

SQ578 Pentium PCI

Mainboard

User's Manual

User's Notice

Static Electricity Precaution

Static electricity can easily damage your SQ578 mainboard. Observing a few basic precautions can help you safeguard against damage that could result in expensive repairs. Follow the simple measures below to protect your equipment from static electricity damage:

Keep the mainboard and other system components in their anti-static packaging until you are ready to install them.

Touch a grounded surface before you remove any system component from its protective anti-static packaging. Unpacking and installation should be done on a grounded, anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same points as the anti-static mat.

After removing the mainboard from its original packing, only place it on a grounded, anti-static surface component side up. Immediately inspect the board for damage. Due to shifting during shipping, it is suggested that the installer press down on all of the socket IC's to ensure they are properly seated. Do this only with the board placed on a firm flat surface.

During configuration and installation, touch a grounded surface frequently to discharge any static electrical charge that may have built up in your body. The best precaution is to wear a grounded wrist strap. When handling the mainboard or an adapter card avoid touching its components. Handle the mainboard and adapter cards either by the edges or by the adapter card's case mounting bracket.

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1 Introduction

1.1 Overview

The SQ578 mainboard integrates the Pentium microprocessor, memory, and I/O technologies and is designed to fit into a standard AT form factor chassis. The design supports Pentium processors, Pentium processors with MMX technology, Cyrix 6X86/6X86L/MX Processors, IDT-C6 Processors, and AMD K5/K6 Processors. Page 2-2 illustrates the mechanical form factor for the SQ578 mainboard.

1.2 How to use this Manual

This manual provides information necessary to install and operate the SQ578 mainboard and is organized into five chapters. The purpose of this manual is to explain the installation procedures and operations of the mainboard as specified below.

1. Introduction Manual information and checklist
2. Key Features An overview specification of this mainboard
3. Installation Preview Instructions on how to setup the mainboard
4. BIOS Setup BIOS software setup information
5. VGA Installation (Option) On Board VGA Feature information

1.3 Item Checklist

The SQ578 mainboard should contain following items (✓). Immediately, contact your retailer if you discover any missing items, or any damage.

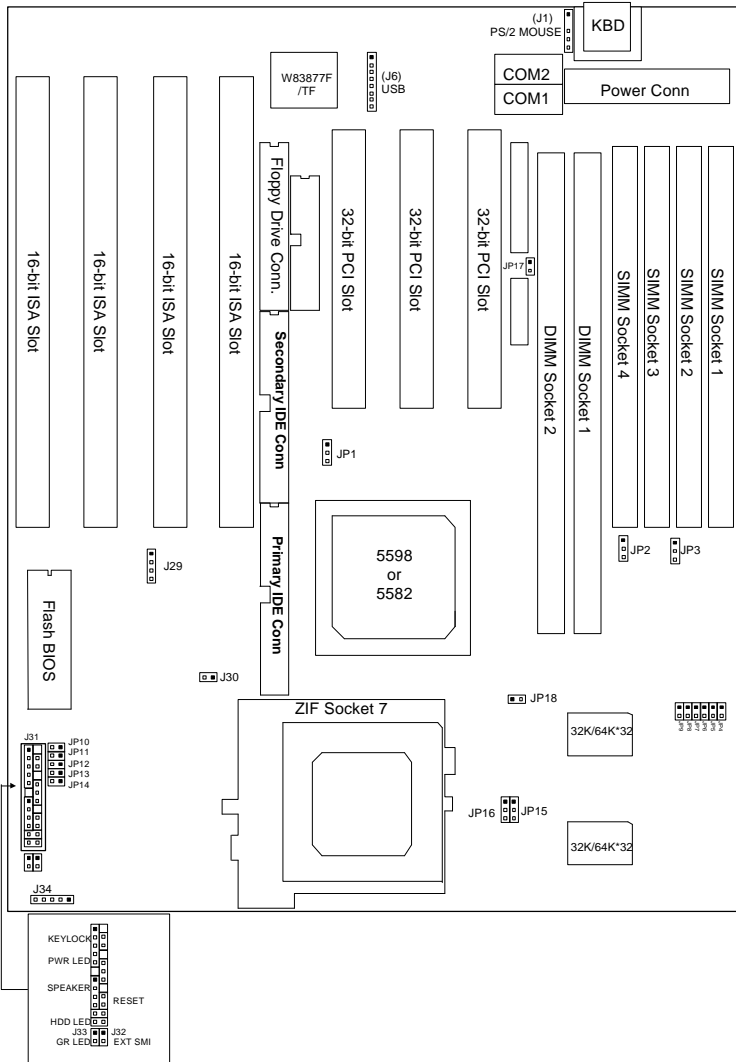
- The SQ578 mainboard
- This SQ578 user's manual
- 1 IDE ribbon cable
- 1 floppy ribbon cable
- 1 parallel ribbon cable and PS/2 mouse cable with mounting bracket
- 2 serial ribbon cable attached to a mounting bracket
- 1 VGA ribbon cable attached to a mounting bracket(optional)
- USB (2 port) cable with bracket (optional)
- Infrared (IrDA) module with ribbon cable (optional)

2 Key Features

2.1 Product Specification

- ✧ **Processor:** Supports 75-300MHz Pentium family: Intel P54C, Pentium Processors with MMX Technology (P55C), AMD-K5, AMD-K6 Cyrix 6X86, 6X86L, 6X86MX and IDT-C6 Processors. The ZIF Socket 7 will support future Pentium Overdrives.
- ✧ **L2 Cache:** Onboard 256KB or 512KB Pipeline Burst SRAM
- ✧ **SIMM (System Memory):** Supports 70ns or faster Extended Data Output (EDO) or Fast Page (FP) SIMM in four 72-pin SIMM sockets using 4MB, 8MB, 16MB, 32MB or 64MB for a maximum of 256MB system memory.
- ✧ **DIMM (System Memory):** Supports 66MHz or faster unbuffer 2 or 4 clock 3.3V DIMM in two 168-pin DIMM sockets using 8, 16, 32, 64 or 128 for a maximum of 256MB system memory.
- ✧ **Chipset:** Features SiS 5598 Pentium Single chip Integrated VGA or SiS 5582 Pentium Single chip without VGA, with a Winbond 83877F/TF super I/O controller chip.
- ✧ **Super VGA(option):** To provide a compact video and graphics solution for PC based system, high performance 3-in-1 PCI true-color graphics accelerator with video accelerate functions, supports **DCI Drivers** and **Direct Draw 3D Drivers**, video overlay for any graphic modes. Real-Magic MPEG API compatible. Supports DDC1 And DDC2B specifications.
- ✧ **Expansion Slots:** Three 32-bit PCI and Four 16-bit ISA expansions slots.
- ✧ **Super Multi-I/O:** Two high-speed UART compatible serial ports and One parallel port with ECP and EPP compatibility. One FDD header supporting either 5.25" or 3.5" (1.2 or 1.44/2.88MB) floppy drives. One IrDA TX/RX infrared port.
- ✧ **Keyboard and PS/2 Mouse:** Onboard Standard AT Keyboard and PS/2 Mouse Port
- ✧ **PCI bus Master IDE Controller:** Onboard dual-channel PCI Bus Master IDE support 4 IDE devices. This controller supports PIO Mode 3 and Mode 4 with a data transfer rate up to 17MB per second. An Ultra DMA 33 (UDMA) supports data transfer rates up to 33 MB per second. Also supports LS120 Floppy Drive.
- ✧ **Universal Serial Bus (USB):** Two standard USB interface supports up to 48MHz and 127 peripheral devices.
- ✧ **PCI BIOS:** Win 95 Plug and Play with Green power saving support, APM 1.2 and DMI Support.
- ✧ **Mechanical:** Baby AT form factor 220 mm x 270 mm.

2.2 Mainboard Layout



3 Installation Preview

Before you install the SQ578 mainboard into the system chassis you may find it convenient to first configure the mainboard hardware. This section describes how to configure the jumper settings, install memory modules, and how to attach the various system components. Before using your computer you must review the following 7 steps:

1. Jumper settings
2. Installation of DRAM modules (SIMM or DIMM)
3. Installation of the CPU
4. Installation of expansion cards
5. Installation of IDE, I/O, VGA cables(Option) connection., and Power Supply connection
6. Installation of the Power Core to the System.
7. Setup of the system BIOS software

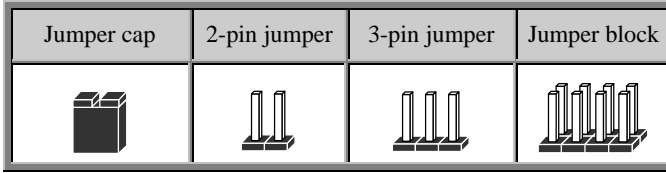
WARNING: When handling the system upgrade or plug in additional Add-On Card, please be sure your System is Power Off.

3.1 Jumper Settings

You can configure the hardware options by setting jumpers on the mainboard. A jumper is a set of two or more metal pins in a plastic base attached to the mainboard. A plastic “jumper cap” with a metal (conductive) plate inside fits over two pins to create an electrical contact or short between them. This contact establishes a hardware setting and is referred to as a “closed” jumper setting.

Some jumper have two pins while others may have three or more. Jumpers are sometimes combined into sets called jumper blocks where all the jumpers in the block must be set together to establish a hardware setting. In this manual, the jumper settings will be described graphically using a triangle (▲) always marking pin 1. Those jumpers with two pins will be shown as closed or open. A jumper is closed by placing the plastic jumper cap over the two jumper pins and is opened by removing the jumper cap. Some jumpers are oriented vertically and others horizontally with pin 1 marked as (▲=P1).

