PC-686C(PC)

PC-686C(PC)H

PICMG PCI/ISA Single Board Computer

For Socket370 CPU (Celeron™, Pentium III™)

With LAN/VGA/(SCSI)

User's Manual

CONTEC

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Acknowledgments

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from inexperienced usage, misuse, or malfunction of this device.

Limited One Year Warranty

CONTEC Industrial CPU card is warranted by CONTEC Co., Ltd. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.

Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office from which it was purchased.

This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original boards. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from our Sales Administration Department before returning any product.

No product will be accepted by CONTEC group without an RMA number.

Caution about Battery

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

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Chapter 1 Introduction

1.1 Specification

- **Processor Socket:** Socket 370
- **Processor:** Intel® Celeron™, 300MHz~850MHz ; Pentium III™ 500MHz ~850MHz (FSB:100MHz) (133MHz Only PC-686C(PC)H-LV & -LVS)
- **Host Bus: Host Bus:** PICMG (PCI - ISA) Bus
- **Chipset:** Intel® 810-DC100/810E (810E Only PC-686C(PC)H-LV & LVS)
- **Cache Size:** 128KB L2 cache is integrated in the Celeron™ CPU

  256KB L2 cache is integrated in the Pentium III™ CPU
- **Memory:** Up to 256MB SDRAM
- **Memory Sockets:** Two 168-pin DIMM sockets for SDRAM in 8MB, 16MB, 32MB, 64MB, 128MB and 256MB configurations.
- **BIOS:** Award BIOS, PnP support
  - Flash EEPROM (512KB) for BIOS update
  - Power management
  - Frequency / Voltage control
- **Bus Speed:** 66MHz/100MHz (133MHz Only PC-686C(PC)H-LV & LVS)
- **Power Management:** ACPI, by 6-pin ATX power control connector
- **ISA Bridge:** ITE 8888 ISA Bridge
- **Super I/O:** Winbond W83627HF chipset
- **Parallel port:** One high-speed parallel port, SPP/EPP/ECP mode
- **Series Port:** Two 16550 UART port, COM2 is RS-232/422/485 configurable.
- **Enhanced IDE:** Two EIDE port, up to 4 IDE devices, support Ultra DMA 33/66
- **FDD Interface:** Two floppy drives (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB, LS-120)
- **USB Interface:** One box-header support 2 USB ports
- **Watchdog Timer:** Software programmable 16 levels, Reset or NMI (Jumper selectable)
- **Hardware Monitor:** (LPC I/O + H/W Monitoring)

- **IrDA:** One 1x6 Pin-header
- **Keyboard connector:** One PS/2 keyboard connector on bracket and one 5-pin box-header for external keyboard
- **Mouse connector:** On bracket PS/2 Mouse connector
- **VGA Connector**: Intel® 810/810E built-in function, One 15-pin D-type VGA connector on bracket
    - 2D Graphics: Up to 1600x1200 in 8-bit Color at 85Hz Refresh
    - 3D Graphics: Hyper pipelined architecture, Visual & Texturing enhancements
    - Display: Integrated 24-bit 230 MHz RAMDAC
    - Display Cache Interface: 32-bit data, 100MHz SDRAM, Support for 1Mx16 (4MB only)
- **LCD:** Intel® 810/810E built-in, Connector for Panel Link (Silicon Image® SiI154)
    - Supports up to 16.7 million color (true color)
    - Receiver Detection: Supports Hot Plug Detection through RxDetect feature
    - Cable Distance Support: over 5m with twisted-pair, fiber-optics ready
    - When using Flat Panel Display (Contec Products) by using LCD Connector, it is impossible to use COM1(CN4) because COM1 is used for Touch Panel Signal.
- **LAN:** Intel® 82559 LAN controller, one RJ-45 connector on bracket
    - Green LED for Link & ACT
    - Yellow LED for 100M
    - Wake On LAN support, Remote Boot-up
- **SCSI:** Symbios 53C895 controller, One 68-Pin connector (PC-686C(PC)-LVS, PC-686C(PC)H-LVS Only)
- **SSD:** DIP socket supports DiskOnChip flash disks (2MB~144MB)
- **AMR:** pin header for Audio Modem Riser and Audio Code setting, (Optional)

- **RTC:** battery backup by Lithium Battery (CR2450), Modem ring-on & Win95 shut-off (by 6 pin ATX power control connector)

  - ACT The coin type Lithium battery specification is shown in table

Specification	CR2450
Nominal Voltage	3V
Nominal Capacity	600mAh
Nominal Weight	6.5g

Please change the CR2450 battery when it goes down under 2.3V. (It is possible to check in BIOS.)
If you don't change it, when booting system, CMOS Checksum Error occurs and OS doesn't boot, and when Power off, RTC maybe stopped.
*The battery backup term of CR2450 is 2.5 years or more. (In main power is off)

1.2 Mechanical & Environmental

- POWER CONSUMPTION

<PC-686C(PC)-LV, -LVS>
(Pentium III 850MHz)

- +5VDC @ 10A Max.
- +12VDC @ 200mA Max.
- +5VSB (stanby) @ 750m Max.

(Celeron 566MHz)

- +5VDC @ 7.5A Max.
- +12VDC @ 200mA Max.
- +5VSB (stanby) @ 750m Max.

<PC-686C(PC)H-LV, -LVS>
(Pentium III 850MHz)

- +5VDC @ 10A Max.
- +12VDC @ 200mA Max.
- +5VSB (stanby) @ 750m Max.

(Celeron 566MHz)

- +5VDC @ 8A Max.
- +12VDC @ 200mA Max.
- +5VSB (stanby) @ 750m Max.

- OPTERATING TEMPERATURE: 0 ~ 60°C.
- STORAGE TEMPPERATURE: - 40 ~ 80°C.
- HUMIDITY: 20% to 80%
- BOARD DIMENSION: 338mm(L) x 122mm(H) / 13.3 inch x 4.8 inch.
- BOARD WEIGHT: 360g

1.3 Check List

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- The PC-686C(PC), PC-686C(PC)H Industrial CPU Card
- This User's Manual & Registration Card
- 1 IDE 40-pin Ribbon Cable
- 1 IDE Ultra ATA/66 80-pin Ribbon Cable (Optional)
- 1 Floppy Ribbon Cable
- 1 mounting bracket attached with 2 serials ports (D-SUB 9-pin) ribbon cable
- 1 mounting bracket attached with 1 parallel port (D-SUB 25pin) ribbon cable
- Jumper Shot Pin :6pcs
- LCD cable (Optional)
- SCSI cable (For PC-686C(PC)-LVS, PC-686C(PC)H-LVS only)
- SCSI terminator (For PC-686C(PC)-LVS, PC-686C(PC)H-LVS only)
- Driver disks utilities
- 5-pin DIN to 6-pin mini-DIN Keyboard exchange Cable
- 1 mounting bracket attached with 2 USB ports Cable (shielded) (Optional)

CPU (Optional)

- PC686C-566 Celeron 566MHz
- PC686C-850 Celeron 850MHz
- PC686-700 Pentium III 700MHz
- PC686-850 Pentium III 850MHz

Memory (Optional)

- PCMSD64-100 168-pin DIMM PC100 SDRAM 64MB
- PCMSD128-100 168-pin DIMM PC100 SDRAM 128MB
- PCMSD256-100 168-pin DIMM PC100 SDRAM 256MB

Description

The PC-686C(PC), PC-686C(PC)H is a PICMG compatible Industrial CPU card based on Intel's 810-DC100/810E chipset and is fully designed for harsh industrial environment. It features socket 370 compatible with Intel's processor. This card accommodates up to 256MB of SDRAM memory.

The PC-686C(PC), PC-686C(PC)H comes with onboard CPU temperature sensor to protect your processor from overheating (Winbond W83627HF chipset). Wired for Management (WFM) 2.0 specification compliance.

The PC-686C(PC), PC-686C(PC)H has a LCD connector that uses PanelLink Digital technology (Silicon Image SiI154 chipset) to support displays ranging from VGA to SXGA resolutions (25-112M Pixel/sec) in a single link interface. The SiI154 transmitter has a highly flexible interface with a 12-bit 1/2 pixel/clock or 24-bit 1 pixel/clock input for true color (16.7 million) support. In 24-bit mode, the data may be latched on either the positive or negative edge of the clock. In 12-bit mode, multiple clocking options exist: with a single clock, data will be clocked on the falling and the rising edge; with dual clocks data can be clocked on either the falling edge or the rising edge of both clocks. All Panel Link products are designed on scaleable CMOS architecture to support future performance requirements while maintaining the same logical interface. System designers can be assured that the interface will be fixed through a number of technology and performance generations. The DVI (Digital Visual Interface) defines the interface between digital displays and any personal computing device, creating an industry standard that ensures cross compatibility. As a result, any PC or host system with a PanelLink interface is guaranteed to be compatible with any PanelLink display.

1.4 Graphics Subsystem

The Intel® 810 GMCH DC-100/Intel 810E GMCH features are show as following:

Integrated Graphics Controller

- 3-D Hyper pipeline architecture
- Full 2-D hardware acceleration
- Motion video acceleration

3-D graphics visual and texturing enhancements Display

- Integrated 24-bit 230MHz RAMDAC
- 4MB display cache
- Display Data Channel Standard, Version 3.0, Level 2B protocols compliant

Video

- Hardware motion compensation for software MPEG2 decode
- Software DVD at 30 fps

Integrated graphics memory controller

Hardware motion compensation for software MPEG2 decode

Intel® 810/Intel® 810E GMCH Refresh Rates						
Resolution	Color	60(Hz)	70(Hz)	72(Hz)	75(Hz)	85(Hz)
640x200	16		O			
640x350	16		O			
640x400	256	O	O		O	O
	64K	O	O		O	O
	16M		O			
640x480	16	O		O	O	O
	256	O	O	O	O	O
	32K	O			O	O
	64K	O	O	O	O	O
	16M	O	O	O	O	O
1024x768	256	O	O		O	O
	32K	O			O	O
	64K	O	O	O	O	O
	16M	O	O	O	O	O
1056x800	16		O			
1280x1024	256	O	O	O	O	O
	32K	O			O	
	64K	O	O	O	O	O
	16M	O	O	O	O	O

1.5 Power Management Features

Power management is implemented at several levels, including:

Software support

ADVANCED POWER MANAGEMENT (APM)

APM makes it possible for the computer to enter an energy saving standby mode. The standby mode can be initiated in the following ways:

- Time-out period specified in the BIOS Setup program
- Suspend/resume switch connected to the front panel sleep connector
- From the operating system, such as the Suspend menu item in Windows 95

In standby mode, the CPU card can reduce power consumption by spinning down hard drives, and reducing power to or turning of VESA DPMS-compliant monitors. Power-management mode can be enabled or disabled in the BIOS Setup program.

While in standby mode, the system retains the ability to respond to external interrupts and service requests, such as incoming faxes or network messages. Any keyboard or mouse activity brings the system out of standby mode and immediately restores power to the monitors.

The BIOS enables APM by default; but the operating system must support an APM driver for the power-management features to work. For example, Windows 95 supports the power-management features upon detecting that APM is enabled in the BIOS.

ADVANCED CONFIGURATION AND POWER INTERFACE (ACPI)

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. The use of ACPI with this CPU card requires the support of an operating system that provides full ACPI functionality. ACPI features include:

- Plug and Play (including bus and device enumeration) and APM functionality normally contained in the BIOS
- Power management control of individual devices, add-in board (some add-in board may require an ACPI-aware driver), video displays, and hard disk drives

- Methods for achieving less than 30-watt system operation in the Power On Suspend sleeping state, and less than 5-watt system operation in the Suspend to Disk sleeping state
- A Soft-off feature that enables the operating system to power off the computer
- Support for multiple wake up events

The following table lists the devices or specific events that can wake the computer from specific states. Sleeping state S5 is the same for the wake up event.

These devices/events can wake up the computer	... from this state	These devices/events can wake up the computer	... from this state
Power switch	S1, S3, S5	USB	S1
RTC alarm	S1, S3, S5	PS/2 keyboard	S1
LAN	S1, S3, S5	PS/2 mouse	S1
Modem	S1, S3, S5	Sleep button	S1
IR command	S1	PME	S1, S3, S5

- Support for a front panel power and sloop mode switch. Table below lists the system states based on how long the power switch is pressed, depending on how ACPI is configured with an ACPI-aware operating system

If system is in this state ...	... and the power switch is pressed for	... the system enters this state
Off (ACPI G2/S5 state)	Less than four seconds	Power on
On (ACPI G0 state)	Less than four seconds	Soft off/Suspend
On (ACPI G0 state)	More than four seconds	Fail safe power off
Sleep (ACPI G1 state)	Less than four seconds	Wake up
Sleep (ACPI G1 state)	More than four seconds	Power off

System States and Power States

Under ACPI, the operating system directs all system and device power state transitions. The operating system puts devices in and out of low-power states based on user preferences and knowledge of how devices are being used by applications. Devices that are not being used can be turned off. The operating system uses information from

applications and user settings to put the system as a whole into a low-power state.

The table below lists the power states supported by the CPU card along with the associated system power target.

Global States	Sleeping States	CPU States	Device States	Targeted System Power
G0 – working state	S0 - working	C0 - working	D0 – working state	Full power > 60W
G1 – sleeping state	S1 – CPU stopped	C1 – stop grant	D1, D2, D3 – device specification specific.	5W < power < 30W
G1 – sleeping state	S3 – Suspend-to-RAM. Context saved to RAM.	No power	D3 – no power except for wake up logic.	Power < 5W**
G2/S5	S5 – Soft off. Context not saved. Cold boot is required.	No power	D3 – no power except for wake up logic.	Power <5W**
G3 – mechanical off. AC power is disconnected from the computer	No power to the system.	No power		No power to the system so that service can be performed.

