AD6NF9

I_2O Ready

Dual Pentium Pro Motherboard

User's Manual

Version 1.0

0

1Contents

Chapter 1 Introduction

This manual is designed to give you information on the AD6NF9 Motherboard. It is divided into the following seven sections:

- **Introduction**
  - **Specifications**
  - **Hardware Description**
  - **Configuring the AD6NF9 Motherboard**
- **Installation**
- **Running the System Set Up**

Checklist

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

The AD6NF9 Motherboard

Cables

2 serial port ribbon cables

1 parallel port ribbon cable

1 VGA ribbon cable

2 IDE ribbon cables

1 floppy ribbon cable

1 disk with Intel PCI Driver and EEPROM Utility

This User's Manual

Chapter 2 Specifications

The AD6NF9 is an I2O Ready Dual Pentium Pro PCI motherboard. It's highly flexible in CPU frequency, and main memory type and size.

The main features of the motherboard are listed as follows:

- **Main Processor**
  - Dual Pentium Pro on a ZIF Socket 8, up to 200MHz
- **Processor Upgrade**
  - Intel P6 based Over Drive
- **L2 Cache**
  - Integrated 256KB or 512KB, non-blocking level two cache (depending on CPU), so that no external SRAM chips are needed
- **Main Memory**
  - Supports Four 72-pin SIMMs of 4MB, 8MB, 16MB, 32MB, 64MB and two 168-pin DIMMs to form a memory size between 8MB to 512MB
  - Supports both Fast Page Mode (FPM) and Extended Data Output (EDO) SIMMs
- **Chipset**
  - Intel 82440FX PCIset
- **BIOS**
  - AWARD BIOS with additional features:
  - ISA Plug and Play (PnP) extension DMI Ready
- **Expansion Slots**
  - Four intelligent PCI slots
  - Three primary PCI slots
  - Two 16-bit ISA slots
- **PCI Bus Master IDE Controller**
  - Onboard PCI Bus Master IDE controller with two connectors that support four IDE devices in two channels
  - Provides faster data transfer rates, and supports enhanced IDE devices such as tape backup and CD-ROM drives
  - Supports PIO Modes 3 and 4 and Bus Master IDE DMA Mode 2
  - BIOS supports IDE CD-ROM boot-up
- **PS/2 Mouse Connector and Optional IrDA**
  - Supports PS/2 mouse connector and an optional infrared port module for wireless interface

2.1 Product Overview

The AD6NF9 is an I_2O (Intelligent I/O) ready dual Pentium Pro motherboard designed as a building block for today's servers. It implements Intel's 440FX PCIset and provides two Socket 8s for up to two Pentium Pro processors. The AD6NF9 also implements Intel i960rp/rd RISC processor, off-loading the host CPU and greatly improving server performance. By simply installing a "non-intelligent" storage controller (ie: a SCSI host adapter) or a communication card (ie: an ethernet card) into an intelligent I/O slot and loading the necessary S/W such as an HDM (Hardware Device Module) and an ISM (Intermediate Services Module) and together with OSM (Operating system Services Module), the AD6NF9 becomes the cornerstone of a cost-effective and yet powerful server.

Figures 1 and 2, on the following pages, illustrate both the block diagram of the AD6NF9 motherboard and the location of the Primary and Secondary PCI slots.

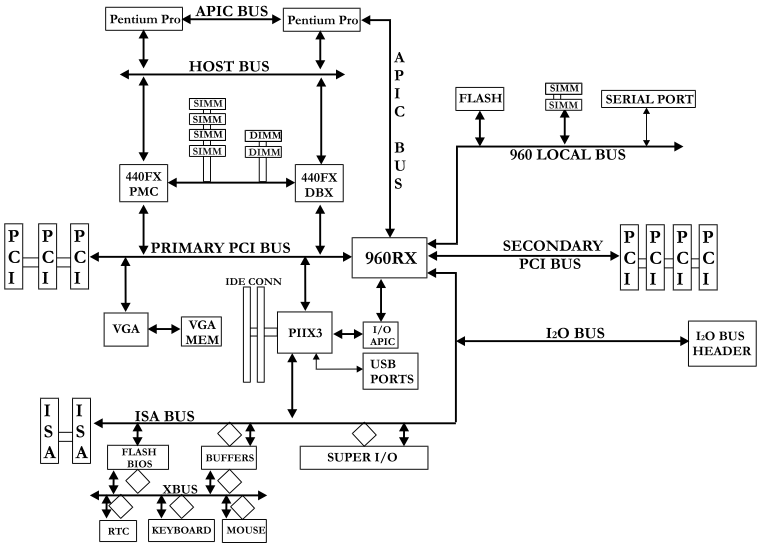


Figure 1 - Block Diagram of the AD6NF9

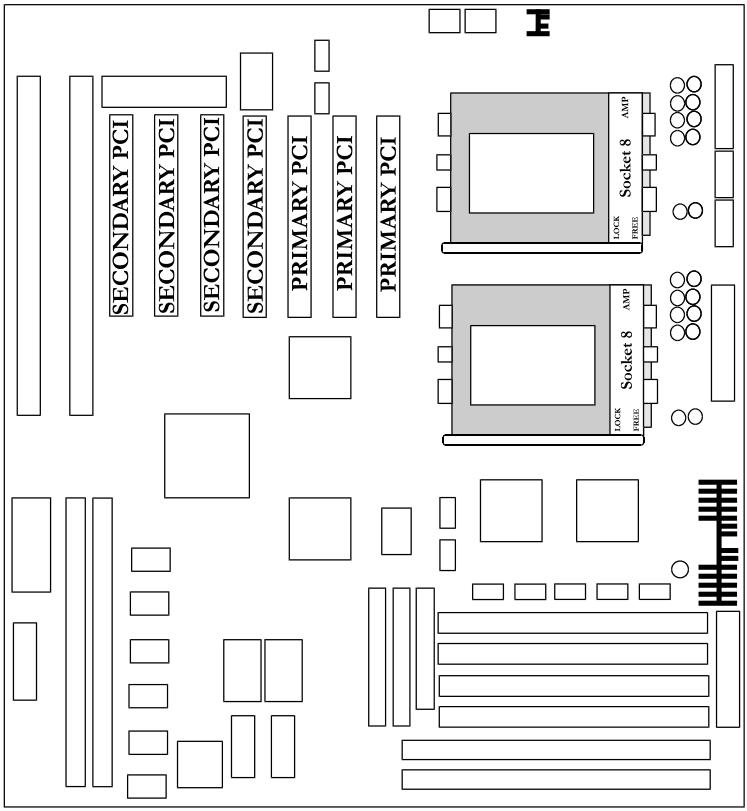


Figure 2 - Locations of the Primary and Secondary PCI slots

Chapter 3 Hardware Description

This chapter briefly describes each of the major features of the AD6NF9 motherboard. The layout of the board is shown in *Figure 3,* which shows the locations of key components.

