

HS-2601A

**Intel Low Power Mobile 500MHz
Mini Board Computer**

- 3.5" Size • All-in-One • CRT/Panel • LAN • WDT •
- DOC • 2 USB • IrDA • PC/104 • Flash Disk •
- PCI Bus Mini Board •

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Table of Contents

Chapter 1	General Description	6
1.1	Major Features	2
1.2	Specifications	3
1.3	Board Dimensions	4
Chapter 2	Unpacking	5
2.1	Opening the Delivery Package	5
2.2	Inspection	5
Chapter 3	Hardware Installation	7
3.1	Before Installation	7
3.2	Board Layout	8
3.3	Jumper List	9
3.4	Connector List	9
3.5	Configuring the CPU	9
3.6	System Memory	10
3.7	DiskOnChip™ Address Setting	10
	3.7.1 Installing DiskOnChip™ Modules	10
	3.7.1 Removing DiskOnChip™ Modules	11
3.8	VGA Controller	12
	JP2: Panel Voltage Select	12
	CN6: 15-pin CRT Connector (DB15)	12
	CN10: 50-pin Panel Connector	13
3.9	IDE Drive Connector	14
	CN12: Primary IDE Connector	14
3.10	Floppy Disk Drive Connector	15
	CN11: FDD Connector	15
3.11	Serial Port Connectors	16
	CN15 and CN14: COM1/COM2 Connector (5x2 Header)	16
3.12	Parallel Connector	16
	CN16: Parallel Connector	16
3.13	Ethernet Connector	17
	CN4: RJ-45 and LAN LED Connector	17
3.14	IrDA Connector	17
	CN9: IrDA Connector	17
3.15	USB Connector	18
	CN13: USB Connector	18
3.16	CMOS Data Clear	18
	JP4: Clear CMOS	18

3.17 Power Connectors -----	18
CN1: 4-pin Power Connector -----	18
CN5: 2-pin Power Input Connector-----	19
3.18 Keyboard/Mouse Connectors -----	19
CN8: 6-pin Keyboard/Mouse Connector -----	19
CN7: PS/2 6-pin Mini DIN Keyboard/Mouse Connector-----	19
3.19 System Front Panel Connectors -----	19
LD2: IDE LED Connector -----	19
LD1: Power LED -----	20
JP3: Reset Button Connector -----	20
3.20 Watchdog Timer -----	20
JP1 : Watchdog Timer Active Type Setting -----	20
3.21 CompactFlash™ Connector-----	22
3.22 Mini PCI Connector -----	23
PC1: Mini PCI Connector Pin Information -----	23
3.23 PC/104 Connectors -----	25
CN3: 40-pin PC/104 Expansion Slot -----	25
CN2: 64-pin PC/104 Expansion Slot -----	26
Chapter 4 Award BIOS Setup -----	27
4.1 Starting Setup -----	27
4.2 Using Setup -----	28
4.2.1 Getting Help-----	28
4.3 Main Menu -----	29
4.4 Standard CMOS Setup-----	31
4.5 BIOS Features Setup-----	34
4.6 Chipset Features Setup -----	39
4.7 Power Management Setup -----	43
4.7.1 PM Timers -----	45
4.7.2 Reload Global Timer Events -----	46
4.8 PNP/PCI Configuration -----	47
4.9 Load BIOS Defaults-----	48
4.10 Load Setup Defaults-----	49
4.11 Integrated Peripherals -----	50
4.12 Supervisor/User Password Setting-----	53
4.13 IDE HDD Auto Detection -----	54
4.14 Save & Exit Setup -----	55
4.15 Exit Without Saving-----	56
Chapter 5 Software Utilities -----	57
5.1 VGA Driver Installation for Win 95/98-----	57
5.2 VGA Driver Installation for Win NT4.0 -----	59
5.3 LAN Driver Installation for WIN95 & WIN98-----	62
5.3.1 Win98-----	62
5.3.2 Win95-----	62
5.4 LAN Driver Installation for Win NT4.0 -----	64

Safety Instructions

Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

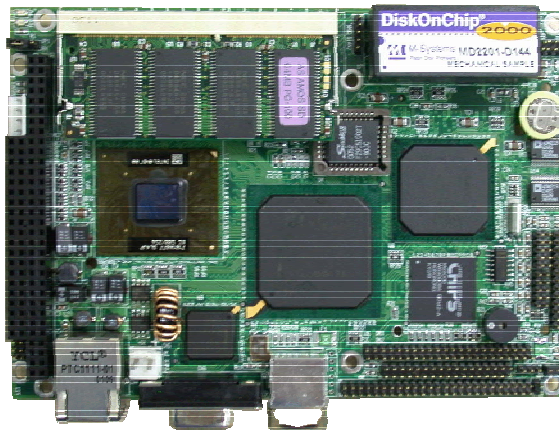
- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components. Fasten the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please wear and connect the strap before handle the HS-2601A to ensure harmlessly discharge any static electricity through the strap.
- Please use an anti-static pad when putting down any components or parts or tools outside the computer. You may also use an anti-static bag instead of the pad. Please inquire from your local supplier for additional assistance in finding the necessary anti-static gadgets.

NOTE: *DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTION.*

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Chapter 1

General Description



The HS-2601A is a 100MHz Intel® BX chipset-based Mini PCI Bus Intel Mobile board. With features such as enhanced I/O effects with CRT/VGA, and LAN all combined, the HS-2601A is an ideal all-in-one compact-size board for the demanding embedded applications and IA platforms.

Its onboard DMA33 to IDE drive interface architecture allows the HS-2601A to support data transfers of 33MB/sec with a maximum of two IDE drives. Its Intel® BX chipset design makes it possible for the board to support most Intel Mobile microprocessors in the market, The C&T 69000 CRT/Panel display controller offers an on-chip 2MB memory that supports up to 1280x1024x256 colors display resolution.

For suitable installation into any size system with 8/16/32bit ISA and/or PCI slots operation, the board's advanced PISA bus add-on feature allows user to easily obtain both ISA's 16bit and PCI's 32bit full set signals from a half size PISA slot. System memory is also sufficient with the two DIMM sockets that can support up to 256MB.

Additional onboard connectors include an advanced USB and IrDA ports providing faster data transmission, a DOS-compatible DiskOnChip™ socket with a maximum capacity of 288MB, and one external RJ45 connector for 10/100 Base-TX Ethernet use.

To ensure the reliability in an unmanned or standalone system, the Watchdog Timer (WDT) onboard HS-2601A is designed with pure hardware that does not need the arithmetical functions of a real-time clock chip. If any program causes unexpected halts to the system, the onboard Watchdog Timer (WDT) will automatically reset the CPU or generate an interrupt to resolve such condition.

1.1 Major Features

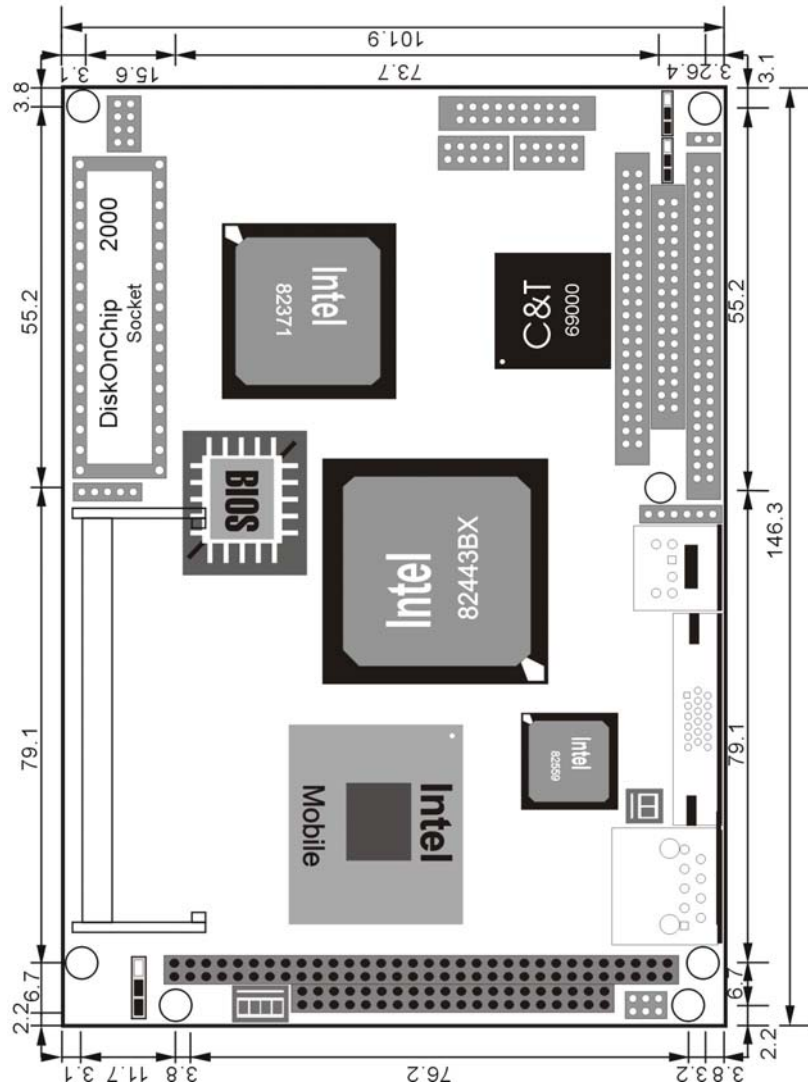
The HS-2601A comes with the following features:

- BGA Packaged Intel® Low Power Mobile CPU at 500MHz, 700MHz, and 800MHz
- One SO-DIMM socket with a maximum capacity of 256MB
- Fast PCI DMA33 controller supporting two IDE disk drives
- Mini PCI Local Bus support
- Two RS-232 serial ports
- PS/2 Keyboard and PS/2 Mouse connectors
- One enhanced bi-directional parallel port supporting SPP/ECP/EPP modes
- Winbond W83977 super I/O chipset
- C&T 69000 CRT/Panel display controller
- Intel® 82559 100 Base-TX LAN controller
- DiskOnChip™ memory size up to 288MB
- PC/104 Bus connector
- Optional 8~64MB Flash Disk support

