

# Overview

The P5GX-M mainboard complies with the specifications for a microATX motherboard. MicroATX boards are no larger than 9.6" x 9.6" (244mm x 244mm). This mainboard measures 9.6" x 7.75" (244mm x 197mm). The MicroATX specification reduces system cost by utilizing a reduced chassis with a smaller power supply. Increased motherboard integration reduces the demand for expansion slots. The microATX form factor permits reduced case sizes and smaller power supply units. However, the board can also be used in standard ATX cases if required.

The P5GX-M mainboard is designed around the Cyrix GXm processor. The Cyrix GXm CPU is an Pentium-MMX compatible processor which reduces system cost by integrating audio and video functions into the CPU and chipset. The system also supports a PCI IDE interface, up to 256 MB of SDRAM, and a full set of I/O ports.

The P5GX-M is an excellent low-cost platform for inexpensive multimedia workstations or an entry-level stand-alone computer. It requires just a processor and memory module to be fully functional.

## Features

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### Pentium-MMX Performance

The key feature of the P5GX-M mainboard is the support for the Cyrix GXm processor. This board can run Cyrix GXm CPUs with clock speeds of 200, 233, and 266 MHz. The processor includes a 16K block of level-1 cache memory for enhanced performance.

### Highly Integrated Support Chipset

The Cyrix GXm processor is supported by the CX5530 companion chip. This chip provides the system logic for a Pentium MMX-compatible mainboard. It supports PCI IDE channels with bus mastering, power management, PCI to ISA bridge, and USB ports. In addition, the CX5530 includes an integrated graphics sub-system with MPEG acceleration, and an integrated 16-bit audio sub-system compatible with the Sound Blaster standard.

### SDRAM Memory Support

The mainboard includes two sockets for the installation of 168-pin, 3.3V SDRAM memory modules. Each socket can be installed with a memory module with a maximum capacity of 128 MB, so the maximum memory of the mainboard is 256 MB.

## **Integrated Audio & Video Sub-systems**

This mainboard features fully integrated audio and video subsystems, so that after the installation of the processor and a memory module, the system is fully functional and ready for use. The graphics system supports the MMX multimedia instruction set and 2D graphics. The graphics system uses the Unified Memory Architecture which eliminates the need for expensive video memory, without loss of performance, by utilizing blocks of main memory for display memory. The audio system is 16-bit stereo and fully compatible with the Sound Blaster standard. The audio system includes a built-in Game/MIDI port and sound jacks for microphone, stereo-in and stereo-out.

## **Four Usable Expansion Slots**

The P5GX-M mainboard has four expansion slots. Two slots are 8/16-bit ISA slots and two slots are 32-bit PCI slots. Since the mainboard has integrated video and audio sub-systems, four expansion slots are adequate for most environments.