3.1.1 Jumpers, Jumper caps and Jumper blocks



3.1.2 Setting 3-pin jumpers



Jumper Pins 1 & 2 are closed with a jumper cap



Jumper Pins 2 & 3 are closed with a jumper cap

3.1.3 Setting 2-pin jumpers



This jumper is closed with the jumper cap placed over 2 pins



This jumper is open with the jumper cap removed from the 2 pins

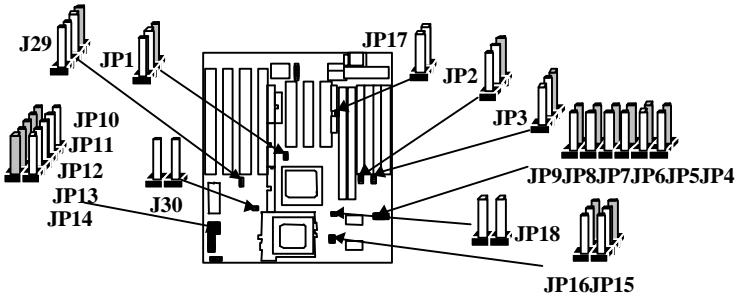
WARNING: Some pins are used for connectors or power sources. These are clearly marked separately from the jumpers listed in “Mainboard Layout”. Any improper placing of jumper caps over these connectors will result in damage to your mainboard

3.1.4 Configuration Jumpers

Jumpers

- | | |
|---|-----------------------------------|
| 1) JP10, JP11, JP12, JP13, JP14, JP15, JP16 | Processor voltage selection |
| 2) JP4, JP5, JP6, JP7, JP8, JP9 | Processor/System speed setting |
| 3) JP1 | CMOS Selection |
| 4) JP3, JP17 (Option) | On board VGA Selection |
| 5) JP18 | CYRIX LINEAR BURST MODE Selection |
| 6) JP2 | DIMM Voltage Selection |

The Jumper located As below:



3.1.5 Processor Voltage Setting (JP10,JP11,JP12,JP13,JP14,JP15, and JP16)































The Pentium P54C/P55C, Cyrix 6x86L/6X86MX, IDT-C6 , AMD-K5/K6 processors have various voltage choices depending on the CPU suppliers. These jumpers provide a way to select the different types of voltage .





































Processor Voltage	JP16	JP15	JP14	JP13	JP12	JP11	JP10
V _{CORE} =3.52V V _{I/O} =3.52V							
V _{CORE} =3.38V V _{I/O} =3.38V							
V _{CORE} =3.2V V _{I/O} =3.3V							
V _{CORE} =2.9V V _{I/O} =3.3V							
V _{CORE} =2.8V V _{I/O} =3.3V							
V _{CORE} =2.1V V _{I/O} =3.3V							





























































3.1.6 Processor/System Speed setting (JP4, JP5, JP6, JP7, JP8,JP9)

























The system speed depends upon the frequency of the CLOCK GENERATOR which is determined by jumpers. These jumpers tell the system what speed to run at. Currently, this mainboard speed range is from 75MHz to 300MHz. The CPU input frequency must match the frequency of CLOCK GEN or it will cause the system to malfunction. For example, setting a 90MHz CPU to run at 133MHz will cause the system to malfunction.

Intel /AMD CPU setting	JP9	JP8	JP7	JP6	JP5	JP4
75MHz (50MHz x 1.5)						
90MHz (60MHz x 1.5)						
100MHz (66MHz x1.5)						
120MHz (60MHz x 2.0)						
133MHz (66MHz x 2.0)						
150MHz (60MHz x 2.5)						
166MHz (66MHz x 2.5)						
200MHz (66MHz x 3)						
233MHz (66MHz x 3.5)						
266MHz (66MHz x4)						
300MHz (66MHz x4.5)						

Cyrix CPU Setting 6X86 & 6X86L	JP9	JP8	JP7	JP6	JP5	JP4
PR120+ (50MHz x 2.0)						
PR133+ (55MHz x 2.0)						
PR150+ (60MHz x 2.0)						
PR166+ (66MHz x 2.0)						
PR200+ (75MHz x 2.0)						



Cyrix CPU Setting 6X86 MX	JP9	JP8	JP7	JP6	JP5	JP4
PR133 (50MHz x 2.0)						
PR133 (55MHz x 2.0)						
PR150 (60MHz x 2.0)						
PR150 (50MHz x 2.5)						
PR166 (66MHz x 2.0)						
PR166 (55MHz x2.5)						

Cyrix CPU Setting 6X86 MX	JP9	JP8	JP7	JP6	JP5	JP4
PR166 (50MHz x3.0)						
PR166 (60MHz x 2.5)						
PR200 (75MHz x 2.0)						
PR200 (55MHz x 3.0)						
PR200 (66MHz x 2.5)						
PR200 (60MHz x3.0)						
PR233 (75MHz x 2.5)						
PR233 (66MHz x 3.0)						
PR266 (66MHz x 3.5)						
PR266 (75MHz x3.0)						

IDT-C6 CPU setting	JP9	JP8	JP7	JP6	JP5	JP4
150MHz (50MHz x 3.0)						
150MHz (75MHz x 2.0)						
180MHz (60MHz x 3.0)						
200MHz (66MHz x 3.0)						





3.1.7 Clear CMOS (JP1)

The SQ578 has a Jumper JP1, which allows you to clear the CMOS memory, the CMOS memory maintains the system configuration information. Make sure this jumper is put on Pin1 and Pin2 for normal operation.

Normal operation	
Close for CMOS memory clear	



3.1.8 On Board VGA (JP3 and JP17) (Option)

The SQ578 has two jumpers JP3 and JP17, which allow you to Enable or Disable On board VGA.

	JP3	JP17
DISABLE		
ENABLE		


3.1.9 Cyrix Linear Burst MODE (JP18)

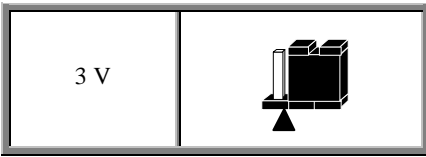
The SQ578 has a jumper JP18, which allow you to Enable L2 cache, running at linear burst Mode for Cyrix CPU. Make sure this jumper is open for normal operation for other kind of processors.

Interleaved Burst	
Linear Burst	

3.1.10 DIMM Vlotage (JP2)

The SQ578 has a jumper JP2 which allows you to set the Operation Vlotage for DIMM module. Make sure this jumper is put on Pin2 and 3 for normal operation.

5 V	
-----	---



3.2 Installation of DRAM modules (SIMM or DIMM)

3.2.1 SIMM (Single Inline Memory Module)

You can configure the system memory size in a variety of ways by using different combinations of the four 72-pin DRAM SIMM. The memory must be 70ns (nanoseconds) or faster using either Fast Page Mode or Extended Data Output (EDO) types. The memory table below shows the different memory size combinations available. Please pay attention to the following restrictions :

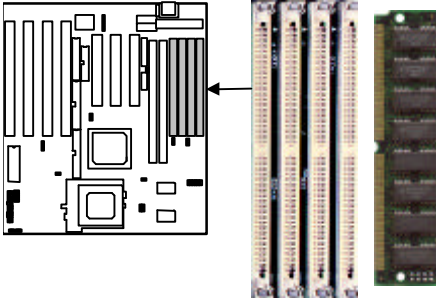
- 1) You must use one pair of sockets at a time in sequence (i.e. SIMM1 and SIMM2, or all four sockets at once).
- 2) ***Each pair of modules must be the same size and speed and may be single sided or double-side.*** Module sizes: Single-side SIMMs: 4MB, 8MB, 16MB; Double-side SIMMs: 8MB, 32MB, 64MB

3.2.2 SIMM Combinations

Total Memory (Slot 1-4)	Bank A (Slot 1 & 2)	Bank B (Slot 3 & 4)
8MB	4MBx2	None
16MB	8MBx2	None
32MB	16MBx2	None
64MB	32MBx2	None
16MB	4MBx2	4MBx2
24MB	4MBx2	8MBx2
40MB	4MBx2	16MBx2
72MB	4MBx2	32MBx2
24MB	8MBx2	4MBx2
32MB	8MBx2	8MBx2
48MB	8MBx2	16MBx2
80Mb	8MBx2	32MBx2
40MB	16MBx2	4MBx2
48MB	16MBx2	8MBx2
64MB	16MBx2	16MBx2
96MB	16MBx2	32MBx2
72MB	32MBx2	4MBx2
80MB	32MBx2	8MBx2
96MB	32MBx2	16MBx2

Total Memory (Slot 1-4)	Bank A (Slot 1 & 2)	Bank B (Slot 3 & 4)
128MB	32MBx2	32MBx2
128MB	64MBx2	None
256MB	64MBx2	64MBx2

3.2.3 Installation Procedure for SIMM



Insert SIMM into the SIMM sockets at a 45 degree angle.

- 1) PIN1 of the SIMM must match with the PIN1 of the SIMM socket.
- 2) The module will only insert into the socket one way. An orientation cut-out will prevent you from inserting it the wrong way.
- 3) Insert the SIMM into the SIMM socket at a 45 degree angle. If pin 1 of the SIMM does not line up with pin 1 of the socket, the SIMM will not insert into the socket. After inserting the SIMM module completely into the socket, push the SIMM module into a vertical position.
- 4) The module should click into place with the retaining clips at each end of the socket snapping behind the module to secure it.
- 5) To release the memory module push both retaining clips outwards and carefully rock the module forward.

IMPORTANT: Do not use SIMM that use an extra TTL chip to convert the memory module from asymmetrical to symmetrical.

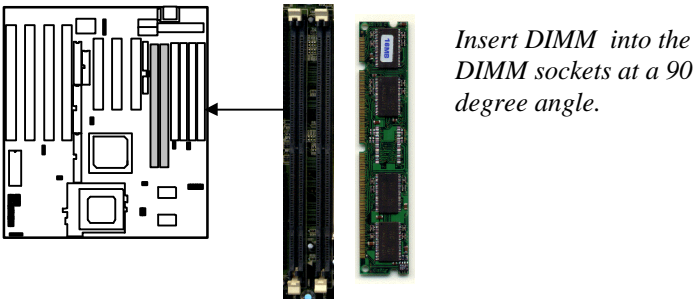
3.2.4 DIMM (Dual Inline Memory Modules)

The SQ578 mainboard features two 168-pin DIMM sockets with each supporting 8MB to 128MB of SDRAM/EDO using 1MBx64, 2MBx64, 4MBx64 and 8MBx64 DIMM (Asymmetrical single and double sided). The DRAM interfaces on a 64-bit wide, data path. Also supported is 3.3 or 5 volts 66.67Mhz unbuffered Synchronous DRAM (SDRAM) and 3.3V or 5V volts 60ns or faster unbuffered EDO DRAM. The EDO DRAM and SDRAM are defined below.

