TRANSDUCTION

USER'S MANUAL

Version 1.0

03/27/09

TR-950 FULL-SIZE INDUSTRIAL SINGLE BOARD COMPUTER FOR INTEL PENTIUM III AND CELERON WITH INTEL SOCKET 370

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Introduction

This manual is designed to give you information on the TR-950 SBC card. The topics covered in this chapter are as follows:

- Checklist
- Description
- Features
- Specifications
- Intelligence

Checklist

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

- ✓ The TR-950 Industrial SBC Card
- ✓ 1 IDE Ribbon Cable
- ✓ 1 Floppy Ribbon Cable
- ✓ 1 Serial Port Ribbon Cable and 1 Parallel Port Attached to a Mounting Bracket
- ✓ 1 Serial Port Ribbon Cable Attached to a Mounting Bracket
- ✓ 1 CD-ROM Containing ATI VGA Driver, Intel 82559 LAN Driver, BIOS Udate Utility and User's Manual.
- ✓ PS/2 to AT Keyboard Cable

Description

The TR-950 is a Pentium III Industrial single board computer (SBC) card based on Intel's 440BX chipset and is fully designed for harsh industrial environment. It features a PPGA Socket370 that is compatible with low-profile Intel PPGA package Celeron processors as well as Intel FC-PGA package Pentium III processor. This card accommodates up to 384MB of un-registered SDRAMs or 768MB of registered SDRAM configurations.

The TR-950 is a high integration design. Intel newest 82559 Fast Ethernet Controller and ATI 3D RageXL 2X AGP VGA controller are integrated into the system. The high-integration design prevents the system compatibility issues and increases the PCI add-on cards scalability. This makes TR-950 an ideal SBC card for CTI, ISP servers, workstations, automation as well as other industrial applications.

The TR-950 comes with Winbond's W83782 hardware monitoring device that monitors system and CPU temperature, system voltages, and CPU fan speeds to prevent system crashes by warning the user of adverted conditions. The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen and stopping the HDD spindle motor.

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Features

- **Muilti-Speed:** Supports Intel PPGA Celeron Processor from 300M to 1.1GMHz with 66/100MHz FSB and Intel FC-PGA Pentium III Processor from 500M to 1.1GHz with 100MHz FSB Speed.
- **Low-profile CPU package**: Low-profile CPU package makes the board more compact and reliable and enhances the add-on-cards scalability.
- **Intel 440BX AGPset:** Features Intel's 440BX AGPset with I/O subsystems and front-side bus (FSB) platform, which boosts the traditional 66-MHz internal bus speed to **100MHz.**
- **PC/100 Memory Support:** Equipped with three DIMM sockets to support Intel PC/100-compliant SDRAMs(8, 16, 32, 64, 128MB or 256MB). Up to 384MB of un-registered SDRAMs or 768MB of registered SDRAM system memory.
- **ECC function support:** Processor front-side bus (FSB) and Memory subsystem support ECC function for Fault-tolerant application.
- **10/100Base-T Fast Ethernet:** Features Intel 82559 Fast Ethernet controllers that boost network performance, enhances the system manageability and offers the proven compatibility.
- **ATI AGP VGA Chipset:** Features ATI RageXL 2X AGP chipset that support high-performance 2D and 3D graphic as well as DVD / MPEG-2 decode assist. Integrated 8MB SGRAM Display buffer runs on 120MHz Speed.
- **PCI Bus Master IDE Controller:** Two enhanced IDE channels for up to four devices, support PIO Mode 3/4 or Ultra DMA/33 IDE Hard Disk, ATAPI CD-ROM and LS-120 drive.
- **Watch-Dog Timer:** 4 level programmable watchdog timer, from 10-80 seconds.
- **Super Multi-I/O:** Provides two high-speed UART compatible serial ports and one parallel port with SPP, EPP and ECP capabilities.
- **IrDA:** Support an optional infrared port module for wireless interface.
- **Concurrent PCI:** Allows multiple PCI transfers from PCI master buses and AGP bus to memory to CPU.

- **Hardware Monitoring:** Features Winbond W83782D to monitor all the power rails as well as CPU and board temperature. It can alert user through the speaker or buzzer when CPU temperature exceeds the safe heat level.
- **Enhanced ACPI:** Features a programmable BIOS (Flash EEPROM), Offering enhanced ACPI for Windows98 compatibility and autodetection of most devices for virtually automatic setup.

Specifications

- **Processor Socket**: Socket370 for PPGA (Plastic Pin Grid Array) and FC-PGA package CPU.
- **Processor**:
  - Intel Celeron Processor 500/550/600/650/700/750/800/850MHz/1/1.1GHz (100MHz and 66MHz FSB)
  - Intel FC-PGA Pentium III 500/550/600/650/700/750/800/850MHz/1/1.1GHz (100MHz and 66MHz FSB)
- **Chipset**: Intel 440BX AGPset with PCI EIDE and RTC built-in
- **Secondary Cache**: 128KB(Celeron) or 256K(Pentium III) L2 cache integrated in CPU and runs on CPU core frequency.
- **Memory Sockets**:
  Three 168-pin DIMM sockets
  Memory types: 3.3V SDRAM (Synchronous DRAM) support 8MB to 768MB memory capacity
  NOTE: Only SDRAM modules that support SPD (Serial Presence Detect) should be use. Use PC100 modules when running 100MHz CPU bus speed and use PC66/PC100 modules when running 66MHz CPU bus speed.
- **BIOS**: Award BIOS, PnP support
  - FLASH EEPROM (256KB) for BIOS update
  - Enhanced ACPI BIOS and DMI 2.0
  - ISA Plug and Play (PnP) extension
  - Power management
  - Anti-Boot Virus
  - Intel 82559 Boot-ROM
- **DMI BIOS Support**: Desktop Management Interface (DMI) allows users to download system hardware-level information such

as CPU type, CPU speed, internal/external frequencies and memory size.