1.2 Specifications

- **CPU:** Intel® Low Power Mobil CPU from 500-800 MHz
- **Bus Interface:** Mini PCI Local Bus
- **Memory:** One SO-DIMM socket supporting up to 256MB
- **Chipset:** Intel® 82443BX
- **I/O Chipset:** Winbond W83977
- **VGA:** C&T 69000 with 2MB memory supporting CRT/Panel displays up to 1280 x1024 at 256 colors
- **IDE:** Two IDE disk drives supporting ATA/33 and with a transfer rate up to 33MB/sec
- **Flash Disk:** 8~64 MB IDE interface Flash Disk support (optional)
- **FDD:** Supports up to two floppy disk drives
- **Parallel:** One enhanced bi-directional parallel port supporting SPP/ECP/EPP
- **LAN:** Intel® 82559 100 Base-TX LAN
- **Serial Port:** Two RS-232 serial ports include 16C550 UART with 16byte FIFO
- **IrDA:** One IrDA TX/RX header
- **USB:** Two USB ports
- **CompactFlash™:** One optional CompactFlash™ adapter slot on solder side
- **Keyboard/Mouse:** PS/2 6-pin Mini DIN or 6-pin connector
- **DiskOnChip™:** Socket for DiskOnChip and memory size up to 288MB
- **BIOS:** Award PnP Flash BIOS
- **Watchdog Timer:** Sets 1, 2, 10, 20, 110, 220 seconds activity trigger with Reset or NMI
- **CMOS:** Battery backup
- **DMA Channels:** 7
- **Interrupt Levels:** 15
- **PC/104:** PC/104 connector for 16bit ISA Bus
- **Main Power:** Single +5V power input
- **Extra Power:** One 4-pin +12V/-12V connector
- **Max. Power Consumption:** +5V@6A
- **Operating Temperature:** 0~60 °C
- **Board Size:** 10.3 x 14.6 cm

1.3 Board Dimensions



Chapter 2

Unpacking

2.1 Opening the Delivery Package

The HS-2601A is packed in an anti-static bag. The board has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

2.2 Inspection

After unpacking the board, place it on a raised surface and carefully inspect the board for any damage that might have occurred during shipment. Ground the board and exercise extreme care to prevent damage to the board from static electricity.

Integrated circuits will sometimes come out of their sockets during shipment. Examine all integrated circuits, particularly the BIOS, processor, memory modules, ROM-Disk, and keyboard controller chip to ensure that they are firmly seated. The HS-2601A delivery package contains the following items:

- ◆ HS-2601A Industrial Single Board
- ◆ Printer Ports Flat Cable x 1
- ◆ COM port Flat Cable x 1
- ◆ IDE port Flat Cable x 1
- ◆ FDD port Flat Cable x 1
- ◆ PS/2 Keyboard/Mouse Transfer Cable x 1
- ◆ Utility Disc
- ◆ User's Manual

It is recommended that you keep all the parts of the delivery package intact and store them in a safe/dry place for any unforeseen event requiring the return shipment of the product. In case you discover any missing and/or damaged items from the list of items, please contact your dealer immediately.

Chapter 3

Hardware Installation

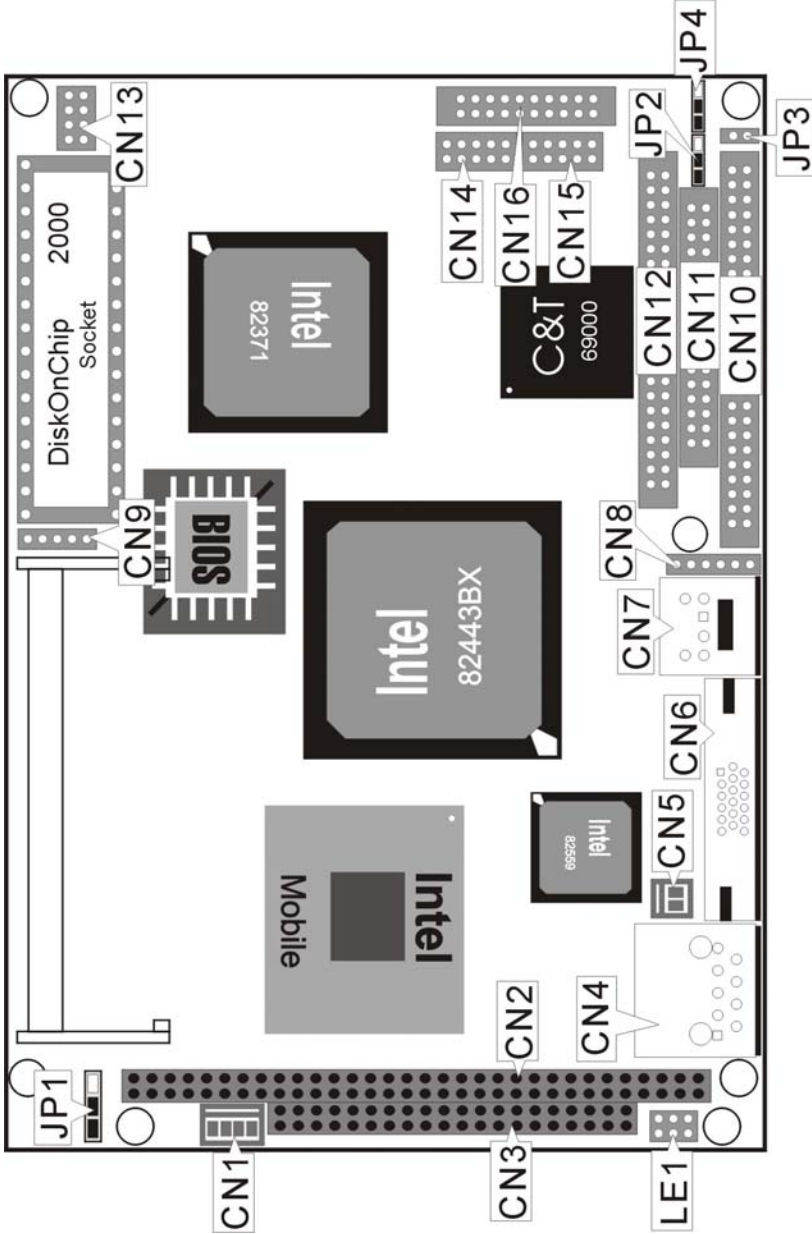
This chapter provides the information on how to install the hardware using the HS-2601A. This chapter also contains information related to jumper settings of switch, watchdog timer, and the DiskOnChip™ address selection etc.

3.1 Before Installation

After confirming your package contents, you are now ready to install your hardware. The following are important reminders and steps to take before you begin with your installation process.

1. Make sure that all jumper settings match their default settings and CMOS setup correctly. Refer to the sections on this chapter for the default settings of each jumper.
2. Go through the connections of all external devices and make sure that they are installed properly and configured correctly within the CMOS setup. Refer to the sections on this chapter for the detailed information on the connectors.
3. Keep the manual and diskette in good condition for future reference and use.

3.2 Board Layout



3.3 Jumper List

Jumper	Definition	Default	Page
JP1	Watchdog Timer Active Type Select	Short 2-3	20
JP2	Panel Voltage Select	Short 1-2	12
JP4	Clear CMOS	Short 1-2	18

3.4 Connector List

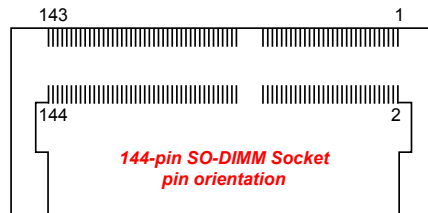
Connector	Definition	Page
JP3	Reset Button	20
CN1	4-pin Power In Connector	18
CN2	PC/104 64-pin Connector	26
CN3	PC104 40-pin Connector	25
CN4	RJ45 and LAN LED Connector	17
CN5	2-pin Power In Connector	18
CN6	CRT Connector	12
CN7	PS/2 6-pin Mini Din KB/Mouse Connector	19
CN8	6-pin Keyboard/Mouse Connector	19
CN9	IrDA Connector	17
CN10	Panel Connector	13
CN11	Floppy Connector	15
CN12	IDE Connector	14
CN13	USB Connector	18
CN14	COM2 Connector (5x2 Header)	16
CN15	COM1 Connector (5x2 Header)	16
CN16	Parallel Connector	16
CN17	CompactFlash™ Connector	22
LD1	Power LED Connector	19
LD2	HDD LED Connector	19
PC1	Mini PCI Connector	23
U2	SO-DIMM Socket	10
U7	DiskOnChip™ Socket	10

3.5 Configuring the CPU

The HS-2601A, with its onboard BGA processor, auto-detects the features of the mounted microprocessor onboard. The HS-2601A automatically identifies the frequency and clock speed of the installed microprocessor chip, thereby eliminating the need for user to do additional CPU configuration or hardware settings related to it.

3.6 System Memory

The HS-2601A provides one SO-DIMM socket at location *U2*. This onboard memory socket can support 64MB, 128MB and 256MB SO-DIMM modules. The system's maximum memory capacity is 256MB.



NOTE: *SO-DIMM sockets out on the market these days have very fragile contacts that attach to modules. We highly recommend you not to regularly remove the installed SO-DIMM from its socket. Doing so may wear out the contact between the socket and module.*

3.7 DiskOnChip™ Address Setting

The DiskOnChip™ function allows the system to boot or operate without a FDD or a HDD. DiskOnChip™ modules may be formatted as drive C or A. With DiskOnChip™, user may also execute DOS commands such as FORMAT, SYS, COPY, XCOPY, DISCOPY and DISKCOMP etc.

