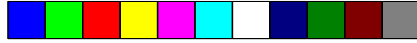




686PK

Rev. A+
System Board
User's Manual





FCC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

Caution:

Danger of explosion if battery incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

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Chapter 1 Introduction

The 686IPK is an Intel Pentium® II processor based system board using Intel's high performance 233MHz Pentium® II processor with 512KB external L2 cache, 233MHz Pentium® II processor with 256KB external L2 cache or 266MHz Pentium® II processor with 512KB external L2 cache.

The 686IPK supports processor fan "failure detection" function that monitors the status of the processor fan. It detects any irregularity in processor fan RPM (Rotation Per Minute) and alerts you to attend to any problem that may damage your system. The "failure detection" circuit requires a processor fan that operates at greater than 3600 RPM.

The 686IPK is equipped with a switching voltage regulator that automatically detects 1.8V to 3.5V. The VID (Voltage Identifications) code found in a processor allows the 686IPK to detect and adjust to the required voltage.

The 686IPK system board can support 8MB to 512MB of system memory. It is equipped with 4 SIMM sockets allowing you to install x32 or x36 EDO or fast page mode SIMMs. The x36 SIMM supports parity checking which informs the user of memory failure and prevents error accumulation.

The 686IPK system board is designed to fit into an ATX form factor case. Using an ATX power supply, you can either shut down your computer by pressing the Power button located on the front bezel of your computer or by executing the Shut Down command under the Windows® 95 operating system. Your system will enter the "soft power off" state. With a modem installed, you can power on your system to remotely transmit or access data. An ATX power supply also provides adequate airflow throughout the chassis to prevent overheating the processor.



Features and Specifications

Intel Pentium® II Processors

- 233MHz Pentium® II processor with 512KB external L2 cache
- 233MHz Pentium® II processor with 256KB external L2 cache
- 266MHz Pentium® II processor with 512KB external L2 cache

Chipset

- Intel® 440FX PCIsset

System Memory

- 8MB to 512MB memory
- Four 72-pin SIMM sockets
- Uses EDO or fast page mode x32 or x36 DRAM, 60/70ns, 5V
- ECC and Parity Check supported (uses x36 DRAM)

BIOS

- Compatible with Windows® 95 Plug and Play standard
- Flash EPROM for easy BIOS upgrades
- Includes NCR 810 SCSI BIOS
- Supports DMI function

Energy Efficient Design

- System power management supported
- CPU stopped clock control
- Hardware supports SMI green mode
- Microsoft®/Intel® APM 1.2 compliant
- External power management switch supported
- Soft Power supported

PCI IDE Interface

- PIO Mode 3 and Mode 4 Enhanced IDE (data transfer rate up to 16.6MB/sec.)
- DMA Mode 2 Bus Master IDE (data transfer rate up to 22.2MB/sec.)
- Bus mastering reduces CPU utilization during disk transfer
- ATAPI CD-ROM supported



Integrated I/O

- Two NS16C550A-compatible high speed UARTs
- One SPP/ECP/EPP parallel port
- Supports 360KB, 720KB, 1.2MB, 1.44MB, and 2.88MB floppy drives

Processor Slot

- Intel® Slot 1 connector (242-pin processor slot)
- Equipped with a switching voltage regulator that automatically detects 1.8V to 3.5V
- Processor fan with failure detection

Connectors

- 2 connectors for external USB (Universal Serial Bus) ports
- 1 connector for IrDA interface
- 2 DB-9 serial ports
- 1 DB-25 parallel port
- 2 IDE connectors
- 1 floppy connector
- 1 mini-DIN-6 PS/2 mouse port
- 1 mini-DIN-6 PS/2 keyboard port
- 1 20-pin ATX power supply connector

Expansion Slots

- 3 dedicated PCI slots
- 3 dedicated 16-bit ISA slots
- 1 shared PCI/ISA slot

PCB

- 4 layers, ATX form factor
- 30.48cm (12") x 22.53cm (8.87")



Package Checklist

The 686IPK package contains the following items:

- The 686IPK system board
- The 686IPK user's manual
- One 40-pin IDE hard disk cable
- One 34-pin floppy disk drive cable
- One IDE driver diskette
- One Retention Mechanism
- Five spare jumpers
- One card-edge bracket with two USB port cables (optional)

If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.





Chapter 2 Hardware Installation

This chapter summarizes the steps to install the 686IPK system board into your system unit. It also includes a description of the area in which you must work and directions for processor and memory installation. Before installing the system board, carefully read the Installing the System Board section for proper installation procedures.

Preparing the Area

Before unpacking the system board, make sure the location you have selected is relatively free of dust and static electricity. Excessive exposure to dust, static electricity, direct sunlight, excessive humidity, extreme cold, and water can damage the operational capabilities of your system board. Place the system board on a workbench (not in a chassis). Avoid placing the unit on surfaces such as carpeted floors. These areas also attract static electricity which can damage some circuits on your system board.

Make sure the power source has a properly grounded, three-pronged socket. It is essential that the power connection be properly grounded for correct functioning of your system board. For further protection, we recommend that you use a surge suppressor. This will protect the system board from damage that may result from a power surge on the electrical line.

Move items that generate magnetic fields away from your system board since magnetic fields can also damage your system board. Once you have selected the ideal location, unpack the 686IPK system board carefully.

Handling the System Board

It is quite easy to inadvertently damage your system board even before installing it in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling the system board to ensure against electrostatic build-up.



Static Electricity Precautions

1. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface with the system board components facing up.
4. Hold the system board by its edges only. Be careful not to touch any of the components, contacts or connections, especially gold contacts, on the board.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules and connectors by their ends.

Warning:

Electrostatic discharge (ESD) can damage your processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Installing the System Board

If you are installing the 686IPK system board, the following outlines the basic installation steps. Before installing the system board into your system unit, you should prepare the tools you will need.

You will need:

- One medium size, flat-bladed screwdriver
- One medium Phillips screwdriver
- One needle-nosed pliers
- One small nutdriver

1. Unlock your system unit. Turn off the power and disconnect all power cords and cables.

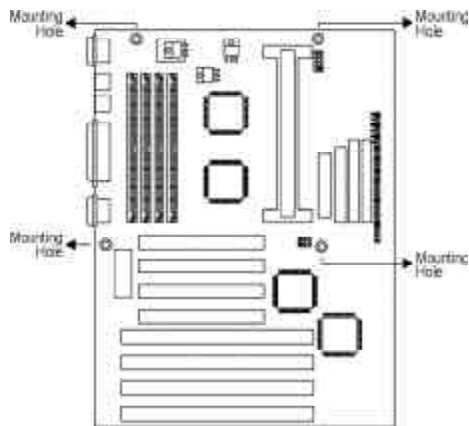


2. Remove the system unit cover. Refer to the manufacturer's instructions if necessary.
3. Detach all connectors from the old system board and remove expansion cards seated in any expansion slots.
4. Loosen the screws holding the original system board and remove the board from the system. Save the screws.
5. Remove the 686IPK from its original packing box. Be careful to avoid touching all connectors and pins on the board. Refer to the handling instructions on pages 8-9 for proper handling techniques.
6. Place the system board on a flat surface (not in a chassis) with the component side facing up.
7. Install the retention mechanism that comes with the package. Refer to the Installing the Retention Mechanism section for installation instructions.
8. You are now ready to install the Intel Pentium® II processor. Before you install the processor, carefully read the installation instructions under the Intel Pentium® II Processor Installation section.

Note:

Make sure the system board is not yet installed with any SIMMs, add-in cards, cables, etc.

9. Insert the memory modules into the memory banks on the 686IPK. The quantity and location of the memory modules depends on the memory configuration and type of modules you intend to use.
10. Set the corresponding jumpers.
11. Install the prepared 686IPK system board into the case. Make sure you install screws into the four mounting holes shown on the next page.

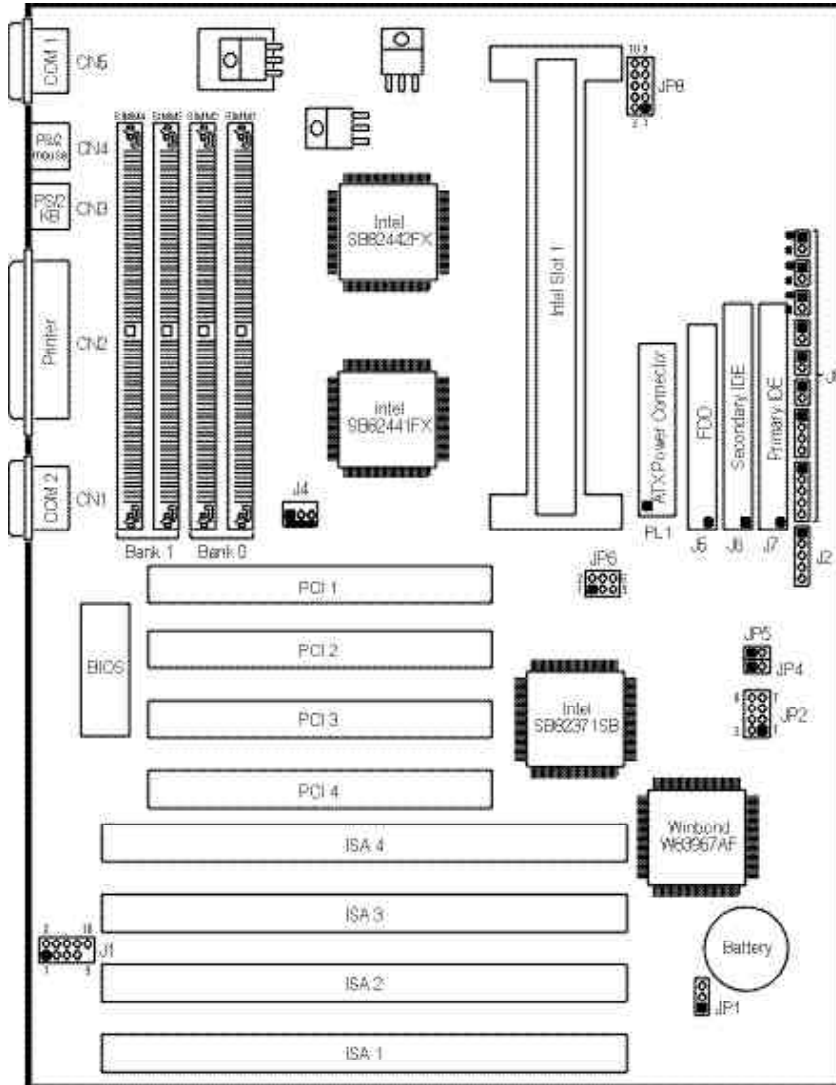


12. Reinstall all add-in cards and connectors and replace the system unit cover. Reconnect all power cords and cables.





Board Layout



■ square denotes pin 1



Jumpers	Refer to
JP2 and JP8 - Intel Pentium® II processors: voltage ID & freq. select	pages 17
JP1 - CMOS clear	page 27
JP5 - Processor fan failure detection	page 28
JP4 and JP6 - Factory testing jumpers	page 28