The topics covered in this chapter are as follows:

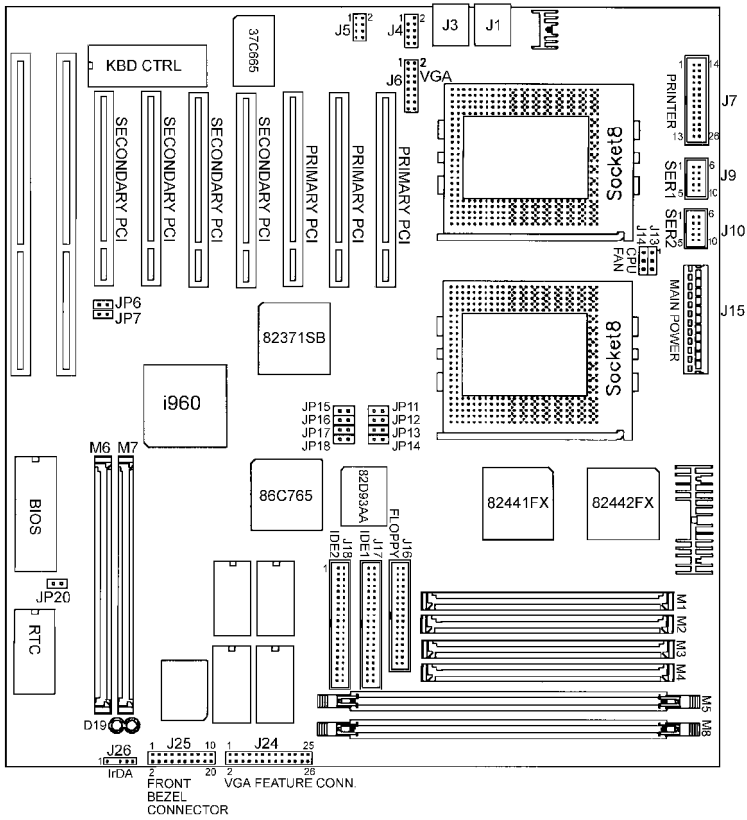


Figure 3 - Layout of the AD6NF9

3.1 Processor and VRM

The AD6NF9 is designed to handle up to two Pentium Pro Processor with a bus speed of 60MHz and 66 MHz. Since the internal clock of the CPU can be in multiples from 2 to 4 in ratio of the internal bus clock, the CPU frequency can be 150MHz to 200MHz. The AD6NF9 provides an onboard Voltage Regulator to automatically detect the voltage from 2.1V to 3.5V and supply the necessary voltage to the CPU. The Voltage Regulator Module (VRM) socket also provides the power consumption higher than 35 watts.

3.2 L2 Cache

The L2 cache has Pentium Pro built-in 256KB or 512KB. The private L2 cache bus is not connected to package pins, rather its signals are routed between the two cavities using standard package techniques. It can be driven at the full CPU core speed.

The high performance bandwidth is used by the CPU to serve all L1 cache misses as well as the characteristics of a CPU-cache bus. It is also utilized 90-95 percent of the time.

3.3 Main Memory

The AD6NF9 provides four 64-bit memory banks for up to 512MB of main memory. Each bank consists of two SIMMs **(M1/M2, M3/M4)** or one DIMM (**M5, M6)**. Burst Extended Data Out (BEDO), Extended Data Out (EDO) and Fast Page Mode DRAM are all supported. The size of the SIMM can be 4MB, 8MB, 16MB, 32MB and 64MB. It can also be configured to support Error Checking and Correction (ECC) or parity. The size of the DIMM can be 8MB, 16MB, 32MB, 64MB and 128MB.

The following are the important factors for populating the SIMM/DIMM sockets:

1. Either the M1/M2 or M3/M4 or M5 or M6 bank can be populated first
2. Each bank should consist of the same size and type of SIMMs
   ex: M1 and M2 should be BEDO, EDO or Fast Page Mode
3. SIMMs can be mixed by the bank
   ex: M1/M2 are Fast Page Mode and M3/ M4 are EDO

4. SIMMs can be with or without parity. If you need ECC or parity support, you need to utilize the SIMMs parity bits.

Install Memory in any or all of the banks in any combination as follows:

Bank	Memory Module		Total Memory
Bank 0 SIMM SLOTS M1 & M2	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM, EDO, BEDO, SIMM	x2	
Bank 1 SIMM SLOTS M3 & M4	4MB, 8MB, 16MB, 32MB, 64MB 72-pin FPM, EDO, BEDO, SIMM	x2	
Bank 2 DIMM SLOTS M5	4MB, 8MB, 16MB, 32MB, 64MB, 128MB, 168-pin FPM, EDO, BEDO, SIMM	x1	
Bank 3 DIMM SLOTS M6	4MB, 8MB, 16MB, 32MB, 64MB, 128MB 168-pin FPM, EDO, BEDO, SIMM	x1	
	Total System Memory	=	

Available memory configurations are shown in the following table:

Bank 0 (M1, M2)	Bank 1 (M3, M4)	Bank 2 (M5)	Bank 3 (M6)	Total Memory
4MB×2	-----	-----	----	8MB
8MB×2	-----	-----	----	16MB
16MB×2	-----	-----	----	32MB
32MB×2	-----	-----	----	64MB
4MB×2	4MB×2	-----	----	16MB
4MB×2	4MB×2	8MB×1		24MB
4MB×2	4MB×2	8MB×1	4MBx2	32MB
4MB×2	8MB×2	-----	----	24MB
4MB×2	8MB×2	8MB×2	----	40MB
4MB×2	16MB×2	-----	----	40MB
4MB×2	16MB×2	16MB×2	----	72MB
4MB×2	32MB×2	-----	-----	72MB
4MB×2	32MB×2	32MB×2	----	136MB
8MB×2	8MB×2	-----	----	32MB
8MB×2	8MB×2	8MB×2	----	48MB
8MB×2	8MB×2	8MB×2	8MBx2	64MB
8MB×2	16MB×2	-----	----	48MB
8MB×2	16MB×2	16MB×2	----	80MB
8MB×2	32MB×2	-----	----	80MB
8MB×2	32MB×2	32MB×2	----	144MB
16MB×2	16MB×2	-----	----	64MB
16MB×2	16MB×2	16MB×2	----	96MB
16MB×2	16MB×2	16MB×2	16MBx2	128MB
16MB×2	32MB×2	-----	----	96MB
16MB×2	32MB×2	32MB×2	----	160MB

32MB×2	32MB×2	-----	----	128MB
32MB×2	32MB×2	32MBx2	----	192MB
64MB×2	64MB×2	----	-----	256MB
64MB×2	64MB×2	128MB×1	----	384MB
64MB×2	64MB×2	128MB×1	128MBx1	512MB

Note: The Bank "0" designates the memory bank populated first, which can be M1/M2 or M3/M4, M5 or M6.

3.4 BIOS

The BIOS on the AD6NF9 motherboard provides the standard BIOS functions plus the following additional features:

1. **ISA Plug and Play (PnP) Extension**
   Unlike PCI cards that are plug and play, ISA cards require setting jumpers to resolve any hardware conflicts. To make a computer system PnP, an ISA PnP standard is established and supported by new operating systems, such as Windows 95. Under Windows 95, the motherboard BIOS must have an ISA PnP extension to support the new ISA PnP cards.

2. **Power Management**
   The power management feature provides power savings by slowing down the CPU clock, turning off the monitor screen, and stopping the HDD spindle motor.

3.5 I/O Port Address Map

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

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2

0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
2F8h - 2FFh	Serial Port #2(COM2)
378h - 3FFh	Parallel Port #1(LPT1)
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

3.6 DMA Channels

There are seven DMA channels available on the motherboard. Only DRQ2 is used by the floppy controller. In the case that ECP mode on the parallel port is used, DRQ1 or DRQ3 will be used.

3.7 Interrupt Request (IRQ)

There are a total of 15 Interrupt Request (IRQ) lines available on the motherboard peripheral devices. They use an IRQ to notify the CPU of the service that is required. The following table shows the IRQ lines and what devices they use on the motherboard:

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

3.8 Onboard PCI-IDE

The PCI IDE controller is a part of the 82440FX PCIset. It supports PIO mode 3/4 and bus mastering. The peak transfer rate of PIO mode 3/4 can be as high as 17MB/sec. Using HDDs that support bus mastering, the peak transfer rate can reach 22MB/sec.