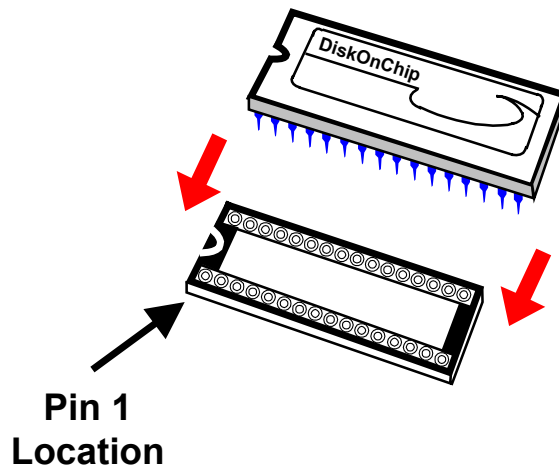
The *U7* location onboard the HS-2601A is the DiskOnChip™ module socket. The board circuitry assigns a LOCKED starting memory address of the installed module at D000. If you have another memory device that has a similar memory capacity with that of the DOC in your system, please set both at different memory address mapping to avoid the mapping area conflicts. Failing to do so will not make the HS-2601A and the additional memory device function properly.

3.7.1 Installing DiskOnChip™ Modules

When installing a DiskOnChip™ module onto your board, please take note of the following:

1. Orient yourself properly with the location of the DiskOnChip™ socket. Try to locate the pin 1 location on your socket. Pin numbers are usually printed on either the component side or the solder side of your board.
2. Locate the Pin 1 location on your DiskOnChip™ module. More often than not, Pin 1 can be found on the lower right corner of the chip. Please refer to the diagram for the exact location.

3. Once you have figured out where the pin 1 locations are on both chip and socket, align the module's pins on an upright angle against the socket. Using both thumbs, gently press the module into the socket until all the pins are secured to their designations.



4. The installation is now complete and your module is now ready for use.

NOTE: *If you encounter difficulty installing your DiskOnChip™ module, please consult a qualified technician or engineer to perform the installation.*

3.7.1 Removing DiskOnChip™ Modules

When removing a DiskOnChip™ module from its socket, please take note of the following:

1. Loosen the contact of the module from its socket using a screwdriver.
2. Insert the screwdriver's flat head into a gap on either end of the socket. Do not insert the screwdriver head on either side where the pins are located. Doing so might damage the pins in the process.
3. Slowly lift the screwdriver handle upwards. This will disengage the module from its socket.

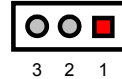
NOTE: *If you encounter difficulty removing your DiskOnChip™ module, please consult a qualified technician or engineer to remove it for you.*

3.8 VGA Controller

The HS-2601A has an onboard jumper that selects the working voltage of the flat panel connected to the system. Jumper *JP2* offers two voltage settings for the user.

- **JP2: Panel Voltage Select**

Options	Settings
5.0 V (default)	Short 1-2
3.3 V	Short 2-3



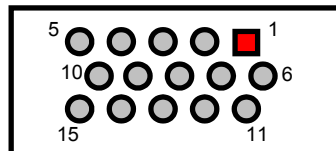
WARNING: Please contact the supplier of your panel and make sure of the correct voltage it uses. Incorrect settings on *JP8* may cause internal damage to your panel.

The built-in C&T 69000 CRT/Panel display controller, onboard HS-2601A, uses 2MB memory to support resolutions up to 1280x1024x256 colors.

The HS-2601A provides two connection methods of a VGA device. *CN20* offers a single standard CRT connector (DB15) while *CN16* is the 50-pin panel connector onboard reserved for flat panel installation.

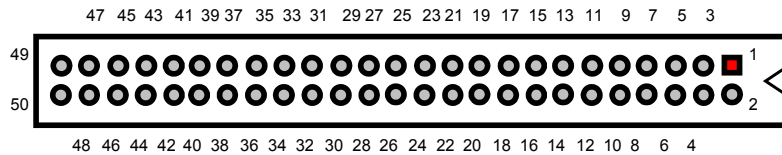
- **CN6: 15-pin CRT Connector (DB15)**

PIN	Description	PIN	Description
1	Red	2	Green
3	Blue	4	N/C
5	GND	6	GND
7	GND	8	GND
9	N/C	10	GND
11	N/C	12	GND
13	HSYNC	14	VSYNC
15	GND		



● **CN10: 50-pin Panel Connector**

PIN.	Description	PIN	Description
1	+12V	2	+12V
3	GND	4	GND
5	3.3V / 5V ^{Note}	6	ENAVDD
7	ENAVEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	P24	34	P25
35	SHFCLK	36	FLM
37	M	38	LP
39	GND	40	ENABKL
41	P26	42	P27
43	P28	44	P29
45	P30	46	P31
47	P32	48	P33
49	P34	50	P35



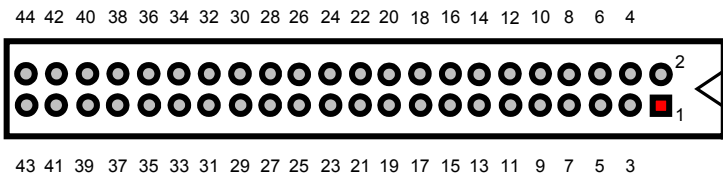
NOTE: Please set the proper voltage of your panel using JP8 before proceeding on installing it.

3.9 IDE Drive Connector

CN12, a 44-pin connector, provides the PCI E-IDE drive provisions onboard. A maximum of four IDE drives may be connected on them.

- **CN12: Primary IDE Connector**

CN15	Description	CN15	Description
1	BRSTDRVJ	2	GND
3	DD7-1	4	DD8-1
5	DD6-1	6	DD9-1
7	DD5-1	8	DD10-1
9	DD4-1	10	DD11-1
11	DD3-1	12	DD12-1
13	DD2-1	14	DD13-1
15	DD1-1	16	DD14-1
17	DD0-1	18	DD15-1
19	GND	20	N/C
21	RPDDREQ-	22	GND
23	RPDIOW-	24	GND
25	RPDIOR-	26	GND
27	PIORDY	28	PRIPD1-
29	RPDACK-	30	GND
31	IRQ14	32	N/C
33	RPDA1-	34	N/C
35	RPDA0-	36	RPDA2-
37	RPCS1-	38	RPCS3-
39	HLED	40	GND
41	VCC	42	VCC
43	GND	44	VCC

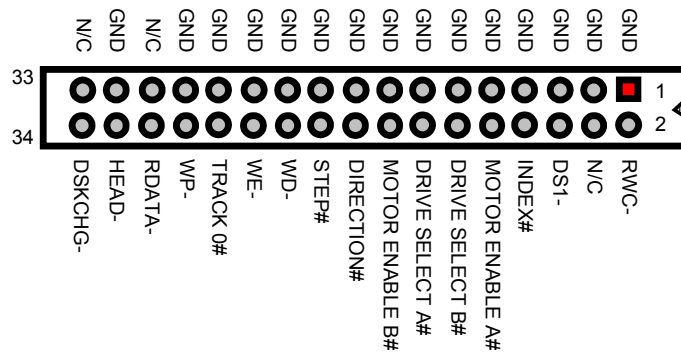


3.10 Floppy Disk Drive Connector

The HS-2601A uses a standard 34-pin header connector, *CN11*, for floppy disk drive connection. A total of two FDD drives may be connected to *CN11* at any given time.

- **CN11: FDD Connector**

PIN	Description	PIN	Description
1	GND	2	RWC-
3	GND	4	N/C
5	GND	6	DS1-
7	GND	8	Index#
9	GND	10	Motor Enable A#
11	GND	12	Drive Select B#
13	GND	14	Drive Select A#
15	GND	16	Motor Enable B#
17	GND	18	Direction#
19	GND	20	Step#
21	GND	22	WD-
23	GND	24	WE-
25	GND	26	Track 0#
27	GND	28	WP-
29	N/C	30	RDATA-
31	GND	32	HEAD-
33	N/C	34	DSKCHG-

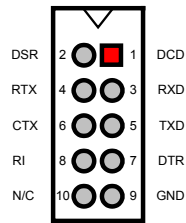


3.11 Serial Port Connectors

The HS-2601A offers two NS16C550 compatible UARTs with Read/Receive 16byte FIFO serial ports and two internal 10-pin headers.

- **CN15 and CN14: COM1/COM2 Connector (5x2 Header)**

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTX
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	N/C



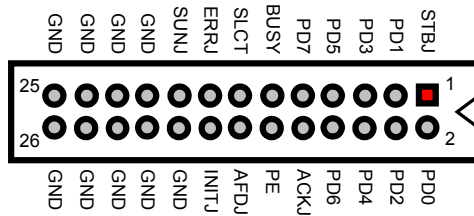
CN14 and CN15

3.12 Parallel Connector

CN16 is a standard 26-pin flat cable connector deigned to accommodate parallel port connection onboard the HS-2601A.

- **CN16: Parallel Connector**

PIN	Description	PIN	Description
1	STBJ	2	PD0
3	PD1	4	PD2
5	PD3	6	PD4
7	PD5	8	PD6
9	PD7	10	ACKJ
11	BUSY	12	PE
13	SLCT	14	AFDJ
15	ERRJ	16	INITJ
17	SLINJ	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND	26	GND

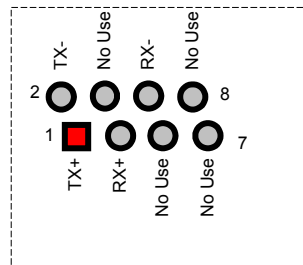


3.13 Ethernet Connector

The HS-2601A provides one external RJ-45 10/100 Base-TX LAN interface connector. Please refer to the following detail of pin information.

- **CN4: RJ-45 and LAN LED Connector**

PIN	Description
1	TX+
2	TX-
3	RX+
4	No Use
5	No Use
6	RX-
7	No Use
8	No Use
9	GND



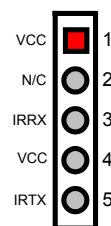
Aside from the RJ-45 provision onboard the HS-2601A, the board also features an LED indicator that displays the 10T speed running, 100T speed running, and active status of the LAN connection.

3.14 IrDA Connector

CN9 is a 5-pin internal IR communication connector for connection of an IrDA device.

- **CN9: IrDA Connector**

PIN	Description
1	VCC
2	FIRRX
3	IRRX
4	GND
5	IRTX

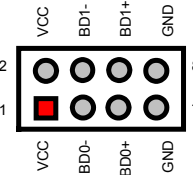


3.15 USB Connector

The HS-2601A provides one 8-pin connector for USB0 & USB1 port connections at location CN13.