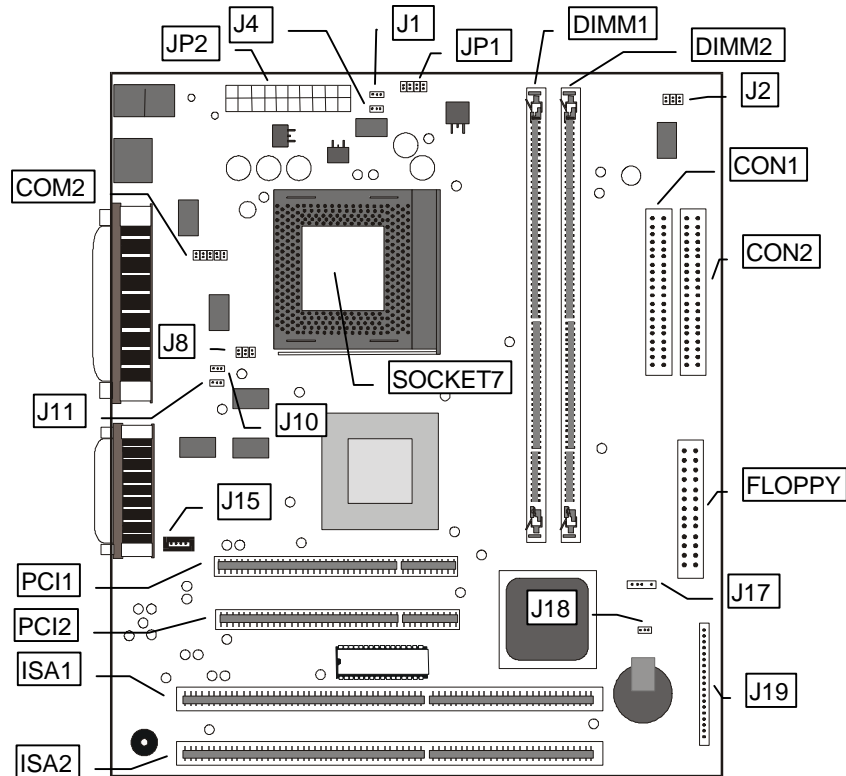
## **Full Set of I/O Ports**

The mainboard is installed with the NS PC97317 Super I/O chip. This chip provides a complete solution for the board's I/O. The board is installed with a parallel port (Bi-directional, ECP, EPP), two serial ports (UART 16550-compatible), a PS/2 keyboard port and PS/2 mouse port. Optionally, one serial port can be configured as a serial port (SIR or FIR). The I/O ports are arranged in a standard ATX two-tier array that is supported by most ATX case I/O templates.

## **Programmable Firmware**

The mainboard includes Award BIOS which allows BIOS setting of CPU parameters. The fully programmable firmware enhances the system features and allows users to set power management, hardware monitoring (optional), LAN and Modem wake up alarms, and so on.

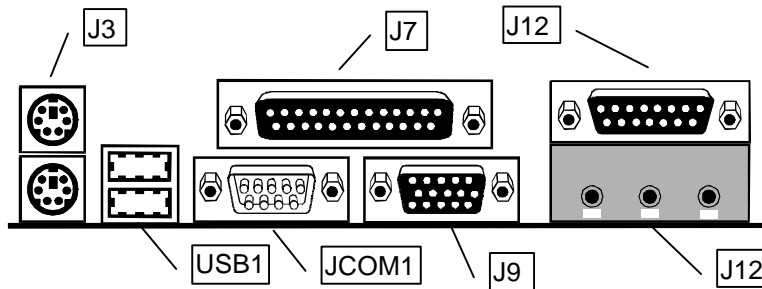
## Mainboard Illustration



## Key to Mainboard Components

Component	Description	Component	Description
SOCKET7	CPU Socket (Cyrix GXm CPU only)	J4	Cooling fan power 2
DIMM1,2	Memory module sockets	JP1	CPU voltage selector
ISA1,2	8/16-bit ISA expansion slots	J2	PCI Bus speed selector
PCI1,2	32-bit PCI expansion slots	J17	SIR infrared connector
JP2	ATX power connector	J18	Clear CMOS memory jumper
COM2	Serial port COM2/4 connector	J19	Panel connector
CON1	Primary IDE connector	J15	CD-ROM audio connector
CON2	Secondary IDE connector	J10	LAN wake up connector
FLOPPY	Floppy disk drive connector	J11	Modem wake up connector
J1	Cooling fan power 1	J8	CPU clock speed selector

## I/O Port Array Illustration



### Key to I/O Port Components

Component	Description
J3 (Upper)	PS/2 port for PS/2 mouse or pointing device
J3 (Lower)	PS/2 port for PS/2 keyboard
J7	Parallel Port (Bi-directional, EPP, ECP)
J12 (Upper)	Game/MIDI port for joystick or MIDI device
J12 (Lower)	Audio Jacks for Stereo Out, Stereo In, Microphone
J9	Port for display monitor
JCOM1	Serial port for COM1 or COM3
USB1	Two Universal Serial Bus ports

# Installation Procedure

## Prepare the Mainboard

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Prepare the main board by installing the Cyrix GXm processor and then installing either one or two memory modules. This board supports the 200, 233, or 266 MHz version of the Cyrix GXm processor. Finally, use the selection jumpers to configure the board for the correct bus and clock speeds.

## Install the Processor

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1. Locate the zero insertion force (ZIF) SOCKET7 for the processor. On the socket and on the processor, identify the pin 1 corner. You can identify the pin 1 corner by noting that in the rectangular matrix of pins and holes on the socket and processor, one pin and one hole is absent on the pin 1 corner.
2. Push the socket locking lever away from the socket to unhook it. Swing the lever into the upright position.
3. Insert the processor into the socket taking care that you have matched the pin 1 corners. No force is required, and the processor should seat smoothly into the socket.
4. Swing the locking lever down and hook it under the latch on the side of the socket to lock it in place.
5. Locate the power connectors for cooling fans J1 and J4. Connect the cable from the processor cooling fan to either J1 or J4.

