

AP-370LH/H
Single Board Computer
for Pentium[®] III / Celeron[™]
Socket 370 Processor

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CHAPTER 1.

INTRODUCTION

The AP-370LH/H is a Half-size Intel[®] Celeron[™] Processor in 370-pin Socket grade PCI/ISA single board computer that is using the Intel 440 BX chipset, that supports the Ultra DMA-33 for faster hard drive and the health monitoring hardware. The health monitoring hardware detects and releases a sound alarm for any abnormal function of the operating voltage & temperature of CPU or it's cooling fan. For boosting operation, this motivated card also supports one socket for a Flash Disk, two DIM modules.

Take note that the AP-370LH is a high power & full engine SBC with display of resolution up to 1024x768 at 256 colors (for 2MB VRAM). It is a board that has so much for a deluxe cost. It is all you got in this full engine SBC with so many features. No hassle of going through the extra effort and cost of additional I/O cards.

The AP-370LH/H is built as a ISA expansion card that is simply upgraded by changing one card from another without replacing the whole system. It provides the primarily elements for building an IBM PC/AT compatible computer for a wide variety of applications with system integration. The AP-370LH/H is fully compatible with the IBM PC/AT which means virtually all the software written for the IBM PC/AT will run on the AP-370LH/H SBC.

Other on-board features include two serial ports (RS-232 and RS-232/422/485), one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller, a PS/2 keyboard and 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 AP-370LH/H able to withstand any harsh industrial 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 chipset C&T 69000 VGA chip Winbond W83977EF I/O chipset compatible
➤ System Memory	: Two 168-pin DIMM sockets, support up to 512MB SDRAM
➤ BIOS	: 256KB Award License BIOS
➤ Flash Memory Disk	: Reserved one sockets for DiskOnChip from M-System support up to 144 MB Flash memory Disk
➤ VGA Controller	: C&T 69000 chip, on-board 2 MB SGRAM resolution up to 1280x1024 at 256 colors
➤ IDE Drive Interface	: One PCI IDE port that supports up to two IDE devices and Ultra DMA/33
➤ Floppy Drive Interface	: One FDD port up to two floppy devices
➤ Serial Port	: Two COM ports, one RS-232 and one RS-232/422/485 serial ports
➤ Parallel Port	: One multi-mode parallel port (SPP/EPP/ECP)
➤ RTC Battery	: Dallas RTC battery or compatible
➤ PS/2 Mouse Connector	: On-board 6-pin Mini-Din PS/2 mouse connector
➤ Keyboard Connector	: 5-pin header and 6-pin Mini-Din PS/2 keyboard connectors
➤ Watchdog Timer	: 16 levels software program time-out intervals
➤ Universal Serial Bus	: Support two USB ports
➤ IR Interface	: Supports one IrDA header
➤ Health Monitoring	: Support CPU temperature alarm
➤ Operating Temperature	: 0°C~60°C (32°F~140°F)
➤ Humidity	: 10%~90% RH
➤ Dimensions	: 185 x 122 mm (7.3" X 4.8")
➤ Net weight	: 340 g (0.748 lb.)

Notice : Version below 2.0 only supports Intel Pentium II Celeron in the PPGA (Plastic Pin Grid Array) Package

1.2 PACKING CHECK LIST

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

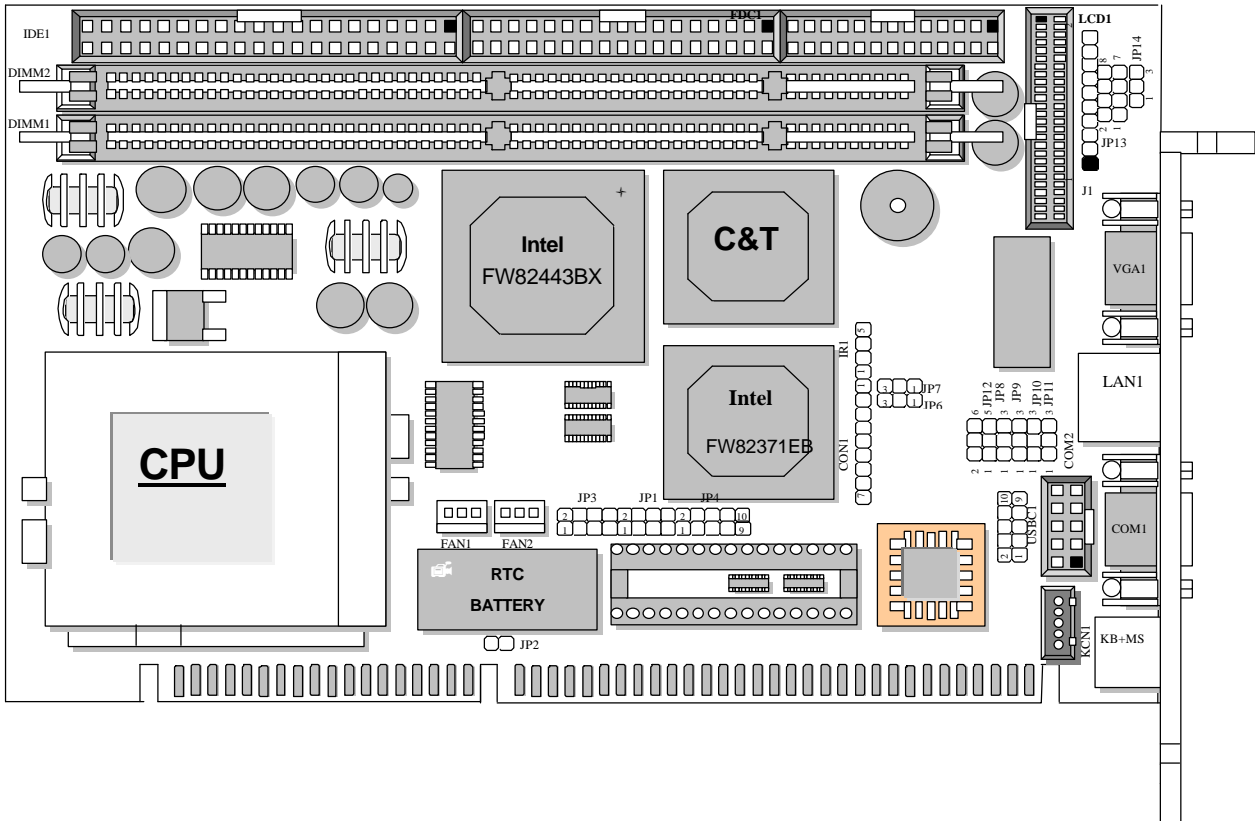
<i>Item</i>	<i>Qty</i>	<i>Remark</i>
AP-370LH/H SBC	1 pcs	AP-370LH/H Single Board Computer
Keyboard adapter cable	1 pcs	5-pin female to 5-pin female cable
EIDE/Floppy cable	1 set	40-pin to 40-pin standard header flat ribbon cable 34-pin to 34-pin standard header flat ribbon cable
Printer and COM ports cable	1 set	26-pin female flat connector header to 25-pin male D-Sub connector, 10-pin female flat connector header to 9-pin male D-Sub connector
Keyboard & Mouse Connector Cable	1 pcs	“Y” shape 6-pin Mini-DIN to one 5-pin DIN keyboard & one PS/2 mouse connectors
Drivers Utility	1 pcs	CD-ROM
User' s manual	1 pcs	AP-370LH/H user' s manual

CHAPTER 2.

JUMPER SETTING AND CONNECTORS

The figure below shows the jumpers and connectors location on the AP-370LH/H:

2.1 Board Outline of AP-370LH/H



2.2 INSTALLING AND UPGRADING THE CPU

To upgrade to a higher power CPU, simply remove the old CPU and install to a new one; be sure to set the jumpers for the new CPU type and speed.

WARNING!

Disconnect the power cord from your system when you intend to work on it or you plan to open the chassis of your IPC. Do not make connections when the power is turned on because the sensitive electronic components could be damaged by the sudden rush of power. Please only allow experienced electronic technicians to do this job.

STATIC ELECTRICITY PRECAUTION!

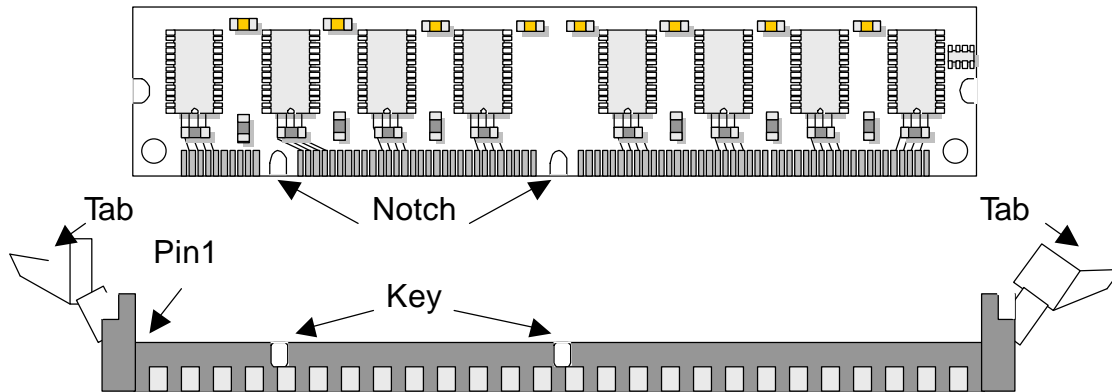
Caution! Computer components are very sensitive to damage from static electric discharge. Always ground yourself to remove static charge build-up before touching the boards in the computer. Use a grounding wrist strap at all time. Place all electronic components on the anti-static pad for static-dissipation or in a static-shielded bag when they are not in the chassis.