- **CN13: USB Connector**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	BD0-	4	BD1-
5	BD0+	6	BD1+
7	GND	8	GND

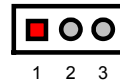


3.16 CMOS Data Clear

The HS-2601A has a Clear CMOS jumper on JP4. The JP4 settings below apply to the standard HS-2601A using a battery backed up CMOS chip.

- **JP4: Clear CMOS**

Options	Settings
Normal Operation	Short 1-2
* Clear CMOS	Short 2-3



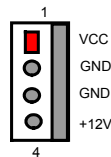
IMPORTANT: The default setting of JP4 is Short 2-3. Before you turn on the power of your system, please set JP4 to Short 1-2 for normal operation.

3.17 Power Connectors

HS-2601A provides one 4-pin power connector at CN1 and a single 2-pin power connector at CN5.

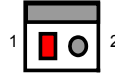
- **CN1: 4-pin Power Connector**

PIN	Description
1	VCC
2	GND
3	GND
4	+12V



- **CN5: 2-pin Power Input Connector**

PIN	Description
1	+5V
2	GND



3.18 Keyboard/Mouse Connectors

The HS-2601A offers two possibilities for keyboard connections. The connections are via *CN7* for an external PS/2 type keyboard/mouse or via *CN8* for an internal 5-pin cable converter to an AT keyboard.

- **CN8: 6-pin Keyboard/Mouse Connector**

PIN	Description
1	Keyboard Clock
2	Keyboard Data
3	Mouse Data
4	GND
5	VCC
6	Mouse Clock

- **CN7: PS/2 6-pin Mini DIN Keyboard/Mouse Connector**

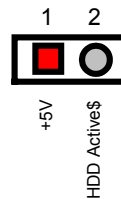
PIN	Description
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC
5	Keyboard Clock
6	Mouse Clock

3.19 System Front Panel Connectors

The HS-2601A has one LED at location *LD1* that indicates the power-on status. This visual feature of the IDE LED may also be connected to an external IDE LED via connector *LD2*.

- **LD2: IDE LED Connector**

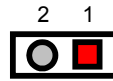
PIN	Description
1	+5V
2	HDD ACTIVE#



LD1 and JP3 are the Keylock and Reset Button connectors onboard.

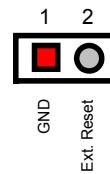
- **LD1: Power LED**

PIN	Description
1	+5V
2	GND



- **JP3: Reset Button Connector**

PIN	Description
1	GND
2	External Reset



3.20 Watchdog Timer

There are three access cycles of Watch-Dog Timer as Enable, Refresh and Disable are the three access cycles of Watchdog Timer. The Enable cycle proceeds via READ PORT 443H whereas the Disable cycle proceeds via READ PORT 045H. A continued Enable cycle after a first Enable cycle means Refresh.

Once the Enable cycle is active, a Refresh cycle is requested before the time-out period. This restarts counting of the WDT period. When the time counting goes over the period preset of WDT, it will assume that the program operation is abnormal. A System Reset signal to re-start or a NMI cycle to the CPU transpires when such error happens. Jumper JP1 is used to select the function of Watchdog Timer.

- **JP1: Watchdog Timer Active Type Setting**

Options	Settings
Active NMI	Short 1-2
System Reset (default)	Short 2-3
Disabled Watchdog Timer	Open



The Watchdog Timer is disabled after the system Power-On. It can be enabled via an Enable cycle and reading the control port (443H), or via a Refresh cycle and reading the control port (443H), or via a Disable cycle and reading the disable control port (045H).

After an Enable cycle of WDT, user must immediately execute a Refresh cycle to WDT before its period setting comes to an end every 1, 2, 10, 20, 110 or 220 seconds. If the Refresh cycle does not activate before WDT period cycle, the onboard WDT architecture will issue a Reset or NMI cycle to the system. There are three I/O ports that control the Watchdog Timer.

443H	I/O Read	The Enable cycle
443H	I/O Read	The Refresh cycle
045H	I/O Read	The Disable cycle

The following sample program shows how to Enable, Disable and Refresh the Watchdog Timer :

```

WDT_EN_RF    EQU    0433H
WDT_DIS      EQU    0045H

WT_Enable    PUSH    AX                ; keep AX DX
              PUSH    DX
              MOV     DX,WDT_EN_RF    ; enable the WDT
              IN     AL,DX
              POP     DX                ; get back AX, DX
              POP     AX
              RET

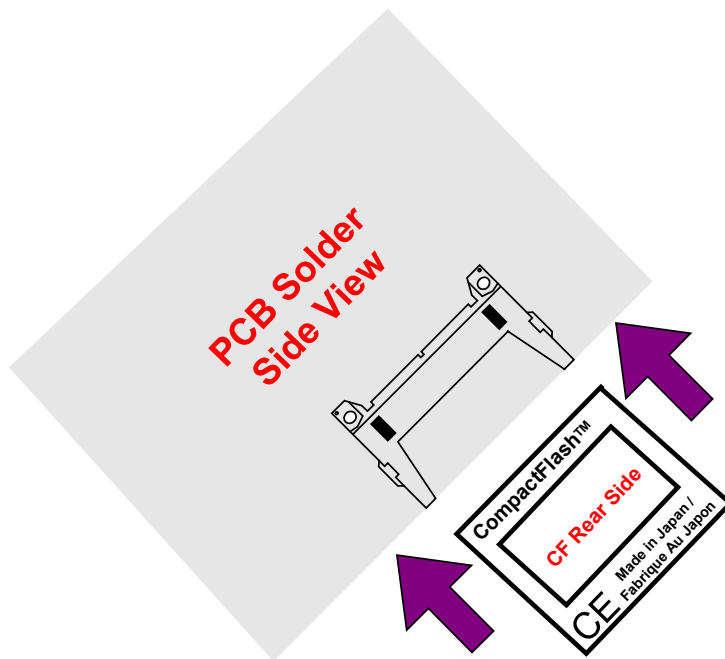
WT_Refresh   PUSH    AX                ; keep AX, DX
              PUSH    DX
              MOV     DX,WDT_ET_RF    ; refresh the WDT
              IN     AL,DX
              POP     DX                ; get back AX, DX
              POP     AX
              RET

WT_DISABLE   PUSH    AX
              PUSH    DX
              MOV     DX,WDT_DIS      ; disable the WDT
              IN     AL,DX
              POP     DX                ; get back AX, DX
              POP     AX
              RET

```

3.21 CompactFlash™ Connector

The HS-2601A also offers an optional CompactFlash™ connector which is IDE interface located at the solder side of the board (beneath the SO-DIMM connector). The designated *CN17* connector, once soldered with an adapter, can hold CompactFlash™ cards of various sizes. Please turn off the power before inserting the CF card. Inserting a CompactFlash™ card into the adapter is not a difficult task. The socket and card are both keyed and there is only one direction for the card to be completely inserted. Refer to the diagram below for the traditional way of inserting the card.



3.22 Mini PCI Connector

HS-2601A supports a Mini PCI interface which is a very popular notebook computer expansion interface for Modem, Video, LAN, etc. The Mini PCI onboard HS-2601A is at location *PC1* with pin definitions listed on the table below.

- **PC1: Mini PCI Connector Pin Information**

PIN.	Description	PIN.	Description
1	INTB#	2	5V
3	3.3V	4	D#
5	RESERVED	6	RESERVED
7	GND	8	N.C.
9	CLK	10	RST#
11	GND	12	3.3V
13	REQ#	14	GNT#
15	3.3V	16	GND
17	AD[31]	18	PME#
19	AD[29]	20	RESERVED
21	GND	22	AD[30]
23	AD[27]	24	3.3V
25	AD[25]	26	AD[28]
27	RESERVED	28	AD[26]
29	C/BE[3]#	30	AD[24]
31	AD[23]	32	IDSEL
33	GND	34	GND
35	AD[21]	36	AD[22]
37	AD[19]	38	AD[20]
39	GND	40	PAR
41	AD[17]	42	AD[18]
43	C/BE[2]#	44	AD[16]
45	IRDY#	46	GND
47	3.3V	48	FRAME#
49	CLKRUN#	50	TRDY#
51	SERR#	52	STOP#
53	GND	54	3.3V
55	PERR#	56	DEVSEL#
57	C/BE[1]#	58	GND
59	AD[14]	60	AD[15]
61	GND	62	AD[13]
63	AD[12]	64	AD[11]
65	AD[10]	66	GND
67	GND	68	AD[9]
69	AD[8]	70	C/BE[0]#

... More on next page ...

PIN.	Description	PIN.	Description
71	AD[7]	72	3.3V
73	3.3V	74	AD[6]
75	AD[5]	76	AD[4]
77	RESERVED	78	AD[2]
79	AD[3]	80	AD[0]
81	5V	82	RESERVED_WIP2
83	AD[1]	84	RESERVED_WIP2
85	GND	86	GND
87	AC_SYNC	88	M66EN
89	AC_SDATA_IN	90	AC_SDATA_OUT
91	AC_BIT_CLK	92	AC_CODEC_IDO#
93	AC_CODEC_ID1#	94	AC_RESET#
95	MOD_AUDIO_MON	96	RESERVED
97	AUDIO_GND	98	GND
99	SYS_AUDIO_OUT	100	SYS_AUDIO_IN



**Mini PCI Socket
pin orientation**

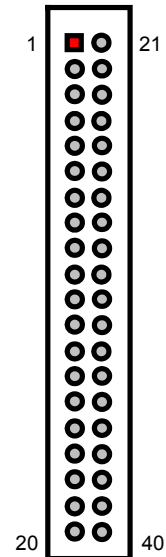
3.23 PC/104 Connectors

The PC/104 expansion bus offers provisions to connect all types of PC/104 modules. With the PC/104 bus being known as the new generation of industrial embedded 16bit PC standard bus, thousands of PC/104 modules from multiple vendors can be easily installed onboard. The detailed pin assignment of the PC/104 expansion bus connectors *CN10* and *CN11* are listed on the following tables:

NOTE : *The PC/104 connector allows direct plugging or stack-through piling of PC/104 modules without requiring the PC/104 mounting kit.*