- **Multi I/O**: Winbond W83977EF
  - **Parallel Port**: One high-speed parallel port, SPP/EPP/ECP mode
  - **Serial Port**: Two 16550 UART compatible ports with COM1 and COM2 as RS232
  - **IrDA Interface**: Pin-header connector for the optional IrDA external connector
- **Enhanced IDE**: Two Bus Mastering EIDE mode, up to 4 devices, Two EIDE interfaces for up to four devices, support PIO Mode 3/4 or Ultra DMA/33 IDE Hard Disk, ATAPI CD-ROM and LS-120 drive
- **FDD Interface**: Two floppy drives (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB)
- **AGP bus VGA**: ATI RAGEXL chipset
  - Support 8MB SGRAM frame buffer, which runs on 120MHz speed and provides bandwidth up to 960MB/Sec.
  - AGP 2X mode (133MHz) offers a peak bandwidth in excess of 500MB/s
  - Support DVD and video with enhanced motion compensation accelerator
  - Incorporated 2D and 3D acceleration engine
  - 230MHz DAC supports 85Hz refresh at 1600x1200x256 resolution
  - 2D display mode / refresh rates

Colors	256	65K		16.7M		
Buffer Size	2MB	2MB	4MB	2MB	4MB	8MB
640x480	200	200	200	200	200	200
800x600	200	200	200	200	200	200
1024x768	150	150	150	—	150	150
1152x864	120	120	120	—	120	120
1280x1024	100	—	100	—	100	100
1600x1200	85	—	85	—	—	75

- Software supported

SOFTWARE SUPPORT	DOS	Win 3.x	Win 95	Win 98	NT 3.51	NT 4.0	Win2K	OS/2
2D Software Support (Note 1)								
• Accelerated driver support	VESA[2]	✓	✓	✓	✓	✓	✓[6]	✓
• AutoCAD / MicroStation	✓							
Video Software Support								
• Microsoft DirectDraw			✓	✓		✓	✓	
• Microsoft ActiveMovie/DirectShow			✓	✓			✓	
• MPEG-1 software playback			✓	✓		✓	✓	
• DVD/MPEG-2 software playback			✓	✓			✓	
• QuickTime acceleration								
3D Software Support								
• Microsoft Direct3D			✓	✓			✓	
• QuickDraw 3D RAVE								
• OpenGL (Note 3)			✓	✓		✓	✓	
• ATI 3D CIF (Note 4)			✓	✓				
• AGP			✓	✓		5	✓	

[1] Additional drivers available from 3rd parties (including SCO and UNIXWARE);[2] Direct BIOS support;
[3] OpenGL LCD; [4] ATI's 3D API for the 3D RAGE family; [5] NT 4.0 Service Pack 3 supports AGP devices, but does not provide support for AGP Texturing;. [6] Includes QuickDraw support.

- **USB Interface**: Two USB pin-header connectors, compliant with USB Specification Rev. 1.0 and support USB Hot-Plug function.
- **DiskOnChip**: The M-Systems flask disk supports system boot and storage capacity from 2MB to 288MB.
- **ATX Power Supply support:**
  - On-borad 4-pin ATX power supply header (requires the passive backplane supports ATX power supply)
  - On-board power button header for Soft power off, i.e. front panel turn off system power.
  - Support Win95 and Win98 shutdown automatically turn off the system power.
  - Instant-off or delay-4-seconds selectable via BIOS setup.
- **Hardware Monitor System:**
  - PC Health Monitoring ASIC supports system power voltages, FAN speed and system temperatures monitoring.
  - One FAN connector and one thermal couple header reserved for chassis FAN and temperature monitoring.

- CPU over-temperature beep-tone alarm or auto-shutdown. The trigger temperature is selectable via BIOS setup.
- Hardware monitoring application software supported for Windows95/98 and NT 4.0. (optional)
- Intel LDCM (DMI driver 2.0) support. (optional)

- **Watchdog Timer**:
  - Read I/O port 0443H to enable watchdog.
  - Read I/O port 043H to disable watchdog.
  - 10s, 20s, 30s and 80s timeout period selectable.
- **Green Function**: Power management via BIOS, activated through mouse/keyboard movement or SMI button
- **Keyboard and Mouse Connectors**: Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to a keyboard and PS/2 mouse. A 5-pin on-board keyboard pin header connector is also available to support PC/AT style external keyboard connector on backplane.
- **PICMG Compliance**: Fully compliant to PICMG 2.0 standards.
- **Environmental and Mechanical**:
  - **Power Supply:** 8A@ +5v typical; 300mA@ +12v typical 100mA@ -12V typical; 200mA@ +5VSTB (Option)
  - **Temperature**: 0°C to 60°C operating
    -40°C to 70°C storage
  - **Humidity**: 5% to 95%
  - **Dimensions**: 13.3"(L) x 4.8"(W) or
    338mm (L) x 124mm (W)

Intelligence

- **Temperature Monitoring and Alert**: A sensor for the CPU temperature on the TR-950 monitors the CPU temperature and alerts the user through the speaker or buzzer when temperature exceeds the safe heat level.
- **Year 2000 Compliant BIOS**: The onboard Award BIOS is Year 2000 Compliant and will pass software applications that have the tendency to invoke INT 1Ah function 04H such as year2000.exe utility released by NSTL.
- **Workstation class On-Board VGA:** The built-in ATI Rage XL VGA chip support AGP 2X (133MHz) mode with Sideband Addressing and AGP Texturing(Execute mode) to realize all the benefits of AGP. Superior 3D performance achieved through a floating point setup engine rated at 1.2 million triangles/sec.
- **Newest Intel Fast Ethernet built-in:** The newest Intel 82559 Fast Ethernet controller is integrated into the SBC card. The drivers for most popular Operation systems and NOS have been validated and proved the compatibility. It also supports latest network standards and protocols like speed auto-negotiation between 10Base-T and 100Base-T, half/full duplex (IEEE8023.3u), flow-control (IEEE8023X), VLAN(IEEE802.3Q), Priority packet(IEEE802.3P) and etc. The multi-protocols support ensures the best interoperability.

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2

Installations

This chapter provides information on how to use the jumpers and connectors on the TR-950 in order to set up a workable system. The topics covered are:

CPU Installation

The TR-950 Industrial SBC Card provides a 370-pins ZIF socket for Celeron and Pentium III-processors with PPGA (Plastic Pin Grid Array) package.

Before installing the processor into the Socket, ensure that the CPU fan is installed first. Without a fan circulating air on the CPU, the CPU can overheat and cause damage to both CPU and SBC card.

