GT-675(P)

Pentium II / III
w/VGA w/LAN
PICMG Half-Size CPU Card

User's Manual

Acknowledgments

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Check List

Before getting started, please check if your GT-675 package includes the following items:

- GT-675(P) Pentium II / III CPU board x 1pcs
- Driver & Utility diskette x 6 pcs
- Keyboard adapter x 1pcs
- FDD cable x 1 pcs
- HDD cable x 1 pcs
- Printer / serial port extension cable with bracket x 1pcs
- User's manual x 1pcs

Table of Contents

Chapter 1

Introduction

This manual describes the GT-675 (ISA) / GT-675P (PISA) single board computers. Chapter 1 provides general information and specifications. Chapter 2 contains dimensional drawings and jumper setting information. Chapter 3 describes component installations. Chapter 4 describes AWARD BIOS setup information and BIOS POST code. Appendix A provides sample code for the watchdog timer. Appendix B list the connector pin assignment Appendix C provides the Memory and I/O address information, Appendix D describes the updating the system BIOS, and Appendix E describes the network interface.

General

The GT-675 (P) is a full featured, industrialized, single board computer with a high-frequency Intel Pentium III®, or Celeron ® processor that brings advanced CPU technology and processing power to the latest ISA/PCI (PICMG) applications and to older ISA systems. The 440BX AGP set built in to the single board computer is the most efficient and reliable way to upgrade existing ISA systems to Pentium II technology.

The GT-675 uses the PICMG form factor with socket 370 to fit in PGA and FC-PGA processor from Intel. The PICMG design contains two gold leaf edge connectors compatible with PCI and ISA connectors to allow all peripherals to interface with the processor. This lets the GT-675 take advantage of the high pin density and strict electromechanical criteria imposed on PCI and ISA connectors.

The GT-675 single board computer is further enhanced by the CHIPS 69000 Graphics Accelerator to deliver the most advanced graphics and video support available. The 69000 supports a wide variety of monochrome and color Single-Panel, Single-Drive (SS) and Dual-Panel, Dual-Drive (DD), standard and high resolution, passive STN and active matrix TFT LCD, and EL panels. With **HiQColor** technology, up to 256 gray scales are supported on passive STN LCDs. Up to 16.7M different colors can be displayed on passive STN LCDs and up to 16.7M colors on 24 bit active matrix LCDs.

The GT-675 combines the many features needed for system operation into one compact single board computer, including 10/100 TX LAN adapter, Ultra/DMA IDE drive controllers, high performance serial ports, enhanced parallel port, and

the latest BIOS features. Additional enhancements to the GT-675 include two USB ports and a programmable watchdog timer. Two dual in-line memory module (DIMM) sockets support up to 512MB of synchronous DRAM (SDRAM) memory. An internal 64-bit second level (L2) cache supports 128/256k of memory. The L2 cache speed is half the CPU core frequency. The Celeron L2 cache equals 128k running at full CPU core.

The 440BX AGPset in the GT-675 incorporates the latest microprocessor technology from Intel to provide the increased bandwidth needed to operate your system bus at speeds up to 100MHz. (The 440BX AGPset uses one chipset for both 66MHz and 100MHz system designs in Pentium III, Pentium II and Celeron processors with speeds of 800 MHz and higher.).

The 440BX AGPset is a two-chip set comprised of the Intel 82443BX (PAC) host bridge and the Intel 82371EB (PIIX4E) I/O subsystem. The 64-bit main memory interface in the PAC provides optimized support for SDRAM at 100 and 66/60MHz. The PIIX4E is a PCI Rev 2.1 compliant PCI-ISA bridge that supports 3.3V and 5V 33MHz PCI operations. Like the PAC, the PIIX4E chip includes Desktop Power Management support, enhanced DMA controller and an integrated IDE controller with Ultra DMA/33 support. In addition, it provides USB host interface support for two USB ports and a System Management Bus (SMB) with support for DIMM Serial PD.

Year 2000 Compliance

Industrial Computer Source warrants that the GT-675 has been tested for Year 2000 compliance. The boards have been verified to "roll over" to the year 2000 properly and to indicate the proper date for the leap year. This warranty applies to the board components only and does not guarantee that improperly written application software will report the year correctly.

Specifications

This chapter provides the specifications and an illustration of the GT-675 single board computer.

Processors Supported

• Intel Pentium III Coppermine-512K with 512K L2 cache
• Intel Pentium III Coppermine-256K with 256K L2 cache
• Intel Pentium III Coppermine-128K with 128K L2 cache
• Intel Celeron with 128K L2 cache

Processor Clock Frequency and Bus Speed

• Pentium III Coppermine - Internal frequency and bus speed is 100MHz
• Celeron – Internal frequency and bus speed is 66MHz

Memory Capacity

• 16MB minimum
• 256MB maximum (non-ECC)
• 512MB maximum (ECC)

DIMM Support

• 2 banks, gold contacts, 168-pin
• Non-ECC/ECC compatible

Memory Speed Required

• 64/72-bit SDRAM (100 MHz)

BIOS

• Hi-Flex Pentium AWARD BIOS, Flash EPROM support, Plug-and-Play
  compatible
• 2Mb flash upgradeable supporting BIOS upgrade via software
• Full support for Year 2000 and leap-year date functions

Chip Set

• Intel 440BX AGPset
  - 82443BX Host Bridge Controller (PCI/AGP)
  - 82371EB PCI/ISA/IDE Accelerator (PIIX4E).
• C&T 69000 PCI bus with Windows accelerator and Video playback.

Display

• C&T 69000 integrated 2M SDRAM for the graphics/video frame buffer.

  - Support Flat-panel resolutions up to 640x480, 800x600, 1024x768

  - Support non-interlace CRT monitors, 1024x768 64K colors

  - Display connector: DB-15 VGA connector for CRT monitor and 2x22 pin

    header for Flat-panel

LAN Controller

• **INTEL 82559** Ethernet controller, 10/100 Tx with RJ-45 connector.

EIDE Disk Controller (dual port)

• Two fixed disk drives supported
• PIO Mode 4 and Ultra DMA/33 supported.
• Full support for LS-120 HD floppy drive.

Floppy Diskette Controller

• Supports 1.44MB slim type floppy drives.

Serial Ports

• Two RS232, 16C550-compatible, FIFO buffer

Parallel Port

• Single parallel port controller with bi-directional compatibility
• EPP and ECP enhanced port modes.

PS/2 Keyboard / Mouse port

• Microsoft compatible
• Six-pin mini-DIN connector at rear panel
• external adapter to separate to Keyboard and Mouse
• Power supplied through +5VDC self-healing fuse
• Single 5-pin header connector for external keyboard interface

Universal Serial Bus (USB)

• Universal Host Controller Interface (UHCI) configuration
• Dual USB connectors at rear panel via separate cable and bracket assembly
  (optional)
• Power supplied through +5VDC self-healing fuse

Watchdog Timer

• Reset CPU automatically if CPU stops operating
• Reset CPU automatically if +5VDC varies more than 10%
• Jumper or software disable/enable

Real-time Clock

• SGS-THOMSON M48T86PC1 compatible
• 256 bytes of battery-backed RAM
• On chip lithium battery with 10 years data retention.

Dimension

• L x W : 186.06mm x 127.64mm (7.3" x 5.0")

Operating Environment

Temperature
• 0 to 55°C
Humidity
• 5 to 90% RHNC

Storage Environment

Temperature
• -10 to 65°C
Humidity
• 5 to 95% RHNC

Current Requirements

• +5V typical current draw: 6 - 10A
• +5V maximum current draw: 8 - 18A
• +12V maximum current draw: 600mA
Note: 1) +5V current draw is processor dependent.
       2) Onboard +3.3 V is regulated down from the +5V source.

Chapter 2. Jumper and Connectors

GT-675 Jumper and Connector locations
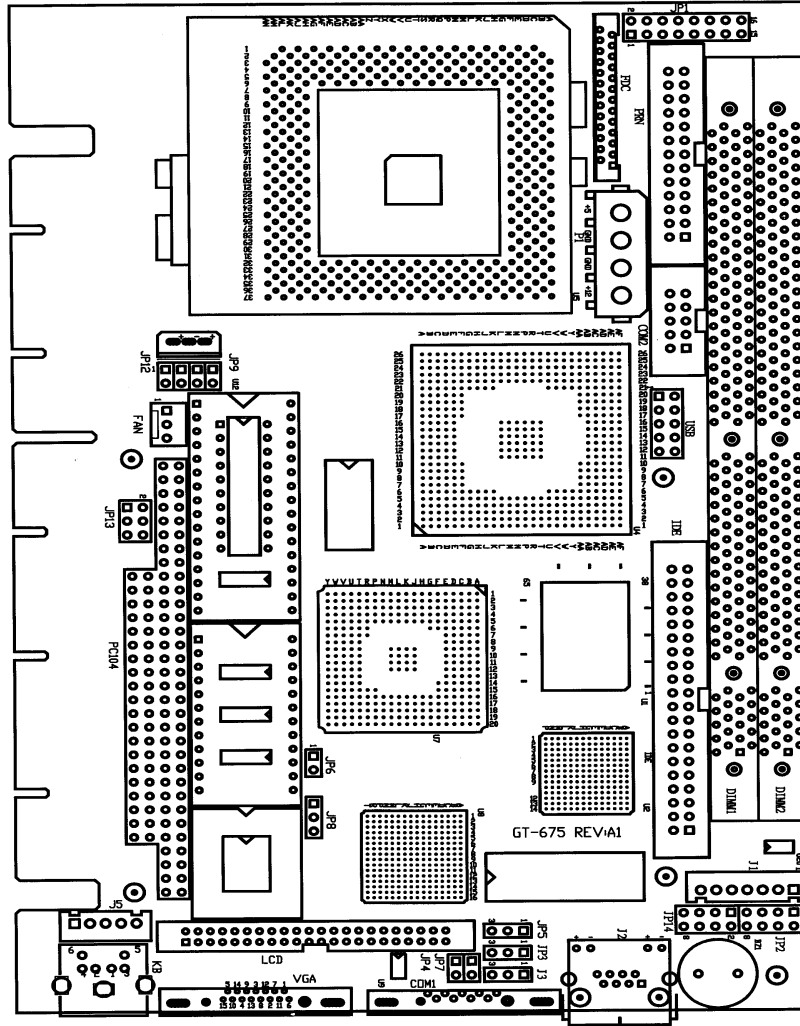
2.1 Jumpers setting

CPU BASE SPEED SELECT (JP9, JP10, JP11)

CPU clock	JP9	JP10	JP11
66.6MHZ	OPEN	OPEN	CLOSE
100MHz	OPEN	OPEN	OPEN

CPU / BUS RATIO SELECT (JP14)

CPU/Bus Ratio	JP14-1	JP14-2	JP14-3	JP14-4
2.0x	ON	ON	ON	ON
2.5x	OFF	ON	ON	ON
3.0x	ON	OFF	ON	ON
3.5x	OFF	OFF	ON	ON
4.0x	ON	ON	OFF	ON
4.5x	OFF	ON	OFF	ON
5.0x	ON	OFF	OFF	ON
5.5x	OFF	OFF	OFF	ON
6.0x	ON	ON	ON	OFF
6.5x	OFF	ON	ON	OFF
7.0x	ON	OFF	ON	OFF
7.5x	OFF	OFF	ON	OFF
8.0x	ON	ON	OFF	OFF

Power Source (JP3, J3, JP5)

Power Source	JP3	J3	JP5
Use PS/2 AT Power supply	2-3	NC	1-2
Use ATX power supply	1-2	To power supply 1 – 5VSB 2 – Ground 3 – PS-ON	2-3

Power ON / OFF Switch (JP4)

Power Source	JP4
Use PS/2 AT Power supply	No Used
Use ATX power supply	OPEN – Power OFF CLOSE – Power ON