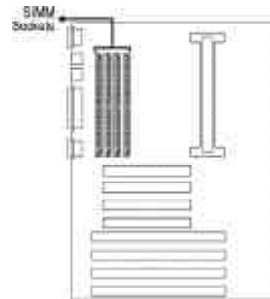
SIMM Sockets	Refer to
SIMM1 to SIMM4 - SIMM sockets	pages 14-16

Slots	Refer to
Intel® Slot 1 - Processor card slot	page 18-26
PCI Slots 1, 2, 3, 4 - 32-bit PCI slots	page 38
ISA Slots 1, 2, 3, 4 - 16-bit ISA slots	page 38

Connectors	Refer to
J1 - USB connectors	pages 33-34
J2 - IrDA connector	pages 34-35
J4 - Fan connector	page 35
J5 - FDD connector	pages 30-31
J6 - Secondary IDE HDD connector	pages 31-33
J7 - Primary IDE HDD connector	pages 31-33
J8 - ATX power LED	page 37
HD LED	
Green LED	
ATX power switch	
Green switch	
Reset switch	
Speaker connector	
AT power LED/Keylock connector	
CN1 - COM 2 serial port	page 29
CN2 - Parallel printer port	pages 29-30
CN3 - PS/2 keyboard port	page 29
CN4 - PS/2 mouse port	page 29
CN5 - COM 1 serial port	page 29
PL1 - ATX power connector	page 36

System Memory

The SIMM (Single In-line Memory Module) sockets are divided into two banks on the system board, Bank 0 and Bank 1. Each bank consists of 2 SIMM sockets. You will need either 2 or 4 pieces of SIM modules, depending on the amount of memory you intend to install. Make sure you insert the same type of SIMMs in one bank.



You can install SIMMs in either of the banks, Bank 0 or Bank 1, but you must populate one bank first before going to the next bank.

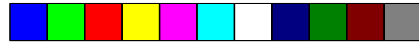
The 686IPK system board can support 8MB to 512MB of memory using 1MBx32/x36, 2MBx32/x36, 4MBx32/x36, 8MBx32/x36, 16MBx32/x36 or 32MBx32/x36 72-pin SIMMs. The table below shows the supported SIM modules and their corresponding memory sizes.

SIMMs	Memory Size
1MBx32/x36	4MB
2MBx32/x36	8MB
4MBx32/x36	16MB
8MBx32/x36	32MB
16MBx32/x36	64MB
32MBx32/x36	128MB

The table on the next page summarizes the bank locations and modules needed for the corresponding memory sizes.

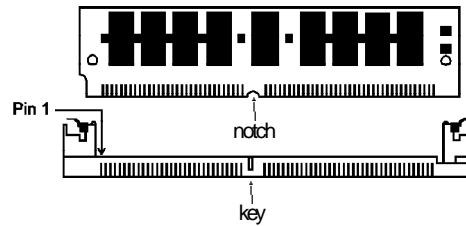


Memory Size	Bank0		Bank1	
	SIMM1	SIMM2	SIMM3	SIMM4
8MB	1MBx32/x36	1MBx32/x36	—	—
16MB	2MBx32/x36	2MBx32/x36	—	—
16MB	1MBx32/x36	1MBx32/x36	1MBx32/x36	1MBx32/x36
24MB	1MBx32/x36	1MBx32/x36	2MBx32/x36	2MBx32/x36
32MB	4MBx32/x36	4MBx32/x36	—	—
32MB	2MBx32/x36	2MBx32/x36	2MBx32/x36	2MBx32/x36
40MB	1MBx32/x36	1MBx32/x36	4MBx32/x36	4MBx32/x36
48MB	2MBx32/x36	2MBx32/x36	4MBx32/x36	4MBx32/x36
64MB	8MBx32/x36	8MBx32/x36	—	—
64MB	4MBx32/x36	4MBx32/x36	4MBx32/x36	4MBx32/x36
72MB	1MBx32/x36	1MBx32/x36	8MBx32/x36	8MBx32/x36
80MB	2MBx32/x36	2MBx32/x36	8MBx32/x36	8MBx32/x36
96MB	4MBx32/x36	4MBx32/x36	8MBx32/x36	8MBx32/x36
128MB	16MBx32/x36	16MBx32/x36	—	—
128MB	8MBx32/x36	8MBx32/x36	8MBx32/x36	8MBx32/x36
136MB	1MBx32/x36	1MBx32/x36	16MBx32/x36	16MBx32/x36
144MB	2MBx32/x36	2MBx32/x36	16MBx32/x36	16MBx32/x36
160MB	4MBx32/x36	4MBx32/x36	16MBx32/x36	16MBx32/x36
192MB	8MBx32/x36	8MBx32/x36	16MBx32/x36	16MBx32/x36
256MB	16MBx32/x36	16MBx32/x36	16MBx32/x36	16MBx32/x36
256MB	32MBx32/x36	36MBx32/x36	—	—
264MB	1MBx32/x36	1MBx32/x36	32MBx32/x36	32MBx32/x36
272MB	2MBx32/x36	2MBx32/x36	32MBx32/x36	32MBx32/x36
288MB	4MBx32/x36	4MBx32/x36	32MBx32/x36	32MBx32/x36
320MB	8MBx32/x36	8MBx32/x36	32MBx32/x36	32MBx32/x36
384MB	16MBx32/x36	16MBx32/x36	32MBx32/x36	32MBx32/x36
512MB	32MBx32/x36	32MBx32/x36	32MBx32/x36	32MBx32/x36



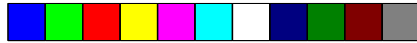
Installing a SIM Module

A SIM module simply snaps into a socket on the system board. Pin 1 of the SIM module must correspond with Pin 1 of the socket.



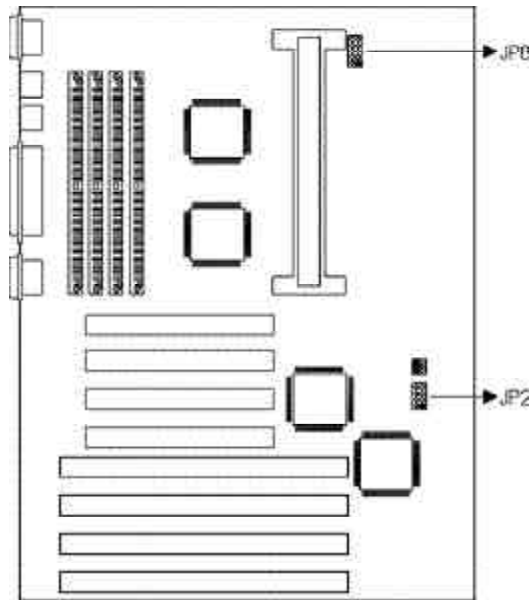
1. Position the SIMM above the socket with the “notch” in the module aligned with the “key” on the socket.
2. Seat the module at a 45° angle into the bank. Make sure it is completely seated. Tilt the module upright until it locks in place in the socket.





Intel Pentium® II Processor

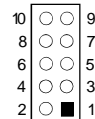
Jumper Settings for Intel Pentium® II Processors



Intel Pentium® II Processors	Freq. Ratio	JP2			
		1-2	3-4	5-6	7-8
233MHz	3.5x	Off	Off	On	On
266MHz	4x	On	On	Off	On
300MHz	4.5x	Off	On	Off	On
333MHz	5x	On	Off	Off	On



CPU Voltage	JP8				
	1-2	3-4	5-6	7-8	9-10
VID Support	Off	Off	Off	Off	Off



Important:

The currently available Intel Pentium® II processors support VID (Voltage ID). This allows the system to auto-detect the voltage of your processor. However, if your processor does not support VID, make sure you set JP8 according to the voltage supported by your processor. Refer to Appendix A for the jumper settings.



Intel Pentium® II Processor Installation

Installing the Retention Mechanism

The 686IPK package includes a Retention Mechanism. The Retention Mechanism is used to hold an Intel Pentium® II processor to the Intel® Slot 1 connector. Make sure the system board is on a workbench (not in a chassis). To install the Retention Mechanism, follow the steps below.

1. The Retention Mechanism package includes a Retention Mechanism and two Retention Mechanism Attach Mounts.



2. Insert the Retention Mechanism Attach Mount through the holes, up from the bottom of the system board. The holes are located near the ends of the Intel® Slot 1 connector.

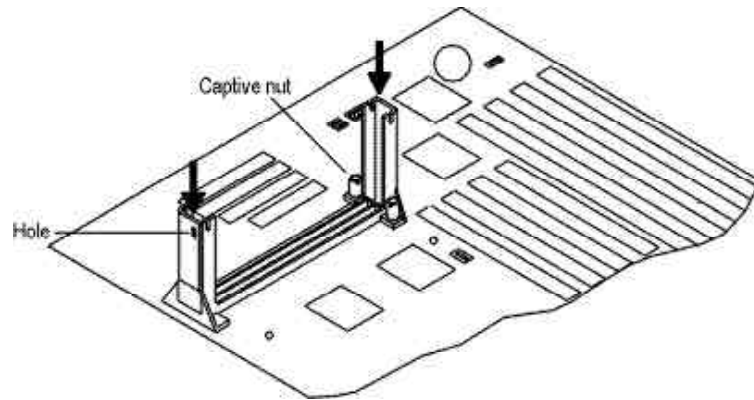




3. Hold the Retention Mechanism upright and position it above the Intel® Slot 1 connector.
4. Slide the Retention Mechanism downward so that the rectangular hole at the center of the Retention Mechanism fits onto the connector. The captive nuts located on both ends of the Retention Mechanism will also fit over the threaded studs of the Retention Mechanism Attach Mount.