3.2.5 DIMM Combination

Total Memory (DIMM1 and DIMM2)	DIMM1	DIMM2
8MB	8MB	Empty
16MB	8MB	8MB
16MB	16MB	Empty
32MB	16MB	16MB
32MB	32MB	Empty
64MB	32MB	32MB
64MB	64MB	Empty
128MB	64MB	64MB
128MB	128MB	Empty
256MB	128MB	128MB

3.2.6 Installation Procedure for DIMM



- 1) Pin of the DIMM must match with pin 1 of the DIMM socket.
- 2) The module will only insert into the socket one way. An orientation cut-out will prevent you from inserting it the wrong way.
- 3) Insert the DIMM into the DIMM socket at a 90 degree angle. If pin 1 of the DIMM does not line up with pin 1 of the socket, the DIMM will not insert into the socket. After inserting the DIMM completely into the socket, push up on the socket latches securing the DIMM into place.
- 4) To release the memory modules, push both latches down and carefully rock the module forward

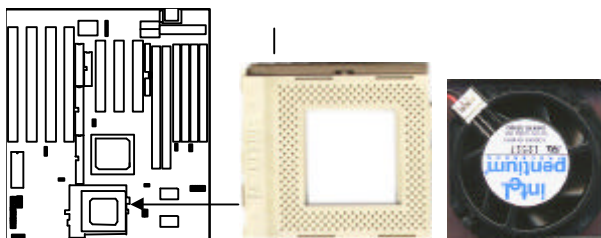
Important: Do not use DIMM which use an extra TTL to convert the memory module from asymmetric to symmetric.

3.3 Installation of the CPU

The SQ578 comes with a 321-pin ZIF socket 7 for installing the CPU. The Socket 7 will also support future Pentium up-grade processors. It is strongly recommended that a heatsink and CPU cooling fan be used to prevent the CPU from overheating. (Tip) Applying a thermal jelly between the CPU and the heatsink/fan will help cool the CPU.

To install a CPU, remember to take the following precautions against static electric discharge. The basic procedure is as follows:

NOTICE: When installing the CPU into the CPU socket, be sure that PIN 1 of the CPU is in the same corner as PIN 1 of socket. The CPU is an extremely sensitive electrical component and can be easily damaged by static electricity.



IMPORTANT: you must set jumpers JP10,JP11,JP12,JP13,JP14,JP15,JP16 to correct CPU Voltage.

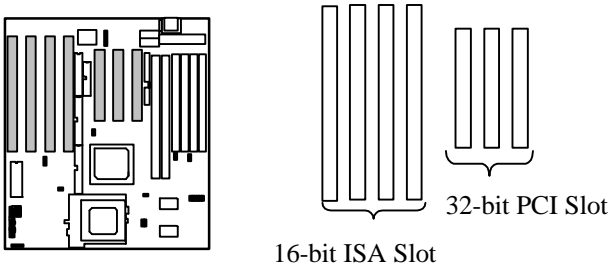
- 1) Turn off your system and disconnect the power source.
- 2) Remove the existing CPU from the ZIF socket by pulling the ZIF lever upwards at a 90 degree angle.
- 3) Insert the CPU with the correct orientation as shown below. Use the notched (white dot) corner of the CPU as your guide. The notch in the corner of the CPU should correspond with PIN 1 of the ZIF socket (Notice: Pin 1 is the blank corner of the ZIF socket with one hole missing).
- 4) Once the CPU is inserted close the socket's lever.

WARNING: Without a fan, the CPU can overheat and will cause damage to both the CPU and the SQ578 mainboard.

3.4 Installation of Expansion Slots

3.4.1 ISA & PCI Slots

There are two types of ISA expansion cards, design-Legacy and PnP (Plug & Play). For Legacy cards you must set the cards' jumpers manually. For Plug & Play cards, your system will adjust the IRQs automatically. You can verify the IRQ allocation either by using Microsoft's Diagnostic (MSD.EXE) utility which is in the Windows directory or through the Windows 95 resources menu.



3.4.2 Installation Procedure

The SQ578 has 7 expansion slots on-board. Four are 16-bit ISA Bus expansion connectors and Three are 32-bit PCI expansion slots. All three PCI expansion slots accept PCI Bus master cards and fully supported by PCI 2.1 specifications.

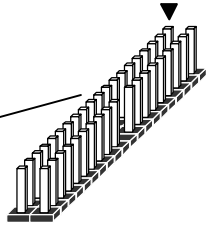
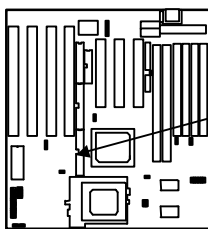
To install expansion cards, please read the expansion card's documentation, which shipped with the expansion card, for instructions.

NOTICE: Some expansion cards require an IRQ to work and may cause a conflict. There are total of 16 IRQs but only 6 are free for expansion cards. In case of a conflict please contact the system manufacturer for technical support.

3.5 Installation of IDE, I/O cables connection

3.5.1 Primary IDE Connector (40-pin block) (J28)

This connector supports two primary channel IDE devices via a ribbon cable. When two IDE devices are installed using the primary IDE connector make sure that the second IDE device is set to slave mode as indicated in the device's manual.

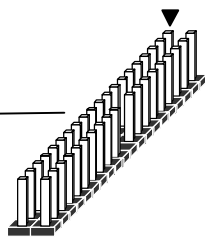
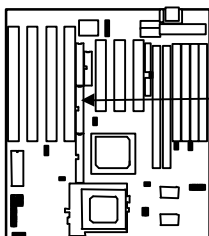


Pin	Signal Name	Pin	Signal Name
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DDRQ0 (DDRQ1)	22	Ground
23	I/O Write #	24	Ground
25	I/O Read #	26	Ground
27	IOCHRD	28	+5V V pull-up
29	DDACK0 (DDACK1) #	30	Ground
31	IRQ14 (IRQ15)	32	Reserved
33	Addr 1	34	Reserved
35	Addr 0	36	Addr 2
37	Chip Select 1P (1S) #	38	Chip Select 3P (3S)
39	Activity #	40	Ground

WARNING: When you connect a ribbon cable to these ports, you must orient the cable connector so that the PIN 1 edge of the cable is at the PIN 1 end of the on-board connector.

3.5.2 Secondary IDE Connector (40-pin block) (J26)

This connector supports two secondary channel IDE devices or 120MB Floppy drive (LS-120) via a ribbon cable. When two IDE devices are installed using the secondary IDE connector make sure that the second IDE device is adjusted to slave mode as instructed in the device's manual.

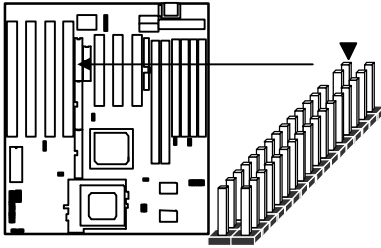


Pin	Signal Name	Pin	Signal Name
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DDRQ0 (DDRQ1)	22	Ground
23	I/O Write #	24	Ground
25	I/O Read #	26	Ground
27	IOCHRD	28	+5V V pull-up
29	DDACK0 (DDACK1) #	30	Ground
31	IRQ14 (IRQ15)	32	Reserved
33	Addr 1	34	Reserved
35	Addr 0	36	Addr 2
37	Chip Select 1P (1S) #	38	Chip Select 3P (3S)
39	Activity #	40	Ground

WARNING: When you connect a ribbon cable to these ports, you must orient the cable connector so that the PIN 1 edge of the cable is at the PIN 1 end of the on-board connector.

3.5.3 Floppy Drive Connector (34-pin block) (J21)

The FDC sub-system can control three types (1.2, 1.44, and 2.88MB) of floppy drivers or compatible tape drives. Connection to floppy drives is via a header (J21). The floppy disk interface includes 48mA drivers and Schmit inputs on the drive interface.

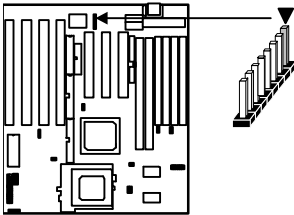


Pin	Signal Name	Pin	Signal Name
1	Ground	2	DENSEL
3	Ground	4	TP
5	Key	6	FDENIN#
7	Ground	8	FDINDX#
9	Ground	10	FDMO0#
11	Ground	12	FDDS1#
13	Ground	14	FDDS0#
15	Ground	16	FDMO1#
17	MSEN1	18	FDDIR#
19	Ground	20	FDSTEP#
21	Ground	22	FDWD#
23	Ground	24	FDWE#
25	Ground	26	FDTRK0#
27	MSEN0	28	FDWPD#
29	Ground	30	FDRDATA#
31	Ground	32	FDHEAD#
33	Ground	34	DSKCHG#

WARNING: When you connect a ribbon cable to this port, you must orient the cable connector so that the PIN 1 edge of the cable is at the PIN 1 end of the on-board port.

3.5.4 Universal Serial Bus (USB) Port(J6)

This SQ578 mainboard has two USB on-board header. USB devices provide a more convenient operating environment and improve data transferring capacity. True Plug-and-Play, this new bus technology will support over 127 different peripherals through a Hub.



Pin	Signal Name (USB1)	Pin	Signal Name (USB2)
1	+5V	5	+5V
2	USB0-	6	USB1-
3	USB0+	7	USB1+
4	Ground	8	Ground

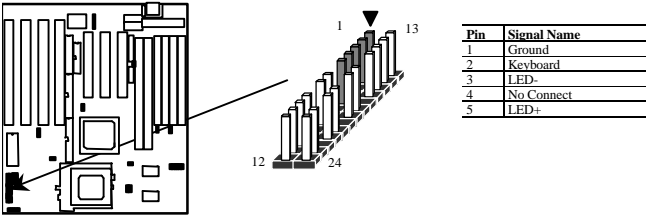
WARNING: When you connect a ribbon cable to these ports, you must orient the cable connector so that the PIN 1 edge of the cable is at the PIN 1 end of the on-board connector.

