4GLX3

MOTHERBOARD

USER'S MANUAL

CONTENTS

SECTION 0: IMPORTANT SAFETY INFORMATION

* Read these instructions before using this board, and save for later use.
* The board is a sensitive electronic component, which can easily be damaged by static electricity. Users must keep it away from metal surface when installing the CPU onto the motherboard.
* Before installing the CPU, the motherboard must be placed on a flat surface to avoid being broken by pressure from inserting the CPU.
* When installing the CPU, please ensure that PIN 1 of the CPU is placed at the same corner as the PIN 1 of the socket. Otherwise there may be damage to the CPU.
* Do not use this product near water. If liquid has been spilled into the board, or if the board has been exposed to water, the board may not work properly.
* Please ensure that the power connectors of the power supply are properly connected to the board before supplying power to the board.
* Turn off the power before changing any hardware jumpers or add -on cards.
* Do not leave any metal or conductive item (such as a loose screw) on the board. Otherwise the board will short permanently when powered on.

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

Welcome to the 4GLX3 motherboard. The mother board is a 64/128/256KB CACHE 486 PC/AT compatible system with ISA bus and VESA Local Bus (VL-Bus). The motherboard uses the most advanced third generation single PC chipset. The 4GLX3 is 100% compatible with IBM PC/AT, and is 100% software compatible.

This manual explains how to install the motherboard for operation, and how to set up the CMOS configuration with the BIOS SETUP program.

1.2 FEATURES

* 80486 based PC/AT compatible motherboard with 2 VESA local bus (VL-Bus) slots.
* Supports Intel/AMD/Cyrix 486DX/DX2/SX ,487SX and P24T/C(Option) CPUs running at 25/33/40/50/66MHz.
* Supports 64/128/256KB of external cache operating in BURST mode.
* Supports 256KB/1MB/4MB/16MB SIMM modules.
* Supports up to 128MB of RAM (system memory) on the motherboard.
* Licensed AMI BIOS. (AWARD and MR BIOS are optional)
* Fully compatible with MS-DOS, WINDOWS (NT), OS/2, XENIX, UNIX and Novell Netware.....

1.3 VESA LOCAL BUS (VL-Bus)

Connecting devices to a CPU's local bus can dramatically increase the speed of I/O-bound peripherals. Many motherboard and chipset manufactures developed their own local bus implementations to take advantage of this speed differential. However, most of them were not compatible with each other. The VL-Bus was created by VESA (Video Electronics Standards Association) to end the incompatibility problem within the industry.

The VL-Bus standard, under development since November 1991, is designed to bring workstation-level performance to a standard PC platform. The VL-Bus removes many of the bottlenecks that have hampered PCs for several years. On the VL-Bus, peripherals operate at the native speed of the computer system, enabling data transfer between peripherals and the system at maximum speed. This performance is critical for bandwidth-constrained devices such as video, multimedia, mass storage, and networking adapters.

VESA's VL-Bus standard provides end-users with a low cost, extendible, and

portable local bus design. which will allow systems and peripherals from different manufactures to work seamlessly together.

1.4 UNPACKING

The motherboard contains sensitive electric components which can be easily damaged by static electricity. Therefore the motherboard should be left in it's original packing until it is ready to be installed.

Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband grounded to the same point as the anti-static mat.

Inspect the motherboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there is no such damage on the board before proceeding.

After opening the motherboard carton, extract the system board and place it on a grounded anti-static mat with the component side up. Again, inspect the board for damages. Press down on all of the socketed IC's to make sure that they are properly seated. Follow the next three sections to check and set the jumpers on the board. Do this only with the board placed on a firm flat surface.

WARNING

DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your 4GLX3 motherboard. The mounting hole pattern on the motherboard matches the IBM-XT/AT system board. It is assumed that the case is designed to mount a standard IBM XT/AT motherboard.

Place the case on the anti-static mat and remove the cover. From the back of the motherboard, insert the plastic stand-offs into the pre-drilled holes. Place the motherboard into the case, and fasten it with screws.

SECTION 2: HARDWARE INSTALLATION

This section explains how to install and set up hardware jumpers on the motherboard for operation. Please follow the items of this section step by step to set up the board.

2.1 HOW TO INSTALL THE CPU

(JP2, JP3, JP4, JP2A)

The 4GLX3 motherboard offers a wide variety of CPU options. It can support INTEL/AMD 80486DX/DX2, 80486SX/487SX CPUs or CYRIX M6/M7 with speeds from 25MHz to 66MHz. Even when the 4GLX3 contains a factory installed CPU (PQFP type at U1), it can be upgraded to a faster CPU.

