

## *Getting Started*

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The following sections contain notices for various countries:

## Safety Information

**CAUTION:** This device is intended to be installed by the user in a CSA/TUV/UL certified/listed IBM AT or compatible personal computers in the manufacturer's defined operator access area. Check the equipment operating/installation manual and/or with the equipment manufacturer to verify/confirm if your equipment is suitable for user-installed application cards.

**ATTENTION:** Ce carte est destiné à être installé par l'utilisateur, dans un ordinateur compatible certifié CSA/TUV/UL ou listé IBM AT, à l'intérieur de la zone définie par le fabricant. Consulter le mode d'emploi ou le fabricant de l'appareil pour vérifier ou confirmer si l'utilisateur peut y installer lui-même des cartes périphériques.

## Notice for the USA

**FCC Part 15:** 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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, this notice is not a 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 one or more of the following measures:

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

**CAUTION:** To comply with the limits for the Class B digital device, pursuant to Part 15 of the FCC Rules, this device must be installed in computer equipment certified to comply with the Class B limits.

All cables used to connect the computer and peripherals must be shielded and grounded. Operation with non-certified computers or non-shielded cables may result in interference to radio or television reception.

## Modifications

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

## Notice for Canada

This apparatus complies with the Class "B" limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations.

Cet appareil est conforme aux normes de CLASSE "B" d'interférence radio tel que spécifiée par le Ministère Canadien des Communications dans les règlements d'interférence radio.

## Compliance

This product conforms to the following Council Directive:

- Directive 89/336/EEC, 92/31/EEC (EMC)



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# Introduction

Welcome to the exciting world of Advanced WavEffects synthesis! You are now the owner of Creative Sound Blaster® AWE64 Gold, a 16-bit audio card, which comes with the state-of-the-art Creative WaveSynth/WG software.

Your Sound Blaster AWE64 Gold audio card allows you to achieve realistic and three-dimensional (3D) acoustic reproduction through a wide range of digitized sound samples and Creative 3D Stereo Enhancement technology.

Fully Sound Blaster compatible, the AWE64 Gold audio card supports the following features:

- Plug and Play ISA Specification version 1.0a compliance
- Major MIDI standards such as General MIDI, Roland GS and MT-32
- Compression algorithms such as A-law, Mu-law, CTADPCM, and IMA-ADPCM
- Full duplex operation for simultaneous audio recording and playback

Creative WaveSynth/WG employs sample-based wavetable synthesis (WaveSynth) and physical model-based waveguide (WG) synthesis, the latest technologies for sound creation and playback in personal computer software.

With the AWE64 Gold audio card installed in an Intel Pentium or AMD-K5 90 MHz (or higher) computer, the sample-based wavetable synthesizer allows you to play high quality music and sound effects via software (instead of hardware) in any Windows-based multimedia application.

The audio card also has a physical model-based waveguide synthesizer which uses Sondius® Sound Synthesis technology to enable you to play waveguide sounds polyphonically and multi-timbrally. In other words, you can play many notes and different instruments or sound effects at the same time.

WaveSynth/WG is also a General MIDI synthesizer that acts like a multi-channel mixer with high quality reverb.

If you do not want to use WaveSynth/WG, disable it through the WaveSynth/WG Control Panel. All MIDI and audio tasks will be handed back to the appropriate hardware in your computer.

The combination of these features, along with our award-winning EMU8000 hardware wavetable synthesizer, allows you to enjoy hours of fun listening to and creating music on your computer.

Read this simple Getting Started manual to find out how to install and make the most of your new audio card.