CAUTION!

Danger of Explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.

INSTALLING THE DIM MODULE:

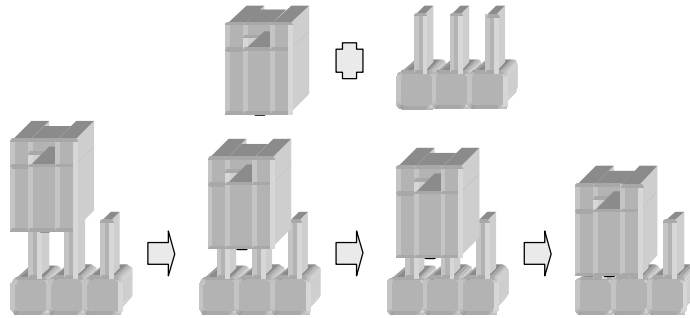
A DIM module simply snaps into a socket on the system board. Pin1 of the DIM module must correspond with Pin1 of the socket.



1. Pull the “tabs” which are at the ends of the socket to the side.
2. Position the DIMM above the socket with the “notches” in the module aligned with the “keys” on the socket.
3. Seat the module vertically into the socket. Make sure it is completely seated. The tabs will hold the DIMM in place.

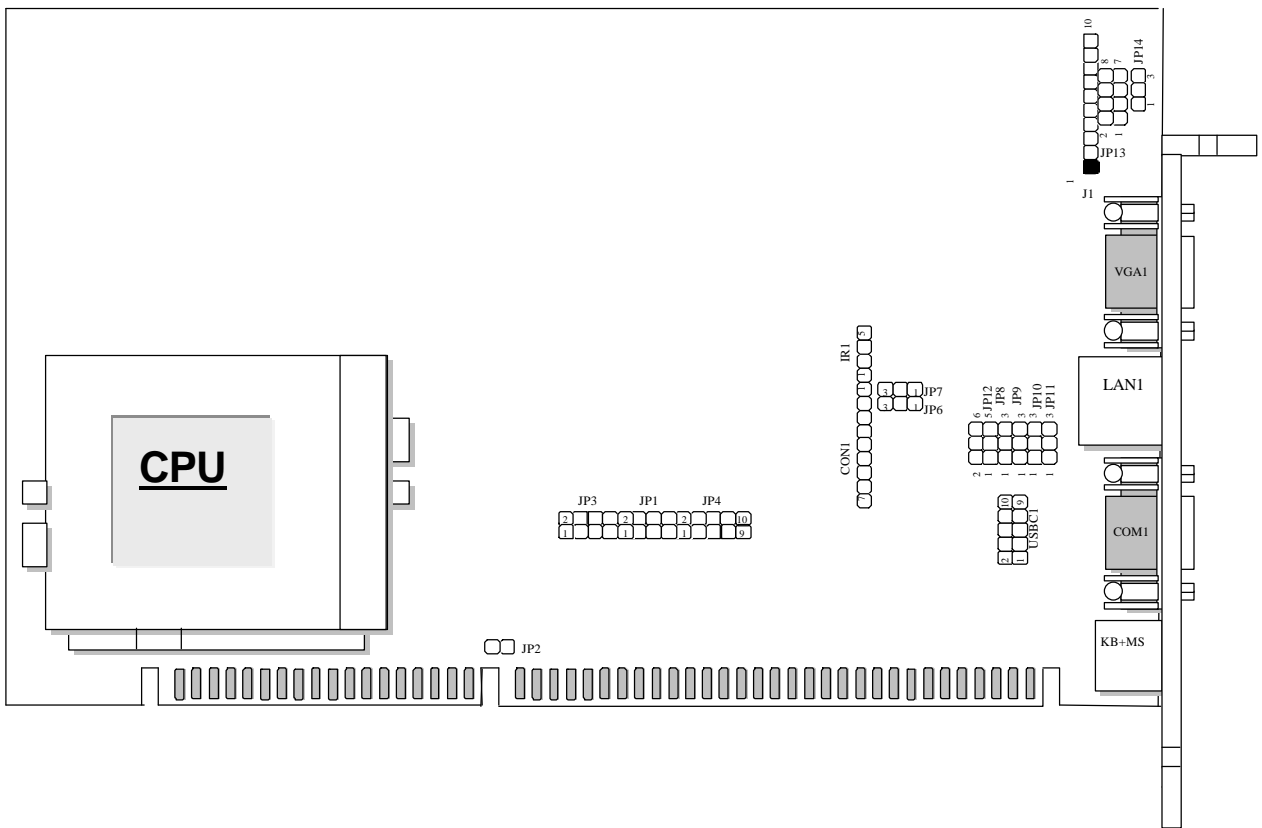
2.3 Jumper Setting Overview

In order to select the operation modes of your system, configure and set the jumpers on the your 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.

2.4 JUMPER LOCATION FOR AP-370LH/H



2.5 JUMPER SETTINGS SUMMARY FOR AP-370LH/H

JUMPER	FUNCTION
JP1	Select Internal CPU Clock Ratio
JP2	Select Clear CMOS Data
JP4	Select M-System Address
JP6 ~ JP7	Select ISP GAL Function (Manufacturer Define)
JP8 ~ JP12	Select COM2 Type
JP13	Select Panel Type
JP14	Select Panel Voltage

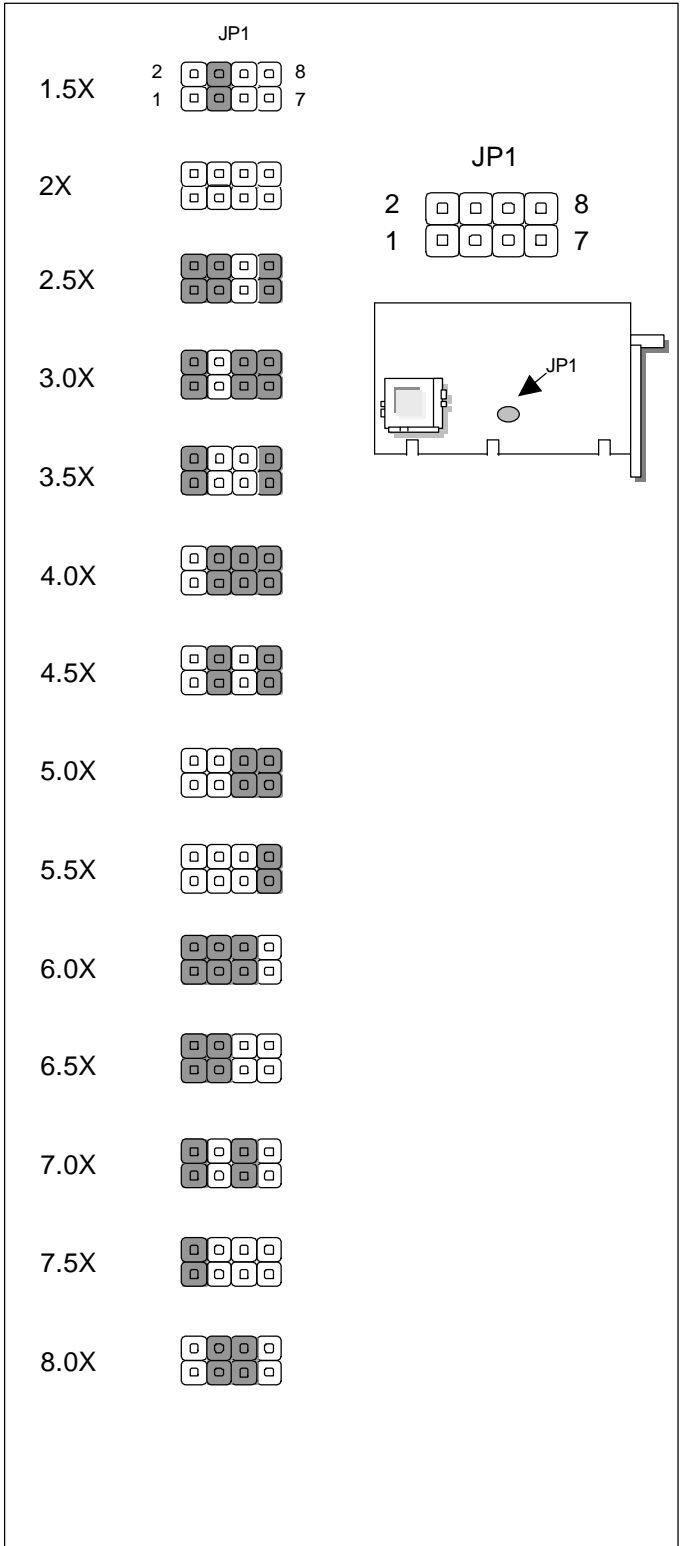
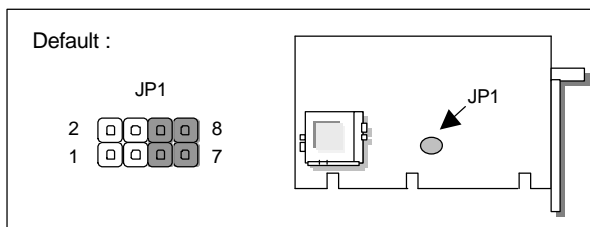
Note : Different jumpers are listed as following of version below V2.0