Note:

The holes on the upper sides of the Retention Mechanism (where the latches of the processor locks) should be facing toward the Intel chips.

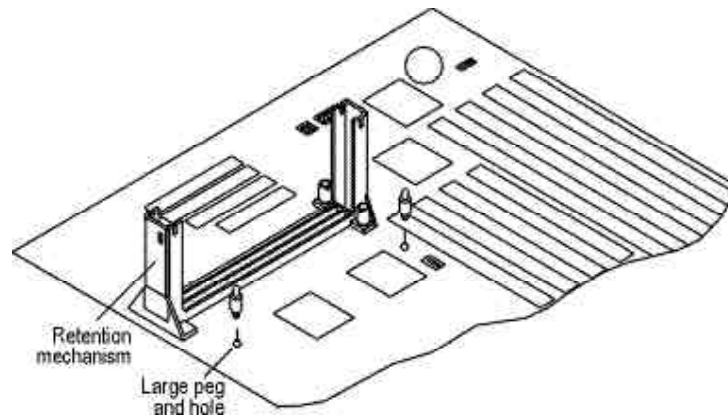


5. Tighten the captive nuts to stabilize the Retention Mechanism.

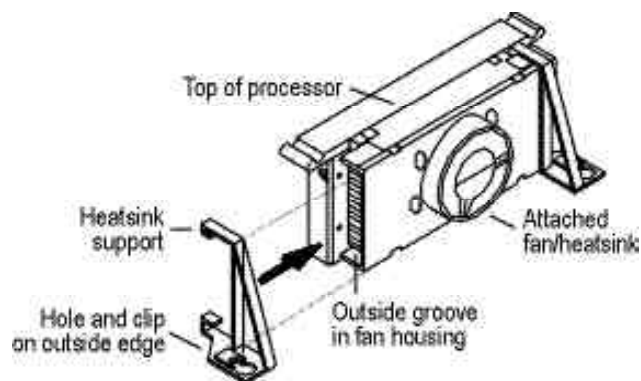


Installing Boxed Processor

1. Mount the two black plastic pegs onto the system board. These pegs will be used to attach the fan heatsink supports. Notice that one hole and the base of one peg are larger than the other hole and peg base. Push each peg into its hole firmly until you hear it “click” into place.

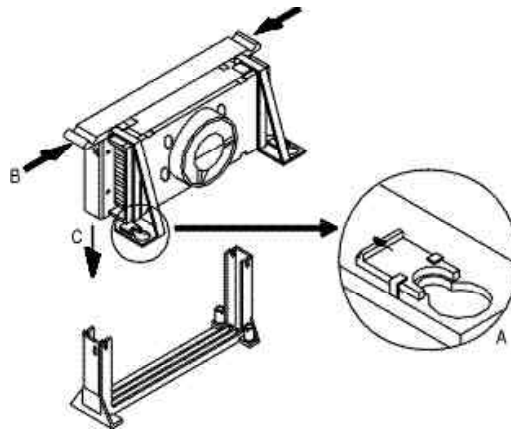


2. Slide a black plastic heatsink support onto each end of the fan heatsink, making sure that the hole and clip are on the outside edge of the support. (If the supports are reversed, the holes will not line up with the pegs on the system board). Slide each heatsink support toward the center of the processor until the support is seated in the outside groove in the fan housing.

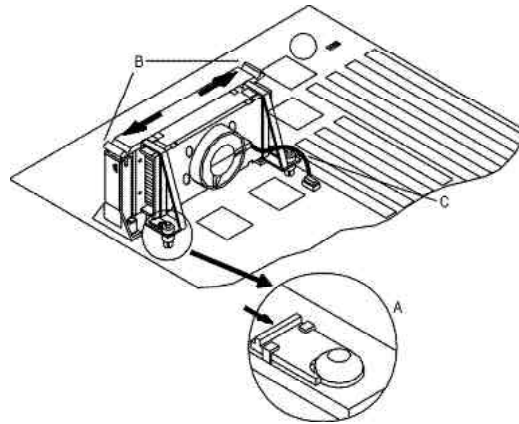




- Slide the clip (A) on each support toward the processor, exposing the hole that will fit over the peg on the system board. Push the latches (B) on the processor toward the center of the processor until they click into place.
- Hold the processor so that the fan shroud is facing toward the pegs on the system board. Slide the processor (C) into the Retention Mechanism and slide the supports onto the pegs. Ensure that the pegs on the system board slide into the holes in the heatsink support and that the alignment notch in the processor fits over the plug in Slot 1. Push the processor down firmly, with even pressure on both sides of the top, until it is seated.



- Slide the clips on the supports (A) forward until they click into place to hold the pegs securely. (Apply slight pressure on the peg and push the peg toward the clip while pushing the clip forward.) Push the latches on the processor (B) outward until they click into place in the Retention Mechanism. The latches must be secured for proper electrical connection of the processor.
- Attach the small end of the power cable (C) to the three-pin connector in the processor, then attach the large end to the three-pin connector (J4 - fan connector) on the system board.



Removing the Processor

To remove the processor from the system board, follow these steps (the reverse of the installation process).

1. Disconnect the fan power cable from the system board. (We recommend that you leave the cable connected to the processor).
2. Slide the clips on the supports backward to release the pegs in the system board. Push the latches on the processor toward the center of the processor until they click into place.
3. Lift one end of the processor until it is freed from Slot 1. Lift the other end of the processor until it is freed from Slot 1. Lift the entire processor (with the fan heatsink supports attached) until it is free from the Retention Mechanism.
4. Remove the heatsink support pegs from the system board and discard them. With one hand, squeeze together the two halves of the peg on the bottom side of the system board. With the other hand, pull the peg out of the hole in the system board. **Do not** reuse the pegs.

Caution:

When handling the processor, avoid placing direct pressure on the label area of the fan. When removing the processor, avoid pressing down on the system board or components. Instead, press down on plastic connectors.



Installing OEM Processor

If you are using Intel Pentium® II processor in OEM package, please follow the steps below.

1. Your OEM package may include the following items.



Important:

- *Make sure your heatsink is attached with a fan to prevent overheating the processor.*
- *Contact your heatsink manufacturer to check whether your processor requires a Heatsink Support (HSS) installed on the system board.*

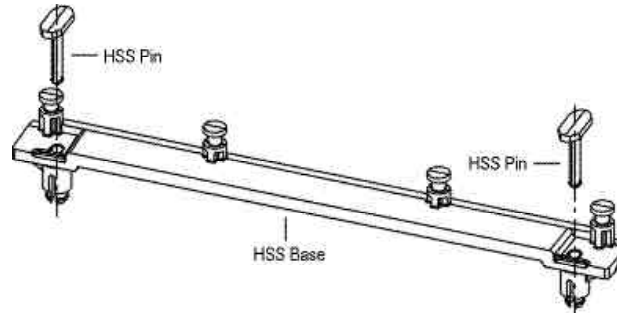


2. Push the HSS Top Bar sideways to free the HSS Top Bar from the retaining “tabs” of the HSS Base.





3. Remove the HSS Pins located on each end of the HSS Base.



4. Install the HSS Base by pushing each side down firmly into the holes on the system board. (The HSS Base can only be installed in one direction). Make sure it locks into place.
5. Replace the HSS Pins on each end of the HSS Base. These pins will insert through the HSS Base to secure it to the system board.
6. Hold the processor and push the latches toward the center of the processor until they click into place.

7. Hold the processor so that the heatsink is facing toward the HSS Base on the system board. Slide the processor into the Retention Mechanism. Ensure that the alignment notch in the processor fits into the plug in Slot 1. Push the processor down firmly, with even pressure on both sides of the top, until it is seated.



8. Push the latches on the processor outward until they click into place in the Retention Mechanism. The latches must be secured for proper electrical connection of the processor.

9. Slide the HSS Top Bar into the heatsink until it locks into place.
10. Attach the small end of the power cable (C) to the three-pin connector in the processor, then attach the large end to the three-pin connector (J4 - fan connector) on the system board.





Clearance Requirements

To maintain proper airflow once the processor is installed on the system board, the processor and fan heatsink require certain space clearances. The clearance above the processor must be at least 0.3 inches. The clearance on at least 3 of 4 sides of the processor and fan heatsink must be at least 0.2 inches. All cables (for floppy drive, hard drive, CD-ROM, etc.) must be routed clear of the processor and its airspace.

Fan Exhaust

The processor must be kept cool by using a processor with heatsink and fan attached. The temperature of the air entering the fan/heatsink cannot exceed 45°C (113°F). The ambient or room temperature must be below 37°C (99°F).

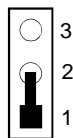


Jumper Settings for CMOS Clear

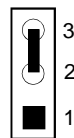
Jumper JP1

CMOS Clear Select

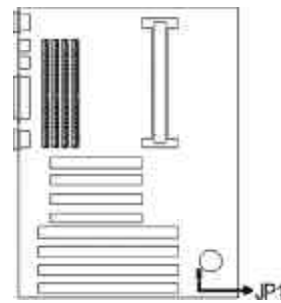
If, for some reason, the CMOS becomes corrupted, the system can be reconfigured with the default values stored in the ROM BIOS. To load the default values, power off your system and set JP1 pins 2 and 3 to On. Power on your system. After you boot up an operating system, turn your system off again. Set JP1 back to its default setting, 1-2 On.



1-2 On: Normal
(default)



2-3 On: CMOS Clear



Jumper Settings for Processor Fan Failure Detection

Jumper JP5

Processor Fan Failure Detection Setting

The 686IPK system board supports processor fan “failure detection” function. Make sure your processor fan also supports this function. To enable this function, set JP5 to On. You will hear music if your fan fails to function. If your processor fan is less than 3600 RPM or does not support the “failure detection” function, leave JP5 in its default setting.