3.5.5 Power Input Connector (12-pin block) (J18)

This connector supports a standard AT power supply. When connecting, make sure the lock key matches the hook attached to a power supply cable. The power cord should be unplugged when you connect it.

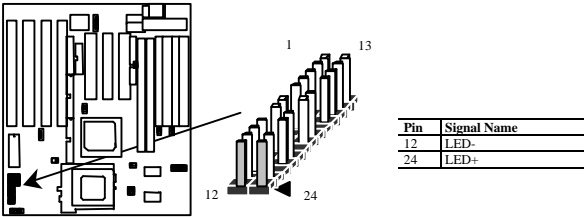
3.5.6 Keylock and Power_On LED Connector(5-Pin)(Pin1-5of J31)

The SQ578 supports one straight 5 pin header for connecting to front pannel keylock switch and Power LED indicator.



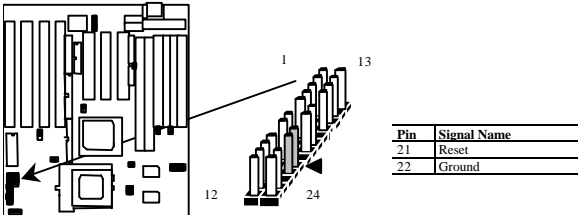
3.5.7 HDD LED Connector (2-pin)(Pin 12 and 24 of J31)

The SQ578 supports one straight 4 pin header for connecting to front panel Hard Disk activity LED indicator.



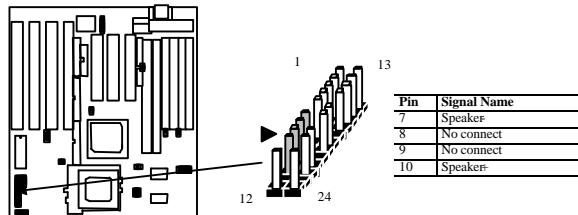
3.5.8 Reset Switch Connector (2-pin) (Pin 21 and 22 of J31)

This connector supports the front pannel case-mounted reset. It is advised that the reset switch be used for rebooting the system in order to extend the life of the system's power supply.



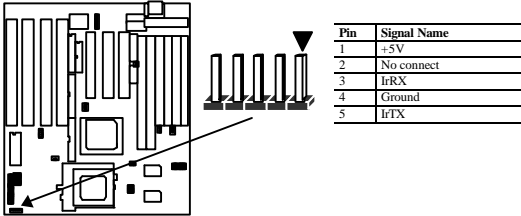
3.5.9 Speaker Connector (4-pin) (Pin 7-10 of J31)

A 1x4 straight header is available to drive a chassis-mounted speaker if desired.



3.5.10 IrDA connector (6-pin) (J34)

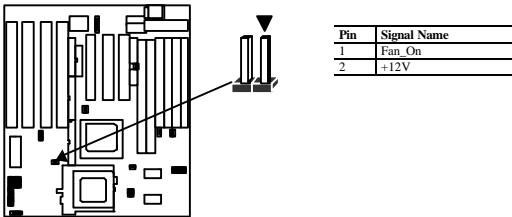
The SQ578 mainboard offers an IrDA function. The case must reserve space for the IR module if you want to use the IrDA function. This connector supports optional wireless transmission and reception of infrared data. The module mounts in a small opening on the system case that supports this feature. The efficient distance is 100cm and the transfer rate is 115,200 bits/sec.



IMPORTANT: You must configure this feature through the BIOS. The IrDA function is supported by the mainboard via a 5-pin connector, ribbon cable and IR Module.

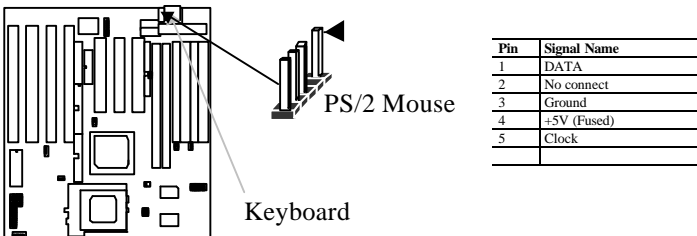
3.5.11 Fan Connector (J30)

This connector supports the power output for CPU fan.



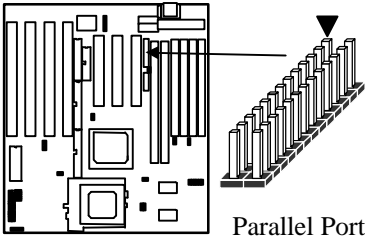
3.5.12 PS/2 Keyboard (J1) and Mouse Connector (J4)

The SQ578 mainboard offers 1 PS/2 Keyboard and 1 PS/2 Mouse port as below.



3.5.13 Parallel Port Connector (26-pin Block) (J22)

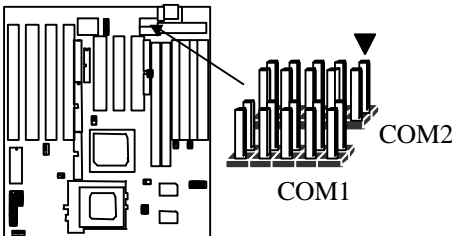
The motherboard includes a bi-directional parallel port (EPP/ECP compatible). The parallel port is capable of being disabled or remapped to either the secondary LPT address or the primary LPT address through BIOS if other parallel ports are installed. The parallel port contains 12mA source output drivers on the drive interface and incorporates Chip Protect circuitry for protection against damage due to printer's power being on.



Pin	Signal Name	Pin	Signal Name
1	STROBE#	14	AUTOFD#
2	DATA BIT 0	15	FAULT#
3	DATA BIT 1	16	PINIT#
4	DATA BIT 2	17	SLCT IN#
5	DATA BIT 3	18	Ground
6	DATA BIT 4	19	Ground
7	DATA BIT 5	20	Ground
8	DATA BIT 6	21	Ground
9	DATA BIT 7	22	Ground
10	ACK#	23	Ground
11	BUSY	24	Ground
12	PEERROR	25	Ground
13	SLCT		

3.5.14 Serial Port (J5/J9)

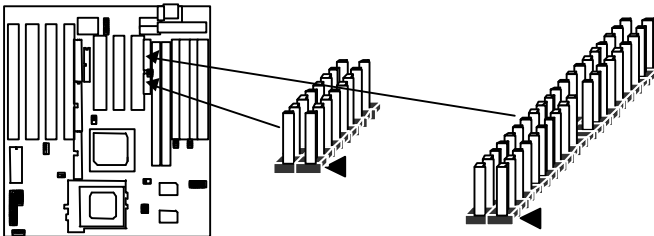
The SQ578 has two serial ports. The electrical characteristics are compliant with the EIA-232-D Serial Communications Specifications. The serial ports may be remapped above other installable serial ports or disabled through the BIOS.



Pin	Signal Name
1	DCD
2	TXD
3	RXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

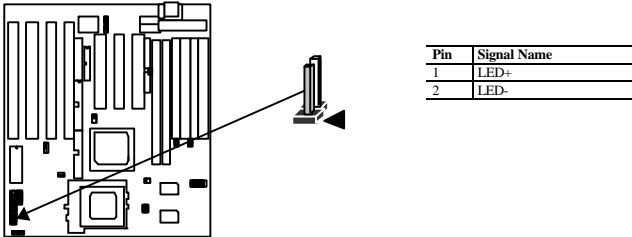
3.5.15 VGA (J27) & Feature Connector (J25) (option)

This SQ578 mainboard has Super VGA onboard. This connector supports the VGA output via a ribbon cable. Connect the VGA ribbon cable to this connectors and mount the bracket to the back of the case.



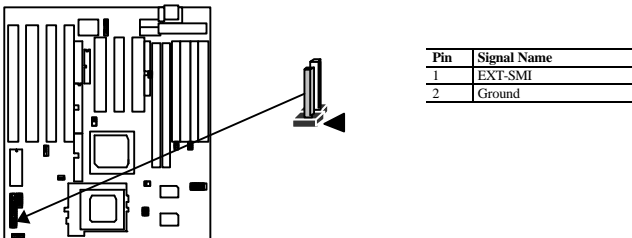
3.5.16 Green LED (J33)

This connector supports the case-mounted Green LED.



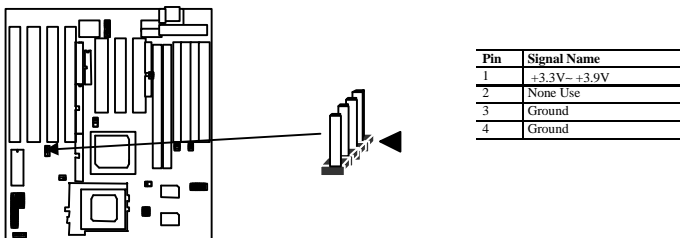
3.5.17 EXT-SMI Switch (2-Pin) (J32)

This connector supports the case-mounted suspend switch allowing you to manually place the system into a suspend mode or "Green" mode. During Green mode, the system activity will be decreased to save energy when the system is not in use. If you want to use this feature, the "Suspend Switch" in the Power Management Setup of the BIOS should be Enabled.



3.5.18 EXT Battery Connector (J29)

This connector allows you to install the auxiliary battery, while the onboard battery is expired.



4 BIOS Setup

The SQ578 mainboard uses an AMI BIOS, which is stored in a Flash EEPROM and which can be upgraded using a floppy disk-based program. The BIOS has a built-in Setup program that allows users to modify the basic system configuration setting. The settings are then stored in a dedicated batter-backed memory, called CMOS RAM , that retains the information when the power is turned off. The BIOS provides critical low-level support for the system central processing, memory, and I/O subsystems. The AMI BIOS has been customized by adding important, but nonstandard, features such as virus and password protection, power management, and detailed fine-tuning of the chipset controlling the system. The rest of this manual is intended to guide you through the process of configuring your system using Setup.