To Install a CPU, first turn off your system and remove its cover. Locate the ZIP socket and open it by first pulling the lever sideways away from the socket then upwards to a 90-degree right angle. Insert the CPU with the correct orientation. Use the notched corner of the CPU with the white dot as your guide. The white dot should point towards the end of the lever. Notice that there is a blank area where one hole is missing from that corner of the square array of pin holds. Because the CPU has a corner pin for three of the four corners, the CPU will only fit in one orientation. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, hold down on the fan and close the socket lever.

To disassembly the processor, simply pull the lever sideways away from the socket then upward to a 90-degree right angle. You can take the CPU out from the socket without help of any tool.

WARNING!: If no FAN circulating Air on the CPU, the processor might been overheated and damage both CPU and SBC components.

IMPORTANT: You must set jumpers for "CPU to BUS Frequency Ratio" and jumper for "CPU FSB speed" depending on the CPU that you install.

Memory Installation

The TR-950 Industrial CPU Card supports three 168-pin DIMM sockets for a maximum total memory of 384MB unregistered SDRAMs or 768MB registered SDRAMs. The memory modules can come in sizes of 16MB, 32MB, 64MB, 128MB and 256MB (for registered type) SDRAMs.

The TR-950 Industrial CPU Card supports three 168-pin DIMM (Dual In-line Memory Module) sockets. In populating the DIMM sockets, DIMM1 and/or DIMM3 bank should be populated first for less signal reflection. However, we do not see any issue while populate DIMM2 only. Refer to the following table on how to configure the memory.

***NOTE**: Use SDRAM modules with PC100 specification when running 100MHz CPU bus speed. With 66MHz CPU bus speed, SDRAM modules with PC66 or PC100 specification can be used.*

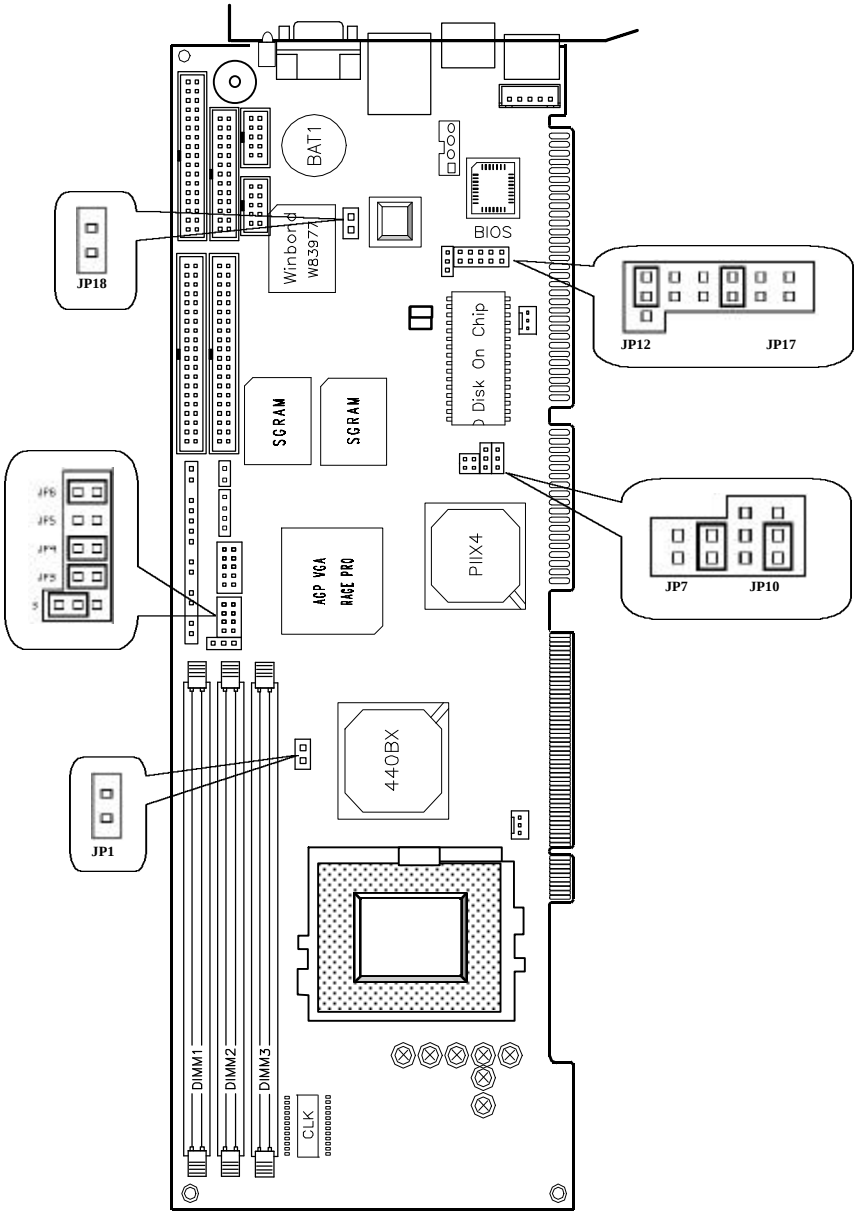
168-pin DIMM (3.3V) Unregistered SDRAM

Bank0 (DIMM1)	Bank1 (DIMM2)	Bank2 (DIMM3)	Total Memory
8MB	-----	-----	8MB
16MB	-----	-----	16MB
32MB	-----	-----	32MB
64MB	-----	-----	64MB
128MB	-----	-----	128MB
8MB	-----	8MB	16MB
16MB	-----	8MB	24MB
32MB	-----	8MB	40MB
64MB	-----	8MB	72MB
128MB	-----	8MB	136MB
16MB	16MB	8MB	40MB
32MB	16MB	16MB	64MB
64MB	16MB	32MB	112MB
128MB	16MB	64MB	208MB
32MB	32MB	128MB	192MB
64MB	32MB	16MB	112MB
128MB	32MB	32MB	192MB
64MB	64MB	64MB	192MB
128MB	64MB	64MB	256MB
128MB	128MB	128MB	384MB

Jumpers on the TR-950

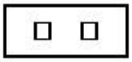
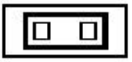
The jumpers on the TR-950 allows you to configure your SBC card according to the needs of your applications. If you have doubts about the best jumper configuration for your needs, contact your dealer or sales representative. The following table lists the jumpers on TR-950 and their respective functions.

