE, INC. | | |
| Power Management : User Define PM Control by APM : Yes Video Off Method : V /H SYNC+ Blank Video Off After : Standby MODEM Use IRQ : 3 Doze Mode : Disabled Standby Mode : Disabled HDD Power Down : Disabled Throttle Duty Cycle : 62.5% PCI / VGA Act-monitor : Disabled PowerOn by Ring : Disabled IRQ 8 Break Suspend : Disabled | ** Reload Global Timer Events ** IRQ [3 - 7, 9 - 15], NMI : Enabled Primary IDE 0 : Disabled Primary IDE 1 : Disabled Secondary IDE 0 : Disable Secondary IDE 1 : Disable Floppy Disk : Disabled Serial Port : Enabled Parallel Port : Disabled | |
| | | ESC : Quit     : Select Item F1 : Help PU /PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults |

Power Management : This option allows you to select the type (or degree) of power saving for Doze, Standby and Suspend modes.

Max Saving : Maximum power savings. **Only Available for SL CPUs.** Inactivity period is 1 minute in each mode.

User Define : Set each mode individually. Select time-out periods in the section for each mode.

Min Saving : Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

PM Control by APM : If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Method : Determines the manner in which the monitor is blanked.

V/H SYNC+Blank : System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

DPMS Support : Select this option if your monitor supports the Display Power

Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.

Video Off After : As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank.

MODEM Use IRQ : Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Doze Mode : After the selected period of system inactivity, the CPU clock throttles to small percentage of its duty cycle between 10 percent and 25 percent for most chipsets. All other devices still operate at full speed.

Standby Mode : After the selected period of system inactivity, the CPU clock stops, the hard drive enters an idle state, and the L2 cache enters a power-save mode. All other devices still operate at full speed.

Suspend Mode : After the selected period of system inactivity, the chipset enters a hardware suspend mode, stopping the CPU clock and possibly causing other system devices to enter power management modes.

HDD Power Down : After the selected period of drive inactivity, any system IDE devices compatible with the ATA-2 specification or later power manage themselves, putting themselves into an idle state after the specified timeout and then waking themselves up when accessed.

Throttle Duty Cycle : When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

PCI/VGA Act-Monitor : When Enabled, any video activity restarts the global timer for Standby mode.

PowerOn by Ring : When Enabled, an input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

IRQ 8 Break Suspend : You can select Enabled or Disabled for monitoring of IRQ8 (the Real Time Clock) so it does not awaken the system from Suspend mode.

Reload Global Timer Events : When Enabled, an event occurring on each device listed below restarts the global time for Standby mode.

IRQ [3-7, 9-15], NMI

Primary IDE 0

Primary IDE 1

Secondary IDE 0

Secondary IDE 1

Floppy Disk

Serial Port

Parallel Port





After you have made your selection in the POWER MANAGEMENT SETUP, press the <ESC> key to go back to the main program screen.

3.7 PnP/PCI CONFIGURATION

Both the ISA and PCI buses on the CPU card use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly through the PnP/PCI Configuration Setup utility, otherwise the SBC will not work properly.

When you select the “PnP /PCI CONFIGURATION” on the main program, the screen display will appears as:

PnP/PCI Configuration Setup Screen

| | |
|--|---|
| ROM PCI / ISA BIOS (2A69KL7G) PNP/PCI CONFIGURATION AWARD SOFTWARE, INC. | |
| PNP OS Installed : No Resources Controlled By : Manual Reset Configuration Data : Disabled | Used MEM base addr : N/A Assign IRQ For USB : Enabled |
| IRQ-3 assigned to : Legacy ISA IRQ-4 assigned to : Legacy ISA IRQ-5 assigned to : PCI/ISA PnP IRQ-7 assigned to : Legacy PnP IRQ-9 assigned to : PCI/ISA PnP IRQ-10 assigned to : PCI/ISA ISA IRQ-11 assigned to : PCI/ISA ISA IRQ-12 assigned to : PCI/ISA PnP IRQ-14 assigned to : PCI/ISA PnP IRQ-15 assigned to : PCI/ISA PnP DMA-0 assigned to : PCI/ISA PnP DMA-1 assigned to : PCI/ISA PnP DMA-3 assigned to : PCI/ISA PnP DMA-5 assigned to : PCI/ISA PnP DMA-6 assigned to : PCI/ISA PnP DMA-7 assigned to : PCI/ISA PnP | ESC : Quit     : Select Item F1 : Help PU /PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults |

PNP OS Installed : Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

Resources Controlled By : The Plug and Play AwardBIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

Reset Configuration Data : Normally, you leave this field Disabled . Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

IRQ n Assigned to : When resources are controlled manual, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).

PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

DMA n Assigned to : When resources are controlled manual, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.

PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

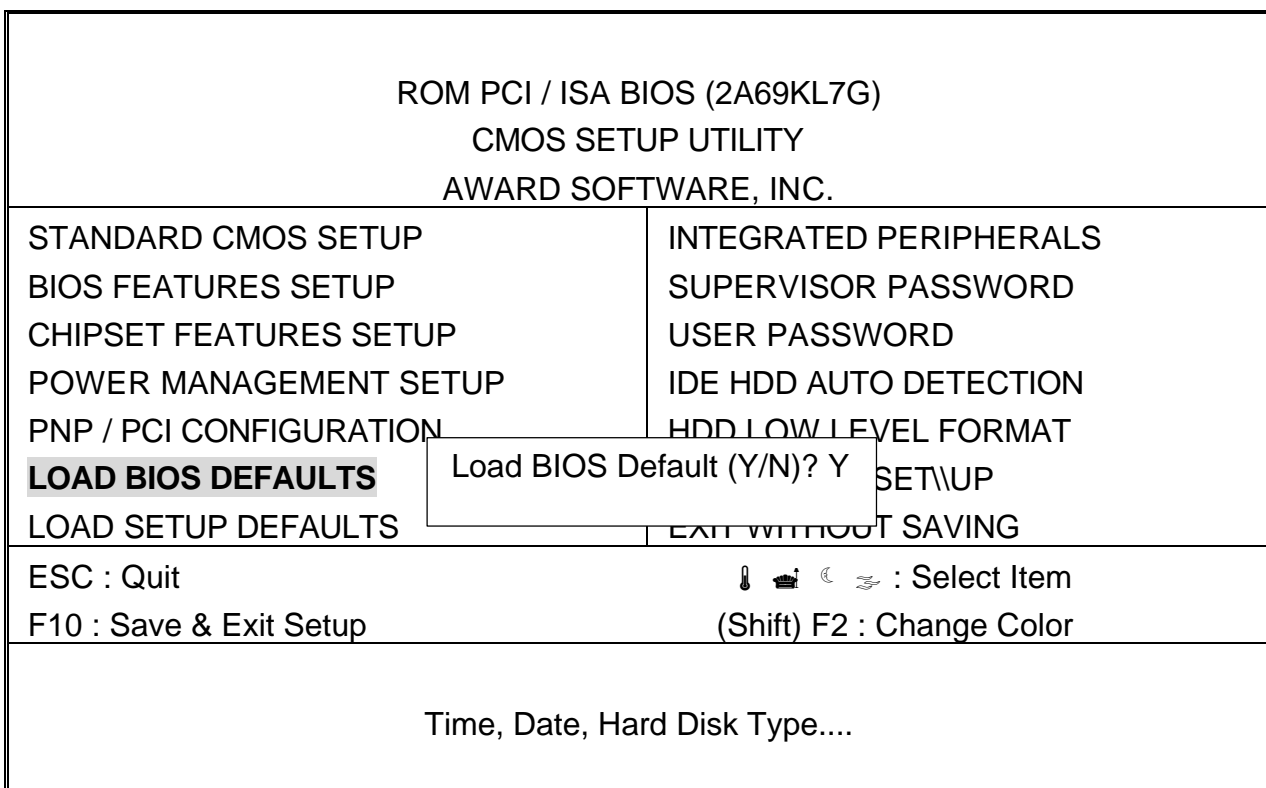
Used MEM base addr : Select a base address for the memory area used by any peripheral that requires high memory.

Assign IRQ For USB : Select Enabled if your system has a USB controller and you have one or more USB devices connected. If you are not using your system USB controller, select Disabled to free the IRQ.

3.8 LOAD BIOS DEFAULTS

The BIOS defaults have been set by the manufacturer which represent settings provided with the minimum requirements for your system to operate. “ **Load BIOS Defaults** ” loads the troubleshooting default values permanently recorded in the BIOS ROM. These settings are non-optimal and turn off all high performance features.

The Standard CMOS Setup screen is not affected. To use this feature, highlight it on the main screen and press <Enter>. A line will appear asking if you want to load the BIOS default values. Press the <Y> key and the <Enter>. The default settings will load. Press <N> if you do not want to proceed.



3.9 LOAD SETUP DEFAULTS

“LOAD SETUP DEFAULTS” loads the optimal settings which are stored in BIOS ROM. The defaults loaded affect only the BIOS Features Setup, Chipset Features Setup, Power Management Setup, PnP/PCI configuration setup and Integrated Peripherals Setup. There is no effect on the Standard CMOS Setup. To use this feature, highlight the entry on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Setup default values. Press the <Y> key and then press the <Enter> key if you want to load the Setup defaults. Press <N> if you do not want to proceed.

3.10 INTEGRATED PERIPHERALS

When you select the “INTEGRATED PERIPHERALS” on the main program, the screen display will appears as:

Integrated Peripheral Setup Screen

| ROM PCI / ISA BIOS (2A69KL7G) | | | |
|-------------------------------|--------------|---------------------------|---------------------|
| INTEGRATED PERIPHERALS | | | |
| AWARD SOFTWARE, INC. | | | |
| IDE HDD Block Mode | : Enabled | Onboard Parallel Port | : 378/IRQ7 |
| IDE Primary Master PIO | : Auto | Parallel Port Mode | : SPP |
| IDE Primary Slave PIO | : Auto | | |
| IDE Primary Master PIO | : Auto | | |
| IDE Primary Slave PIO | : Auto | Onboard Serial Port 3 | : 3E8H |
| IDE Secondary Master UDMA | : Auto | Serial Port 3 Use IRQ | : IRQ10 |
| IDE Secondary Slave UDMA | : Auto | Onboard Serial Port 4 | : 2E8H |
| IDE Secondary Master UDMA | : Auto | Serial Port 4 Use IRQ | : IRQ11 |
| IDE Secondary Slave UDMA | : Auto | Onboard Parallel Port 2 | : 278H |
| On-Chip Primary PCI IDE | : Enabled | Parallel Port 2 Use IRQ | : IRQ9 |
| On-Chip Secondary PCI IDE | : Enabled | Parallel Port 2 Mode | : EPP+SPP |
| USB Keyboard Support | : Disabled | | |
| KBC input clock | : 8 MHz | | |
| Onboard FDC Controller | : Enabled | ESC : Quit | : Select Item |
| Onboard Serial Port 1 | : 3F8 / IRQ4 | F1 : Help | PU /PD/+/- : Modify |
| Onboard Serial Port 2 | : 2F8 / IRQ3 | F5 : Old Values (Shift) | F2 : Color |
| UART Mode Select | : Normal | F6 : Load BIOS Defaults | |
| | | F7 : Load Setup Defaults | |

IDE HDD Block Mode : Select Enabled only If your hard drive supports block mode.

IDE (Primary/Secondary Master/Slave) PIO : There are four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE (Primary/Secondary Master/Slave) UDMA : UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

On-Chip (Primary/Secondary) PCI IDE : The Intel 82C440BX chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary and/or secondary IDE interface. Select Disabled to deactivate this interface, if you install a primary and/or secondary add-in IDE interface.

USB Keyboard Support : Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

Init Display First : Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display.

KBC input clock : The system designer must select the correct frequency for the keyboard controller input clock. Do not change this value from default value.

Onboard FDC Controller : Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

Onboard Serial Port 1 / 2: Select a logical COM port address for the first and second serial ports.

UART Mode Select : The UART serial port on your system may offer a variety of infrared port modes. Click here for a description of various modes. (Click your browser's Back button, or your right mouse button, to return to this page).

Onboard Parallel Port : Select a logical LPT port name and matching address for the physical parallel (printer) port.

Parallel Port Mode: Select an operating mode for the onboard parallel (printer) port. Select Normal, unless your hardware and software require one of the other modes offered in this field.

For information about parallel port modes, see <http://www.fapo.com/1284.htm>

3.11 SUPERVISOR/USER PASSWORD

The “SUPERVISOR/USER PASSWORD” utility sets the password. The SBC is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt -- enter your new password. The password is case sensitive, and can be up to 8 alphanumeric characters. Press <Enter> after you have finished typing in the password. At the next prompt, confirm the new password by re-typing it and pressing <Enter> again. When you are done, the screen automatically reverts to the main screen. Remember that when you use this feature, the “Security Option” line in BIOS FEATURES SETUP will determine when entering the password will be required.

To disable the password, press the <Enter> key instead of entering a new password when the “Enter Password” in the dialog box appears. A message will appear confirming that the password is disabled.

If you have set both supervisor and user password, only the supervisor password allows you to enter the BIOS SETUP PROGRAM.

Note : If you forget your password, the only way to solve this problem is to discharge the CMOS memory by turning power off and placing a shunt on the S1 (open pad) for 5 seconds, then removing the shunt.

3.12 IDE HDD Auto Detection

If your system has an IDE hard drive, you can use this utility to detect its parameters and enter them into the Standard CMOS Setup automatically.

If the auto-detected parameters displayed do not match the ones that should be used for your hard drive, do not accept them. Press the <N> key to reject the values and enter the correct ones manually on the Standard CMOS Setup screen.

Note :If you are setting up a new hard disk drive (nothing on it) that supports LBA mode, more than one line will appear in the parameter box, choose the line that lists LBA for an LBA drive.

Do not choose Large or Normal if the hard disk drive is already fully formatted when you install it, choose the mode "HDD Low Level Format" to format it.

3.13 HDD LOW LEVEL FORMAT

Select and highlight this option press the <Enter> key to enable you to perform the low level format of hard disk drive.

3.14 SAVE & EXIT SETUP

Select this option and press the <Enter> key to save the new setting information in the CMOS memory and continue with the booting process.

3.15 EXIT WITHOUT SAVING

Select this option and press the <Enter > key to exit the Setup Utility without recording any new values or changing old ones.

CHAPTER 4.

DRIVERS SUPPORT

4.1 DRIVERS OF CD-ROM LIST

The Table list below shows the drivers supported for EM-370/B.

| Diskette Name | Driver Directory Name |
|----------------------|--|
| 69kdrv | Win31,Win95,Win98 Nt40,JOS2 |
| h-monitor | Win95_98 |
| ess1938 | Win 95 Win 98 Nt40 |
| 8139 | Win 31/95/98/2000,Linux, Nt3.51/4.0 |

APPENDIX A

HOW TO USE WATCH-DOG TIMER

You can enable the watch-dog when your application software monitors an unexpected or not respond, then the timer generates a reset to reboot your system. During the period of enable to reset, you could still cancel reset by disable the watch-dog. Decision the way you want to set the period for reset by select hardware or software watch-dog (if both of them are available). For hardware setting period, select period by jumper. For software setting period, normally setting hardware watch-dog timer period to 16 sec.

Hardware watch-dog using example

EX.1: For DOS

Execute the **DEBUG.EXE** under DOS, Then key-in **i443**. The system will reboot automatically according to the time-out you set.

Enable

```
C:\DOS> DEBUG
-i443
```

Disable

```
C:\DOS>DEBUG
-i43
```

EX.2: For assemble Language

Enable :

```
MOV DX, 443H
IN AL, DX
```

Disable :

```
IN AL, 43H
```

Software watch-dog using example

EX.1: For DOS

Enable

```
C:\DOS> DEBUG
-o443F
```

Disable

```
C:\DOS>DEBUG
-o441F
```

EX.2: For assemble Language

Enable :

```
MOVDX, 443H
MOVAL, 0FH
OUT DX, AL
```

Disable :

```
MOV DX, 441H
MOV AL, 0FH
OUT DX, AL
```

Note : "F" is the period of software watch-dog timer (normally "F" indicated 0 sec.). 0 to 9 and A to F are used for represent different period. Normally, the step is 2 sec. That means "E" is 2, "D" is 4, "2" is 26, "1" is 28 and "0" is 30 seconds.

APPENDIX B

TECHNICAL REFERENCE

I/O PORT ADDRESS MAP

| Address | Function |
|----------------|--|
| 000 - 01F | DMA Controller #1 |
| 020 - 03F | Interrupt Controller #1 |
| 040 - 05F | Timer Chip |
| 043 | Disable Watch-Dog Times Operation (Read) |
| 060 - 06F | Keyboard Controller |
| 070 - 07F | Read Time Clock/NMI Mask |
| 080 - 09F | DMA Page Register |
| 0A0 - 0BF | Interrupt Controller #2 |
| 0C0 - 0DF | DMA Controller #2 |
| 0F0 - 0F1 | Clear/Reset Math Coprocessor |
| 1F0 - 1F7 | Hard Disk Controller |
| 200 - 210 | Game Port |
| 278 - 27F | Parallel Port #2 |
| 2E8 - 2EF | Serial Port #4 (COM 4) |
| 2F8 - 2FF | Serial Port #2 (COM 2) |
| 300 - 31F | prototype Card/Streaming Tape Adapter |
| 360 - 36F | PC Network |
| 378 - 3FF | Parallel Port #1 |
| 380 - 38F | SDLC #2 |
| 3A0 - 3AF | SDLC #1 |
| 3B0 - 3BF | MDA Video Card (Including LPT0) |
| 3C0 - 3CF | EGA Card |
| 3D0 - 3DF | CGA Card |
| 3E8 - 3EF | Serial Port #3 (COM 3) |
| 3F0 - 3F7 | Floppy Disk Controller |
| 3F8 - 3FF | Serial Port #1 (COM 1) |
| 443 | Enable Watch-dog Timer Operation (read) |

MEMORY ADDRESS MAP

| Address Range (Hex) | Description |
|----------------------|-----------------------------|
| 000000H - 09FFFFH | 640 KB of Conventional RAM |
| 0A0000H - 0BFFFFH | 128 KB of Video RAM |
| 0C0000H - 0EFFFFH | 256 KB of I/O Expansion ROM |
| 0F0000H - 0FFFFFFH | 64 KB of System BIOS ROM |
| 0100000H - 7FFFFFFFH | 1 MB ~ 128MB of User RAM |

DMA CHANNELS

| CHANNEL | Function |
|---------|------------------------|
| DMA 0 | Reserved |
| DMA 1 | Reserved |
| DMA 2 | Floppy Disk Controller |
| DMA 3 | ECP Parallel Port |
| DMA 4 | Cascade for DMA #1 |
| DMA 5 | Reserved |
| DMA 6 | Reserved |
| DMA 7 | Reserved |

INTERRUPT CONTROLLER

| IRQ | Function |
|--------|--|
| IRQ 0 | System timer output |
| IRQ 1 | Keyboard |
| IRQ 2 | Cascade for INTC #2 |
| IRQ 3 | Serial port #2 |
| IRQ 4 | Serial port #1 |
| IRQ 5 | Parallel port #2 |
| IRQ 6 | Floppy disk controller |
| IRQ 7 | Parallel port #1 |
| IRQ 8 | Real time clock |
| IRQ 9 | Software redirected to INT 0AH (IRQ 2) |
| IRQ 10 | Reserved |
| IRQ 11 | Reserved |
| IRQ 12 | PS/2 Mouse |
| IRQ 13 | Math Coprocessor (CPU Internal) |
| IRQ 14 | Primary Hard disk |
| IRQ 15 | Secondary Hard Disk |
| NMI | Parity Check Error |

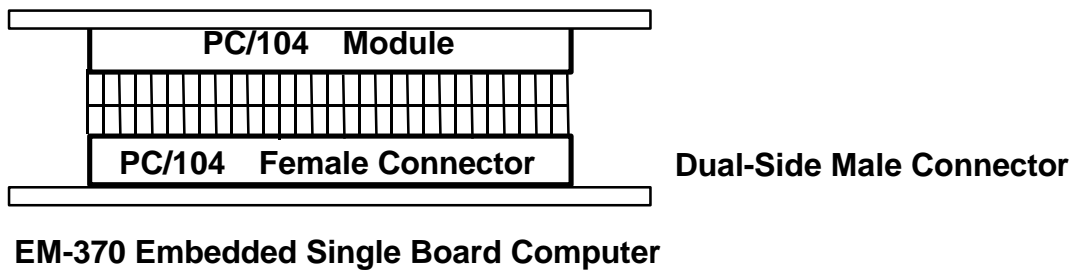
APPENDIX C

PC/104 MODULE INSTALLATION

There are two steps to install the PC/104 module on EM-370 Embedded Single Board Computer.

Step 1. Plug the Dual Side Male Connector into the PC/104 female connector.

Step 2. Plug the PC/104 module's female connector into the EM-370 male connector.



GLOSSARY

8-Bit Bus – Data is transmitted to expansion slots and other components on the bus only along 8 parallel data line.

10Base-T – It is a 10Mbps IEEE 802.3/Ethernet standard that uses unshielded twisted pair cable specification. 10Base-T supports network configuration using the CSMA/CD access method over a twisted pair transmission system up to 100 meters in length without the use of repeater.

16-Bit Bus or ISA Bus – Data is transmitted along either 8 or 16 data lines, depending on what kind of adapter card is used in an expansion slot. ISA is the abbreviation of Industry Standard Architecture.

100Base-TX – It is a 100Mbps IEEE 802.3/Ethernet standard that uses UTP cable. Also called Fast Ethernet, it uses RJ-45 connectors and EIA/TIA T568B pinning. Maximum cable length from hub to node is 100 meters without a repeater.

Adapter – It is also called an expansion board, expansion card, or adapter card. It is a small circuit board that is installed in the expansion slots on the motherboard. You can install a particular adapter that connects a new device such as internal modem, sound card, and scanner.

AGP (Accelerated Graphic Port) – is a 32-bit, 66MHz external frequency data bus that transmit a maximum of 528MB/s of data (4 times the speed of PCI transmission); this design improves the speed of large amount in video transaction.

BIOS (Basic Input /Output System) – This is a chip on the motherboard that contains the instructions for starting up, or booting, the computer, and more.

Bus – Data that travels in a computer along the circuits on the motherboard are called buses. Although three main buses (data bus, address bus, and control bus) manage the computer's operation, often these are collectively called the bus. The bus carries instructions back and forth between the CPU and other devices in the system. ISA, EISA, VL-Bus, PCI and SCSI are examples of PC buses.

bps – Bits per second. Also often preceded by K (kilo/thousands), **Kbps** – Kilo bytes per second, and M (mega/million), **Mbps** – Mega bytes per second.

Bus Mastering – A method of transferring data through a bus in which the device takes over the bus and directly controls the transfer of data to the computer's memory. Bus mastering is a method of Direct Memory Access (**DMA**) transfer.

Cache – Cache RAM is an extra holding area for program instructions that need to be frequently used by the CPU or swapped in and out of RAM. Your CPU can usually access those instructions from the cache more quickly than it could from a hard disk or even RAM, so a cache helps the system work more efficiently. Most systems sold today offer either 256K or 512K cache.

CPU (Central Processing Unit) – executes all commands and controls the flow of data, providing the “ brain ” that enables the PC to calculate and perform the operations like sorting information more quickly than a human could. The CPU makes perhaps the greatest contribution to a PC's speed and power. Note: Any additional information is subject to change without prior revision from the supplier.

Table 1 -- CPU Speeds

| Processor type | Speed ratings (MHz) |
|----------------|-----------------------------|
| 486DX2 | 66, 80 |
| 486DX4 | 75, 100, 120 |
| Pentium | 90, 100, 120, 133, 166, 200 |
| Pentium MMX | 166, 200, 233 |
| Pentium Pro | 166, 180, 200 |
| Pentium II | 233, 266, 300, 333 |

EIDE (Enhanced IDE) – It is a hard drive controller that enables your system to be able to handle fast hard disk drives at a speed of 10Mbps.

EISA or MCA Bus – Data is transmitted along 32 data lines to adapter cards designed specifically to work with the 32-bit buses. MCA expansion slots cannot accept 8-bit or 16-bit adapter cards. EISA stands for Extended Industry Standard Architecture, while MCA stands for MicroChannel Architecture. MCA is architecture used in IBM Microcomputer.

Expansion slots – Expansion slots are plug-in connectors that allow you to insert additional circuit boards that attach to the rest of the PC through special circuitry called the **bus**. By inserting the right circuit board -- usually called an **adapter** or an **expansion card** – you can increase the resolution and the number of colors used by the display, or you can transform your PC into a machine for recording and playing music.

Fast SCSI – The common nomenclature associated with SCSI-2, the second generation of SCSI offering mandatory parity checking improvements over SCSI-1.

IDE (Integrated Drive Electronics) – It was developed from ST-506 type hard drive interface, utilizes BIOS INT 13h hard drive secondary software and supports two hard drives (Master and Slave). Do not need extra software to drive since it is directly initiated in the BIOS. Data transfer rate is 4.1 Mbps. Take note that this interface cannot support other drive like CD-ROM drive.

IEEE (Institute of Electrical and Electronic Engineers) – It is an international professional society that issues its own standard, and is a member of ANSI and ISO. Popular known standards is:

- IEEE802.3** – is a physical layer standard for 10Base-T, 100Base-T, Ethernet, and StarLAN.
- IEEE802.5** – is a physical layer standard for Token Ring.
- IEEE802.11** – is a physical layer standard for Wireless LAN/WAN compatibility.
- IEEE802.12** – is a physical layer standard for 100VG AnyLAN.

LAN (Local Area Network) – A data communications network spanning a limited area. It provides communications between three or more computers and peripherals, in most cases using a high-speed media as it's backbone.

Keyboard – This is a component that comes in direct contact for you with your PC. The mechanism of keyboard converts a key cap's movement into a signal sent to the computer. The most common key mechanism are “ **capacitate** ” and “ **hard contact** ”. Capacitate keyboard has a spring that causes the plastic and the metal plunger to move nearer to two pads that have large plates (plated in tin, nickel, and copper). These pads are connected to the keyboard's printed circuit board. Hard contact keyboard causes the key cap to collapse a foam rubber dome that presses against a sheet of plastic on the bottom of which is metallic area connected to the rest of the keyboard's circuit board.

LDCM (LANDesk Client Manager) – With the help of LDCM, PCs that are either stand-alone or on a network can not escape the control of a system administrator. Alerts will be sent to the user if an abnormal condition is encountered in a PC. It allows the administrator to give each PC a thorough check-up. Additionally, this feature is available to multiple OS' s on the market today. LDCM Key Features include the following : ■ Health Monitoring , ■ Real-Time Alerting , ■ Remote Accessibility , ■ Extensive Instrumentation. This is a product from Intel.

Mouse – The keyboard is a barrier to learn how to use a computer. Xerox Corporation first developed the concept of a pointing device, something a computer user could move with his or her hand, causing a corresponding move on screen. Because of its size and tail like cable, the device was named for the mouse. Apple Computer made the mouse a standard feature of its Macintosh computers, and with the popularity of Windows, a mouse is becoming standard equipment on all PCs, as well. The “ **Trackball** ” have survived more awkward methods of navigating with the keyboard. “ **Digitizing tablets** ” are popular with architects and engineers who must translate precise movements of a pen into lines on the screen. “ Touch screens “ , on which you press either your finger and a special light pen to control the software, are too tiring to use for any length of time.

MMX – CPU' s with MMX technology are optimized to run multimedia application, and therefore, offer faster multimedia playback than standard CPUs. However, when manufacturers introduce any new hardware technology, the software makers need to catch up. At this time of compilation, most applications can' t yet take advantage of MMX capabilities.

Parallel port – Parallel ports (labeled **LPT1**, **LPT2**, and so on) are usually for plugging in printers. It is also often called a **Centronics port** – has been almost synonymous with **printer port**. Although a serial port can also be used to send data from a PC to some models of printers, the parallel port is faster. A serial port sends data one bit at a time over a single one-way wire; a parallel port can send several bits of data across eight parallel wires simultaneously. Take note that a serial connection sends a single bit, a parallel port send an entire byte. A parallel connection has one drawback.

PCI Bus (Peripheral Component Interconnect) – It is a connection slot in a motherboard that supports 32-bit bus transfer rates. The now standard PCI Local Bus carries data along at least 32 lines, that is, at least 32 bits at a time. Local bus computer designs add special buses so the CPU can communicate directly with key components like the monitor, resulting in much better performance. You should look for PCI local bus capabilities in any system you buy, especially PCI local bus video (which helps the monitor display more quickly).

POST (Power-On Self-Test) – is the first thing your PC does when you turn it on, and it's your first warning of trouble with any of the components. When the POST detects an error from the display, memory, keyboard, or other basic components, it produces an error warning in the form of a message on your display and—in case your display is part of the problem—in the form of a series of beeps.

RAM (Random Access Memory) – consists of a bank of chips that act as “ working memory ”, holding program instructions and data only while your computer's on. Unless the instructions and data are saved to a disk, RAM forgets them when you turn your computer off. RAM is measured in megabytes (M). Most computers today come with 32M of RAM, though some sell with only 16M installed. There are a few different flavors and speeds of RAM, as well. One of the most prominent today is Extended Data Output (EDO) RAM, but an even faster type of RAM that has just hit the market is called **SyncDRAM**.

Serial port – Serial ports are also sometimes called **COM** (short for COMmunications) ports, and are labeled **COM1**, **COM2**, and so on. It is simple in concept: one line to send data, another line to receive data, and a few other lines to regulate how data is sent over the other two lines – from commonplace modems and printers to plotters and burglar alarms. The most common use for serial port is with a **mouse** or **modem**. The reason for this is that a serial port is not a very efficient way to transfer data, so little data

that speed is not crucial, and perfect for modems because. With current technology, phone lines cannot transport more than one signal at a time anyway. The **serial port** is often referred to as an **RS-232 port**.

SCSI (Small Computer System Interface) – An intelligent bus for transmitting data commands between a variety of devices. There are many implementations of SCSI, including Fast SCSI, Wide SCSI, Fast Wide SCSI, Fast-20, and Fast-40.

SCSI-2 – The second generation of SCSI; includes many improvements to SCSI-1, including Fast SCSI, Wide SCSI, and mandatory parity checking.

SCSI-3 – The third generation of SCSI; introduces Fast-20 and Fast-40 as improvements to the parallel bus. The standard also includes a number of specifications for high-speed serial bus architectures such as SSA, Fiber Channel, and IEEE 1394. Also known as Ultra SCSI.

Ultra SCSI – Also known as SCSI-3, is a third generation SCSI standard that introduced parallel bus speed improvements (FAST-20 and FAST-40), and the miniaturized 68-pin micro connector.

USB (Universal Serial Bus) – USB consolidates serial, parallel, keyboard, mouse, and game ports into one asynchronous and isochronous communications port with bandwidth for data transfer speeds up to 12 Mbps without termination. By daisy-chaining USB hubs, up to 127 I/O devices can be connected to one USB port on the PC. USB is completely plug-and-play meaning peripherals can be correctly detected and configured automatically as soon as they are connected.

UTP (Unshielded Twisted Pair) – Twisted pair cable with neither individual nor overall shielding. **Twisted Pair** are two wires twisted together to reduce susceptibility to RF crosswalk.

VGA (Video Graphics Array) – A video adapter that supports 640x480 pixels color resolution. The Windows OS provides medium text & graphics standard.

VL-Bus – It is also known as Local Bus; this is an I/O interface that is directly connected and depended of the system CPU. The VL-Bus is an abbreviation of VESA Local Bus.

Terms and Conditions

Date:1997.10.20

Warranty Policy

1. All products are warranted against defects in materials and workmanship on a period of two years from the date of purchase by the customer.
2. The buyer will bear the return freight charges for goods that are returned for repair within the warranty period whereas manufacturer will bear the other way after repair.
3. The buyer will pay for repair (for the replaced materials plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service " , RMA goods will be returned at the customer expense.
5. The following conditions are excluded from this warranty :
 - A. Improper or inadequate maintenance by the customer.
 - B. Unauthorized modification or misuse.
 - C. Operation outside of the environmental specifications for the product.

RMA Service

1. **Request a RMA# :**

Complete and fax to Supplier the "RMA Request Form" to obtain a RMA number.

2. **Shipping:**

- A. The customer is requested to fill up the problem code as listed . If none of the code is selected, please write the symptom description on the remark.
- B. Ship the defective units with freight prepaid.
- C. Mark the RMA # clearly on the box.
- D. Shipping damage as a result of inadequate packing is the customer's responsibility.
- E. Use the original packing materials whenever possible .

3. **All RMA# are valid for 30 days only:**

When RMA goods are received after valid RMA# period , the goods will be rejected.

When requesting RMA service, please fill out this **“RMA Service Request Form”**.
Without this form your RMA will be REJECTED!!!

| | | |
|--------------------------|------------------------------------|--|
| RMA No: | Reasons to Return: | Repair(Please include failure details) |
| | Testing Purpose | |
| Company: | Contact Person: | |
| Phone No. | Purchased Date: | |
| Fax No.: | Applied Date: | |
| Return Shipping Address: | | |
| Shipping by: | Air Freight Sea Express : | Others:_____ |

| Item | Model Name | Serial Number | Configuration |
|------|------------|---------------|---------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Item | Problem Code | Failure Status |
|------|--------------|----------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

***Problem Code:**

- | | | | |
|------------------------|------------------------------|--------------------|--------------------------|
| 01: D.O.A. | 07: BIOS Problem | 13: SCSI | 19: DIO |
| 02: Second Time R.M.A. | 08: Keyboard Controller Fail | 14: LPT Port | 20: Buzzer |
| 03: CMOS Data Lost | 09: Cache RMA Problem | 15: PS2 | 21: Shut Down |
| 04: FDC Fail | 10: Memory Socket Bad | 16: LAN | 22: Panel Fail |
| 05: HDC Fail | 11: Hang Up Software | 17: COM Port | 23: CRT Fail |
| 06: Bad Slot | 12: Out Look Damage | 18: Watchdog Timer | 24: Others (Pls specify) |

Request Party

Confirmed By Supplier

Authorized Signatures / Date

Authorized Signatures / Date