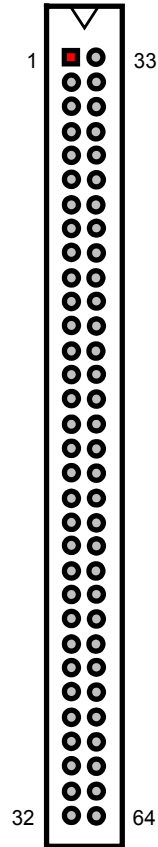
● CN3: 40-pin PC/104 Expansion Slot

PIN	Description	PIN	Description
1	GND	21	GND
2	MEMCS16*	22	SBHE*
3	IOSC16*	23	LA23
4	IRQ10	24	LA22
5	IRQ11	25	LA21
6	IRQ12	26	LA20
7	IRQ15	27	LA19
8	IRQ14	28	LA18
9	DACK0*	29	LA17
10	DRQ0	30	MEMR*
11	DACK5*	31	MEMW*
12	DRQ5	32	SD8
13	DACK6*	33	SD9
14	DRQ6	34	SD10
15	DACK7*	35	SD11
16	DRQ7	36	SD12
17	+5V	37	SD13
18	MASTER*	38	SD14
19	GND	39	SD15
20	GND	40	N/C



● CN2: 64-pin PC/104 Expansion Slot

PIN	Description	PIN	Description
1	IOCHECK*	33	GND
2	SD7	34	RESETDRV
3	SD6	35	+5V
4	SD5	36	IRQ9
5	SD4	37	-5V
6	SD3	38	DRQ2
7	SD2	39	-12V
8	SD1	40	NOW*
9	SD0	41	+12V
10	IOCHRDY	42	GND
11	AEN	43	SMEMW*
12	SA19	44	SMEMR*
13	SA18	45	IOW*
14	SA17	46	IOR*
15	SA16	47	DACK3*
16	SA15	48	DRQ3
17	SA14	49	DACK1*
18	SA13	50	DRQ1
19	SA12	51	REFRESH*
20	SA11	52	SYSCLK
21	SA10	53	IRQ7
22	SA9	54	IRQ6
23	SA8	55	IRQ5
24	SA7	56	IRQ4
25	SA6	57	IRQ3
26	SA5	58	DACK2*
27	SA4	59	TC
28	SA3	60	BALE
29	SA2	61	+5V
30	SA1	62	OSC
31	SA0	63	GND
32	GND	64	GND



Chapter 4

Award BIOS Setup

The HS-2601A uses Award PCI/ISA BIOS for the system configuration. The Award BIOS setup program is designed to provide the maximum flexibility in configuring the system by offering various options that could be selected for end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Starting Setup

The Award BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing immediately after switching the system on, or
2. By pressing the key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

4.2 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the <PageUp> and <PageDown> keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Calendar, only for Status Page Setup Menu
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.2.1 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

4.3 Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to enter the sub-menu.

**ROM PCI/ISA BIOS (2A69KD2L)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.**

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑↓→← : Select Item
F10 : Save & Exit	(Shift)F2 : Change Color

NOTE: *A brief description of the highlighted choice appears at the bottom of the screen.*

- **Standard CMOS Setup**
This setup page includes all the items in a standard, AT-compatible BIOS.
- **BIOS Features Setup**
This setup page includes all the items of Award special enhanced features.
- **Chipset Features Setup**
This setup page includes all the items of chipset special features.
- **Power Management Setup**
This entry only appears if your system supports Power Management, "Green PC", standards.
- **PNP/PCI Configuration Setup**
This entry appears if your system supports PNP/PCI.
- **Load BIOS Defaults**
The BIOS defaults have been set by the manufacturer and represent settings that provide the minimum requirements for your system to operate.

- **Load Setup Defaults**

The chipset defaults are settings that provide for maximum system performance. While Award has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.

- **Integrated Peripherals**

This section page includes all the items of IDE hard drive and Programmed Input / Output features.

- **Set Supervisor / User Password**

Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.

- **IDE HDD Auto Detection**

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk's parameters.

- **Save & Exit Setup**

Save CMOS value changes to CMOS and exit setup.

- **Exit Without Saving**

Abandon all CMOS value changes and exit setup.

4.4 Standard CMOS Setup

The Standard Setup is used for the basic hardware system configuration. The main function is for Data/Time and Floppy/Hard Disk Drive settings. Please refer to the following screen for the setup. When the IDE hard disk drive you are using is larger than 528MB, you must set the HDD mode to **LBA** mode. Please use the IDE Setup Utility in BIOS SETUP to install the HDD correctly.

**ROM PCI/ISA BIOS (2A69KD2L)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.**

Data (mm:dd:yy) : Fri, Dec 19 1998									
Time (hh:mm:ss) : 00:00:00									
		TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	:	0	0	0	0	0	0	0	CHS
Primary Slave	:	0	0	0	0	0	0	0	CHS
Secondary Master	:								
Secondary Slave	:								
Drive A	:	1.44M , 3.5 in.							
Drive B	:	None							
LCD&CRT	:	Auto							
Halt On	:	All, But Keyboard							
		Base	Memory	: 640K					
		Extended	Memory	: 15360K					
		Other	Memory	: 384K					
		Total	Memory	: 16384K					
ESC : Quit		↑↓→← : Select Item				PU/PD/ + / - : Modify			
F1 : Help		(Shift) F2: Change Color							

- Date:**
 The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day, from Sun to Sat, determined by the BIOS and is display-only
date	The date, from 1 to 31 (or the maximum allowed in the month)
month	The month, Jan through Dec.
year	The year, from 1900 through 2099

- Time:**
 The time format is <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **Primary Master/Slave & Secondary Master/Slave Drives:**

The categories identify the types of 4 channels that have been installed in the computer. There are 45 predefined types with 4 user-definable types for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type user is user-definable.

Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type "User" to define your own drive type manually.

If you select Type "User", you will need to know the information listed below. Enter the information directly from the keyboard and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".

If the controller of HDD interface is SCSI, the selection shall be "None".

If you select Type "Auto", BIOS will Auto-Detect the HDD & CD-ROM Drive at the POST stage and showing the IDE for HDD & CD-ROM Drive.

If a hard disk has not been installed select NONE and press <Enter>.

TYPE	drive type
CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precompensation
LANDZONE	landing zone
SECTORS	number of sectors
MODE	mode type

- **Drive A / Drive B:**

The category identifies the types of floppy disk drive A or drive B that have been installed in the computer.

None	No floppy 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, 3.5 in	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

- **LCD&CRT:**

The category selects the type of video adapter used for the system monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

BOTH	Enables display of both CRT and LCD
LCD	Enables display of LCD displays only
CRT	Enables display of CRT displays only
Auto	Auto detects the installed display on the system

- **Halt On:** The category determines whether the computer will stop if an error is detected during power up.

No errors	The system boot will not be stopped for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
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.

- **Memory:**

The category is display-only that is determined by POST (Power On Self Test) of the BIOS.

- **Base Memory:** The POST will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with *640K or more memory installed on the motherboard*.
- **Extended Memory:** The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.
- **Total Memory:** This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers in an effort to keep as much base memory free for application programs. The BIOS is the most frequent user of this RAM area since this is where it shadows RAM

4.5 BIOS Features Setup

This section allows you to configure your system for the basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

ROM PCI/ISA BIOS (2A69KD2L) BIOS FEATURES SETUP AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Disabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Processor Number Feature	: Enabled	D4000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot from LAN First	: Disabled	DC000-DFFFF Shadow	: Disabled
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 (Msec)	: 250		
Security Option	: Setup	ESC	: Quit ↑↓→←: Select Item
PS/2 mouse function control	: Enabled	F1	: Help PU/PD+/-: Modify
PCI/VGA Palette Snoop	: Disabled	F5	: Old Values (Shift) F2 : Color
OS Select For DRAM > 64MB	: Non-OS2	F6	: Load BIOS Defaults
Report No FDD For WIN 95	: Yes	F7	: Load Setup Defaults

- **Virus Warning:**

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

<p>! WARNING ! Disk boot sector is to be modified Type "Y" to accept write or "N" to abort write Award Software, Inc.</p>
--

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

NOTE: *Many disk diagnostic programs that attempt to access the boot sector table can cause the above warning message. If you will be running such a program, we recommend that you first disable Virus Protection beforehand.*

- **CPU Internal Cache/External Cache:**

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is enable.

Enabled	Enable cache
Disabled	Disable cache

- **CPU L2 Cache ECC Checking:**

This item allows you to enable/disable CPU L2 Cache ECC checking. The available choices are Enabled, Disabled.

- **Processor Number Feature:**

This option allows the system to automatically detect and display the Pentium III microprocessor installed. When enabled, this option is only available when using Pentium III chips.

- **Quick Power On Self Test:**

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

- **Boot from LAN First:**

When Enabled, the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

- **Boot Sequence:**

This category determines which drive to search first for the disk operating system (i.e., DOS). The available options are:

- | | |
|----------------|--------------|
| ■ A, C, SCSI | ■ SCSI, C, A |
| ■ C, S, SCSI | ■ C only |
| ■ C, CD-ROM, A | ■ LS, C |
| ■ CD-ROM, C, A | ■ Zip100, C |
| ■ D, A, SCSI | ■ USB-FDD, C |
| ■ E, A, SCSI | ■ USB-Zip, C |
| ■ F, A, SCSI | ■ USB-CD, C |
| ■ SCSI, A, C | ■ USB-HDD, C |

- **Swap Floppy Drive:**

This item allows you to determine whether enable the swap floppy drive or not. The available choices are Enabled/Disabled.

- **Boot Up Floppy Seek:**

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS cannot tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

- **Boot Up NumLock Status:**

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on.

On	Keypad is number keys
Off	Keypad is arrow keys

- **Gate A20 Option:**

This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Normal	keyboard
Fast	chipset

- **Typematic Rate Setting:**

This determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin the report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys.

Enabled	Enable typematic rate
Disabled	Disable typematic rate

- **Typematic Rate (Chars/Sec):**

When the typematic rate is enabled, this selection allows you select the rate at which the keys are accelerated.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec):**

When the typematic rate is enabled, this selection allows you to select the delay between when the key was first depressed and when the acceleration begins.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option:**

This category allows you to limit access to the system and Setup, or just to Setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

NOTE: *To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **PS/2 Mouse Function Control:**

This lets you enable or disable the hardware PS/2 mouse function onboard.

