TM-A1631LM
All-In-One Mainboard

Version: 1.1

Warning: Never run the processor without the heatsink properly and firmly installed. Permanent Damage Will result!

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Printed in Taiwan

Overview

The TM-A1631LM is a PPGA-Celeron & CuMine FC-PGA based All-In-One mainboard that utilizes Ali 1631/TNT2 chipset, a high level of integrated function. Aside from supporting new architectures such as high speed AGP x4 graphic port, ATA/66 Bus Master IDE, this mainboard integrated TNT2 3D 128-bit AGP Graphics with 32MB frame buffer embedded and resolution up to 1920x1600, 10BaseT/100BaseTX LAN, PCI 3D Sound with 4 channels speaker out and a V.90 Fax/Modem Module.

In addition to above features, this mainboard implements most advanced technology such as Synchronous switching regulator, CPU thermal protection, CPU fan monitoring, System voltage monitoring, Over current protection, Modem Wake Up, Keyboard Power On, PS/2 Mouse Power On and 2 USB ports.

CONTENTS

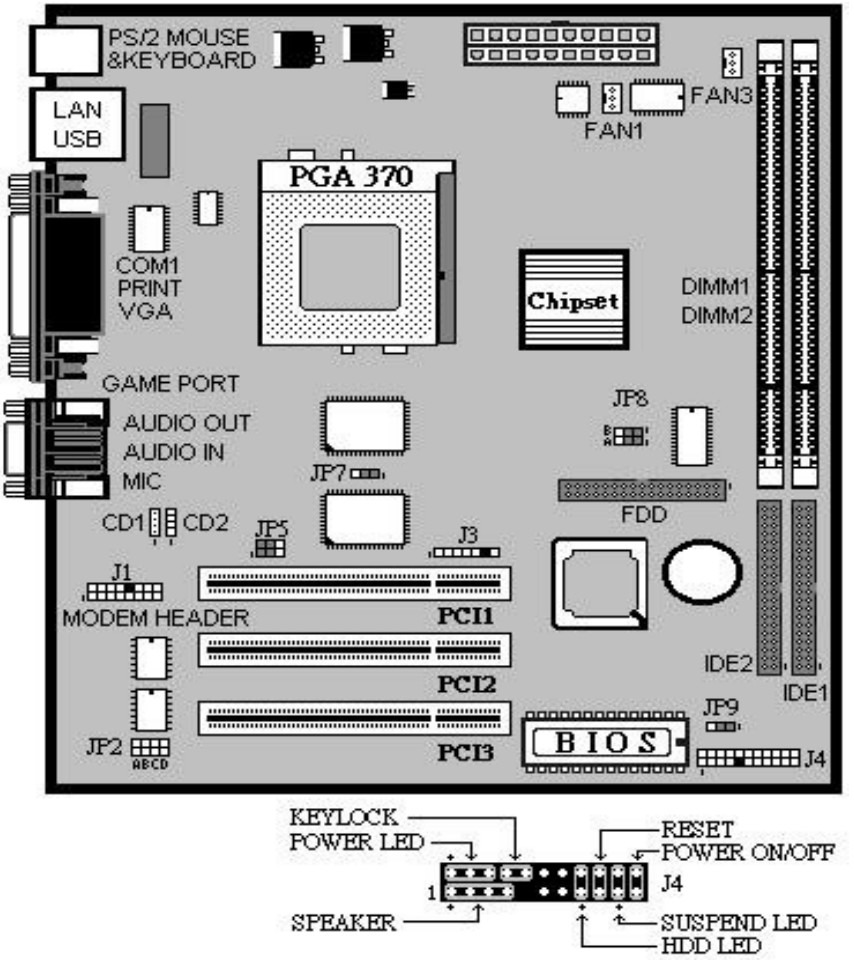
Introduction Specifications

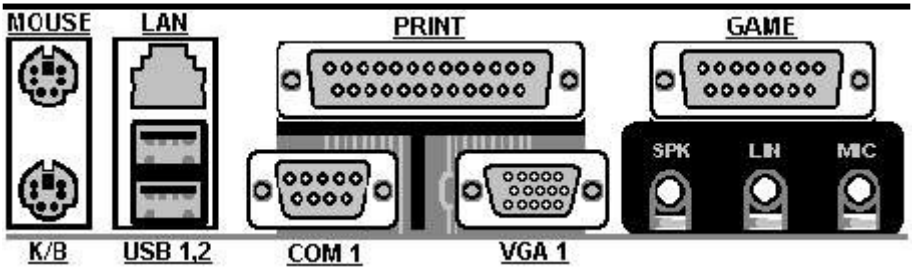
System Chipset	Ali 1631 + 1543C chipset integrated TNT2 VGA
CPU	Intel PPGA-Celeron processors, support 266/300/ 333/366/400/433/466/500/533 (Ex. Clk 66 MHz); CuMine FC-PGA 450/500/550/ 600/ 650/ 700/750/ 800 (Ex. Clk 100 MHz); CuMine FC-PGA 533/600/667/733/800/866 (Ex.Clk 133 MHz) CPU.
Memory	Expandable to 512MB (2 banks) with two 168-pin DIMM socket support 3.3 V SDRAM 66/100 &133.
IDE	Primary and Secondary PCI IDE channels. Support PIO, Multiword DMA, Bus Mastering and Ultra DMA 33/66 modes.
Graphic On Board	Ali TnT2 AGP 2D/3D AGP Graphics Shared SDRAM memory allows a 32MB max. frame butter. Supports high resolutions up to 1920x1200, up to 2048x2048 Texture size and Virtual screen up to 4096x4096.
Sound On Board	3D PCI Sound Pro, meets PC98 Spec. 16-bit CODEC for full-duplex playback and record. HRTF professional Audio supports both Direct Sound 3D and Aureal's 3D comptiable interface plus support for 4-channel speakers out. Software Wave-Table Synthesizer and Digital Audio Interface(SDPIF) In/Out with 24-bit, 48 KHz sample rate and measured 120db Audio quality. Built-in 32 ohm earphone buffer and 3D surround sound. Provides MPU-401 Game/MIDI port and legacy Sound Blaster 16 support. Stereo Mixer supports analog mixing from CD-Audio and Line In or digital mixing from voice, FM/Wave-Table and digital CD-Audio. Driver support for MS-DOS, Microsoft Windows 95/98/2000/NT 4.0.
LAN On Board	10 BaseT/100BaseTX Ethernet LAN. Supports IEEE 802.3u 100Base-TX, 10Base-T

	and ANSI x3.263 TP-PMD physical sub-layer.
Fax/Modem On Board	56K Fax/Modem, supports V.90 standard for Internet communication. Supports Auto Fallback and MNP5, V.42bis data compression.
I/O	PC99 Color Connectors, 2 x PS/2 Mouse and Mouse Ports, 2xUSB, 1x VGA port.
	1x Serial Port with 16550-compatible fast UART.
	1x Parallel with ECP and EPP. 1x Infrared port.
Power Management	ATX Power Supply, Suspend, Shutdown, Wake Up On LAN, Wake On Modem, Wake On Alarm, Interrupt Wake Up from Keyboard/Mouse. Keyboard Power On/Off.
Hardware Monitor	Supports CPU Temperature Voltage and Fan Speed monitor.
Expansion slots	3 x PCI 32-bit port.
Dimension	4-layer PCB, size (240mm x 210mm).
Package Content	• Manual & CD Diskette
	• 1x FDD, 1x DMA/33 & 1xDMA/66 Cables
	• Fax/Modem DAA Module
Bundled Software	***Super VB :** Provides anti-virus protection.
	***Super Voice :** For data, FAX and voice communication.
	***Gamut 2000:** Provides professional audio features.
	***Media Ring Talk :** Provides PC to PC, or PC to phone internet communication.
	***Corel WordPerfect Suite 8 :** A office application suite under Windows.
	***3 DEEP :** Provides for adjust color, contrast and brightness of monitor.