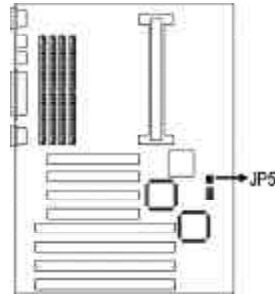
Please note - the connector on your fan must be a 3-pin connector and the third pin an “open collector” type. Connect the 3-pin connector to J4.



Off: Disabled
(default)



On: Enabled

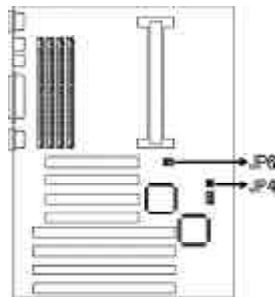


Factory Testing Jumpers

The jumpers below are for factory testing only and should always be set to their default configuration. Reconfiguring these jumpers will cause problems with your system board.

JP4: Off

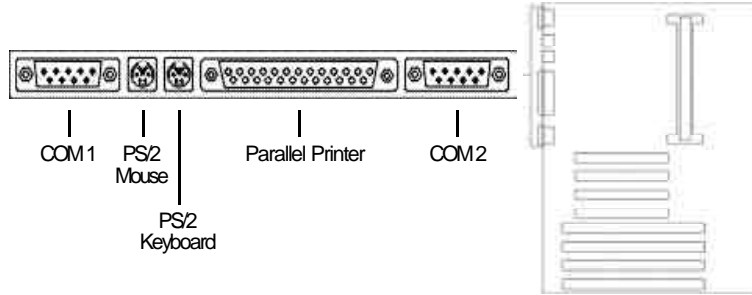
JP6: 1-3, 2-4 On





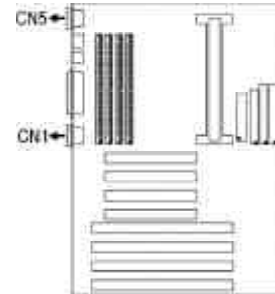
Ports and Connectors

The ATX single deck ports consist of two serial ports, one parallel printer port, one keyboard port and one PS/2 mouse port.



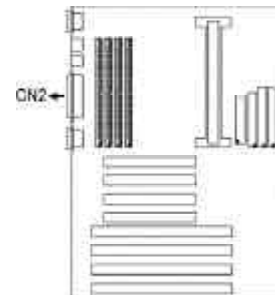
Serial Ports

The 686IPK is equipped with two serial ports at locations CN1 (COM 2) and CN5 (COM 1) of the system board. These built-in serial ports are RS-232C asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.



Parallel Port

The 686IPK system board has a standard printer port (CN2) for interfacing your PC to a parallel printer. It supports SPP, ECP and EPP modes. You can set the port's mode in the Integrated Peripherals setup of the Award BIOS (Refer to Chapter 3).





Setting	Function
SPP (Standard Parallel Port)	Allows normal speed operation but in one direction only.
ECP (Extended Capabilities Port)	Allows parallel port to operate in bidirectional mode and at a speed higher than the maximum data transfer rate.
EPP (Enhanced Parallel Port)	Allows bidirectional parallel port operation at maximum speed.

The parallel port on your system board can be set to any of the following system I/O addresses:

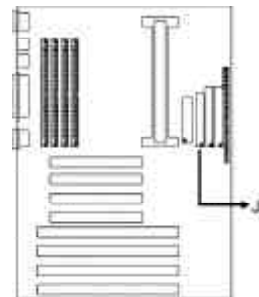
I/O Address	3BC-3BE Hex
	378-37A Hex (default)
	278-27A Hex

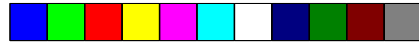
Floppy Disk Drive Controller

The 686IPK system board is equipped with a shrouded floppy disk header that supports two standard floppy disk drives. You can install any 360KB, 720KB, 1.2MB, 1.44MB, or 2.88MB floppy disk drive. To prevent improper floppy cable installation, the shrouded floppy disk header has a keying mechanism. The 34-pin connector on the floppy cable can be placed into the header only if pin 1 of the connector is aligned with pin 1 of the header.

Connecting the Floppy Disk Cable

1. Install the 34-pin header connector into the shrouded floppy disk header (J5) on the system board. The colored edge of the ribbon should be aligned with pin 1 of connector J5.





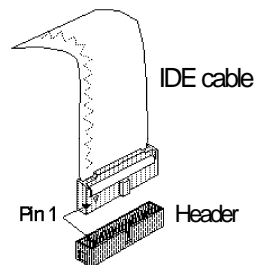
2. Install the other 34-pin header connector(s) into the disk drive(s). Align the colored edge of the daisy chained ribbon cable with pin 1 of the drive edge connector(s). The end-most connector should be attached to the drive you want to designate as Drive A.

IDE Hard Disk Interface

The 686IPK system board is equipped with two shrouded PCI IDE headers that will interface four Enhanced IDE (Integrated Drive Electronics) hard disk drives.

Connecting the IDE Hard Disk Interface

To prevent improper IDE cable installation, each shrouded PCI IDE header has a keying mechanism. The 40-pin connector on the IDE cable can be placed into the header only if pin 1 of the connector is aligned with pin 1 of the header.



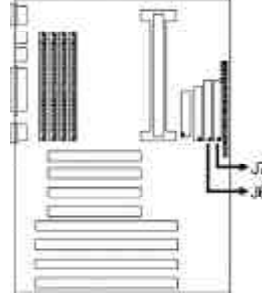
Note:

An IDE cable with a standard 40-pin connector (without the keying mechanism) can be installed in the shrouded PCI IDE header. Be extremely careful to match the colored edge of the ribbon with pin 1 of the header.



Connecting the Hard Disk Cable

1. If you are connecting two hard drives, install the 40-pin connector of the IDE cable into the primary shrouded IDE header (connector J7). If you are adding a third or fourth IDE device, install the 40-pin connector of the other IDE cable into the secondary shrouded IDE header (connector J6).



2. Install the other 40-pin header connector(s) into the device with the colored edge of the ribbon cable aligned with pin 1 of the drive edge connector(s).

Note:

Refer to your disk drive user's manual for information about selecting proper drive switch settings.

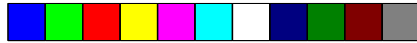
Adding a Second IDE Hard Drive

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

We recommend that you use Enhanced IDE hard drives from the same manufacturer. In some cases, drives from two different manufacturers will not function properly when used together. This occurs due to hard drive incompatibility, not a problem with the 686IPK system board.

Using 686IPK with CD-ROM Drives

If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.



Preparing an IDE Drive for Use

IDE disk drives are already low-level formatted, with any bad-track errors entered, when shipped by the drive manufacturer. Do not attempt to do a low-level format or you may cause serious damage to the drive. To use an IDE drive, you need to enter the drive type (this information is provided by the drive manufacturer) into the system's CMOS setup table. Then run FDISK and FORMAT provided with DOS. You may also use the IDE HDD Auto Detection function which will allow the BIOS to auto detect your hard drive type. Refer to the IDE HDD Auto Detection section for details.

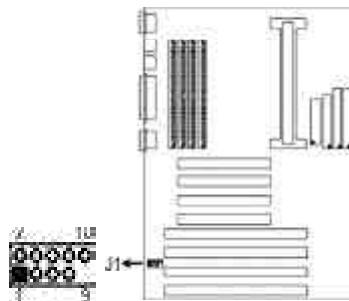
Warning:

Do not run FDISK and FORMAT programs on a drive that has already been formatted or you will lose all programs and data stored on the drive.

Universal Serial Bus Connectors

The 686IPK system board is equipped with a connector, at location J1 on the system board, for external USB ports. USB allows data exchange between your computer and a wide range of simultaneously accessible peripherals. Make sure "USB Controller" in the Integrated Peripherals setup of the Award BIOS is Enabled.

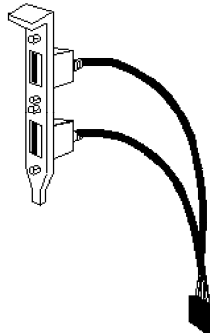
Pin	Function
1	+5V
2	+5V
3	-Data
4	-Data
5	+Data
6	+Data
7	Ground
8	Ground
9	Key
10	Ground





Connecting the USB Ports

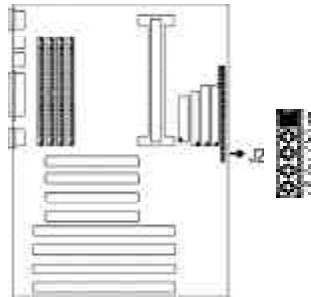
As an option, one card-edge bracket mounted with two USB port cables may be provided with the system board. The ends of the cables are attached to a connector. Connect the USB cable connector to J1 on the system board. The USB port cables can be inserted only if pin 1 of the cable (red wire) is aligned with pin 1 of J1. Pin 9 of J1 has been removed and the hole in the USB cable connector, which corresponds to pin 9, has been plugged to prevent incorrectly inserting the connector. Mount the card-edge bracket to the system chassis.



USB port cables (optional)

IrDA Connector

The 686IPK system board is equipped with an IrDA connector for wireless connectivity between your computer and peripheral devices. Connect your IrDA cable to connector J2 on the 686IPK system board. Make sure “Onboard IR Controller” in the Integrated Peripherals setup of the Award BIOS is Enabled. Carefully read this section (Onboard IR Controller) in Chapter 3 of this manual for instructions prior to using your IrDA device.



Pin	Function
1	RTX
2	GND
3	IRRX
4	IRR3
5	VCC

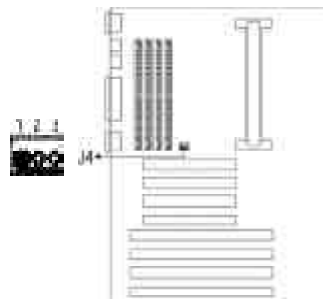
Fan Connector

We highly recommend that you attach a fan to the heatsink of your processor to prevent overheating the processor. The 686IPK system board supports processor fan “failure detection” function. To use this function, your processor fan must also support this feature. The “failure detection” circuit requires a processor fan that operates at greater than 3600 RPM. If your fan fails to function, it will alert you to attend to any problem that may damage your system or processor. Jumper JP5 must be set to On to enable this function. Refer to the Jumper Settings for Processor Fan Failure Detection section for more information.