- **PCI/VGA Palette Snoop:**

It determines whether the MPEG ISA/VESA VGA Cards can work with PCI/VGA or not.

Enabled	When PCI/VGA working with MPEG ISA/VESA VGA Card
Disabled	When PCI/VGA not working with MPEG ISA/VESA VGA Card

- **OS Select For DRAM > 64MB:**

This item allows you to access the memory that over 64MB in OS/2. The available choices are Non-OS2, OS2.

- **Report No FDD For WIN 95:**

Whether report no FDD for Win 95 or not. The available choices are Yes, No.

- **Video BIOS Shadow:**

Determines whether video BIOS will be copied to RAM. However, it is optional depending on chipset design. Video Shadow will increase the video speed.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

- **C8000 - CBFFF Shadow/D0000 - DFFFF Shadow:**

These categories determine whether option ROMs will be copied to RAM. An example of such option ROM would be support of on-board SCSI.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

4.6 Chipset Features Setup

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and the access to the system memory resources, such as DRAM and the external cache. It also coordinates the communications between the conventional ISA and PCI buses. It must be stated that these items should never be altered. The default settings have been chosen because they provide the best operating conditions for your system. You might consider and make any changes only if you discover that the data has been lost while using your system.

ROM PCI/ISA BIOS (2A69KD2L) CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	Power-Supply Type	: Auto
EDO DRAM Speed Selection	: 60ns	Auto Detect DIMM/PCI Clk	: Enabled
EDO CASx# MA Wait State	: 2	Spread Spectrum	: Disabled
EDO RASx# Wait State	: 1	CPU Host Clock (CPU/PCI)	: Default
SDRAM RAS-to-CAS Delay	: 3	CPU Warning Temperature	: Disabled
SDRAM RAS Precharge Time	: 3	Current CPU Temperature	
SDRAM CAS latency Time	: 2	Shutdown Temperature	: Disabled
SDRAM Precharge Control	: Enabled		
DRAM Data Integrity Mode	: Non-ECC		
System BIOS Cacheable	: Enabled		
Video BIOS Cacheable	: Enabled		
Video RAM Cacheable	: Enabled		
8 Bit I/O Recovery Time	: 3		
16 Bit I/O Recovery Time	: 2		
Memory Hole At 15M-16M	: Disabled		
Passive Release	: Enabled	ESC : Quit	↑↓→←: Select Item
Delayed Transaction	: Disabled	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:**
 Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled. The available choices are Enabled, Disabled.
- EDO DRAM Speed Selection:**
 The DRAM timing is controlled by the DRAM Timing Registers. The timings programmed into this register are dependent on the system design. Slower rates may be required in certain system designs to support loose layouts or slower memory.

50ns	DRAM Timing Type
60ns	DRAM Timing Type

- **EDO CAS# MA Wait State:**
You could select the timing control type of EDO DRAM CAS MA (memory address bus). The available choices are 1, 2.
- **EDO RAS# Wait State:**
You could select the timing control type of EDO DRAM RAS MA (memory address bus). The available choices are 1, 2.
- **SDRAM RAS to CAS Delay:**
You can select RAS to CAS Delay time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The available choices are 2, 3.
- **SDRAM RAS Precharge Time:**
Defines the length of time for Row Address Strobe is allowed to precharge. The available choices are 2, 3.
- **SDRAM CAS Latency Time:**
You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The available choices are 2, 3.
- **SDRAM Precharge Control:**
When enabled, all CPU cycles to SDRAM results in an All Banks Precharge Command on the SDRAM Interface.
- **DRAM Data Integrity Mode:**
Select Parity or ECC (error-correcting code), according to the type of installed DRAM. The available choices are Non-ECC, ECC.
- **System BIOS Cacheable:**
Select Enabled allows caching of the system BIOS ROM at F000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Enabled	BIOS access cached
Disabled	BIOS access not cached

- **Video BIOS Cacheable:**
Select Enabled allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Enabled	Video BIOS access cached
Disabled	Video BIOS access not cached

- **Video RAM Cacheable:**
Select Enabled allows caching of the video RAM , resulting in better system performance. However, if any program writes to this memory area, a system error may result.
- **8 Bit I/O Recovery Time:**
The recovery time is the length of time, measured in CPU clocks, which the system will delay after the completion of an input/output request. This delay takes place because the CPU is operating so much faster than the input/output bus that the CPU must be delayed to allow for the completion of the I/O. This item allows you to determine the recovery time allowed for 8-bit I/O. The available choices are from NA, 1 to 8 CPU clocks.
- **16 Bit I/O Recovery Time:**
This item allows you to determine the recovery time allowed for 16-bit I/O. The available choices are from NA, 1 to 4 CPU clocks.
- **Memory Hole At 15M-16M:**
In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.

Enabled	Memory hole supported
Disabled	Memory hole not supported

- **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. The available choices are Enabled, Disabled.
- **Delayed Transaction:**
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. The available choices are Enabled, Disabled.
- **AGP Aperture Size (MB):**
Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a 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. The available choices are 16 MB, 32 MB, 64 MB, 128 MB, and 256MB.

- **Power-Supply Type:**
This item allows you to select the type of power supply installed to your board. The available choices are Auto (for auto-detection), P8&P9 (for AT power supplies), and ATX (for ATX power supply).
- **Auto Detect DIMM/PCI Clk:**
This item allows you to enable/disable auto detect DIMM/PCI Clock. The available choices are Enabled, Disabled.
- **Spread Spectrum:**
When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling this option changes the extreme values from spikes to flat curves, thus reducing EMI. The available choices are Enabled, Disabled.
- **CPU Host Clock (CPU/PCI):**
This option sets the timing combination of both CPU and PCI bus. The available choices are 66/133MHz, 100/33MHz, and 133/33MHz.
- **CPU Warning Temperature:**
This option sets the temperature limit of the CPU, once reached, would yield a system alarm. Select the CPU warning temperature. If your CPU temperature is higher than the selected temperature, the BIOS will slow down your CPU process till the temperature is below the CPU warning temperature then the CPU will work normally. The available choices are 50°C/122°F, 53°C/127°F, 56°C/133°F, 60°C/140°F, 63°C/145°F, 66°C/151°F, and 70°C/158°F.
- **Current CPU Temperature:**
This field displays the current CPU temperature, if your computer contains a monitoring system.
- **Shutdown Temperature:**
You may select the combination of lower and upper limits for the system shutdown temperature IF your computer contains an environmental monitoring system,. If the temperature extends beyond either limits, the system will automatically shut down. The available choices are Disabled, 60°C/100°F, 65°C/149°F, 70°C/158°F, and 75°C/167°F.

4.7 Power Management Setup

The Power Management Setup allows user to configure the system for saving energy in a most effective way while operating in a manner consistent with his own style of computer use.

ROM PCI/ISA BIOS (2A69KD2L) POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.

ACPI function	: Enabled	** Reload Global Timer Events **
Power Management	: User Define	IRQ3 [3-7, 9-15], NMI
PM Control by APM	: Yes	: Enabled
Video Off Method	: V/H Sync + Blank	Primary IDE0
Video Off After	: Standby	: Disabled
MODEM Use IRQ	: 3	Primary IDE1
Doze Mode	: Disabled	: Disabled
Standby Mode	: Disabled	Secondary IDE0
Suspend Mode	: Disabled	: Disabled
HDD Power Down	: Disabled	Secondary IDE1
Throttle Duty Cycle	: 62.5%	: Disabled
PCI/VGA Act-Monitor	: Disabled	Floppy Disk
Soft-Off by PWR-BTTN	: Instant-Off	: Disabled
CPUFAN Off In Suspend	: Disabled	Serial Port
Power On by Ring	: Disabled	: Enabled
Wake Up On LAN	: Disabled	Parallel Port
IRQ8 Break Suspend	: Disabled	: Disabled
		ESC : Quit ↑↓→←: Select Item
		F1 : Help PU/PD/+/-: Modify
		F5 : Old Values (Shift) F2 : Color
		F6 : Load BIOS Defaults
		F7 : Load Setup Defaults

- **ACPI function:**

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The available choices are Enabled, Disabled.

- **Power Management:**

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

- Doze Mode
- Standby Mode
- Suspend Mode
- HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- ONLY AVAILABLE FOR SL CPU'S . Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each range is from 1 min. to 1 hr. except for HDD Power Down that ranges from 1 min. to 15 min. and disable.

- **PM Control by APM:**

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If the Max. Power Saving is not enabled, this will be preset to *No*.

- **Video Off Method:**

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

- **Video Off After:**

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

N/A	Monitor will remain on during power saving modes.
Suspend	Monitor blanked when the systems enters the Suspend mode.
Standby	Monitor blanked when the system enters Standby mode.
Doze	Monitor blanked when the system enters any power saving mode.

- **MODEM Use IRQ:**
This item determines the IRQ in which the MODEM can be used.
The available choices are 3, 4, 5, 7, 9, 10, 11, NA.

4.7.1 PM Timers

The following four modes are Green PC power saving functions that are only user configurable when *User Defined* Power Management has been selected. See above for available selections.

- **Doze Mode:**
When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.
- **Standby Mode:**
When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.
- **Suspend Mode:**
When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.
- **HDD Power Down:**
When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
- **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. The available choices are 12.5%, 25.0%, 37.5%, 50.0%, 62.5%, and 75.0%
- **PCI/VGA Act-Monitor:**
When Enabled, any video activity restarts the global timer for Standby mode. The available choices are Enabled, Disabled.
- **Soft-Off by PWR-BTTN:**
When Enabled, turning the system off with the on/off button places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or Resume by Ring activity. The available choices are Instant-Off, Delay 4 Sec.
- **CPUFAN Off in Suspend:**
When Enabled, the CPU fan turns off during Suspend mode.

- **PowerOn by Ring:**
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. The available choices are Enabled, Disabled.
- **Wake Up On LAN:**
An input signal on the local area network (LAN) awakens the system from a soft off state.
- **IRQ 8 Break Suspend:**
You can Enable or Disable monitoring of IRQ8 so it does not awaken the system from Suspend mode. The available choices are Enabled, Disabled.