* Total system power is dependent on the system configuration, including add-in boards and peripherals powered by the system chassis' power supply.

** Dependent on the standby power consumption of wake-up devices used in the system.

Plug and Play

In addition to power management, ACPI provides controls and information so that the operating system can facilitate Plug and Play device enumeration and configuration. ACPI is used only to enumerate and configure CPU card devices that do not have other hardware standards for enumeration and configuration. PCI devices on the CPU card, for example, are not enumerated by ACPI.

Hardware support:

The CPU card provides several hardware features that support power management, including:

Wake on LAN technology

Wake on LAN technology enables remote wakeup of the computer through a network. The LAN subsystem, whether onboard or as a PCI bus network adapter, monitors network traffic at the Media Independent Interface, Upon detecting a Magic Packet frame, the LAN subsystem asserts a wakeup signal that powers up the computer. PC-686C(PC), PC-686C(PC)H CPU card supports Wake on LAN through the PCI bus PME# signal.

Note: *For Wake on LAN technology, the 5V standby line for the power supply must be capable of delivering +5V ±5% at 720mA. Failure to provide adequate standby current when implementing Wake on LAN technology can damage the power supply.*

Instantly Available technology

Instantly Available technology enables the CPU card to enter the ACPI S3 (Suspend-to-RAM) sleep state. While in the s# sleep state, the computer will appear to be off. When signaled by a wake up device or even, the system quickly returns to its last known wake state.

The CPU card supports the PCI bus Power Management Interface Specification and the 3.3V Aux. ECR. Add-in boards that also support these specifications can participate in power management and can be used to wake the computer.

The optional standby power indicator provides an indication that power is still present to the DIMMs and PCI bus connectors, even when the computer appears to be off.

Note: *For Instantly Available technology, the power supply must be capable of providing the +5V standby current that those boards require in addition to the standby current required by the CPU card. Failure to provide adequate standby current when using this feature can damage the power supply.*

Resume on Ring

The operation of Resume on Ring can be summarized as follows:

- Resumes operation from either the APM sleep mode or the ACPI S1 state
- Requires only one call to access the computer
- Detects incoming call similarly for external and internal modems; does not use the Wake on Ring connector
- Requires modem interrupt be unmasked for correct operation

1.6 Power Requirements

Your system requires a clean, steady power source for reliable performance of the high frequency CPU on the PC-686C(PC), PC-686C(PC)H Industrial CPU card, the quality of the power supply is even more important. For the best performance make sure your power supply provides a range of 4.75 volts minimum to 5.25 volts maximum DC power source.

Power Consumption

For typical configurations, the CPU card is designed to operate with at least a 200W power supply. A higher-wattage power supply should be used for heavily-loaded configurations. The power supply must meet the following requirements:

- Rise time for power supply: 2 ms to 20 ms
- Minimum delay for reset to Power Good: 100 ms
- Minimum Powerdown warning: 1 ms
- 3.3V output must reach its minimum regulation level within 20ms of the +5V output reaching its minimum regulation level

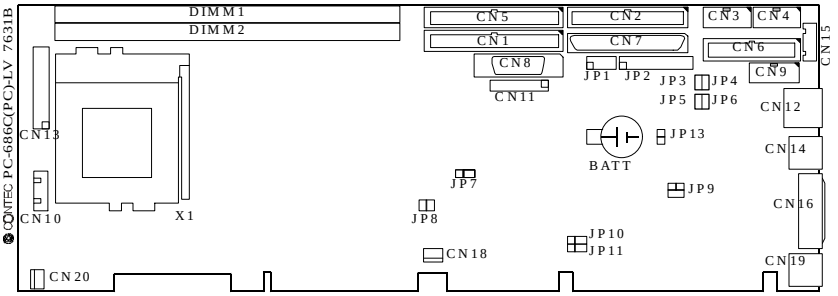
The following table lists the power supply's tolerances for DC voltages:

DC Voltage	*Acceptable Tolerance*
+3.3 V	± 5 %
+5 V	± 5 %
+5 VSB (standby)	± 5 %
-5 V	± 5 %
+12 V	± 5 %
-12 V	± 5 %

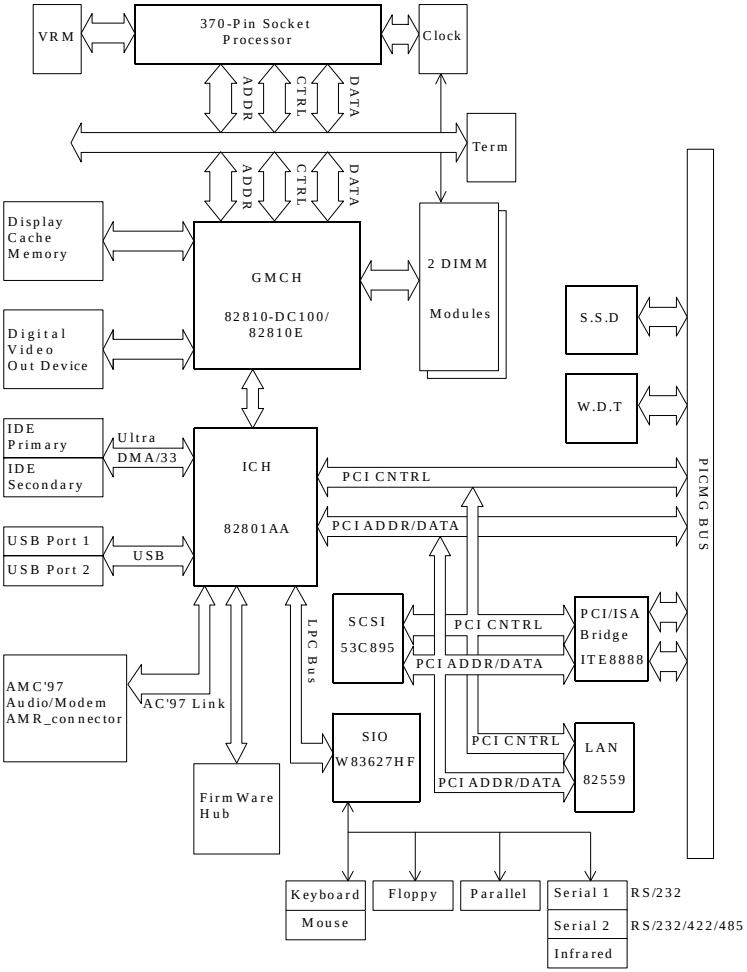
1.7 Backplane

The SCSI function on the PC-686C(PC)-LVS, PC-686C(PC)H-LVS is designed based on PCI Bus master, that means one of the PCI Bus Master is occupied. The SCSI Bus Master is same as 4th PCI Slot (DREQ3) on the backplane. Therefore the 4th PCI Slot (DREQ3) on the backplane would only support Slave Mode.

1.8 Connector & Jumper Location



1.9 Block Diagram



Chapter 2 Hardware Installations

This chapter provides information on how to use the jumpers and connectors on the PC-686C(PC), PC-686C(PC)H in order to set up a workable system.

2.1 Installation procedure

2.1.1 Insert the system BIOS (if not already installed) genteelly. Pay attention to the position of pin 1 of BIOS socket.

2.1.2 Install the processor with correct orientation.

2.1.3 Insert the DRAM module with correct orientation.

2.1.4 Mount the Fan on the top of the processor and connect it to FAN connector.

2.1.5 Remove protection strip of battery.

2.1.6 Insert all external cables except for flat panel. (VGA, Hard disk, floppy, keyboard, Mouse, LAN, etc.)

2.1.7 Prepare a CRT monitor for CMOS setup.

2.1.8 Confirm the power supply of Backplane is off.

2.1.9 Insert the CPU card to Backplane.

2.1.10 Turn on the power.

2.1.11 Enter the BIOS setup mode by pressing 'Del' key during boot up.

2.1.12 Use the "Load BIOS Optimal Defaults" feature.

2.1.13 Configure the ***Peripheral Setup*** and the ***Standard Setup*** correctly.

Note: The CMOS memory may be in an undefined state at power-on after a period of no battery backup.

2.2 CPU Installation: X1

The PC-686C(PC), PC-686C(PC)H Industrial CPU Card supports a single **Intel® Celeron™ or Pentium III™ processor**. The processor's VID pins automatically program the voltage regulator on the CPU card to the required processor voltage. The host bus speed is automatically selected. The processor connects to the CPU card through the 370-pin ZIF PPGA socket.

The CPU card supports the processors listed in table below:

Processor	Processor Speed	Host Bus frequency	Cache size	CONTEC Model
Celeron	433MHz	66MHz	128KB	---
	566MHz	66MHz	128KB	PC686C-566
	850MHz	100MHz	128KB	PC686C-850
Pentium III	600MHz	100MHz	256KB	---
	700MHz	100MHz	256KB	PC686-700
	850MHz	100MHz	256KB	PC686-850

The ZIF PPGA socket comes with a lever to secure the processor. Make sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket.

After you have installed the processor into the socket 370, check if the configuration setup for the CPU type and speed are correct. The CPU should always have a Heat Sink and a cooling fan attached to prevent overheating.

Note: *Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

2.3 Main Memory Installation: DIMM1, DIMM2

The PC-686C(PC), PC-686C(PC)H Industrial CPU Card supports two dual inline memory module (DIMM 168-pin) sockets for a maximum total memory of 256MB. The DRAMs (3.3Volts) for the DIMM sockets can be 32MB 64MB, 128MB and 256MB in SDRAM types. When populating the DIMM sockets, either of the DIMM sockets can be populated first. The BIOS automatically detects memory type, size, and speed. Due to the video requirements of the PC-686C(PC), PC-686C(PC)H CPU card, minimum memory for the Windows NT 4.0 operating system is 64MB.

The CPU card supports memory with the following features:

- 168-pin DIMMs with gold-plated contacts
- 100MHz unbuffered SDRAM
- Non-ECC (64-bit)
- 100MHz memory may be either Serial Presence Detect (SPD) or non SPD memory
- 3.3 V memory only

Note: *Because the main system memory is also used as video memory, the CPU card requires 100MHz SDRAM DIMMs even though the processor front side bus is 66MHz. It is highly recommended that SPD DIMMs be used, since this allows the chipset to accurately configure memory settings for optimum performance. If non-SPD memory is installed, the BIOS will attempt to correctly configure the memory setting, but performance and reliability may be impacted.*

SDRAM

SYNCHRONOUS DRAM (SDRAM) improves memory performance through memory access that is synchronous with the memory clock. This simplifies the timing design and increases memory speed because all timing is dependent on the number of memory clock cycles.

The CPU card supports single or double-sided DIMMs in the following sizes:

DIMM size	Non-ECC configuration
16MB	2Mbit x 64
32MB	4Mbit x 64
64MB	8Mbit x 64
128MB	16Mbit x 64
256MB	32Mbit x 64

Note: *All memory components and DIMMs used with the PC-686C(PC), PC-686C(PC)H CPU card must comply with the PC SDRAM Unbuffered DIMM Specification.*

2.4 Primary & Secondary IDE port Connector: CN5/CN1

The CPU card PC-686C(PC) has two independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), and Ultra DMA/33 synchronous-DMA mode transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

These connectors support the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Please refer to your hard disk documentation for the jumper setting.

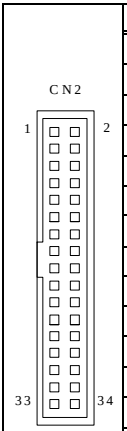
Pin No.	Function	Pin No.	Function
1	RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	DREQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	ALE
29	DACK	30	GND
31	IRQ	32	IOCS16
33	A1	34	PDIAG
35	A0	36	A2
37	CS0	38	CS1
39	HD ACT	40	GND

2.5 Floppy Disk Connector: CN2

The floppy interface can be configured for the following floppy drive capacities and sizes:

- 360 KB, 5.25-inch
- 1.2 MB, 5.25-inch
- 720 KB, 3.5-inch
- 1.2 MB, 3.5-inch (driver required)
- 1.25/1.44 MB, 3.5-inch
- 2.88 MB, 3.5-inch

This connector supports the provided floppy drive ribbon cable. After connecting the single and to the board, connect the two plugs on the other end to the floppy drives.

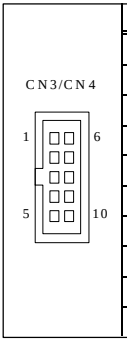


Pin No.	Function	Pin No.	Function
1	GND	2	RWC
3	GND	4	N.C.
5	GND	6	N.C.
7	GND	8	INDEX
9	GND	10	DS0
11	GND	12	DS1
13	GND	14	DS2
15	GND	16	MOT ON
17	GND	18	DIR
19	GND	20	STEP
21	GND	22	WD
23	GND	24	WG
25	GND	26	TRCK 0
27	GND	28	WP
29	GND	30	RD
31	GND	32	SIDE 1
33	GND	34	DSK CHG

2.6 Serial Port connector: CN3 / CN4

COM1 and COM2 are 10-pin box-header, are onboard serial ports of the CPU card PC-686C(PC), PC-686C(PC)H. The following table shows the pin assignments of these connectors. COM1: CN4 COM2: CN3

RS422/485 assigned for COM2 connector only



Pin No.	RS-232	RS-422	RS-485
1	DCD	TX-	TX-
2	RXD	TX+	TX+
3	TSD	RX+	RX+
4	DTR	RX-	RX-
5	GND	GND	GND
6	DST	RTS-	N.C.
7	RTS	RTS+	N.C.
8	CTS	CTS+	N.C.
9	RI	CTS-	N.C.
10	N.C.	N.C.	N.C.