There are two IDE connectors, primary IDE and secondary IDE. With two devices per connector, up to four IDE devices can be supported.

3.9 Onboard Multi-I/O

The onboard multi-I/O chip, SMC37C66X, provides two serial ports: one parallel port and one floppy controller. The serial ports are 16550 UART compatible. The parallel port supports high-speed EPP/ECP mode. The floppy controller supports up to 2.88 MB format.

Chapter 4 Configuring the AD6NF9

The following sections describe the necessary procedures and proper jumper settings to configure the AD6NF9 system board.

For the locations of the jumpers, refer to Figure 4.

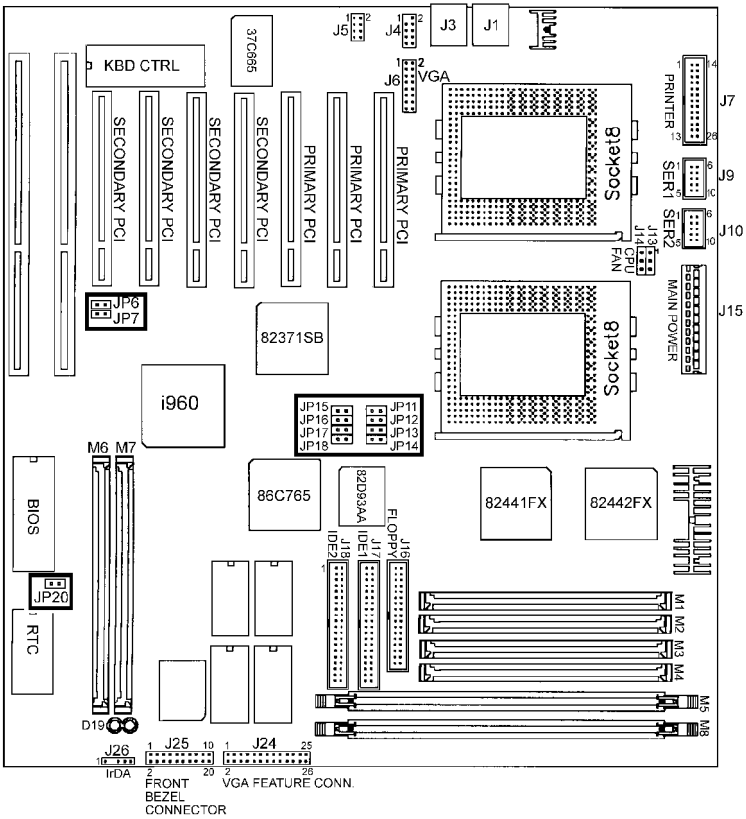
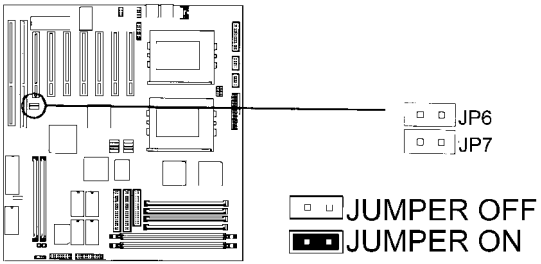


Figure 4 - Jumper Location of the AD6NF9

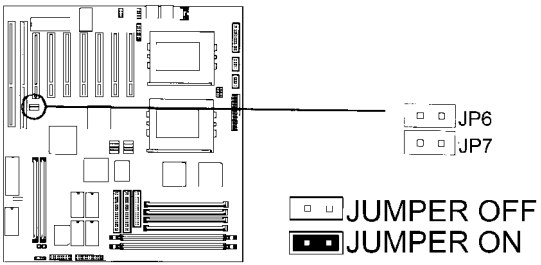
4.1 ISA Speed: JP6

JP6	Function
OFF	PCICLK/3
ON	PCICLK/4 (Default)



4.2 PS/2 Mouse: JP7

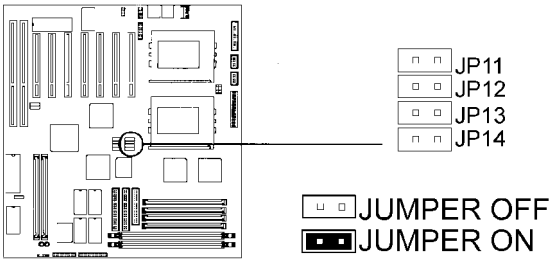
JP7	Function
OFF	Disable
ON	Enable (Default)



4.3 CPU to Bus Frequency Multiplier: JP11-14

JP11-JP14 sets the *ratio of bus clock to the CPU internal clock*. Refer to the table below for the correct settings to match the CPU frequency.

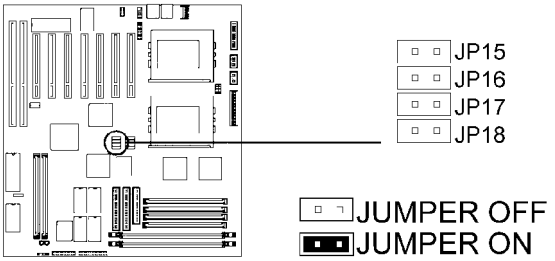
JP11	JP12	JP13	JP14	Multiplier
ON	ON	ON	ON	2.0x
OFF	ON	ON	ON	2.5x
ON	OFF	ON	ON	3.0x (default)
OFF	OFF	ON	ON	3.5x
ON	ON	OFF	ON	4.0x



4.4 Host Bus Frequency: JP15-18

JP15-18 *set the clock generator frequency* to be *60 or 66MHz*, which is the frequency of the CPU to the bus clock.

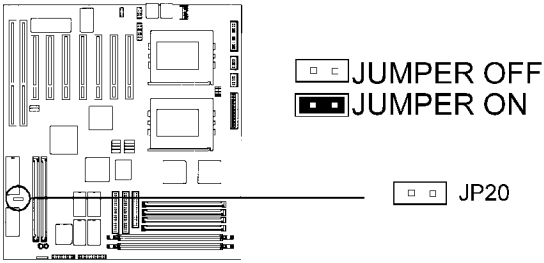
JP15	JP16	JP17	JP18	Frequency
OFF	ON	ON	OFF	60MHz
ON	OFF	OFF	ON	66MHz (default)



4.5 CMOS Clear Selection: JP20

Use JP20, a 2-pin header, to clear the contents of the CMOS RAM. Do not clear the CMOS RAM unless it is absolutely necessary: i.e. lost your password, etc.