Reset/SMI/LED/Speaker/Key-lock (JP1)

Signals	JP1
Internal buzzer	1-3
External speaker (remove 1-3)	1-7
Power LED, Pin 2+, Pin6-	2-6
Key-lock	8-10
System reset switch	13-14
System Management Interrupt	11-12
HDD LED, Pin16+, Pin15-	15-16

External keyboard (J5)

Signals	J5
Keyboard clock	1
Keyboard data	2
NC	3
Ground	4
Power	5

External power connector for CPU (P1)

Signals	P1
+12V	1
+5V	4
Ground	2,3

Disk On Chip (M-System) Address Select (JP13)

I/O ADDRESS	JP13		
	1-2	3-4	5-6
CC00-CDFF	open	close	close
D000-D1FF	open	open	close
D800-D9FF	open	close	open
E000-E1FF	open	open	open

Watchdog (JP7)

Enable / Disable	JP7
Watchdog time out gen. system reset	CLOSED
Disable Watchdog timer	OPEN

CMOS Clear (JP6)

Clear	JP6
POWER OFF AND SHORT JUMPER ON 1-2 OF JP6, REMAINING POWER ON 1MIN. THEN POWER OFF, REMOVE JUMPER ON 1-2 OF JP6	

USB connector (USB)

Signals	USB0	USB1
VCC	1	10
USB -	3	8
USB +	5	6
USB GND	7	4
SIGNAL GND	9	2

Infrared connector (J1)

Signals	J1
VCC	6
5VSB	4
IRRX	1
IRTX	3
FIRRX	5
CIRRX	7
SIGNAL GND	2

LCD Shift clock Select (JP8)

Enable / Disable	JP8
LCD shift clock inverted	1-2
LCD shift clock normal	2-3

2.2 Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered with your system may be caused by loose or improper connections. Ensure that all connectors are in place and firmly attached.

Component	Label
HDD (IDE) connector	IDE
FDD connector	FDC
Parallel port	PRN
USB connector	USB
VGA CRT connector	VGA
LCD connector	LCD
Keyboard / Mouse connectors	K/B, J5
Reset switch connector	JP1 (13-14)
External speaker connector	JP1 (1-7)
HDD LED connector	JP1 (15-16)
CMOS RAM clear	JP6
External power connector	P1
ATX power switch	JP4
Serial port1	COM1
Serial port2	COM2
Infrared	J1

Chapter 3
Installation

This chapter describes the procedures for installing the GT-675 CPU card into your system.

The following is a list of typical peripherals required to build a minimum system:

- Power supply and passive backplane(optional)
- IBM PC/AT keyboard
- Display monitor
- Floppy or hard disk with MS-DOS or Flash Disk emulator

To setup the system may require installing board components (such as CPU, memory), configuring the system (setting DIP switches, jumper for component compatibility or to enable functions), connecting the input / output devices, and setting up the operating system. For the location of the components and connectors, please refer to the chapter 2 for detail.

3.1 Installing the DIMMs

The GT-675 single board computer accepts from 16 MB up to 512 MB of SDRAM. The two 168-pin SDRAM Dual Inline Memory Module (DIMM) sockets will accept 64 and 72 bit DIMM modules (3.3V memory – un-buffered SDRAM only).

The single board computer will accept only DIMM with gold-plated contacts. To ensure reliable operation at zero wait states, use only 10ns or faster SDRAM DIMM for bus speeds less then 100MHz. For 100MHz or higher, use only 8ns or faster SDRAM DIMM. If more then two DIMM sockets are used, they may be filled with different size memory, but the DIMMs should be made by the same manufacturer and be of the same speed.

Note: Before performing the following procedures, remove the board from the backplane and lay it on a flat ESD protected, non-static surface.

1. Move the module release levers (on each end of the socket) outward, away from the socket. (Please see the Figure 3.1)
2. Place the DIMM so that the two notches on the contact edge line up with the two alignment nodes in the DIMM socket. Insert the DIMM into the socket at a 90-degree angle.
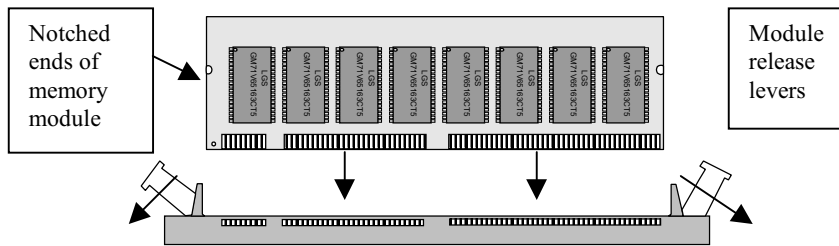
Figure 3.1: DIMM Orientation

3. Using both hands, press downward and guide the DIMM into socket. The module release levers will return to their upright position when the DIMM is completely seated in the socket. The pegs on the tips of the release levers should align with the notches on the both ends of the DIMM.
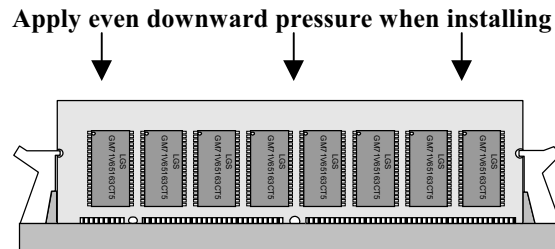
Figure 3.2: DIMM Installation

4. Repeat Steps 1-3 for the remaining DIMM in <u>DIMM 2</u>. You can install two DIMMs on the board.

3.2 Installing the CPU

1. Match key pin on the CPU with key pin of the PGA370 socket. Please see the figure 3.3 for detail.
2. To complete the installation, gently press the CPU onto place.
3. Double check the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.
4. Add the heat sink on the top of CPU properly.
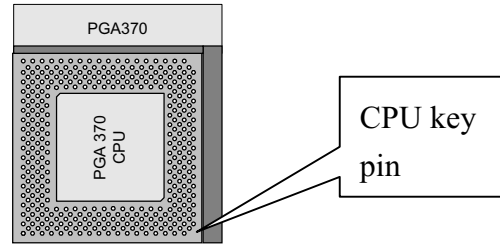
Figure 3.3: PGA 370 socket

3.3 Completing the Installation

To complete the installation, the following steps should be followed:

1. Make sure the power is off.
2. Set the configuration jumpers in accordance with Chapter 2.
3. Install the GT-675 CPU card into one of the slots in a passive backplane. Or, just take the GT-675 alone as a single board computer.
4. Connect the applicable I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply and etc.

   Note: the color of pin one is usually red or blue, while others are gray.

5. Turn on the power.

Chapter 4
Award's BIOS Setup

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backup RAM (CMOS RAM). When the power is off, it will retain the Setup information.

4-1 Entering Setup

Power on the computer and press <Del> immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the message below appears briefly at the bottom of the screen during the POST (Power On Self Test). Press <Del> key or simultaneously press <Ctrl>, <Alt>, and <Esc> Keys.

TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC> OR <DEL> KEY

As long as this message is present on the screen you may press the <Del> key (the one that shares the decimal point at bottom of the number keypad) to access the Setup program. In a moment, the main menu of the Award SETUP program will appear on the screen.

You may use the cursor up/down keys to highlight the individual menu items. As you highlight each item, a brief description of that item's function appears in the lower windows. If you have a color monitor you can use the <Shift>, <F2> keys to scroll through the various color combinations available.

4-2 The MAIN Menu

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

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	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑↓→← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color

STANDARD CMOS SETUP

This setup page includes all the items of standard compatible BIOS. See Page 4-4 to page 4-7 or details.

BIOS FEATURES SETUP

This setup page includes all the items of Award special enhanced features. See Page 4-8 to Page 4-12 for details.

CHIPSET FEATURES SETUP

This setup page includes all the items of chipset special feature. See Page 4-13 to Page 4-16 for details.

POWER MANAGEMENT SETUP

This category determines how much power consumption for the system after selecting the items below. Default value is Disable. See Page 4-17 to Page 4-20 for details.

PNP/PCI CONFIGURATION

This category specifies the setup of PCI related devices. See Page 4-21 to Page 4-22 for details.

LOAD BIOS DEFAULTS

BIOS defaults function indicate the most appropriate values of the system parameter when the system is in minimum performance.

LOAD SETUP DEFAULTS

Chipset defaults functions indicate the values required by the system for the maximum performance.

INTEGRATED PERIPHERALS

This category specifies the setup of on board I/O devices. See Page 4-23 to Page 4-25 for details.

SUPERVISOR/USER PASSWORD

This category specifies the password setting for BIOS setup menu. See page 4-26 for details.

IDE HDD AUTO DETECTION

Automatically configures hard disk parameters. See Page 4-27 to Page 4-29 for details.

SAVE & EXIT SETUP

Saves the SETUP value changes to CMOS and exits setup.

EXIT WITHOUT SAVE

Abandons all the CMOS value changes and exits setup.

4-3 STANDARD CMOS SETUP

The items in Standard CMOS Setup Menu divided into 10 categories. Each category includes one or more than one setup item. 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.

Standard CMOS Setup Menu (Support Enhanced IDE)