Setup Guide

A. Layout





B. Jumper Settings

- **JP8 :**

CPU Frequency Selector : JP8				
Frequency	**66 MHz**	**100 MHz**	**105 MHz**	**133 MHz**
JP8 - A	**2-3**	**1-2**	**2-3**	**1-2**
JP8 - B	**2-3**	**2-3**	**1-2**	**1-2**

- **JP2 : CPU Multiplier Selector :**

Multiplier	JP2-A	JP2-B	JP2-C	JP2-D
X2.0	On	On	On	On
X2.5	Off	On	On	On
X3.0	On	On	Off	On
X3.5	Off	On	Off	On
X4.0	On	On	On	Off
X4.5	Off	On	On	Off
X5.0	On	On	Off	Off
X5.5	Off	On	Off	Off
X6.0	On	Off	On	On
X6.5	Off	Off	On	On
X7.0	On	Off	Off	On
X7.5	Off	Off	Off	On
X8.0	On	Off	On	Off

- JP9 : Clear CMOS

JP9	
Pin 1-2 On	**Normal Operation (Default)**
Pin 2-3 On	**For Clearing CMOS Data**

- **JP5 : Enable or Disable Modem & Audio System**

JP5	
Pin 2-4 On	**Enable Onboard Audio**
Pin 4-6 On	**Disable Onboard Audio**
Pin 1-3 On	**Enable Onboard Modem**
Pin 3-5 On	**Disable Onboard Modem**

Note : If Sound Onboard system is disabled, the Fax/Modem Is also simultaneously disabled, even if Pin1, 3 is shorted

- **JP7: Enable or Disable LAN**

JP7	
Pin 1-2 On	**Enable Onboard LAN**
Pin 2-3 On	**Disable Onboard LAN**

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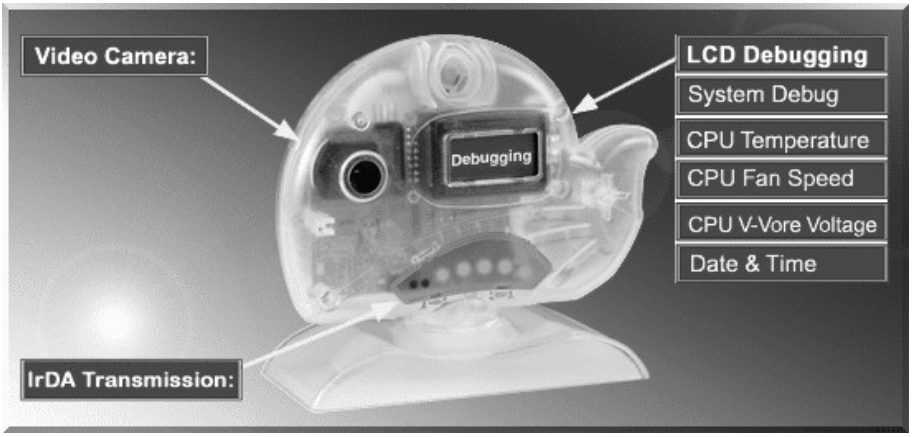
- **J3 : Infrered Port (IrDA)**
  1 – VCC
  2 – NC
  3 – IRRx
  4 – GND
  5 - IRTx

EscoCAM – An Integrated Module



It's so valuable that you don't have to pay thrice to buy three fashionable devices of PC Camera, Debugging and IrDA ware now because we have integrated them into our EscoCAM in the shape of a lovely whale to escort your system. The whale is the king of the sea and the symbol of all-mighty power. With PC camera, Debug, CPU heat monitor and IrDA device built into the EscoCAM, we offers you the unbeatable solution to upgrade the value of your PC system.

1. PC Camera:

As video and audio email is gaining popularity, PC cameras are making inroads into PC systems and it will increasingly become a standard PC peripheral. In view of this strong market demand, we has timely launched its state-of-the-art PC cameras. Besides, our PC Camera is allowed to adjust the Focus of Camera via Keyboard or mouse instead of wheel. It's a patent design in PC Camera. Hope you enjoy this new technology.

2. External Debug :

When initializing system, LCD will check the peripherals of CPU, Chipset, DRAM, BIOS, Keyboard, CMOS, VGA card, Devices, FDD, HDD and Cache…Once peripherals were not been properly installed or defective, the LCD display will show out the detective place. After system successfully booted up, Time & Date, CPU Temperature, CPU V-Core Voltage, CPU Fan Speed will take turn to show out on the LCD display.

Advantages of Debug Device For User:

In comply with fast development of IT and e-Commerce, the time of people to stay together with PC is beyond what we can image. Eventually, the high density use of PC is unavoidable to cause high defect rate. Especially, when warranty is over, user is not in a position to bargain the upraising repair cost. The worse is that users are always overcharged when they have don't have any sense about defect status. However, once PC system is equipped with basic debugging devices, user is able to easily understand how far the hardware problem going; thereby drastically minimize the time and cost from RMA.

3. Monitor CPU Temp. And FAN Working Status:

Audio, video and multi-tasking functions call for faster and faster CPUs to improve system efficiency. However, faster CPUs will generate more heat which must be dissipated in a timely manner. Therefore, a more efficient fans to dissipate heat is as important as watch-out of fan working situation. In this Internet era, people prolonged use of their computers is easily to cause overheat and damage to the CPU. It is therefore necessary to have a device to constantly monitor the CPU temperature, CPU fan speed and V-Core voltage, and timely remind user.

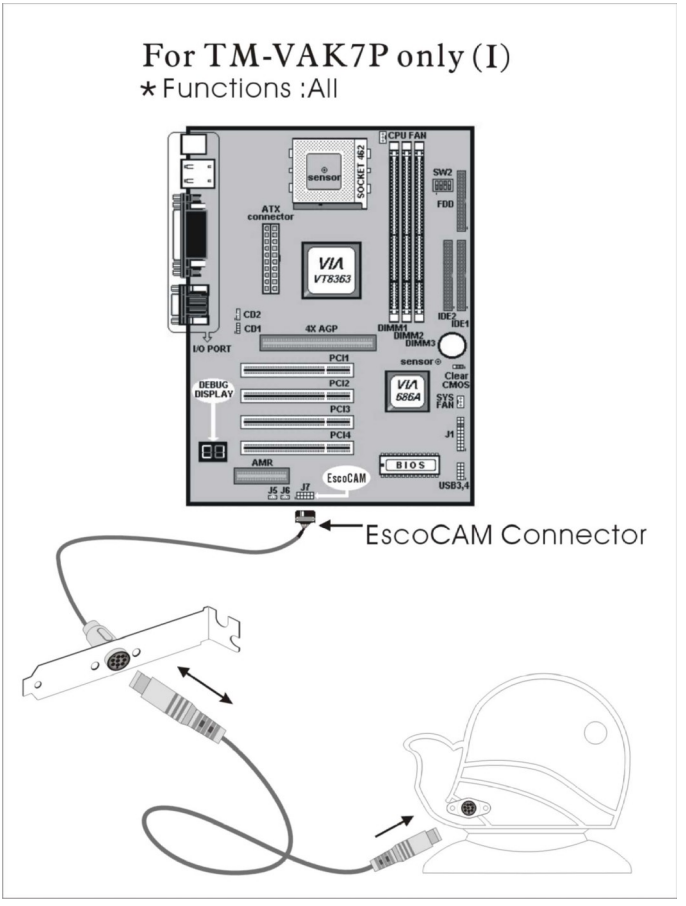
4. IrDA For Data Transmission :

As more and more computers, notebook, mobile phone and PDA are installed with the IrDA device for wireless transmission, we add in this extra value in the EscoCAM.

The Connection of EscoCAM

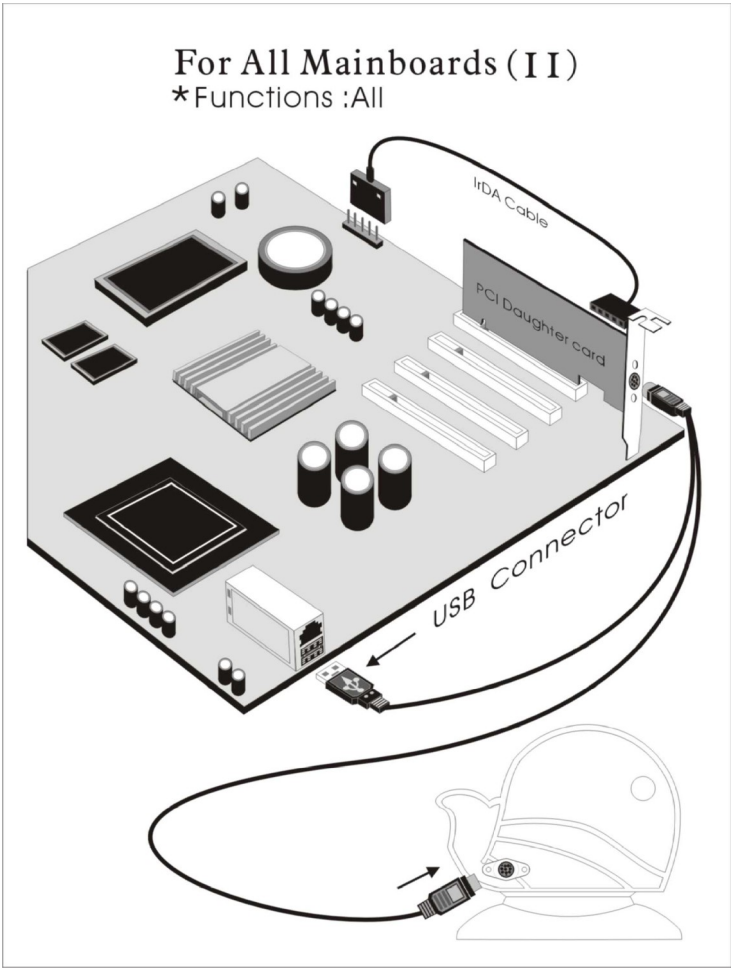
I. For TM-VAK7 Mainboard :

If you use TM-VAK7P, the most updated mainboard, it's already built-in all the circuit of **EscoCAM** so that user don't need a extra daughter card to connect it. The connection drawing as follows:

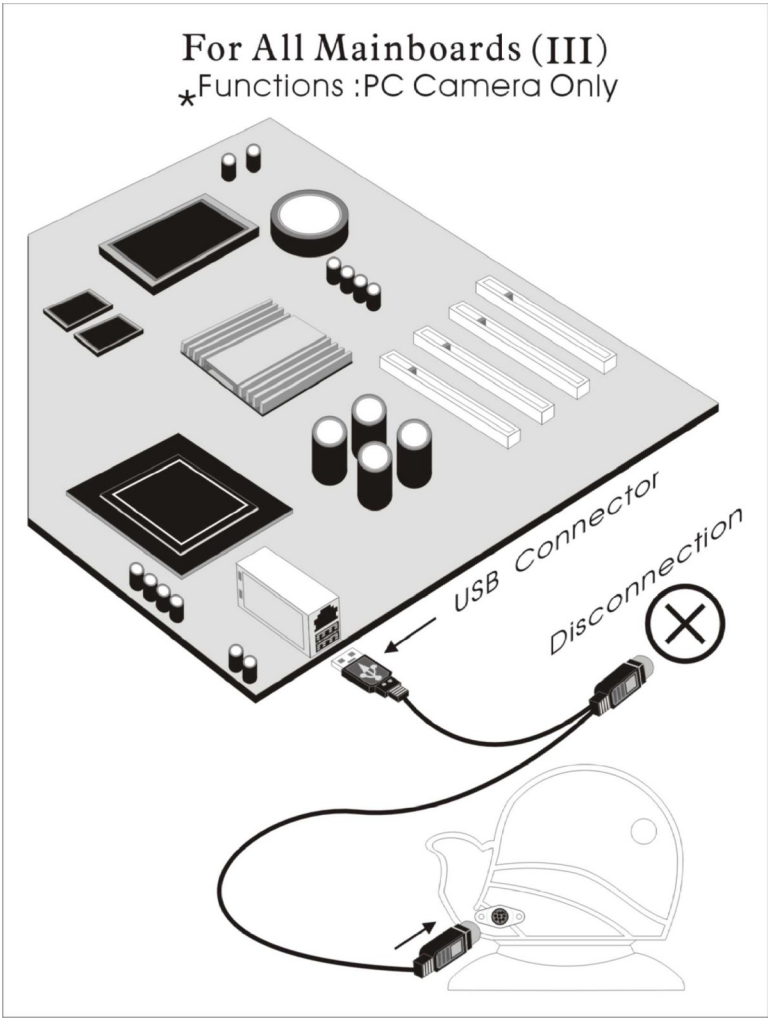


II. For All Others Mainboards:

If the mainboard you used is not TM-VAK7, you need A PCI daughter card to be inserted and make connection as follows:



III. Or, if you just want use the function of PC Camera, the connection drawing as follows:



BIOS Update Note

Do not update the BIOS if no abnormalities occur. However, if BIOS update is needed, consult your dealer first. Prior to updating your BIOS, you are recommended to save the original BIOS values.

1. Download the AMI BIOS Flash Utility file (**AMIFL818.exe**)

2. Download the BIOS file used by your mainboard(**e.g., xxx.BIN**)

3. **Reboot** your system (but do not run **Himem.sys** and **Emm386.exe**) to execute the new BIOS program.

4. Execute these commands: **AMIFL818 xxx.BIN**

BIOS Setup

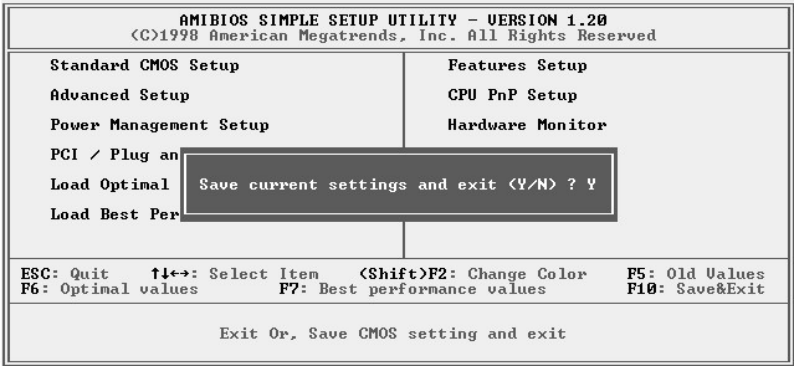
This Flash ROM BIOS has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

Getting Help

The online description of the highlighted setup function is displayed at the bottom of the screen.