4.1 Starting Setup

The AMI BIOS is immediately activated when you first turn on the computer. The BIOS reads system configuration information in CMOS RAM and begins the process of checking out the system and configuring it through the power-on self test (POST). When these preliminaries are finished, the BIOS seeks an operating system on the of the data storage devices (hard drive, floppy drive, etc.). The BIOS launches the operating system and hands control of system operations to it.

To start Setup, press the key some time before or while a message similar to this appears briefly at the bottom of the screen during POST:

*Press **DEL** to enter **SETUP***

If the message disappears before you respond and you still wish to enter Setup, reboot the system to try again by turning the system OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not reboot, an error message will be displayed at the bottom of the screen and you will again be asked to,

Press **F1** to continue, **DEL** to enter **SETUP**

4.1.1 Setup Keys

These Keys help you navigate in Setup:

Keystroke	Function
<Tab>	Move to the next window or field.
→, ←, ↑, ↓	Move to the next field to the right, left, above, or below.
+	Increments of value.
-	Decrements of value.
<Esc>	Closes the current operation and return to previous level.
<PgUp>	Modify Value (item) up.
<PgDn>	Modify Value (item) down.
<Alt> <H>	Access a help window.
F2/F3	Change Color.
Alphabetic keys	A to Z are used in the Virtual Keyboard, and are not case-sensitive.
Numeric keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

4.1.2 Getting Help

AMI BIOS Setup Provides Help screens for Advanced Setup, Chipset Setup Power Management Setup, and Peripheral Setup.

4.1.3 In Case of Problems

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

You can invoke this override by immediately pressing Insert; when you restart your computer You can restart by either using the ON/OFF switch, the RESET button or by pressing Ctrl-Alt-Delete.

The best advice is to alter only settings that you thoroughly understand. In particular, do not change settings in the Chipset screen without a good reason. The Chipset defaults have been carefully chosen by AMI or your system manufacturer for the best performance and reliability. Even a seemingly small change to the Chipset setup may causing the system to become unstable.

4.2 Main Setup Menu

When you enter the AMI BIOS CMOS Setup Utility, a Main Menu (Figure 1) appears on the screen. The Main Menu allows you to select from several Setup functions and two exit choices. Use the arrow keys to select among the items and press Enter to accept and enter the sub-menu.

A brief description of each highlighted selection appears at the bottom of the screen.

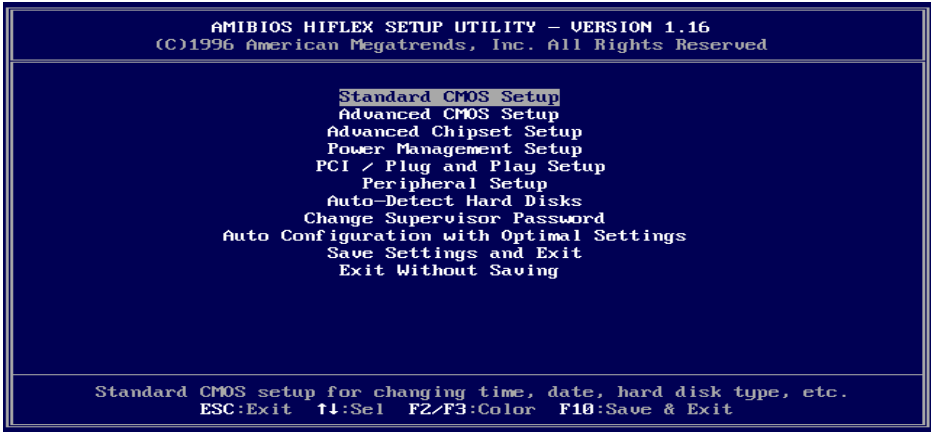


Figure 1

Following is a brief summary of each Setup category.

Type	Description
Standard CMOS	Options in the original PC AT-compatible BIOS.
Advanced CMOS	AMI enhanced BIOS options.
Advanced Chipset	Option specific to your system chipset.
Power Management	Advanced Power Management (APM) options.
PCI/Plug and Play	Plug and Play standard and PCI Local Bus configuration options.
Peripheral	I/O subsystems that depend on the integrated peripherals controller in your system.
Auto-Detect Hard Disks	Automatically detect and configure IDE hard disk parameters.
Change Supervisor Password	Change, set, or disable s password. The supervisor password permits access to Setup.
Auto Configuration with Optimal Setting	Setup defaults are factory settings for optimal-performance system operations.
Save Setting and Exit	Save settings in nonvolatile CMOS RAM and exit Setup
Exit Without Saving	Abandon all changes and exit Setup.

4.3 Standard CMOS Setup Menu

In the Standard CMOS Menu (Figure2) you can set the system clock and calendar, record disk drive parameters and the video subsystem type, and select the type of errors that stop the BIOS POST.

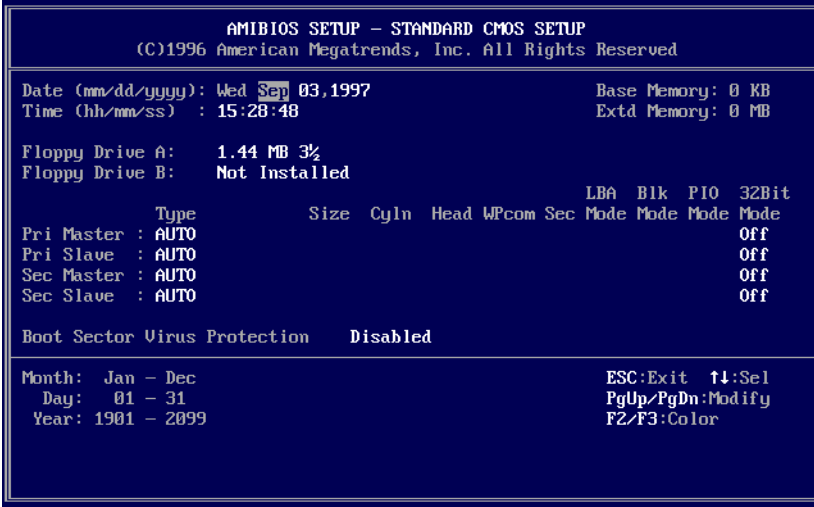


Figure 2

4.3.1 Date/Time

Select the Standard option. Select the Date and Time icon. The current values for each category are displayed. Enter new values through the keyboard.

4.3.2 Floppy Drive A: and B:

Move the cursor to these fields via - and $\bar{\text{~}}$ and select the floppy type. The settings are *360 KB 5 1/4 inch*, *1.2 MB 5 1/4 inch*, *720 KB 3 1/2 inch*, *1.44 MB 3 1/2 inch*, or *2.88 MB 3 1/2 inch*.

4.3.3 Hard Disk

Pri Master, Pri Slave, Sec Master, Sec Slave Select one of these hard disk drive icons to configure the hard disk drive named in the option. Select *Auto* from the drive parameters screen to let AMIBIOS automatically configure the drive. A screen with a list of drive parameters appears. Click on *OK* to configure the drive.

Drive Type	How to Configure
SCSI	Select <i>Type</i> . Select <i>Not Installed</i> in the drive parameter screen. The SCSI drivers provided by the SCSI drive or SCSI host adapter manufacturer should allow you to configure the SCSI drive.
IDE	<p>Select <i>Detect IDE</i> from the AMIBIOS Setup main screen to let AMIBIOS determine the parameters. AMIBIOS automatically configures the correct IDE parameters for all IDE hard disk drives attached to the primary and secondary IDE channels.</p> <p><i>To manually set IDE drive parameters:</i></p> <p>Select <i>LBA/Large Mode</i>. Select <i>On</i> if the drive has a capacity greater than 540 MB.</p> <p>Select <i>Block Mode</i>. Select <i>On</i> to allow block mode data transfers. <i>Make sure the IDE drive supports block mode. Data may be destroyed if block mode is selected but the IDE drive does not support block mode.</i></p> <p>Select <i>32-Bit Transfer</i>. Select <i>On</i> to allow 32-bit data transfers.</p> <p>Select the <i>PIO Mode</i>. It is best to select <i>Auto</i> to allow AMIBIOS to determine the PIO mode. If you select a PIO mode that is not supported by the IDE drive, the drive will not work properly. If you are absolutely certain that you know the drive PIO mode, select PIO mode 0 - 5, as appropriate.</p>
CD-ROM	Select <i>Type</i> . Select <i>CDROM</i> . Click on <i>OK</i> when AMIBIOS displays the drive parameters.
Standard MFM Drive	Select <i>Type</i> . You must know the drive parameters. Select the drive type that exactly matches your drive parameters.
Non-Standard MFM Drive	Select <i>Type</i> . If the drive parameters do not match the drive parameters listed for drive types 1 - 46, select <i>User</i> and enter the correct hard disk drive parameters.

Entering Drive Parameters You can also enter the hard disk drive parameters. The drive parameters are:

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.

Write Precompensation	The actual physical size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write precompensation circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number on the disk surface where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads normally park when the system is shut down.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drives have even more sectors per track.
Capacity	The formatted capacity of the drive is the number of heads times the number of cylinders times the number of sectors per track times 512 (bytes per sector).