Connecting the Fan

Connect the fan’s power cable to J4 on the system board. Please note - the connector on your fan must be a 3-pin connector and the third pin an “open collector” type.

Pin	Function
1	Ground
2	+12V
3	Sense (open collector type)



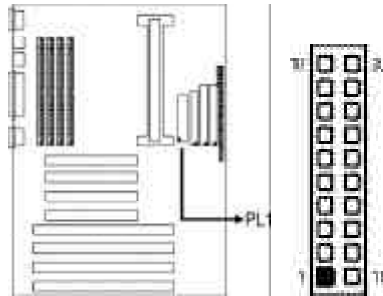


ATX Connector

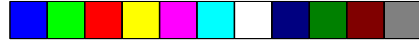
The 686IPK system board is equipped with an ATX power connector at location PL1 of the system board. Using an ATX power supply, you can either shut down your computer by pressing the Power button located on the front bezel of your computer or by executing the Shut Down command under the Windows® 95 operating system. Your system will enter the “soft power off” state. An ATX power supply also provides adequate airflow throughout the chassis to prevent overheating the processor.

Connecting an ATX Power Supply

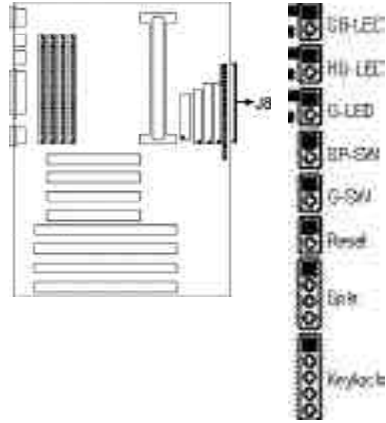
Install the 20-pin ATX power cable connector into location PL1 on the system board. The 20-pin connector can be inserted into PL1 only if pin 1 of the connector is aligned with pin 1 of PL1.



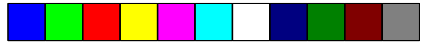
Pin	Function	Pin	Function
1	N. C.	11	N. C.
2	N. C.	12	-12V
3	Ground	13	Ground
4	+5V	14	PSON
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	PW-OK	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V



Connector J8

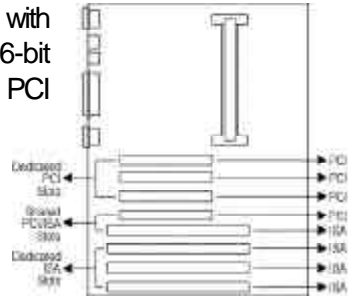


SB-LED (ATX power LED)	Pin 1 LED Power Pin 2 Ground
HD-LED (Primary/Secondary IDE LED)	Pin 1 LED Power Pin 2 Signal
G-LED (Green LED)	Pin 1 LED Power Pin 2 Signal
SP-SW (ATX power switch)	Pin 1 Signal Pin 2 Ground
G-SW (Green switch)	Pin 1 Signal Pin 2 Ground
RESET (Reset switch)	Pin 1 Signal Pin 2 Ground
SPEAKER (Speaker connector)	Pin 1 Signal Pin 2 N.C. Pin 3 Ground Pin 4 +5V
KEYLOCK (Keylock Connector)	Pin 1 LED Power Pin 2 N.C. Pin 3 Ground Pin 4 Keylock Signal Pin 5 Ground



Installing Expansion Cards

The 686IPK system board is equipped with 3 dedicated PCI slots, 3 dedicated 16-bit ISA slots and 1 shared PCI/ISA slot. All PCI and ISA slots are bus masters.





Chapter 3 Software Installation

After you power up your system, the BIOS message appears on your screen and the memory count begins.

After the memory test, the following message will appear on the screen:

Press DEL to enter setup

If the message disappears before you respond, restart your system or press the “Reset” button on the front of your computer. You may also restart the system by pressing the <Ctrl> <Alt> and keys simultaneously.

If you have set a password and selected “System” in the Security Option of the BIOS Features Setup menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup. Type in the correct password and press <Enter>.

If you selected “Setup” in the Security Option, you will be prompted for the password only when you try to enter Setup. Refer to the “BIOS Features Setup” section for more information.

Award BIOS Setup Utility

While booting up, press <Ctrl> <Alt> <Esc> simultaneously or to enter the Setup utility. A screen similar to the one on the next page will appear.



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

STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION LOAD BIOS DEFAULTS LOAD SETUP DEFAULTS	INTEGRATED PERIPHERALS SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑↓→← : Select Item (Shift) F2 : Change Color
Time, Date, Hard Disk Type...	

Use the arrow keys to highlight the option you want and press <Enter>. The following describes each of these options.

Note:

The settings on the BIOS setup screens on the following pages are for reference only. Some of the settings will vary according to your system's configuration and should not be referred to as the standard default setting.

Standard CMOS Setup

Use the arrow keys to highlight "Standard CMOS Setup" and press <Enter>. A screen similar to the one below will appear.

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

Date (mm:dd:yy) : Mon, Jul 29 1996							
Time (hh:mm:ss) : 13: 27: 50							
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR MODE
Primary Master	: Auto	0	0	0	0	0	0 Auto
Primary Slave	: Auto	0	0	0	0	0	0 Auto
Secondary Master	: Auto	0	0	0	0	0	0 Auto
Secondary Slave	: Auto	0	0	0	0	0	0 Auto
Drive A : 1.44M, 3.5 in.							
Drive B : None							
Video : EGA/VGA							
Halt on : All Errors							
				Base Memory : 640K		Extended Memory : 64512K	
				Other Memory : 384K		Total Memory : 65536K	
Esc : Quit		↑↓→← : Select Item		PU/PD/+/- : Modify			
F10 : Save & Exit Setup		(Shift)F2 : Change					



Date

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

Day	Displays a day, from Sunday to Saturday
Month	Displays the month, from January to December
Date	Displays the date, from 1 to 31
Year	Displays the year, from 1900 to 2099

Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

Hour	Displays hours from 00 to 23
Minute	Displays minutes from 00 to 59
Second	Displays seconds from 00 to 59

Primary Master, Primary Slave, Secondary Master and Secondary Slave

These categories allow you to enter the appropriate specifications for the type of hard disk drive(s) installed in your system. There are 45 predefined types and 4 user definable types for IDE hard drives. Type 1 to Type 45 are predefined. Type "User" is user-definable.

Press <PgUp> or <PgDn> to select a numbered hard disk type or type the number and press <Enter>. The hard disk will not work properly if you enter improper information for this category. You can use Type "User" to define your own drive type manually.

If you select Type "User", you will need to know the information on the table on the next page. Enter the information and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.

If the controller of the HDD interface is ESDI, you must select "Type 1".

If the controller of the HDD interface is SCSI, you must select "None".

If you select Type "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show IDE for the HDD & CD-ROM drive.

Type	Drive type
Cyls	Number of cylinders
Heads	Number of heads
Precomp	Write precomp
Landzone	Landing zone
Sectors	Number of sectors
Mode	Mode type

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

Drive A and Drive B

These categories identify the types of floppy disk drives installed. The following are the options for drives A and B.

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

Note:

Choosing an incorrect type might cause your system to format the floppy disk improperly, and you can not access your data.



Video

This category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in Setup. The default setting is EGA/VGA (BIOS default, Setup default).

EGAVGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters.
CGA 40	Color Graphics Adapter. Power up in 40-column mode.
CGA 80	Color Graphics Adapter. Power up in 80-column mode.
Mono	Monochrome adapter. Includes high resolution monochrome adapters.

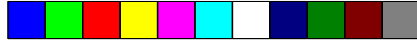
Halt On

This category determines whether the system will stop if an error is detected during power up. The default setting is All Errors (BIOS default, Setup default).

No Errors	The system boot will not stop for any errors detected.
All Errors	The system boot will stop whenever the BIOS detects a non-fatal error.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a disk or keyboard error; it will stop for all other errors.

Memory

The base memory size, extended memory size and the other memory size cannot be altered; your computer automatically detects and displays them.



Base Memory	This refers to the amount of base or conventional memory installed on the system board.
Extended Memory	This is the amount of memory located above 1MB in the memory address map of the CPU.
Other Memory	This memory size refers to the memory located in the address space between 640K and 1024K. DOS uses this area to load device drivers to keep base memory free for application programs. The most appropriate use of this area is for Shadow RAM.

BIOS Features Setup

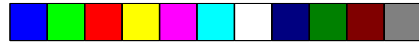
The BIOS Features Setup allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

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

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU L1 Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
CPU L2 Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup	ESC : Quit	↑↓←→ : Select Item
PCI/VGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
OS Select For DRAM > 64MB	: Non-OS2	F5 : Old Values (Shift) F2	: Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Virus Warning

This category protects the boot sector and partition table of your hard disk drive. When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive. If an attempt is made to write to the boot sector or partition table of the hard disk drive, the BIOS will halt the system and the following error message will appear.



! WARNING !
 Disk boot sector is to be modified
 Type "Y" to accept write or "N" to abort write
 Award Software, Inc.

After seeing this message, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

Many disk diagnostic programs which attempt to access the boot sector table will cause the warning message to appear. If you are running such a program, we recommend that you first disable this category. Also, disable this category if you are installing or running certain operating systems like Windows 95 or the operating system may not install nor work.

Enabled	BIOS issues a warning when any program or virus sends a Disk Format command or attempts to write to the boot sector of the hard disk drive.
Disabled	No warning message will appear when the hard disk drive is accessed.

CPU L1 Cache and CPU L2 Cache

These categories speed up memory access which provides better performance. The default value is enabled.

Quick Power On Self Test

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

Enabled	Enables quick POST.
Disabled	Normal POST.



Boot Sequence

This category determines which drive to search first for the disk operating system (i.e. DOS). The default is A, C, SCSI.