JUMPER	FUNCTION
JP3	Select CPU External Bus Clock

2.6 JUMPER SETTINGS FOR AP-370LH/H

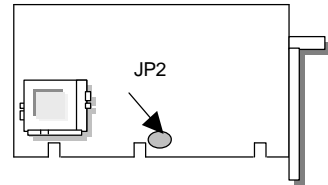
✦ JP1 : Select Internal CPU Clock Ratio

Internal CPU Clock Ratio	JP1
1.5	3-4
2	OFF
2.5	1-2, 3-4, 7-8
3	1-2, 5-6, 7-8
3.5	1-2, 7-8
4	3-4, 5-6, 7-8
4.5	3-4, 7-8
5(Default)	5-6, 7-8
5.5	7-8
6	1-2, 3-4, 5-6
6.5	1-2, 3-4
7	1-2, 5-6
7.5	1-2
8	3-4, 5-6



✦ **JP2 : Select Clear CMOS Data (Power-On situation)**

JP2	Description
ON	Clear CMOS
OFF (Default)	Normal



Clear CMOS

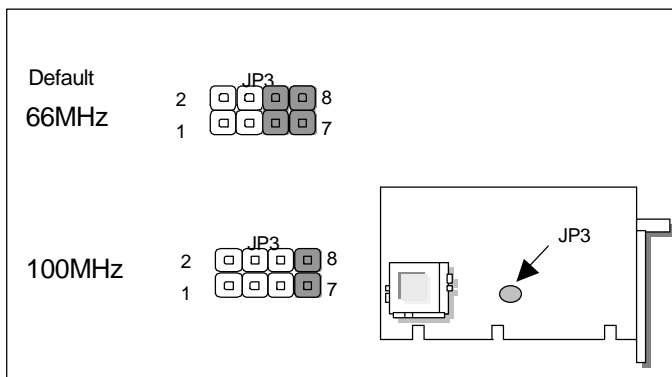


Normal



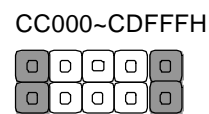
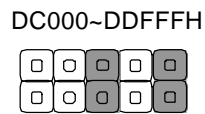
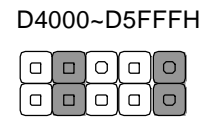
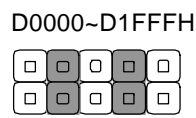
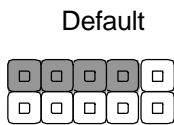
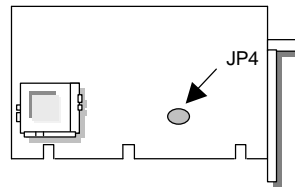
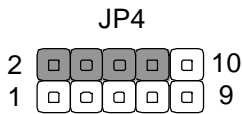
✦ **JP3 : Select CPU External Bus Clock (For version below 2.0)**

JP3	Description
5-6, 7-8	66MHz (Default)
7-8	100MHz



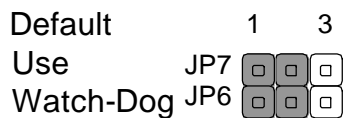
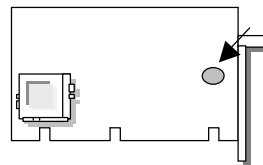
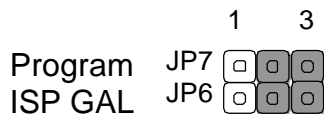
✦ **JP4 : Select M-System (Flash Disk) Address**

Address	JP4
D0000H~D1FFFH	3-4, 7-8
D4000H~D5FFFH	3-4, 9-10
D8000H~D9FFFH	5-6, 7-8
DC000H~DDFFFH	5-6, 9-10
CC000H~C0FFFH	1-2, 9-10
Default	2-4,6-8



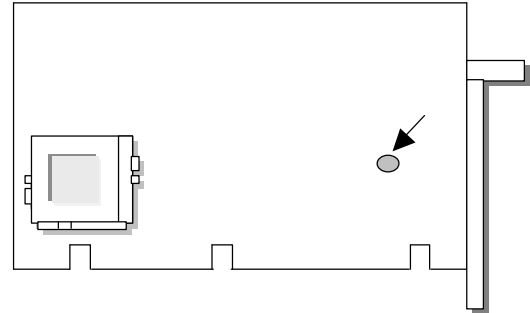
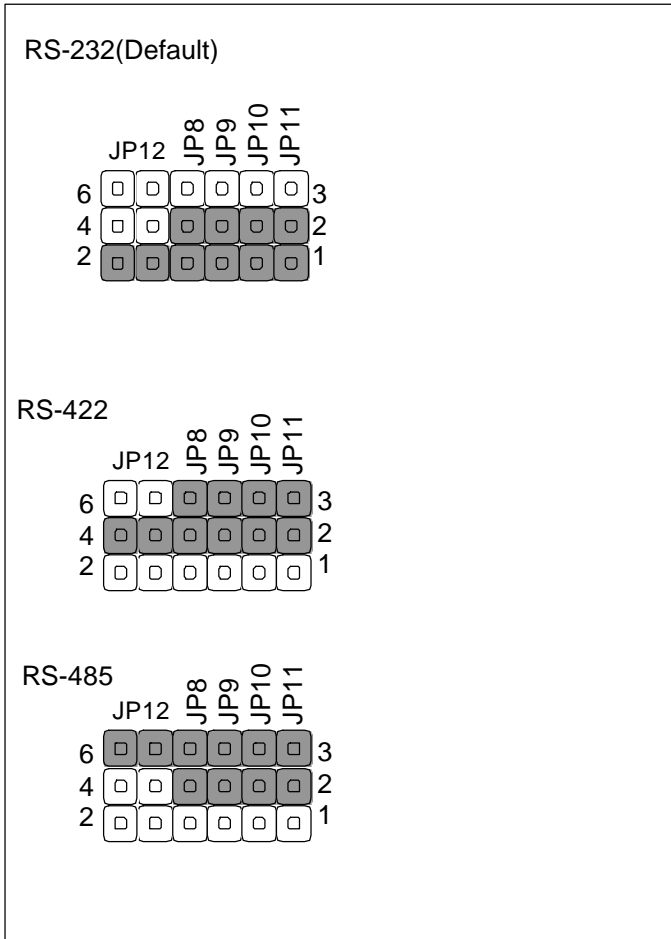
✦ **JP6 / JP7 : Select ISP GAL Function (Manufacture Define)**

	JP6	JP7
Program ISP GAL	2-3	2-3
Use Watch-Dog	1-2	1-2



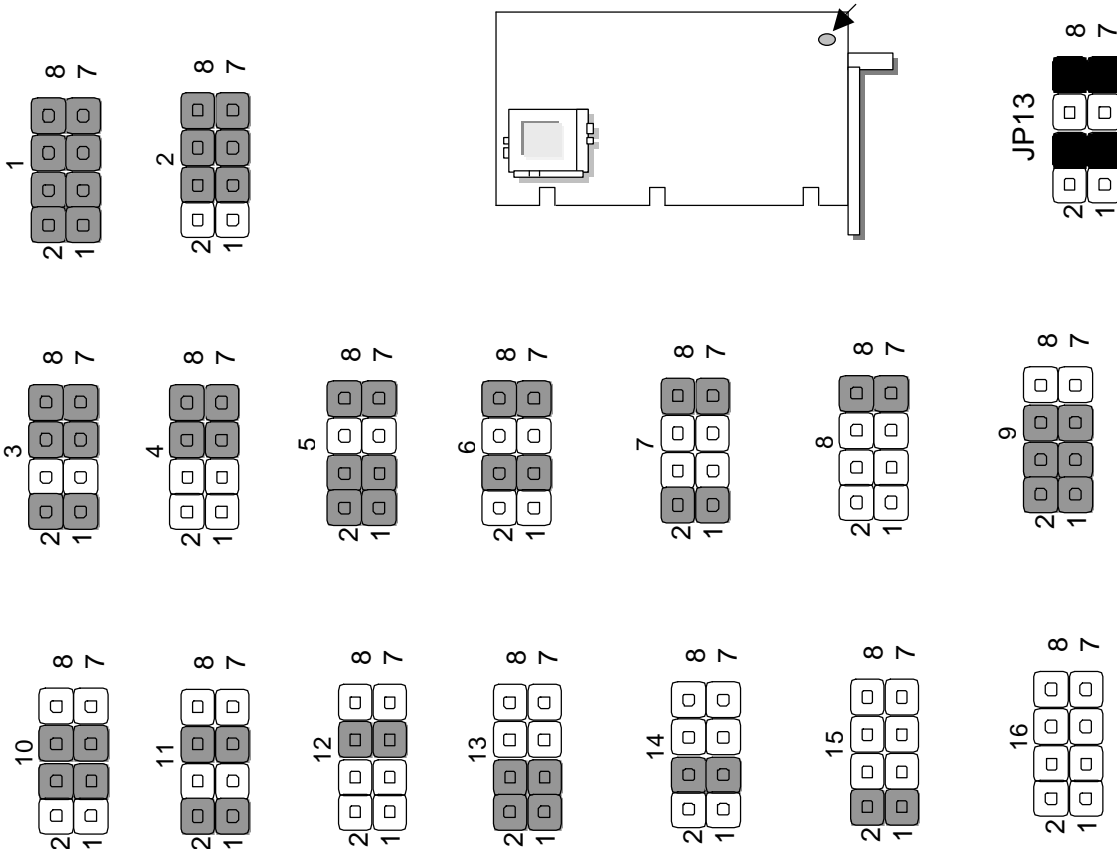
✦ JP8 ~ JP12 : Select COM2 Type

COM2 Type	JP12	JP8, JP9, JP10, JP11
RS-232 (Default)	1-2	1-2
RS-422	3-4	2-3
RS-485	5-6	2-3