Notes:

- *For RS-485, TX+(pin 2) and RX+ (pin 3) must jumper together inside the D type connector.*
- *TX- (pin 1) and RX- (pin 4) is the same above.*

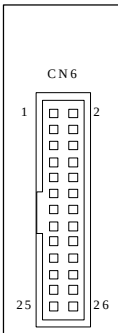
2.6.1 RS-422 / RS-485 specifications

- Transmission system: Asynchronous, half-/full-duplex serial transmission conforming to RS-422/RS-485
- Baud rate: 19200 to 50bpx (programmable)
- Signal extensible distance: 1.2km Max.

2.7 Parallel Port Connector: CN6

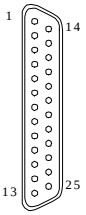
The parallel port bracket can used to add an additional parallel port for additional parallel devices.

You can enable the parallel port and choose the IRQ through BIOS setup function [Onboard Parallel Port].



Pin No.	Function	Pin No.	Function
1	STROBE	2	ALF
3	PD0	4	ERROR
5	PD1	6	INIT
7	PD2	8	SLCT IN
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N.C.

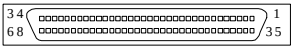
In case of using the accessory cable (D-SUB 25pin)



Pin No.	Function	Pin No.	Function
1	STROBE	14	ALF
2	PD0	15	ERROR
3	PD1	16	INIT
4	PD2	17	SLCT IN
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT		

2.8 Ultra Wide SCSI Connector: CN7

The following table shows the pin-out assignments of this 68-pin connector.



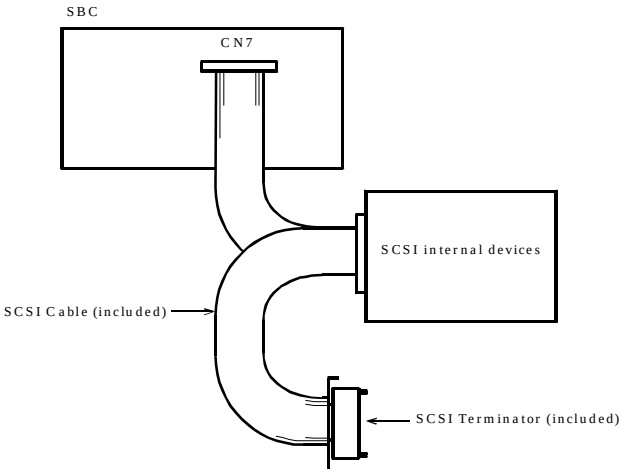
Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+SD12	18	TPW_EX	35	-SD12	52	TPW_EX
2	+SD13	19	N.C.	36	-SD13	53	N.C.
3	+SD14	20	GND	37	-SD14	54	GND
4	+SD15	21	+SATN	38	-SD15	55	-SATN
5	+SDP1	22	GND	39	-SDP1	56	GND
6	+SD0	23	+SBSY	40	-SD0	57	-SBSY
7	+SD1	24	+SACK	41	-SD1	58	-SACK
8	+SD2	25	+SRST	42	-SD2	59	-SRST
9	+SD3	26	+SMSG	43	-SD3	60	-SMSG
10	+SD4	27	+SSEL	44	-SD4	61	-SSEL
11	+SD5	28	+SCD	45	-SD5	62	-SCD
12	+SD6	29	+SREQ	46	-SD6	63	-SREQ
13	+SD7	30	+SIO	47	-SD7	64	-SIO
14	+SDP0	31	+SD8	48	-SDP0	65	-SD8
15	GND	32	+SD9	49	GND	66	-SD9
16	DIFFSEN	33	+SD10	50	SEN_IN	67	-SD10
17	TPW_EX	34	+SD11	51	TPW_EX	68	-SD11

Notes:

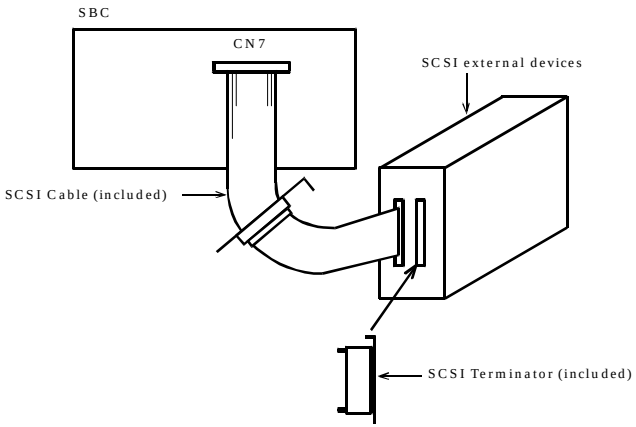
- *The case of connecting the SCSI device (8 bit bus) to this connector, please install the SCSI terminator on the High byte side.*
- *The case of no-connecting to this connector, please set the JP10 "Disabled" (2-3 short).*

Reference the drawings below.

In using internal SCSI devices

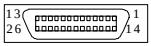


In using external SCSI devices

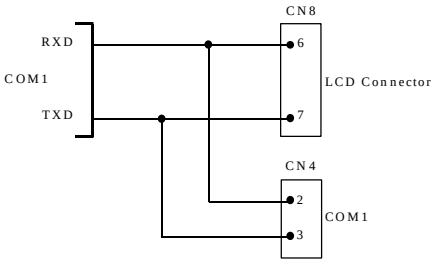


2.9 LCD Connector: CN8

CN8 is a 26-pin connector for flat panel LCD displays. The following shows the pin assignments of this connector. (HIROSE DX20M-26S)



Pin No.	Function	Pin No.	Function
1	GND	14	TX2+
2	TX2 shield	15	TX2-
3	HTPLG	16	GND(USB)
4	TX1+	17	TX1 shield
5	TX1-	18	DDC/SDA
6	RxD(COM1)	19	GND(COM1)
7	TxD(COM1)	20	USB+
8	USB shield	21	USB-
9	DDC/SCL	22	TX0+
10	TX0 shield	23	TX0-
11	+5V(USB)	24	+5V(USB)
12	TXC+	25	TXC shield
13	TXC-	26	GND(USB)



In case of using the LCD display series (CONTEC Products), you need the LCD exchange cable "IPC-PL2620-002/C" (Optional). [Touch Panel Signals are the same to the Serial Port COM1 (CN4) on this board. So it is impossible to use COM1 (CN4) in using LCD Connector.]

Signal Description – Panel Link Connector

TXC+/TXC-: Low voltage swing differential output clock pair.

TX0+/TX0-: Low voltage swing differential output data pair. This pair transmits the flat panel signals: P0 ~ P7, LP and FLM.

TX1+/TX1-: Low voltage swing differential output data pair. This pair transmits the flat panel signals: P8 ~ P15.

TX2+/TX2-: Low voltage swing differential output data pair. This pair transmits the flat panel signals: P16 ~ P23.

RxD: Serial input (COM1). This signal receives serial data to the communication link.

TxD: Serial output (COM1). This signal sends serial data to the communication link.

USB+/USB-: This board does not use these two signals.

2.10 USB Connector: CN9

The Universal Serial Bus (USB) that allows plug and play computer peripherals such as keyboard, mouse, joystick, scanner, printer, modem/ISDN, CD-ROM and floppy disk drive to be automatically detected when they are attached physically without having to install drivers or reboot.

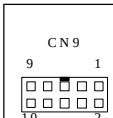
The USB connectors allow any of several USB devices to be attached to the computer. Typically, the device driver for USB devices is managed by the operating system. However, because keyboard and mouse support may be needed in the Setup program before the operating system boots, the BIOS supports USB keyboards and mice.

The CPU card has two USB ports; one USB peripheral can be connected to each port. For more than two USB devices, an external hub can be connected to either port. The CPU card fully supports UHCI and uses UHCI-compatible software drivers.

USB features includes:

- Self-identifying peripherals that can be plugged in while the computer is running
- Automatic mapping of function to driver and configuration
- Support for isochronous and asynchronous transfer types over the same set of wires
- Support for up to 127 physical devices
- Guaranteed bandwidth and low latencies appropriate for telephony, audio and other applications
- Error-handling and fault-recovery mechanisms built into the protocol

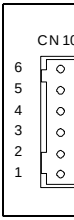
Note: *Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device or a low-speed USB device is attached to the cable. Use shielded cable that meets the requirements for full-speed devices.*
Optional Cable does not have the shield.



Pin No.	Function	Pin No.	Function
1	VCC	2	VCC
3	USBP0-	4	USBP1-
5	USBP0+	6	USBP1+
7	USBG	8	USBG
9	GND	10	GND

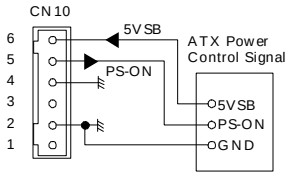
In USB connector cable, you need the “USB Connector Cable” CONTEC Products.

2.11 External ATX Power Connector: CN10



Pin No.	Function
6	5V SBY(input)
5	PS-ON (Soft ON/OFF)(output)
4	GND
3	PBTN-IN(input)
2	GND
1	N.C.

Housing : XHP-6 (JST)
Contact : SXH-001T-P0.6 (JST)



Notes

- *"PBTN-IN" Signal (3pin) is the same to the CN13-8pin(PBTN-IN).*
- *In PC-686C(PC)-LV, -LVS, it supplies the Power to this board as soon as input AC to the ATX Power Supply. But PC-686C(PC)H-LV, -LVS is improved.*

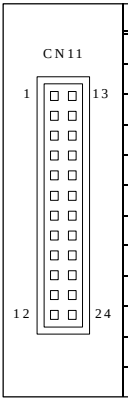
2.12 AUDIO/MODEM RISER connector: CN11 (Optional)

The Audio Codec'97 (AC'97) specification defines a digital link that can be used to attach an audio codec (AC), a modem codec (MC), an audio/modem codec (AMC), or both an AC and an MC. The AC '97 specification defines the interface between the system logic and the audio or modem codec known as the AC'97 digital link.

The Audio Codec'97 (AC'97) compatible audio subsystem includes these features:

- Slip digital/analog architecture for improved signal-to-noise ratio (≥85dB) measured at line out, from any analog input, including line in, CD-ROM, and auxiliary line in
- 3-D stereo enhancement
- Power management support for APM 1.2 and ACPI 1.0

The audio subsystem consists of these devices:



Pin No.	Function	Pin No.	Function
1	GND	13	+5V
2	AC_SPKR	14	AC_OC
3	-12V	15	AC_SB+
4	GND	16	AC_SB-
5	+12V	17	+3.3V_SBY
6	GND	18	AC_YNC
7	+5V	19	GND
8	GND	20	AC_SDIN1
9	+3.3V	21	GND
10	AC_SDOUT	22	AC_SDIN0
11	AC_ESET	23	GND
12	AC_MSTCLK	24	AC_BITCLK

Note : *Optionals is none for using this Connector (CN11)*

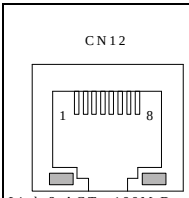
2.13 RJ-45 LAN connector: CN12

The PC-686C(PC), PC-686C(PC)H CPU card is used Intel® 82559 PCI LAN chipset for LAN controller, the controller's features include:

- CSMA/CD Protocol Engine
- PCI bus interface
- DMA engine for movement of commands, status, and network data across PCI bus
- Integrated physical layer interface, including:
  1. Complete functionality necessary for the 10Base-T and 100Base-TX network interfaces; when in 10Mbit/sec mode, the interface drives the cable directly
  2. A complete set of Media Independent Interface (MII) management registers for control and status reporting
  3. 802.3µ Auto-Negotiation for automatically establishing the best operating mode when connected to other 10Base-T or 100Base-TX devices, whether half- or full-duplex capable
- Integrated power management features, including:
  1. Support for APM
  2. Support for Wake on LAN technology

This connector is for the 10/100Mbps Ethernet capability of the CPU card. The follow table shows the pin assignments of this connector.

- The category-5 cable is required for transmission at 100Mbps.



Pin No.	Function
1	TX+
2	TX-
3	RX+
4	N.C.
5	N.C.
6	RX-
7	N.C.
8	N.C.

2.14 Front Panel Connector: CN13

This header can be connected to a front panel power switch. The front panel connector includes headers for these I/O connections:

Infrared (IrDA) port

Serial Port 2 can be configured to support an IrDA module connected to this 6-pin header. After the IrDA interface is configured, files can be transferred to or from portable devices such as laptops, PDAs and printers using application software. This connector is for optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function.

Power switch

Power LED

This header can be connected to an LED that will light when the computer is powered on.

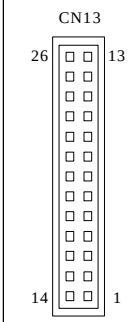
Key Lock

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock to this pin.

Hard drive activity LED

This header can be connected to an LED to provide a visual indicator that data is being read from or written to an IDE hard drive. For the LED to function properly, the IDE drive must be connected to the onboard IDE controller.

Speaker



Pin No.	Function	Pin No.13	Function
26	SPKR_IN	12	GND
25	SPKR_NEG	11	RST_PD
24	N.C.	10	N.C.
23	VCC	9	N.C.
22	GND	8	GND
21	KEY_LOCK	7	PBTN_IN
20	GND	6	GND
19	N.C.	5	3.3V
18	PWR_LED	4	VCC
17	N.C.	3	N.C.
16	N.C.	2	IRRX
15	FP_PD	1	GND
14	IDE_ACTIVE		IRTX

Function	Pin No.
InfraRed	1,2,3,4,5,6
Power Switch	8,9
Reset Switch	12,13
HDD LED	14,15
Power LED	17,18,19,20
Key Lock	21,22
Speaker	23,24,25,26

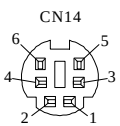
Default: 25-26pin short

A speaker can be installed on the PC-686C(PC), PC-686C(PC)H as a manufacturing option. The speaker is enabled by a jumper on pins 23-26 of the front panel connector. The onboard speaker can be disabled by removing the jumper, and an offboard speaker can be connected in its place. The speaker (onboard or offboard) provides error beep code information during the POST in the event that the computer cannot use the video interface. The speaker is not connected to the audio subsystem and does not receive output from the audio subsystem.