The options are: A, C, SCSI; C, A, SCSI; C, CDROM, A; CDROM, C, A; D, A, SCSI; E, A, SCSI; F, A, SCSI; SCSI, A, C; SCSI, C, A; or C only.

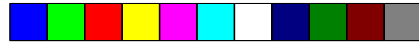
Swap Floppy Drive

Enabled	When this option is enabled and the system is booting from the floppy drive, the system will boot from drive B instead of drive A.
Disabled	When this option is disabled and the system is booting from the floppy drive, the system will boot from drive A.

Boot Up Floppy Seek

During POST, the BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M, 1.44M and 2.88M are all 80 tracks.

Enabled	The BIOS will check whether the floppy disk drive installed is 40 or 80 tracks. Note that the BIOS cannot distinguish between 720K, 1.2M, 1.44M or 2.88M drive types as they are all 80 tracks.
Disabled	The BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360KB.



Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on.

On	The function of the numeric keypad is the number keys.
Off	The function of the numeric keypad is the arrow keys.

Security Option

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

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

PCI/VGA Palette Snoop

This is used to select whether to allow MPEG ISA/VESA VGA cards to work with PCI/VGA or not.

Enabled	PCI/VGA working with MPEG ISA/VESA VGA cards.
Disabled	PCI/VGA not working with MPEG ISA/VESA VGA cards.

OS Select for DRAM > 64MB

This item allows you to access the memory that is over 64MB in OS/2. The options are: Non-OS2 and OS2.



Video BIOS Shadow

Determines whether video BIOS will be copied to RAM. Video Shadow will increase the video speed. Note that some graphics boards require that this option be disabled.

Enabled	Video shadow is enabled.
Disabled	Video shadow is disabled.

C8000-CBFFF Shadow to DC000-DFFFF Shadow

These categories determine whether option ROMs will be copied to RAM.

Enabled	Optional shadow is enabled.
Disabled	Optional shadow is disabled.

Chipset Features Setup

This section gives you instructions on how to configure the system based on the specific features of the chipset. This chipset manages bus speeds and access to system memory resources. It also coordinates communications between the conventional ISA bus and the PCI bus. These items should not be altered unless necessary. Depending on your add-in boards, you may not or should not enable some of those features. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system. The Chipset Features Setup screen is shown on the next page.



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

Auto Configuration	: Enabled	System BIOS Cacheable	: Disabled
DRAM RAS# Precharge Time	: 4	Video BIOS Cacheable	: Enabled
MA Additional Wait State	: Disabled	VGA Write Combining	: Disabled
RAS# To CAS# Delay	: Enabled	8 Bit I/O Recovery Time	: 4
DRAM Read Burst (B/E/F)	: x2/3/4	16 Bit I/O Recovery Time	: 2
DRAM Write Burst (B/E/F)	: x3/3/3	Memory Hole At 15M-16M	: Disabled
ISA Bus Clock	: PCICLK/4	Passive Release	: Enabled
DRAM Fast Leadoff	: Disabled	Delayed Transaction	: Disabled
DRAM Refresh Queue	: Enabled		
DRAM RAS Only Refresh	: Disabled	ESC : Quit	↑ ↓ → ← : Select Item
DRAM ECC/Parity Select	: Disabled	F1 : Help	PU/PD/+/- : Modify
Fast DRAM Refresh	: Disabled	F5 : Old Values (Shift) F2	: Color
Read-Around-Write	: Enabled	F6 : Load BIOS Defaults	
PCI Burst Write Combine	: Disabled	F7 : Load Setup Defaults	
PCI-To-DRAM Pipeline	: Enabled		
CPU-To-PCI Write Post	: Enabled		
CPU-To-PCI IDE Posting	: Disabled		

Auto Configuration

Enabled	The system will set the "DRAM RAS# Precharge Time" to the "ISA Bus Clock" categories automatically.
Disabled	This allows you to set the "DRAM RAS# Precharge Time" to the "ISA Bus Clock" categories manually.

DRAM ECC/Parity Select

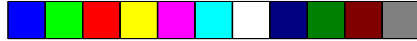
Parity	Enables the memory parity check. If the system DRAM has no parity bit, the system will display "RAM parity error".
Disabled	The system will ignore the memory parity check even if the DRAM has no parity bit. The system will not display "RAM parity error".
ECC	Enables the ECC (Error Correction Code) function.

ISA Bus Clock

PCICLK/4	The PCI Bus Clock is 33MHz and the ISA bus clock is 8.25MHz
PCICLK/3	The PCI Bus Clock is 33MHz and the ISA bus clock is 11MHz

Warning:

We recommend that you set the ISA Bus Clock category to "PCICLK/4". Compatibility problems with some ISA cards may occur if the ISA Bus Clock is set at "PCICLK/3".



Power Management Setup

The Power Management Setup allows you to configure your system to effectively save energy.

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

Power Management	: Disable	** Power Down & Resume Events **	
PM Control by APM	: Yes	IRQ3 (COM 2)	: On
Video Off Method	: V/H SYNC+Blank	IRQ4 (COM 1)	: On
Modem Use IRQ	: 3	IRQ5 (LPT 2)	: On
		IRQ6 (Floppy Disk)	: On
Doze Mode	: Disabled	IRQ7 (LPT 1)	: On
Standby Mode	: Disabled	IRQ8 (RTC Alarm)	: Off
Suspend Mode	: Disabled	IRQ9 (IRQ2 Redir)	: On
HDD Power Down	: Disabled	IRQ10 (Reserved)	: On
		IRQ11 (Reserved)	: On
** Wake Up Events In Doze & Standby **		IRQ12 (PS/2 Mouse)	: On
IRQ3 (Wake-Up Event)	: On	IRQ13 (Coprocessor)	: On
IRQ4 (Wake-Up Event)	: On	IRQ14 (Hard Disk)	: On
IRQ8 (Wake-Up Event)	: On	IRQ15 (Reserved)	: Off
IRQ12 (Wake-Up Event)	: On	ESC : Quit	↑ ↓ → ← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Power Management

This category allows you to select the type (or degree) of power saving by changing the length of idle time that elapses before each of the following modes are activated: Doze Mode, Standby Mode, and Suspend Mode.

Disable (default)	No power management. Disables all four modes.
Min. Saving	Minimum power management. Doze Mode = 1 hr., Standby Mode = 1 hr., Suspend Mode = 1 hr. and HDD Power Down = 15 min.
Max. Saving	Maximum power management. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min. and HDD Power Down = 1 min.
User Define	Allows you to set each mode individually. When enabled, each option ranges from 1 min. to 1 hr.



PM Control by APM

Yes	An Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU's internal clock. Use this option in Windows® 95.
Nb	Default.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+ Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initializes display power management signaling. Use this option if your video board supports it.

Doze Mode, Standby Mode, Suspend Mode and HDD Power Down

These Green PC power saving categories are user configurable only when the Power Management category is set to User Defined. They are used to define the idle time that elapses before the system enters the power saving mode.

Doze Mode	When enabled and after the set time of system inactivity, the CPU clock will run at a slower speed (1/2 of full speed) while all other devices still operate at full speed.
Standby Mode	When enabled and after the set time of system inactivity, the CPU clock will run at a speed slower than the speed during Doze mode (1/3 of full speed) while all other devices still operate at full speed.
Suspend Mode	When enabled and after the set time of system inactivity, the CPU and onboard peripherals will be shut off.
HDD Power Down	This is used to define the continuous HDD idle time that elapses before the HDD enters the power saving mode (motor off). When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

IRQ3 to IRQ15 (Wake Up Events in Doze and Standby, and Power Down and Resume Events)

These are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as On, even when the system is in a power saving mode.

When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. When set to On, the activity will neither prevent the system from going into a power saving mode nor awaken it.

PNP/PCI Configuration

This section describes configuring the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

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

Resources Controlled By : Auto Reset Configuration Data : Disabled	PCI IRQ Activated By : Level PCI IDE IRQ Map To : PCI-Auto Primary IDE INT# : A Secondary IDE INT# : B Assign IRQ for VGA : Enable
ESC : Quit ↑ ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	



Resources Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95.

Auto	The system will automatically detect the settings for you. The categories that follow will not be shown on the PNP/PCI Configuration screen.
Manual	This will allow you to set the IRQ (you have assigned your add-in card) to Legacy ISA or PCI/ISA PnP. For non-PnP ISA cards, select Legacy ISA. For PnP ISA or PCI cards, select PCI/ISA PnP.

Reset Configuration Data

Enabled	The BIOS will reset the configuration data automatically.
Disabled	The BIOS will not reset the configuration data.

PCI IRQ Activated By

This category is used to set the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless a different setting is needed.

PCI IDE IRQ Map To

This category is used to configure your system to the type of IDE disk controller in use.

ISA	Default setting. (The IDE disk controller is an ISA controller).
PCI Slot 1-4	The slot that has the PCI IDE controller; if you are using a PCI IDE controller card.
PCI-Auto	The system will automatically determine how your IDE disk system is configured.



If this category is set to PCI Slot 1/2/3/4 or PCI-Auto, the Primary and Secondary IDE INT# categories will appear allowing you to select the PCI interrupt (A, B, C, or D) that is associated with the connected hard drives.

Assign IRQ for VGA

If Enabled, the system will automatically set an IRQ for the VGA card installed. Your VGA card will need an IRQ address only when using the video capture function of the card. If you are not using this function and a new device requires an IRQ address, you can set this function to Disabled. The IRQ address (previously occupied by the VGA card) will be available for your new device.

Load BIOS Defaults

The “Load BIOS Defaults” option loads the troubleshooting default values permanently stored in the ROM chips. These settings are not optimal and turn off all high performance features. You should use these values only if you have hardware problems. Highlight this option on the main menu and press <Enter>. The message below will appear.

Load BIOS Defaults (Y/N)? N

If you want to proceed, type <Y> and press <Enter>. The default settings will be loaded.

Load Setup Defaults

The “Load Setup Defaults” option loads optimized settings from the BIOS ROM. Use the Setup default values as standard values for your system.

Highlight this option on the main menu and press <Enter>. The message below will appear.