JP20	Function
OFF	Normal Operation
ON	Clear the contents of the CMOS



Chapter 5 Installation

This chapter describes how to prepare for set up. Figure 5 shows the connector location of the motherboard. The following topics are covered in this chapter:

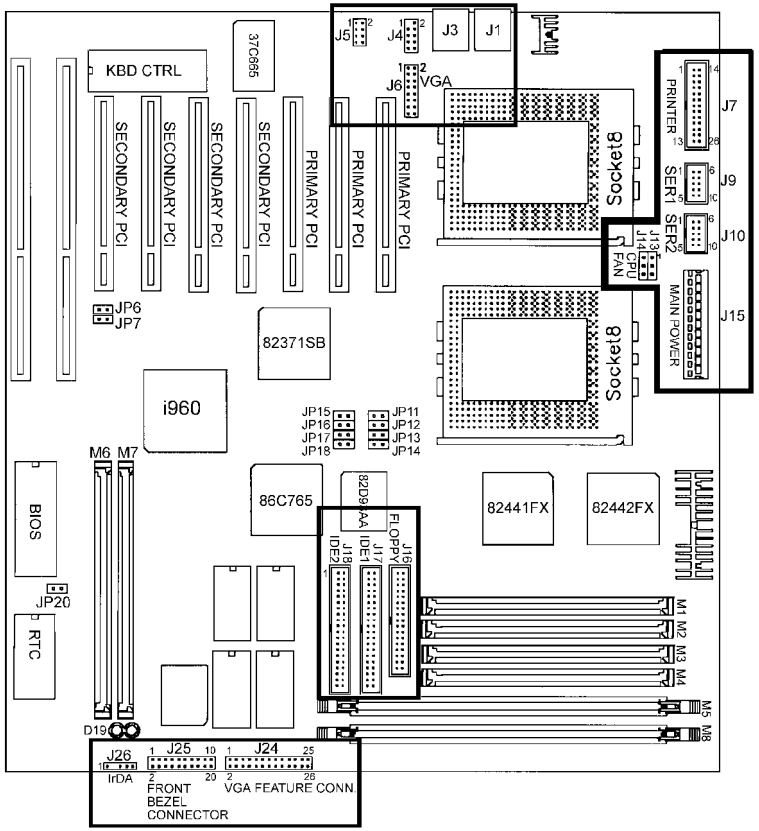
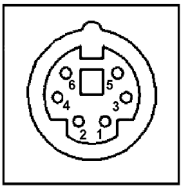


Figure 5 - Connector Location of the AD6NF9

5.1 Keyboard/Mouse Connector: J1, J3

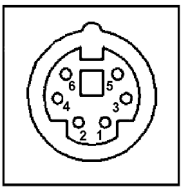
There are two configurations available on the AD6NF9 board, an AT keyboard or PS/2 keyboard and mouse.

PS/2 Keyboard Connector: J1



J1 Pin #	Function
1	Data
2	N.C.
3	GND
4	5V
5	Clock
6	N.C.

PS/2 Mouse Connector: J3



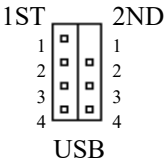
J3 Pin #	Function
1	Data
2	N.C.
3	GND
4	5V
5	Clock
6	N.C.

5.2 PS/2 Mouse Header: J4

J4 Pin #	Signal Name
1	N.C.
2	N.C.
3	N.C.
4	Mouse Clock
5	N.C.
6	5V
7	Mouse Data
8	N.C.
9	GND

5.3 USB Connectors: J5

This connector is an 8-pin header, with two USB connectors on J5. The following table shows the pin outs (USB1 & USB2) of the J5 connector, 4-pin each.



1ST Pin #	2ND Pin #	Signal Name
1	1	Vcc
2	2	USB-
3	3	USB+
4	4	Ground

5.4 VGA Connector: J6

J6 is a 16-pin header that is designed for a proprietary daughter card.

J6 Pin #	Signal Name
1	Red
2	Green
3	Blue
4	N.C.
5	Ground

6	Ground
7	Ground
8	Ground
9	N.C.
10	Ground
11	N.C.
12	N.C.
13	Horizontal Sync
14	Vertical Sync
15	N.C.
16	N.C.

5.5 I/O Connectors

The I/O connectors connect the AD6NF9 board to the most common peripherals. To connect cables to these connectors, carefully align Pin 1 of the cables to that of the connectors. Refer to Figure 5 for the location and orientation of the connectors.

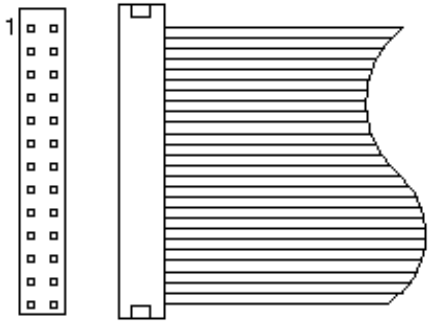
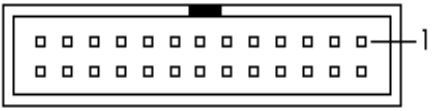


Figure 5: Orientation of the I/O connector

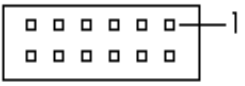
5.6 Parallel Port Connector (25-pin D-Type connector): J7

The onboard parallel port of the AD6NF9 is a DB-25 connector.



5.7 Serial Port COM1 and COM2 Connectors (Two 9-pin D-Type connector): J9, 10

The onboard serial ports of the AD6NF9 are DB-9 connectors.



5.8 CPU Fan Power Connector: J13, 14

JP13, 14 are 3-pin headers for a CPU fan. The fan must be a +12V fan.

JP13, 14 Pin #	Signal Name
1	Ground
2	+12V
3	Ground

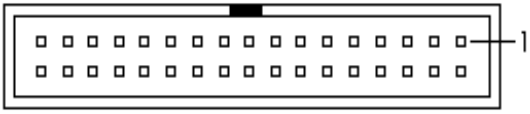
5.9 Power Supply Connector: J15

When using an AT (12-Pin) power supply, plug both of the power supply connectors into J15. The following table indicates the pinout assignments of the power supply connectors.

J15 Pin #		Description	Wire Color
1	Θ	Power Good	Orange
2	λ	+5V	Red
3	λ	+12V	Yellow
4	λ	-12V	Blue
5	λ	Ground	Black
6	λ	Ground	Black
7	Θ	Ground	Black
8	λ	Ground	Black
9	λ	-5V	White
10	λ	+5V	Red
11	λ	+5V	Red
12	λ	+5V	Red

5.10 Floppy Drive Connector (34-pin block): J16

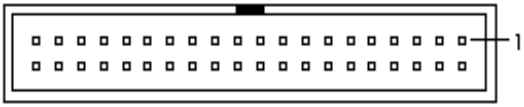
This connector supports the provided floppy drive ribbon cable. After connecting the single end to the board, connect the other two plugs on the other end to the floppy drives.



J16: Floppy Drive Connector

5.11 Primary (J17)/Secondary (J18) IDE Connectors (Two 40-pin Block)

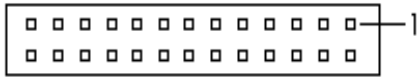
This connector supports the provided IDE hard disk ribbon cable. After connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to "Slave" mode by setting its jumpers accordingly. Refer to the documentation of your hard disk for the jumper settings. You may also configure two hard disks to be both "Masters," using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.



IDE Connector

5.12 VGA Feature Connector: J24

Signal Name	J24 Pin#	J24 Pin #	Signal Name
Data 0	1	2	Ground
Data 1	3	4	Ground
Data 2	5	6	Ground
Data 3	7	8	Data enable
Data 4	9	10	Sync enable
Data 5	11	12	PCLK Enable
Data 6	13	14	N.C.
Data 7	15	16	Ground
PCLK	17	18	Ground
Blank	19	20	Ground
HSYNC	21	22	Ground
VSYNC	23	24	N.C.
Ground	25	26	N.C.



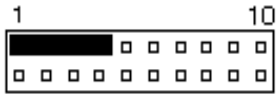
J24: VGA Feature Connector

5.13 Front Bezel Connectors: J25

The front bezel of the case has a control panel which provides light indication of the computer's activities and switches to change the computer status. J25 is a 20-pin header that provides interfaces for the following functions.