First of all the user needs to put a CPU at the 168 pin-grid-array (PGA) socket or 238 pins blue ZIF socket or 237 pins white ZIP socket at location U2. If the motherboard does not have a factory installed CPU.

Refer to the following table to correctly install the CPU and jumper settings:

	JP2	JP3	JP4
CPU : 80486DX	1-2 & 3-4	2-3	OPEN
CPU : 80486SX(PGA)	2-3	OPEN	OPEN
CPU : 80486SX(PQFP)	OPEN	OPEN	OPEN
CPU : 80487SX or P24T/C	1-2 & 3-4	1-2	SHORT

Now check the CPU brand (Intel/AMD or Cyrix). Refer to the following table to correctly install the jumper JP2A setting:

	Intel or AMD	Cyrix (M6/M7)
JP2A	1 - 2	2 - 3

WARNING

1. **The CPU is a sensitive electronic component, which can easily be damaged by static electricity. Users must keep it away from metal surfaces when installing the CPU onto the motherboard.**
2. **Before installing the CPU, the motherboard must be placed on a flat surface to avoid being broken by pressure of inserting the CPU.**
3. **When installing the CPU, ensure that PIN 1 of the CPU is placed at the same corner as the PIN 1 of the socket. Otherwise the CPU may be damaged.**

2.2 HOW TO SET SYSTEM SPEED

(JP36, JP37, JP38, JP5/5A, JP33, JP72, ID3)

Refer to the following table for correct jumper settings:

	(25MHz) DX/SX -25 or DX2-50	(33MHz) DX/SX -33 or DX2-66	(40MHz) DX/SX -40	(50MHz) DX -50
JP36	SHORT	SHORT	OPEN	OPEN
JP37	1-2	2-3	1-2	2-3
JP38	2-3	1-2	2-3	1-2
JP5*	2-3	2-3	1-2	1-2
(JP5A)*	4-5	4-5	3-5	X
JP72	SHORT	OPEN	OPEN	OPEN
JP33	2-4	2-4	2-3	1-2
ID3	OPEN	OPEN	SHORT	SHORT

(*) JP5 setting for U2 , PGA type CPU. JP5A setting for U1, PQFP type CPU.

2.3 HOW TO INSTALL SYSTEM MEMORY

The 4GLX3 motherboard has two banks of page mode local memory. Bank 0 must be installed first before bank 1. Each bank requires 4 SIMM modules. The motherboard will accept 256KB, 1MB, 4MB or 16MB type of 30-Pin SIMM modules. Therefore the total memory size can vary from 1MB to 128MB. See the table below for the various configurations.

BANK-0	BANK-1	TOTAL MEMORY
256K	none	1MB
256K	256K	2MB
256K	1M	5MB
256K	4M	17MB
256K	16M	65MB
1M	none	4MB
1M	256K	5MB
1M	1M	8MB
1M	4M	20MB
1M	16M	68MB
4M	none	16MB
4M	256K	17MB
4M	1M	20MB
4M	4M	32MB
4M	16M	80MB
16M	none	64MB
16M	256K	65MB
16M	1M	68MB
16M	4M	80MB
16M	16M	128MB

Be sure the Pin-1 of the SIMM module matches the Pin-1 position of the SIMM socket. Insert the SIMM module into the SIMM socket at a 45 degree angle. If the SIMM module is put in from the wrong direction, it cannot be inserted into the socket completely. After completely inserting the SIMM module into the socket, push the SIMM module to the vertical position until the left and right clips hold the SIMM module firmly in place.

2.4 HOW TO INSTALL CACHE MEMORY

(JP7, JP8)

The cache memory system consists of two parts: the Tag SRAM and Data SRAM.

The 4GLX3 motherboard has two banks of Data SRAM. Each bank has four Data SRAM chips. Only one Tag SRAM chip is needed for both banks of Data SRAM.