Load Setup Defaults (Y/N)? N

Type <Y> and press <Enter> to load the Setup default values.

Integrated Peripherals

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

IDE HDD Block Mode : Enabled	Onboard Parallel Port : 378/IRQ7
IDE Primary Master PIO : Auto	Parallel Port Mode : SPP
IDE Primary Slave PIO : Auto	
IDE Secondary Master PIO : Auto	Modem Ring-on : Disabled
IDE Secondary Slave PIO : Auto	
On-chip Primary PCI IDE : Enabled	
On-chip Secondary PCI IDE : Enabled	
PCI Slot IDE 2nd Channel : Disabled	
USB Controller : Disabled	
KBC Input Clock : 12MHz	
Onboard FDC Controller : Enabled	
Onboard Serial Port 1 : 3F8/IRQ4	
Onboard Serial Port 2 : 2F8/IRQ3	
Onboard IR Controller : Disabled	
ESC : Quit ↑ ↓ → ← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults	

IDE HDD Block Mode

Enabled	The IDE HDD uses the block mode. The system BIOS will check the hard disk drive for the maximum block size the system can transfer. The block size will depend on the type of hard disk drive.
Disabled	The IDE HDD uses the standard mode.

IDE Primary Master/Slave PIO and IDE Secondary Master/Slave PIO

Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking the hard drive.

Auto	The BIOS will automatically set the system according to your hard disk drive's timing.
0-4	You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.



On-Chip Primary PCI IDE and On-Chip Secondary PCI IDE

These categories allow you to enable or disable the primary and secondary IDE controller. The default is Enabled. Select Disabled if you want to add a different hard drive controller.

PCI Slot IDE 2nd Channel

This allows you to designate an IDE controller board inserted into one of the PCI slots as your secondary IDE controller.

Enabled	External IDE controller designated as the secondary controller.
Disabled	No IDE controller occupying a PCI slot.

USB Controller

By default, the USB controller is Disabled. To use the USB controller, set this option to Enabled. Refer to the Universal Serial Bus Connectors section for instructions on connecting the USB ports.

KBC Input Clock

By default, the keyboard clock is 12MHz. However, if you encountered network compatibility problem, set your system to the most appropriate keyboard clock speed.

Onboard FDC Controller

Enabled	Enables the onboard floppy disk controller.
Disabled	Disables the onboard floppy disk controller.

Onboard Serial Port 1 and Onboard Serial Port 2

Auto	The system will automatically select an I/O address for the onboard serial port 1 and serial port 2.
3F8/IRQ4, 2F8/IRQ3 3E8/IRQ4, 2E8/IRQ3	Allows you to manually select an I/O address for the onboard serial port 1 and serial port 2.
Disabled	Disables the onboard serial port 1 and/or serial port 2.

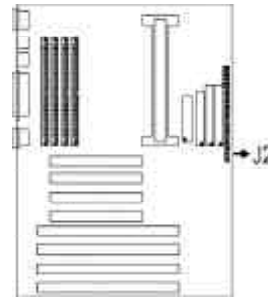


Onboard IR Controller

The 686IPK system board supports IrDA function for wireless connectivity between your computer and peripheral devices. You may not use IrDA (J2) and the COM 2 serial port (CN1) at the same time. If you are using the COM 2 serial port, make sure “Onboard IR Controller” is Disabled.

To use the IrDA function, follow the steps below.

1. Connect your IrDA cable to connector J2 on the 686IPK system board.
2. Set “Onboard IR Controller” to Enabled.
3. If Enabled, the following options will appear right after “Onboard IR Controller”.



IR Address Select

This is used to select an I/O address for the IrDA peripheral/device installed. The options are: 3F8H, 2F8H, 3E8H and 2E8H. Default setting: 2E8H.

IR Mode

Set “IR Mode” to the type of IrDA standard supported by your IrDA peripheral/device. The options are: IrDA (HP mode) and ASKIR (Sharp mode). Default setting: IrDA.

IR Transmission Delay

If this option is Enabled, transmission of data will be slower. This is recommended when you encounter transmission problem with your device. The options are: Enabled and Disabled.

IR IRQ Select

Selects an IRQ for the IrDA peripheral/device installed. The options are: IRQ3, IRQ4, IRQ10 and IRQ11. The default setting is IRQ10.



Onboard Parallel Port

378/IRQ7 3BC/IRQ7 278/IRQ5	Selects the I/O address and IRQ for the onboard parallel port.
Disabled	Disables the onboard parallel port. The Parallel Port Mode option will not appear on the screen.

Parallel Port Mode

Parallel Port Mode will appear only if you selected an I/O address and IRQ in the Onboard Parallel Port option (shown above). This option applies to a standard specification and will depend on the speed of your device.

SPP EPP ECP ECP+EPP	Selects the parallel port mode according to the type of printer device connected to your onboard parallel port.
------------------------------	---

If you selected EPP, "EPP Mode Select" will appear. This option applies to standard specification. The options are EPP1.9 and EPP1.7. Default setting: EPP1.7.

If you selected ECP, "ECP Mode Use DMA" will appear. This is used to select a DMA channel for the parallel port. The options are 1 and 3. Default setting: 3.

If you selected ECP+EPP, "ECP Mode Use DMA" and "EPP Mode Select" will both appear on the screen.

Modem Ring-on

If your system is in the "soft power off" state, you can remotely transmit or access data without physically going to your system. To "power on" your system, follow the steps below.

1. If your ATX power supply has an On/Off switch, make sure it is switched to On so that even when you have shut down ("soft power off") your system, it will always remain in "standby" mode.



2. The default setting of the “Modem Ring-on” option is disabled. If you wish to remotely access your computer, set this option to COM A, COM B or COM A & B. This will depend on the COM port where your modem is connected.
3. Enable Power Management. This will allow your system to enter the Suspend mode after you have finished accessing data. Refer to the Power Management Setup section for more information.

Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor’s password with the “System” option selected in the BIOS Features Setup.

If you want to protect access to setup only, but not your system, set a supervisor’s password with the “Setup” option selected in the BIOS Features Setup. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight the “Supervisor Password” option and press <Enter>. The message below will appear.

Enter Password:

Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are being asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again.

To delete or disable the password function, highlight “Supervisor Password” and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the BIOS Features Setup.

If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the BIOS Features Setup. Using user's password to enter Setup allows a user to access only the "User Password" option that appears on the main screen. Access to all other options is denied.

To set, confirm, verify, disable or delete a user's password, follow the procedures described in the section "Supervisor Password". If you forget your password, refer to the procedure described in the same section, "Supervisor Password".

IDE HDD Auto Detection

This option detects the hard disk parameters for the hard disk drives installed in your system. Highlight this option and press <Enter>. A screen similar to the one below will appear.

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

HARD DISKS	TYPE	SIZE	CYLS	HEAD	RECOMP	LANDZ	SECTOR	MODE
Primary Master:								
Select Primary Master Option (N=Skip): N								
OPTIONS	SIZE	CYLS	HEAD	RECOMP	LANDZ	SECTOR	MODE	
2 (Y)	853	827	32	0	1653	63	LBA	
1	853	1654	16	65535	1653	63	Normal	
3	853	827	32	65536	1653	63	Large	

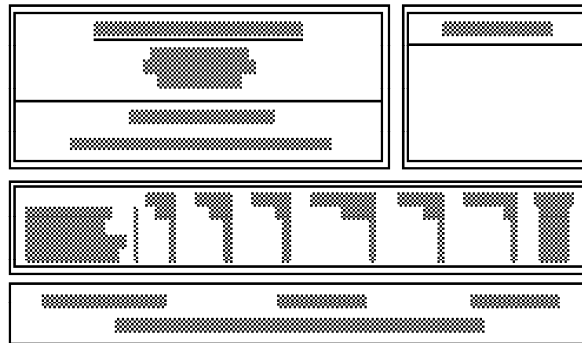
Note: Some OS (like SCO-UNIX) must be "NORMAL" for installation

ESC: Skip

Enter your choice, and press <Enter> to accept the parameters or press <Esc> to abort. The parameters of the hard disk will be displayed in the Standard CMOS Setup.

HDD Low Level Format

The Low Level Format utility is designed as a tool to save you time formatting your hard disk. It automatically looks for the necessary information of the drive you selected. This utility also searches for bad tracks and lists them for your reference. Highlight this option and press <Enter>. A screen similar to the one below will appear.



Warning:

Do not use this HDD Low Level Format feature for IDE hard drives. They already have been low-level formatted at the factory. Do a high-level format only for those drives. Refer to the manual that comes with your operating system.

Save & Exit Setup

When all the changes have been made, highlight "Save & Exit Setup" and press <Enter>. The message below will appear:

Save to CMOS and Exit (Y/N)? N

Type "Y" and press <Enter>. The following message will appear:

Reboot System (Y/N)? N

Type "Y" and press <Enter>. The modifications you have made will be written into the CMOS memory, and the system will reboot. You will once again see the initial diagnostics on the screen. If you wish to make additional changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or after memory testing is done.



Exit Without Saving

When you do not want to save the changes you have made, highlight “Exit Without Saving” and press <Enter>. The message below will appear:

Quit Without Saving (Y/N)? N

Type “Y” and press <Enter>. The system will reboot and you will once again see the initial diagnostics on the screen. If you wish to make any changes to the setup, press <Ctrl> <Alt> <Esc> simultaneously or after memory testing is done.

Desktop Management Interface (DMI)

The 686IPK system board comes with a DMI built into the BIOS. DMI, along with the appropriately networked software, is designed to make inventory, maintenance and troubleshooting of computer systems easier. With DMI, a network administrator or MIS engineer can remotely access some information about a particular computer system without physically going to it. Quite often a service call may be unnecessary as the problem can be solved remotely.

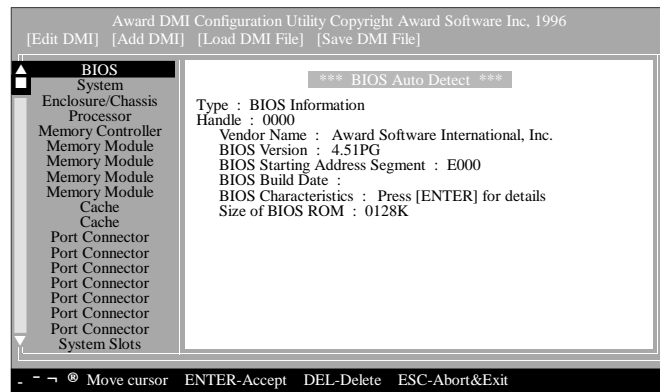
The DMI utility in the BIOS automatically records various information about your system configuration. Information about the type and speed of CPU, type and amount of memory for each memory slot, BIOS revision level, types of add-in PCI boards and components, certain revision numbers of hardware installed, etc. are automatically detected and stored in the DMI pool, which is a part of the system board's Plug and Play BIOS. Additional information, such as ISA based peripherals, which may not be automatically detected, can be manually recorded in the DMI pool by using the Add DMI menu. The DMI pool data is then verified or updated whenever the system hardware or setup is altered.

Running the DMI Utility

To run the DMI utility, type: DMICFG.EXE. You can download this utility from <http://www.dfi.com.tw> - BIOS & DRIVERS section or <ftp.dfiusa.com> - /pub/DMI directory.

The DMI utility must run in real mode with at least 180K of base memory. Memory managers like HIMEM.SYS (required by Windows) must not be installed. To do this, boot up from a system diskette without the AUTOEXEC.BAT and CONFIG.SYS files. "REM" HIMEM.SYS in the CONFIG.SYS or press <F5> during bootup to bypass your AUTOEXEC.BAT and CONFIG.SYS files.

Using the DMI Utility



The four menus located on top of the DMI Configuration Utility screen are Edit DMI, Add DMI, Load DMI File and Save DMI File. Use the ← or → (left or right) arrow keys to select a menu from the Menu bar.

On the left side of the screen is a list of the system configuration items. Use the ↑ or ↓ (up or down) arrow keys to select an item. The commands at the bottom of the screen will allow you to navigate through the various setup menus.

Edit DMI

1. Use the ← or → arrow keys to select the Edit DMI menu.
2. Highlight the item on the left screen that you would like to edit by using the ↑ or ↓ arrow keys, then press <Enter>.
3. The cursor will move to the screen you select allowing you to edit information. The screen will also display the auto-detected information.



4. Press <F10> to update the edited information into the flash ROM.

Add DMI

1. Use the ← or → arrow keys to select the Add DMI menu.
2. Highlight the item on the left screen that you would like to add by using the ↑ or ↓ arrow keys, then press <Enter>.
3. The cursor will move to the screen you select allowing you to enter information about the added item.
4. Press <F10> to save information into the flash ROM.

To view information about the added items, go to the Edit DMI menu.

Load DMI File

1. Use the ← or → arrow keys to select the Load DMI File menu.
 2. The following message will appear.
- Press [Enter] to select DMI file for load*
- Press <Enter>.
3. The DMI files will appear on the screen. Select the file you would like to load and press <Enter>.
 4. The following message will appear.

Do you want to execute? (Y/N)

Type <Y>. All previous DMI structures will be destroyed and the new file will be saved into the flash ROM.

Save DMI File

1. Use the ← or → arrow keys to select the Save DMI File menu.



2. The following message will appear.

Press [Enter] to select DMI file for save

Press <Enter>.

3. Enter the directory and filename under which you would like the DMI file saved.

System Error Report

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, **PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP**, will be shown in the information box at the bottom. Enter Setup to correct the error.

POST Beep

There are two kinds of beep codes in the BIOS. One code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps. The other code indicates that a DRAM error has occurred. This beep code consists of a single long beep.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.



DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct. Either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.



BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFFH is bad.

Memory test fail

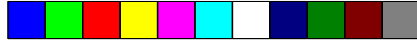
The BIOS reports memory test fail if the memory has error(s).

Driver Installation

To install the IDE drivers supported by the 686IPK system board, please refer to the "Readme" file contained in the provided diskette.

All steps or procedures to install software drivers are subject to change without notice as the softwares are occasionally updated. Please refer to the readme files for the latest information.





Chapter 4 Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

When you encounter problems while using your system, first check that:

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.



The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and that the other end is properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.
2. The diskette may be write-protected. Use a diskette that is not write-protected.
3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
4. There is not enough space left on the diskette. Use another diskette with adequate storage space.



Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave.

Excessively long formatting period.

1. If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem.

Parallel Port

The parallel printer doesn't respond when you try to print.

1. Make sure that your printer is turned on and that the printer is on-line.
2. Make sure your software is configured for the right type of printer attached.
3. Verify that the onboard LPT port's I/O address and IRQ settings are configured correctly.
4. Verify that the attached device works by attaching it to a parallel port that is working and configured correctly. If it works, the printer can be assumed to be in good condition. If the printer remains inoperative, replace the printer cable and try again.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.



3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM port settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all SIMMs are seated securely into the SIMM sockets.
4. Make sure the SIMMs are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.



Appendix A Types of Modules

The following modules have been tested with this board. Most untested brands will work but a few may fail to do so.

SIMM	Brand	Chip Number
1MBx32/x36	Fujitsu	81C1000A-70
1MBx32	OKI	M51440A-70
2MBx32/x36	OKI	M511000B-70
2MBx32	NEC	424400-60
2MBx32	Micron	40447-60
2MBx32/x36	TI	TMS4400DJ-70
2MBx32	Micron	MT4C4007-70 (EDO)
2MBx32	Micron	MT4C4007-60 (EDO)
2MBx32	NEC	4218165-60 (EDO)
4MBx32/x36	Hitachi	7400AS-70
4MBx32/x36	Fujitsu	8117400-70
4MBx32/x36	Mitsubishi	422A06-70
4MBx32/x36	Hitachi	5117400AS-70
4MBx32	NEC	4217400-60
4MBx32	NEC	4217405-70 (EDO)
8MBx32	NEC	4217405-60 (EDO)
16MBx32	LGS	71C16100AJ6



Appendix B Processor Voltage Settings

If your processor does not support VID, make sure you set JP8 according to the voltage supported by your processor.

CPU Voltage	JP8				
	Pins 1-2	Pins 3-4	Pins 5-6	Pins 7-8	Pins 9-10
VID Support*	Off	Off	Off	Off	Off
1.8V	Off	On	Off	On	On
1.85V	On	On	Off	On	On
1.9V	Off	Off	On	On	On
1.95V	On	Off	On	On	On
2.0V	Off	On	On	On	On
2.05	On	On	On	On	On
2.1V	On	Off	Off	Off	Off
2.2V	Off	On	Off	Off	Off
2.3V	On	On	Off	Off	Off
2.4V	Off	Off	On	Off	Off
2.5V	On	Off	On	Off	Off
2.6V	Off	On	On	Off	Off
2.7V	On	On	On	Off	Off
2.8V	Off	Off	Off	On	Off
2.9V	On	Off	Off	On	Off
3.0V	Off	On	Off	On	Off
3.1V	On	On	Off	On	Off
3.2V	Off	Off	On	On	Off
3.3V	On	Off	On	On	Off
3.4V	Off	On	On	On	Off
3.5V	On	On	On	On	Off



* Default



Appendix C Memory and I/O Maps

Memory Address Map

Address	Name	Function
00000000 to 0009FFFF	640KB System Board RAM	System Board Memory
000A0000 to 000BFFFF	128KB Video Display Memory	Reserved for Graphics Display Memory
000C0000 to 000E7FFF	192KB I/O Expansion ROM	Reserved for ROM on I/O Adapter Card
000F0000 to 000FFFFFF	64KB ROM on the System Board	System Board BIOS
00100000 to 1FFFFFFF	Maximum Memory 512MB	System Board Memory





I/O Address Map

I/O Address	Function
0000-001F	DMA Controller 1, 8237A-5
0020-003F	Interrupt Controller 1, 8259A, Master
0040-005F	Timer, 8254-2
0060-006F	8742 (Keyboard Controller)
0070-007F	Real-time Clock, NMI (Non-maskable Interrupt) Mask
0080-009F	DMA Page Memory, 74LS612
00A0-00BF	Interrupt Controller 2, 8259A
00C0-00DF	DMA Controller 2, 8237A-5
00E8	Shadow RAM and Cache Control Bit
00F0	Clear Numeric Processor Extension Busy
00F1	Reset Numeric Processor Extension
00F8-00FF	Numeric Processor Extension
01F0-01F8	Fixed Disk
0200-0207	Game IO
0278-027F	Parallel Printer Port 2
02F8-02FF	Serial Port 2
0300-031F	Prototype Card
0360-036F	Reserved
0378-037F	Parallel Printer Port 1
0380-038F	SDLC, Bisynchronous 2
03A0-03AF	Bisynchronous 1
03B0-03BF	Monochrome Display and Printer Adapter
03C0-03CF	Reserved
03D0-03DF	Color/Graphics Monitor Adapter
03F0-03F7	Diskette Controller
03F8-03FF	Serial Port 1

Note:

The I/O address hex 0000 to 00FF are reserved for the system board I/O. Hex 0100 to 03FF are available on the I/O channels.



HSS Support

Heatsink

HSS Base

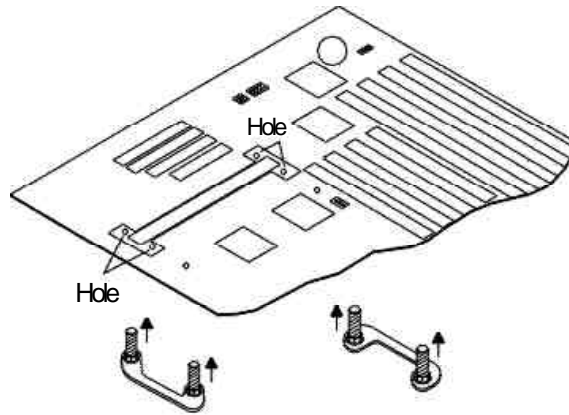
HSS Top Bar

Processor

HSS Top Bar

HSS Base

Retaining tab





Retention mechanism

Captive nuts

Threaded studs

Retention mechanism attach mounts