Jumper Locations on the TR-950



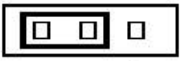
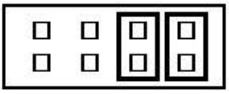
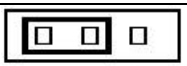
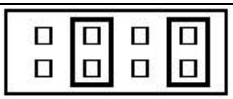
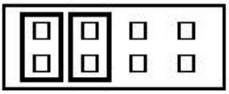
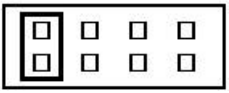
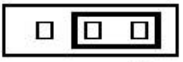
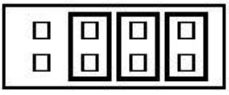
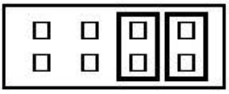
JP1: On-Board VGA Enable/Disable selection

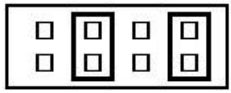
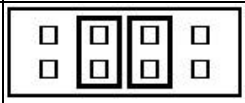
On-Board AGP VGA chip can be disabled by shorting the JP1 jumper.

Enable	Disable
	
JP1	**JP1**

JP2 ~ 6: CPU Frequency Selector

The table below shows the correct setting to match the CPU frequency

CPU Type	CPU Frequency	JP2	JP3 ~ 6
66MHz Host Clock CPU	66MHz x 6.5 **433MHz**		
66MHz Host Clock CPU	66MHz x 7 **466MHz**		
100MHz Host Clock CPU	100MHz x 5 **500MHz**		
100MHz Host Clock CPU	100MHz x 5.5 **550MHz**		
100MHz Host Clock CPU	100MHz x 6 **600MHz**		
100MHz Host Clock CPU	100MHz x 6.5 **650MHz**		

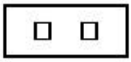
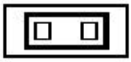
100MHz Host Clock CPU	100MHz x 7 **700MHz**		
100MHz Host Clock CPU	100MHz x 8 **800MHz**		

NOTE:

1. *Jumper JP2 is used to select the CPU and SDRAM bus speed. It can be 66MHz or 100MHz. Jumper JP3 to JP6 is for CPU core frequency ratio selection.*
2. *Most Intel Pentium III have fixed CPU core frequency ratio. You don't really need to set up the JP3~JP6 for the CPU already fused the core frequency.*
3. *Overclocking your processor and SDRAM module is not recommended. There is no guarantee for any over-speed operation.*

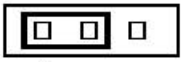
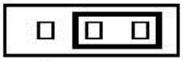
JP8: ATX POWER

This 2-pin Jumper is to inform the SBC what kind of power supply is being used for the system. The option can be ATX power or PS2/AT power.

JP8	Setting	Function
	Open/OFF	Use ATX Power (when Cable connectted)
	Short/ON	Use PS2/AT Power Supply (Default)

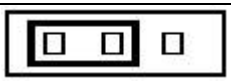
JP10: CMOS RAM Data

This 3-pin Jumper allows the user to disconnect the built-in 3V battery power to clear the information stored in the CMOS RAM. To clear the CMOS data: (1) Turn off the system power, (2) Remove Jumper cap from pin1&2, (3) Short the pin2 and pin3 for three seconds, (4) Put Jumper cap back to pin1& 2. (5) Turn on your computer, (6) Hold Down <Delete> during bootup and enter BIOS setup to enter your preferences.

JP10	Setting	Function
 1	Pin 1-2 Short/Closed	Normal Operation (default)
 1	Pin 2-3 Short/Closed	Clear CMOS Content

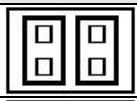
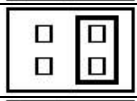
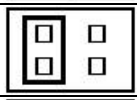
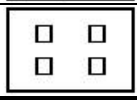
JP12: WatchDog Timer Mode Selection

The WatchDog Timer is enabled by reading I/O port 443H. The WatchDog Timer should be triggered before the Watch-Dog Timer time-out period ends, otherwise the Watch-Dog Timer assumes the program operation is abnormal and will issue either a reset signal to re-boot system again, or activate NMI (By pull-low IOCHK#) to the CPU. The WatchDog Timer is disabled by reading I/O port 043H. The JP12 jumper is used to select time-out signal. It can be RESET to re-boot system or NMI to signal CPU.

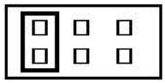
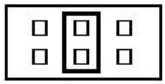
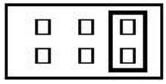
JP12	Time-out Mode
 1 2 3	**RESET**
 1 2 3	**NMI**

JP13, JP14: WatchDog Timer Period Selection

The WatchDog Timer time-out period can be set 10 sec, 20 sec, 30 sec and 80 sec. The following table describes the jumper settings for the period.

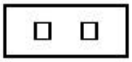
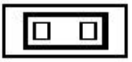
JP13 JP14	Time-out Period
	**10 Sec**
	**20 Sec**
	**30 Sec**
	**80 Sec**