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
1	306	4	128	305	17	10 MB
2	615	4	300	615	17	20 MB
3	615	6	300	615	17	31 MB
4	940	8	512	940	17	62 MB
5	940	6	512	940	17	47 MB
6	615	4	65535	615	17	20 MB
7	462	8	256	511	17	31 MB
8	733	5	65535	733	17	30 MB
9	900	15	65535	901	17	112 MB
10	820	3	65535	820	17	20 MB
11	855	5	65535	855	17	35 MB
12	855	7	65535	855	17	50 MB
13	306	8	128	319	17	20 MB
14	733	7	65535	733	17	43 MB
16	612	4	0	663	17	20 MB
17	977	5	300	977	17	41 MB
18	977	7	65535	977	17	57 MB
19	1024	7	512	1023	17	60 MB
20	733	5	300	732	17	30 MB
21	733	7	300	732	17	43 MB
22	733	5	300	733	17	30 MB
23	306	4	0	336	17	10 MB
24	925	7	0	925	17	54 MB
25	925	9	65535	925	17	69 MB
26	754	7	754	754	17	44 MB
27	754	11	65535	754	17	69 MB
28	699	7	256	699	17	41 MB
29	823	10	65535	823	17	68 MB
30	918	7	918	918	17	53 MB

31	1024	11	65535	1024	17	94 MB
32	1024	15	65535	1024	17	128 MB
33	1024	5	1024	1024	17	43 MB
34	612	2	128	612	17	10 MB
35	1024	9	65535	1024	17	77 MB
36	1024	8	512	1024	17	68 MB
37	615	8	128	615	17	41 MB
38	987	3	987	987	17	25 MB
39	987	7	987	987	17	57 MB
40	820	6	820	820	17	41 MB
41	977	5	977	977	17	41 MB
42	981	5	981	981	17	41 MB
43	830	7	512	830	17	48 MB
44	830	10	65535	830	17	69 MB
45	917	15	65535	918	17	114 MB
46	1224	15	65535	1223	17	152 MB
USER-DEFINED HARD DRIVE - Enter user-supplied parameters.						

4.3.4 Boot Sector Virus Protection

When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

4.3.5 Memory

You cannot change any values in the Memory fields; they are only for your information. The fields show the total installed random access memory (RAM) and amounts allocated to base memory, extended memory. RAM is counted in kilobytes (KB: approximately one thousand bytes) and megabytes (MB: approximately one million bytes).

RAM is the computer's working memory, where the computer stores programs and data currently being used, so they are accessible to the CPU. Modern personal computers may contain up to 64MB, 128MB, or more.

Base Memory

Typically 640 KB. Also called conventional memory. The DOS operating system and conventional applications use this area.

Extended Memory

Above the 1-MB boundary. Early IBM personal computers could not use memory above 1 MB, but current PCs and their software can use extended memory.

4.4 BIOS Features Setup Menu

This screen (Figure 3) contains industry-standard options additional to the core PC AT BIOS. This section describes all fields offered by AMI Software in this screen. Some fields may vary from those in your Setup program. Your system board designer may omit or modify some fields.

AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
1st Boot Device	FLOPPY	Available Options:
2nd Boot Device	IDE-0	Disabled
Quick Boot	Enabled	IDE-0
BootUp Num-Lock	On	IDE-1
Floppy Drive Swap	Disabled	IDE-2
Floppy Drive Seek	Disabled	IDE-3
PS/2 Mouse Support	Enabled	▶ FLOPPY
Typematic Rate	Fast	FLOPTICAL
Primary Display	VGA/EGA	CDROM
Password Check	Setup	SCSI
Boot To OS/2	No	NETWORK
External Cache	WriteBack	
System BIOS Cacheable	Enabled	
C000,16k Shadow	Cached	ESC:Exit ↑↓:Sel
C400,16k Shadow	Cached	PgUp/PgDn:Modify
C800,16k Shadow	Disabled	F2/F3:Color
CC00,16k Shadow	Disabled	
D000,16k Shadow	Disabled	
D400,16k Shadow	Disabled	
D800,16k Shadow	Disabled	

Figure 3

4.4.1 1st Boot Device

This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *Disabled*, *Floppy*, *Network*, *Floptical*, *SCSI*, *CDROM*, *IDE-0*, *IDE-1*, *IDE-2*, or *IDE-3*. The Optimal default settings are Floppy.

4.4.2 2nd Boot Device

This option sets the type of device for the second boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *Disabled*, *Floppy*, *Floptical*, *CDROM*, or *IDE-0*. The Optimal default settings are IDE-0.

4.4.3 Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. This option replaces the old Above 1 MB Memory Test Advanced Setup option. The settings are:

Setting	Description
<i>Disabled</i>	AMIBIOS test all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hard disk drive. AMIBIOS waits for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a key press and runs AMIBIOS Setup if the key has been pressed.
<i>Enabled</i>	AMIBIOS does not test system memory above 1 MB. AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. You cannot run AMIBIOS Setup at system boot, because there is no delay for the <i>Hit to run Setup</i> message.

4.4.4 Boot Up Num Lock

Set this option to *Off* to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off*. The default settings are *On*.

4.4.5 Floppy Drive Swap

Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

4.4.6 Floppy Drive Seek

Set this option to *Enabled* to specify that floppy drive A: will perform a Seek operation at system boot. The settings are *Disabled* or *Enabled*. The default settings are *Disabled*.

4.4.7 PS/2 Mouse Support

Set this option to *Enabled* to enable AMIBIOS support for a PS/2-type mouse. Pins 2-3 of the PS/2 Mouse Selector jumper on the motherboard must be shorted together to enable PS/2 mouse support. The settings are *Enabled* or *Disabled*. The default settings are *Enabled*.

4.4.8 Typematic Rate

This option sets the rate at which characters on the screen repeat when a key is pressed and held down. The settings are *Slow* or *Fast*. The default settings are *Fast*.

4.4.9 Primary Display

This option configures the type of monitor attached to the computer. The settings are *Mono*, *CGA40x25*, *CGA80x25*, *VGA/EGA*, or *Absent*. The default settings are *VGA/EGA*.

4.4.10 Password Check

This option enables password checking every time the system boots or when you run AMIBIOS Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if AMIBIOS is executed. See the Advanced Setup chapter for instructions on changing a password. The defaults are *Setup*.

4.4.11 Boot To OS/2

Set this option to *Enabled* if running OS/2 operating system and using more than 64 MB of system memory on the motherboard. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

4.4.12 External Cache

This option sets the type of caching algorithm used for the L2 secondary (external) cache memory. The settings are *WriteBack*, *WriteThru*, or *Disabled*. The default setting is *WriteBack*.

When set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to cache memory. The contents of this memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are *Enabled* or *Disabled*. The default setting is *Enabled*.

4.4.13 C000,16K Shadow & C400,16K Shadow

These options specify how the 32 KB of video ROM at C0000h is treated. The settings are:

Setting	Description
<i>Disabled</i>	The contents of the video ROM are not copied to RAM.
<i>Enabled</i>	The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.
<i>Cached</i>	The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.

4.4.14 C800,16K Shadow

- D000,16K Shadow
- D400,16K Shadow
- D800,16K Shadow
- DC00,16K Shadow

These options enable shadowing of the contents of the ROM area named in the option. The ROM area not used by ISA adapter cards is allocated to PCI adapter cards. The settings are:

Setting	Description
<i>Disabled</i>	The contents of the video ROM are not copied to RAM.
<i>Cached</i>	The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.
<i>Enabled</i>	The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

4.5 Chipset Features Setup Menu

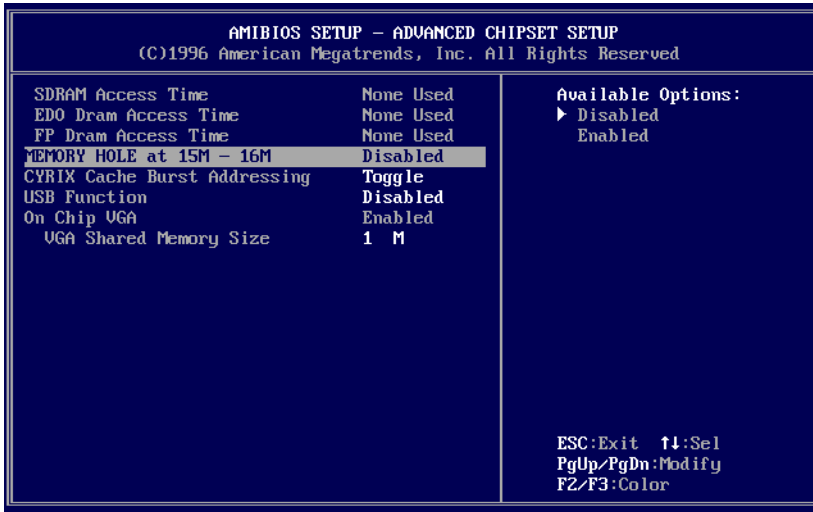


Figure 4

4.5.1 SDRAM/EDO/FP DRAM Access Time

After power on, BIOS will detect the System Ram Type automatically and shows the value in unit of n.s. behind detected items. Meanwhile, unused items will present "None Used".

4.5.2 Memory Hole at 15M-16M

This option specifies the location of an area of memory that cannot be addressed on the ISA bus. The settings are *Disabled*, *15 MB-16 MB*, or *512KB-640KB*. The default settings are *Disabled*.

4.5.3 CYRIX Cache Burst Address

Operating the CPU in linear burst mode minimizes processor bus activity resulting in higher system performance. The settings are *Toggle* or *Linear*. The default setting is *Toggle*.

4.5.4 USB Function

Set this option to *Enabled* to enable USB (Universal Serial Bus) support. The settings are *Enabled* or *Disabled*. The default settings are *Disabled*.

4.5.5 ON Chip VGA (Option)

This item contains 2 settings, Enabled to enable OCV(On Chip VGA) and Disabled to disable OCV. It will be automatically detected and disabled when a external VGA card was installed. So you can no need to set this item. The default setting is Enabled.

4.5.6 VGA Shared Memory Size (Option)

Share memory size from system memory for VGA use. There are 8 settings, 0.5M, 1M, 1.5M, 2M, 2.5M, 3M, 3.5M, 4M. Default setting is 1M.

4.6 Power Management Setup Menu

This category determines how much power consumption for system after selection below items.