4.7.2 Reload Global Timer Events

When Enabled, an event occurring on each device listed below restarts the global time for Standby mode.

- **Parallel Port IRQ[3-7,9-15], NMI**
- **Floppy Disk**
- **Primary IDE 0/1**
- **Serial Port**
- **Secondary IDE 0/1**
- **Parallel Port**

4.8 PNP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or Personal Computer Interconnect, is a system that allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

**ROM PCI/ISA BIOS (2A69KD2L)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.**

PnP OS Installed	: Yes	Assign IRQ For VGA	: Enabled
Resources Controlled by	: Auto		
Reset Configuration Data	: Disabled	Assign IRQ For USB	: Enabled
		ESC	: Quit
		F1	: Help
		F5	: Old Values
		F6	: Load BIOS Defaults
		F7	: Load Setup Defaults
		↑↓→←	: Select Item
		PU/PD/+/-	: Modify
		(Shift) F2	: Color

- **PnP OS Installed:**
This item allows you to determine install PnP OS or not. The available choices are Yes or Not.
- **Resources Controlled by:**
The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95. The available choices are *Auto* and *Manual*.
- **Reset Configuration Data:**
This item allows you to determine reset the configuration data or not. The available choices are *Enabled* and *Disabled*.

4.11 Integrated Peripherals

The IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship that is determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you can install up to four separate hard disks.

PIO means Programmed Input/Output. Rather than having the BIOS issue a series of commands to affect the transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is much simpler and more efficient (also faster).

ROM PCI/ISA BIOS (2A69KD2L) INTEGRATED PERIPHERALS AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	RXD , TXD Active	: Hi, Hi
		IR Transmission delay	: Disabled
		Onboard Parallel Port:	: 378/IRQ7
		Parallel Port Mode:	: SPP
		ECP Mode Use DMA	: 3
IDE Primary Slave UDMA	: Auto	EPP Mode Select	: EPP 1.7
IDE Secondary Master UDMA	: Enabled	LCD Panel Type	: Panel 5
IDE Secondary Slave UDMA	: Enabled		
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
USB Keyboard Support	: Disabled		
Init Display First	: PCI Slot		
KBC input clock	: 8MHz		
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
UART2 Duplex mode	: Full	F7	: Load Setup Defaults

- **IDE HDD Block Mode:**

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled	IDE controller uses block mode
Disabled	IDE controller uses standard mode

- **IDE Primary/Secondary Master/Slave UDMA:**

Ultra DMA/33 is possible only if your IDE drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive/system software both support Ultra DMA/33, select Auto to enable BIOS support.

- **On-Chip Primary/Secondary PCI IDE:**
The integrated peripheral controller contains an IDE interface that supports a single IDE channels. Select Enabled to activate the channel.
- **USB Keyboard Support:**
Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. The available choices are Enabled, Disabled.
- **Init Display First:**
This item allows you to decide to active whether PCI Slot or on-chip VGA first The available choices are PCI Slot, Onboard .
- **KBC Input Clock:**
The input clock setting of your onboard keyboard controller is set from here.
- **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 and-in FDC or the system has no floppy drive, select Disabled in this field. The available choices are Enabled, Disabled.
- **Onboard Serial Port 1/2:**
This item allows you to determine access onboard serial port 1/2 controller with which I/O address. The available choices are 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.
- **UART Mode Select:**
This option allows you to configure the infrared interface modes (IrDA, ASKIR (an IrDA-compliant serial infrared) port, and Normal) generated from the second serial port. Only when set to ASKIR mode will the options RxD. TxD Active and IR Transmission delay activate for configuration. Disabling the Onboard Serial Port 2 setting automatically removes the UART Mode Select option from the options list.
- **UART2 Duplex mode:**
Select the value required by the IR device connected to the IR port. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time. The available choices are Half, Full.
- **RxD, TxD Active:**
This item allows you to determine the active of RxD, TxD. The available choices are "Hi, Hi", "Lo, Lo", "Lo, Hi", "Hi, Lo".

- **IR Transmission delay:**
Full duplex mode permits simultaneous bi-directional transmission. Half duplex mode permits transmission in one direction only at a time. Select Disabled if there is no infrared port present.
- **Onboard Parallel Port:**
Select a logical LPT port name and matching address for the physical parallel (printer) port. The available choices are 378H/IRQ7, 278H/IRQ5, 3BCH/IRQ7, Disabled.
- **Parallel Port Mode:**
Select an operating mode for the onboard parallel port. Select Compatible or Extended unless you are certain both your hardware and software support EPP or ECP mode. The available choices are SPP, ECP+EPP1.7, EPP1.7+SPP, EPP1.9+SPP, ECP, ECP+EPP1.9, and Normal.
- **ECP Mode Use DMA:**
Select a DMA channel for the port. The available choices are 3, 1.
- **EPP Mode Select:**
This item allows you to determine the IR transfer mode of onboard I/O chip. The available choices are EPP1.9, EPP1.7.
- **LCD Panel Type:**
This option allows you to select the panel display type and resolution installed on your system.

Panel#	Panel Type
0	1024*768 Dual Scan STN Color Panel
1	128*1024 TFT Color Panel
2	640*480 Dual Scan STN Color Panel
3	800*600 Dual Scan STN Color Panel
4	640*480 Sharp TFT Color Panel
5	640*480 18-bit TFT Color Panel
6	1024*768 TFT Color Panel
7	800*600 TFT Color Panel
8	800*600 TFT Color Panel (Large BIOS ONLY)
9	800*600 TFT Color Panel (Large BIOS ONLY)
10	800*600 Dual Scan STN Color Panel (Large BIOS ONLY)
11	800*600 Dual Scan STN Color Panel (Large BIOS ONLY)
12	1024*768 TFT Color Panel (Large BIOS ONLY)
13	1280*1024 Dual Scan STN Color Panel (Large BIOS ONLY)
14	1024*600 Dual Scan STN Color Panel (Large BIOS ONLY)
15	1024*600 TFT Color Panel (Large BIOS ONLY)

4.12 Supervisor/User Password Setting

ROM PCI/ISA BIOS (2A69KD2L)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURA	ETUP
LOAD BIOS DEFAULT	SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Change / Set / Disable Password	

You can set either supervisor or user password, or both of them. The differences between are:

- **supervisor password:** can enter and change the options of the setup menus.
- **user password:** just can only enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.13 IDE HDD Auto Detection

This option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.

Up to four IDE drives can be detected, with parameters for each appearing in sequence inside a box. To accept the displayed entries, press the "Y" key; to skip to the next drive, press the "N" key. If you accept the values, the parameters will appear listed beside the drive letter on the screen.

**ROM PCI/ISA BIOS (2A69KD2L)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.**

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:								
Select Primary Master Option (N=SKIP) : N								
OPTIONS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
1 (Y)	0	0	0	0	0	0	0	NORMAL
NOTE: Some OSes (like SCO-UNIX) must use "NORMAL" for installation								

4.14 Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Pressing “Y” stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

**ROM PCI/ISA BIOS (2A69KD2L)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.**

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURA	ETUP
LOAD BIOS DEFAULT	SAVING
LOAD SETUP DEFAULTS	
SAVE to CMOS and EXIT (Y/N)? N	
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Saves all Data & Exit Setup	

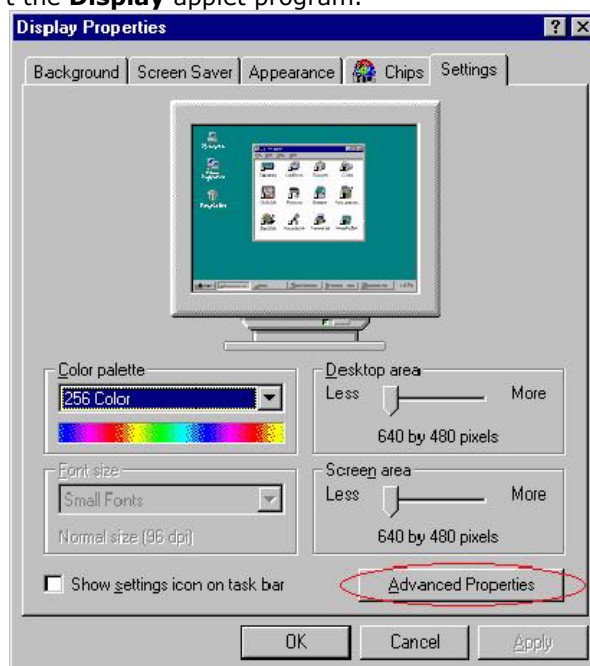
Chapter 5

Software Utilities

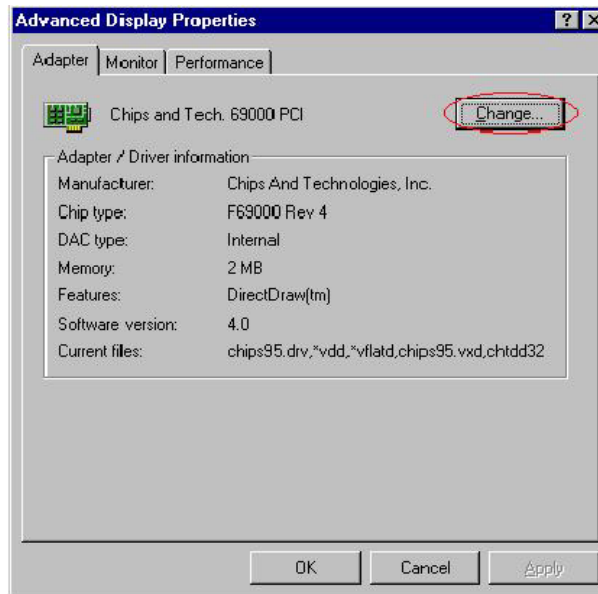
This chapter contains the detailed information of IDE, VGA, Audio and LAN driver installation procedures.

5.1 VGA Driver Installation for Win 95/98

1. Click **Start**, then **Setting**, then **Control Panel**.
2. Start the **Display** applet program.



3. Select the setting page, click on the **Advanced** properties button.
4. Press the **Change** button in the adapter area.