In using ATX Power Supply, PC-686C(PC)-LV, -LVS supplies the Power to this board as soon as input AC to the ATX Power Supply. But PC-686C(PC)H-LV, -LVS is improved.

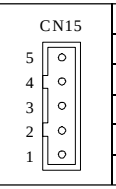
2.15 PS/2 Mouse Connector: CN14

The CPU card provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The Connector pin definition is shown below:



Pin No.	Function
1	MOUSE DATA
2	N.C.
3	GND
4	+5V
5	MOUSE CLOCK
6	N.C.

2.16 EXT. Keyboard Connector: CN15

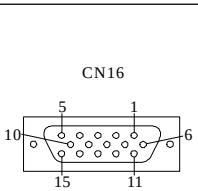


Pin No.	Function
5	+5V
4	GND
3	N.C.
2	KB DATA
1	KB CLOCK

Housing : XHP-5 (JST)
Contact : SXH-001T-P06 (JST)

2.17 VGA Connector: CN16

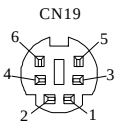
It is a VGA CRT connector (DB-15). The pin assignments are as follows:



Pin No.	Function	Pin No.	Function
1	RED	9	N.C.
2	GREEN	10	GND
3	BLUE	11	D-DATE
4	N.C.	12	N.C.
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	D-DCLK
8	GND		

2.18 Keyboard Connector: CN19

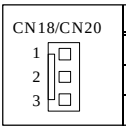
The CPU card provides a standard PS/2® keyboard mini DIN connector for attaching a keyboard. You can plug a keyboard directly into this connector. The Connector pin definition is shown below:



Pin No.	Function
1	K.B DATA
2	N.C.
3	GND
4	+5V
5	K.B CLOCK
6	N.C.

2.19 CPU FAN Connector: CN18/CN20

CN18 and CN20 are 3-pin box-header for the CPU cooling fan power connector. The fan must be a 12V fan. Pin 3 is for Fan speed sensor input.

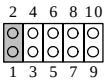
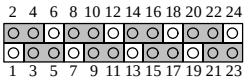
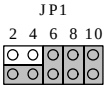
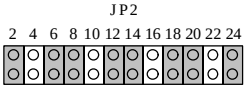
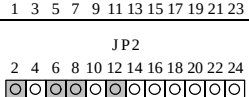


Pin No.	Function
1	GND
2	DC+12V
3	Sensor

Housing : 5102-03 (molex)
Contact : 5103 (molex)

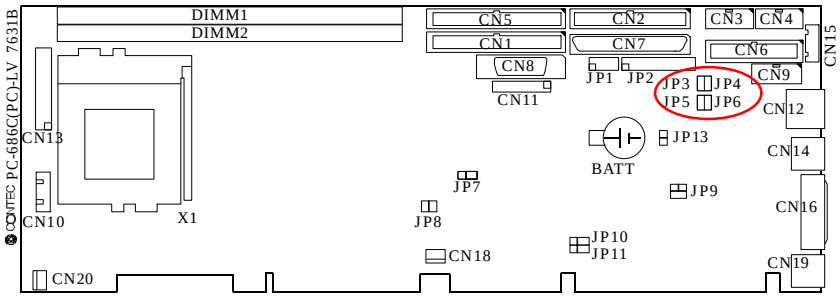
Chapter 3 Jumper Setting

3.1 CN4 RS232/422/485 Selector: JP1 & JP2

	JP1	JP2
RS-232C (Default)		
RS-422		
RS-485		

1. For RS-485, TX+(pin 2) and RX+ (pin 3) must jumper together inside the D type connecotr.

2. TX-(pin 1) and RX-(pin 4) is the same above.



Transmit date control in half-duplex mode

In half-duplex mode, the transmission buffer must be controlled to prevent transmit data from causing a collision. The PC-686C(PC), PC-686C(PC)H uses the RTS signal and bit 1 in the modem control register to control transmit data.

Modem control register

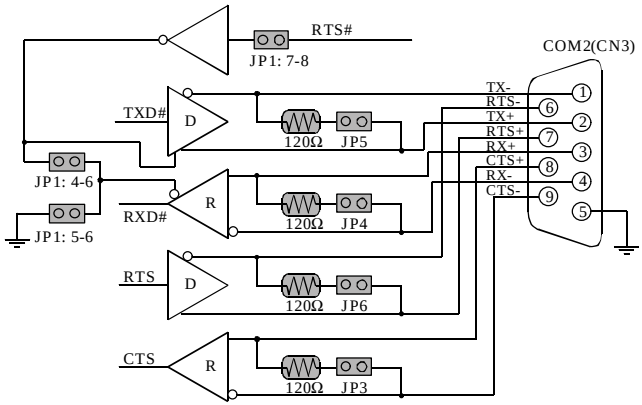
(Setting I/O address +4H) bit 1: 0 … RTS High (Disables transmission)

1 … RTS low (Enables transmission)

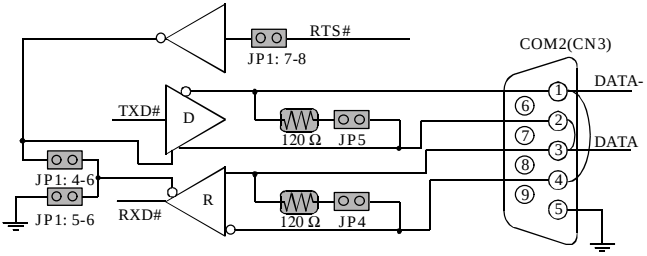
Setting the RS-422/RS-485 receiver disable control jumper

When the RS-422/RS-485 port is used, the RTS signal is used for driver enable control Connecting JP1 Pins 4 and 6 disables the receiver at the same time, preventing the port from receiving output data to an external device.

3.1.1 RS-422 Setting



3.1.2 RS-485 Setting



I/O addresses and instructions

The table below lists I/O addresses for use as COM2.

I/O address	DLAB	Read/Write	Register	
02F8H	0	W	Transmitter holding Register	THR
		R	Receiver buffer Register	RBR
	1	W	Divisor latch Register (LSB)	DLL
02F9H	1	W	Divisor latch Register (MSB)	DLM
	0	W	Interrupt enable Register	IER
02FAH	X	R	Interrupt ID Register	IIR
02FBH	X	W	Line control Register	LCR
02FCH	X	W	Modem Control Register	MCR
02FDH	X	R	Line status Register	LSR
02FEH	X	R	Modem Status Register	MSR
02FFH	X	R/W	Scratch Register	SCR

3.2 CTS Terminator on for RS-422: JP3

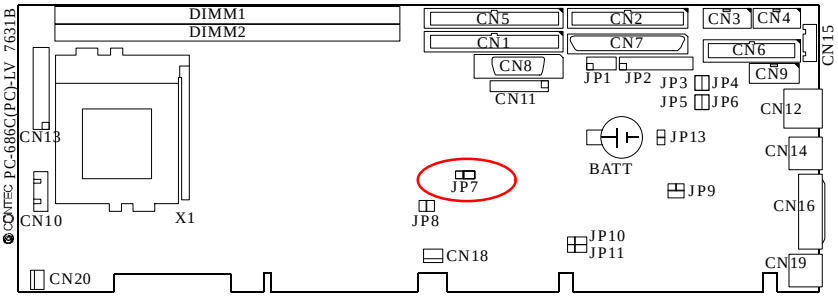
3.3 RX Terminator on for RS-422/485: JP4

3.4 TX Terminator on for RS-422/485: JP5

3.5 RTS Terminator on for RS-422: JP6

JP3/JP4/JP5/JP6	Function
	No terminating resister (Default)
	terminating resister provided

3.6 Clear CMOS Content: JP7

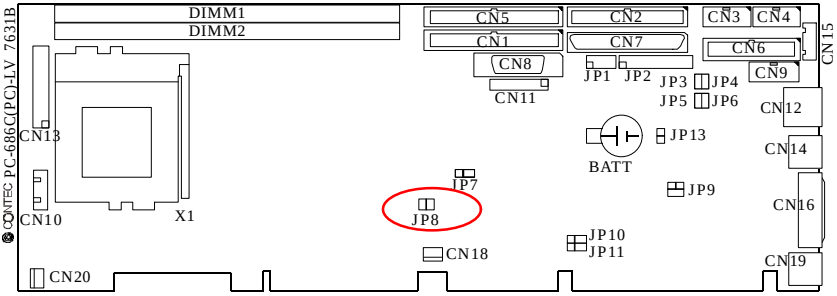


The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program. The RAM data contains the password information is powered by the onboard button cell battery. User can erase the CMOS memory content by short pin2 and pin3 of JP7 together.

An external coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the 3.3 V standby current from the power supply extends the life of the battery. The clock is accurate to ± 2 minutes/month at 25ºC with 3.3V applied.

JP7	Function
	Normal Operation (Default)
	Clear CMOS Content

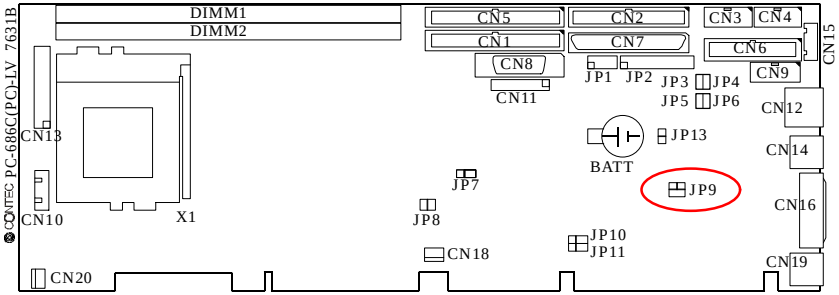
3.7 Top Block Lock jumper: JP8



TOP BLOCK LOCK (TBL#): When Locked, prevents programming or block erase to the highest addressable block 7 in a 4M, 15 in an 8M), regardless of the state of the lock register. When unlocked, disables hardware writes protection for the top block, though register-based protection still applies. The status of TBL# does not affect the status of block-locking registers.

JP8	Function
JP8	Locked
JP8	Unlocked (Default)

3.8 Disk On Chip Memory Add. Selector: JP9

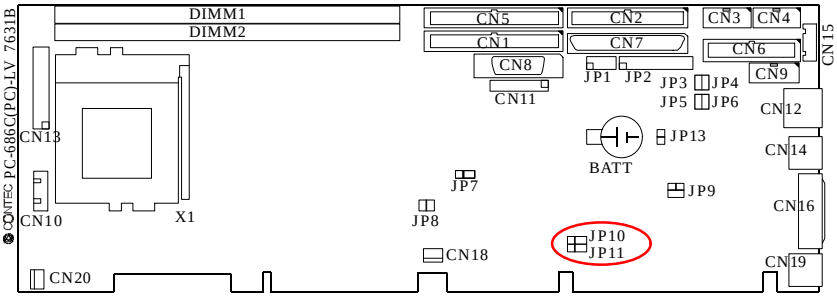


JP9 is used for memory address selection of DiskOnChip. Below are 4 kinds of DiskOnChip memory address configuration.

JP9	Function
JP9 	0DC00~ 0DDFFh
JP9 	0D800h~0D9FFh
JP9 	0D400h~0D5FFh
JP9 	0D000h~0D1FFh (Default)

3.9 SCSI enable/disable selector: JP10

You can enable or disable the SCSI function via hardware by setting the jumper JP10.



JP10	Function
JP10 1 2 3	SCSI Enabled (Default)
JP10 1 2 3	SCSI Disabled

Note: *The case of no-connecting to SCSI connector: CN7, please set this JP10 "Disabled" (2-3)short.*

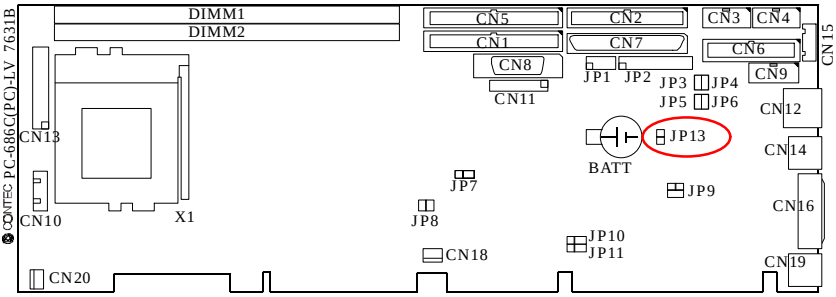
3.10 Watch Dog Timer output selector: JP11

When the watchdog timer activates, setup involves two jumpers. (CPU processing has come to a halt), it can reset the system or generate a NMI. This can be setting JP11 as shown below:

JP11	Function
JP11 1 2 3	NMI (Default)
JP11 1 2 3	Reset

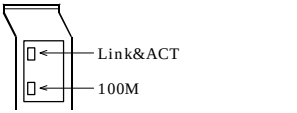
3.11 LAN enable/disable jumper: JP13

You can enable or disable the LAN function via hardware by setting the jumper JP13.