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

```
Date (mm:dd:yy) : Fri., Jul 18 1997
Time(hh:mm:ss) : 00:00:00

HARD DISKS       TYPE  SIZE  CYLS  HEAD  PRECOMP  LAND  SECTOR  MODE
Primary Master    :Auto   0     0     0       0      0      0    Auto
Primary Slave     :None   0     0     0       0      0      0    Auto
Secondary Master  :None   0     0     0       0      0      0    Auto
Secondary Slave   :None   0     0     0       0      0      0    Auto


Drive A : 1.44M , 3.5 in                 Base Memory    :   640K
Drive B : None                           Extended Memory : 31744K
Video   : EGA / VGA                       Other Memory    :   384K
Floppy 3 mode Support : Disable          Total Memory    : 32768K


Halt On : All Errors

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

Date

The date format is <day>, <date> <month> <year>.

day   The day of week, from Sun to Sat, determined by the BIOS, is read only

date   The date, from 1 to 31 (or the maximum allowed in the month), can be key in with the numerical / function key

month The month of the year. Jan. through Dec.

year   The year, depends on the year of BIOS

Time

The time format is <hour> <minute> <second>, which accepts both function key and numeral key. The time calculated is based on the 24-hour military-time clock. For example, (1 p.m.) is 13:00:00.

Primary Master/Primary Slave

This category identifies the types of one channel that has been installed in the computer. There are 45 predefined types and 4 user definable types of Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type "User" is user-definable.

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

If you select User Type, related information must be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should have been provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".
If the controller of HDD interface is SCSI, the selection shall be "None".
If the controller of HDD interface is CD-ROM, the selection shall be "Auto"

Cyls.	number of cylinders
Heads	number of heads
Precomp	write precom
Landzone	landing zone
Sectors	number of sectors
Mode	HDD access mode

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

Drive A type/Drive B type

This category identifies the type of floppy disk drive A and drive B that are installed in the computer.

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

Video

This category selects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitor can be supported, you do not have to select the type in Setup for secondary monitor.

There are two ways to boot up the system:
1. If the system has two display cards installed, VGA card as primary and monochrome card as secondary, the selection of display type shall be "VGA Mode".
2. If the system has two display cards installed, monochrome as primary and VGA as secondary, the selection of display type shall be "Monochrome mode".

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

Error halt

This category determines whether the computer will stop if an error is detected during the power up procedure.

No errors   Whenever the BIOS detect a non-fatal error, the system will stop and you will be prompt.

All errors   The system's boot up will not be stopped for any errors that may be detect.

All, But Keyboard   The system's boot will not be stopped for a keyboard error; but it will be stopped for all other errors.

All, But Diskette   The system's boot will not be stopped for a disk error; but it will be stopped for all other errors.

All, But Disk/Key   The system's boot will not be stopped for a keyboard or disk error; but it will be stopped for all other errors.

Memory

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

Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory typically is 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

The BIOS determines how much extended memory is exists in the system during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

Other Memory

This refers to the memory located in the 640K to 1024K address space. This memory can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use of this area is for Shadow RAM.

Total Memory

System total memory is the sum of basic memory, extended memory and other memory.

4-4 BIOS FEATURES SETUP

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
			D4000-D7FFF Shadow	:	Disabled
Quick Power On Self Test	:	Disabled	D8000-DBFFF Shadow	:	Disabled
Boot Sequence	:	C. A. SCSI	DC000-DFFFF Shadow	:	Disabled
Swap Floppy Drive	:	Disabled			
Boot Up Floppy Seek	:	Enabled			
Boot Up Numlock Status	:	On			
Gate A20 Option	:	Fast			
Typematic Rate Setting	:	Disabled			
Typematic Rate (Chars/Sec)	:	6			
Typematic Rate (Msec)	:	250			
Security Option	:	Setup	ESC : Quit ↑↓→← : Select Item		
PS/2 mouse function control	:	Enabled	F1 : Help PU/PD/+/- : Modify		
PCI/VGA Palette Snoop	:	Disabled	F5 : Old Values (Shift) F2 : Color		
OS Select for DRAM >64MB	:	Non-OS2	F6 : Load BIOS Defaults		
Report No FDD For WIN 95	:	Yes	F7 : Load Setup Defaults		

Virus Warning

This category flashes the screen when the system boots up. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive, will halt the system and the following error message will appear. In the mean time, you can run an anti-virus program to locate the problem.

WARNING!
Disk boot sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.
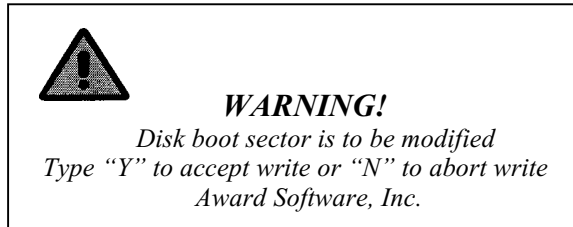
Enabled The virus warning activates automatically and will cause warning message, when any attempt to access the boot sector or hard disk partition table during the system's boot up process.

Disabled No warning message appears.

Note: Many disk diagnostic programs that attempt to access the boot sector table can cause the above warning message.   If you are going to run such a program, we recommend that you disable the Virus Protection beforehand.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enable. If your CPU does not have Internal Cache then this item "CPU Internal Cache" will not appear.

Enabled	Enable cache
Disabled	Disable cache

CPU L2 Cache ECC Checking

Quick Power On Self Test

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

Enabled	Enable quick POST
Disabled	Normal POST

Boot Sequence

This category determines which drive that the computer searches first for the disk operating system. i.e. DOS. Default value is "A,C,SCSI".

C only	System will first search the hard disk drive
LS/ZIP ,C	System will first search the LS/ZIP drive then hard disk drive C
A,C,SCSI	System will first search the floppy disk drive then hard disk drive C, SCSI hard disk drive.
C,A,SCSI	System will first search the hard disk drive C then floppy disk drive, SCSI hard disk drive.
D,A,SCSI	System will first search the hard disk drive D then floppy disk drive, SCSI hard disk drive.
E,A,SCSI	System will first search the hard disk drive E then floppy disk drive, SCSI hard disk drive.
F,A,SCSI	System will first search the hard disk drive F then floppy disk drive, SCSI hard disk drive.
SCSI,A,C	System will first search the SCSI hard disk drive then floppy disk drive, floppy disk drive C.

SCSI,C,A   System will first search the SCSI hard disk drive then hard disk drive C, floppy disk drive.

C,CDROM,A   System will first search the hard disk drive C then CDROM, floppy disk drive.

A,C,CDROM   System will first search the floppy disk drive then hard disk drive C, CDROM

Swap Floppy Drive

This category allows user to swap floppy driver definition from driver A / B to B / A.

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. The 360K diskette is 40 tracks, and 720K, 1.2M, 1.44M is all 80 tracks.

Enabled   BIOS search the floppy disk drive to determine if it is 40 or 80 tracks. Note that the BIOS can not distinguish the difference among 720K, 1.2M or 1.44M drive type. The BIOS considers as an 80 tracks' disk drives.

Disabled   BIOS will not search the type of floppy disk drive by track number. Hence there will not be any warning message if the drive installed is 360K.

Boot Up NumLock Status

The default value is On.

On   Keypad is number keys

Off   Keypad is arrow keys

Gate A20 Option

Normal   The A20 signal controlled by keyboard controller or chipset hardware.

Fast   Default : Fast.   The A20 signal controlled by Port 92 or chipset specific method.

Typematic Rate Setting

This determines the typematic rate.

Enabled	Enable typematic rate and typematic delay programming
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items and the default controlled by keyboard.

Typematic Rate (Chars/Sec)

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

Typematic Delay (Msec)

When user is holding a key, Typematic Delay means the time delay between the first and second character is displayed.

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

Security Option

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

System	The system will not boot up and access to Setup will deny if the wrong password is entered at the prompt.
Setup	The system will bootup, but access to Setup will deny if the wrong password is entered at the prompt.

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

PS/2 mouse function control

The choice: **Enable, disable**

PCI / VGA palette snoop

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

Enabled   PCI/VGA can work with MPEG ISA/VESA VGA Card.

Disabled   PCI/VGA can not work with MPEG ISA/VESA VGA Card.

OS Select for DRAM >64

This item allows you to access the memory over 64MB in OS/2.

The choice: **Non-OS2, OS2**.

Report No FDD For WIN 95

The choice: **YES, NO**

Video BIOS Shadow

It determines whether video BIOS will be copied to RAM or not. However, it is optional in Chipset design. Video Shadow will increase the video speed.

Enabled   Video shadow is enabled

Disabled   Video shadow is disabled

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM. An example of such optional ROM would be supported. i.e. on-board SCSI.

Enabled   Optional shadow is enabled
Disabled   Optional shadow is disabled

Note: *1.) For C8000-DFFF option-ROM on PCI BIOS, BIOS will automatically enable the shadow RAM. User does not have to select the item.*
2.) IDE second channel control:
Enable: enable secondary IDE port and BIOS will assign IRQ15 for this port.
Disable: disable secondary IDE port and IRQ15 is available for other device. The item is optional only for PCI BIOS.
3.) Some of the sound cards have an onboard CD-ROM controller that uses IDE Secondary Port. In order to avoid PCI IDE conflict, the IDE Secondary channel control has to select "disable" before CD-ROM can work.

4-5 CHIPSET FEATURES SETUP

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

Auto Configuration	: Enabled	Power-Supply Type	: Auto
EDO DRAM Speed Selection	: 60ns	Current System Temp.	: 24°C/75°F
EDO CASx# MA Wait State	: 2	Current CPUFAN1 Speed	: 0RPM
EDO RASx# Wait State	: 1	Current CPUFAN3 Speed	: 5000RPM
SDRAM RAS-to-CAS Delay	: 3	IN0(V): 1.95V IN1(V) : 2.51V	
SDRAM RAS Precharge Time	: 3	IN2(V): 3.28V IN3(V) : 5.26V	
SDRAM CAS latency Time	: 3	IN4(V): 12.03V IN5(V) : -11.48V	
SDRAM Precharge Control	: Disabled	IN6(V): -4.78V	
DRAM Data Integrity Mode	: Non-ECC		
System BIOS Cacheable	: Disabled		
Video BIOS Cacheable	: Disabled		
Video RAM Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1		
Memory Hole At 15M-16M	: Disabled	ESC : Quit ↑↓→← : Select Item	
Passive Release	: Disabled	F1 : Help PU/PD/+/- : Modify	
Delayed Transaction	: Disabled	F5 : Old Values (Shift) F2 : Color	
AGP Aperture Size(MB)	: 64	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Auto Configuration

Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

The Choice: **Enabled, Disabled.**

EDO DRAM Speed Selection

The DRAM timing is controlled by the DRAM Timing Registers.   The timings programmed into this register are dependent on the system design. Slower rates may be required in certain system designs to support loose layouts or slower memory.

50ns	DRAM Timing Type.
60ns	DRAM Timing Type.

EDO CASx# MA Wait State

You could select the timing control type of EDO DRAM CAS MA (memory address bus).

The choice: **1, 2.**

EDO RASx# Wait State

You could select the timing control type of EDO DRAM RAS MA (memory address bus).

The choice: **1, 2.**

SDRAM RAS-to-CAS Delay

You can select RAS to CAS Delay time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

The Choice: **2, 3.**

SDRAM RAS Pre-charge Time

Defines the length of time for Row Address Strobe is allowed to pre-charge.

The Choice: **2, 3.**

SDRAM CAS latency Time

You can select CAS latency time in HCLKs of 2/2 or 3/3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

The Choice: **2, 3.**

SDRAM Precharge Control

The Choice: **Enabled, Disabled**.

DRAM Data Integrity Mode

Select Parity or ECC (error-correcting code), according to the type of in-stalled DRAM.

The Choice: **Non-ECC, ECC.**

System BIOS Cacheable

Select Enabled allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Enabled   BIOS access cached

Disabled   BIOS access not cached

Video BIOS Cacheable

Select Enabled allows caching of the video BIOS ROM at C0000-C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Enabled   Video BIOS access cached

Disabled   Video BIOS access not cached

Video RAM Cacheable

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

8 Bit I/O Recovery Time

The recovery time is the length of time, measured in CPU clocks, which the system will delay after the completion of an input/output request. This delay takes place because the CPU is operating so much faster than the input/output bus that the CPU must be delayed to allow for the completion of the I/O.
This item allows you to determine the recovery time allowed for 8 bit I/O.

Choices are from **NA, 1 to 8 CPU clocks.**

16 Bit I/O Recovery Time

This item allows you to determine the recovery time allowed for 16 bit I/O.

Choices are from **NA, 1 to 4 CPU clocks**.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.

Enabled   Memory hole supported.
Disabled   Memory hole not supported.

Passive Release

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

The Choice: **Enabled, Disabled**.

Delayed Transaction

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

The Choice: **Enabled, Disabled.**

Power supply type

The choice: **Auto, P8 & P9, ATX**

Current System Temp

This field displays the *current* system temperature, if your computer contains a monitor system.

Current CPUFAN1/3 Speed

These fields display the *current* speed of up to three CPU fans, if your computer contains a monitoring system.

4-6 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.

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

Power Management	: User Defined	** Reload Global Timer Events **	
PM Control by APM	: No	IRQ[3-7, 9-15], NMI	: Disable
Video Off Method	: Blank Screen	Primary IDE 0	: Disable
Video Off After	: NA	Primary IDE 1	: Disable
MODEM Use IRQ	: NA	Secondary IDE 0	: Disable
Doze Mode	: Disable	Secondary IDE 1	: Disable
Standby Mode	: Disable	Floppy Disk	: Disable
Suspend Mode	: Disable	Serial Port	: Disable
HDD Power Down	: Disable	Parallel Port	: Disable
Throttle Duty Cycle	: 12.5%		
PCI/VGA Active Monitor	: Disabled		
Soft-Off by PWR-BTTN	: Instant-Off		
Power ON by Ring	: Disabled		
Resume by Alarm	: Disabled		
Wake up On LAN	: Disabled	ESC: Quit ↑↓→←: Select Item	
IRQ 8 Break Suspend	: Disabled	F1 : Help PU / PD / + / - : Modify	
		F5 : Old Values (Shift)F2: Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Power Management

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

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