PIN 1 - 4: Speaker

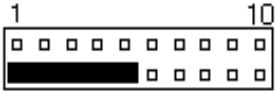
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



J25 Pin #	Signal Name
1	Speaker out
2	No connect
3	Ground
4	+5V

PIN 11-15: Power LED and Keylock

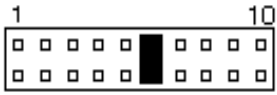
The power LED indicates the status of the main power switch. The keylock switch, when closed, will disable the keyboard function.



J25 Pin #	Signal Name
11	Power LED
12	No connect
13	Ground
14	Keylock
15	Ground

PIN 6&16: SMI Suspend Switch

This connector is for the "Green Switch" on the control panel. When pressed, it will force the system board into power saving mode immediately

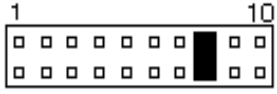


J25 Pin #	Signal Name
6	Sleep
16	Ground

PIN 7&17: (Not Defined)

PIN 8&18:Turbo LED Connector

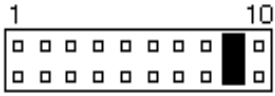
There is no turbo/non-turbo function on the motherboard. The Turbo LED on the control panel will always be on when attached to this connector.



J25 Pin #	Signal Name
8	5V
18	Ground

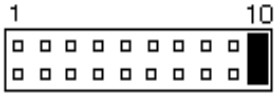
PIN 9&19: Reset Switch

The reset switch allows the user to reset the system without turning the main power switch off and then on. *Orientation is not required when making a connection to this header.*



PIN 10&20: HDD LED Connector

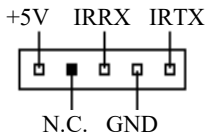
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



J25 Pin #	Signal Name
10	Ground
20	5V

5.14 IrDA-compliant infrared module connector (IR option): JP26

This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to a small opening on system cases that support this feature. You must also configure the setting through BIOS setup to select whether UART2 is directed for use with COM2 or IrDA. Use the five pins (as defined by Intel) as shown on the "Back View" and connect a ribbon cable from the module to the motherboard according to the pin definitions. The ribbon cable supplied may either have five or ten pins (for other standards). If using a ten-pin ribbon cable, use only the top five rows of the ribbon cable plug.



J26 Pin #	Signal Name
1	+5V
2	No connect

3	Ir RX
4	Ground
5	Ir TX

5.15 i960RX Fail LED: D19

The Fail LED indicates a failure of the i960RX's built-in self test performed during initialization and should go off after power-on. It is asserted immediately upon reset and toggles during self-test to indicate the status of individual tests.

Chapter 6 Running the System Setup

This chapter is designed to assist you in setting up your system. It holds information about the various menus and their prompts to help you along the way. The following topics are covered:

6.1 Point and Click Interface

The Setup uses the familiar point and click navigation technique. You can point, with the mouse, anywhere on the screen, click the left mouse button, and Setup control is transferred to the new location. The previous window is closed. All parameters that have been changed will automatically be saved, pending the selection on the exit screen.

6.2 Using a Mouse with Setup

Setup can be accessed via a keyboard, mouse or pen. The mouse click functions are:

- Click once to change or select both global and current fields, or
- Double-click to perform an operation in the selected field.

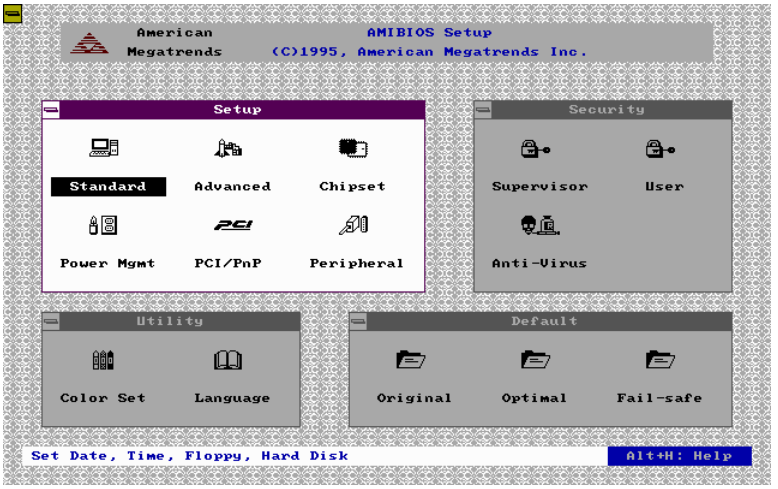
6.3 Using the Keyboard with Setup

Use the following keys to modify and move around in Setup:

Keystroke	Function
<Tab>	Move to the next window or field.
→, ←, ↑, ↓	Move to the next field to the right, left above, or below.
<Enter>	Select in the current field.
+	Increments a value.
–	Decrements a value.
<Esc>	Close the current operation and return to previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt><H>	Access a help window.
<Alt><Spacebar>	Exit WINBIOS Setup.
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.

6.4 Setup Main Menu

After pressing the <DEL> key, the BIOS Setup Screen will display:



1. **Default Values**
   The icons in this section permit you to select a group of settings for all setup options. Not only can you use these icons to quickly set system configuration parameters, but you can also choose a group of settings that work better when the system is having configuration-related problems.

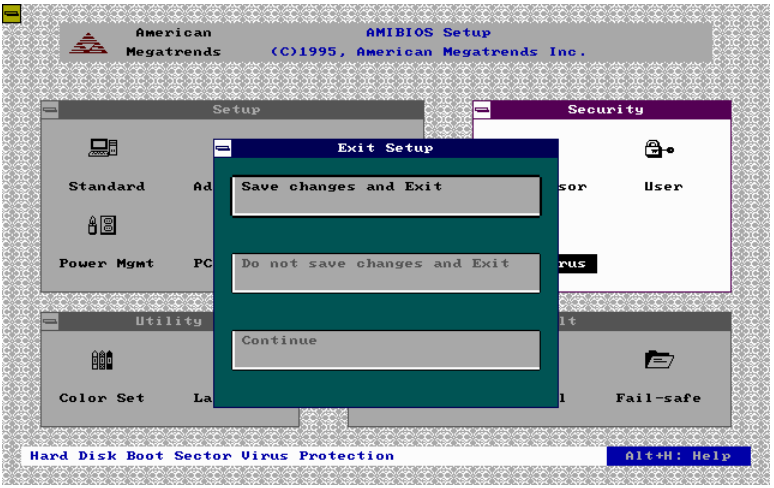
2. **Original**
   Choose the "Original" icon to return to the system's configuration values, present in WINBIOS Setup when you first began this session.

3. **Optimal**
   You can load the optimal default settings for the BIOS by selecting the "Optimal" icon. The optimal default settings are best-case values that should optimize the system's performance. If CMOS RAM is corrupted, the optimal settings are loaded automatically.

Note: The optimal values is for regular use.

4. Fail safe

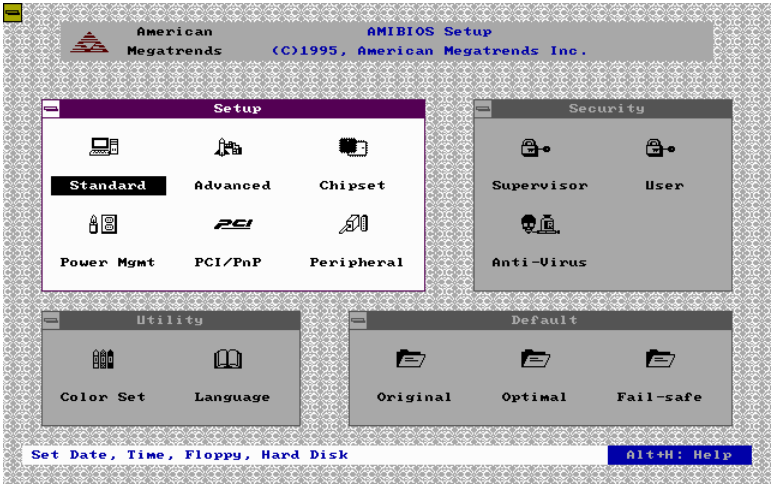
You can load the Fail-safe BIOS Setup option setting by selecting the “Fail-safe” icon from the “Default” section of the Setup main menu. The Fail-safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.