JP15~JP17: DiskOnChip BIOS Expansion Address Selection

JP15 JP16 JP17	Address
	**C8000 ~ CFFFF**
	**D0000 ~ D7FFF**
	**D8000 ~ DFFFF**

JP18: On-Board LAN Enable/Disable selection

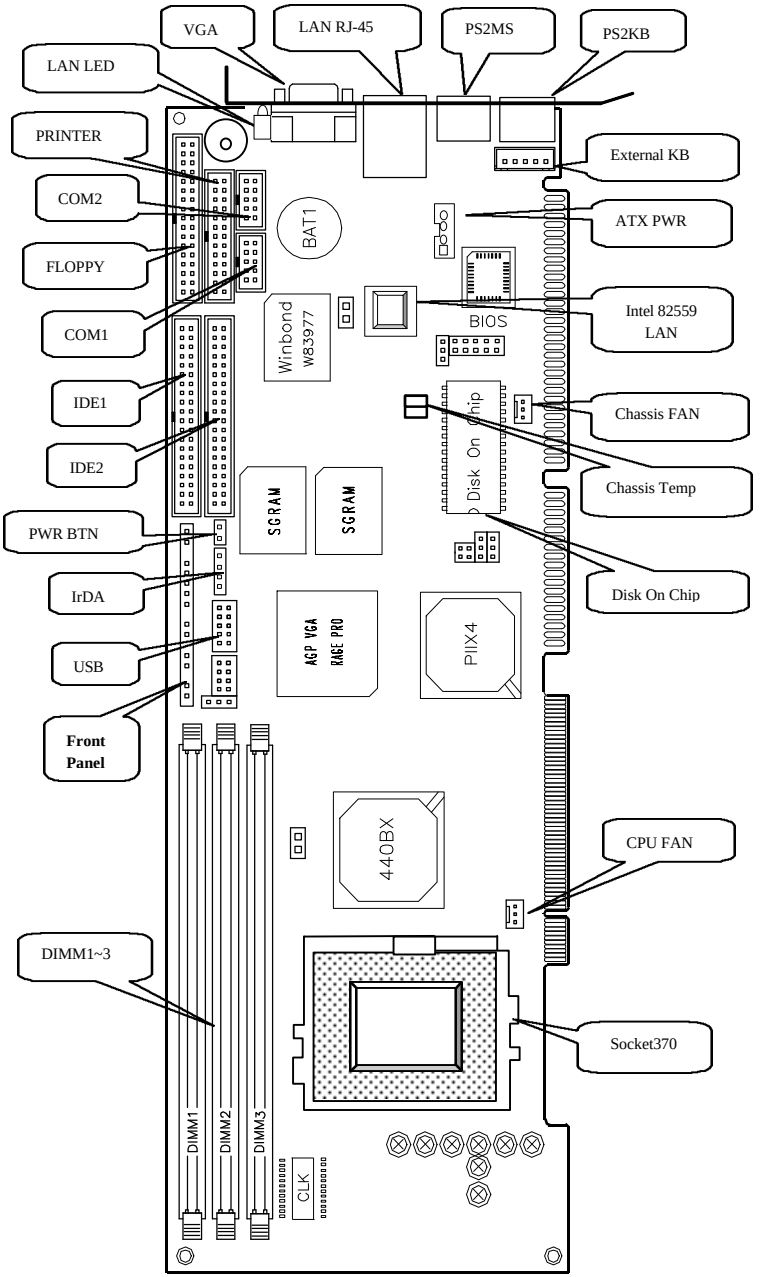
On-Board Fast Ethernet LAN chip can be disabled by shorting the JP18 jumper.

Enable	Disable
	
JP18	**JP18**

Connectors on the TR-950

The connectors on the TR-950 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on TR-950 and their respective page number.

Connector Locations on the TR-950



Front Panel Connector

The front panel of the case has a control panel which provides light indication of the computer activities and switches to change the computer status.

SMI **PWR LED** **RESET** **SPEAKER** **KEYLOCK** **IDE LED**

- **SMI/Hardware Switch**
  This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.

SMI

SMI Pin #	Signal Name
1	Sleep
2	Ground

- **Power LED**
  This connector indicate the computer power status.

Power

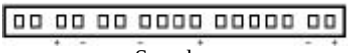
Power LED Pin #	Signal Name
3	+5V
4	Ground

- **RESET Switch**
  The reset switch allows the user to reset the system without turning the main power switch Off and then On. Orientation is not required when making a connection to this header.

Reset

RESET Pin #	Signal Name
5	Reset
6	Ground

➢ **Speaker Connector**
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.


Speaker

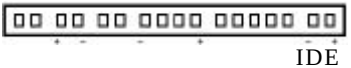
SPEAKER Pin #	Signal Name
7	SPEAKER
8	Ground
9	Ground
10	+5V

➢ **Keylock Switch**
The keylock switch, when closed, will disable the keyboard function.


KEYLOCK

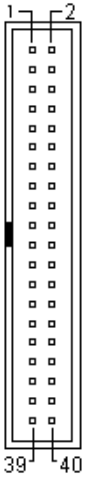
KEYLOCK Pin #	Signal Name
11	+5V
12	No connect
13	Ground
14	Keylock
15	Ground

➢ **IDE Hard Disk LED Connector**
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.


IDE

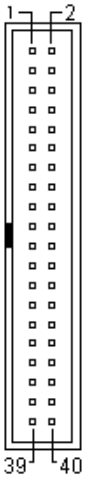
SMI Pin #	Signal Name
1	IDE_ACT
2	Ground

EIDE Connectors



Primary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

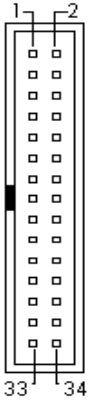


Secondary IDE Connector

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ1	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK1	29	30	Ground
IRQ15	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

Floppy Drive Connector

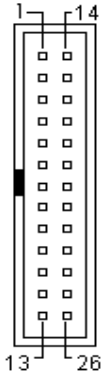
Floppy connector is a 34-pin header and will support up to 2.88MB floppy drives.



Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	RM/LC
Ground	3	4	No connect
Ground	5	6	No connect
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

Parallel Port Connector

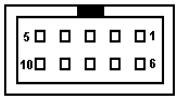
The following table describes the pin out assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

COM1 Serial Port

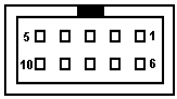
COM1, a 10-pin header connector , is the onboard COM1 serial port of the TR-950. The following table shows its pin assignments.



Pin #	Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	N.C.

COM2 Serial Port

COM2, a 10-pin header connector , is the onboard COM2 serial port of the TR-950. The following table shows its pin assignments.

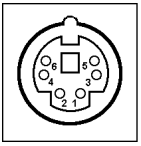


Pin #	Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	N.C.

External Keyboard Connector

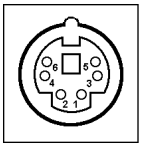
Pin #	Signal Name
1	Keyboard clock
2	Keyboard data
3	PG
4	GND
5	+5V

PS/2 Keyboard Connector



Pin #	Signal Name
1	Keyboard data
2	N.C.
3	GND
4	5V
5	Keyboard clock
6	N.C.

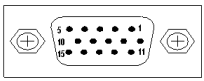
PS/2 Mouse Connector



Pin #	Signal Name
1	Mouse data
2	N.C.
3	N.C.
4	5V
5	Mouse Clock
6	N.C.

VGA Connector

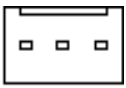
The pin assignments of VGA CRT connector are as follows:



Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

CPU Fan Power Connector

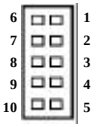
This is a 3-pin header for the CPU fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

USB Connectors

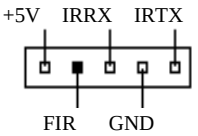
The following table shows the pin outs of the USB connectors.