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

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 CPUs**. 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.

PM Control APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock.

If the Max. Power Saving is not enabled, this will be preset to *No*.

Video Off Method

This determines the manner in which the monitor is blanked.

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

Video Off After

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

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

MODEM Use IRQ

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

The choices: **NA, 3, 4, 5, 7, 9, 10,** and **11**

The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected.

Doze Mode

When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

Standby Mode

When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

Suspend Mode

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

HDD Power Down

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

Throttle Duty Cycle

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

The Choice: **12.5%, 25.0%, 37.5%, 50.0%, 62.5%,** and **75.0%**

PCI/VGA Active Monitor

When Enabled, any video activity restarts the global timer for Standby mode.

The Choice: **Enabled, Disabled.**

Soft-Off by PWR-BTTN

When Enabled, turning the system off with the on/off button places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or Resume by Ring activity.

The Choice: **Instant-Off, Delay 4 Sec.**

Power ON by Ring

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

The Choice: **Enabled, Disabled**.

Resume by Alarm

An timer alarm will awaken the system from a soft off state.

The Choice: **Enabled, Disabled**.

IRQ 8 Break Suspend

You can Enable or Disable monitoring of IRQ8 so it does not awaken the system from Suspend mode.

The Choice: **Enabled, Disabled**.

Wake up On LAN

The Choice: **Enabled, Disabled**.

Reload Global Timer Events

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

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

The choice: **Enable, Disable**

4-7 PnP/PCI CONFIGURATION

This section describes how to configure the PCI bus. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system that allows I/O devises to operate at a speed close to the speed of the CPU itself when it communicates with its own special components. This section cover several technical items and we strongly recommend that only experienced users should make any change to the default settings.

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

PNP OS Installed	: Yes	Slot 1 Use IRQ No.	: AUTO
Resources Controlled By	: Manual	Slot 1 Use IRQ No.	: AUTO
Reset Configuration Data	: Disabled	Slot 1 Use IRQ No.	: AUTO
		Slot 1 Use IRQ No.	: AUTO
IRQ-3 assigned to	: PCI/ISA PnP		
IRQ-4 assigned to	: PCI/ISA PnP	Used MEM base addr	: C800
IRQ-5 assigned to	: PCI/ISA PnP	Used MEM Length	: 8K
IRQ-7 assigned to	: PCI/ISA PnP	Assign IRQ For USB	: Enabled
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

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

The Choice: **Yes** and **No**.

Resource Controlled by

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assign them.

The choice: **Auto** and **Manual.**

Reset Configuration Data

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

The choice: **Enabled** and **Disabled.**

IRQ n Assigned to

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

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

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

DMA n Assigned to

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

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

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

Used MEM base address

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

The Choice: **C800, CC00, D000, D400, D800, DC00, N/A.**

Used MEM Length

Select a length for the memory area specified in the previous field. This field does not appear if no base address is specified.

The Choice: **8K, 16K, 32K, 64K.**

4-8 Integrated Peripherals

ROM PCI/ISA BIOS
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	Onboard FDC Controller	: Enabled
IDE Primary Master PIO	: Auto	Onboard Serial Port 1	: 3F8/IRQ4
IDE Primary Slave PIO	: Auto	Onboard Serial Port 2	: 2F8/IRQ3
IDE Secondary Master PIO	: Auto	UART Mode Select	: Normal
IDE Secondary Slave PIO	: Auto		
IDE Primary Master UDMA	: Auto		
IDE Primary Slave UDMA	: Auto	Onboard Parallel Port	: 378/IRQ7
IDE Secondary Master UDMA	: Auto	Parallel Port Mode	: SPP
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		
POWER ON Function	: Button only	ESC : Quit ↑↓→← : Select Item	
		F1 : Help PU / PD / + / - : Modify	
		F5 : Old Values (Shift)F2 : Color	
KBC Input Clock	: 8 MHz	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

IDE HDD Block Mode

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

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

IDE Primary / Secondary Master / Slave 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.

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**

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.

The Choice: **Enabled, Disabled.**

POWER ON Function

This feature will be effective only the system attached with ATX power supply. The power on function used to specify the power on control by:

The Choice: **Button only** – Power ON system by push the power button.
Keyboard 98 – Power ON by windows 98 keyboard.
Mouse Right – Power ON by pushes mouse RIGHT key.
Mouse Left – Power ON by push mouse LEFT key.
Password – Power ON system by typing PASWORD.
Hot Key – Power ON system by push the HOT key.
Ctrl-F1, Ctrl-F2, Ctrl-F3…Ctrl-F12

KBC input clock

The Choice: **6,8,12,16MHz**.

Onboard FDD Controller

This should be enabled if your system has a floppy disk drive (FDD) installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

The Choice: **Enabled, Disabled**.

Onboard Serial Port 1 / Port 2

This item allows you to determine access onboard serial port 1/port 2 controller with which I/O addresses.

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

UART 2 Mode

This item allows you to determine which InfraRed (IR) function of onboard I/O chip.

The Choice: **Standard, ASKIR, and HPSIR**.

Duplex Select

Select the value required by the IR device connected to the IR port. Full-duplex mode permits simultaneous two-direction transmission. Half-duplex mode permits transmission in one direction only at a time.

The Choice: **Half, Full.**

RxD, TxD Active

This item allows you to determine the active of RxD, TxD.

The Choice: "**Hi, Hi", "Lo, Lo", "Lo, Hi", "Hi, Lo"**.

Onboard Parallel Port

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

The choice: **378H/IRQ7, 278H/IRQ5, 3BCH/IRQ7, Disabled.**

Parallel Port Mode

Select an operating mode for the onboard parallel port. Select Compatible or Extended unless you are certain both your hardware and software support EPP or ECP mode.

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

ECP Mode Use DMA

Select a DMA channel for the port.

The choice: **3, 1.**

EPP Mode select

Select EPP mode revision.

The choice: **EPP 1.9, EPP 1.7**

4-9 Supervisor / User Password

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

ENTER PASSWORD:

Type the password, up to eight characters, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You should 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 the password, just press <Enter> when you are prompted to enter password. A message will confirm that the password is disabled. Once the password disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password each time when the system is rebooted or any time when you try to enter Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

4-10 IDE HDD Auto Detection

The Enhance IDE features are included in all Award BIOS. The following is a brief description of this feature.

(1) Setup Changes

<I> Auto-detection

BIOS setup will display all possible modes that are supported by the HDD including NORMAL, LBA and LARGE mode.

If the HDD does not support LBA modes, no 'LBA' option will be show.

If the number of cylinders is less than or equal to 1024, no 'LARGE' option will be shown.

Users can select a mode that is appropriate for them.

<div align="center">
ROM/PCI/ISA BOPS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
</div>

HARD DISK   TYPE   SIZE   CYLS   HEAD   PRECOMP   LANDZ   SECTOR   MODE

Primary Master :

Select Primary Master Option (N = Skip) : N

OPTION	SIZE	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
2 (Y)	2112	1023	64	0	4091	63	LBA
1	2112	4092	16	65535	4091	63	NORMAL
3	2112	1023	64	65535	4091	63	LARGE

<II> Standard CMOS Setup

	CYLS	HEADS	PRECOMP	LANDZONE	SECTOR	MODE
Drive C : User (516MB)	120	16	65535	1119	59	NORMAL
Drive D : None (203MB)	684	16	65535	685	38	----------

When the HDD type is in 'user' type, the "MODE" option is open for users to select their own HDD mode.

(2) HDD Modes

The Award BIOS supports 3 HDD modes: NORMAL, LBA & LARGE

NORMAL mode

This is a generic access mode; neither the BIOS nor the IDE controller can make any transformation during access the HDD.

The maximum numbers of cylinders, head and sectors for NORMAL mode are 1024, 16 & 63.

$$
\begin{array}{lr}
\quad \text{no. Cylinder} & (1024) \\
x \quad \text{no. Head} & (\quad 16) \\
x \quad \text{no. Sector} & (\quad 63) \\
x \quad \text{no. per sector} & (512) \\
\hline
& 528 \quad \text{Megabytes}
\end{array}
$$

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (Logical Block Addressing) mode

This is a new HDD accesses method to overcome the 528 Megabytes bottleneck. The number of cylinders, heads & sectors shown in the setup may not be the number physically contained in the HDD.

During the HDD accessing, the IDE controller transforms the logical address described by sector, head & cylinder number into its own physical address inside the HDD.

The maximum HDD size supported by the LBA mode is 8.4 Gigabytes that obtained by the following formula:

$$
\begin{array}{lr}
\quad \text{no. Cylinder} & (\ 1024) \\
x \quad \text{no. Head} & (\quad 255) \\
x \quad \text{no. Sector} & (\quad 63) \\
x \quad \text{bytes per sector} & (\quad 512) \\
\hline
& 8.4 \ \text{Gigabytes}
\end{array}
$$

LARGE mode

This is an Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinders without LBA support (in some cases, users do not want LBA). The Award BIOS provides an alternative to support these kinds of HDD.

Example of the LARGE mode:

CYLS.	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS trick the DOS (or other OS) that the number of cylinders is less than1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process is made inside INT13h in order to access the right HDD address.

Maximum HDD size:

	no. Cylinder	(1024)
x	no. Head	(32)
x	no. Sector	(63)
x	bytes per sector	(512)

1 Gigabytes

(3) Remarks

In order to support the LBA or the LARGE mode of HDDs, some software must be involved in the BIOS. All of the software is located in the Award HDD Service Routine (INT 13h). If your system is under an Operating System that replaces the whole INT 13h, you may not be able to access a HDD with LBA (LARGE) mode.

Power-On Boot

After you made all the changes to the CMOS values, the system cannot boot up with the CMOS values selected in Setup. Restart the system by turning it OFF then ON or Pressing the "RESET" button on the system case. You may also restart by simultaneously press <Ctrl>, <Alt>, and <Delete> keys. Upon restart the system, immediately press <Insert> to load the BIOS default CMOS value for boot up.

4-11 BIOS Reference - POST Codes

NOTE: ISA POST codes output to the port address 80h typically.

POST (hex)	Description

C0	1. Turn off OEM specific cache, shadow...
	2. Initialize all the standard devices with default values
	      Standard device includes:
	          -DMA controller (8237)
	          -Programmable Interrupt Controller (8259)
	          -Programmable Interval Timer (8254)
	          -RTC chip

C1	Auto-detection of onboard DRAM & Cache
C3	1. Test system BIOS checksum 2. Test the first 256K DRAM 3. Expand the compressed codes into temporary DRAM area including the compressed System BIOS & Option ROMs
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS only)
04	Reserved
05	1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	Reserved
07	Verifies CMOS's basic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
08	Test the first 256K DRAM
09	1. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 2. OEM specific cache initialization (if needed)

0A	1. Initialize the first 32 interrupt vectors with corresponding
	   Interrupt handlers
	   Initialize INT no from 33-120 with Dummy(Spurious)
	   Interrupt Handler
	2. Issue CPUID instruction to identify CPU type
	3. Early Power Management initialization (OEM specific)

0B	1. Verify the RTC time is valid or not
	2. Detect bad battery
	3. Read CMOS data into BIOS stack area
	4. PnP initialization include (PnP BIOS only)
	        -Assign CSN to PnP ISA card
	        -Create resource map from ESCD
	5. Assign IO & Memory for PCI devices (PCI BIOS only)

0C	Initialization of the BIOS Data Area (40 : 0N − 40:FF)

POST (hex)	Description
0D	1. Program some of the Chipset values according to Setup.(Early Setup Value Program) 2. Measure CPU speed for display & decide the system clock speed 3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device is found, the speaker will beep
0E	1. Initialize the APIC (Multi-Processor BIOS only) 2. Test video RAM (If Monochrome display device is found) 3. Shown messages include: -Award Logo, Copyright string, BIOS Date code & Part No. -OEM specific sign on messages -Energy Star Logo (Green BIOS ONLY) -CPU brand, type & speed -Test system BIOS checksum (Non-Compress Version only)
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved
1E	If EISA NVM checksum is good, then execute EISA initialization (EISA BIOS only)
1F-29	Reserved
30	Detect Base Memory & Extended Memory Size
31	1. Test Base Memory from 256K to 640K 2. Test Extended Memory from 1M to the Max. of the memory
32	1. Display the Award Plug & Play BIOS Extension message (PnP BIOS only) 2. Program onboard super I/O chip (if any) including COM ports, LPT ports, FDD port. according to setup value
33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache on this stage. But usually, the cache is turned on later in POST 61h
3F-40	Reserved
BF	1.Program the rest of the Chipset value according to Setup. (Later Setup Value Program) 2.If auto-configuration is enabled, programmed the chipset with pre-defined values in the MODBINable Auto-Table
41	Initialize floppy disk drive controller
42	Initialize Hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports

POST (hex)	Description
44	Reserved
45	Initialize math coprocessor.
46-4D	Reserved
4E	If any error is detected (such as video, kb...), show all the error messages on the screen & wait for user to press <F1> key
4F	1. If a password is needed, ask for the password 2. Clear the Energy Star Logo (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS
51	Reserved

52	1. Initialize all ISA ROMs
	2. Later PCI initialization (PCI BIOS only)
	      -assign IRQ to PCI devices
	      -initialize all PCI ROMs
	3. PnP Initialization (PnP BIOS only)
	      -assign IO, Memory, IRQ & DMA to PnP ISA devices
	      -initialize all PnP ISA ROMs
	4. Program shadows RAM according to the Setup settings
	5. Program parity according to Setup setting
	6. Power Management Initialization
	      -Enable/Disable global PM
	      -APM interface initialization

53	1. If it is NOT a PnP BIOS, initialize serial & parallel ports 2. Initialize time value in the BIOS data area by translating the RTC time value into a timer tick value
60	Setup the Virus Protection (Boot Sector Protection) function according to Setup setting
61	1. Try to turn on Level 2 cache Note: if L2 cache is already turned on in POST 3E, this part will be skipped 2. Set the boot up speed according to the Setup setting 3. Last chance for Chipset initialization 4. Last chance for Power Management initialization (Green BIOS only) 5. Show the system configuration table
62	1. Setup daylight saving according to Setup value 2. Program the NUM Lock, typematic rate & typematic speed according to the Setup setting
63	1. If there is any change in the hardware configuration, update the ESCD information (PnP BIOS only) 2. Clear the memory that has been used 3. Boot the system via INT 19H
FF	System Booting. This means that the BIOS already pass the control right to the operating system

Unexpected Errors:

POST(hex)	Description
B0	Interrupt occurs in protected mode.
B1	Unclaimed NMI occurs

Chapter 5
Display

The on-board VGA interface of the GT-675 supports traditional analog CRT monitors and a wide range of popular LCD, EL, and gas plasma flat panel displays. It can drive CRT displays with resolutions up to 1024x768 in 64K colors. It is also capable of driving color panel displays with resolutions of 800x600 in 16.7M colors.

5.1 Drivers and Utilities

5.1.1 Microsoft Windows 95/98 installation

1. ENSURE that the MS Windows 95/98 is up and running properly using the VGA driver that has been detected.
2. OPEN the "*My computer*" program group and SELECT the "*Control Panel*" icon.
3. SELECT the "*Display*" icon and then SELECT the "*Settings*" page.
4. SELECT the "*Change Display Type*" selection bar, and then SELECT the "*Change*" button next to the Adapter Type.
5. On the "*Select Device*" page, SELECT the "*Have Disk*" button to install the display driver from the diskette.
6. After the "*Have Disk*" button selected a "*Install From Disk*" window will appear. SELECT the "*Browse*" button to browse the directory "X:\WIN95" of your diskette drive. (X=A or B)
7. The files ***.INF** will appear under the file name list. SELECT "*OK*" to return to the "*Install From Disk*" window. Under the statement "*Copy manufacturer's files from*" SELECT "*OK*" to start installing the driver files from the FLOPPY drive.
8. "*Select device*" window will appear. Under Models, the driver file name will be listed, SELECT "*OK*" to close "*Select Device*" window and select "*Color Palette*" and "*Desktop Area*" of your choice.
9. Once the desired color palette (the number of colors) and desktop area (resolution) has been chosen, the Windows 95 or 98 system will be restarted to load this accelerated driver.

5.1.2 MS Windows NT 4.0 Driver Install

1. Click the Start button, then go to Settings and click on Control Panel.

2. Click on the Display icon to start the Display Properties window.

3. Click on the Settings tab, and then click on Display Type.

4. In the Change Display Type window, click on Change in Adapter Type.

5. This will bring up the Select Device Window.

Chips & Technologies display drivers can be installed from a manufacturer supplied Installation Diskette, or from the default drivers provided on the Windows NT 4.0 CDROM.

Installing from Manufacturer supplied diskette

In the Change Display window, click on <Have Disk>. Follow the directions on the screen to supply the directory where the Windows NT driver files are located. Then select OK, or press <enter>.

Select Chips Video Accelerator from Display list provided, then click OK or press <enter>.

You will then see a warning panel about Third Party Drivers. Click on Yes to finish the install.

Once the installation is complete, the system must be shut down and restarted for the new drivers to take effect.

Installing Drivers provided on NT 4.0 CDROM

In the Change Display window, from the list of Manufacturers, select Chips & Technologies. In the Display Window, select Chips & Technologies Video Accelerator, then click OK or press <enter>.

You will then see a warning panel about Third Party Drivers. Click on Yes to finish the install.

Follow the directions on the screen to supply the directory where the Windows NT driver files are located. Then select OK, or press <enter>.

Once the installation is complete, the system must be shut down and restarted for the new drivers to take effect.

When the system has restarted, the default graphics mode (usually 640x480x256 colors) has been automatically selected.

1. Click the Start button, then go to Settings and click on Control Panel.
2. Click on the Display icon to start the Display Properties window.
3. Click on the Settings tab.
4. A new screen setting can be selected using either of the following methods:

    1: Use the slide-bar in the Desktop Area to select new setting.

    2: Click on List All Modes. From the list provided, select a new setting, then click <OK> or press <enter>.

5. Click on Test to test the newly selected graphics mode. Follow the instructions given on the screen. A test screen should appear, followed by the Testing Mode window. Click on <Yes> to continue. Click on <Apply> to switch to the new graphics mode.
6. Graphics modes are changed dynamically on NT 4.0, so you do not need to shutdown and restart for the new screen settings to work.

5.1.3 MS Windows 95/98 Refresh Rate Utility Regulation

1. Open the "*My computer*" program group and <u>SELECT</u> the "*Control panel*" icon.
2. Double click on *DISPLAY* and <u>SELECT</u> "*CHIPS*". There will now be a refresh tab for changing the refresh rate. You may click the tab to change the refresh rate.

5.2 Panel Support

The GT-675 board provides a very convenient way to setup panels that are up to 14 types.

I.   For 40K BIOS

If you install a standard 40K BIOS on the board, the GT-675 board supports 8 panels as follows:

Panel #	Panel Type
1	1024x768 Dual Scan STN Color Panel
2	1280x1024 TFT Color Panel
3	640x480 Dual Scan Color Panel
4	800x600 Dual Scan Color Panel
5	640x480 Sharp TFT Color Panel
6	640x480 18-bit TFT Color Panel
7	1024x768 TFT Color Panel
8	800x600 TFT Color Panel

Meanwhile, please also set the jumpers on **JP2** as the following:

Panel #	7-8	5-6	3-4	1-2
1	Open	Close	Close	Close
2	Open	Close	Close	Open
3	Open	Close	Open	Close
4	Open	Close	Open	Open
5	Open	Open	Close	Close
6	Open	Open	Close	Open
7	Open	Open	Open	Close
8	Open	Open	Open	Open

II. For 44K BIOS

If you install a standard 44K BIOS on the board, the GT-675 board supports 14 panels as the following:

Panel #	Panel Type
1	1024x768 Dual Scan STN Color Panel
2	1280x1024 TFT Color Panel
3	640x480 Dual Scan Color Panel
4	800x600 Dual Scan Color Panel
5	640x480 Sharp TFT Color Panel
6	640x480 18-bit TFT Color Panel
7	1024x768 TFT Color Panel
8	800x600 TFT Color Panel
9	800x600 TFT Color Panel (44K BIOS only)
10	800x600 TFT Color Panel (44K BIOS only)
11	800x600 Dual Scan Color Panel (44K BIOS only)
12	800x600 Dual Scan Color Panel (44K BIOS only)
13	1024x768 TFT Color Panel (44K BIOS only)
14	1024x 768 TFT Color Panel (44K BIOS only)
15	Reserved
16	Reserved

Meanwhile, please also set the jumpers on **JP2** as the following:

Panel #	7-8	5-6	3-4	1-2
1	Close	Close	Close	Close
2	Close	Close	Close	Open
3	Close	Close	Open	Close
4	Close	Close	Open	Open
5	Close	Open	Close	Close
6	Close	Open	Close	Open
7	Close	Open	Open	Close
8	Close	Open	Open	Open
9	Open	Close	Close	Close
10	Open	Close	Close	Open
11	Open	Close	Open	Close
12	Open	Close	Open	Open
13	Open	Open	Close	Close
14	Open	Open	Close	Open
15	Open	Open	Open	Close
16	Open	Open	Open	Open

5.3 Video Modes

This display card supports all standard VGA modes as well as a wide selection of extended modes. The following table lists the modes and vertical refresh rates that BIOS can support.

Table 1: Standard Video Display Modes

Video Mode	VESA VBE Mode	Pixel Reso-lution	Color Res.	Mode Type	Display Adapter	Font Size	Char. Disp.	Dot Clock (MHz)	Horiz. Freq. (MHz)	Vert Freq (Hz)	Video Mem. (KB)
00h	--	320x200	16(gray)	Text	CGA	8x8	40x25	25	31.5	70	256
		320x350	16(gray)		EGA	8x14	40x25	25	31.5	70	256
		360x400	16		VGA	9x16	40x25	28	31.5	70	256
01h	--	320x200	16	Text	CGA	8x8	40x25	25	31.5	70	256
		320x350	16		EGA	8x14	40x25	25	31.5	70	256
		360x400	16		VGA	9x16	40x25	28	31.5	70	256
02h	--	640x200	16(gray)	Text	CGA	8x8	80x25	25	31.5	70	256
		640x350	16(gray)		EGA	8x14	80x25	25	31.5	70	256
		720x400	16		VGA	9x16	80x25	28	31.5	70	256
03h	--	640x200	16	Text	CGA	8x8	80x25	25	31.5	70	256
		640x350	16		EGA	8x14	80x25	25	31.5	70	256
		720x400	16		VGA	9x16	80x25	28	31.5	70	256
04h	--	320x200	4	Graph	All	8x8	40x25	25	31.5	70	256
05h	--	320x200	4(gray)	Graph	CGA	8x8	40x25	25	31.5	70	256
		320X200	4(gray)		EGA	8x8	40x25	25	31.5	70	256
		320X200	4		VGA	8x8	40x25	25	31.5	70	256
06h	--	640x200	2	Graph	All	8x8	80x25	25	31.5	70	256
07h	--	720x350	Mono	Text	MDA	9x14	80x25	28	31.5	70	256
		720x350	Mono		EGA	9x14	80x25	28	31.5	70	256
		720x400	Mono		VGA	9x16	80x25	28	31.5	70	256
08h-0Ch	--	Reserved			-		-				
0Dh	--	320x200	16	Graph	E/VGA	8x8	40x25	25	31.5	70	256
0Eh	--	640x200	16	Graph	E/VGA	8x8	80x25	25	31.5	70	256
0Fh	--	640x350	Mono	Graph	E/VGA	8x14	80x25	25	31.5	70	256
10h	--	640x350	16	Graph	E/VGA	8x14	80x25	25	31.5	70	256
11h	--	640x480	2	Graph	VGA	8x16	80x30	25	31.5	60	256
12h	--	640x480	16	Graph	VGA	8x16	80x30	25	31.5	60	256
13h	--	320x200	256	Graph	VGA	8x8	40x25	25	31.5	70	256

Table 2: Extended Low Resolution Video Modes

Video Mode	VESA VBE Mode	Pixel Reso-lution	Color	Mode Type	Mem. Org.	Font Size	Char. Disp.	Dot Clock (MHz)	Horiz. Freq. (MHz)	Vert Freq (Hz)	Video Mem. (KB)
14h	--	320x200	256	Graph(L)	Pack Pix	8x16	40x12	12.587	31.5	70	256
15h	--	320x200	64K	Graph(L)	Pack Pix	8x16	40x12	12.587	31.5	70	256
16h	--	320x200	16M	Graph(L)	Pack Pix	8x16	40x12	12.587	31.5	70	256
17h	--	320x240	256	Graph(L)	Pack Pix	8x16	40x15	12.587	31.5	60	256
18h	--	320x240	64K	Graph(L)	Pack Pix	8x16	40x15	12.587	31.5	60	256
19h	--	320x240	16M	Graph(L)	Pack Pix	8x16	40x15	12.587	31.5	60	256
1Ah	--	400x300	256	Graph(L)	Pack Pix	8x16	50x18	20	37.5	60	256
1Bh	--	400x300	64K	Graph(L)	Pack Pix	8x16	50x18	20	37.5	60	256
1Ch	--	400x300	16M	Graph(L)	Pack Pix	8x16	50x18	20	37.5	60	352
1Dh	--	512x384	256	Graph(L)	Pack Pix	8x16	64x24	32.5	48.4	60	256
1Eh	--	512x384	64K	Graph(L)	Pack Pix	8x16	64x24	32.5	48.4	60	384
1Fh	--	512x384	16M	Graph(L)	Pack Pix	8x16	64x24	32.5	48.4	60	576
31h	100h	640x400	256	Graph(L)	Pack Pix	8x16	80x25	25.175	31.5	70	256
62h	--	640x400	64K	Graph(L)	Pack Pix	8x16	80x25	25.175	31.5	70	500
63h	--	640x400	16M	Graph(L)	Pack Pix	8x16	80x25	25.175	31.5	70	750

Notes: I = Interlaced;   L = Linear

Table 3: Extended Video Modes

Video Mode	VESA VBE Mode	Pixel Resolution	Color	Mode Type	Mem. Org	Font Size	Char. Disp.	Dot Clock (MHz)	Horiz. Freq. (MHz)	Vert Freq (Hz)	Video Mem. (KB)
20h	120h	640x480	16	Graph(L)	Pack Pix	8x16	80x30	25.175	31.5	60	256
								31.5	37.5	75	256
								36	43.3	85	256
22h	122h	800x600	16	Graph(L)	Pack Pix	8x16	100x3	36	35.1	56	256
								40	37.9	60	256
								49.5	46.9	75	256
								56.25	53.7	85	256
24h	124h	1024x768	16	Graph(L)	Pack Pix	8x16	128x4	44.9	35.5	43(I)	384
								65	48.4	60	384
								78.75	60	75	384
								94.5	68.7	85	384
28h	128h	1280x1024	16	Graph(L)	Pack Pix	8x16	160x6	78.75	47	43(I)	640
								108	64	60	640
								135	79.98	75	640
2Ah*	--	1600x1200	16	Graph(L)	Pack Pix	8x16	200x7	135	79.98	75	938
30h	101h	640x480	256	Graph(L)	Pack Pix	8x16	80x30	25.175	31.5	60	300
								31.5	37.5	75	300
								36	43.3	85	300
31h	100h	640x400	256	Graph(L)	Pack Pix	8x16	80x25	25.175	31.5	70	256
32h	103h	800x600	256	Graph(L)	Pack Pix	8x16	100x3	36	35.1	56	469
								40	37.9	60	469
								49.5	46.9	75	469
								56.25	53.7	85	469
34h	105h	1024x768	256	Graph(L)	Pack Pix	8x16	128x4	44.9	35.5	43(I)	768
								65	48.4	60	768
								78.75	60	75	768
								94.5	68.7	85	768
38h	107h	1280x1024	256	Graph(L)	Pack Pix	8x16	160x6	78.75	47	43(I)	1280
								108	64	60	1280
								135	79.98	75	1280
3Ah*	--	1600x1200	256	Graph(L)	Pack Pix	8x16	200x7	162	75	60	1875
40h	110h	640x480	32K	Graph(L)	Pack Pix	8x16	80x30	25.175	31.5	60	600
								31.5	37.5	75	600
								36	43.3	85	600

Notes: I = Interlaced;   L = Linear   * =Modes 2A,3Ah is for flat panel only

Table 3: Extended Video Modes (continued)

Video Mode	VESA VBE Mode	Pixel Reso- lution	Color Res.	Mode Type	Mem. Org	Font Size	Char. Disp.	Dot Clock (MHz)	Horiz. Freq. (MHz)	Vert Freq (Hz)	Video Mem. (KB)
41h	111h	640x480	64K	Graph(L)	Pack Pix	8x16	80x30	25.175	31.5	60	600
								31.5	37.5	75	600
								36	43.3	85	600
42h	113h	800x600	32K	Graph(L)	Pack Pix	8x16	100x37	36	35.1	56	938
								40	37.9	60	938
								49.5	46.9	75	938
								56.25	53.7	85	938
43h	114h	800x600	64K	Graph(L)	Pack Pix	8x16	100x37	36	35.1	56	938
								40	37.9	60	938
								49.5	46.9	75	938
								56.25	53.7	85	938
44h	116h	1024x768	32K	Graph(L)	Pack Pix	8x16	128x48	44.9	35.5	43(I)	1536
								65	48.4	60	1536
								78.75	60	75	1536
								94.5	68.7	85	1536
45h	117h	1024x768	64K	Graph(L)	Pack Pix	8x16	128x48	44.9	35.5	43(I)	1536
								65	48.4	60	1536
								78.75	60	75	1536
								94.5	68.7	85	1536
46h	--	Generic	32K	Graph(L)	Pack	8x16	--	--	--	--	--
47h	--	Generic	64K	Graph(L)	Pack	8x16	--	--	--	--	--
50h	112h	640x480	16M	Graph(L)	Pack Pix	8x16	80x30	25.175	31.5	60	900
								31.5	37.5	75	900
								36	43.3	85	900
52h	115h	800x600	16M	Graph(L)	Pack Pix	8x16	100x37	36	35.5	56	1407
								40	37.9	60	1407
								49.5	46.9	75	1407
								56.25	53.7	85	1407
6Ah	102h	800x600	16	Graph(L)	Planar	8x16	100x37	36	35.1	56	256
								40	37.8	60	256
								49.5	46.9	75	256
								56.25	53.7	85	256

Notes: I = Interlaced   L = Linear

Table 3: Extended Video Modes   (continued)

Video Mode	VESA VBE Mode	Pixel Reso- lution	Color Res.	Mode Type	Mem. Org	Font Size	Char. Disp.	Dot Clock (MHz)	Horiz. Freq. (MHz)	Vert Freq (Hz)	Video Mem. (KB)
64h	104h	1024x768	16	Graph	Planar	8x16	128x48	44.9	35.5	43(I)	384
								65	48.4	60	384
								78.75	60	75	384
								94.5	68.7	85	384
68h	106h	1280x1024	16	Graph	Planar	8x16	160x64	78.75	47	43(I)	640
								108	64	60	640
								135	79.98	75	640
70h	101h	640x480	256	Graph	Pack Pix	8x16	80x30	25.175	31.5	60	300
								31.5	37.5	75	300
								36	43.3	85	300
71h	100h	640x400	256	Graph	Pack Pix	8x16	80x25	25.175	31.5	70	256
72h	103h	800x600	256	Graph	Pack Pix	8x16	100x37	36	35.1	56	469
								40	37.9	60	469
								49.5	46.9	75	469
								56.25	53.7	85	469
74h	105h	1024x768	256	Graph	Pack Pix	8x16	128x48	44.9	35.5	43(I)	768
								65	48.4	60	768
								78.75	60	75	768
								94.5	68.7	85	768
78h	107h	1280x1024	256	Graph	Pack Pix	8x16	160x64	78.75	47	43(I)	1280
								108	64	60	1280
								135	79.98	75	1280

Notes: I = Interlaced   L = Linear

Appendix A
Watchdog Timer

Watchdog Timer Configuration

The watchdog timer would reset the system automatically if the system program didn't refresh the watchdog timer during the watchdog time out interval. It is defined at I/O port **0443H** and **043H** to enable/disable the watchdog time out function.

Regarding to the watchdog function, user must have a program to set the watchdog time out value, and refresh the watchdog timer cycle. If the system program goes into a dead loop or goes into an abnormal cycle, the watchdog timer cannot be refreshed immediately. Meanwhile, the system will be reset by watchdog timer automatically. The watchdog timer will be refreshed by "disable watchdog output" then "enable watchdog output".

The following flowchart shows the normal structure of system program.

Watchdog timer examples:

(1) **Setup watchdog timer time out value**:

```
        mov al,0ah
        mov dx,70h
        out dx,al
        jmp short $+2
        mov dx,71h
        in al,dx
        jmp short $+2
        and al,0f0h
        add ax,TimeValue          ; TimeValue= 00h..0fh, reference as following
                                    watchdog time out table

        out dx,al
        jmp short $+2
        mov al, 0bh
        mov dx, 70h
        out dx, al
        jmp short $+2
        mov dx, 71h
        in al, dx
        jmp short $+2
```

```
    or al, 08h
    out dx, al
    jmp short $+2
```

Watchdog Time Out Table:

Time Value	Time Out	Time Value	Time Out
0	None	8	0.5 sec.
1	0.5 sec.	9	1 sec.
2	1 sec.	A	2 sec.
3	0.015sec.	B	4 sec.
4	0.03 sec.	C	8 sec.
5	0.06 sec.	D	16 sec.
6	0.125 ec.	E	32 sec.
7	0.25 sec.	F	64 sec.

(2) **Enable watchdog output**:

```
    mov dx, 443h                    ; SET WATCH DOG ENABLE
    in al, dx
    jmp short $+2
```
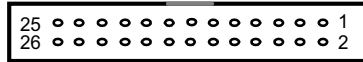
(3) **Disable watchdog output:**

```
    mov dx,043h                     ; SET WATCH DOG DISABLE
    in al,dx
    jmp short $+2
```

Appendix B
Connectors' Pin Assignment

• Parallel/Printer connector (PRN)

```
25 o o o o o o o o o o o o o 1
26 o o o o o o o o o o o o o 2
```

Pin no.	Signal
1	Strobe
2	Data 0
3	Data 1
4	Data 2
5	Data 3
6	Data 4
7	Data 5
8	Data 6
9	Data 7
10	-Acknowledge
11	Busy
12	Paper Empty
13	+ Select
14	- Auto Feed
15	- Error
16	- INIT Printer
17	- Select Input
18-25	Ground

• HDD Connector (IDE)