5. **Save Changes and Exit**
   Select this option to save all of the modifications (the configuration changes) you specify during the current session into the CMOS RAM.

Note: If you would like to review or modify the configuration in more detail, you could select the "Continue" option to go to the next page before choosing the "Save Changes and Exit" option.

6.5 Setup Menu Categories



Your Setup program can have up to six separate screens. Different types of system configuration parameters are set on each screen.

Type	Description
Standard Setup	Set the time and date Configure disk drives
Advanced Setup	Configure basic system performance parameters
Chipset Setup	Configure features specific to the chipset used in the computer
Power Management Setup	Configure power conservation features
PCI/PnP Setup	Configure PCI and Plug-and-Play features
Peripheral Setup	Configure I/O support

1. **Standard Setup Menu**

   Standard Setup options are displayed by choosing the "Standard" icon from the Setup menu. All standard setup options are described below.

2. **Date/Time**

   Select the "Date/Time" option to change the date or time. The current date and time are displayed. New values may be entered through the displayed window.

3. **Floppy Drive A, B**

   Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *360KB 5 1/4", 1.2MB 5 1/4",720KB 3 1/2", 1.44MB 3 1/2", or 2.88MB 3 1/2"*

4. **Pri Master**
   Pri Slave
   Sec Master
   Sec Slave

   Choose these icons to configure the hard disk named in the option. When you click on an icon, the following parameters are listed: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters to IDE drives except *Type*.

5. **Configuring an MFM Drive**

   If configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, cylinders, sectors, the starting write precompensation cylinder, and the drive capacity). Choose "Type" and choose the appropriate hard disk drive type (1-46).

6. **User-Defined Drive**

   If you are configuring a SCSI drive or a (RLL, MFM, ARLL or ESDI) drive with parameters that do not match drive types 1-46, you must select "*User"* in the "*Type*" field. You must then enter the drive parameters on the screen that appears.

   The drive parameters include:

   - Cylinder (number of cylinders),
   - Hd (number of heads),
   - WP (starting write precompensation cylinder),
   - Sec (number of sectors) and

- Size (drive capacity).

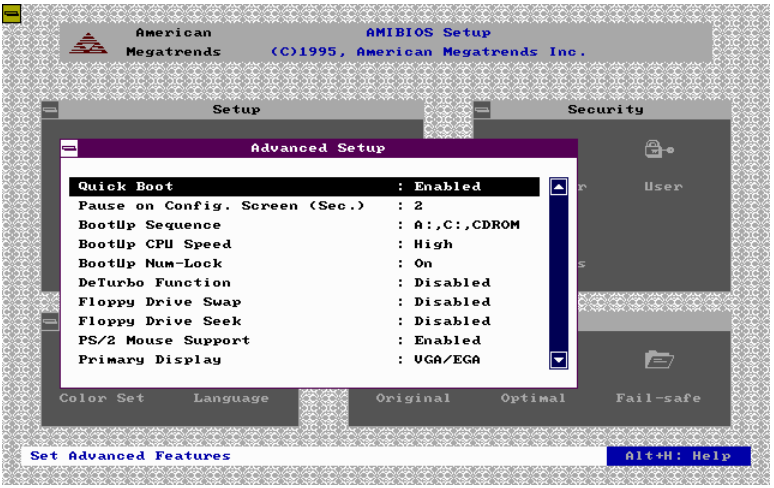
7. Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the "*Type*" parameter and select "*Auto*." The BIOS automatically detects the IDE drive parameters and displays them. Click on the OK button to accept these parameters.

8. Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the "*Type*" parameter and select CDROM. You can boot the computer from a CD-ROM drive.

6.6 Advanced Setup Menu



1. Quick Boot

Set the Advanced Setup 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.

2. Boot Up Sequence

This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:, A:, CDROM; CDROM, C:, A:, or A:, C:, CDROM.* The default setting is *A:, C:, CDROM*.

3. Boot Up CPU Speed

This option lets you specify the CPU speed at system boot. The settings are *Low* or *High*. The Optimal and Fail-safe default settings are *High.*

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 setting is *On.*

5. Deturbo Function

Set this option to control the Deturbo Function. The settings are *Disabled* or *Enabled*. The Optimal and Fail-safe default settings are *Disabled.*

6. 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 setting is *Disabled.*

7. Floppy Drive Seek

Set this option to Enabled to specify that floppy drive A: will perform a Seek operation at system boot. The setting are D*isabled* or *Enabled*. The Optimal and Fail-safe default settings are *Disabled.*

8. Mouse Support

When this option is set to Enabled, AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled*. The default setting is *Enabled.*

9. Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Mono, CGA40, CGA80,EGA/VGA,* or *Absent*. The Optimal and Fail-safe default settings are *EGA/VGA*.

10. Password Check

This option enables password checking every time the computer is powered on or every time the BIOS Setup is executed. 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 BIOS is executed. The Optimal and Power-On defaults are *Setup*.

11. Parity Check

Set this option to enabled to check the parity of all system memory. The settings are *Disabled* or *Enabled*. The Optimal and Fail-safe default settings are *Disabled.*

12. OS/2 Compatible Mode

Set this option to Enable to permit AMIBIOS to run with IBM OS/2. The settings are *Enabled* or *Disabled*. The default setting is *Disabled.*

13. Internal Cache

This option specifies the caching algorithm used for L1 internal cache memory. The settings are:

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
Write Back (default)	Use the write-back caching algorithm.
Write Thru	Use the write-through caching algorithm.

14. System BIOS Shadow Cacheable

When this option is set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-safe default setting is *Disabled*.

15. C000, 16K Shadow **D000, 16K Shadow**
C400, 16K Shadow **D400, 16K Shadow**
C800, 16K Shadow **D800, 16K Shadow**
CC00, 16K Shadow **DC000, 16K Shadow**

These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If there is no adapter ROM using the named ROM area, this area is made available to the local bus. The settings are:

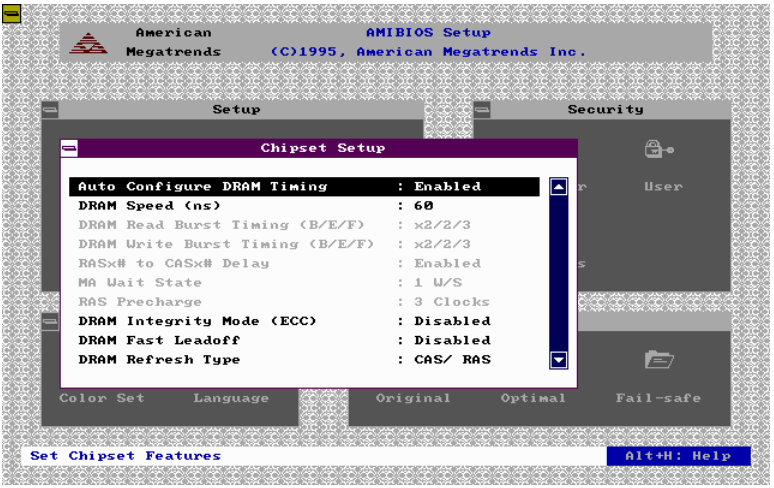
Setting	Description
Shadow	The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster execution.
Cache	The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adapter ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.
Disable	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The C000~C7FF 32K default setting is *Enable*, the other segment is *Disable*.