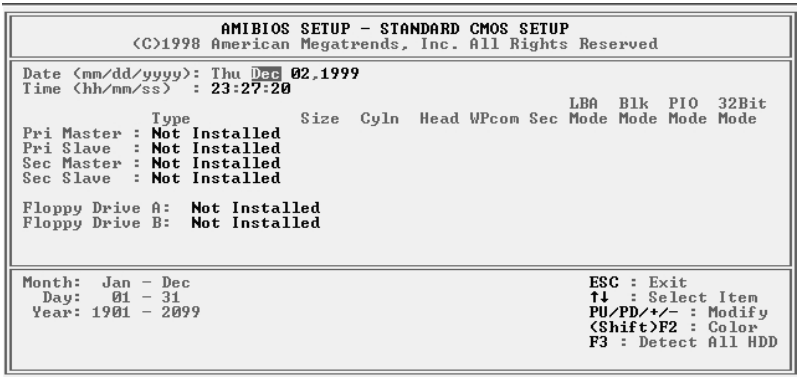
The Main Menu

Once you enter BIOS CMOS Setup Utility, the Main Menu will appear on the Screen.. Use arrow keys to select the desired items, press <Enter> to select or enter a submenu.



Standard CMOS Setup

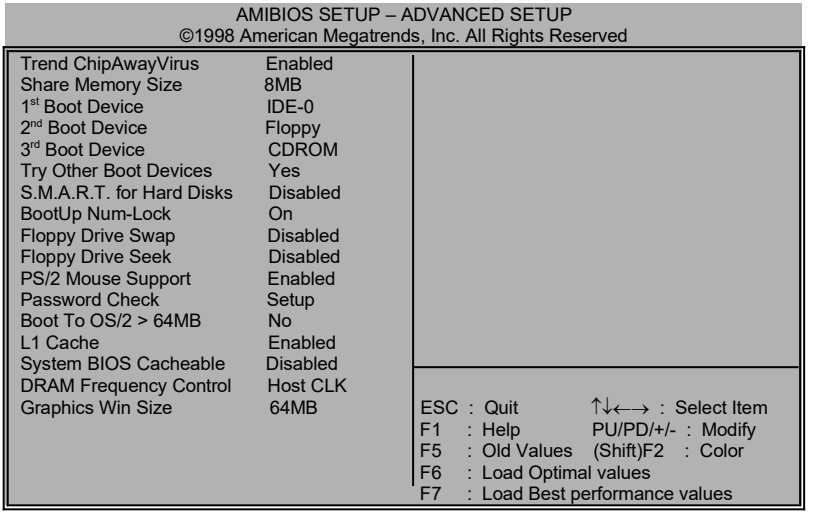
The items in Standard CMOS Setup Menu are divided into several categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



Date & Time	Use these items to set the system date and time
Pri Master **Pri Slave** **Sec Master** **Sec Slave**	If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, then the hard disk size and model will be auto-detected. If the *Auto* setting fails to find a hard disk drive, set it to *User*, and then type in the hard disk
Floppy Drive A **Floppy Drive B**	Use these items to set the size and capacity of the floppy diskette drive(s) installed in the system.

Advanced Setup

Use this page to set more advanced information about your system. Take some care with this page. Making changes can affect the operation of your computer.



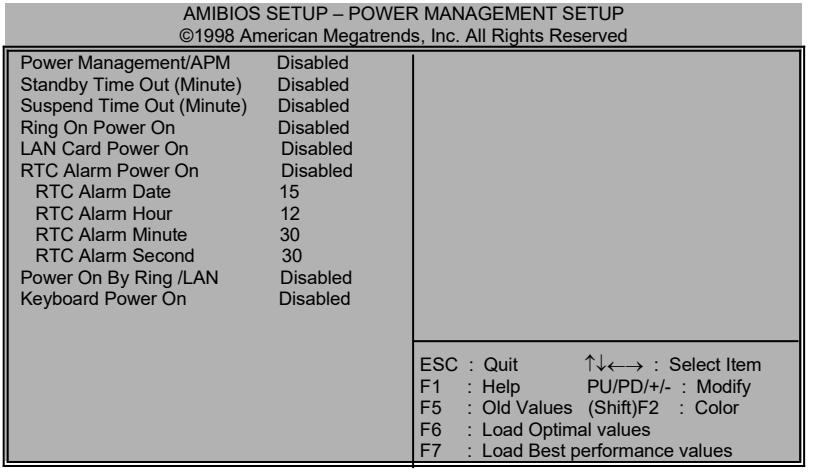
Trend ChipAway Virus	During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear. Keep in ming that this feature protects only the boot sector, not the entire hard drive. to Enable or Disable the built-in virus protection.
Share Memory Size	This item lets you allocate a portion of the main memory for use by the onboard VGA display.
1st /2nd/3rd Boot Device/Try Other Boot Device.	he BIOS trys to load the operating system from the devices in the sequence of 1st, 2nd, 3rd and other devices. The choice : HDD, FDD, CD-ROM, LS120, SCSI.
S.M.A.R.T. for Hard Disks	Enable this item if any IDE hard disks support the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) feature.

BootUp Num-Lock	This item control the NumLock key is active or inactive when system boots. On: The keypad Acts as a 10-key pad. Off: The keypad acts like the cursor keys.
Floppy Drive Swap	This will swap your physical drive letters A & B when you are using two floppy disks. The default is Disabled.
Floppy Drive Seek	During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2MB and 1.44MB are all 80 tracks. The default is Disabled.
PS/2 Mouse Support	If this item is set to Enabled, the onboard PS/2 Mouse port will work. Setting this to Disable turns off the port.
Password Check	If you have entered a password for the system, use this item to determine if the password is required to enter the Setup Utility (*Setup*) or required both at start-up and to enter the Setup Utility (*Always*).
Boot to OS/2 > 64MB	If you have entered a password for the system, use this item to determine if the password is required to enter the Setup Utility (*Setup*) or required both at start-up and to enter the Setup Utility (*Always*).
L1 Cache	Use this item to control the status of CPU's internal Cache. When this item is Enabled, the CPU performance will be increased.
System BIOS Cacheable	When enable this item, a segment of the system BIOS will be cached to main memory for faster execution.
DRAM Frequency Control	This item determines the operation of the onboard graphics adapter. We recommend that you leave this item at the default value.
Graphics Win	

Size	This item determines the operation of the onboard graphics adapter. We recommend that you leave this item at the default value.

Power Management Setup

This page sets some of the parameters for system power management operation.



Power Management/APM	Use this item to enable or disable a power management scheme. Both APM and ACPI are supported.
Standby Time Out	This sets the timeout for Standby mode. If the set time past without any system activity, the computer will enter into Standby mode.
Suspend Time Out	This sets the timeout for Suspend mode in minutes. If the time selected past without any system activity, the computer will enter into Suspend mode.
RTC Alarm Power On	**RTC Alarm Resume:** When enable RTC Alarm, you could set the date and time (hh:mm:ss), and event occurring at will awaken a system which has been powered down**.**
Power On By Ring/ LAN	When set to Enabled, any event occurring to the Modem or LAN will awaken a system which has been powered down.
Keyboard Power On	If enable this function, you can turn the system on and off by pressing hot keys set on the keyboard. ATX power supply with +5VSB minimum 750mA is requested.

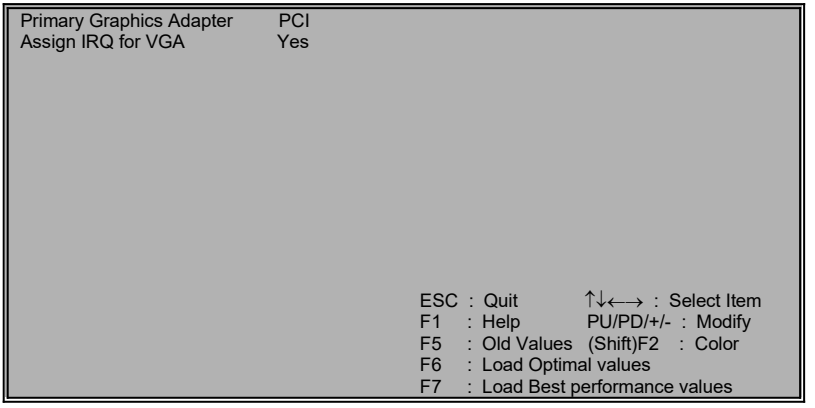
PCI / Plug and Play Setup

This page sets some of the parameters for devices installed on the PCI bus and devices that use the system plug and play capability.

AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP

Plug and Play Aware O/S	Yes

BIOS Setup



Plug and Play Aware O/S	Select Yes when your O/S is supportive for Plug and Play such as Windows 95 or 98.
Primary Graphics Adapter	The Graphics Onboard was set to be Primary. The default PCI onboard display is able to work simultaneously with the secondary display card installed in a PCI slot.
Assign IRQ for VGA	If this item is enabled, an IRQ will be assigned to the PCI VGA graphics system. You set this value to No to free up an IRQ.

Load Best Performance Settings

When you press <**Enter>** on this item, a dialog box appears as below:

Load Best Performance Defaults (Y/N) ? N

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

Load Optimized Defaults

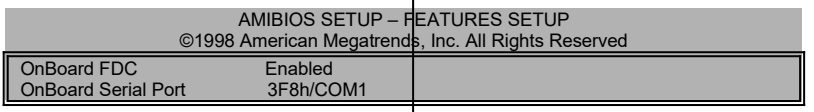
When you press **<Enter>** on this item you get a confirmation dialog box with a message likely to :

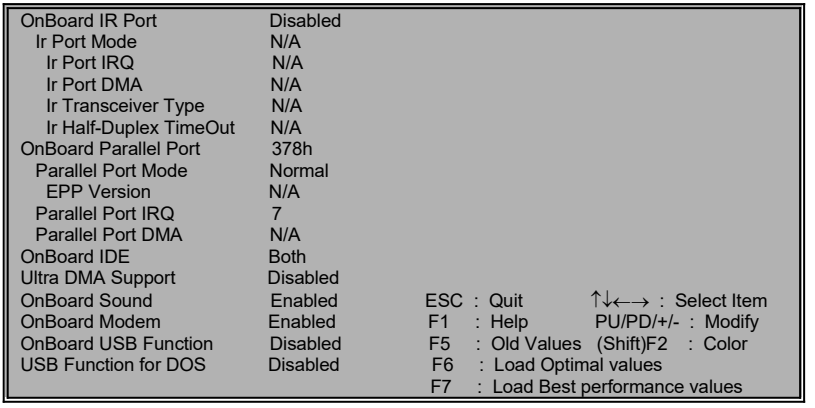
Load Optimized Defaults (Y/N) ? N

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

Features Setup

This page sets some of the parameters for peripheral devices connected to the system.





OnBoard FDC	This item controls the state of Onboard floppy controller. Default is Enabled. **Enabled:** Enable Onboard VIA686A Chip's FDD interface controller.
OnBoard Serial Port	Use this item to enable or disable the onboard COM1 serial port, and to assign a port address
OnBoard IR Port	This field is available only if Onboard Serial Port 2 is Disabled. UART mode enables you to select the Infrared protocol – **Standard (default),** HPSIR or ASKIR. HPSIR is HP's IR protocol with a maximum baud rate up to 115.2Kbps. ASKIR is Sharp's IR protocol with a maximum baud rate up to 57.6Kbps.

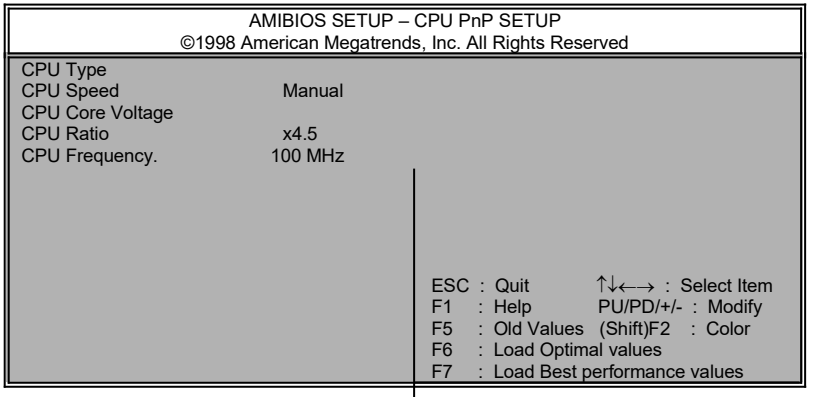
Ir Port Mode **Ir Port IRQ** **Ir Port DMA** **Ir Transceiver …** **Ir Half-Duplex …**	Use these items to define the settings for an infrared port if you have installed an optional IR port.
Onboard Parallel Port	This item allows user to configure the LPT port. Default is 378H/IRQ7. **378H:** Enable Onboard LPT and address is 378H/IRQ7. **278H:** Enable Onboard LPT and address 278H/

	IRQ5. **3BCH:** Enable Onboard LPT and address is 3BCH/IRQ7. **Disabled:** Disable Onboard I/O chip's LPT port.
Parallel Port Mode	Use this item to set the parallel port mode. You can select SPP (Standard Parallel Port), ECP (Extended Capabilities Port), EPP (Enhanced Parallel Port), or ECP + EPP. Default is Normal. **Normal:** Standard mode. IBM PC/AT Compatible bidirectional parallel port.
EPP Version	Use this item to set the version of EPP while the parallel port mode is set to EPP.
Parallel Port IRQ	Use this item to assign either IRQ 5 or 7 to the parallel port.
Parallel Port DMA	Use this item to assign a DMA channel to the parallel port. The options are 0, 1 and 3.
Onboard IDE	Use this item to enable or disable either or both of the onboard Primary and Secondary IDE channels.
Ultra DMA Support	Use this item to set Ultra DMA support for IDE devices on the Primary or Secondary IDE channels. You must enable this or UDMA devices will not work at their intended speed.
OnBoard Sound	This item enables or disables the onboard audio chip.
OnBoard Modem	This item enables or disables the onboard modem chip.
OnBoard USB Function	Enable this item if you plan to use the USB ports on this mainboard.
USB Function for DOS	Enable this item if you plan to use the USB ports on this mainboard in a DOS environment.

CPU PnP Setup

This page lets you manually configure the mainboard for the CPU. The system will automatically detect the kind of CPU that you have installed and make the appropriate adjustments to the items on this page.

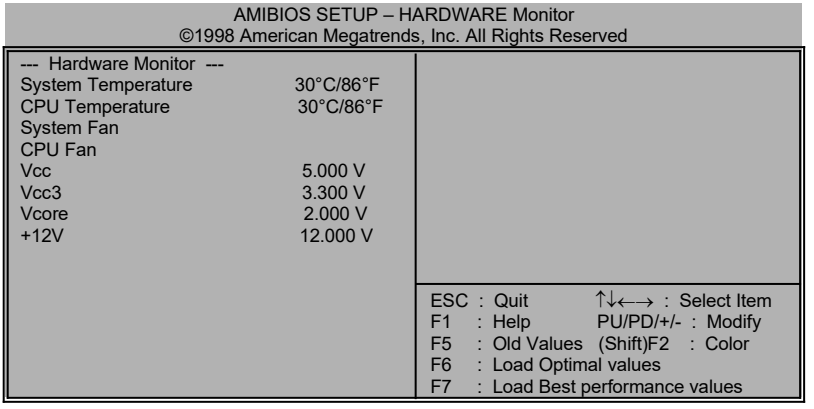
Note: If you manually set the wrong speed and the system won't run properly, press the **Page Up** key while the system is booting and a default setting will replace the incorrect CPU setting.



CPU Type **CPU Core Voltage**	These two items display the type and the core voltage of installed CPU
CPU Speed/Ratio/Frequency	Use this item to set the internal clock speed. When it's set to Manual, the CPU speed equal to the CPU Ratio (Multiplier) x CPU external Frequency (i.e. CPU clock).

Hardware Monitor

This page sets some of the parameters for the hardware monitoring function of this mainboard.



CPU, System Temperature	These items display CPU and the system temperature measurement. The system will alert you if a safe temperature is exceeded.
FANs & Voltage Measurements	These items indicate cooling fan speeds in RPM and the various system voltage

	measurements. If the values deviate beyond certain limits, the hardware monitoring feature will alert you with a warning.

Change Password

Type the password, up to 6 characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password once again. Now, type the password again and press <Enter>. You may also press <ESC> to abort the password set up. Once the password is disabled, the system will boot and you can enter **Setup** freely. If you highlight this item and press **Enter**, a dialog box appears which lets you enter a Supervisor password. You can enter no more than six letters or numbers. Press **Enter** after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press **Enter** after you have retyped it correctly. The password is then required to access the Setup Utility or for that and at start-up, depending on the setting of the Password Check item in Advanced Setup.

Change or Remove the Password

For changing password, you need to press <Enter> and enter the current password. At the next dialog box, type in the new password. To disable a password, just press <Enter> when you are requested to entered the password . A message to confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter setup freely.

Exit

Pressing <Enter> on this item to save changes that you have made, and exit the program. When the Save and Exit dialog box appears, press **Y** to save and exit, or press **N** to exit without saving.

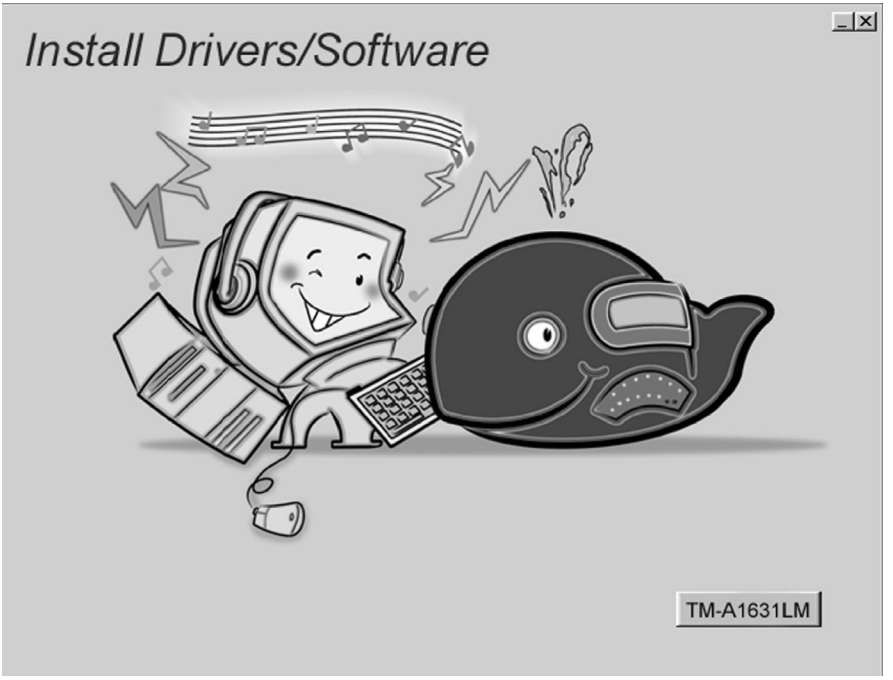
Driver & Software

Installation Guide

This driver is for Windows 95/NT/2000 and Win. 98. Aside from the installation procedure differs from the Operating System used, **the automatic installation is only available for Windows 98.**

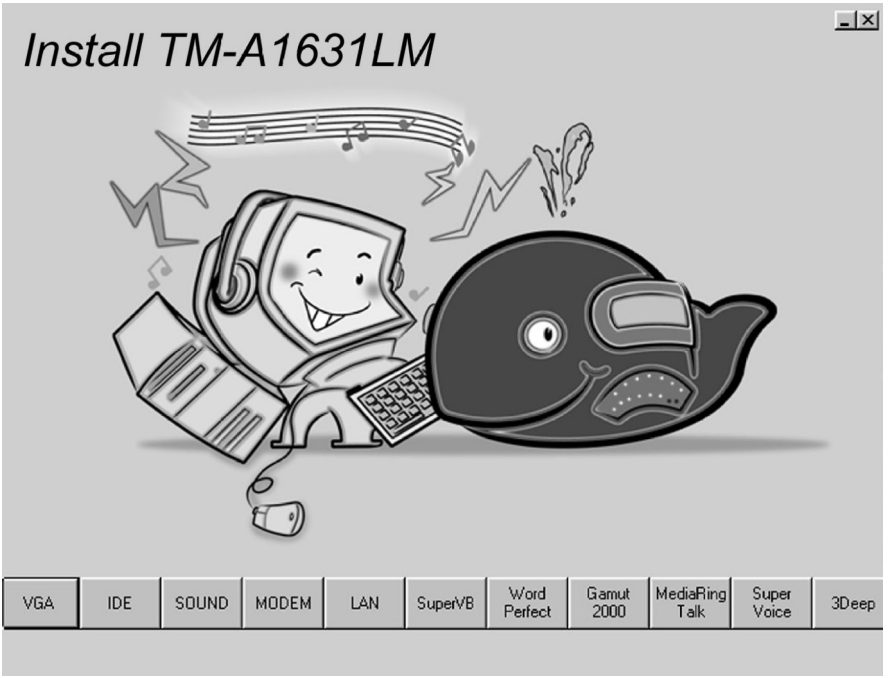
Quick Installation under Windows 98

When insert the CD-ROM disc in the system CD-ROM drive, the set up feature will automatically come up the screen with buttons for mainboard models name **as follows:**



Browse All The Drivers in CD

After selecting mainboard model name, all the available drivers will appears on the screen as follows:



How to install Windows 95/NT/2000 ?

1. Insert the support CD-ROM disc in the CD-ROM drive.
   *Just bypass the error message from PnP function.
2. Since **quick installation** is not supported by Windows 95/NT/2000, you have to select correct drivers and **EXE** given file names as follows:

Bus Master IDE Driver

- Windows 9x - \IDE\A1631LM\SETUP.EXE

USB Driver

- Win95 – :\Others\USB\EUSBSUPP\USBSUPP.EXE
- Win95 (Chinese) – :\Others\USB\CUSBSUPP\CUSBSUPP.EXE

Audio Driver

- DOS & Windows 3.x – :\SOUND\C-MEDIA\DOSDRV\
- Windows 9x – :\SOUND\C-MEDIA\W95-98\Drv\
- Windows NT – :\SOUND\C-MEDIA\Nt40\Drv\
- Windows 2000 – :\SOUND\C-MEDIA\W2K\Drv\

Audio applications :

- Windows 9x - :\GAMUT\SETUP.EXE

Display Drivers and Software

- :\VGA\A1631LM\353WIN9X.EXE

Path for updating Display driver

- Windows 9x - \VGA\A1631LM\WIN9X\
- Windows NT - \VGA\A1631LM\WINNT4\
- Windows 2000 - \VGA\A1631LM\WIN2K\

3Deep

- \3DEEP\3DEEP 3.3\SETUP\SETUP.EXE

Fax/Modem Drivers and Software

- Windows 9x,NT - \MODEM\PCI\9XNT\SETUP.EXE
- Windows 2000 - \MODEM\PCI\WIN2000\
- Windows ME - \MODEM\PCI\WINME\

Super Voice

- \SUPER VOICE\PICSHELL.EXE

MediaRing Talk

- \MEDIARING TALK\MRTALK-SETUP7.2.EXE

LAN Driver

- Windows 9x - \LAN\SIS900\SETUP.EXE
- Windows NT - \LAN\SIS900\NT40\
- Windows 2000 - \LAN\SIS900\WIN2000\

Corel WordPerfect Suite 8

- \CD1\COREL\SUITE8\APPMAN\SETUP\SETUP.EXE

BIOS Update

- :\ UTILITY\AMIFL818.EXE

Super VB Software

This software provides anti-virus protection PC.

- :\ SuperVB\Auto.EXE

Further Guide to Audio Software :

1. Making sure the Operating System has been properly installed prior to the installation of the PCI Sound Drivers. Otherwise, the Onboard PCI Audio might be recognized as an **"Other Device".**
2. For featuring Wave-Table drivers as a MIDI output device, just select **MULTIMEDIA** from the Control Panel. Select the **MIDI tab** → Click "**C-media SoftMidi Synthesis** (Win 98) / Driver (Win 95)" → Click **OK** to complete.

3. **Audio Rack**, a Windows application, is provided to control all the Audio functions for simply working as a high quality home stereo system.
4. For featuring MIDI port as the control interface, just select **MULTIMEDIA** from the Control Panel. Select the **MIDI tab** → Click "**C-M8738 MPU-401**" **(Win 98) or "DM8738/C3DX PCI Audio External MIDI Port" (Win 95)** → Click **OK** to complete.

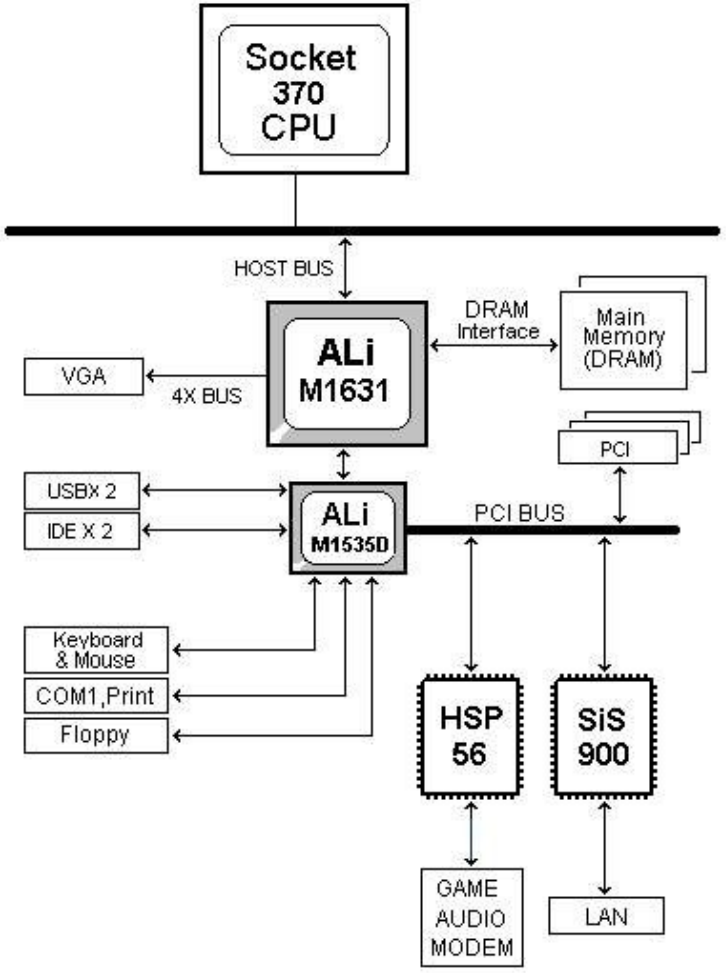
The Four Speakers System

This onboard Audio System supports 2 wave channels (Front/rear) known as the 4 speakers system. For achieving simulation of realistic 3D sound effect through a 4 speakers, just to run applications which is featured with **DirectSound 3D** or **A3D Audio** interface.

Mixer Setup

After setting up the **PCI Audio Application**, a 4-speakers option appears in the Mixer. Just click on the **4 Speakers** icon to achieve this option. The rear speakers will output only via Line-in/Rear jack now. So, when Line-in/Rear jack is occupied by a Line-in device, **Do Not** enable this option to avoid hardware conflict.

Block Diagram



AMI BIOS POST Code :

POST (HEX)	Description
C2	NMI is Disabled. Power on delay starting.
C5	Power on delay complete. Going to disable Cache if any.
C6	Calculating ROM BIOS checksum.
C7	ROM BIOS checksum passed. CMOS shutdown register test to be done next.
C8	CMOS shutdown register test done. CMOS checksum calculation to be done next.
CA	CMOS checksum calculation is done, CMOS Diag byte written. CMOS status register about to init for Date and Time.
CB	CMOS status register init done. Any initialization before keyboard BAT to be done next.
CD	BAT command to keyboard controller is to be issued.
CE	Keyboard controller BAT result verified. Any initialization after KB controller BAT to be done next.
CF	Initialization after KB controller BAT done. Keyboard command byte to be written next.
D1	Keyboard controller command byte is written. Going to check pressing of <INS> key during power-on.
D2	Checking for pressing of <INS> key during power-on done. Going to disable DMA and Interrupt controllers.
D3	DMA controller #1,#2, interrupt controller #1,#2 disabled. Chipset init/ auto memory detection about to begin.
D4	Chipset initialization/ auto memory detection over. To uncompress the RUNTIME code.
D5	RUNTIME code is uncompressed.
DD	Transfer control to uncompressed code in shadow ram at F000:FFF0.
03	NMI is Disabled. To check soft reset/power-on.
05	Soft reset/power-on determined. Going to disable Cache if any.
06	POST code to be uncompressed.
07	POST code is uncompressed. CPU init and CPU data area init to be done next

POST (HEX)	Description
08	CPU and CPU data area init done. CMOS checksum calculation to be done next.
09	CMOS checksum calculation is done, CMOS Diag byte written. CMOS init to begin (If "Init CMOS in every boot" is set).
0A	CMOS initialization done (if any). CMOS status register about to init for Date and Time.
0B	CMOS status register init done. Any initialization before keyboard BAT to be done next.
0C	KB controller I/B free. Going to issue the BAT command to keyboard controller.
0D	BAT command to keyboard controller is issued. Going to verify the BAT command.
0E	Keyboard controller BAT result verified. Any initialization after KB controller BAT to be done next.
0F	Initialization after KB controller BAT done. Keyboard command byte to be written next.
10	Keyboard controller command byte is written. Going to issue Pin-23,24 blocking/unblocking command.
11	Pin-23,24 of keyboard controller is blocked/ unblocked. Going to check pressing of <INS> key during power-on.
12	Checking for pressing of <INS> key during power-on done. Going to disable DMA and Interrupt controllers.
13	DMA controller #1,#2, interrupt controller #1,#2 disabled. Video display is disabled and port-B is initialized. Chipset init about to begin.
15	Chipset initialization over. 8254 timer test about to start.
19	8254 timer test over. About to start memory refresh test.
1A	Memory Refresh line is toggling. Going to check 15 micro second ON/OFF time.
20	Memory Refresh period 30 micro second test complete. Base 64K memory to be initialized.
23	Base 64K memory initialized. Going to set BIOS stack and to do any setup before Interrupt vector init.
24	Setup required before interrupt vector initialization complete. Interrupt vector initialization about to begin.