```
39 o o o o o o o o o o o o o o o o o o o o  1
40 o o o o o o o o o o o o o o o o o o o o  2
```
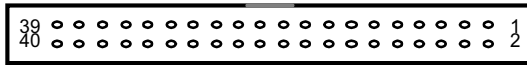
Pin no.	Signal	Pin no.	Signal
1	- RST	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	IORDY	28	BALE
29	N.C.	30	GND
31	IRQ	32	-IO CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND

• FDD Connector (FDC)

FDC

26 [   ] 1

Drawing of FDD 26 pin FPC header

Pin no.	Signal
1,3,5	+5V
7,11,13,19,21	Unused
2	Index
4	Driver Select
6	Disk Change
8	High Density
9	RPM
10	Motor Select
12	Direction
14	Step Pulse
16	Write Data
18	Write Enable
20	Track 0
22	Write Protect
24	Read Data
26	Select Head
15,17,23,25	Ground

• RS-232 Connector (COM1, 2)
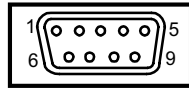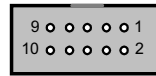
COM1   COM2

RS-232 Connector (COM1)

Pin no.	Signals
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

RS-232 Connector (COM2)

Pin no.	Signals
1	DCD
2	DSR
3	RX
4	RTS
5	TX
6	CTS
7	DTR
8	RI
9	GND
10	N.C.

CRT Display Connector(VGA)
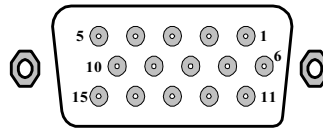
Pin no.	Signal
1	RED
2	GREEN
3	BLUE
4	N/C
5	GND
6	GND
7	GND
8	GND
9	N/C
10	GND
11	N/C
12	N/C
13	H-SYNC
14	V-SYNC
15	N/C

Flat Panel Display Connector mini pin header (LCD)