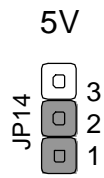
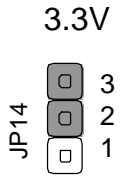
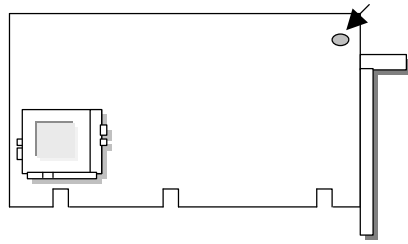
✦ **JP13 : Select Panel Type**

	JP13	Panel Type		JP13	Panel Type
1.	1-2,3-4,5-6,7-8	1024x768 Dual Scan STN Color Panel	9.	1-2,3-4,5-6	800x600 TFT Color Panel
2.	3-4,5-6,7-8	1280x1024 TFT Color Panel	10.	3-4,5-6	800x600 TFT Color Panel
3.	1-2,5-6,7-8	640x480 Dual Scan STN Color Panel	11.	1-2,5-6	800x600 Dual Scan STN Color Panel
4.	5-6,7-8	800x600 Dual Scan STN Color Panel	12.	5-6	800x600 Dual Scan STN Color Panel
5.	1-2,3-4,7-8	640x480 Sharp TFT Color Panel	13.	1-2,3-4	1024x768 TFT Color Panel
6.	3-4,7-8(Default)	640x480 18bit TFT Color Panel	14.	3-4	1280x1024 Dual Scan STN Color Panel
7.	1-2,7-8	1024x768 TFT Color Panel	15.	1-2	1024x600 Dual Scan STN Color Panel
8.	7-8	800x600 TFT Color Panel	16.	OFF	1024x600 TFT Color Panel

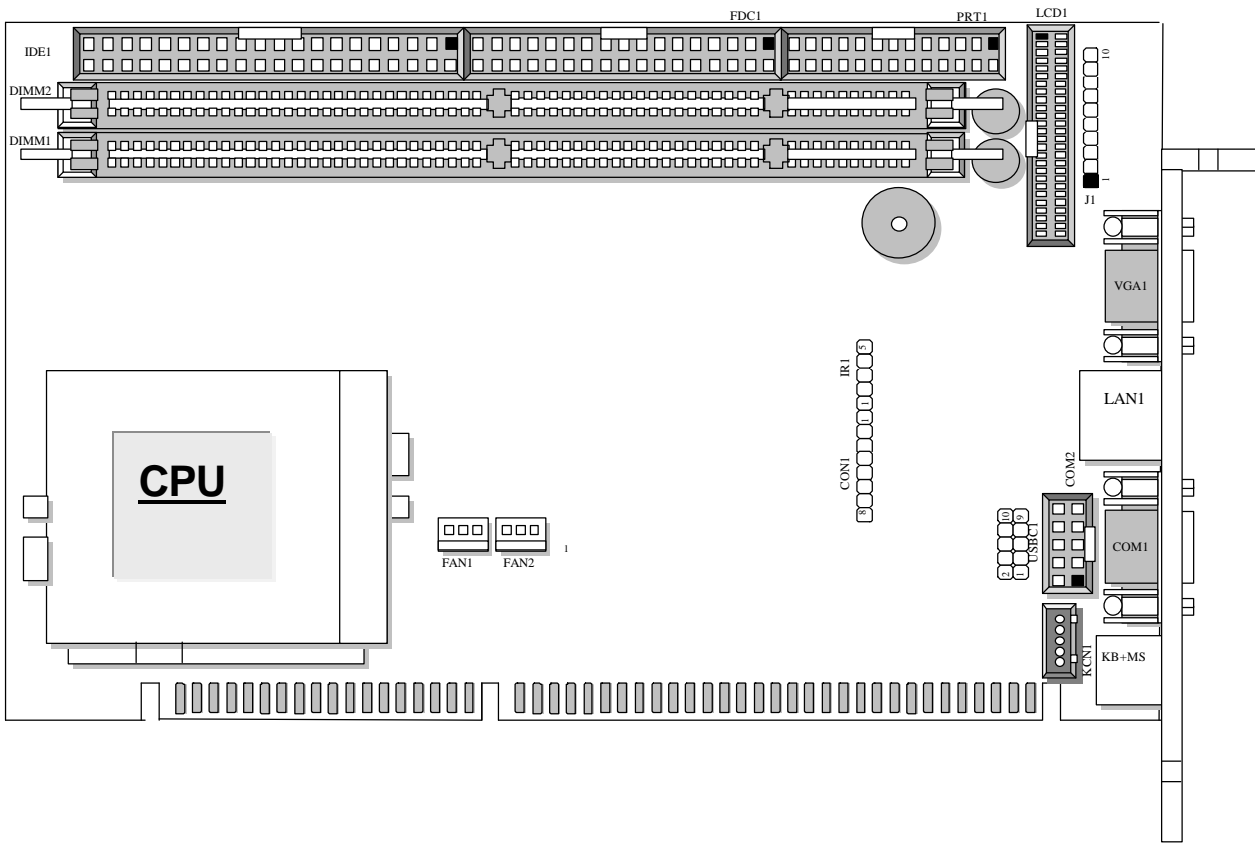


✦ **JP14: Select Panel Voltage**

Panel Voltage	JP14
3.3V (Default)	2-3
5V	1-2



2.7 I/O CONNECTOR LOCATION FOR AP-370LH/H



2.8 I/O CONNECTOR SUMMARY FOR AP-370LH/H

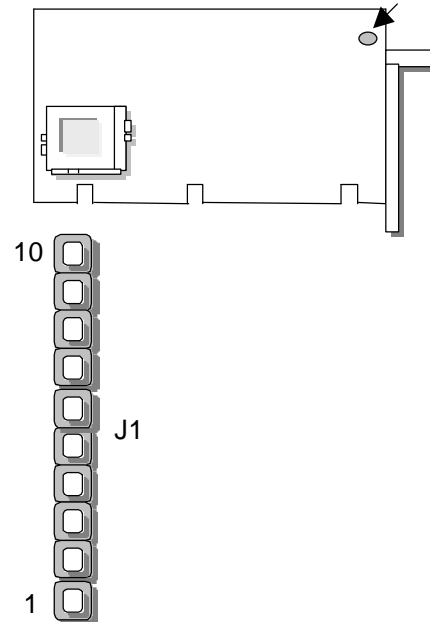
CONNECTOR	FUNCTION
J1	Power LED, Key Lock, Speaker, Reset, HDD LED
FAN1 / FAN2	Fan Connector
COM1	COM1 Connector (D-Sub Connector)
COM2	COM2 Connector (Header)
USBC1	USB Connector (Pins)
KCN1	External Keyboard Connector (Header)
PKB1	PS2 Keyboard & Mouse "Y" Connector (6-Pin Min-DIN)
LAN1	RJ-45 Connector
IDE1 / IDE2	EIDE Interface Connector (Header)
FDC1	Floppy Interface Connector (Header)
PRT1	Parallel Port Connector (Header)
VGA1	VGA Connector (D-Sub Connector)
LCD1	LCD Panel Connector
CON1	Program ISP GAL Connector
IR1	Alternate IrDa

2.9 SYSTEM STATUS INDICATE AND CONTROL CONNECTORS

✦ J1 : Power LED, Key lock, Speaker, Reset, HDD LED

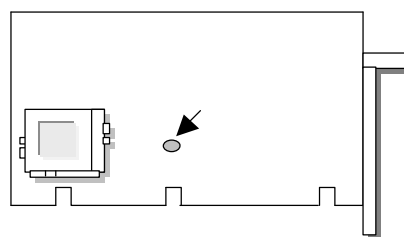
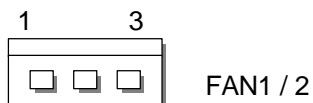
PIN NO.	DESCRIPTION
1	Power LED+
2	GND
3	HD LEDD+
4	HD LED-
5	RESET SW+
6	RESET SW-
7	EXTERNAL SPEAKER
8	INTERNAL BUZZER
9	NC
10	EXTERNAL SPEAKER

Default : 7-8 ON for internal buzzer



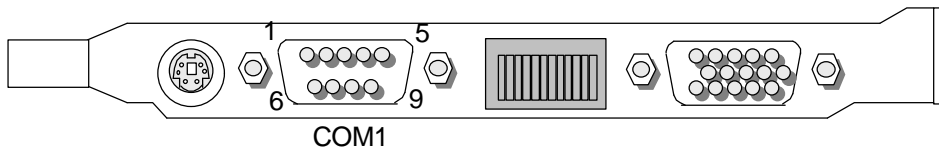
✦ FAN1/FAN2 : Fan Connector

PIN NO.	DESCRIPTION
1	Ground
2	+12V
3	FAN Status



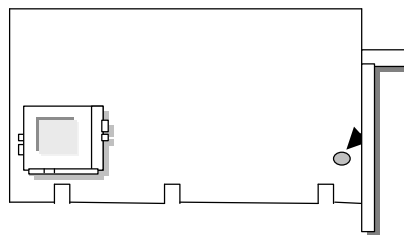
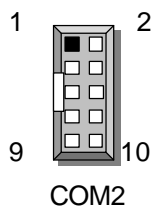
✦ **COM1 : RS-232 Serial Port #1 Connector (D-Sub)**

PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCDA #)
2	Receive Data (RXDA)
3	Transmit Data (TXDA)
4	Data Terminal Ready (DTRA #)
5	Ground (GND)
6	Data Set Ready (DSRA #)
7	Request To Send (RTSA #)
8	Clear To Send (CTSA #)
9	Ring Indicator (RIA #)