2.4.1 Cache Memory Size Jumper Setting:

SIZE	JP7	JP8	BANK-0 U6,U7 U8,U9	BANK-1 U10,U11 U12,U13	TAG RAM U4
64KB	2 - 3	2 - 4	8Kx8	8Kx8	8Kx8
128KB	1 - 2	2 - 3	32Kx8	none	8Kx8
256KB	1 - 2	1 - 2	32Kx8	32Kx8	32Kx8

2.4.2 SRAM Chips part number:

Manufacture	8Kx8 SRAM	32Kx8 SRAM
IDT	IDT7164	IDT71256
Micron	MT5C6408	MT5C2568
Motorola		MCM6206NP
Performance	P4C164	P4C1256
Toshiba	TC5588	TC55328P

2.4.3 Chips (S-RAM) Speed Select:

SYSTEM SPEED	DATA-RAM SPEED	TAG-RAM SPEED	BURST MODE
25MHz	30ns or faster	25ns or faster	2-1-1-1
33MHz	20ns or faster	15ns or faster	2-1-1-1
33MHz	20ns or faster	20ns or faster	3-1-1-1
40MHz	20ns or faster	15ns or faster	3-1-1-1
40MHz	20ns or faster	20ns or faster	3-2-2-2
50MHz	15ns or faster	12ns or faster	3-1-1-1
50MHz	20ns or faster	15ns or faster	3-2-2-2

2.5 HOW TO SET UP VESA LOCAL BUS (VL-BUS) WAIT STATE

(ID2)

Open	0 wait state
Short	1 wait state

2.6 HOW TO INITIALIZE THE CMOS MEMORY

(JP16)

If the user wants to clear the CMOS memory (e.g. forgetting the password), the user can short jumper JP16 pins 2 and 3, and disconnect the battery power of CMOS RAM. The user must wait for a few seconds to let the remaining power in the CMOS discharge, then switch the jumper JP16 to position 1 and 2.

1-2	For Normal operation
2-3	To clear CMOS data

2.7 HOW TO USE EXTERNAL BATTERY JUMPER

(JP17)

The Real Time Clock (RTC) and CMOS memory on the motherboard require constant power to keep data inviolate and effective. There is a rechargeable battery on the motherboard as well as an external battery connector.

The rechargeable battery is automatically recharged when the system is powered-on. The rechargeable battery provides power to RTC and CMOS when the system is powered-off. The life expectancy of the rechargeable battery is 5 to 7 years. When it fails to work, the user can use an external 4.5V or 6V battery to replace the rechargeable battery.

Pin-1	Battery (+)
Pin-2	No connection (Key)
Pin-3	Ground
Pin-4	Ground

2.8 HOW TO CONFIGURE THE SYSTEM CONTROL PANEL

(JP10, JP11, JP13, JP15, JP95)

JP13 : Keylock & Power LED connector

Pin-1	LED Anode (+)
Pin-2	N/c (key)
Pin-3	LED Cathode (-)
Pin-4	Keylock

Pin-5	Ground

JP11 : Speaker connector

Pin-1	Data
Pin-2	N/c (key)
Pin-3	Ground
Pin-4	+5V

JP95 : Turbo switch (Hardware)

Open	Turbo speed
Short	Normal speed

JP10 : Turbo LED jumper

Pin-1	Anode (+)
Pin-2	Cathode (-)

JP15 : Reset (Hardware) switch connector

Open	For normal operation
Short	For hardware reset

2.9 HOW TO USE JUMPER JP1

JP1: This jumper only for disable U1, PQFP type CPU's function

SHORT	Disable U1 CPU's function
OPEN	Normal operation

2.10 HOW TO INSTALL POWER TO THE BOARD

(J2)

Pin-1	Power good	orange
Pin-2	+5V	red
Pin-3	+12V	yellow
Pin-4	-12V	blue
Pin-5	Ground	black

Pin-6	Ground	black
Pin-7	Ground	black
Pin-8	Ground	black
Pin-9	-5V	white
Pin-10	+5V	red
Pin-11	+5V	red
Pin-12	+5V	red

2.11 HOW TO INSTALL KEYBOARD TO THE BOARD

(J14)

Pin-1	Keyboard clock
Pin-2	Keyboard data
Pin-3	No connection
Pin-4	Ground
Pin-5	+5V (Power)

SECTION 3: BIOS SETUP

3.1 SYSTEM POWER-ON

The AMI BIOS SETUP program is used for configuring the system. These system options are stored in the CMOS. If the CMOS is good, the system uses the configuration stored in the CMOS. If the CMOS is bad, the system uses the default configuration stored in the ROM BIOS. There are two sets of default configurations stored in the ROM BIOS: the *BIOS Setup* default configuration and the *Power-On* default configuration. The *BIOS Setup* default configuration is supposed to give the optimum performance for the system. The *Power-On* default configuration is a more stable set of values for the system.

After powering on and booting the system, the user is given a message for entering the SETUP program. Normally, you can press the (DEL) key while booting to enter the SETUP program. The following menu will be shown on the screen:

```
        BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES
(C) 1993 American Megatrends Inc., All Rights Reserved

                    STANDARD CMOS SETUP
                    ADVANCED CMOS SETUP
                  ADVANCED CHIPSET SETUP
          AUTO CONFIGURATION WITH BIOS DEFAULTS
        AUTO CONFIGURATION WITH POWER-ON DEFAULTS
                    CHANGE PASSWORD
                  AUTO DETECT HARD DISK
                    HARD DISK UTILITY
                  WRITE TO CMOS AND EXIT
               DO NOT WRITE TO CMOS AND EXIT

Standard CMOS Setup for changing Time, Date, Disk Type, etc.

  | ESC:Exit  |-|-:Sel  F2/F3:Color  F10:Save & Exit |
```

3.2 STANDARD CMOS SETUP

Select STANDARD CMOS SETUP. The following warning message will be shown on the screen:

```
          BIOS SETUP PROGRAM - WARNING INFORMATION
  (C) 1993 American Megatrends Inc., All Rights Reserved

        Improper Use of Setup may Cause Problems !!

  If System Hangs, Reboot System and Pressing "ESC" key

      Do any of the following After Entering Setup
        (i)   Alter Options to make System Work
        (ii)  Load BIOS Setup Defaults
        (iii) Load Power-On Defaults

    Hit "ESC" to Stop now, Any other Key to Continue
```

Press the (ENTER) key to get the following screen:

```
          BIOS SETUP PROGRAM - STANDARD CMOS SETUP
  (C) 1990 American Megatrends Inc., All Rights Reserved

Date(mn/date/year):Sun, Nov 11 1990          Base memory:640KB
Time(hour/min/sec):12:35:42                  Ext. memory:3072KB
Daylight saving   : Disabled    Cylin Head Wpcom LZone Sect Size
Hard disk C: type :Not Installed
Hard disk D: type :Not Installed
Floppy drive A:   :Not Installed     ----------------------------
Floppy drive B:   :Not Installed     |Sun|Mon|Tue|Wed|Thu|Fri|Sat|
Primary display   :Monochrome        |---|---|---|---|---|---|---|
Keyboard          :Installed         |28 |29 |30 |31 | 1 | 2 | 3 |
                                     |---|---|---|---|---|---|---|
                                     | 4 | 5 | 6 | 7 | 8 | 9 |10 |
                                     |---|---|---|---|---|---|---|
-----------------------------------  |11 |12 |13 |14 |15 |16 |17 |
| Month : Jan, Feb.......Dec      |  |---|---|---|---|---|---|---|
| Date  : 01, 02, 03.....31       |  |18 |19 |20 |21 |22 |23 |24 |
| Year  : 1901, 1902.....2099     |  |---|---|---|---|---|---|---|
-----------------------------------  |25 |26 |27 |28 |29 |30 | 1 |
                                     |---|---|---|---|---|---|---|
                                     | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
                                     ----------------------------
   | ESC:Exit  |-|-:Sel  F2/F3:Color  PU/PD:Modify |
```

This screen is used for configuring the system. Use the [↑], [↓], [←], [→] keys to move the cursor, and (PAGE UP), (PAGE DOWN) keys to modify the values.

Item		Valid Choices
Date:	Month Date Year	Jan - Dec 1-31 1900-2000
Time:	Hour Minute Second	0-23 0-59 0-59
Daylight saving:	Enable or Disable	
Hard disk C: and D:	Standard Type 1-46 or User Type 47 or Not Installed	
Floppy drive A: and B:	360KB 5 1/4" 1.2MB 5 1/4" 720KB 3 1/2" 1.44MB 3 1/2" 2.88MB 3 1/2" Not Installed	
Primary display:	Monochrome Color 40x25 Color 80x25 VGA/PGA/EGA Not Installed	
Keyboard:	Installed or Not Installed	

After finishing with the STANDARD CMOS SETUP, the user can return to the BIOS SETUP UTILITIES menu by pressing (ESC) key.

3.3 ADVANCED CMOS SETUP

Select ADVANCED CMOS SETUP. The user will be given a warning message. Press [ENTER] key to get the following screen:

```
        BIOS SETUP PROGRAM - ADVANCED CMOS SETUP
  (C) 1990 American Megatrends Inc., All Rights Reserved

Above 1MB memory test          : Disable
System boot up Num lock        : ON
Numeric processor test         : Enable
Floppy drive seek at boot      : Enable
System boot up sequence        : A:,C:
External cache memory          : Enable
Password checking option       : Setup
Video ROM shadow               : Enable
System ROM shadow              : Enable
Boot sector virus protection   : Disable

|ESC:Exit |-|-:Sel (Ctrl)PU/PD:Modify F1:Help F2/F3:Color|
|F5:Old Value F6:BIOS Setup Defaults F7:Power-on Defaults|
```

If this is the first time using the ADVANCED CMOS SETUP or if the *Power-On* default configuration was loaded, the user must press (F6) and (Y) to load the *BIOS Setup* default configuration. Otherwise the system may not work at its maximum performance.

Item	Valid Choices	Explanation
Above 1MB memory test:	Enable or Disable	Executes the POST memory routines on the RAM above 1MB. If disable, the BIOS only checks the 1MB of RAM.
System Boot Up Num Lock:	On Off	Turn on Num Lock when system boots up. Do not turn on Num Lock when system boots up.
Numeric processor test:	Enable or Disable	This option specifies if a math. coprocessor is configured.
Floppy drive seek at boot:	Enable or Disable	This option performs a seek on floppy drive A: or B: at system boot. Some faster boot if select Disable.
System Boot Up Sequence:	A:, C: C:, A:	Boot from floppy first. Boot from hard disk first.
External cache Memory:	Enable or Disable	Enable the caching function. Disable the caching function.

Password Checking Option:	Setup Always	Prompt for password only when running SETUP. Prompt for password every time it boots.
Video ROM shadow:	Disable or Enable	Disalbe or Enable the shadow function of video BIOS.
System ROM Shadow:	Disable or Enable	Disable or Enable the shadow function of system BIOS.
Boot Sector Virus Protection:	Enable or Disable	Enable the virus protection function. Disable the virus protection function.

WARNING

If the user enables *Password Checking* function and then forgets the password, the user will not be able to access the system at all until the CMOS memory is cleared. So the user must remember the password.

After finishing with the ADVANCE CMOS SETUP, the user can return to the BIOS SETUP UTILITIES menu by pressing (ESC) key.

3.4 ADVANCED CHIPSET SETUP

Select ADVANCED CHIPSET SETUP. The user will be given a warning message. Press [ENTER] key to get the following screen:

```
          BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP
   (C) 1993 American Megatrends Inc., All Rights Reserved

Auto configuration function  : Enable
CPU Frequency Select         : 50MHz
SRAM Read Burst Control      : 3-2-2-2
SRAM Write Wait States       : 1WS
DRAM Write Wait States       : 1WS
DRAM Read Wait States        : 3WS
RAS precharge time           : 3SYSCLK
System BIOS is cacheable     : Disable
Video BIOS is cacheable      : Disable
Cacheable range              : 128MB

|ESC:Exit |-|-:Sel (Ctrl)PU/PD:Modify F1:Help F2/F3:Color|
|F5:Old Value F6:BIOS Setup Defaults F7:Power-on Defaults|
```

If this is the first time using the ADVANCED CMOS SETUP or if the *Power-On* default configuration was loaded, the user must press (F6) and (Y) to load the *BIOS Setup* default configuration. Otherwise the system may not work at its maximum performance.

Item	Valid Choices	Explanation
Auto configuration function	Enable Disable	Auto take care the speed & wait state setting. System running follow your setting of CPU speed & memory wait state.
CPU Frequency Select:	25MHz 33MHz 40MHz 50MHz	For 25MHz or DX2-50MHz system. For 33MHz or DX2-66MHz system For 40MHz system. For systems with 50MHz.
SRAM Read Burst Control:	2111 3111 3222	For 20MHz or 25MHz systems. For 33MHz systems. For 40MHz/50MHz systems.
SRAM Write Wait States:	0WS 1WS	For systems with 33MHz or slower. For systems with 40/50MHz or faster.
DRAM Write Wait State:	0WS 1WS	For systems with 33MHz or slower. For systems with 40/50MHz or faster.
DRAM Read Wait State:	0WS 1WS 2WS 3WS	Recommended for 25MHz system. Recommended for 33MHz system. Recommended for 40MHz system. Recommended for 50MHz system.
RAS Precharge Time:	2SYSCLK 3SYSCLK	Default is 3SYSCLK.
System BIOS is Cacheable:	Enable Disable	Allow System BIOS to be cached. Do not allow System BIOS to be cached
Video BIOS is Cacheable:	Enabled Disabled	Allow Video BIOS to be cached. Do not allow Video BIOS to be cached.
Cacheable Range:	4MB to 128MB	Setting system memory cacheable range.

After finishing with the ADVANCED CHIPSET SETUP, the user can return to BIOS SETUP UTILITIES menu by pressing (ESC) key.

3.5 AUTO CONFIGURATION SETUP

The user can use AUTO CONFIGURATION function to load the *BIOS Setup* or *Power-On* default configuration. The *BIOS Setup* default configuration yields the best system performance. Therefore, you can load the *BIOS Setup* default configuration instead of setting up the ADVANCED CMOS SETUP and ADVANCED CHIPSET SETUP.

3.6 HARD DISK UTILITY

This selection is to perform a low level formatting of the hard disk. The disk drive information is taken from the STANDARD CMOS SETUP. If the user wants to change the disk drive type, he must go to STANDARD CMOS SETUP

and change the drive type.

If the user has 2 disks installed, he will be asked which disk to format (C or D).

3.7 CHANGE PASSWORD

The new BIOS has a password feature in it. The user will be asked for the password either during every boot or entering the setup program or never. (See ADVANCED CMOS SETUP about enabling password checking.)

To change the password, the user selects CHANGE PASSWORD. The user will be prompted for the Current Password. Enter the current password. Only when the current password matches, will the user be prompted for the New Password. Enter the new password. The system will then prompt for Re-enter New Password. Enter the new password again. This is to make sure you did not miss type the first time. The password is limited to 8 characters in length.

After entering the password correctly, the BIOS will give the user a message "NEW Password Installed". However, the new password will not take effect until it is written into CMOS. If the user exits the setup program without writing to CMOS, then the old password remains in effect.

3.8 ENDING BIOS SETUP & BOOTING OS

After setting all the configurations, the user can exit the setup program by selecting WRITE TO CMOS AND EXIT and press (Y). If the user decides not to change the configuration, then he can exit the setup program by selecting DO NOT WRITE TO CMOS AND EXIT and press (Y).

SECTION 4: TECHNICAL INFORMATION

4.1 ISA BUS PIN OUT

I/O	SIGNAL	B#	A#	SIGNAL	I/O
-	GND	B1	A1	/IOCHCK	I
O	RSTDRV	B2	A2	SD7	I/O
-	+5V	B3	A3	SD6	I/O
I	IRQ9	B4	A4	SD5	I/O
-	-5V	B5	A5	SD4	I/O
I	DRQ2	B6	A6	SD3	I/O
-	-12V	B7	A7	SD2	I/O
I	/0WS	B8	A8	SD1	I/O
-	+12V	B9	A9	SD0	I/O
-	GND	B10	A10	IOCHRDY	I/O
O	/SMEMW	B11	A11	AEN	O
O	/SMEMR	B12	A12	SA19	I/O
O	/IOW	B13	A13	SA18	I/O
O	/IOR	B14	A14	SA17	I/O
O	DACK3	B15	A15	SA16	I/O
I	DRQ3	B16	A16	SA15	I/O
O	/DACK1	B17	A17	SA14	I/O
I	DRQ1	B18	A18	SA13	I/O
I/O	/MEMREF	B19	A19	SA12	I/O
O	SYSCLK	B20	A20	SA11	I/O
I	IRQ7	B21	A21	SA10	I/O
I	IRQ6	B22	A22	SA9	I/O
I	IRQ5	B23	A23	SA8	I/O
I	IRQ4	B24	A24	SA7	I/O
I	IRQ3	B25	A25	SA6	I/O
O	/DACK2	B26	A26	SA5	I/O
O	TC	B27	A27	SA4	I/O
O	BUSALE	B28	A28	SA3	I/O
-	+5V	B29	A29	SA2	I/O
O	OSC	B30	A30	SA1	I/O
-	GND	B31	A31	SA0	I/O
I	/MEMCS16	D1	C1	/SBHE	I/O
I	/IOCS16	D2	C2	LA23	I/O
I	IRQ10	D3	C3	LA22	I/O
I	IRQ11	D4	C4	LA21	I/O
I	IRQ12	D5	C5	LA20	I/O
I	IRQ15	D6	C6	LA19	I/O
I	IRQ14	D7	C7	LA18	I/O
O	/DACK0	D8	C8	LA17	I/O
I	DRQ0	D9	C9	/MEMR	O
O	/DACK5	D10	C10	/MEMW	O
I	DRQ5	D11	C11	SD8	I/O
O	/DACK6	D12	C12	SD9	I/O
I	DRQ6	D13	C13	SD10	I/O
O	/DACK7	D14	C14	SD11	I/O
I	DRQ7	D15	C15	SD12	I/O
-	+5V	D16	C16	SD13	I/O
I	/MASTER	D17	C17	SD14	I/O
-	GND	D18	C18	SD15	I/O

4.2 VESA LOCAL BUS PIN OUT:

SIGNAL	F#	E#	SIGNAL
DAT00	F1	E1	DAT01
DAT02	F2	E2	DAT03
DAT04	F3	E3	GND
DAT06	F4	E4	DAT05
DAT08	F5	E5	DAT07
GND	F6	E6	DAT09
DAT10	F7	E7	DAT11
DAT12	F8	E8	DAT13
VCC(+5V)	F9	E9	DAT15
DAT14	F10	E10	GND
DAT16	F11	E11	DAT17
DAT18	F12	E12	VCC(+5V)
DAT20	F13	E13	DAT19
GND	F14	E14	DAT21
DAT22	F15	E15	DAT23
DAT24	F16	E16	DAT25
DAT26	F17	E17	GND
DAT28	F18	E18	DAT27
DAT30	F19	E19	DAT29
VCC(+5V)	F20	E20	DAT31
ADR31	F21	E21	ADR30
GND	F22	E22	ADR28
ADR29	F23	E23	ADR26
ADR27	F24	E24	GND
ADR25	F25	E25	ADR24
ADR23	F26	E26	ADR22
ADR21	F27	E27	VCC(+5V)
ADR19	F28	E28	ADR20
GND	F29	E29	ADR18
ADR17	F30	E30	ADR16
ADR15	F31	E31	ADR14
VCC(+5V)	F32	E32	ADR12
ADR13	F33	E33	ADR10
ADR11	F34	E34	ADR08
ADR09	F35	E35	GND
ADR07	F36	E36	ADR06
ADR05	F37	E37	ADR04
GND	F38	E38	WBACK#
ADR03	F39	E39	BE0#
ADR02	F40	E40	VCC(+5V)
N/C	F41	E41	BE1#
RESET#	F42	E42	BE2#
D/C#	F43	E43	GND
M/IO#	F44	E44	BE3#
W/R#	F45	E45	ADS#
RDYRTN#	H1	G1	LRDY#
GND	H2	G2	LDEV<x>#
IRQ9	H3	G3	LREQ<x>#
BRDY#	H4	G4	GND
BLAST#	H5	G5	LGNT<x>#
ID0	H6	G6	VCC(+5V)
ID1	H7	G7	ID2
GND	H8	G8	ID3
LCLK	H9	G9	ID4
VCC(+5V)	H10	G10	LKEN#
LBS16#	H11	G11	LEADS#

4.3 I/O ADDRESS MAP

Address	Device
000 - 01F	DMA Controller (MASTER)
020 - 03F	Interrupt Controller (MASTER)
040 - 05F	Timer / Counter
060 - 06F	Keyboard Controller
070 - 07F	Clock / Calendar Port and CMOS Port
080 - 09F	DMA Register
0A0 - 0BF	Interrupt Controller (SLAVE)
0C0 - 0DF	DMA Controller (SLAVE)
0F0 - 0FF	Math Coprocessor
1F0 - 1F8	Hard Disk Controller
278 - 27F	Parallel Port 2
2B0 - 2DF	Graphics Adapter Controller
2F8 - 2FF	Serial Port 2
360 - 36F	Network Ports
378 - 37F	Parallel Port 1
3B0 - 3BF	Monochrome and Printer Adapter
3C0 - 3CF	EGA Adapter
3D0 - 3DF	CGA Adapter
3F0 - 3F7	Floppy Disk Controller
3F8 - 3FF	Serial Port 1

4.4 INTERRUPT CONTROLLER

Interrupt	Used by
0	System Timer interrupt
1	Keyboard controller
2	Cascade for IRQ 8 to 15
3	Serial port 2
4	Serial port 1
5	Parallel port 2
6	Floppy Disk controller
7	Parallel port 1
8	Clock/Calender
9	Available
10	Available
11	Available
12	Available
13	Math Coprocessor
14	Available
15	Available