USB1 Pin#	USB0 Pin #	Signal Name
10	1	+5V
9	2	USB-
8	3	USB+
7	4	Ground
6	5	N.C.

IrDA Connector

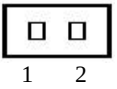
This connector is used for an IrDA connector for wireless communication.



IrDA Pin #	Signal Name
1	+5V
2	FIR
3	Ir RX
4	Ground
5	Ir TX

ATX Power on/off Button

This 2-pin connector acts as the "Power Supply On/Off Switch" on the SBC card. When pressed, the switch will force the SBC card to power on. When pressed again, it will force the SBC card to power off.



Pin #	Signal Name
1	PWR-BTN
2	GND

ATX Power Connector

This is a four pin connector to support the ATX power and corresponding back-plane. When your back-plane is configured to perform ATX power supply Soft-on/off function, you have to connect the control signals and stand-by power on this connector to your back-plane by a corresponding cable.

ATX-PWR

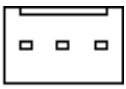
Pin #	Signal Name
1	PWR_GD
2	5V_SB (standby +5V)
3	PS-ON (soft on/off)
4	GND

IMPORTANT:

Please remove the Jumper cape on **JP8** while you use stand-by power, 5V_STB, from back-plane. Keep the JP8 Short/On while you do not connect ATX-PWT cable to your ATX supported back-plane or when you simply use traditional back-plane. This is very important to keep system operating properly.

Chassis Fan Power Connector

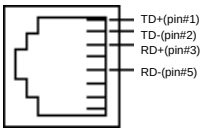
This is a 3-pin header for the chassis fan. The fan must be a 12V fan.



Pin #	Signal Name
1	Rotation
2	+12V
3	Ground

LAN- RJ45 Connector

This connector is for the 10/100Mbps Ethernet capability of the CPU card. The figure below shows the pin out assignments of this connector and its corresponding input jack.



LAN LEDs

The LAN LEDs on top of bracket is to display the current network connection status. The green color LED on the left-hand side shows the link status and TX/RX activity. The Yellow color on the right-hand side indicates the operation mode, i.e. 10Base-T or 100Base-T.

LNK/ACT	STATUS
ON	Link
OFF	Disconnected
FLASH	Packets TX/RX

SPEED	MODE
ON	100Base-T
OFF	10Base-T

Watchdog Timer Configuration

The function of the watchdog timer is to reset the system automatically and is defined at I/O port 0443H. To enable the watchdog timer and allow the system to reset, read I/O port 0443H. To disable the timer, read I/O port 043H for the system to stop the watchdog function. The timer has a tolerance of 20% for its intervals.

The following describes how the timer should be programmed.

Enabling Watchdog

```
MOV    DX, 0443H
IN     AX, DX
```

Disabling Watchdog

```
MOV    DX, 043H
OUT    DX, AX
```

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3

BIOS Configuration

This chapter describes the different settings available in the Award BIOS that comes with the TR-950 CPU card. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium II/III processors in a standard IBM-AT compatible I/O system. The BIOS provides critical low-level support for standard devices such as disk drives, serial and parallel ports. It also adds virus and password protection as well as special support for fine-tuning of the chipset to control the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST(Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type	

The section below the setup items of the Main Menu displays the control keys for this menu. Another section at the bottom of the Main Menu just below the control keys section displays information on the currently highlighted item in the list.

NOTE: *After making and saving system changes with Setup, you find that your computer cannot boot, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the maximum performance and reliability.

Standard CMOS Setup

"Standard CMOS Setup" allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the SBC card is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Wed, Mar 4 1998
Time (hh:mm:ss) : 00 : 00 : 00

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	Auto	0	0	0	0	0	0	Auto
Primary Slave	Auto	0	0	0	0	0	0	Auto
Secondary Master	Auto	0	0	0	0	0	0	Auto
Secondary Slave	Auto	0	0	0	0	0	0	Auto

Drive A	: 1.44M, 3.5in	Base Memory	: 640K
Drive B	: None	Extended Memory	: 15360K
		Other Memory	: 384K
Video	: EGA / VGA		
Halt On	: All Errors	Total Memory	: 16384K

ESC : Quit	↑ ↓ → ← : Select Item	PU / PD / + / - : Modify
F1 : Help	(Shift) F2 : Change Color	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

Primary HDDs / Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

To enter the specifications for a hard disk drive, you must select first a "Type". There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to 45 are predefined. Type "User" is user-definable. For the Primary Master/Slave as well as Secondary Master/Slave, you can select "Auto" under the TYPE and MODE fields. This will enable auto detection of your IDE drives and CD-ROM drive during POST.

Press <PgUp>/<PgDn> to select a numbered hard disk type or type the number and press the <Enter> key. The hard disk will not work properly if you enter incorrect information for this field. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually. If you select Type User, related information is asked to be entered to the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors
SIZE :	Automatically adjust according to the configuration
MODE (for IDE HDD only) :	Auto Normal (HD < 528MB) Large (for MS-DOS only) LBA (HD > 528MB and supports Logical Block Addressing)

NOTE: *The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in these fields. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.*

Drive A / Drive B
These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video
This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On
This field determines whether the system will halt if an error is detected during power up.

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

BIOS Features Setup

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

ROM / PCI ISA BIOS
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	**: Disabled**	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
Processor Number Feature	: Enabled	D4000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D8000-DBFFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	DC000-DFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled		
Boot Up Floppy Drive	: Enabled		
Boot Up Numlock Status	: On		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI /VGA Palette Snoop	: Disabled	ESC : Quit	↑ ↓ → ← : Select Item
OS Select For DRAM>64MB	: Non-OS2	F1 : Help	PU/PD/+/- : Modify
Report No FDD For WIN 95	: No	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

NOTE: *Many disk diagnostic programs which attempt to access the boot sector table can cause the virus warning. Before you run such a program, disable the Virus Warning feature.*

CPU Internal Cache / External Cache

Cache memory is the additional memory which is much faster than conventional DRAM (system memory). CPUs from 486-type and up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When CPU requests data, the system transfers the requested data from main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. The default of these items are ***Enabled***.

CPU L2 Cache ECC Checking
When enabled, this allows ECC checking on the CPU's L2 cache. The default of this field is ***Enabled***.

Processor Number Feature
When enabled, this enables Pentium III processor serial number feature. The default of this field is ***Enabled***.