POST (HEX)	Description
25	Interrupt vector initialization done. Going to read Input port of 9042 for turbo switch (if any) and to clear password if post diag switch is on.
26	Input port of 8042 is read. Going to initialize global data for turbo switch.
27	Global data initialization for turbo switch is over. Any initialization before setting video mode to be done next.
28	Initialization before setting video mode is complete. Going for monochrome mode and color mode setting.
2A	Different BUSes init (system, static, output devices) to start if present. (Please see Appendix for details of different BUSes).
2B	About to give control for any setup required before optional video ROM check.
2C	Processing before video ROM control is done. About to look for optional video ROM and give control.
2D	Optional video ROM control is done. About to give control to do any processing after video ROM returns control.
2E	Return from processing after the video ROM control. If EGA/VGA not found then do display memory R/W test.
2F	EGA/VGA not found. Display memory R/W test about to begin.
30	Display memory R/W test passed. About to look for the retrace checking.
31	Display memory R/W test or retrace checking failed. About to do alternate Display memory R/W test.
32	Alternate Display memory R/W test passed. About to look for the alternate display retrace checking.
34	Video display checking over. Display mode to be set next.
37	Display mode set. Going to display the power on message.
38	Different BUSes init (input, IPL, general devices) to start if present. (Please see Appendix for details of different BUSes).
39	Display different BUSes initialization error messages. (Please see Appendix for details of different BUSes).
3A	New cursor position read and saved. Going to display the Hit <DEL> message.

POST (HEX)	Description

3B	Hit <DEL> message displayed. Virtual mode memory test about to start.
40	Going to prepare the descriptor tables.
42	Descriptor tables prepared. Going to enter in virtual mode for memory test.
43	Entered in the virtual mode. Going to enable interrupts for diagnostics mode.
44	Interrupts enabled (if diagnostics switch is on). Going to initialize data to check memory wrap around at 0:0.
45	Data initialized. Going to check for memory wrap around at 0:0 and finding the total system memory size.
46	Memory wrap around test done. Memory size calculation over. About to go for writing patterns to test memory.
47	Pattern to be tested written in extended memory. Going to write patterns in base 640k memory.
48	Patterns written in base memory. Going to findout amount of memory below 1M memory.
49	Amount of memory below 1M found and verified. Going to findout amount of memory above 1M memory.
4B	Amount of memory above 1M found and verified. Check for soft reset and going to clear memory below 1M for soft reset. (If power on, go to check point# 4Eh).
4C	Memory below 1M cleared. (SOFT RESET) Going to clear memory above 1M.
4D	Memory above 1M cleared. (SOFT RESET) Going to save the memory size. (Goto check point# 52h).
4E	Memory test started. (NOT SOFT RESET) About to display the first 64k memory size.
4F	Memory size display started. This will be updated during memory test. Going for sequential and random memory test.
50	Memory testing/initialization below 1M complete. Going to adjust displayed memory size for relocation/ shadow.
51	Memory size display adjusted due to relocation/ shadow. Memory test above 1M to follow.
52	Memory testing/initialization above 1M complete. Going to save memory size information.

POST (HEX)	Descriptions
53	Memory size information is saved. CPU registers are saved.

	Going to enter in real mode.
54	Shutdown successful, CPU in real mode. Going to disable gate A20 line and disable parity/NMI.
57	A20 address line, parity/NMI disable successful. Going to adjust memory size depending on relocation/shadow.
58	Memory size adjusted for relocation/shadow. Going to clear Hit <DEL> message.
59	Hit <DEL> message cleared. <WAIT...> message displayed. About to start DMA and interrupt controller test.
60	DMA page register test passed. To do DMA#1 base register test.
62	DMA#1 base register test passed. To do DMA#2 base register test.
65	DMA#2 base register test passed. To program DMA unit 1 and 2.
66	DMA unit 1 and 2 programming over. To initialize 8259 interrupt controller.
67	8259 initialization over.
7F	Extended NMI sources enabling is in progress.
80	Keyboard test started. clearing output buffer, checking for stuck key, About to issue keyboard reset command.
81	Keyboard reset error/stuck key found. About to issue keyboard controller interface test command.
82	Keyboard controller interface test over. About to write command byte and init circular buffer.
83	Command byte written, Global data init done. About to check for lock-key.
84	Lock-key checking over. About to check for memory size mismatch with CMOS.
85	Memory size check done. About to display soft error and check for password or bypass setup.
86	Password checked. About to do programming before setup.
87	Programming before setup complete. Going to uncompress SETUP code and execute CMOS setup.
88	Returned from CMOS setup program and screen is cleared. About to do programming after setup.
89	Programming after setup complete. Going to display power on screen message.

POST (HEX)	Description
8B	First screen message displayed. <WAIT...> message displayed. About to do Video BIOS shadow.

8C	Video BIOS shadow successful. Setup options programming after CMOS setup about to start.
8D	Setup options are programmed, mouse check and init to be done next.
8E	Mouse check and initialization complete. Going for hard disk controller reset.
8F	Hard disk controller reset done. Floppy setup to be done next.
91	Floppy setup complete. Hard disk setup to be done next.
94	Hard disk setup complete. To set base and extended memory size.
95	Memory size adjusted due to mouse support. Init of different BUSes optional ROMs from C800 to start. (Please see Appendix-I for details of different BUSes).
96	Going to do any init before C800 optional ROM control.
97	Any init before C800 optional ROM control is over. Optional ROM check and control will be done next.
98	Optional ROM control is done. About to give control to do any required processing after optional ROM returns control.
99	Any initialization required after optional ROM test over. Going to setup timer data area and printer base address.
9A	Return after setting timer and printer base address. Going to set the RS-232 base address.
9B	Returned after RS-232 base address. Going to do any initialization before Coprocessor test.
9C	Required initialization before Coprocessor is over. Going to initialize the Coprocessor next.
9D	Coprocesor initialized. Going to do any initialization after Coprocessor test.
9E	Initialization after Coprocessor test is complete. Going to check extd keyboard, keyboard ID and num-lock.
9F	Extd keyboard check is done, ID flag set, num-lock on/off. Keyboard ID command to be issued.
A0	Keyboard ID command issued. Keyboard ID flag to be reset.
A1	Keyboard ID flag reset. Cache memory test to follow.
A2	Cache memory test over. Going to display any soft errors.
A3	Soft error display complete. Going to set keyboard typematic rate.

POST (HEX)	Description
A4	Keyboard typematic rate set. To program memory wait states.
A5	Memory wait states programming over. Going to clear the screen and enable parity/NMI.

A7	NMI and parity enabled. Going to do any initialization required before giving control to optional ROM at E000.
A8	Initialization before E000 ROM control over. E000 ROM to get control next.
A9	Returned from E000 ROM control. Going to do any initialization required after E000 optional ROM control.
AA	Initialization after E000 optional ROM control is over. Going to display the system configuration.
B0	System configuration is displayed.
B1	Going to copy any code to specific area.
00	Copying of code to specific area done. Going to give control to INT-19 boot loader.

APPENDIX:

CHECK-POINT	Description of CHECK-POINT
2A	Different BUSes init (system, static, output devices) to start if present.
38	Different BUSes init (input, IPL, general devices) to start if present.
39	Display different BUSes initialization error messages.
95	Init of different BUSes optional ROMs from C800 to start.

Problem Sheet

To conduct correct diagnosis and repairing work, you were requested to fill this RMA from and attach it with each RMA mainboard before sending back for repairing.

Customer			
Name		Tel	
address		Fax	

Mainboard			
Mode		Mainboard Rev	
Serial No.		BIOS version	

Peripherals Description					
CPU	Brand		RAM	Brand	
	Type			Type & Size	
	Voltage			Speed	
Floppy disk	Brand		VGA card	Brand	
	Mode			Chipset	
	Size			RAM Type	
Hard disk	Brand		CD-ROM	Brand	
	Mode			Mode	
	Size			Speed	
Sound card	Brand		Lan card	Brand	
	Mode			Mode	
	Remark			PCI/ISA Bus	
Mouse	Brand		O.S	Brand	
	Mode			Name	
	PS/2 or Serial			Version	
Problem Description					

MEMO