## Install the Memory Modules

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For this mainboard, you must use 168-pin Dual In-line Memory Modules (DIMMs) which are installed with SDRAM (Synchronous Dynamic Random Access Memory) (SDRAM). This mainboard supports 3.3 volt DRAMs. This board can operate with a 30, 33 (Default) MHz system bus.

You can install 1 or 2 modules. If you only install one memory module, install it in DIMM socket 1, and if you install two modules, install them in DIMM sockets 1 and 2. Each module can have a maximum capacity of 128 MB, so you can install a maximum of 256 MB using two modules.

1. The SDRAM sockets are keyed with notches and the DIMMs are keyed with cut-outs so that they can only be installed correctly. Check that the cut-outs on the DIMM edge connector matches the notches in the SDRAM socket.
2. Push the latches on each side of the SDRAM socket down.
3. Install the edge connector of the DIMM into the socket and press it carefully but firmly down so that it seats correctly. The latches at either side of the socket will

be levered upwards and latch on the edges of the DIMM when it is installed correctly.

## Check the Jumper Settings

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Use the mainboard selection jumpers to configure your board for the correct clock speed, voltage, and bus timing according to the CPU that you have installed. Set other selection jumpers to the correct settings.

### CPU Setting

To install a CPU on this mainboard you need to set up the board for a specific CPU by doing the following:

- Set the External Clock Speed
- Set the Clock Multiplier Factor
- Set the CPU Voltage

You configure the CPU settings using the jumpers on the mainboard. In order to do this, you will need to know some information about the CPU you plan to use. This should be provided by the CPU vendor. You'll need the following information:

- CPU Internal Clock Speed
- CPU Voltage

The internal clock speed is the speed the CPU operates at to process data and is the one used by CPU manufacturers to indicate the speed of the chip. The CPU also has an external clock speed which is the speed at which it interacts with the external components.

CPU voltage may either be the same internally and externally or it may be split, depending on the CPU design. Some processors use one voltage for the core (Vcore) and another for input/output (Vio).

To configure the board for a CPU's internal clock speed, you need to set the external clock speed, sometimes referred to as the bus speed, and the clock multiplier, so that the result is the internal clock speed of the CPU you are installing.

For example, the default setting for these is:

$$33 \text{ MHz (External Clock)} \times 6 \text{ (Clock Multiplier)} = 200\text{MHz}$$

or an effective setting of 200MHz

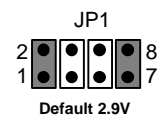
Check the table below to find the default settings for the CPU's used by this motherboard.

CPU Type	PCI Speed	Clock Multiplier
GXm 200	33	6X
GXm 233	33	7X
GXm 266	33	8X

## JP1: Set CPU Voltage Jumper

JP1 consists of four 2-pin jumpers. Use the jumpers to set the core voltage for the processor. See the processor documentation for information on which voltage your processor requires.

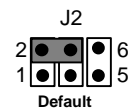
Processor Core Voltage	Jumper Settings			
	Pins 1-2	Pins 3-4	Pins 5-6	Pins 7-8
Shutdown	Open	Open	Open	Open
2.1V	Short	Open	Open	Open
2.2V	Open	Short	Open	Open
2.3V	Short	Short	Open	Open
2.4V	Open	Open	Short	Open
2.5V	Short	Open	Short	Open
2.6V	Open	Short	Short	Open
2.7V	Short	Short	Short	Open
2.8V	Open	Open	Open	Short
2.9V	Short	Open	Open	Short
3.0V	Open	Short	Open	Short
3.1V	Short	Short	Open	Short
3.2V	Open	Open	Short	Short
3.3V	Short	Open	Short	Short
3.4V	Open	Short	Short	Short
3.5V	Short	Short	Short	Short



## J2: Set PCI Bus Speed Jumper

J2 consists of three 2-pin jumpers. Use the jumpers to set the speed of the PCI bus.