Quick Power On Self Test
When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

Boot Sequence
This field determines the drives search sequence for an operating system. The first drive contains the operating system will be the boot device. The options are :

A, C, SCSI	CDROM, C, A	SCSI, A, C
C, A, SCSI	D, A, SCSI	SCSI, C, A
C, CDROM, A	E, A, SCSI	C only
CDROM, C, A	F, A, SCSI	LS/ZIP, C

The default boot sequence is ***A, C, SCSI***.

Swap Floppy Drive
This item allows you to determine whether to enable Swap Floppy Drive or not. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. The default of this field is set to ***Disabled.***

Boot Up Floppy Seek
When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks. The default of this field is set to ***Enabled.***

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system. By default, the system boots up with ***NumLock*** On.

Gate A20 Option
This field allows you to select how Gate A20 works. Gate A20 is a device used to address memory above 1 MB. The default setting is ***Fast.***

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Enable.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. The default of this item is set to ***6.***

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option
This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

PCI/VGA Palette Snoop
Some non-standard VGA display cards may not show colors properly. This field allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When this field is enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

OS Select for DRAM > 64MB
This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95
This option allows Windows 95 to share with other peripherals IRQ6 which is assigned to a floppy disk drive if the drive is not existing. The default setting is ***No***.

Video BIOS Shadow
This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow
Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether optional ROM will be copied to RAM or not.

Chipset Features Setup

This Setup menu controls the configuration of chipset on the SBC card.

ROM PCI/ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE INC.

Auto Configuration	: Enabled	Auto Detect DIMM/PCI Clk			: Enabled
SDRAM RAS-to-CAS Delay	: 3	Spread Spectrum			: Disabled
SDRAM RAS Precharge Time	: 3	CPU Host Clock (CPU/PCI)			: Default
SDRAM CAS Latency Time	: 3	CPU Warning Temperature			: 70° C / 158° F
SDRAM Precharge Control	: Disabled	Current System Temp.			: 30° C / 88° F
DRAM Data Integrity Mode	: Non-ECC	Current CPU1 Temperature			: 35° C / 95°F
System BIOS Cacheable	: Disabled	Current CPUFAN1 Speed			: 4789 RPM
Video BIOS Cacheable	: Enabled				
Video RAM Cacheable	: Disabled	IN0 (V)	: 1.98 V	IN1 (V)	: 1.50 V
8 Bit I/O Recovery Time	: 3	IN2 (V)	: 3.45 V	+ 5 V	: 4.99 V
16 Bit I/O Recovery Time	: 2	+12 V	: 12.46 V	-12 V	: -12.54V
Memory Hole At 15MB-16MB	: Disabled	-5V	: - 5.21 V		
Passive Release	: Disabled	Shutdown Temperature			: 60° C / 140°F
Delayed Transaction	: Disabled				
AGP Aperture Size (MB)	: 64				

ESC : Quit	↑ ↓ → ← : Select Item
F1 : Help	PU/PD/+/- : Modify
F5 : Old Values	(Shift) F2 : Color
F6 : Load BIOS Defaults	
F7 : Load Setup Defaults	

Auto Configuration
This field predefines values for DRAM, cache timing according to CPU type and system clock. When this field is enabled, the predefined items will become read-only.

SDRAM RAS-to-CAS Delay
When DRAM is refreshed, both rows and columns are addressed separately. This field allows you to determine the timing of transition from Row Address Strobe (RAS) to Column Address Strobe (CAS). The default setting is ***3***.

SDRAM RAS Precharge Time
The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data. The default setting is ***3***.

SDRAM CAS Latency Time
When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer. The default setting is ***3***.

DRAM Data Integrity Mode
This option sets the data integrity mode of the DRAM installed in the system. The default setting is ***Non-ECC***.

System BIOS Cacheable
When enabled, access to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is disabled.

Video BIOS Cacheable
When enabled, access to video BIOS addressed at C0000H to C7FFFH are cached, provided that the cache controller is disabled.

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

8 Bit I/O Recovery Time
This option specifies the length of the delay (in sysclks) inserted between consecutive 8-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The default setting is ***3***.

16 Bit I/O Recovery Time
This option specifies the length of the delay (in sysclks) inserted between consecutive 16-bit I/O operations. The settings are 1, 2, 3, 4, 5, 6, 7, or 8. The default setting is ***2***.

Memory Hole at 15MB - 16MB
In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default of this field is set to ***Disabled***.

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

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

AGP Aperture Size (MB)
The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The options available are 4M, 8M, 16M, 32M, 64M, 128M and 256M. The default setting is ***64M***.

Auto Detect DIMM/PCI Clk
When enabled, the BIOS will disable the clock for the PCI slot without add-on card on it and DIMM socket without memory module populated. This function requires a compliant back-plane. If you encounter PCI add-on card can't be detected issue. Please disable this function, turn-off the power and try it again.

Spread Spectrum
This fields allow user to select ±0.5% or ±1.5% modulation to reduce the EMI.

CPU Host Clock (CPU/CLK)
This fields allow user to change the CPU Host bus clock speed and corresponding PCI bus clock speed. The available options are default, 66/33M, 75/37M, 83/41M, 100/33M, 103/34M, 112/37M, 124/41M, 133/41M, 105/35M, 110/36M, 115/38M, 120/40M, 124/31M, 133/33M, 140/35MHz. The default speed is the clock speed set by hardware jumper.

CPU Warning Temperature
This field sets the threshold temperature at which an alert is generated by the system's speaker. The CPU temperature is monitored by the onboard thermal sensor to prevent the CPU from overheating.

Current System Temp.
These read-only fields reflect the functions of the hardware thermal sensor that monitors the chip blocks and system temperatures to ensure the system is stable.

Current CPU1 Temperature
These read-only fields reflect the functions of the hardware thermal sensor that monitors the CPU temperatures to ensure the system is stable.

Current CPU FAN1 Speed
These optional and read-only fields show the current speeds in RPM (revolution per minute) for the CPU fan and chassis fan which are monitored by the hardware monitoring IC.

VCCP / VTT / VCC3
These optional and read-only fields show the current voltages in the voltage regulators and power supply which are monitored by the hardware monitoring IC.

Shutdown Temperature
This field sets the threshold temperature at which the system will be shut down to prevent the CPU from overheating

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn off video display after a period of inactivity.