JP13	Function
JP13	LAN Enabled (Default)
JP13	LAN Disabled

3.12 LED Indicator



Link&ACT : TX&RX
100M : 100BASE-T

Chapter 4 CPU Card Resources

4.1. I/O MAP

Address (hex)	Size	Description
0000 ~ 000F	16 bytes	DMA Controller
0020 ~ 0021	2 bytes	Programmable Interrupt Control (PIC)
0040 ~ 0043	4 bytes	System timer
0060	1 byte	Keyboard Controller Byte: Reset IRQ
0061	1 byte	System speaker
0064	1 byte	Keyboard controller, CMD/STAT Byte
0070 ~ 0071	2 bytes	System CMOS / Real Time Clock
0072 ~ 0073	2 bytes	System CMOS
0080 ~ 008F	16 bytes	DMA controller
0092	1 byte	Fast A20 and PIC
00A0 ~ 00A1	2 bytes	PIC
00B2 ~ 00B3	2 bytes	APM control
00C0 ~ 00DF	32 bytes	DMA
00F0	1 byte	Numeric data processor
0170 ~ 0177	8 bytes	Secondary IDE channel
01F0 ~ 01F7	8 bytes	Primary IDE channel
One of these ranges: 0200 – 0207 0208 – 020F 0210 – 0217 0218 – 021F	Can vary from 1 byte to 8 bytes	Audio / game port
One of these ranges: 0220 – 022F 0240 – 024F	16 bytes 16 bytes	Audio (Sound Blaster Pro - compatible)
0228 ~ 022F*	8 bytes	LPT3
0278 ~ 027F*	8 bytes	LPT2
0295,0296	2 bytes	Hard Ware Monitor
02E8 ~ 02EF*	8 bytes	COM4/Video (8514A)
02F8 ~ 02FF*	8 bytes	COM2
One of these ranges: 0320 – 0327 0330 – 0337 0340 – 0347 0350 – 0357	8 bytes	MPU~401 (MIDI)
0376	1 byte	Secondary IDE channel command port
0377	1 byte	Floppy channel 2 command
0377, bits 6:0	7 bits	Secondary IDE channel status port
0378 ~ 037F	8 bytes	LPT1

Address (hex)	Size	Description
0388~ 038D	6 bytes	AdLib (FM synthesizer)
03B0 ~ 03BB	12 bytes	Intel® 810 – DC100/Intel® 810E Graphics/Memory Controller Hub (GMCH)
03C0 ~ 03DF	32 bytes	Intel® 810/Intel® 810E Graphics/Memory Controller Hub (GMCH)
03E8 ~ 03EF	8 bytes	COM3
03F0 ~ 03F5	6 bytes	Floppy Channel 1
03F6	1 byte	Primary IDE channel command port
03F7 (Write)	1 byte	Floppy channel 1 command
03F8 ~ 03FF	8 bytes	COM1
04D0 ~ 04D1	2 bytes	Edge/level triggered PIC
One of these ranges: 0530 – 0537 0E80 – 0E87 0F40 – 0F47	8 bytes	Windows Sound System
LPT n + 400h	8 bytes	ECP port, LPT n base address + 400h
0CF8 ~ 0CFB**	4 bytes	PCI configuration address register
0CF9***	1 byte	Turbo and reset control register
0CFC ~ 0CFF	4 bytes	PCI configuration data register
FFA0 ~ FFA7	8 bytes	Primary bus master IDE registers
FFA8 ~ FFAF	8 bytes	Secondary bus master IDE registers
96 contiguous bytes starting on a 128-byte divisible boundary		ICH (ACPI + TCO)
64 contiguous bytes starting on a 64-byte divisible boundary		Motherboard resource
64 contiguous bytes starting on a 64-byte divisible boundary		Onboard audio controller
32 contiguous bytes starting on a 32-byte divisible boundary		Ich (USB)
16 contiguous bytes starting on a 16-byte divisible boundary		Ich (SMB)
4096 contiguous bytes starting on a 4096-byte divisible boundary		Intel® 810AA PCI bridge
32 contiguous bytes starting on a 32-byte divisible boundary		Intel® 82559 LAN controller

* Default, but can be changed to another address range.
** Dword access only
*** Byte access only

4.2. MEMORY MAP

Address Range (H)	Size	Description
100000-1FFFFFFF	511MB	Extended memory
F0000-FFFFF	64KB	Runtime BIOS
E0000-EFFFF	64KB	Reserved
D0000-DFFFF	64KB	Available high DOS memory (available external board)
C8000-CFFFF	32KB	Reserved (not available for external board)
A0000-C7FFF	160KB	Video memory and BIOS
9FC00-9FFFF	1KB	Extended BIOS data (movable by memory manager software)
80000-9FBFF	127KB	Extended conventional memory
00000-7FFFF	512KB	Conventional memory

4.3. DMA Channels

DMA	Data Width	System Resources
0	8 or 16bits	Audio
1	8 or 16bits	Audio / parallel port
2	8 or 16bits	Diskette drive
3	8 or 16bits	Parallel port (for ECP)/audio
4		DMA channel
5	16bits	Open
6	16bits	Open
7	16bits	Open

4.4. PCI Configuration Space Map

Bus #	Device #	Function #	Description
00	00	00	Intel® 810/Intel® 810E Graphics/Memory Controller Hub (GMCH)
00	01	00	Intel® 810/Intel® 810E Graphics/Memory Controller Hub (GMCH)
00	1E	00	Hub link to PCI bridge
00	1F	00	Intel® 82801AA I/O Controller Hub (ICH) PCI to PCI bridge

Bus #	Device #	Function #	Description
00	1F	01	IDUSBE
00	1F	02	SMBUS
00	1F	03	AC'97 audio controller or reserved
00	1F	05	AC'97 modem controller or reserved
00	1F	06	Intel® 82559 LAN controller or reserved

4.5. Interrupters

IRQ #	System Resources
NMI	I/O Channel check
0	Reserved, interval timer
1	Reserved, keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	COM2* (user available if COM2 is not present)
4	COM1*
5	LPT2 (Plug and Play option)/audio/user available
6	Diskette drive controller
7	LPT1*
8	Real time clock
9	User available
10	User available
11	User available
12	Onboard mouse port (if present, else user available)
13	Reserved, math coprocessor
14	Primary IDE (if present, else user available)
15	Secondary IDE (if present, else user available)

* Default, but can be changed to another IRQ

Chapter 5 Software Utilities

This chapter introduces the software utilities supplied for PC-686C(PC), PC-686C(PC)H which including a 10/100M Ethernet driver, SCSI II driver, Intel® 810/Intel® 810E chipset INF Installation Utility / Graphics drivers / UltraATA Storage Driver and watchdog function configuration Setting.

5.1 Driver for Intel® 810/Intel® 810E chipset

Graphics Drivers

- Windows 98, Windows 95 OSR2.x
- Windows NT 4.0
- Windows 95 Retail, OSR1 *
- Windows NT 3.51 *
- Windows 3.1 *

* PC-686C(PC)H does not support.

INF Installation Utility for Windows 9.x

UltraATA Storage Driver

- Windows 98
- Windows NT 4.0

Note: *The INF Installation Utility is only needed when installing Windows 9.x. For more information on the INF Installation utility, please refer to the readme.txt file.*

INF Installation Utility

System INF Utilities for Windows 98, Windows 95 OSR 2.x, Windows 95 OSR1, Windows 95 Retail

The Intel® INF Installation Utility installs to the target system the INF files that outline to the operating system how the chipset components shall be configured. This is needed for proper functionality of the Intel® 810/Intel® 810E chipset.

CD-ROM Directory are

```
\-+                          ; CD-ROM Root Directory
  +---CHIPSET                ; Intel(R) 810/Intel(R) 810E Chipset Driver &
  |   |                        Utility
  |   +---INF_INST           ;   INF Installation Utility
  |   |    +---WIN9X         ;   for Windows 9x
  |   |        (SETUP.EXE)   ;
  |   |
  |   +---ULTRAATA           ;   UltraATA Storage Driver
  |       +---W98_NT40       ;   for Windows 98/NT 4.0
  |           (SETUP.EXE)    ;
```

Note in WinNT 4.0

1. In using 512MB(Memory) to install WinNT 4.0 by Flopply boot, it is unstable to install complete. In this case please install by CD-ROM boot. And Floppy disk can't be recognized, so install on and after Service Pack 3.
2. In selecting NTFS format, when you setup Windows NT 4.0 under one specific environment, the information that displays in the point change text mode setup to GUI mode setup will be wrong. But convert to NTFS will work normally.

Graphics Drivers

This driver package contains the drivers of the OS as below.

Windows 3.1, Windows NT 3.51/4.0, Windows 95(Retai,OSR1),

Windows 95(OSR2.x), Windows 98(SE), Windows Me, Windows 2000

Note: *PC-686C(PC)H does not support Windows 95 OSR1, Windows 95 Retail, Windows NT 3.51, Windows 3.1.*

CD-ROM Directory are

```
\-+
  +---GRAPHICS              ; Intel(R) 810 Chipset Graphics Driver
  |    +---WIN9x            ;   for Windows 95*/98/98SE and Windows ME
  |    |       (SETUP.EXE)  ;
  |    |
  |    +---WINNT351         ;   for Windows NT3.51 *
  |    |
  |    +---WINNT40          ;   for Windows NT4.0
  |    |       (SETUP.EXE)  ;
  |    |
  |    +---WIN31            ;   for Windows 3.1 *
  |    |       (SETUP.BAT)  ;
  |    |
  |    +---WIN2K            ;   for Windows 2000
  |            (SETUP.EXE)  ;
```

5.2 LAN Driver

Introduction

The CPU card PC-686C(PC), PC-686C(PC)H is adopt 82559 10/100 Mbps Fast Ethernet controller with an integrated 10/100 Mbps for PCI board LAN designs.

Specifications

- Advanced Configuration and Power Interface (ACPI) 1.20A based power management
- Wake on Magic Packet
- Wake on interesting packet
- Advanced System Management Bus (SMB) based manageability
- Wired for Management (WFM) 2.0 compliance
- IP checksum assist
- PCI 2.2 compliance
- PC 98, PC 99, and Server 99 compliance.

LAN Drivers

- Windows 98, Windows 95 OSR2.x , Windows 95 Retail, OSR1, Windows NT 4.0, NT 3.51

  CD-ROM directory : \LAN

- DOS

  CD-ROM directory : \DOS

- NETWARE Client

  CD-ROM directory : \DOS

- NETWARE Server

  CD-ROM directory : \NWSERVER

- Microsoft LAN Manager

  CD-ROM directory : \mslanman.dos

Before install the LAN utilities please refer to the files *.txt in the rootdirectory and subdirectory \LAN,\LAN\INFO.

If you need to use the Floppy Disk to install the LAN drivers, use the MAKEMS.BAT or MAKENW.BAT utilities located in the \LAN\MAKEDISK directory on CD-ROM.

5.3 SCSI Driver

Introduction

This section serves as an installation guide to the onboard SCSI interface on your CPU card. It contains important information to ease the installation and configuration process.

With the SCSI interface, you can connect SCSI peripherals such as hard disk drives, scanners, CD-ROM drivers and tape drives.

The adoption of LSI 53C895 SCSI chips makes best utilize of new Ultra2 SCSI technology, which doubles the data throughput and break the cable length limitation from Ultra Wide SCSI. These great features combined with the comprehensive Graphic User Interface (GUI) RAID Manager delivers cost effective, high performance and high data security solutions for users.

DOS 5.0 and later versions

ASPI8XX.SYS, SYMDISK.SYS, SYMCD.SYS, INSTALL.EXE

Description: DOS/Windows drivers for 53C8xx family I/O processors and host adapters. These drivers support DOS 5.0 and later versions.

Novell NetWare

Description: NetWare drivers for 53C8xx family I/O processors and host adapters. Contains drivers that support NetWare 3.12, 3.2, 4.11, 4.20 and 5.0 operating systems to include DMI. Use the -d option if using pkunzip. Drivers will not work with Compaq systems that have embedded Symbios brand I/O processors or host adapters, or with Diamond Fireport PCI-SCSI cards using Symbios brand I/O processors.

OS/2 Warp 3.0 and 4.x

Description: OS/2 drivers for 53C8xx family I/O processors and host adapters. supports OS/2 versions 3.0 (Warp) and 4.x operating systems. Drivers will not work with Compaq systems that have embedded Symbios brand I/O processors or host adapters, or with Diamond Fireport PCI-SCSI cards using Symbios brand I/O processors.

Windows 95 and Windows 98

Description: Windows 95/98 driver for 53C8xx family I/O processors and host adapters in Intel x86-based platforms. Supports Windows 95/98 upgrade, Windows 95 (Retail, OSR1), Windows 95 (OSR2.x) and Windows 98 operating systems.

Windows NT 4.0 for Intel chipsets Intel x86 Chipsets

Description: Windows NT driver for 53C8xx family I/O processors and host adapters in Intel x86-based platforms. Supports Windows NT 4.0 operating system.

NTASPI

Description: Windows NT ASPI driver for 53C8xx family I/O processors and host adapters in Intel x86-based platforms. Supports Windows NT 4.0 operating system, based on the "ASPI for Win32" version 2.0 specification.

SP4 fix documentation

Please note that even though the Windows NT driver will in most cases work with NT 3.51, it has not been tested with that O/S. Future testing will no longer be conducted with Windows NT 3.51. The driver is meant to be used with Windows NT 4.0 and future releases.

The method of installation Windows NT 4.0 to the SCSI HDD by CD-ROM Boot

a. Start install Windows NT 4.0
b. Push “F6” key when it displays “Setup is inspecting your computer’s hardware configuration”.
c. Then please follow the instruction of display, and operate.