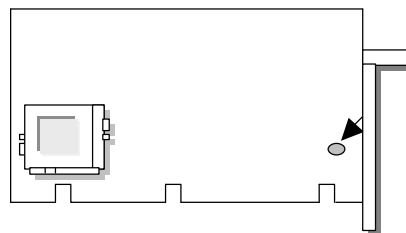
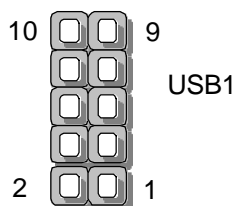
✦ **COM2 : RS-232 Serial Port #2 Connector (Header)**

PIN NO.	DESCRIPTION
1	DCDB #
2	SINB
3	SOUTB
4	DTRB #
5	Ground
6	DSRB #
7	RTSB #
8	CTSB #
9	RIB #
10	NC



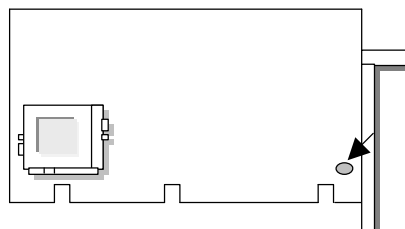
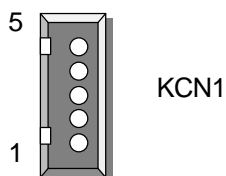
✦ **USBC1 : USB Connector**

PIN NO.	DESCRIPTION
1	USB Port#0 V _{CC}
2	USB Port#0 D0-
3	USB Port#0 D0+
4	USB Port#1 Ground
5	Analog Ground
6	USB Port#1 V _{CC}
7	USB Port#1 D1-
8	USB Port#1 D1+
9	USB Port#1 Ground
10	Analog Ground



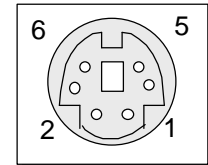
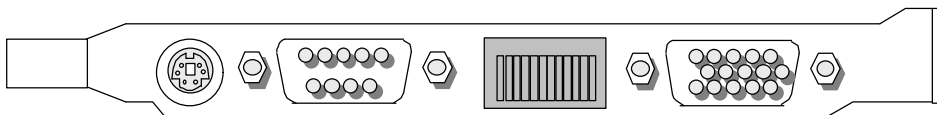
✦ **KCN1 : 5-pin Keyboard Cable Connector**

PIN NO.	DESCRIPTION
1	Keyboard Clock
2	Keyboard Data
3	NC
4	Ground
5	V _{cc}



✦ **PKB1 : PS/2 Keyboard & Mouse Connector (Mini-Din)**

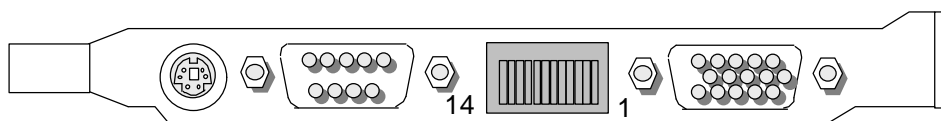
PIN NO.	DESCRIPTION
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	Ground
4	Vcc
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock



PKB1

✦ **LAN1 : Ethernet 100Base-T RJ-45 Connector**

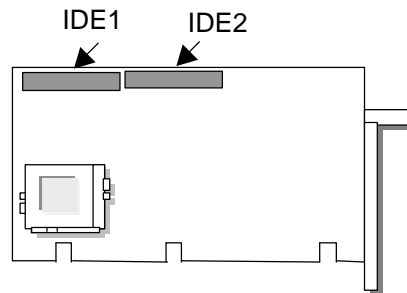
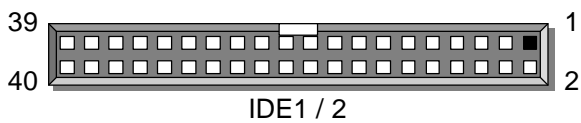
PIN NO.	Description	PIN NO.	Description
1	TX+	2	TX-
3	RX+	4	T45
5	T45	6	RX-
7	T78	8	T78
9	LINK_LED	10	Vcc
11	ACTIVE_LED	12	Vcc
13	GND	14	GND



LAN1

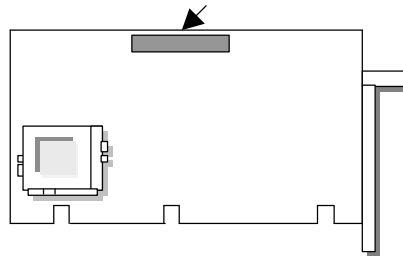
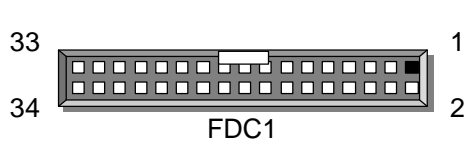
✦ IDE1 / 2 : IDE Cable Connector (Header)

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	NC
29	DMA ACK #	30	Ground
31	Interrupt	32	IOCS16 #
33	SA1	34	NC
35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #
39	HDD Active #	40	Ground



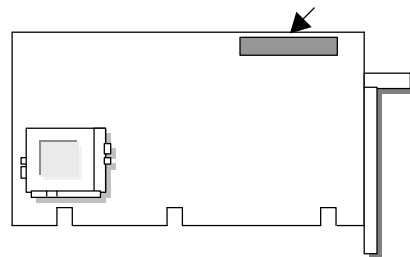
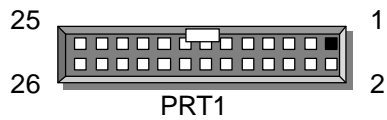
✦ **FDC1 : Floppy Cable Connector (Header)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Ground	2	Density Select
3	Ground	4	NC
5	Ground	6	NC
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 #



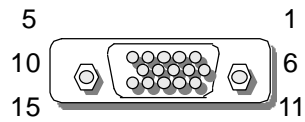
✦ **PRT1 : Parallel Cable Connector (Header)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Strobe #	2	Auto Form Feed #
3	Data 0	4	Error #
5	Data 1	6	Initialize #
7	Data 2	8	Printer Select IN #
9	Data 3	10	Ground
11	Data 4	12	Ground
13	Data 5	14	Ground
15	Data 6	16	Ground
17	Data 7	18	Ground
19	Acknowledge #	20	Ground
21	Busy	22	Ground
23	Paper Empty	24	Ground
25	Printer Select	26	NC



✦ **VGA1 : VGA Connector(For 370LH only)**

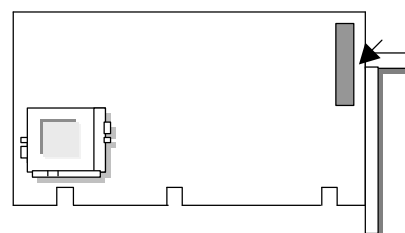
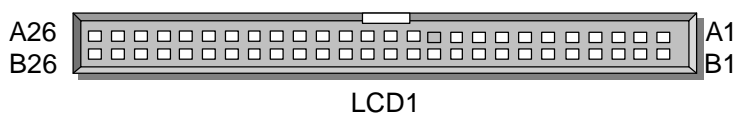
PIN NO.	DESCRIPTION
1	Red Color Signal
2	Green Color Signal
3	Blue Color Signal
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	NC
10	Ground
11	NC
12	SPD
13	H-Sync.
14	V-Sync.
15	SPCLK



VGA1

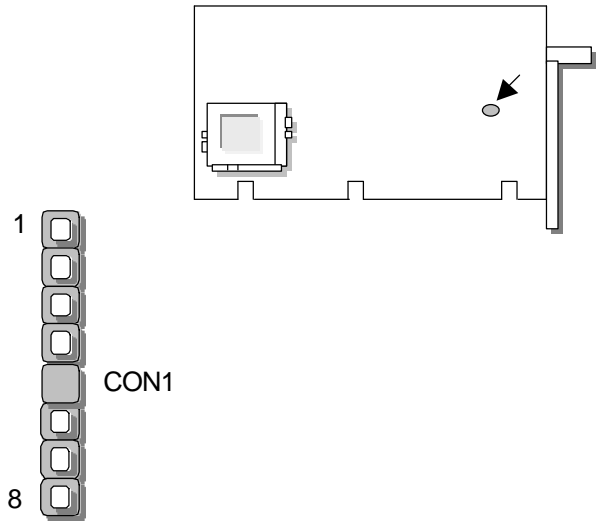
✦ **LCD1 : FLAT-PANEL INTERFACE CONNECTOR (For 370LH only)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	DATA0	B1	DATA15
A2	DATA1	B2	DATA31
A3	DATA2	B3	DATA16
A4	DATA24	B4	DATA17
A5	DATA3	B5	DATA18
A6	DATA4	B6	DATA32
A7	DATA25	B7	GND
A8	GND	B8	SHFCLK
A9	DATA5	B9	GND
A10	DATA6	B10	DE
A11	DATA26	B11	FLM
A12	DATA7	B12	LP
A13	DATA8	B13	GND
A14	GND	B14	DATA19
A15	DATA27	B15	DATA20
A16	DATA9	B16	GND
A17	DATA10	B17	DATA21
A18	DATA28	B18	DATA22
A19	DATA11	B19	DATA33
A20	GND	B20	DATA23
A21	DATA12	B21	DATA34
A22	DATA29	B22	ENABLE BACKLIHT
A23	DATA13	B23	DATA35
A24	DATA30	B24	ENVCC
A25	DATA14	B25	FVCC
A26	ENAVEE	B26	FVCC