6.7 Chipset Setup Menu

1. Auto Configure DRAM Timing

Use this option to specify an area in the memory that sets the read/write and pre-charge timing on the memory bus. The default setting is *Enabled.*



2. **DRAM Speed**

   Specify the RAS access speed of the SIMMs, installed in the motherboard as system memory. The settings are *60ns* or *70ns*. The default is *70ns*.

3. **Fixed Memory Hole**

   Enabling this feature reserves 15MB to 16MB, or 512KB to 640KB, memory address space to the ISA expansion cards that specifically require this setting. This makes the memory from 15MB, or 512KB, and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default is *Disabled*.

4. **CPU-to-PCI IDE Posting**

   Leave on the default setting of *Enabled* so that the CPU to PCI IDE posting cycles are treated as normal I/O write transactions.

5. **USWC Write Posting**

   Leave on the default setting of *Enabled* to allow USWC write posting during I/O bridge access.

6. **CPU-to-PCI Write Post**

   The default setting of *Enabled* will increase the efficiency of the PCI bus and speed up the execution in the processor.

7. PCI-to DRAM Pipeline

The default setting of *Enabled* will increase the bandwidth of the path between the PCI and the DRAM to enhance the PCI bus efficiency and DRAM accessing.

8. PCI Burst Write Combining

The default setting of *Enabled* will increase the efficiency of the PCI bus by combining several CPU to PCI write cycles into one. VGA performance is increased by this action.

9. Read-Around-Write

The default setting of *Enabled* will increase the execution efficiency of the processor. It allows the processor to execute read commands out of order if there is no dependence between these read and other write commands.

10. 8-bit I/O Recovery Time (SYSCLK)

This option specifies the length of the delay (in SYSCLKs) inserted between consecutive 8-bit I/O operations. The settings are *1, 2, 3, 4, 5, 6, 7, or 8.* The Optimal and Fail-safe default settings are *3*.

11. 16-Bit I/O Recovery Time (SYSCLK)

This option specifies the length of the delay (in SYSCLKs) inserted between consecutive 16-bit I/O operations. The settings are *1, 2, 3, 4, 5, 6, 7, or 8*. The Optimal and Fail-safe default settings are *3*.

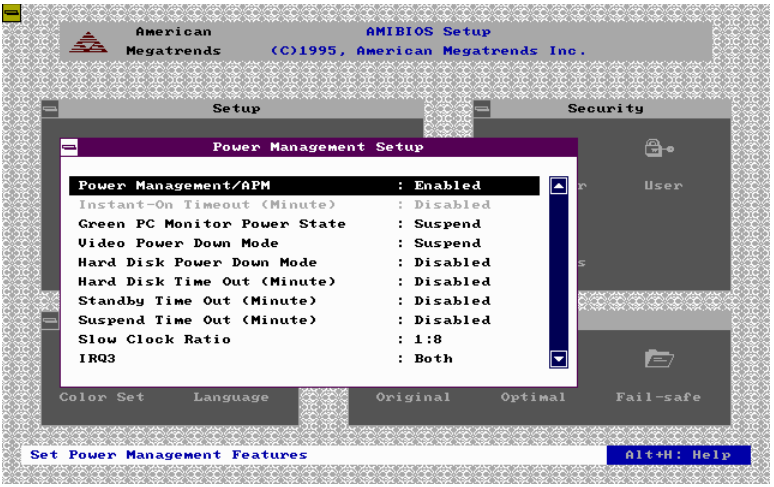
6.8 Power Management Setup

1. Power Management/APM

Set this option to Enabled to activate the power management and APM (Advanced Power Management) features. The settings are *Enabled* or *Disabled*. The default setting is *Enabled***.**

2. Instant On Support

Set this option to *Enabled* to allow the computer to go to full power on mode when leaving a power-conserving state.



Note: This option is only available if supported by the computer hardware.

AMIBIOS uses the RTC Alarm function to wake the computer at a pre-specified time. The settings are *Enabled* or *Disabled*. The default setting is *Disabled*.

3. Green PC Monitor Power State

This option specifies the power management state that the Green PC-compliant video monitor enters after the specified period of display inactivity has expired. The settings are *Disabled, off Standby, or Suspend*. The default setting is *Suspend*.

4. Video Power Down Mode

This option specifies the power management state that the video subsystem enters after the specified period of display inactivity has expired. The settings are *Disabled*, *Standby*, or *Suspend*. The default is *Suspend*.

5. Hard Disk Power Down Mode

This option specifies the power management state that the hard disk drive enters after the specified period of display inactivity has expired. The setting are *Disabled, Standby, orSuspend*. The default setting is *Disabled.*

6. Hard Disk Time Out (Min)

This option specifies the length of a period of hard disk inactivity. When this period expires, the hard disk drive enters the power conserving mode which specifies in the Hard Disk Power Down Mode option described previously. The settings are *Disabled, 1Min (minutes)*, and all one minute intervals up to and including 15 Min. The default setting is *Disabled.*

7. Full-On to Standby Time Out

This option specifies the length of the period of system inactivity when the computer is in Full-On mode before the computer is placed in Standby mode. In Standby mode, some power use is curtailed. The settings are *Disabled, 1 Min, 2 Min*, and all one minute intervals up to and including 15 Min. The default setting is *Disabled*.

8. Standby to Suspend Time Out

This option specifies the length of the period of system inactivity when the computer is already in Standby mode before the computer is placed in Suspend mode. In Suspend mode, nearly all power used is curtailed. The settings are *Disabled, 1 Min, 2 Min,* and all one minute intervals up to and including 15 Min. The default setting is *Disabled.*

9. Slow Clock Ratio

This option specifies the speed at which the system clock runs in power saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed. The settings are *1:1, 1:2* (half as fast as normal), *1:4* (the normal clock speed), *1:8, 1:16, 1:32*, *1:64, or 1:128*. The default setting is *1:8*.

10. Display Activity

This option specifies if AMIBIOS is to monitor activity on the display monitor for power conservation purposes. When this option is set to "Monitor" and there is no display activity for the length of time specified in the value of *the Full-On to Standby Time out (Min)* option, the computer enters a power saving state. The settings are *Monitor or Wake up or Ignore or Both*. The default setting is *Ignore*.

11. **IRQ3** **IRQ11**
IRQ4 **IRQ12**
IRQ5 **IRQ13**
IRQ7 **IRQ14**
IRQ9 **IRQ15**
IRQ10

These options enable event monitoring. When the computer is in a power saving mode, activity on the named interrupt request is monitored by AMIBIOS. When any activity occurs, the computer enters ”Full-On” mode.

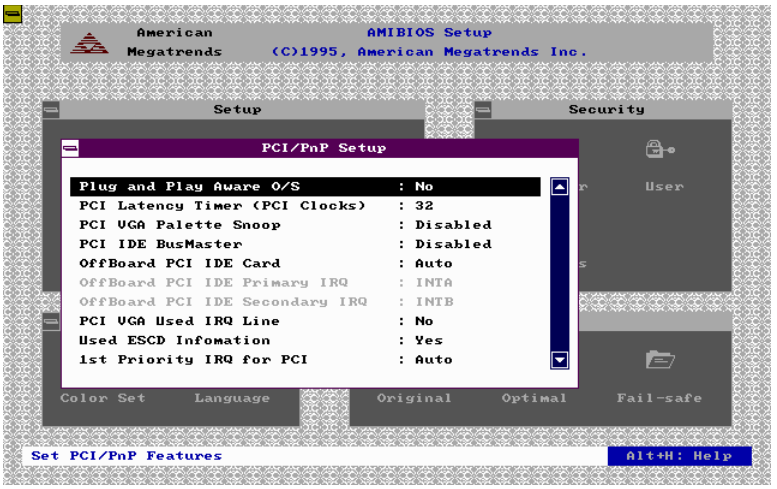
Each of these options can be set to *Monitor* or *Ignore*. The default setting for all options is *Ignore*, except for IRQ3, IRQ4, IRQ14, IRQ15 which are *Both*.