DOS Utilities

Low-level format (ASPIFMT.EXE)

Description: Low-level SCSI format utility for use with Symbios brand PCI-SCSI host adapters.

Diagnostic program SYM53C8xx (SYMDIAG.EXE)

Description: Utility to detect SDMS software, SCSI adapters, ASPI managers and detailed device information with a graphical user interface. For use with SYM53C8xx based products.

Configuration utility for DOS and Windows 3.x (CONFIG.EXE)

Description: Configuration utility for Symbios brand PCI-SCSI host adapters. NOTE: aspi8xx.sys must be loaded in the config.sys before the utility will work.

PCI Configuration utility for DOS (PCI_CNFG.EXE)

Description: This file presents general information about the Symbios brand Multi-language Configuration Utility. (US Mode Only)

CD-ROM Directory are

```
\-+                          ; CD-ROM Root Directory
  +---SCSI                   ; SYMBIOS 53C8xx SCSI Driver & Utility
  |   | (MKFDSCSI.BAT)       ;    (Batch file to make SCSI Driver FD)
  |   +---DOS_UT             ;    DOS Configuration Utility
  |   +---DOS                ;    Driver for DOS/Windows
  |   +---NETWARE            ;    Driver for NetWare and OS/2
  |   +---WIN9X_NT           ;    Driver for Windows 9x/NT
  |       +---NT_DMI         ;
  |       +---WINNT          ;
  |       |   +---NTASPI     ;
  |       |   +---MINIPORT   ;      for Windows NT
  |       +---8XX95          ;      for Windows 9x
```

If you need to use the Floppy Disk to install the SCSI drivers, use the MKFDSCSI.BAT utilities located in the \SCSI directory on CD-ROM.

5.4 Watch-Dog-Timer (WDT) Setting

WDT is widely used for industry application to monitoring the activity of CPU. Application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT time out, the functional normal system will reload the WDT. The WDT never time out for a normal system. The WDT will not be reload by an abnormal system, then WDT will time out and reset the system automatically to avoid abnormal operation.

PC-686C(PC), PC-686C(PC)H supports 16 levels watchdog timer by software programming I/O ports. Write any value to I/O address 0441H will disable Watch-Dog-Timer. Write setting code (please reference to WDT Setting Table) to I/O 0443h will re-load WDT.

Below is an assembly program example for disable and load of WDT.

```
MOV DX,0441H REM Write any value to 0441H, disable WDT
OUT DX,AX;
MOV AX,0001H REM set WDT timer = 28 Sec
MOV DX,0443H
OUT DX,AX REM trigger WDT with timer setting
```

VALUE	TIMER	VALUE	TIMER	VALUE	TIMER	VALUE	TIMER
0	30 Sec.	4	22 Sec.	8	14 Sec.	C	6 Sec.
1	28 Sec.	5	20 Sec.	9	12 Sec.	D	4 Sec.
2	26 Sec.	6	18 Sec.	A	10 Sec.	E	2 Sec.
3	24 Sec.	7	16 Sec.	B	8 Sec.	F	0 Sec.

5.5 Update new version BIOS

Steps 1: Make a record of your original or existing BIOS Setup parameters. Press [Del] during the Power-On-Self-Test to enter BIOS Setup Program and write down the value of each parameter in order to re-configure your System after BIOS updating

Step 2: Make a System Disk. Put a 3.5 inch disk in Drive A. For MS-DOS, Key in "format a:/s" and press [Enter]. For Windows, select My Computer, click 3.5 inch Floppy (A:), select File/Format from Command Bar. On the "Format 3.5 inch Floppy (A:)" menu, select "Copy system files" and then click [Start] button.

Step 3: Copy the updated BIOS bin file and awdflash.exe file to the System Disk.

Step 4: Put the System Disk in Drive A and re-start your computer from Drive A.

Step 5: Begin to update your BIOS. Enter [awdflash] command, the "Flash Memory Writer" message will appear on screen. Enter the updated BIOS file name at "File Name to Program:". Enter the backup file name for the existing BIOS at "File Name to Save:". Press [Y] to proceed with the BIOS updating.

Step 6: Re-configure your system. Remove the System Disk and re-start your computer. Press [Del] during the Power-On-Self-Test to enter BIOS Setup Program. Re-set the relevant parameters according to your record of the Original setting. Save and Exit BIOS Setup program to re-boot your system.

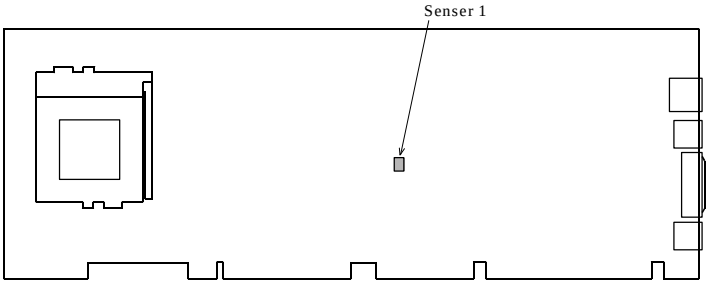
Chapter 6 Hard Ware Monitor

Hardware Monitor function is included in LPC Controller (Winbond W83627HF) on PC-686C(PC), PC-686C(PC)H.

You can read Temperature ,Voltage and Fan Sensor output of SBC

6.1. Temperature

Two Thermistors are mounted on SBC as following. You can read Temperature of this position.



6.2. Voltage

You can read 3.3V, +5V, -5V, +12V, -12V, VTT(1.5V), Vcore,
5VSB, VBAT of SBC.
VTT(1.5V) :CPU I/O Voltage
Vcore :CPU Core Voltage
5VSB :5V Stand by voltage of ATX Power supply
VBAT(3V) :Lithium Battery Voltage

6.3. FAN Speed Sensor

FAN Speed Sensor signal is input in CN20 pin3 when you use FAN with speed sensor.

You can read FAN speed .

<Caution>

You must use FAN with speed sensor if you would like to read FAN speed.

6.4. W83627HF Registers

There are two ports to read W83627HF HardWare Monitor Registers. These two ports are described as following.

Index Register :295h
Data Register :296h

The registers Index is showed as next page.

<Sample Program : Read Chip ID Register to bx>

```
mov ax,4eh;
mov dx,295h;
out dx,ax ;   (index register set for BANK select register)
inc dx;
out dx,80h;   (BANK=0 is set)
mov ax,58h;
mov dx,295h;
out dx,ax;          (index register set for Chip ID register)
inc dx;
in   bx,dx;   (Read Chip ID Register to bx)
```

Hard Ware Monitor Register Index:

Address	Auto-Increment Address	Description
20h	60h	VTT(1.5V) reading
21h	61h	Vcore reading
22h	62h	+3.3V reading
23h	63h	+5V reading
24h	64h	+12V reading
25h	65h	-12V reading
26h	66h	-5V reading
27h	67h	Sensor1 Temperature reading
28h	68h	CN20 FAN sensor reading
29h	69h	Reserved
2Ah	6Ah	Reserved
2Bh-3Dh	6Bh-7Dh	Limit Registers (*1)
3Eh-3Fh	7Eh-7Fh	Reserved
40h-46h	-	Configuration registers (*1)
47h	-	VID/Fan Register
48h-4Dh, 4Fh	-	Configuration registers (*1)
4Eh	-	50h-5Fh Bank Select register
BANK0		
50h-55h	-	Winbond TEST register
56h,57h		Beep Control register(*1)
58h	-	Chip ID Register <21h>
59h-5Eh	-	Configuration registers (*1)
5Dh	-	FAN Divisor register

Address	Auto-Increment Address	Description
5Eh,5Fh	-	Reserved
BANK1		
50h,51h	-	Sensor2 Temperature reading
52h-5Fh	-	Sensor2 Temperature Configuration Register (*1)
BANK2		
50h-5Fh	-	Reserved
BANK3		
50h-5Fh	-	Reserved
BANK4		
50h-5Fh	-	Configuration Register (*1)
BANK5		
50h	50h	5VSB reading
51h	51h	VBAT reading
52h,53h	52h,53h	Reserved
54h-67h	54h-67h	Limit Registers (*1)
BANK6		
50h-5Fh	-	Winbond TEST Register

(*1)Please refer to W83627HF manual in detail

VTT(1.5V) reading Register(20h)

Vcore(V) = 16mV x ReadData

Vcore reading reading Register(21h)

VTT(V) = 16mV x ReadData

+3.3V reading Register(22h)

V3.3(V) = 16mV x ReadData

+5V reading Register(23h)

V5(V) = 16mV x ReadData x 1.68

+12V reading Register(24h)

V+12(V) = 16mV x ReadData x 3.8

-12V reading Register(25h)

V-12(V) = ((16mV x ReadData) - (3.6 x 0.806))/(1-0.806)

=((16mV x ReadData) - 2.9)/0.194)

-5V reading Register(26h)

V-5(V) = ((16mV x ReadData) - (3.6 x 0.682))/(1-0.682)

=((16mV x ReadData) - 2.46)/0.318)

5VSB reading Register(BANK5:50h)

V5VSB(V) = 16mV x ReadData x 1.52

VBAT reading Register(BANK5:51h)

VBAT(V) = 16mV x ReadData

Temperature Sensor1 Temperature Register(27h)

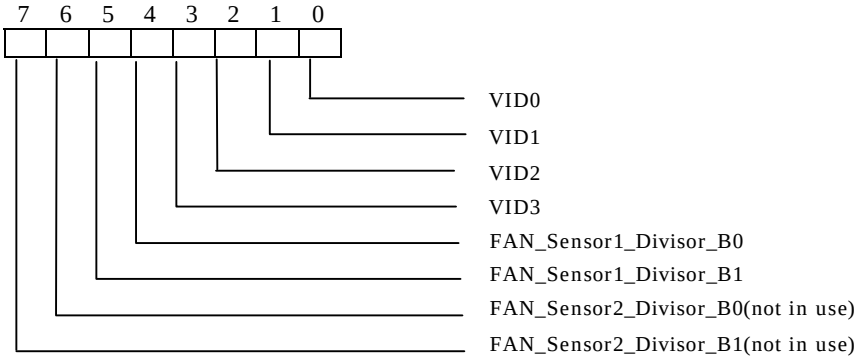
Temperature Sensor1 Data Format Table:

Temperature	Temperature Sensor Register
+125°C	7Dh
:	:
+25°C	19h
:	:
+5°C	05h
:	:
+1°C	01h
+0°C	00h
-1°C	FFh
:	:
-5°C	FBh
:	:
-25°C	E7h
:	:
-55°C	C9h

CN20 FAN sensor Reading Register(28h)

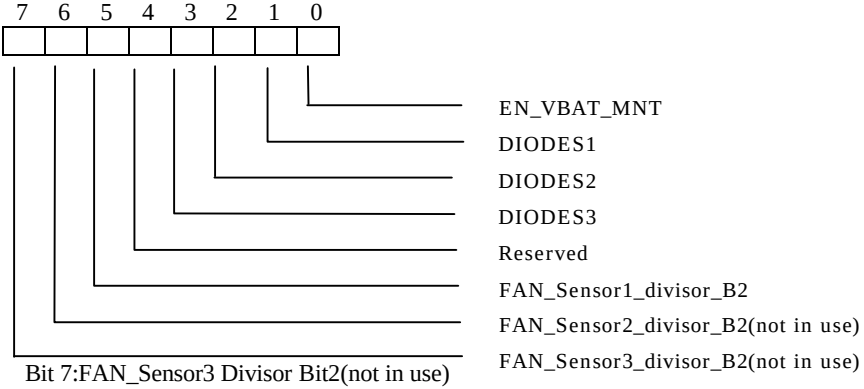
RPM=$1.35x10^6$ / (ReadData x FAN_sensor1_Divisor)

VID/FAN Register(47h)



Bit 7-6:FAN_Sensor2 Divisor Bit 1-0(not in use)
Bit 5-4:FAN_Sensor1 Divisor Bit 1-0
Bit 3-0:VID<3:0> Input

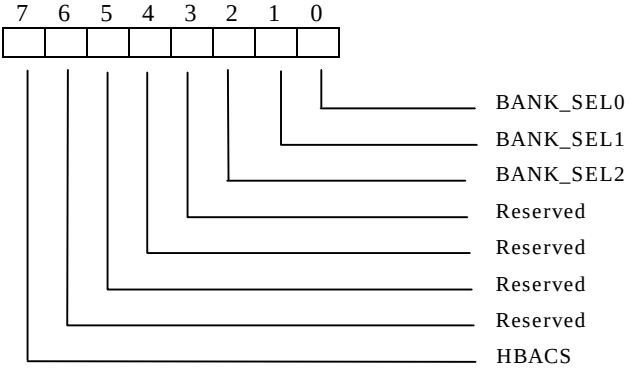
FAN Divisor Register(BANK0:5Dh)



Bit 7:FAN_Sensor3 Divisor Bit2(not in use)
Bit 6:FAN_Sensor2 Divisor Bit2(not in use)
Bit 5:FAN_Sensor1 Divisor Bit2
Bit 4:Reserved
Bit 3:Sensor 3 type selection(not in use)
Bit 2:Sensor 2 type selection(not in use)
Bit 1:Sensor 1 type selection (Set to "0")
Bit 0:Battery Monitor Enable/Disable (1:Enable,0:Disable)
FAN Divisor Table:

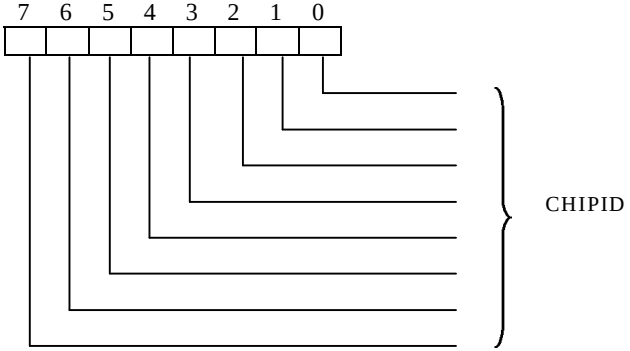
Bit2	Bit1	Bit0	Divisor		Bit2	Bit1	Bit0	Divisor
0	0	0	1		1	0	0	16
0	0	1	2		1	0	1	32
0	1	0	4		1	1	0	64
0	1	1	8		1	1	1	128

50-5Fh Bank Select Register(4Eh)



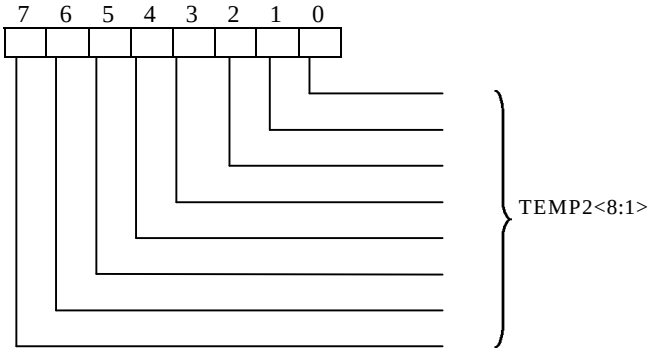
Bit 7:Byte access select for 4Fh (not in use)
Bit 6-3:Reserved
Bit 2-0:Index ports 50h-5Fh Bank Select

Chip ID Register(BANK0:58h)



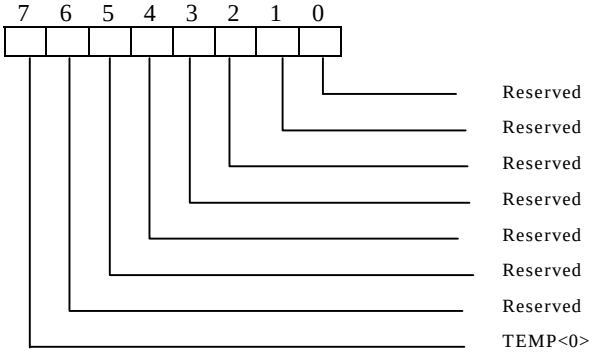
Bit 7-0:Winbond Chip ID number. Read this register return “21h”.

Temperature Sensor2 Temperature Register1(BANK1:50h)



Please refer to temperature Sensor2 Data Format Table

Temperature Sensor2 Temperature Register2(BANK1:51h)



Please refer to temperature Sensor2 Data Format Table

Temperature Sensor2 Data Format Table:

Temperature	TEMP<8:1>	TEMP<0>
+125°C	7Dh	0
:	:	:
+25°C	19h	0
:	:	:
+1 °C	01h	0
+0.5°C	00h	1
+0°C	00h	0
-0.5°C	FFh	1
-1°C	FFh	0
:	:	:
-25°C	E7h	0
:	:	:
-55°C	C9h	1

Chapter 7 BIOS Setup

7.1. Introduction

This chapter discusses Award's Setup program built into the FLASH ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

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 <Del> immediately after switching the system on, or
2. by pressing the <Del> 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

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.

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
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
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
F1 key	General help on Setup navigation keys
F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

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.

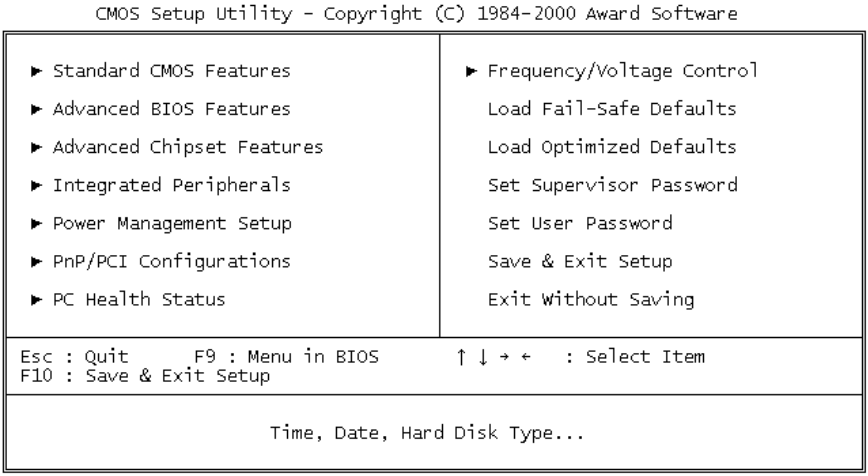
In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the Award BIOS™ supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

A Final Note About Setup

The information in this chapter is subject to change without notice.



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 accept and enter the sub-menu.

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration. See Section 7.3. for the details.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system. See Section 7.4. for the details.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance. See section 7.5. for the details.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. See section 7.6. for the details.

Power Management Setup

Use this menu to specify your settings for power management. See section 7.7. for the details.

PnP / PCI Configuration

This entry appears if your system supports PnP / PCI. See section 7.8. for the details.

PC Health Status

Use this menu to specify your settings for PC Health Status. See section 7.9. for the details.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control. See section 7.10. for the details.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. See section 7.11.1. for the details.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to

maximize performance, the factory has the right to change these defaults to meet their needs. See section 7.11.2. for the details.

Supervisor / User Password

Use this menu to set User and Supervisor Passwords. See section 7.12. for the details.

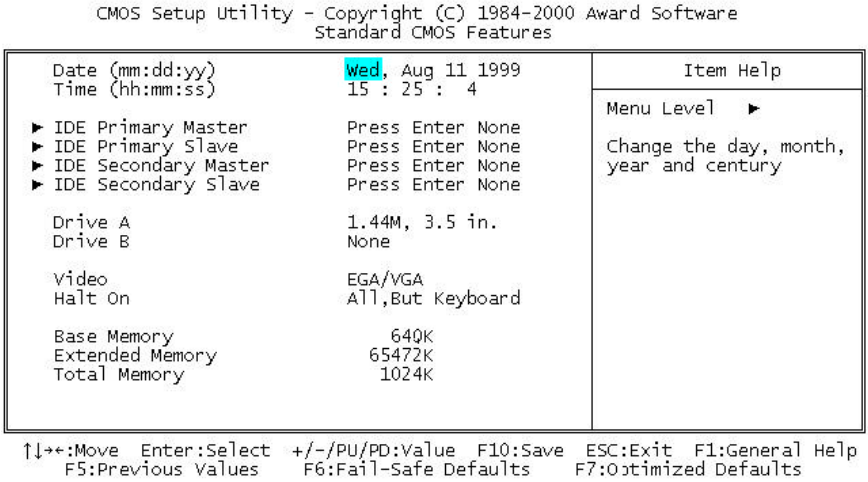
Save & Exit Setup

Save CMOS value changes to CMOS and exit setup. See section 7.13.1. for the details.

Exit Without Save

Abandon all CMOS value changes and exit setup. See section 7.13.2. for the details.

7.2. Standard CMOS Setup



The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

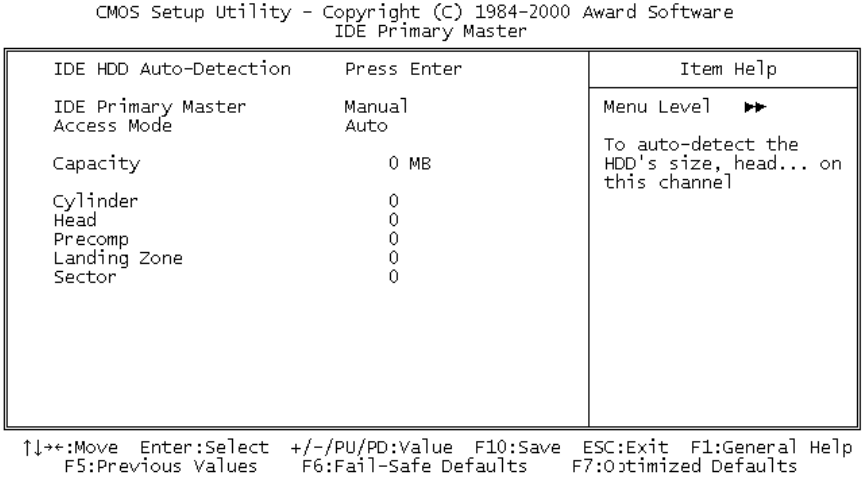
Main Menu Selections

This table shows the selections that you can make on the Main Menu

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically changes when you set the date
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.



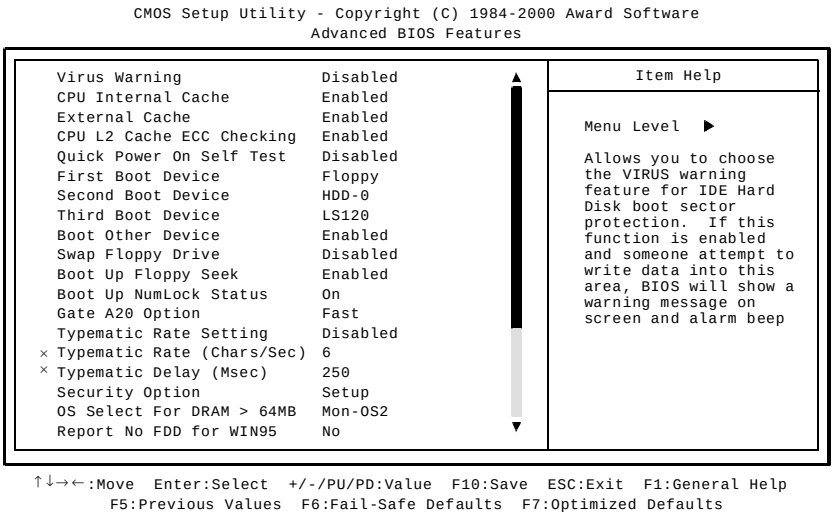
Use the legend keys to navigate through this menu and exit to the main menu. Use Table 3 to configure the hard disk.

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	Normal LBA LargeAuto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.

Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

7.3. Advanced BIOS Features

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



Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

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.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled	Enable cache
Disabled	Disable cache

CPU L2 Cache ECC Checking

This item allows you to enable/disable CPU L2 Cache ECC checking.

The choice: Enabled, Disabled.

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

First/Second/Third/Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

The Choice: Floppy, LS/ZIP, HDD, SCSI, CDROM, Disabled.

Swap Floppy Drive

If the system has two floppy drives, you can swap the logical drive name assignments.

The choice: Enabled/Disabled.

Boot Up Floppy Seek

Seeks disk drives during boot up. Disabling speeds boot up.

The choice: Enabled/Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Enabled/Disabled**.**

Gate A20 Option

Select if chipset or keyboard controller should control GateA20.

Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

Typematic Rate Setting

Key-Strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a key-stroke when you hold the key down.

The choice: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.

The choice: 250, 500, 750, 1000.

Security Option

Select whether the password is required every time the system boots or only when you enter 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.*

OS Select For DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.

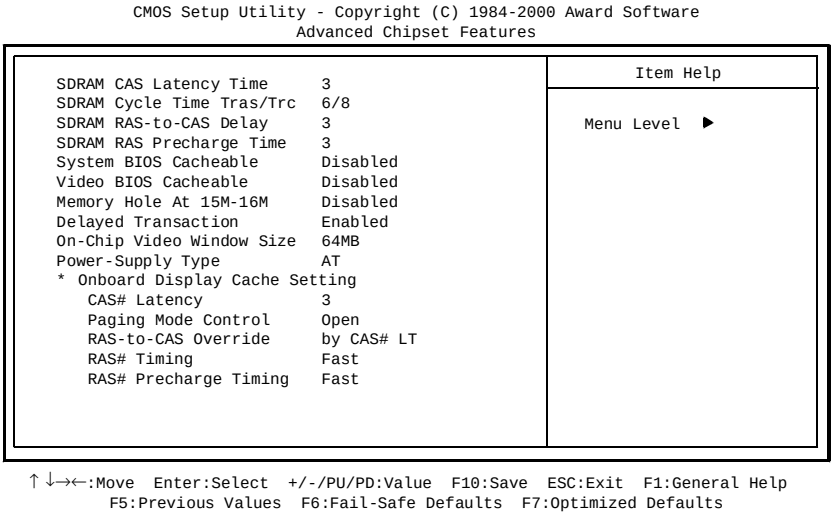
The choice: Non-OS2, OS2.

Report No FDD For Win 95

Whether report no FDD for Win 95 or not.

The choice: Yes, No.

7.4. Advanced Chipset Features



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

DRAM Settings

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occurs if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

SDRAM CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.

The Choice: 2, 3

SDRAM Cycle Time Tras/Trc

Select the number of SCLKs for an access cycle.

The Choice: 5/7, 6/8.

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.

The Choice: 2, 3.

SDRAM RAS Precharge Time

If an 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.

The Choice: 2, 3.

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.

The choice: Enabled, Disabled.

Video BIOS Cacheable

Select Enabled allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The Choice: Enabled, Disabled.

Memory Hole At 15M-16M

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

The Choice: Enabled, Disabled.

Delay 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 Choice: Enabled, Disabled.

On-Chip Video Window Size

Select the on-chip video window size for VGA drive use.

The Choice: 32MB, 64MB, Disabled.

Power-Supply Type: AT, ATX

The Choice: AT/ATX

Onboard Display Cache Setting

Setting the onboard display cache timing.