ROM PCI/ISA BIOS
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

ACPI function	: Enable	** Reload Global Timer Events **	
Power Management	: User Define	IRQ3 (3-7, 9-15), NMI	: Disabled
PM Control by APM	: Yes	Primary IDE 0	: Enabled
Video Off Method	: V/H SYNC +Blank	Primary IDE 1	: Enabled
Video Off After	: Standby	Secondary IDE 0	: Disabled
MODEM Use IRQ	: 3	Secondary IDE 1	: Disabled
Doze Mode	: Disabled	Floppy Disk	: Disabled
Standby Mode	: Disabled	Serial Port	: Enabled
Suspend Mode	: Disabled	Parallel Port	: Disabled
HDD Power Down	: Disabled		
Throttle Duty Cycle	: 62.5%		
VGA Active Monitor	: Enabled		
Soft-Off by PWR-BTTN	: Instant-Off		
IRQ 8 Break Suspend	: Disabled		
		ESC : Quit	↑↓→← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

ACPI function
This field allows you to select the type of power saving management modes. There are fours selections for Power Management.

Power Management
This field allows you to select the type of power saving management modes. There are fours selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	The items range from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min. (Default)

NOTE: *In order to enable the CPU overheat protection feature, the Power Management field should not be set to Disabled.*

PM Control by APM
This field allows you to use the Advanced Power Management device to enhance the Max. Power Saving mode and stop the CPU's internal clock. If the Max. Power Saving is not enabled, this will be preset to NO.

Video Off Method
This field defines the Video Off features. There are three options.
V/H SYNC + Blank, Default setting, blank the screen and turn off vertical and horizontal scanning.

DPMS	Allows the BIOS to control video display card if it supports the DPMS feature.
Blank Screen	This option only writes blanks to the video buffer.

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

Modem Use IRQ
This field names the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. By default, the IRQ is set to *3*.

Doze Mode
When enabled, and after the user-defined time of system inactivity, the CPU clock will run at a slower speed while all other devices still operate at full speed.

Standby Mode
After the user-defined time of system inactivity, the hard disk drive and the video will shut off while all other devices still operate at full speed.

Suspend Mode
When enabled, and after the user-defined time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down
When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

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

VGA Active Monitor
When enabled, any video activity restarts the global timer for Standby mode. The default setting is ***Enabled***.

IRQ 8 Break Suspend
You can enable or disable the monitoring of IRQ 8 (Real Time Clock) so it does not awaken the system from Suspend mode.

PNP/PCI Configuration

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

ROM PCI/ISA BIOS
PNP/PCI CONFIGURATION
AWARD SOFTWARE INC.

PNP OS Installed	: No	Used MEM base addr	: N/A
Resources Controlled by	: Manual		
Reset Configuration Data	: Disabled		
IRQ-3 assigned to	: Legacy ISA		
IRQ-4 assigned to	: Legacy ISA		
IRQ-5 assigned to	: PCI/ISA PnP		
IRQ-7 assigned to	: Legacy ISA		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP	ESC : Quit	↑↓→← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift) F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

PNP OS Installed
This field allows you to specify if the operating system installed in your system is plug and play aware.

NOTE: *Operating systems such as DOS, OS/2, and Windows 3.x do not use PnP*

Resources Controlled by
This PnP BIOS can configure all of the boot and compatible devices automatically. However, this capability needs you to use a PnP operating system such as Windows 95. The default value is ***Manual***.

Reset Configuration Data
This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled***.

IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to
These fields allow you to determine the IRQ/DMA assigned to the ISA bus and is not available to any PCI slot.

Used MEM base addr
Select a base address for the memory area used by any peripheral that requires high memory. The default setting is ***N/A***.

Load BIOS Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑↓→←: Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Load BIOS Defaults except Standard CMOS Setup	

To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑↓→← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Load BIOS Defaults except Standard CMOS Setup	

To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

Integrated Peripherals

This option sets your hard disk configuration, mode and port.

ROM PCI/ISA BIOS
INTEGRATED PERIPHERALSP
AWARD SOFTWARE INC.

IDE HDD Block Mode	: Enabled	Onboard Serial Port 1	: 3F8/IRQ4
IDE Primary Master PIO	: Auto	Onboard Serial Port 2	: 3F8/IRQ4
IDE Primary Slave PIO	: Auto	UART Mode Select	: Normal
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
IDE Primary Master UDMA	: Auto	Onboard Parallel Port	: 378/IRQ7
IDE Primary Slave UDMA	: Auto	Parallel Port Mode	: SPP
IDE Secondary Master UDMA	: Auto		
IDE Secondary Slave UDMA	: Auto		
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
USB Keyboard Support	: Disabled		
Init Display First	: PCI SLOT		
Onboard FDC Controller	: Enabled		

ESC : Quit	↑↓→← : Select Item
F1 : Help	PU/PD/+/- : Modify
F5 : Old Values	(Shift) F2 : Color
F6 : Load BIOS Defaults	
F7 : Load Setup Defaults	

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

IDE Primary/Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

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.

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

Init Display First
This field allows the system to initialize the first VGA card on the PCI slot of the back-plane when system is turned on. The default is the on-board ATI AGP VGA.

Onboard FDC Controller
Select *Enabled* if your system has a floppy disk controller (FDC) installed on the SBC card and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port
These fields allow you to select the onboard serial and parallel ports and their addresses. The default value for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select
This field determines the UART mode in your computer. The settings are *Normal, IrDA and ASKIR*. The default value is ***Normal***.

Parallel Port Mode
This field allows you to determine parallel port mode function.

SPP	Normal Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Supervisor / User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

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

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	**SUPERVISOR PASSWORD**
CHIPSET FEATURES SETUP	**USER PASSWORD**
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Change / Set / Disable Password	

IDE HDD Auto Detection

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

ROM PCI/ISA BIOS
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master:								

Select Primary Master Option (N=SKIP) : N

OPTIONS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
1 (Y)	0	0	0	0	0	0	0	NORMAL

NOTE: Some OSes (like SCO-UNIX) must use NORMAL for installation

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

Save & Exit Setup

This option allows you to determine whether to accept the modifications or not. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

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

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	**EXIT WITHOUT SAVING**
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Abandon all Data & Exit Setup	

Appendix

A. I/O Port Address Map

B. Interrupt Request Lines (IRQ)

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. There are a total of 1K port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Parallel Port #2
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Software Redirected to Int 0Ah
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE