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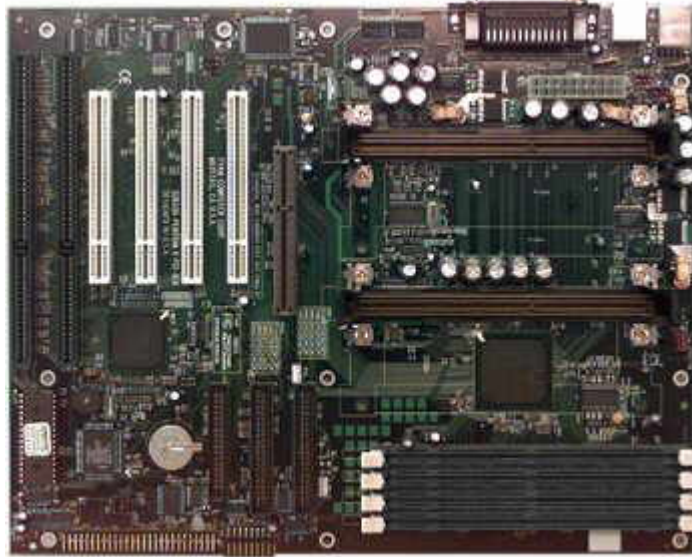Email Customer Service
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00AANG
Part # 4000056 Intel® 440BX Motherboard, dual processor

Battery	**Bios**
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I/O Ports	**Processor Upgrades**
System Jumper	

Driver download for the Integrated Audio 1371 chipset

Battery

This illustration is a closer view of the external coin-cell style battery which provides power to the Real-Time Clock (RTC) and BIOS RAM. When the computer is plugged in, power is supplied from the power supply's standby current to extend the life of the battery.

The clock provides a time-of-day clock and a multicentury calendar with alarm features and a century rollover. The RTC is accurate to ± 13 minutes per year at 25°C with 3.3 V applied. The battery has a

rating of 220mAh and can be replaced with a coin-cell lithium battery. It is socketed for easy replacement.

Bios

Flash EEPROM
The motherboard uses flash memory to store BIOS programs. It can be updated as new versions of the BIOS become available. The BIOS can be easily updated by using the Flash Writer Utility.

Flash Writer Utility
The AMI Flash Writer Utility is now included in the AMIBIOS, and so it simpler to upgrade the BIOS of your motherboard. The computer's BIOS is stored on a flash EEPROM ROM chip on the motherboard which can be erased and reprogrammed by following the instructions below.

Flashing The BIOS

1. From the DOS prompt, rename the BIOS file that was downloaded to **Amiboot.rom** and copy it to a floppy disk.

2. Insert the floppy disk with the BIOS upgrade in the floppy drive.

3. Turn off the computer.

4. While holding the CTRL+HOME keys, then turn on the computer. The computer will begin to read from the floppy drive, and write the BIOS information contained on the floppy disk in that drive to the EEPROM ROM chip. When the BIOS has been totally reprogrammed, the computer will restart with the new BIOS in operation.

5. If the computer does not restart in three minutes, turn off the computer, wait a few seconds, and then turn on the computer again. As the computer restarts, press the F1 key when you see the message: **Press F1 to enter Setup**. Check the settings at this time, or simply save the exit the program.

The latest BIOS revision can be found here.

DIMM Configuration

DIMM Bank 1	DIMM Bank 2	DIMM Bank 3	DIMM Bank 4	Total
8MBx1	0	0	0	8MB
8MBx1	8MBx1	0	0	16MB
8MBx1	8MBx1	8MBx1	0	24MB
16MBx1	8MBx1	8MBx1	0	32MB
16MBx1	16MBx1	8MBx1	8MBx1	48MB
16MBx1	16MBx1	16MBx1	0	48MB

32MBx1	16MBx1	16MBx1	0	64MB
32MBx1	32MBx1	16MBx1	16MB	96MB
32MBx1	32MBx1	32MBx1	32MB	128MB
64MBx1	32MBx1	32MBx1	0	128MB
64MBx1	64MBx1	32MBx1	0	160MB
64MBx1	64MBx1	64MBx1	0	192MB
128MBx1	64MBx1	64MBx1	0	256MB
128MBx1	128MBx1	64MBx1	0	320MB
128MBx1	128MBx1	128MBx1	0	384MB
128MBx1	128MBx1	256MBx1	0	512MB
128MBx1	256MBx1	256MBx1	0	640MB
256MBx1	256MBx1	256MBx1	0	768MB
256MBx1	256MBx1	256MBx1	256MBx1	1024MB

The motherboard has four Dual Inline Memory Module (DIMM) sockets. Minimum memory size is 8 MB; maximum size is 1 Gigabyte (GB). Memory speed must be 60ns or faster. The BIOS automatically detects memory type, size, and speed. Memory can be installed in one, two, three or four sockets. Memory type, size and speed can vary between sockets. The motherboard supports the following memory features:

- 168-pin DIMMs with gold-plated contacts

- Unbuffered SDRAM

    - Synchronous DRAM improves memory performance through memory access that is synchronous with the memory clock. This simplifies the timing design and increases memory speed because all timing is dependent on the number of memory clock cycles. The SDRAM should also meet the PC SDRAM Unbuffered DIMM Specification for 72-bit SDRAM.

    - Memory Error Checking and Correction (ECC) is a powerful feature designed to detect memory errors as they occur without interrupting system operation.

        - ECC memory detects multiple-bit errors, when two or more bits have failed, and corrects single-bit errors, when a single bit has failed.

- 66 or 100MHz SDRAM only

    - Processors with a 100MHz Front Side Bus (FSB) should only be used with 100MHz RAM.

    - Processors with a 66MHz FSB can be used with 100 or 66MHz RAM.

- ECC (72-bit) memory

- 3.3V memory only

- Single or double-sided DIMMs in the following sizes: 8,16,32,64,128, or 256 MB

Drive Connections (Floppy and IDE)
This is a view of the IDE and floppy drive connectors. These connectors are keyed. Pin 1 is on the right side of the top illustration. More information is available below.

IDE Connectors
The motherboard provides two independent bus-mastering Peripheral Component Interface (PCI) and Integrated Drive Electronics (IDE) interfaces that support PIO Mode 3 and Mode 4 devices. The system BIOS supports Logical Block Addressing (LBA) and Extended Cylinder Sector Head (ECHS) translation modes as well as ATAPI devices on both IDE interfaces. The system BIOS automatically detects IDE device transfer rate and translation mode.

Normally, Programmed I/O operations require a substantial amount of CPU bandwidth. In true multi-tasking operating systems, the CPU bandwidth freed up by using bus mastering IDE can be used to complete other tasks while disk transfers are occurring. When used in conjunction with the appropriate driver for the Windows NT environment, the IDE interface can operate as a PCI master capable of supporting PIO Mode 4 devices with transfer rates of up to 16 MB/sec.

When hooking up the cabling to the IDE connectors, be sure to maintain pin 1 orientation. The red speckled edge on both of the ribbon cables faces pin 1.

Floppy Interface
When hooking up the cabling to the floppy connector, be sure to maintain pin 1 orientation. The red speckled edge on the ribbon cable should face pin 1.

The floppy interface can be configured for 360 KB or 1.2 MB 5 1/4" media or for 720 KB, 1.25 MB, 1.44 MB, or 2.88 MB 3.5-inch media in the BIOS setup. By default, the Floppy A interface is configured for 1.44 MB and Floppy B is disabled. Another setup option prevents the user from being able to write to a floppy.

I/O Ports
This is a closer view of the I/O connections present on the motherboard. As the illustration shows, the ports are integrated into the motherboard. There are no separate cables that connect the ports to the motherboard. The I/O panel features one parallel port, two serial ports, two PS/2 ports, and two USB (Universal Serial Bus) connectors.

Parallel Port
A 25-pin D-sub header is provided on the back panel for a multi-mode, bi-directional port. The parallel port operates in Compatible (standard mode), Bi-directional (PS/2 compatible), Enhanced Parallel

Port (EPP) and a high speed Extended Capabilities Port (ECP) mode. EPP Mode requires a driver provided by the peripheral manufacturer to operate correctly. The parallel port can be configured in BIOS.

Serial Ports

Two integrated 9-pin serial connectors are provided on the back panel. The 16450 and 16550A compatible UARTs support data transfers at speeds up to 115.2Kbits/sec (in extended UART mode). Both of these ports can be configured in several different combinations in the BIOS Setup.

### PS/2 Keyboard and Mouse Interface

PS/2 keyboard and mouse connectors are located on the back panel of the motherboard. The +5V lines to these connectors are protected with a PolySwitch circuit which acts like a self-healing fuse, re-establishing the connection after an over-current condition is removed. While this device eliminated the possibility of having to replace a fuse, care should be taken to turn off the computer power before installing or removing a keyboard or mouse. The keyboard and mouse may be plugged into either connector. The keyboard controller contains the keyboard and mouse controller code, provides the keyboard and mouse control functions, and supports password protection for power on/reset. A power on/reset password may be specified in the BIOS Setup program. The keyboard controller also supports the hot-key sequence CTRL+ALT+DEL for a software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power-On Self Test (POST).

USB - Universal Serial Bus

The motherboard has two USB ports; one USB peripheral may be connected to each port. Port 0 is on top, port 1 on the bottom. For more than two USB devices, an external hub may be connected to either port. Some devices may even have a throughput on the plug. The motherboard fully supports the Universal Host Controller Interface (UHCI) and uses UHCI-compatible software drivers. USB features include:

- Self-identifying, hot-pluggable peripheral devices
    - Drivers will not have to be loaded and the computer will not have to be reconfigured or restarted.
    - After plugging the USB peripheral device into the USB port, the device automatically becomes fully functional.
- Automatic mapping of function to driver and configuration
- Support of isochronous and asynchronous transfer types
- Support for 127 physical devices, as long as the cumulative bandwidth demands do not exceed 12 Mbps.
    - This is roughly 100 times the limit of current serial busses and is wide enough to daisy-chain a printer, scanner, still camera, and removable hard disk from one port.
- Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other programs
- Error handling and fault recovery mechanisms built into protocol

- USB keyboards and mice are supported as legacy devices during startup and under operating systems without USB support.
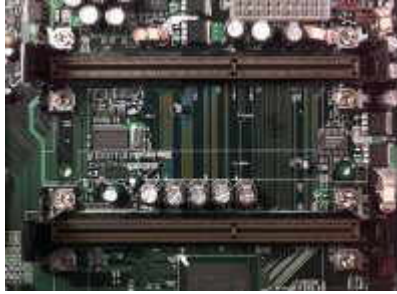
Processor Upgrade

These are the processor slots. In a uniprocessor configuration or single processor, the startup processor must be installed in the startup processor slot -- the slot on the top. If the processor is installed in the program processor slot, the computer will not startup. In uniprocessor configurations, a termination card must be installed in the program processor slot, which is on the bottom. The terminator card must be a 100MHz card if using 100 MHz Front Side Bus processors. For processor jumper settings see the next section of the reference.
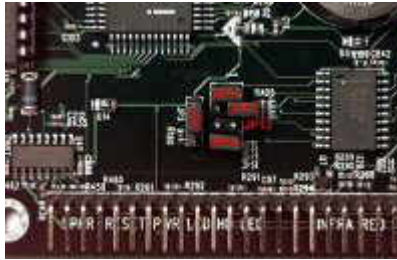
System Jumpers

There are many jumpers on this board located in many areas. The following tables represent each jumper available for use, their functions, and pictures. The information in this document includes CPU settings and BIOS Reset information.

CPU Settings for 66 MHz Bus

Clock Speed	JP11	JP12	JP13	JP14
233MHz	ON	OFF	OFF	ON
266MHz	OFF	ON	ON	ON
300MHz	OFF	ON	OFF	ON
333MHz	OFF	OFF	ON	ON

CPU Settings for 100MHz Bus

Clock Speed	JP11	JP12	JP13	JP14
300MHz	ON	OFF	ON	ON
350MHz	ON	OFF	OFF	ON
400MHz	OFF	ON	ON	ON

BIOS Reset

Pin 1 in the picture is located on the top of the jumper block. The BIOS Reset jumper is set to Default in this picture.

	JP3
Default	1-2
Reset BIOS	2-3

Hardware BIOS and Password Reset

If the system password has been forgotten, or the BIOS has been set incorrectly, follow the instructions below.

1. Turn off the computer.

2. Set Jumper JP3 to pins 2 and 3

3. Wait for two seconds, then return jumper JP3 to pins 1 and 2.

4. Turn on the computer.

By following the this procedure, the password will be erased, and the BIOS will be reset to the BIOS defaults.

Last Updated: (Date)

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