CAS # Latency
Select the local memory clock periods.
The Choice: 2, 3

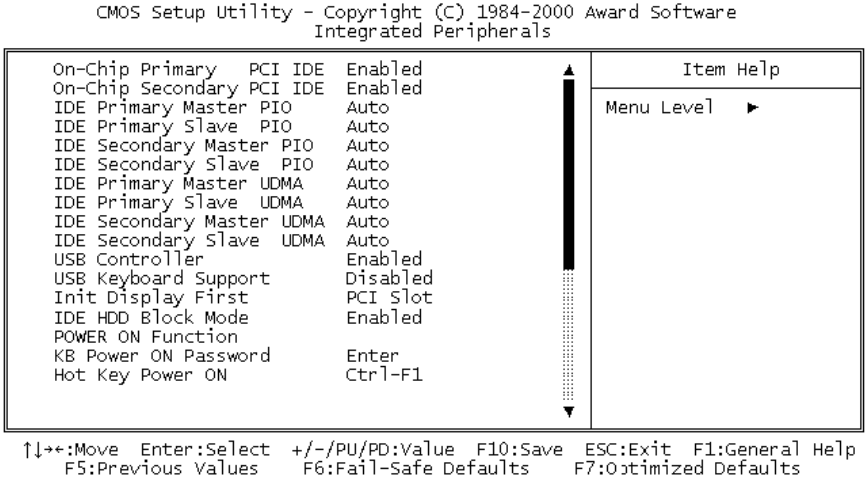
Paging Mode Control
Select the paging mode control.
The Choice: Fast, Slow.

RAS-to-CAS Override
Select the display cache clock periods control.
The Choice: Fast, Slow.

RAS# Timing
This item controls RAS# active to Protegra, and refresh to RAS# active delay (in local memory clocks).
The Choice: Fast, Slow.

RAS# Precharge Timing
This item controls RAS# precharge (in local memory clocks).
The choice: Fast, Slow.

7.5. Integrated Peripherals



On Chip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

The choice: Enabled, Disabled.

IDE Primary/Secondary Master/Slave PIO

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

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard 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 and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

The Choice: Auto, Disabled.

USB Controller

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

The choice: Enabled, Disabled.

USB Keyboard Support

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

The choice: Enabled, Disabled.

Init Display First

This item allows you to decide to active whether PCI Slot or on-chip VGA first

The choice: PCI Slot, Onboard .

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled

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 choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART Mode Select

This field determines the UART2 mode in your computer.

The choice: Normal, ASKIR, IrDA

Onboard Parallel Port

These fields allow you to select the onboard parallel port and its address.

The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled

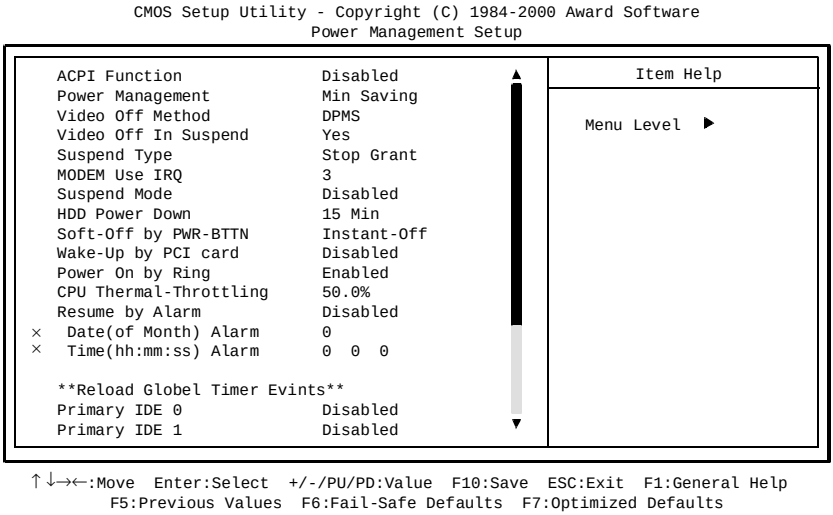
Parallel Port Mode

This field allow you to select the parallel port mode function.

The choice: SPP, EPP, ECP, ECP+EPP

7.6. Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.



ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: 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:

1. HDD Power Down
2. Doze Mode
3. Suspend Mode

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 of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

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 In Suspend

This determines the manner in which the monitor is blanked.

The choice: Yes, No.

Suspend Type

Select the Suspend Type.

The choice: PWRON Suspend, Stop Grant.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The choice: 3, 4, 5, 7, 9, 10, 11, NA.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Enabled, Disabled.

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.

The choice: Enabled, Disabled.

Soft-Off by PWRBTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."

The choice: Delay 4 Sec, Instant-Off.

Wake-Up by PCI card

This allows the system to be powered by Wake On LAN. But this board allows the Network only on this board. In this case, please select "Enabled".

The choice: Disabled, Enabled

Power On by Ring

This allows the system to be powered on through a RI signal.

The choice: Disabled, Enabled

CPU THRM-Throttling

Select the CPU THRM-Throttling rate.

The choice: 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

Resume by Alarm

This allows the system to be turned on automatically through the timer set in the BIOS to make the system more schedulable. By default, this field is set to Disabled.

PM Events

PM events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as Enabled , even when the system is in a power down mode.

Primary IDE 0

Primary IDE 1

Secondary IDE 0

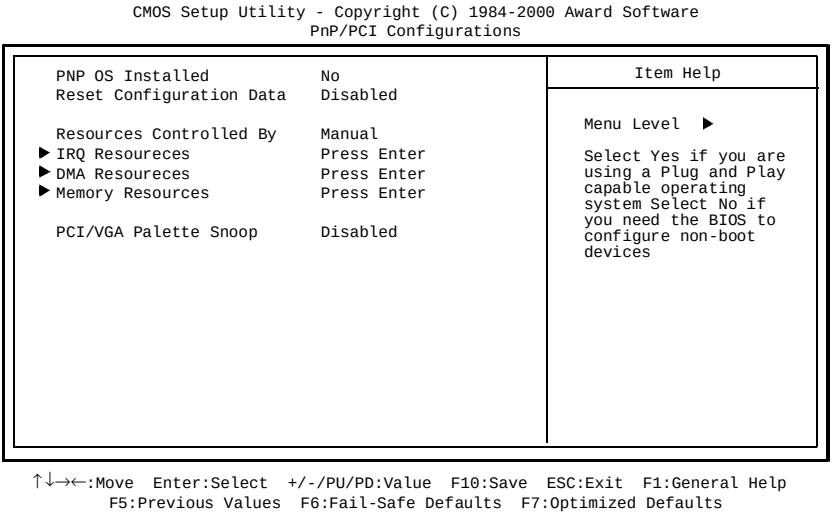
Secondary IDE 1

FDD, COM, LPT Port

PCI PIRQ[A-D] #

7.7. PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which 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.



PNP OS Installed

This item allows you to determine install PnP OS or not.

The choice: Yes, No.

Reset Configuration Data

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

The choice: Enabled, Disabled.

Resource 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. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢").

The choice: Auto(ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

IRQ3/4/5/7/9/10/11/12/14/15 assigned to

This item allows you to determine the IRQ assigned to the ISA bus and is not available to any PCI slot. Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

The Choice: *Legacy ISA* and *PCI/ISA PnP*.

DMA Resources

When resources are controlled manually, assign each system DMA channel a type, depending on the type of device using the DM channel.

DMA 0/1/3/5/6/7 assigned to

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

Choices are *Legacy ISA* and *PCI/ISA PnP*.

Memory Resources

This sub menu can let you control the memory resource.

Reserved Memory Base

Reserved a low memory for the legacy device (non-PnP device).

Choices are C800, CC00, D000, D800, DC00, D400, N/A.

Reserved Memory Length

Reserved a low memory length for the legacy device (non-PnP device).

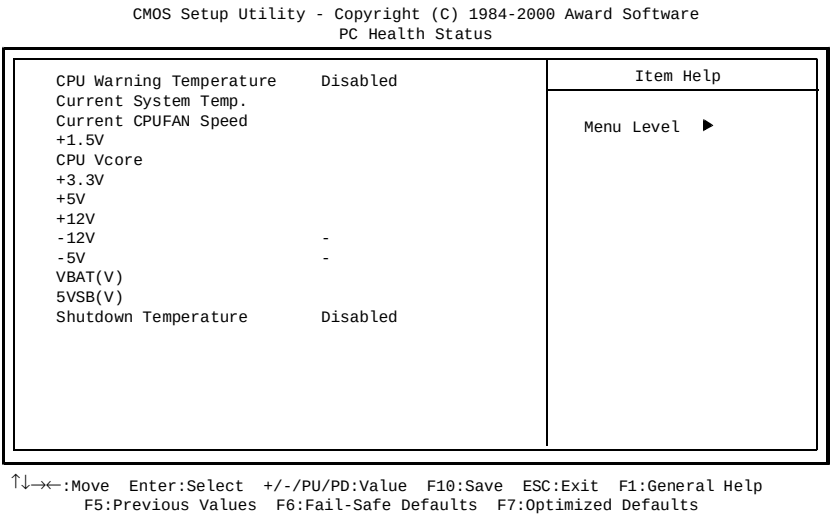
Choices are 8K, 16K, 32K, 64K.

PCI/VGA Palette Snoop

Leave this field at Disabled.

Choices are Enabled, Disabled.

7.8. PC Health Status



CPU Warning Temperature

This item allows you to enable/disable the CPU Warning Temperature.

The choice: Enabled, Disabled.

Current System temperature

This item will show you the current system temperature.

Current CPU FAN Speed

This item will show you the FAN's rpm.

+1.5V, CPU Vcore, +3.3V, +5V, +12V, -12V, -5V

This item will show you the each Voltage on this board.

VBAT(V)

This item will show you the Voltage of the Lithium battery on this board.

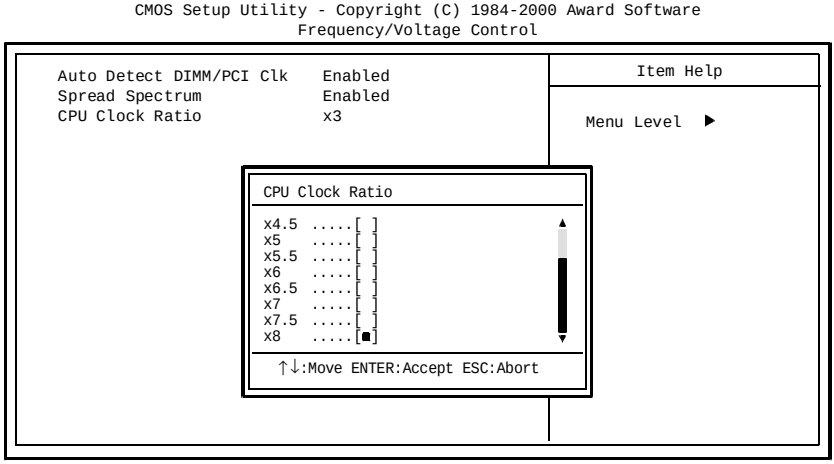
5VSB(V)

This item will show you the Voltage of 5V Stand By from ATX Power Supply.

Shutdown Temperature

This item is disabled only.

7.9. Frequency/Voltage Control



Auto Detect

This item allows you to enable/disable auto detect DIMM/PCI Clock.

The choice: Enabled, Disabled.

Spread Spectrum Modulated

This item allows you to enable/disable the spread spectrum modulate.

The choice: Enabled, Disabled.

CPU Clock Ratio

CPU Ratio is recognized automatically by BIOS read the CPU's information.
So this Ratio Selection does not have mean on this board.

7.10. Defaults Menu

Selecting "Defaults" from the main menu shows you two options which are described below

Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

7.11. Supervisor/User Password Setting

You can set either supervisor or user password, or both of then. 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 unction, 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.

7.12. Exit Selecting

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

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.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

7.13. POST Messages

During the Power On Self-Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.

If a message is displayed, it will be accompanied by:

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

7.14. POST Beep

Currently there are two kinds of beep codes in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. The other code indicates that your DRAM error has occurred. This beep code consists of a single long beep repeatedly.

7.15. Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS battery has failed

CMOS battery is no longer functional. It should be replaced.

CMOS checksum error

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT failure

INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

Diskette drives or types mismatch error

RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

Display switch is set incorrectly

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

Display type has changed since last BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA configuration checksum error

PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA configuration is not complete

PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

> Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Error encountered initializing hard drive

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

Error initializing hard disk controller

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

Floppy disk controller error or no controller present

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA configuration

PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory address error at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory size has changed since last BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory verify error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

Offending address not found

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

Offending segment

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

Press a key to REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

Press F1 to disable NMI, F2 to REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM parity error

CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should be empty but EISA board found

PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configured as having no board ID.

> NOTE; When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should have EISA board but not found

PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

> NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot not empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

System halted, (CTRL-ALT-DEL) to REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong board in slot

PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.

> NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Floppy disk(s) fail (80)

Unable to reset floppy subsystem.

Floppy disk(s) fail (40)

Floppy Type dismatch.

Hard disk(s) fail (80)

HDD reset failed.

Hard disk(s) fail (40)

HDD controller diagnostics failed.

Hard disk(s) fail (20)

HDD initialization error.

Hard disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key.

Unlock the key. BIOS detect the keyboard is locked. P17 of keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the P15 of keyboard controller is pull low. This is also used for M/B burn in test.

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

BIOS reports the memory test fail if the onboard memory is tested error.

7.16. POST Codes

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization:
C1h	Detect memory
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved

POST (hex)	Description
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel®) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved

POST (hex)	Description
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0~640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved

POST (hex)	Description
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved

POST (hex)	Description
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved

POST (hex)	Description
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature)
74h	Reserved

POST (hex)	Description
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.

POST (hex)	Description
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

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