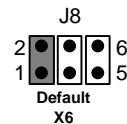
PCI Bus Speed	Short Pins
30 MHz	4-6
33 MHz	2-4



## J8: Set CPU Clock Speed Jumper

J8 is a set of three 2-pin jumpers. J8 defines a multiplier. The multiplier times the system bus speed produces the clock speed for the processor.

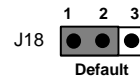
Bus Speed Multiplier	Jumper Cap Setting		
	Pins 1-2	Pins 3-4	Pins 5-6
X10	Short	Open	Short
X9	Open	Short	Short
X8	Open	Open	Open
X7	Open	Short	Open
X6	Short	Open	Open
X5	Open	Open	Short
X4 (Testing only)	Short	Short	Short
Reserved			



## J18: Clear CMOS Memory Jumper

If you ever need to clear the system CMOS memory, you can do this by moving the jumper cap to short pins 2-3 for a few seconds. When you clear the CMOS memory, the system must be turned off and the ATX power supply cable disconnected from the ATX power connector on the motherboard.

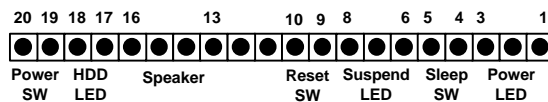
Function	Jumper Position
Normal Operation	Short pins 1-2
Clear CMOS Memory	Short pins 2-3



## Make the Internal Connections

1. Locate the floppy diskette drive connector FLOPPY. Use the ribbon cable to connect the floppy diskette drive to the mainboard.
2. Locate the Enhanced IDE connectors CON11 (primary) and CON2 (secondary). A single IDE cable is provided with the mainboard. Connect the cable to CON1. The cable has two connectors for IDE devices. If you connect two devices, you must configure one device as Master, and one device as Slave. See the documentation provided with the devices for information on this. If you need to install more drives, obtain another IDE cable and connect one or two devices to CON2 following the same procedure as you used with CON1.
3. Locate the bank of switch and indicator connectors J19. These connectors provide control functions to your system case. Use the illustration below and the following table to make the connections.

Function	Pinout
Power Indicator	+1, +2, 3
Sleep Switch	4, 5
Suspend Indicator	+6, +7, 8
Reset Switch	9, 10
Speaker	+13, 14, 15, 16
Hard Disk Indicator	+17, 18
Power Switch	19, 20



4. Locate the ATX power connector JP2. Connect the cable from your system ATX power supply into the connector. The connector is keyed so that it can only be installed correctly.



## Make the Optional Internal Connections

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1. Install any expansion cards into the expansion slots. The system has two 32-bit PCI slots (PCI1, 2) and two 8/16-bit ISA slots (ISA1, 2).
2. If you have installed an internal fax/modem, cable the fax/modem to the modem wake up connector J11. This will allow the system to wake up from a power saving mode when an incoming call is detected.
3. If you have installed an internal network adapter, cable the adapter to the LAN wake up connector J10. This will allow the system to wake up from a power saving mode when incoming network traffic is detected.
4. If you have installed a CD-ROM drive, connect the audio-out cable from the CD-ROM drive to the CD-Audio connector J15 on the mainboard.
5. If you are installing an optional infrared port, connect the cable from the infrared port to the mainboard infrared connector, J17 (SIR-Serial Infrared).
6. If you are installing an optional second serial port, connect the cable from the second serial port to the mainboard serial port connector COM2.

*Note: If you install an infrared port, it must share a COM port assignment with the second external serial port COM2. If you have installed a second serial port and an infrared port, select which port is in use by using the setup utility.*

7. If your system case has a chassis-mounted cooling fan, connect the cable from the fan to one of mainboard cooling fan power supplies J1 or J4.

# System BIOS

The system is installed with a programmable Award BIOS. The BIOS is stored on an erasable EEPROM so that updated BIOS can be flashed to the system using the flash BIOS utility in system software.

The BIOS allows system integrators to set processor and timing parameters for maximum performance or maximum stability. It allows end users to set power management routines and install password protection.

The BIOS setup utility can be started by pressing the Delete key, shortly after the system has been powered on. A prompt appears on the screen telling you to do this. When the setup utility starts, a main menu appears which shows the main features of the setup utility.

ROM PCI/ISA BIOS (P5GX-M)  
CMOS SETUP UTILITY  
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD OPTIMUM SETTINGS	
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color

## Standard CMOS Setup

This option sets basic information about the system such as the date and time, the disk drives, and the memory.

## BIOS Features Setup

This option sets more advanced information about the system such as processor clock and system bus, the boot sequence, virus protection, and so on.

## Chipset Features Setup

This option displays advanced information about system timing parameters. System integrators can use this option to troubleshoot the system, and configure hardware for performance or reliability.

## **Power Management Setup**

This option lets users set power management timeouts for the system and install features such as LAN wake up, modem wake up, and so on.

## **PNP/PCI Configuration**

This option configures assigns Plug and Play control to either the BIOS or the OS (if supported). It allows older (legacy) ISA cards to be configured manually.

## **Load BIOS Defaults**

This option loads all of the setup utility with an undemanding set of defaults which should work with most hardware configurations.

## **Load Optimum Settings**

This option loads all of the setup utility with a high-performance set of defaults which should work with the recommended hardware configurations for this system.

## **Integrated Peripherals**

This option lets users and system integrators configure parameters for disk drives, I/O ports, and so on. Port addresses and interrupt request lines can be set.

## **Supervisor Password and User Password**

These options allow users and system integrators to install Supervisor and User password protection to either system start up or entry to the system setup utility.

## **IDE Auto Detection**

This option provides automatic detection and configuration for most modern IDE hard disk drives.

## **Save & Exit Setup and Exit Without Saving**

These two items allow changes to the system setup utility to be saved or discarded.

# System Software

The support software for this mainboard is supplied on either a CD-ROM disk, or a floppy diskette, depending on the configuration of the mainboard. Some mainboard configurations do not need all the software described in this chapter.

- ◆ Bus master IDE driver  
Please notice that the support software for this mainboard is supplied without IDE Bus Master Driver for the time being. Thus, this board can not run IDE Driver under the Bus Master Mode and it can not support Ultra DMA33 neither. The chipset vendor Cyrix just provide us IDE Driver beta version at this stage, we will provide the complete IDE Bus Master Driver in the next version.
- ◆ Audio driver
- ◆ Graphics driver
- ◆ PCI Bridge Driver

## Installing the Audio Driver

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1. Go to the System Properties window (Start/Settings/Control Panel/system).
2. Click on the Device Manager tab and select the "View Devices by type" radio button.
3. Under System Devices, make sure to remove the items "Unknown Device" and "PCI Multimedia Audio Device" on the "? Other devices"
4. Close the System Properties window.
5. Go to the Add New Hardware window (Start/Settings/Control Panel/).
6. When the wizard pops up to help you install new hardware, click next once. In the next window, select "No", you do not want Windows to help you search for new hardware. Click Next to proceed.
7. In the next window, select Sound, Video and Game Controllers when asked to pick the type of hardware you want to install. Click Next to proceed.
8. In the next window, click the Have Disk button. The program then prompts you to type a path name where it can find the proper driver. The Sound Driver can be found in the a:\audio\win95 directory of the disk provided.
9. The program will then list all the drivers available on that disk, make sure to pick "Cyrix Corporation" and "XpressAUDIO (TM) 16-bit Sound". Proceed and follow the directions onscreen.

## Installing the Graphics Driver

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1. Close all programs.
2. Go to the Display Properties window (Start/Settings/Control Panel/).
3. Click on the Settings.
4. Click on the Advanced Properties button.
5. On the Adapter window, click on the Change button.

6. In the next window, click the Have Disk button. The program then prompts you to type a path name where it can find the proper driver. The Graphics Driver can be found in the a:\vga\win95 directory of the disk provided.
7. The program will then list all the drivers available on that disk. Pick the appropriate driver from the list. Proceed and follow the directions onscreen.
8. After successfully installing the graphics driver, you need to restart the system for the new drivers to take effect.

## **PCI Bridge Driver**

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Since Windows 95/98 doesn't provide support for NS5530 I/O chipset, it will recognize the "PCI Bridge" as an "Unknow Device". We offer "PCI Bridge Driver" to solve this issue, please follow the instructions below :

1. Go to the "Control Panel/System".
2. Go to Device Manager and pick up "Unknow Device/PCI Bridge".
3. Click "Content/Driver/Update driver".
4. When the Winzard pop up, select the file a:\5530\5530.inf to install driver.