5. Click on **Next** to continue and then select

Display a list of all drivers in a specific location,
so you can select the drivers you want.
6. Click on **Next**.
7. Select the **Specify a location** checkbox then **Browse**.
8. Specify the path to the new driver and then press the <ENTER> key (if in driver A: select a:\win95).
9. Once completed, the **Select** device dialog box will appear. Choose on:

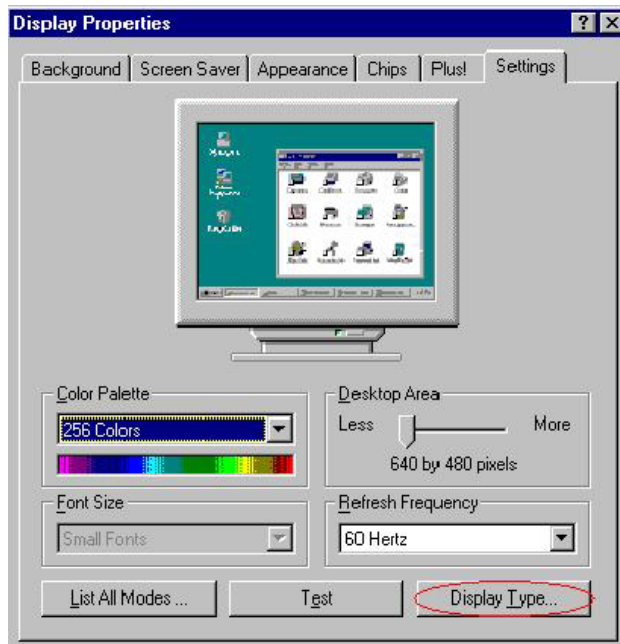
Chips and Tech. 69000 PCI
10. Continue choosing until asked to restart machine.

11. After the system has restarted, you can go back into the display applet and select alternate screen resolutions and color depths.

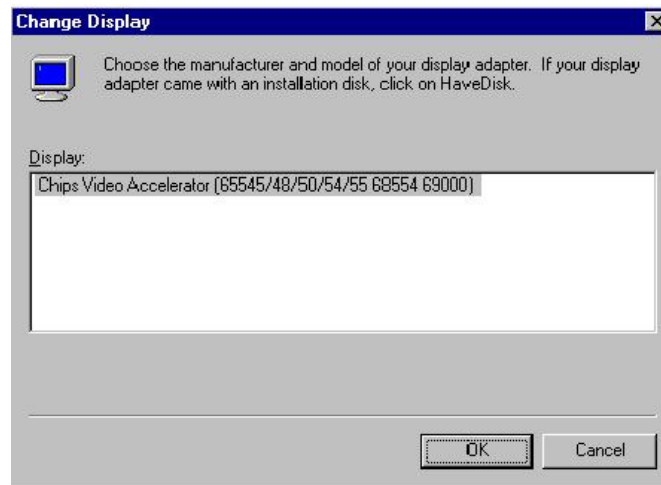
NOTE: *Installation procedure for Windows 98 is similar to Windows95.*

5.2 VGA Driver Installation for Win NT4.0

1. Click the Start button, then go to Settings and click on Control Panel.
2. Click on Display icon to start the Display Properties window.
3. Click on the Settings tab, and then click on Display Type.



4. In the **Change Display Type** window, click on **Have Disk**.

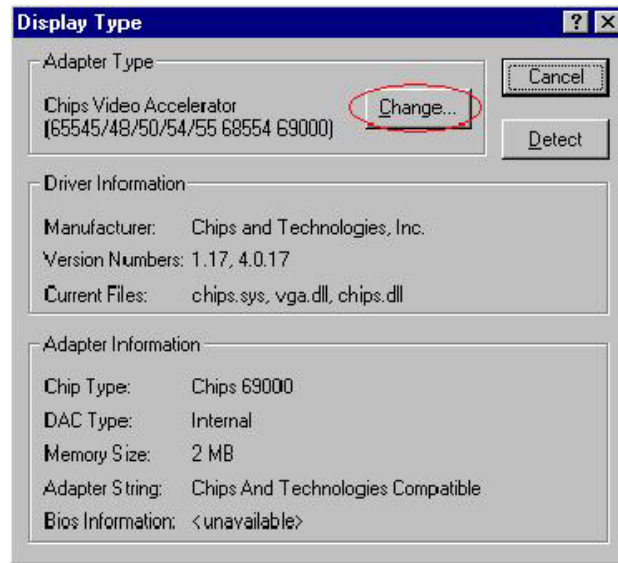


5. Specify the path to the new driver and press the <ENTER>key (if in driver A:, type a:\nt40). Select

**Chips Video Accelerator
(65545/48/50/54/55/68554 69000)**

6. Click OK or press Enter.
7. You will then see warning panel about Third Party Drivers. Click on Yes to complete installation.
8. Once the installation is complete, the system must be shut down and restarted for the new driver to take effect.

9. After restarting, check on the VGA driver and make sure the properties of the driver look similar to the following figure.



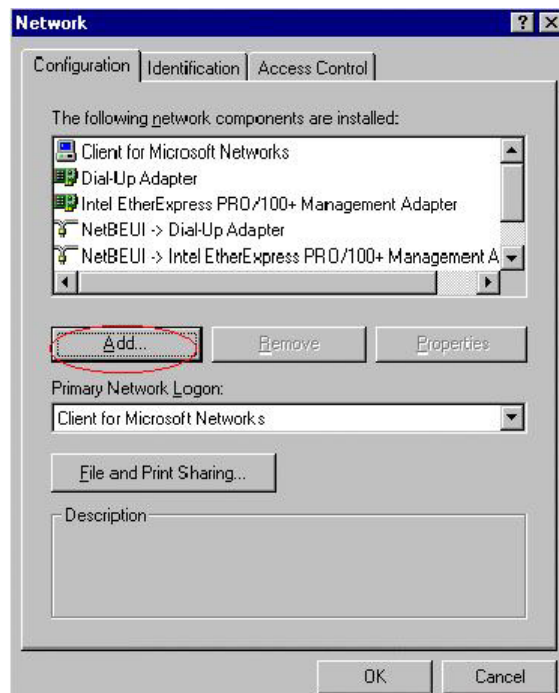
5.3 LAN Driver Installation for WIN95 & WIN98

5.3.1 Win98

Windows 98 will detect the network driver automatically therefore there is no need for further configuration.

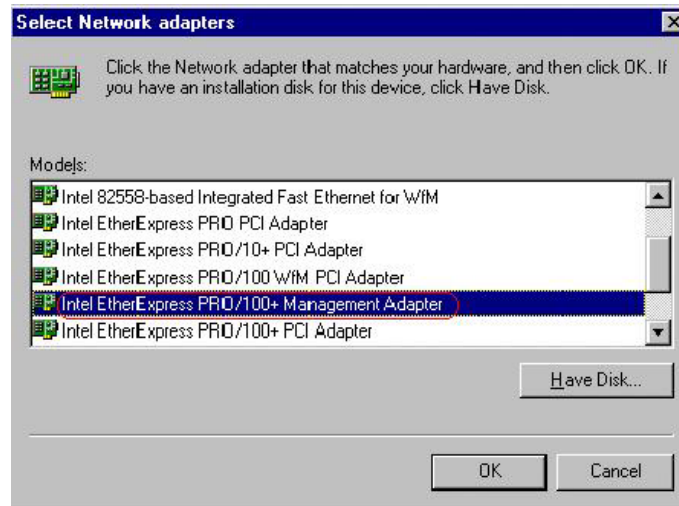
5.3.2 Win95

1. Click Start, then Setting then select Control panel.
2. Start the network applet program.
3. In the Network window, click Add.



4. From the Select Network Component Type, select Adapter then click Add.

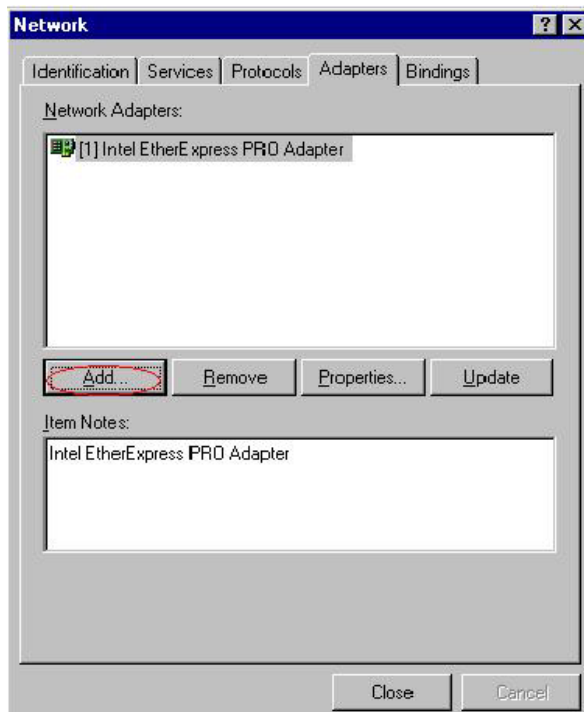
5. Specify the path the new driver and press <ENTER> key (if in driver a:, type a:\). If you're not sure exactly where the drivers are, choose the Browse button and find it.



6. Click OK.
7. Windows 95 will copy the network drivers to the proper directories into your system.
8. Continue choosing OK until asked to restart your system.
9. After restarting your computer, check the network driver and its properties. Be sure it looks similar with the following figure.

5.4 LAN Driver Installation for Win NT4.0

1. Click the Start button, then go to Setting and click on Control Panel.
2. Click on the Network icon to start the Network Window.
3. Click on the Adapters tab, and then click Add.



4. In the Select Network Adapter window, click Have Disk.
5. This will bring up the Insert Disk window.
6. Supply the directory where the Windows NT driver files are located (If in driver a: type a:\).
7. The Select OEM Option window will show up. Select **Intel EtherExpress PRO Adapter**
8. Click OK to finish the installation.

9. Once the installation is completed, the system must be shut down and restarted for the new driver to take effect.
10. After restart, confirm the network driver and its properties.

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