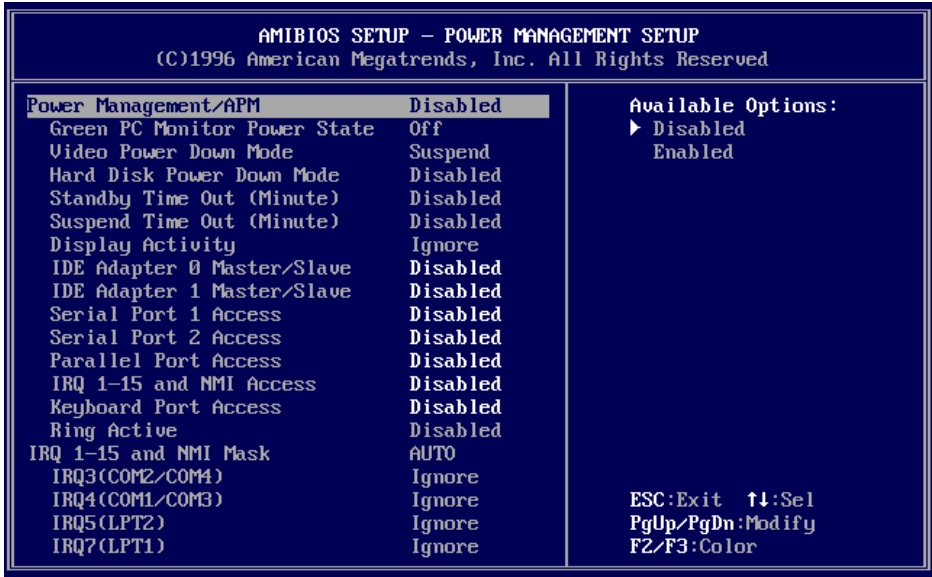


Figure 5

4.6.1 Power Management/APM

Enabled to enable the chipset power management and APM (Advanced Power Management) features. The settings are Enabled or Disabled. Default setting is Disabled.

4.6.2 Green PC Monitor Power State

Enabled to enable AMIBIOS support for the Intel InstantON specification. The settings contains Enabled and Disabled. The default settings are Disabled.

4.6.3 Video Power Down Mode

This option specifies the power state that the video subsystem enters when AMIBIOS places it in a power saving state after the specified period of display inactivity has expired. The settings contains Standby, Suspend and Disabled. The default setting is Disabled.

4.6.4 Hard Disk Power Down Mode

This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings contains Disabled, Standby and Suspend. The default setting is Disabled.

4.6.5 Standby Time Out (Minute)

This option specifies the length of a period of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state. The settings are Disabled, 1 minute, up to 14 minute, in increments of 1 minute. The default setting is Disabled.

4.6.6 Suspend Time Out (Minute)

This option specifies the length of a period of system inactivity while in Standby state.

When this length of time expires, the computer enters Suspend power state. The settings are Disabled, 1 minute, up to 14 minute, in increments of 1 minute. The default setting is Disabled.

4.6.7 Display Activity

When set to Monitor, this option enable s event monitoring on the video display. If set to Monitor and the computer is in a power saving state, AMIBIOS watches for display activity. The computer enters the Full On state if and activity occurs. AMIBIOS reloads the Standby and Suspend timeout timers if display activity occurs. The settings contains Monitor and Ignore. The default setting is Ignore.

4.6.8 Wake Up Events In Doze & Standby

There are 2 settings, Enabled and Disabled, in each following items. Users can set Enabled or Disabled in following items in order to reload saved settings after being waked up.

- IDE Adapter 0 Master/Slave
- IDE Adapter 1 Master/Slave
- Serial Port 1 Access
- Serial Port 2 Access
- Parallel Port Access
- IRQ 1-15 and NMI Access
- Keyboard Port Access
- Ring Active

4.6.9 Power Down & Resume Events

When set to Monitor, these options enable event monitoring on the specified hardware interrupt request line. If set to Monitor and the computer is in a power saving state, AMIBIOS watches for activity on the specified IRQ line. The computer enters the Full On state if any activity occurs. AMIBIOS reloads the Standby and Suspend timeout timers if activity occurs on the specified IRQ line. The settings for each of these options are Monitor or Ignore. The default setting is Ignore.

- IRQ 1-15 and NMI Mask
- IRQ3 (COM2/COM4)
- IRQ4 (COM1/COM3)
- IRQ5 (LPT2)
- IRQ7 (LPT1)

4.7 PCI / Plug and Play Setup

Choose PCI/Play and Play Setup from the AMIBIOS Setup screen to display the PCI and Plug and Play Setup options, described below.

AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP		
(C)1996 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	Yes	Available Options: No ▶ Yes ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F2/F3:Color
Clear NVRAM	No	
PCI VGA Palette Snoop	Disabled	
PCI IDE BusMaster	Disabled	
OffBoard PCI IDE Card	AUTO	
OffBoard PCI IDE Primary IRQ	Disabled	
OffBoard PCI IDE Secondary IRQ	Disabled	
Assign IRQ to PCI VGA Card	No	
PCI Slot1 IRQ Priority	AUTO	
PCI Slot2 IRQ Priority	AUTO	
PCI Slot3 IRQ Priority	AUTO	
DMA Channel 0	ISA/EISA	
DMA Channel 1	ISA/EISA	
DMA Channel 3	ISA/EISA	
DMA Channel 5	ISA/EISA	
DMA Channel 6	ISA/EISA	
DMA Channel 7	ISA/EISA	
IRQ3	ISA/EISA	
IRQ4	ISA/EISA	
IRQ5	ISA/EISA	

Figure 6

4.7.1 Plug and Play Aware O/S

Set this option to *Yes* to inform AMIBIOS that the operating system can handle plug and Play (PnP) devices. The settings are *No* or *Yes*. The default settings are *No*.

4.7.2 Clear NVRAM

Set this option to *yes* to clear data stored in NVRAM each time in rebooting, and *no* to keep the data stored in NVRAM whenever system rebooting.

4.7.3 PCI VGA Palette Snoop

When this option is set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example: if there are two VGA devices in the computer (one PCI and one ISA) and:

VGA Palette Snoop Bit	Action
Disabled	Data read and written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read and written by the CPU is directed to the both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

This option must be set to *Enabled* if any ISA adapter card installed in the system requires VGA palette snooping. The Optimal and Fail-Safe default settings are *Disabled*.

4.7.4 PCI IDE BusMaster

Set this option to *Enabled* to specify that the IDE controller on the PCI bus has bus mastering capability. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

4.7.5 Off Board PCI IDE Card

This option specifies if an off board PCI IDE controller adapter card is used in the computer. You must also specify the PCI expansion slot on the motherboard where the off board PCI IDE controller card is installed. If an off board PCI IDE controller is used, the motherboard onboard IDE controller is automatically disabled. The settings are *Disabled*, *Auto*, *Slot1*, *Slot2*, *Slot3*, *Slot4*, *Slot5*, or *Slot6*. If *Auto* is selected, AMIBIOS automatically determines the correct setting. The Optimal and Fail-Safe default settings are *Auto*. This option forces IRQ 14 and 15 to a PCI slot on the PCI local bus. This is necessary to support non-compliant PCI IDE adapter cards.

4.7.6 Off Board PCI IDE Primary IRQ

This option specifies the PCI interrupt used by the primary IDE channel on the off board PCI IDE controller. The settings are *Disabled*, *Hardwired*, *INTA*, *INTB*, *INTC*, or *INTD*. The default setting is *Disabled*.

4.7.7 Off Board PCI IDE Secondary IRQ

This option specifies the PCI interrupt used by the secondary IDE channel on the off board PCI IDE controller. The settings are *Disabled*, *Hardwired*, *INTA*, *INTB*, *INTC*, or *INTD*. The default setting is *Disabled*.

4.7.8 Assign IRQ to PCI VGA Card

Assign the IRQ# for VGA card.

4.7.9 PCI Slots IRQ Priority

These options specify the IRQ priority for PCI devices installed in the PCI expansion slots. The settings are *Auto*, (*IRQ*) 3, 4, 5, 7, 9, 10, and 11, in priority order. The default setting is *Auto*.

- PCI Slot1 IRQ Priority
- PCI Slot2 IRQ Priority
- PCI Slot3 IRQ Priority

4.7.10 DMA Channels

These options allow you to specify the bus type used by each DMA channel. The settings are *PnP* or *ISA/EISA*. The default setting is *PnP*.

- DMA Channel 0
- DMA Channel 1
- DMA Channel 3
- DMA Channel 5
- DMA Channel 6
- DMA Channel 7

4.7.11 IRQs Settings

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards. These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these options to reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*.

IRQ12 only appears if the **Mouse Support** option in Advanced Setup is set to *Disabled*. IRQ14 and 15 will not be available if the onboard PCI IDE is enabled. If all IRQs are set to *ISA/EISA* and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices. The settings are *ISA/EISA* or *PCI/PnP*. The Optimal and Fail-Safe default settings are *PCI/PnP*.

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9

- IRQ10
- IRQ11
- IRQ12
- IRQ14
- IRQ15

4.8 Peripheral Setup

Peripheral Setup options are displayed by choosing Peripheral Setup from the AMIBIOS Setup main menu. All Peripheral Setup options are described here.

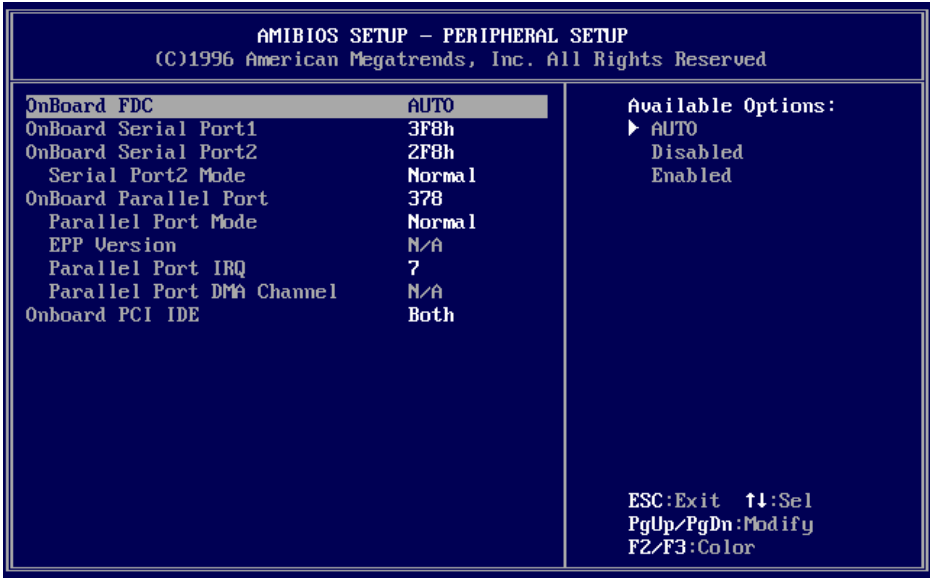


Figure 6

4.8.1 OnBoard FDC

Set this option to *Enabled* to enable the floppy drive controller on the motherboard. The settings are *Auto* (AMIBIOS automatically determines if the floppy controller should be enabled), *Enabled*, or *Disabled*. The default setting is *Enabled*.