```
43 o o o o o o o o o o o o o o o o o o o o o 1
44 o o o o o o o o o o o o o o o o o o o o o 2
```
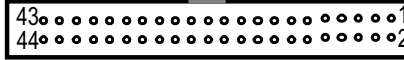
Pin no.	Signal	Pin no.	Signal
1	+12V	2	+12V
3	GND	4	GND
5	VDD	6	VDD
7	ENVEE	8	GND
9	P0	10	P1
11	P2	12	P3
13	P4	14	P5
15	P6	16	P7
17	P8	18	P9
19	P10	20	P11
21	P12	22	P13
23	P14	24	P15
25	P16	26	P17
27	P18	28	P19
29	P20	30	P21
31	P22	32	P23
33	GND	34	GND
35	CLOCK	36	FLM
37	M	38	LP
39	GND	40	EN_BKL
41	GND	42	ENVDD
43	VDD	44	VDD

Keyboard / Mouse connector (Mini_Din & pin header)
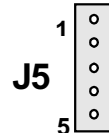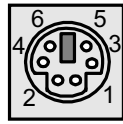
Pin no.	Signal (Mini Din)	Signal (pin header)
1	KB data	KB clock
2	MS data	KB data
3	GND	NC
4	VCC	GND
5	KB clock	VCC
6	MS clock	

Ethernet connector (J2)

LAN
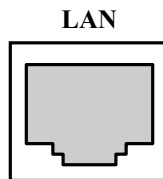
Drawing of Ethernet connector RJ-45

Pin no.	signals
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	N.C.

PC/104 Connector

PC104
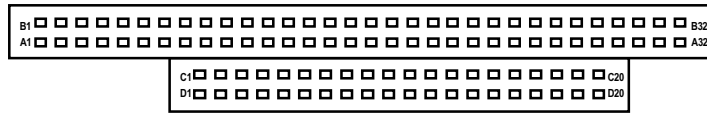
Drawing of PC104 pin header

Pin no.	A	B	C	D
1	IOCHCHK*	GND	SBHE	MEMCS16*
2	SD7	RESETDRV	LA23	IOSC16*
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	OWS*	LA17*	DACK0*
9	SD0	+12V	MEMR*	DRQ0*
10	IOCHRDY*	GND	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	GND
19	SA12	REFRESH*	NC	GND
20	SA11	SYSCLK	--	--
21	SA10	IRQ7	--	--
22	SA9	IRQ6	--	--
23	SA8	IRQ5	--	--
24	SA7	IRQ4	--	--
25	SA6	IRQ3	--	--
26	SA5	DACK2*	--	--
27	SA4	TC	--	--
28	SA3	BALE	--	--
29	SA2	+5V	--	--
30	SA1	OSC	--	--
31	SA0	GND	--	--
32	GND	GND	--	--

ISA BUS PIN ASSIGNMENT (For GT-675 only)

D18		D1	B31	SOLDER SIDE	B1
C18		C1	A31	COMPONENT SIDE	A1
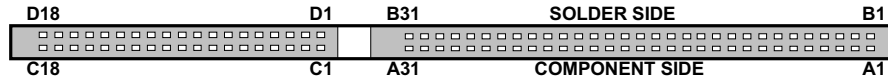
Pin no.	A	B	C	D
1	IOCHCHK*	GND	SBHE	MEMCS16*
2	SD7	RESETDRV	LA23	IOCS16*
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	OWS*	LA17*	DACK0*
9	SD0	+12V	MEMR*	DRQ0*
10	IOCHRDY*	GND	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	GND
19	SA12	REFRESH*	--	--
20	SA11	SYSCLK	--	--
21	SA10	IRQ7	--	--
22	SA9	IRQ6	--	--
23	SA8	IRQ5	--	--
24	SA7	IRQ4	--	--
25	SA6	IRQ3	--	--
26	SA5	DACK2*	--	--
27	SA4	TC	--	--
28	SA3	BALE	--	--
29	SA2	+5V	--	--
30	SA1	OSC	--	--
31	SA0	GND	--	--

PISA BUS PIN ASSIGNMENT (For GT-675P only)
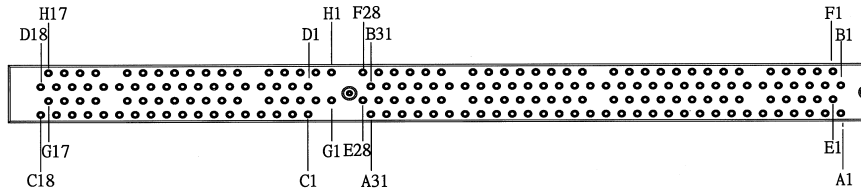
Pin no.	A	B	E	F	Pin no.	C	D	G	H
1	IOCHK*	GND	I2CLK	I2DATA	32	KEY	KEY	SDONE	SERR*
2	SD7	RSTDRV	GND	GND	33	KEY	KEY	SBO*	AD15
3	SD6	+5V	INTB*	INTA*	34	SBHE	MCS16*	C/BE1*	AD14
4	SD5	IRQ9	INTD*	INTC*	35	LA23	IOCS16*	PAR	AD12
5	SD4	-5V	+5V	+5V	36	LA22	IRQ10	GND	GND
6	SD3	DRQ2	KEY	KEY	37	LA21	IRQ11	KEY	KEY
7	SD2	-12V	+5V	+5V(I/O)	38	LA20	IRQ12	GND	M66EN
8	SD1	OWS*	PCIRST*	PCLK2	39	LA19	IRQ15	AD13	AD10
9	SD0	+12V	GNT0*	GND	40	LA18	IRQ14	AD11	AD8
10	IORDY*	GND	REQ0*	GNT1*	41	LA17*	DACK0*	AD9	AD7
11	AEN	SMEMW*	GND	GND	42	MEMR*	DRQ0*	C/BE0*	AD5
12	SA19	SMEMR*	PCLK1	REQ1*	43	MEMW*	DACK5*	AD6	AD3
13	SA18	IOW*	GND	AD31	44	SD8	DRQ5	AD4	AD1
14	SA17	IOR*	AD30	AD29	45	SD9	DACK6*	AD2	AD0
15	SA16	DACK3*	REQ2*	PCLK3	46	SD10	DRQ6	KEY	KEY
16	SA15	DRQ3	KEY	KEY	47	SD11	DACK7*	+5V	+5V(I/O)
17	SA14	DACK1*	GNT2*	PCLK4	48	SD12	DRQ7	+5V	+5V
18	SA13	DRQ1	AD28	AD27	49	SD13	+5V	GND	GND
19	SA12	REFRESH*	AD26	AD25	50	SD14	MASTER*	GND	GND
20	SA11	SYSCLK	AD24	C/BE3*	51	SD15	GND		
21	SA10	IRQ7	AD22	AD23	52				
22	SA9	IRQ6	AD20	AD21	53				
23	SA8	IRQ5	AD18	AD19	54				
24	SA7	IRQ4	NC	REQ3*	55				
25	SA6	IRQ3	KEY	KEY	56				
26	SA5	DACK2*	NC	GNT3*	57				
27	SA4	TC	AD16	AD17	58				
28	SA3	BALE	FRAME*	IRDY*	59				
29	SA2	+5V	C/BE2*	DEVSEL*	60				
30	SA1	OSC	TRDY*	PLOCK*	61				
31	SA0	GND	STOP*	PERR*	62				

Appendix C
Installing DiskOnChip of M-systems

. Installing the DiskOnChip 2000 :
   When installing or removing the DiskOnChip be sure to first touch a grounded surface to discharge any static electricity from your body.
   Use the following procedure to install the DiskOnChip:
1.   Align pin 1 on the DiskOnChip with the pin1 of socket.
2.   Push the DiskOnChip into the socket carefully until it is fully seated.
3.   Check to make sure the DiskOnChip is installed securely, and there are no bent pins.
     Caution: The DiskOnChip may be permanent damaged if installed incorrectly.
4.   To install the DiskOnChip as drive C on a system without a hard disk, set the CMOS setup of drive C to NOT INSTALLED (indicating that no physical magnetic disk is installed), and reboot the computer. The DiskOnChip 2000 will installed as drive C. The DiskOnChip needs to formatted with the system files in order for it to be a bootable drive.

. Configuring the DiskOnChip 2000 as the boot device:
   In order to configure the DiskOnChip as the boot device, the operating system files need to be copied into it. Copying the operating system files into DiskOnChip should be done like in any other hard disk. The following is an example of a typical initialization process:
1.   Set the DiskOnChip as a regular drive in your system (not a boot drive).
2.   Install a bootable floppy diskette in drive A, and boot the system from drive A.
3.   At the **DOS** prompt, type **SYS C:** to transfer the **DOS** system files to the DiskOnChip. (assuming the DiskOnChip is installed as drive C)
4.   Copy any files needed into DiskOnChip.
5.   Remove floppy diskette and reboot the system. The system will boot from the DiskOnChip and will allow you to run and access any files that have been copied into the DiskOnChip.

. Configuring the DiskOnChip 2000 as the first drive:
   The DiskOnChip can be configured as the last drive (default) or as the first drive in the system. When configured as the last drive, the DiskOnChip is installed as drive D if there is another hard drive installed, and as drive C if no other hard drive is installed. When configured as the first drive, the DiskOnChip is always installed as drive C. To configure the DiskOnChip as first drive, proceed as follows:
1.   Boot the system and make sure the DiskOnChip is installed correctly as drive D.
2.   At the **DOS** prompt type   **DUPDATE   D: /FIRST   / S:DOC2000.EXB**
3.   After rebooting the system, the DiskOnChip will appear as drive C:

Appendix D
Updating BIOS

You should find one diskette for updated BIOS program in the package. The updating procedures are as the following:

1. Insert the diskette(There is a file " AWDFLASH.EXE') in drive A or B.
2. Type AWDFLASH under the prompt A or B.
3. The screen will ask you to enter the file name for programming. Please enter the 'filename' for the updating BIOS that is from your agent. Meanwhile, please type 'N' to answer the question 'Do you want to save BIOS (y/n)?' under the bottom of the screen.
4. After that, please type 'Y' to answer the question 'Are you sure to program (y/n)?' on the bottom line of the current screen.
5. Turn off the power after the system updates the BIOS.
6. Turn on the power again.

Appendix E

System Assignments

I/O Port Address Map

Address (HEX)	Device
000-01F	DMA controller 1
020-021	Interrupt controller 1
040-05F	Timer 1 & 2
043	Disable Watch-dog timer operation (read)
060-06F	Keyboard controller
070-07F	Real Time Clock, Non_Maskable interrupt
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller 2
0F0	Clear math. Coprocessor busy signal
0F1	Reset math. Coprocessor
0F8-0FF	Math. Coprocessor
1F0-1F8	Fixed disk controller
200-207	Game port
278-27F	Parallel port #2 (LPT3)
2E8-2EF	Serial port #4 (COM 4)
2F8-2FF	Serial port #2 (COM 2)
300-31F	Prototype card / Streaming Tape Adapter
378-37F	Parallel port #1 (LPT2)
380-38F	SDLC, Bisynchronous 2
3A0-3AF	SDLC, Bisynchronous 1
3B0-3BF	Monochrome Display , Parallel port 0 (LPT1)
3C0-3CF	EGA card
3D0-3DF	CGA card
3E8-3EF	Serial port #3 (COM3)
3F0-3F7	Floppy Disk controller
3F8-3FF	Serial port #1 (COM1)
443	Enable Watch-dog timer operation (read)
CF8-CFF	Chipset Address

DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8 bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Interrupt Assignments

Interrupt #	Interrupt Source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	Serial port 2
IRQ 4	Serial port 1
IRQ 5	Parallel port 2
IRQ 6	Floppy disk controller
IRQ 7	Parallel port 1
IRQ 8	Real-time clock
IRQ 9	Cascade to controller 1 (IRQ 2)
IRQ 10	Available
IRQ 11	Available
IRQ 12	PS/2 Mouse
IRQ 13	Math coprocessor
IRQ 14	Hard disk controller (Primary)
IRQ 15	Hard disk controller (Secondary)

Memory Address Map

Address (HEX)	Device
0000000-009FFFF	System memory
00A0000-00BFFFF	Display memory
00C0000-00C7FFF	VGA BIOS ROM
00C8000-00EFFFF	I/O device BIOS ROM or RAM buffer
00F0000-00FFFFF	System BIOS ROM
0100000-BFFFFFF	System extension memory

System Timer Map

Timer #	Assignment
1	System timer interrupt
2	DRAM Refresh Request
3	Speaker tone generator

Appendix F
Ethernet

On board Ethernet interface of the GT-675(P) all-in-one board supports all major network operating systems. Please follow the step to configure the network.

Connect the Network Cable

1. Connect a Twisted Pair Ethernet (TPE) network cable to RJ-45.
    - For 100 BASE-TX, your network cable must be Category 5, twisted pair wiring. If you plan to run at 100Mbps, it must be connected to a 100BASE-TX hub or switch (not a 100 BASE-T4 hub).
    - For 10BASE-T, use Category 3, 4, or 5 twisted pair wiring. If you want to use a residential environment, you must use a Category 5 cable.
2. To configure networking, continue with the procedures specific to your operating system outlined later in this chapter.

Making a Setup Floppy Disk

If you need to use a floppy disk to install the networking drivers, use MAKEMS.BAT (for Microsoft operating systems) or MAKENW.BAT (for Netware), located in the \MAKEDISK directory on the CD. The format for the command is:

> D:\MAKEDISK\MAKEMS.BAT   D: A:

In the example above, D: is your CD-ROM drive and A: is your floppy drive.

Configure the Networking and Install the Drives

Novell NetWare 5.0 Only

Use the NetWare* Install program to install driver in Novell NetWare 5.0. For Novell NetWare 4.1x, see the section *Novell NetWare 4.X Only*. For 3.11 and 3.12, see the readme files. For DOS ODI, see the section *DOS and Windows 3.1 Setup for Novell NetWare DOS ODI Clients*. The following procedure is a condensed description of installation process.

1   From the NetWare console, type **LOAD NWCONFIG** and press Enter.
2   From the Configuration Options screen, choose "Driver options" and press Enter.
3   Choose "Configure network drivers" and press Enter. If any drivers are already loaded, a list of them appears.
4   Choose "Select an additional driver" and press Enter. A list of drivers appears.
5   Insert the floppy disk or CD and press the Insert key to install an unlisted driver.

6   Specify the correct path to your media if necessary by pressing F3. Press Enter to search the floppy or CD-ROM driver.

7   Highlight the Intel PRO PCI Adapter and press Enter to select it.

8   The next screens ask for frame and protocol types. Use the arrow keys to select specific items or choose the defaults. Select "Save parameters and load driver" to continue.

9   To complete the driver installation process, go back to the Installation Options screen by pressing the Esc key until you see it.

10   Choose Exit to return to the console prompt.
       Note: If the network can not transmit or receive following the installation, you may need to modify the frame type in the AUTOEXEC.NCF file.

. Novell NetWare 4.1x Only

Use the NetWare install program to install driver in Novell NetWare 4.1x. For Novell NetWare 3.11 and 3.12, see the readme files. For DOS ODI, see the section *DOS and Windows 3.1 Setup for Novell NetWare DOS ODI Clients*. The following procedure is a condensed description of installation process.

Note: Prior to installing, either load DOS or NetWare drivers for your computer's CD-ROM drive or create a floppy disk from the CD on a different computer.

1. From the NetWare console, type **LOAD INSTALL** and press Enter.
2. From the Install Options screen, choose "Driver options" and press Enter.
3. Choose "Configure network drivers" and press Enter. If any drivers are already loaded, a list of them appears.
4. Choose "Select an additional driver" and press Enter. A list of drivers appears.
5. Insert the floppy disk or CD and choose "Install an unlisted driver" by clicking Insert.
6. Specify the correct path to your media if necessary by pressing F3. Press Enter to search the floppy or CD-ROM driver.
7. The driver name is displayed: Intel PRO/100+ Adapter and press Enter to select it.
8. The next screens ask for frame and protocol types. Use the arrow keys to select specific items or choose the defaults. Select "Save parameters and load driver" to continue.
9. To complete the driver installation process, go back to the Installation Options screen by pressing the Esc key until you see it.
10. Choose Exit to return to the console prompt.
     Note: If the network can not transmit or receive following the installation, you may need to modify the frame type in the AUTOEXEC.NCF file.

Windows 95 / 98

Windows 95 / 98 Automatic Configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS automatically sets the adapter IRQ level and I/O address each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when Windows 95 / 98 starts.

If your computer displays an error while booting, it may require additional step to configure. See the section *PCI Installation Tips* later in this chapter for more.

Install Network Drivers from Disk

Have your Windows 95 / 98 installation CD or diskettes available, since you'll be prompted for them when you install the new adapter.

1. After connect the cable, start Windows 95 / 98. You will see the New Hardware Found dialog box. If this box does not appear and Windows starts normally, you may need to manually add the adapter. See the MS.TXT readme file in the \MS directory for more information.
2. Click "Driver from disk provided by hardware manufacturer", and then click OK. You'll see the Install From Disk dialog box.
3. Insert the Driver adapter disk.
4. Specify D:\ (or the appropriate drive letter for the CD-ROM drive) or A:\ (for floppy) as the path, then click OK.
5. Follow prompts for any Windows installation disks and restart when prompted.

Windows NT Automatic Configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS automatically sets the adapter IRQ level and I/O address each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when Windows 95 / 98 starts.

If your computer displays an error while booting, it may require additional step to configure. See the section *PCI Installation Tips* later in this chapter for more.

Windows NT Version 4.0 Only

After connecting the cables and starting Windows NT, you need to install the correct drivers.
1.   Double-click the network icon in the Control Panel.
2.   Click the Adapters tab.
3.   Click ADD. You'll see a list of adapters.
4.   Don't select an adapter from list. Instead, insert the Driver Disk or CD into the appropriate drive and click Have Disk.
5.   Specify the appropriate drive in the dialog box and click OK. Then follow the prompts to complete installation. When the adapter is added you'll see a new adapter listed in the Network adapters list.
6.   Click Close to finish.
7.   Restart Windows NT when prompted.

Windows NT Version 3.51 Only

After connecting the cables and starting Windows NT, you need to install the correct drivers.
1.   Double-click the network icon in the Control Panel.
2.   Click ADD Adapter.
3.   When the list of adapters appears, scroll to the end of the list and select <Other> requires disk from manufacturer and then clicks Continue.
4.   Insert the Driver Disk or CD into the appropriate drive, specify that drive, and click OK.
5.   Select the INTEL PRO Adapter and click OK. Drivers and utilities are installed.
6.   The TCP/IP Configuration dialog box appears. Enter the appropriate information and click OK. Remove the installation disk or CD.
7.   When prompted, restart Windows NT.

DOS and Windows 3.1 Setup for Novell NetWare DOS ODI Clients

NOTE: Windows 95/98 users should refer to the previous sections on Windows 95/98. NetWare Client 32 users should refer to the NetWare readme files in the \NETWARE directory.

DOS and Windows 3.1 Automatic Configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS sets the adapter IRQ level and I/O memory address automatically each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when the DOS prompt appears. You can now continue with the procedure below.

If your computer displays an error while booting, it may require additional steps to configure a PCI adapter. See PCI Installation Tip*s* later in this guide for more information.

Run setup to Install Network Drivers

Setup can automatically install NetWare DOS ODI client drivers for you or display a readme file with installation instructions for other NOS drivers.

1. If your computer already has network drivers installed, restart the computer without loading them. If the drivers are loaded from the AUTOEXEC.BAT or CONFIG.SYS file, type REM in front of each line that loads a network driver. Or, with DOS 6.x or later press F5 as DOS starts, to bypass the drivers.
2. Insert the PRO/100+ adapter disk in a drive, switch to that drive and at the DOS prompt, type SETUP and press Enter.
3. Select the adapter from the menu.
4. Select Automatic Setup from the Main menu. Then follow the instructions on the screen. If you want to test the adapter with a responder on the network, see the Responder Testing on the Network (Optional) section later in this guide. Setup displays the adapter's configuration and then runs a series of diagnostic tests that make sure the adapter and network are functioning properly. If Setup finds a problem, it displays the results and some possible solutions.
5. When Setup finishes the tests, you'll see the Install Network Drivers screen.
6. Select the driver you want to install. Setup can install a NetWare client driver for you. If you want to install other drivers, Setup displays a readme file with installation instructions.

PCI Installation Tips

PCI computers are designed to automatically configure add-in cards each time the computer starts. Your PCI computer sets the I/O address and IRQ level for your network adapter when the computer starts. These values cannot be changed by Intel adapter software. If you experience a problem when the computer starts, you may need to follow additional configuration steps.

On some computers, manual configuration is possible through the computer's PCI BIOS setup utility. Refer to your computer's documentation. You may need to verify or change some BIOS settings.

Some common PCI solutions are listed here:

- Busmaster-enabled slots. On some computer, not all slots are busmaster enabled by default. Check your BIOS PCI bus setting. It will be set to either Busmaster or Non-busmastered. Choose Busmaster.
- Reserve interrupts (IRQs) and/or memory addresses for ISA adapters. This prevents PCI cards from trying to use the same settings ISA cards are using. Check your PCI BIOS setup program. There may be IRQ options such as Enable for ISA, Reserve for ISA, or Disable for PCI. This option is sometimes in the Plug and Play area of the BIOS setup.
- Enable the PCI slot. In some PCI computers, you must use the PCI BIOS setup program to enable the PCI slot. This is especially common in PCI computers with the PhoenixBIOS*
- Update your PCI BIOS. An updated PCI system BIOS can correct some PCI configuration problems. Call your computer manufacturer to see if an updated BIOS version is available for your computer.
- Configure the slot for level-triggered interrupts. The slot the adapter is using must be configured for level-triggered interrupts rather than edge-triggered interrupts. Check your PCI BIOS Setup program.

Appendix G
Mechanical Drawing