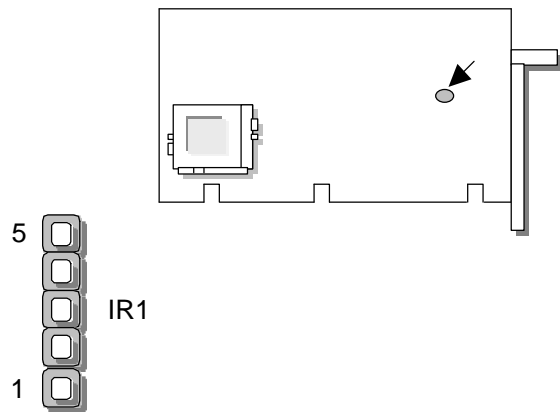
CON1 : Program ISP GAL Connector

PIN NO.	DESCRIPTION
1	VCC
2	SDO
3	SDI
4	ISP
5	NC
6	MODE
7	GND
8	SCLK



IR1 : Alternate IrDa

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX



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 boot up 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 (2A69KL7F) 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 F10 : Save & Exit Setup	    : Select Item (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 appears as :

Standard CMOS Setup Screen

ROM PCI / ISA BIOS(2A69KL7F) STANDARD CMOS SETUP AWARD SOFTWARE, INC.																																				
Date (mm : dd : yy) : Fri, Jul 30 1999																																				
Time (hh : mm : ss) : 13:42:18																																				
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">HARD DISKS</th> <th style="text-align: left;">TYPE</th> <th style="text-align: left;">SIZE</th> <th style="text-align: left;">CYLS</th> <th style="text-align: left;">HEAD</th> <th style="text-align: left;">PRECOMP</th> <th style="text-align: left;">LANDZ</th> <th style="text-align: left;">SECTOR</th> <th style="text-align: left;">MODE</th> </tr> </thead> <tbody> <tr> <td>Primary Master</td> <td>: Auto</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>AUTO</td> </tr> <tr> <td>Primary Slave</td> <td>: Auto</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>AUTO</td> </tr> </tbody> </table>										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
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																												
Drive A : 1.44M, 3.5 in.					Base Memory : 640K Extended Memory : 195584K Other Memory : 384K Total Memory : 196608K																															
Drive B : None																																				
Video : EGA/VGA																																				
Halt On : All Errors																																				
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 appears as:

Hard Disks : There are two hard disks listed: “Primary Master” and “Primary 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 pre-compensation 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 that 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 software 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.

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 : The default setting is "Disabled". When you select Enabled, memory checking is enable when the external cache contains ECC SRAMs.

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 "A:,C:, SCSI"; 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 "Enabled". 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 : The default setting is “Enabled”. If your system has a PS/2 mouse port and you 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.

Report No FDD For Win95 : Select “Yes” to release IRQ6 when the system contains no floppy drive, for compatibility with Windows 95 logo certification. In the Integrated Peripherals screen select “Disabled” for the Onboard FDC Controller field.

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 (2A69KL79) CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.	
AUTO Configuration : Enabled EDO DRAM Speed Selection : 60 ns EDO CASx# MA Wait State : 2 EDO RASx# Wait State : 2 SDRAM RAS-to-CAS Delay : 3 SDRAM RAS Precharge Time : 3 SDRAM CAS latency Time : Auto SDRAM Precharge Control : Disabled DRAM Data Integrity Mode : Non-ECC System BIOS Cacheable : Disabled 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 Delayed Transaction : Disabled AGP Aperture Size (MB) : 64	Auto Detect DIMM Clk : Enabled Spread Spectrum Modulated : Disabled CPU Host Clock : 66 MHz CPU Warning Temperature : Disabled Current CPU Temperature : 27°C / 80°F Current System Temp. : 33°C / 91°F Current CPU FAN Speed : 3720 RPM Current System FAN Speed : 0RPM Current Vdd (V) : 5.05V Current Vin1 (V) : 3.28V Current Vin2 (V) : 11.86V Current Vin3 (V) : 2.03V ESC : Quit ⏏ ⌂ ☾ ☄ : Select Item F1 : Help PU /PD +/- - : Modify 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 DRAM installed in your system. DO NOT change the default setting of this field, as determined by the system board manufacturer for the installed DRAM. This value is access speed, so a lower value means a faster system.

EDO CASx# MA Wait State : The system board designer may elect to insert a wait state into EDO CASx# Memory addressing cycle, if necessary. CAS stands for Column Address Select.

EDO RASx# Wait State : The system board designer may elect to insert a wait state into EDO RASx# Memory addressing cycle, if necessary. RAS stands for Row Address Select.

SDRAM RAS to CAS Delay : This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

SDRAM RAS Precharge Time : If insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

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

SDRAM CAS Latency Time : When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

DRAM Data Integrity Mode : Select Parity 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 BIOS ROM at C0000h to C7FFFh, 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 : The default setting is "Disabled". Set to "Enabled" when the system memory size is equal to or greater than 16M bytes, then the physical memory address from 15M to 16M will be passed to PCI or ISA. Thus, there will be 1M Bytes hole in your system memory. This option is designed for some OS with special add-on cards which need 15M-16M memory space.

Passive Release : The default setting is "Enabled". 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 default setting is "Disabled". The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

AGP Aperture Size (MB) : Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for APG information.

Auto Detect DIMM 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 Modulated : 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,

CPU Host Clock : Select default or select a timing combination for the CPU and the PCI bus. When set to default, the BIOS uses the actual CPU and PCI bus clock values.

CPU Warning Temperature : The default setting is “66°C/151°F”. Select the combination of lower and upper limits for the CPU temperature. If the CPU temperature extends beyond either limit, any warning mechanism programmed into your system will be activated.

Current CPU Temperature : The itself of CPU is “27°C/80°F”. This field displays the current CPU temperature, if your computer contains a monitoring system.

Current System Temp. : The itself of system is “33°C/91°F”. This field displays the current system temperature, if your computer contains a monitoring system.

Current CPU FAN Speed : The FAN of CPU is “3720 RPM”. This field displays the current speed of the CPU fan, if your computer contains a monitoring system.

Current System FAN Speed : This field displays the current speed of the system Fan, if your computer contains a monitoring system,





Current Vdd (V), Current Vin1 (V), Current Vin2 (V) and Current Vin3 (V): This field detects the voltage input of the board, if your computer contains a monitoring system.

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 (2A69KL7F) POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.		
Power Management	: User Define	** Reload Global Timer Events **
PM Control by APM	: Yes	IRQ [3 – 7, 9 – 15], NMI : Disabled
Video Off Method	: V /H SYNC+ Blank	Primary IDE 0 : Disabled
Video Off After	: Standby	Primary IDE 1 : Disabled
MODEM Use IRQ	: 3	Secondary IDE 0 : Disabled
Doze Mode	: Disabled	Secondary IDE 1 : Disabled
Standby Mode	: Disabled	Floppy Disk : Disabled
Suspend Mode	: Disabled	Serial Port : Disabled
HDD Power Down	: Disabled	Parallel Port : Disabled
Throttle Duty Cycle	: 62.5%	
PCI / VGA Act-monitor	: Disabled	
PowerOn by Ring	: Disabled	
IRQ 8 Break Suspend	: 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 setting controls the System Doze Mode, Standby Mode and Suspend Mode Timer features. There are four options namely –

User Define : Allows you to customize all power saving timer features.

Optimize : This is the recommended setting for general use.

Test/Demo : This is for test/demonstration purpose.

Disable : Disable the power management features.

PM Control by APM : The default setting is “No”. If it is set to “Yes”, the system BIOS will wait for APM’s prompt before it enters any PM mode.

Note : If your system power management is controlled by APM and there is a task running, the APM will not prompt the BIOS to enter any power saving mode after time out.

Video Off Method : This setting controls the Video off method in power saving mode. The default setting is “V/H SYNC+Blank”. This setting disables V/H SYNC signals and blanks the screen into the power saving mode. Other options are “Blank Screen” and “DPMS”.

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. The default setting is “Standby”.

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. The default setting is “3”.

Doze Mode : Options are from “1 Min.” to “1 Hour” and “Disable”. The system speed will change from turbo to slow and the video signal will be suspended, if no Power Management events occur for a specified length of time. Full power function will return when a Wake-Up event is detected.

Standby Mode : Options are from “1 Min” to “1 Hour” and “Disable”. The system speed will change from turbo to slow and the video signal will be suspended, if no Power Management events occur for a specified length of time. Full power function will return when a Wake-Up event is detected.

Suspend Mode : Option are from “1 Min” to “1 Hour” and “Disable”. The CPU clock will be stopped and the video signal will be suspended, if no Power Management events occur for a specified length of time. Full power function will return when a Wake-Up event is detected.

HDD Power Down : Options are from “1 Min.” to “15 Min.” and “Disable”. The IDE hard drive will spin down if it is not accessed within a specified length of time.

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. The default setting is "Disabled".

PowerOn by Ring : When "Enabled", an input signal on the serial Ring Indicator (RI) line awakens the system from soft off state.

IRQ8 Clock Event : You can turn On or Off 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 appear as:

PnP/PCI Configuration Setup Screen

ROM PCI / ISA BIOS (2A69KL7F) 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 ISA IRQ-9 assigned to : PCI/ISA PnP IRQ-10 assigned to : PCI/ISA PnP IRQ-11 assigned to : PCI/ISA PnP IRQ-12 assigned to : Legacy ISA IRQ-14 assigned to : Legacy ISA IRQ-15 assigned to : Legacy ISA 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 default setting is “Auto” which will control all IRQs and DMAs automatically. The other option is “Manual” which allows you to control IRQs and DMAs individually.

Reset Configuration Data : The default setting is “Disabled”. When set to “Enabled”, the content of the ESCD block in flash BIOS will be cleared.

IRQ Assigned to and DMA Assigned to : If there is a legacy ISA device which uses an IRQ or a DMA, set the corresponding IRQ or DMA to “Legacy ISA”; otherwise you should set to PCI/ISA PnP.

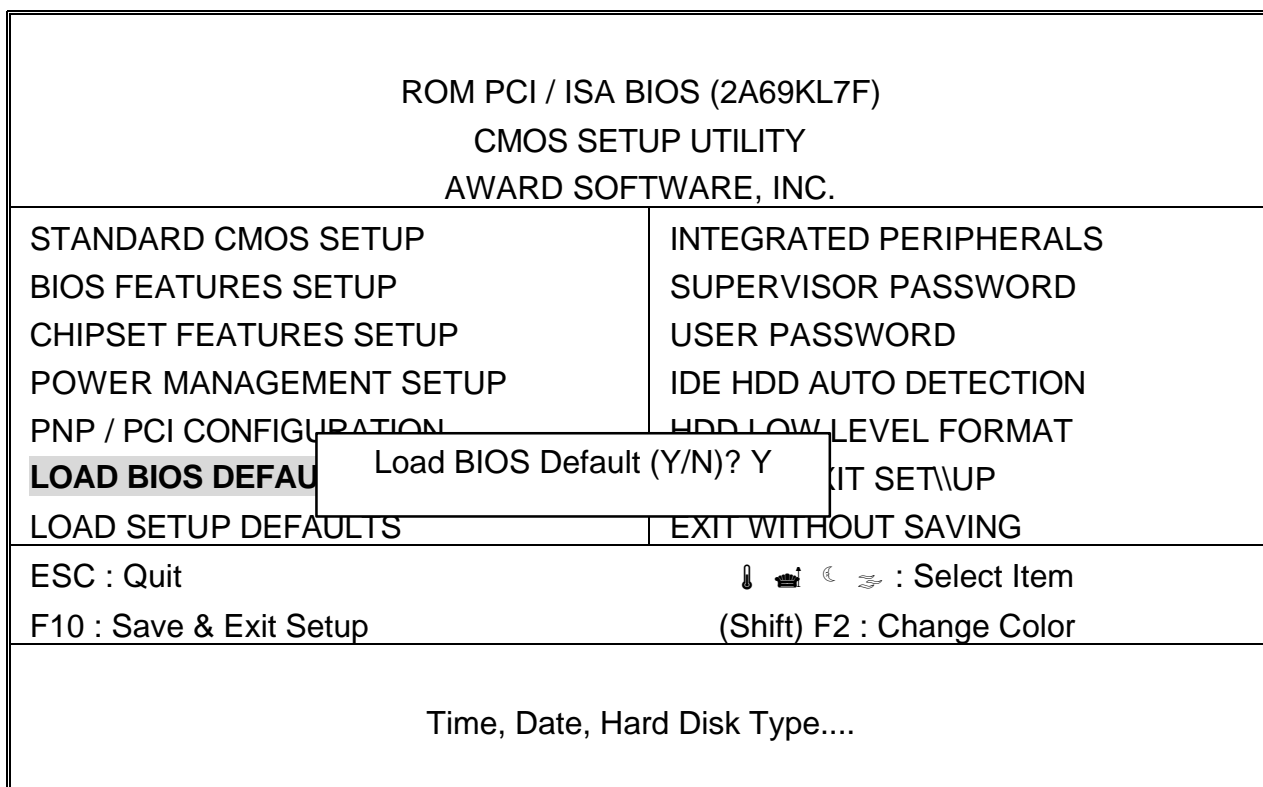
Used MEM base addr : Because BIOSes fail to auto detect some specific ISA Legacy cards with requested memory space below 1M address, we have added the “Used MEM base addr” and “Used MEM Length” to support such kind of cards. Now, with these two functions, users can define where the used memory address is located and its length of the legacy area correspondingly. Based on this, BIOS will skip the UMB area that is used by the legacy device to avoid the memory space conflict. For example, if the user select “D000” for “Used MEM base addr” and “16K” for “Used MEM Length” that means the address region D0000H-D3FFFH is occupied by ISA legacy cards, and BIOS will not assign this region for PnP/ISA and PCI cards.

Assign IRQ For USB : To use USB feature, set the IRQ to “Enabled”. The default setting is “Enabled”.

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 appear as:

Integrated Peripherals Setup Screen

ROM PCI / ISA BIOS (2A69KL7F) 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 UMDA	: Auto		
IDE Primary Slave UMDA	: Auto		
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
USB Keyboard Support	: Disabled		
Init display First	: PCI Slot		
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 : The Default setting is “Enabled”. This feature enhances the hard disk performance by making multi-sector transfers instead of one sector per transfer. Most IDE drives, except the very early design, have Block Mode transfer feature.

IDE Primary Master PIO, IDE Primary Slave PIO : There are four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the two 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 Master UMDA, IDE Primary Slave UMDA : Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Window 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

On-Chip Primary PCI IDE : The default setting is "Enabled". This option enables the onboard Primary /Secondary PCI IDE controller.

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: These options are used to assign the I/O addresses for the two on-board serial ports. They can be assigned as follows:

- Auto
- 3F8 / IRQ4 (Serial Port 1 Default)
- 2F8 / IRQ3 (Serial Port 2 Default)
- 3E8 / IRQ4
- 2E8 / IRQ3
- Disabled (Disable the onboard serial port)

UART Mode Select: Select an operating mode for the second serial port. They can be assigned as follows:

Normal	RS-232C serial port
IrDA	Infrared Port
ASKIR	Amplitude Shift Keyed Infrared Port

RxD, TxD Active : Consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals.

Onboard Parallel Port : This option is used to assign the I/O address for the onboard parallel port. The options are “378/IRQ7” (defaults), “278/IRQ7”, “3BC/IRQ7” and “Disabled” (disable the onboard parallel port). Note: Printer port always use IRQ7 when set to “378/IRQ7” or “278/IRQ7”, or from “3BE/IRQ7” to “Enabled”.

Parallel Port Mode: There are four options “Normal” (default), “ECP”, “ECP/EPP” and “EPP/SPP”. Change the mode from “Normal” to the enhanced mode only if your peripheral device can support it. When it is set to ECP mode, the printer port always uses DMA3.

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.

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.

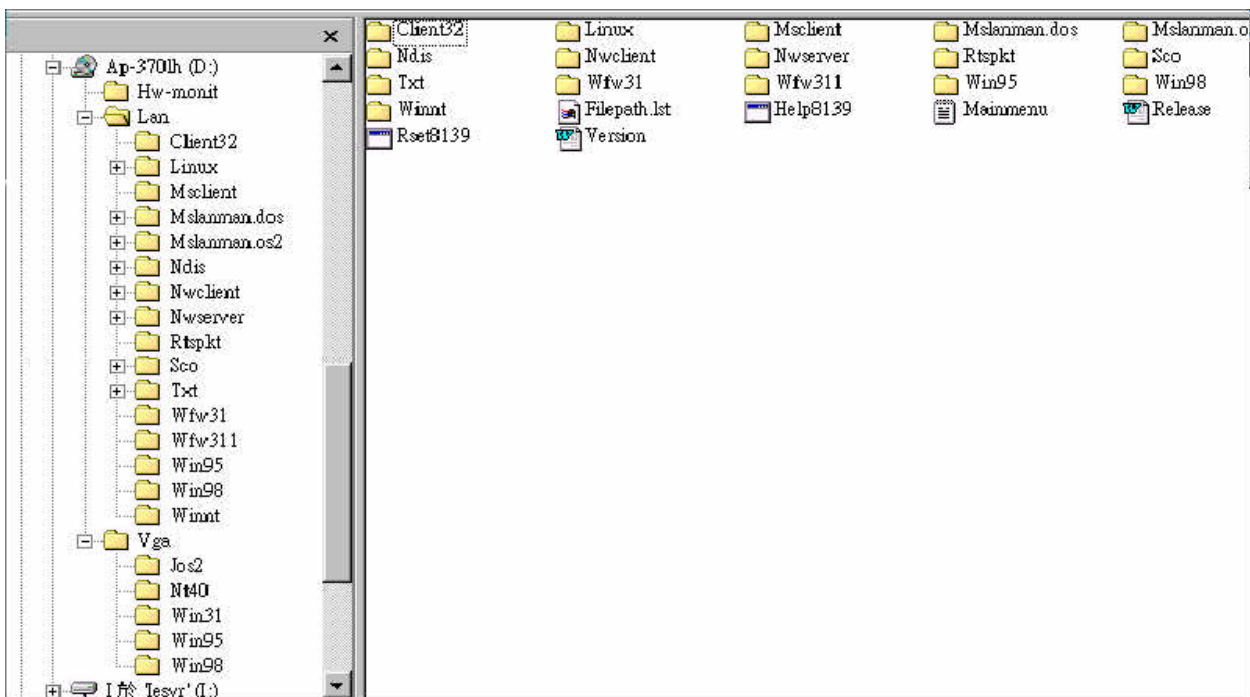
DRIVERS SUPPORT

4.1 USE YOUR DRIVER CD-ROM

This chapter provides information on how to install the drivers that come in the CD-ROM with the package. Please follow the instructions set forth in this chapter carefully.

1. Find the VGA or LAN directory first.
2. Find the directory for your O/S accordingly.
3. Always read the README.TXT before installation.
4. Run the *.EXE, and follow the installation prompt step by step.

4.2 FILE DIRECTORY



CHAPTER 5.

LCD SUPPORT

5.1 LCD SUPPORT LIST

KIT No.	Panel No.	Bios Name
LK-027	LQ15X0125	370LHV10.BIN
LK-027	LQ150X1DG16	F370LH2D.BIN
LK-028	LQ121SDG11	370LHV10.BIN
LK-029	LQ10D42	370LHV10.BIN
LK-034(2MB)	LTM150XS-T01	F370LH2B.BIN
LK-034(4MB)	LTM150XS-T01	F370LH4B.BIN
LK-018(2MB)	LQ150X1DG16	F370LH2A.BIN
LK-018(4MB)	LQ150X1DG16	F370LH4A.BIN

5.2 LCD KIT INSTRUCTIONS

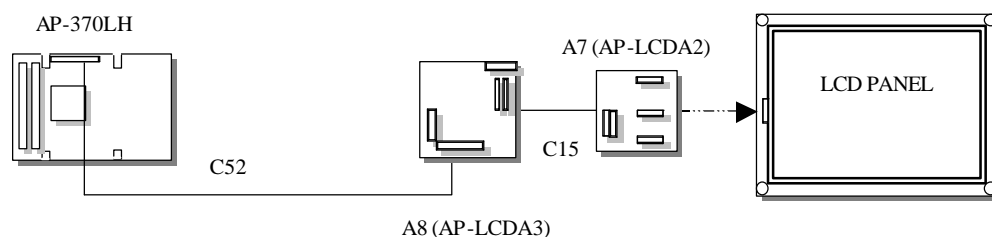
LK-018:

Cable :

Code	Parts No.	Cable Type	Pin to Pin	Length	Q' ty
C15	0800603200001	LVDS 20 to 20 pin Cable	LVDS 20 to 20 pin	250 mm	1
C52	0800312520001	LCDA3 52 to 52 pin Cable	52 to 52 pin	250 mm	1

Interface :

Code	Parts No.	Interface Type	Version	Size
A7	S01LCDA200410	AP-LCDA2	Ver. 1.1	74.00 x 70.00 mm
A8	S01LCDA300110	AP-LCDA3	Ver. 1.0	95.88 x 90.17 mm



LK-027

Packing List

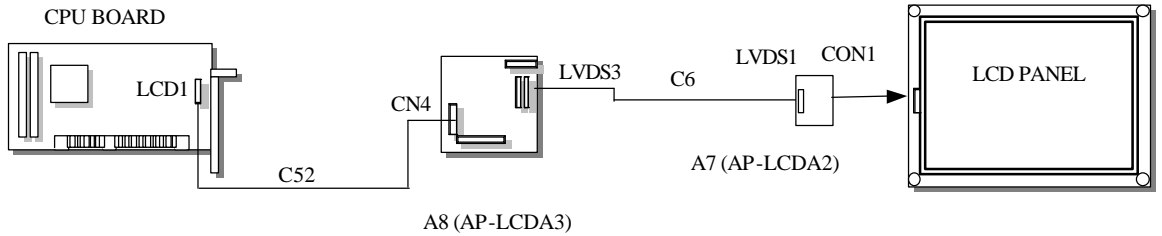
Code	Parts No.	Description	Length	Q' ty	
C6	0800307200002	20-pin to 20-pin	660 mm	1	
C52	0800312520001	52-pin to 52-pin	250 mm	1	
Code	Parts No.	Interface Type	Version	Size	Q' ty
A7	S01LCDA200410	AP-LCDA2	1.1	74 x 70 mm	1
A8	S01LCDA300110	AP-LCDA3	1.0	31 x 23 mm	1

Installation

Connection							
CPU BOARD	C52	AP-LCDA3		C6	AP-LCDA2		Panel
LCD1		CN4	LVDS3		LVDS1	CON1	

Note :

- 1.Set jumper JP1 on A8 to 5V.
- 2.Set jumper JP3 on A8 to +Vee.
- 3.Connect each side of C52 to LCD1 on CPU board and CN4 on A8.
- 4.Connect each side of C6 to LVDS3 on A8 and LVDS1 on A7.
- 5.Connect CON1 on A7 to panel.



LK-028

Packing List

Code	Parts No.	Description		Length	Q' ty
C18	0800313410001	41-pin to 15 / 15-pin		600 mm	1
Code	Parts No.	Interface Type	Version	Size	Q' ty
A13	S01LCDA700110	AP-LCDA7	1.0	14.48 x 44.25 mm	1

Installation

Connection					
CPU BOARD	LCD1	A13	CN1 / 3	C18	Panel
LCD1			CN2		

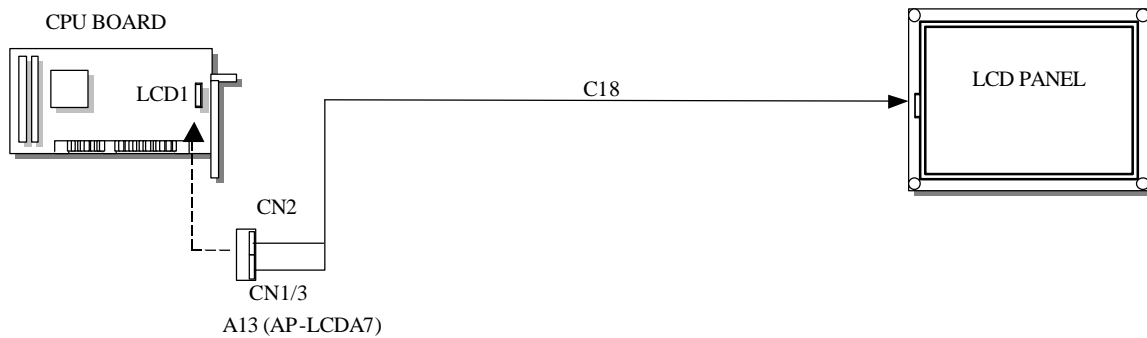
Note :

1. Connect 15-pin connector which has yellow wires on pin 1 to pin 3 of C18 to CN1/3 on A13.

2. Connect 15-pin connector which has red wires on pin 1 and pin 2 of C18 to CN2 on A13.

3. Connect LCD1 of A13 to LCD1 on CPU board.

4. Connect 41-pin connector of C18 to LCD panel.



LK-029

Packing List

Code	Parts No.	Description	Length	Q' ty	
C19	0800313310001	31-pin to 15 / 15-pin	600 mm	1	
Code	Parts No.	Interface Type	Version	Size	Q' ty
A13	S01LCDA700110	AP-LCDA7	1.0	14.48 x 44.25 mm	1

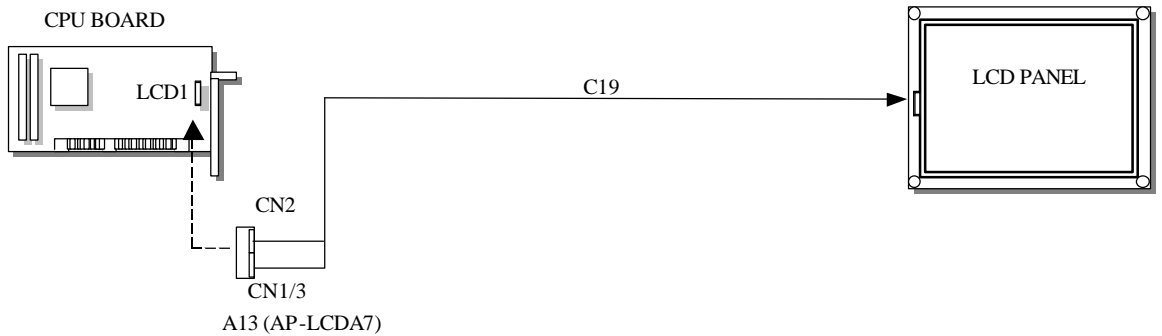
Installation

Connection					
CPU BOARD	LCD1	A13	CN1 / 3	C19	Panel
LCD1			CN2		

Note :

- 1.Connect 15-pin connector which has “yellow wires” on pin 1 to pin 3 of C19 to CN1/3 on A13.
- 2.Connect 15-pin connector which has “red wires” on pin 1 and pin 2 of C19 to CN2 on A13.
- 3.Connect LCD1 of A13 to LCD1 on CPU board.

4.Connect 31-pin connector of C19 to LCD panel.



LK-034

Packing List

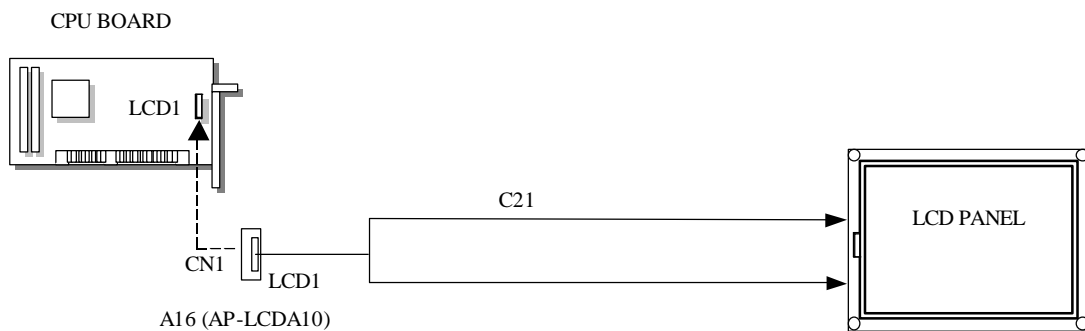
Code	Parts No.	Description		Length	Q' ty
C21	0800357500001	50-pin to 25 / 30-pin		500 mm	1
Code	Parts No.	Interface Type	Version	Size	Q' ty
A16	S01LCDA100Y10	AP-LCDA10	0.0	22.00 x 44.10 mm	1

Installation

Connection					
CPU BOARD	CN1	A16	LCD1	C21	Panel
LCD1					

Note :

- 1.Connect 50-pin connector of C21 to LCD1 on A16.
- 2.Connect CN1 of A16 to LCD1 on CPU board.
- 3.Connect 25-pin and 30-pin connectors of C21 to LCD panel.



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 :
MOV DX, 443H
MOV AL, 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

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.