4.5 DMA CONTROLLER

DMA Channel	Used by
0	Available
1	IBM SDLC
2	Floppy Disk Adapter
3	Available
4	Cascade for DMA Controller 1
5	Available
6	Available

7	Available

4.6 AMI BIOS HARD DISK TYPE

TYPE	CYLINDERS	HEADS	SECTOR	CAPACITY
1	306	4	17	10MB
2	615	4	17	20MB
3	615	6	17	31MB
4	940	8	17	64MB
5	940	6	17	48MB
6	615	4	17	21MB
7	462	8	17	31MB
8	733	5	17	31MB
9	900	15	17	115MB
10	820	3	17	21MB
11	855	5	17	36MB
12	855	7	17	51MB
13	306	8	17	21MB
14	733	7	17	44MB
15	-	-	-	-
16	612	4	17	21MB
17	977	5	17	42MB
18	977	7	17	58MB
19	1024	7	17	61MB
20	733	5	17	31MB
21	733	7	17	42MB
22	733	5	17	31MB
23	306	4	17	10MB
24	925	7	17	56MB
25	925	9	17	72MB
26	754	7	17	46MB
27	754	11	17	72MB
28	699	7	17	42MB
29	823	10	17	71MB
30	918	7	17	55MB
31	1024	11	17	98MB
32	1024	15	17	133MB
33	1024	5	17	44MB
34	612	2	17	10MB
35	1024	9	17	80MB
36	1024	8	17	71MB
37	615	8	17	42MB
38	987	3	17	25MB
39	987	7	17	60MB
40	820	6	17	42MB
41	977	5	17	42MB
42	981	5	17	42MB
43	830	7	17	50MB
44	830	10	17	72MB
45	917	15	17	115MB
46	1224	15	17	152MB
47	User Definable			

A. ON BOARD JUMPER INSTALLATION

1. Check the CPU type then setup the following jumpers :

	JP2	JP3	JP4
CPU : 80486DX	1-2 & 3-4	2-3	OPEN
CPU : 80486SX	2-3	OPEN	OPEN
CPU : 80487SX or P24T/C	1-2 & 3-4	1-2	SHORT

2. Check the CPU brand then setup jumper JP2A :

	Intel or AMD	Cyrix (M6/M7)
JP2A	1 - 2	2 - 3

3. Check the Cache Memory size then set the following jumpers :

SIZE	JP7	JP8	BANK-0 U6,U7 U8,U9	BANK-1 U10,U11 U12,U13	TAG RAM U4
64KB	2 - 3	2 - 4	8Kx8	8Kx8	8Kx8
128KB	1 - 2	2 - 3	32Kx8	none	8Kx8
256KB	1 - 2	1 - 2	32Kx8	32Kx8	32Kx8

4. Set the following jumpers :

	(25MHz) DX/SX -25 or DX2-50	(33MHz) DX/SX -33 or DX2-66	(40MHz) DX/SX -40	(50MHz) DX -50
JP36	SHORT	SHORT	OPEN	OPEN
JP37	1-2	2-3	1-2	2-3
JP38	2-3	1-2	2-3	1-2
JP72	SHORT	OPEN	OPEN	OPEN
ID2 & ID3	OPEN	OPEN	SHORT	SHORT
JP33	2-4	2-4	2-3	1-2
JP5/5A	2-3 / 4-5	2-3 / 4-5	1-2 / 3-5	1-2 / X

NOTE: If 2 local bus cards were used on board, or if the system is running at 50/66 MHz speed, the user should add a cooling fan on the CPU. Then the system will be more stable.

In order to run different frequencies correctly, we recommend the MEMORY WAIT STATE SETUP in ADVANCED CHIPSET SETUP of BIOS be set as follow :

	25MHZ*	33MHZ**	40MHZ	50MHZ
Auto config. func.	Enable	Enable	Enable	Enable
CPU frequency	25	16/33	40	50
SRAM read burst	2111	3111	3222	3222
SRAM write wait	0	0	1	1
DRAM write wait	0	1	1	2
DRAM read wait	0	1	2	3
RAS precharge	2	3	3	3

* This column is for 486DX-25, 486SX-25, 486DX2-50 CPU.

** This column is for 486SX-33, 486DX-33, 486DX2-66 CPU.

C : BOARD LAYOUT & JUMPER LOCATION