6.9 PCI/PnP Setup Menu

1. **Plug and Play Aware OS**
Set this option to ”Yes,” if the operating system installed in is Plug and Play aware. AMIBIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enable all other PnP-aware adapter cards. Windows 95 is PnP aware.

Set this option to “No,” if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly. The settings are *No* or *Yes*. The Optimal and Fail-safe default settings are *No*.

2. **PCI Latency Timer (in PCI Clocks)**
This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. The settings are *32, 64, 96, 128, 160, 192, 244, or 248.* The Optimal and Fail-safe default setting is *32.*



3. PCI VGA Palette Snoop

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

4. PCI IDE Bus Master

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

5. Off Board PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is used in the computer. You must also specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller card is installed. If an off board PCI IDE controller is used, the onboard IDE controller on the motherboard is automatically disabled. The settings are *Disabled, Auto Slot1, Slot2, Slot3, or Slot4*.

If *Auto* is selected, AMIBIOS automatically determines the correct setting for this option. The Optimal and Fail-safe default settings are *Auto.*

6. Offboard PCI IDE Primary IRQ

The Optimal and Fail-safe default settings are *INTA*.

7. Offboard PCI IDE Secondary IRQ

The Optimal and Fail-safe default settings are *INTB*.

IRQ3	**IRQ10**
IRQ4	**IRQ11**
IRQ5	**IRQ12**
IRQ7	**IRQ14**
IRQ9	**IRQ15**

These options specify to the bus that the named interrupt request lines (IRQs) are used. These options allow you to specify IRQs for use by legacy ISA adapter cards. These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQs pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the ISA/EISA setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured *PCI/PnP*.

The settings are PCI/PnP or ISA/EISA. The Optimal and Fail-safe default settings are *PCI/PnP*.

8. Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are *Disabled*, *16K, 32K, or 64K*. The Optimal and Fail-safe default settings are *Disabled.*

9. Reserved Memory Address

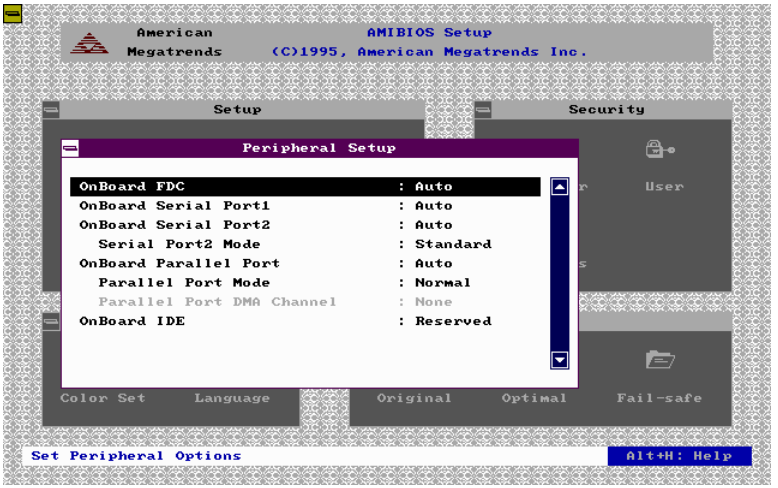
This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards. The settings are *C0000, C4000, C8000, CC000, D0000, D4000, D8000, or DC000*. The Optimal and Fail-safe default settings are *C0000.*

6.10 Peripheral Setup Menu

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the Setup main menu. All options are described in this section.

1. **Onboard FDC**

   This option enables the floppy drive controller on the motherboard. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-safe default setting is *Disabled*.



2. **Onboard Serial Port 1**

   This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1. The settings are *3F8h, 3E8h, Auto, or Disabled*. The Optimal default setting is *Auto*. The Fail-safe default setting is *Disabled*.

3. **Onboard Serial Port 2**

   This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2. The setting are *2F8h, 2E8h, Auto, or Disabled*. The Optimal default setting is *Auto*. The Fail-safe default setting is *Disabled*.

4. Onboard Parallel port

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *378h, 278h, Auto, or Disabled.* The Optimal default setting is *Auto*. The Fail-safe default setting is *Disabled*.

5. Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IDEEE P1284 specifications. The settings are:

Setting	Description
Normal	The normal parallel port mode is used. This is the default setting.
Bi-Dir	Use this setting to support bi-directional transfers on the parallel port.
EPP	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 bi-directional data transfers driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5MB. ECP provides symmetric bi-directional communications.

6. Parallel Port DMA

This option is only available if the setting for the Parallel Port Mode option is ECP. The setting is *Disabled, DMA CH (channel) 0, DMA CH 1, or DMA CH 3*. The default setting is *Disabled.*

7. Onboard IDE

This option specifies the onboard IDE controller channels that will be used. The settings are *Primary, Secondary, Both, or Disabled*. The Optimal and Fail-safe default settings are *Both.*

6.11 Password

1. **If You Do Not Want to Use a Password**

   Just press <Enter> when the password prompt appears.

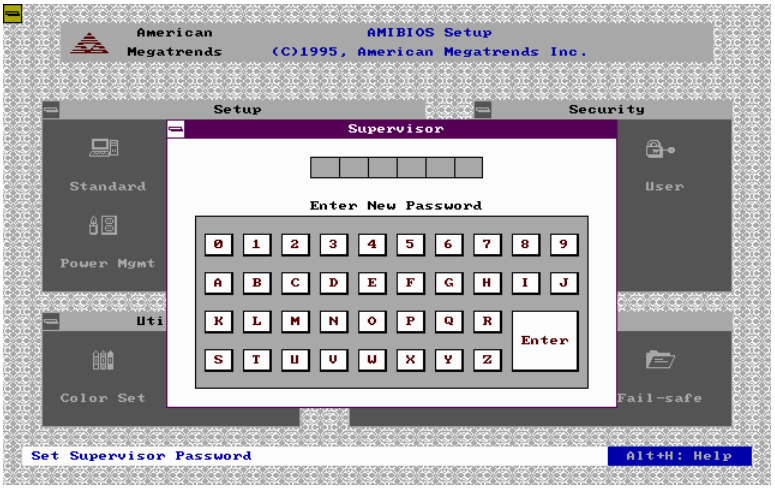
2. **Setting a Password**

   The password check option is enabled in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when BIOS is run). The password is stored in CMOS RAM. You can enter a password by:

   - typing the password on the keyboard,
   - selecting each letter via the mouse, or
   - selecting each letter via the pen stylus.

   Pen access must be customized for each specific hardware platform.

   When you select Supervisor or User, AMIBIOS prompts for a password. You must set the Supervisor password before you can set the User password. Enter a 1 - 6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system.



6.12 Anti-Virus

When this icon is selected from the Security section of the Setup main menu, AMIBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* or *Disabled*. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write.

```
Boot Sector Write!!!
Possible VIRUS: Continue (Y/N)? _
```

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

```
Format!!!
Possible VIRUS: Continue (Y/N)? _
```