4.8.2 OnBoard Serial Port 1

This option specifies the base I/O port address of serial port 1. The settings are *Auto* (AMIBIOS automatically determines the correct base I/O port address), *Disabled*, *3F8h*, *2F8h*, *2E8h*, or *3E8h*. The default setting is *Auto*.

4.8.3 OnBoard Serial Port 2

This option specifies the base I/O port address of serial port 2. The settings are *Auto* (AMIBIOS automatically determines the correct base I/O port address), *Disabled*, *3F8h*, *2F8h*, *2E8h*, or *3E8h*. The default setting is *Auto*.

4.8.4 Serial Port2 Mode

This option specifies the operating mode for serial port 2. This option only appears if the **Onboard Serial Port2** option is not set to *Auto* or *Disabled*. The settings are *IrDA* or *Normal*. The default setting is *Normal*.

4.8.5 OnBoard Parallel Port

This option specifies the base I/O port address of the parallel port on the motherboard. The settings are *Disabled*, *378h*, *278h*, or *3BCh*. The Optimal default setting is *378h*. The default setting is *Disabled*.

4.8.6 Parallel Port Mode

This option specifies the parallel port mode. The Optimal default setting is *Normal*. The default setting is *Disabled*. The settings are:

Setting	Description
<i>Normal</i>	The normal parallel port mode is used.
<i>SPP/EPP</i>	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.
<i>ECP</i>	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bidirectional communication.

4.8.7 EPP Version

This option specifies the Enhanced Parallel Port specification version number that is used in the system. This option only appears if the Parallel Port Mode option is set to *EPP*.

The settings are *1.7* or *1.9*. There are no Optimal and Fail-Safe default settings because the default setting for the Parallel Port Mode option is not *EPP*.

4.8.8 Parallel Port IRQ

This option specifies the IRQ used by the parallel port. The settings are *Auto*, (*IRQ*) *5*, or (*IRQ*) *7*. The default setting is *Auto*.

4.8.9 Parallel Port DMA Channel

This option is only available if the setting for the Parallel Port Mode option is *ECP*. This option sets the DMA channel used by the parallel port. The settings are (*DMA Channel0, 1, or 3*). The Optimal and Fail-Safe default settings are not provided.

4.8.10 OnBoard PCI IDE

This option specifies the IDE channel used by the onboard IDE controller. The settings are *Disabled, Primary, Secondary or Auto*. The default settings are Auto.

4.9 Auto-Detect Hard Disks

This option will automatically detect all possible modes that supported by the HDD including NORMAL, LBA& LARGE for users' selecting. Please refer to Figure 1.

4.10 Supervisor Password Setting

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



Figure 7

4.10.1 Changing Supervisor Password

Select the *Supervisor* from the Security section of the AMIBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press<=Esc>. The password is stored in NVRAM after AMIBIOS completes. The next time the system boots, a password prompt appears if the password function is present and enabled.

4.11 Auto Configuration with Optimal Settings

The Optimal default settings are best-case values that should optimize system performance. If NVRAM is corrupted, the Optimal settings are loaded automatically.

5 VGA Installation(Optional)

5.1 Introduction

The SQ578 All-In-One Mainboard provide a compact video and graphics solution for PC based system. It provides a high performance 3-In-1 PCI true-color graphics accelerator with video accelerate functions. It works in five different modes: VESA VAFC (VESA Advanced Feature Connector) mode, standard FC (Feature Connector) mode, SiS FC (SiS Proprietary Defined Feature Connector) mode, direct draw video mode, and PCI multimedia mode.

5.1.1 Features

- ◆ Support tightly coupled host interface to VGA to speed up GUI performance and the video playback frame rate.
- ◆ Support direct access to video memory to speed up GUI performance and the video playback frame rate.
- ◆ Shared System Memory Area 0.5MB,1MB,1.5MB,2MB,2.5MB,3MB,3.5MB,4MB.
- ◆ Built-in 8QW CPU post write buffer with byte merging capability
- ◆ Support 32-bit PCI local bus standard revision2.1.
- ◆ Support PCI burst write.
- ◆ Support PCI multimedia design guide Rev.1.0.

5.1.2 Performance

- ◆ Support Turbo Queue (Software Command Queue in off-screen memory) architecture to achieve extra-high performance.
- ◆ Built-in transparent BitBLT functions to accelerate Direct Draw performance.
- ◆ Built-in an enhanced 64bit BITBLT graphics engine with the following functions:
 - 256 raster operation functions
 - Rectangle fill
 - Color/Font expansion
 - Line-drawing with styled pattern
 - Built-in 8x8 pattern registers for 256 and high-color modes
 - Built-in 8x8 mask registers
 - 32 doublewords hardware Command Queue

- ◆ Built-in 64x64x2 bit-mapped hardware cursor
- ◆ Built-in 6 stages PCI post write-buffer and 128 bits read-ahead cache to minimize wait-states in video memory access.
- ◆ Built-in 4 stages GUI engine write-buffer and 9 stage read-buffer to minimize engine wait-state.
- ◆ Built-in 64x64 CRT FIFOs with multiple scan lines prefetch capability to improve integration VGA performance
- ◆ Support Memory-mapped I/O.
- ◆ Support linear addressing mode up to 4Mbyte to speed up graphics performance

5.1.3 Iteration

- ◆ Built-in programmable 24-bit true-color RAMDAC with reference-voltage generator
- ◆ Built-in dual-clock generator
- ◆ Built-in monitor-sense circuit
- ◆ Built-in graphics accelerator and VGA controller
- ◆ Built-in video acclerator
- ◆ Built-in Phillips SAA7110/SAA7111, Brooktree Bt815/817/819A(8-bit SPI mode 1,2) video decoder interface
- ◆ Built-in Standard feature connector logic support
- ◆ Built-in downloadable RAMDAC for graphics and video gamma correction in direct color modes

5.1.4 Display Memory Interface

- ◆ Support FPM/EDO/Synchronous DRAM
- ◆ Support 32/64-bit display memory path resolution, Color & Frame Rate
- ◆ Support 170 MHz pixel clock
- ◆ Support super high resolution graphics modes
 - 640x480 256/32K/64K/16M colors NI
 - 800x600 16/256/32K/64K/16M color NI
 - 1024x768 16/256/32K/64K/16M color NI
 - 1280x1027 16/256 colors NI, 32K/64K colors interlace only
 - 1600x1200 256 colors NI

- ◆ Support virtual screen up to 2048x2048
- ◆ Support 80/132 columns text mode in 25, 30, 44 or 60 rows and other modes

5.1.5 Video Functions

- ◆ Support full motion video playback up to 1027x768 256 colors in 1 MB DRAM configuration
- ◆ Support single frame buffer architecture to save the DRAM cost
- ◆ Support graphics/video overlay function by color-key and /or chroma-key operations
- ◆ Support multi-format Video For Windows such as YUV420, YUV422, RGB565, and RGB555
- ◆ Support YUV-to-RGB color space conversion
- ◆ Support video scaling in integer increments of 1/64
- ◆ Support horizontal 2-tap, 8-phase DDA interpolation for better quality of video windows expansion
- ◆ Built-in 64x16 video capture FIFOs to support video capture
- ◆ Built-in four 64x48 line buffers to support vertical interpolation in YUV packed and planar modes
- ◆ Built-in contrast enhancement and brightness adjustment logic to improve video playback quality
- ◆ Support Microsoft Video For Windows
- ◆ Support color key and chroma key overlay
- ◆ Support 4-bit blending
- ◆ Support DCI drivers
- ◆ Support Direct Draw Drivers
- ◆ Support Direct MPEG Drivers

5.1.6 Power Management

- ◆ Support VESA Display Power Management Signaling (DPMS) compliant VGA monitor for power management
- ◆ Built-in 30 min. standby and suspend timers with keyboard, hardware cursor, and/or video memory read/write as activating source
- ◆ Support direct I/O command to force graphics controller into standby/suspend/off state.
- ◆ Power down internal SRAM in direct color mode

- ◆ Power down SRAM and video DAC in standby and suspend mode
- ◆ Meet ACPI requirements

5.1.7 Multimedia Application

- ◆ Support DDC1 and DDC2B specifications
- ◆ Follows the plug & play specification for display controller
- ◆ Support RAMDAC snoop for multimedia applications
- ◆ Support anti-tearing with single register fast page-flipping and scan line read back

5.2 Software Support

To fully utilize and support the Integrated VGA Controller hardware features, SiS has developed a high-performance VESA extension compliant BIOS.

Extended graphics and text modes are supported by software application drivers developed by SiS. The following applications are currently supported:

- ◆ 3D Studio Ver. 3.0 & 4.0
- ◆ AutoCAD/386 Release 11,12,13
- ◆ Auto Shade/386 Ver. 2.0
- ◆ GEM 3.0/Ventura 2.0
- ◆ Lotud1-2-3/Symphony Ver.3.x
- ◆ MicroSoft Windows 3.1
- ◆ MicroSoft Windows 95
- ◆ MicroSoft Windows NT Ver. 3.1 & 3.5
- ◆ OrCad (SDT/VST/PCB) Rel 4
- ◆ OS/2 Presentation Manager 2.1 & 3.0
- ◆ P-CAD Ver. 7.06
- ◆ VersaCAD/386 Ver.2.1
- ◆ Word Perfect 5.x&6.0

Video operation are supported by software application drivers developed by SiS. The following applications are currently supported:

- ◆ Microsoft Video For Windows
- ◆ DCI driver
- ◆ Direct Draw driver