---

## Before You Begin

The README file on the first diskette or the CD-ROM contains information and changes not available at the time of printing. Read the file before you continue. If your package contains diskettes, you may want to make backup copies. In addition, read the following sections:

- Checking System Requirements
- Using This Guide
- Getting More Information
- Document Conventions

## Checking System Requirements

Your audio card requires at least:

- An Intel Pentium or AMD-K5 90 MHz computer with a VGA or SVGA card installed
- 8 MB RAM
- 20 MB free hard disk space
- Windows 95 or  
Windows 3.1x with MS-DOS 5.0 and a Plug and Play (PnP) configuration manager

## Using This Guide

Chapter 1 explains the various hardware components on your audio card, and also shows you how to install the card into your computer. Chapters 2 and 3 describe how to install the audio software in Windows 95 and Windows 3.1x, respectively. For general specifications, installation background information, settings changes, and troubleshooting tips, see the appendices.

## Getting More Information

Refer to the online *User's Guide* for MIDI specifications and connector pin assignments, as well as instructions on how to use the various applications found in your package.

## Document Conventions

This manual follows certain conventions to help you locate and identify the information that you need. These conventions are described in the following sections.

### Text Conventions

The following text conventions are used to help you distinguish elements of the text in this manual (see Table i).

*Table i: Text Conventions.*

Text Element	Use
<b>bold</b>	Text that must be entered exactly as it appears.
<i>italic</i>	Title of a book. Otherwise, when presented at the DOS command line, it is a placeholder that represents information you must provide. This information usually appears in the parameter listing after the command is presented.
UPPERCASE	Directory name, file name, or acronym.
<>	Symbols, letters, and key names on the keyboard.

## Icons

In this manual, icons are used to highlight areas of text that require extra attention (see Table ii).

*Table ii: Icons.*

Icon	Use
	Tip or useful information.
	Warning.

# 1

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## Setting Up Your Audio Card

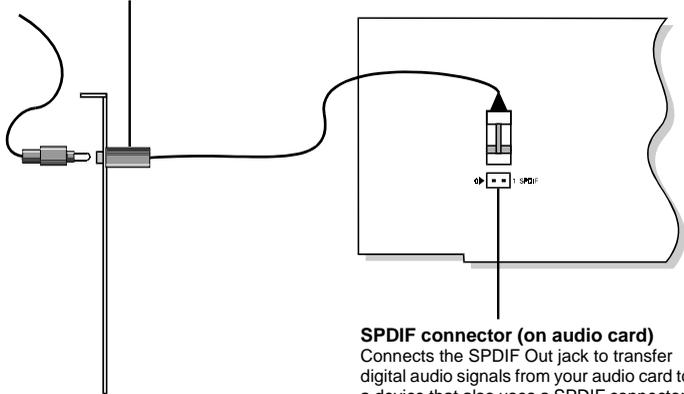
This chapter is organized as follows:

- ❑ Knowing Your Audio Card
- ❑ Installing the Card and Related Hardware



**SPDIF Out jack (on separate metal bracket)**

Connects an external digital device that uses a SPDIF connector, such as a Digital Audio Tape (DAT) machine, for playback or recording.



**SPDIF connector (on audio card)**

Connects the SPDIF Out jack to transfer digital audio signals from your audio card to a device that also uses a SPDIF connector, such as the DAT machine.

*Figure 1-2: Connection of SPDIF Out jack to SPDIF connector.*



The end of the cable attached to the SPDIF Out jack must be connected to the SPDIF connector on your audio card.

The digital audio signals from the SPDIF Out jack contain audio output from the EMU8000 wavetable chip mixed with digital voice playback if the playback is in 16-bit stereo mode, 44.1 kHz CD quality. If you want to listen to WaveSynth/WG through the SPDIF Out jack, you must enable the “Enable WaveSynth to play at CD quality” feature. To do so:

1. Start CreativeWaveSynth-Waveguide.  
The WaveSynth/WG properties sheet appears, displaying the Profile tab.
2. Click the Performance Settings button.
3. In the Settings dialog box, select the Enable WaveSynth To Play At CD Quality check box and click the OK button.
4. In the WaveSynth/WG properties sheet, click the Quit button to close it.

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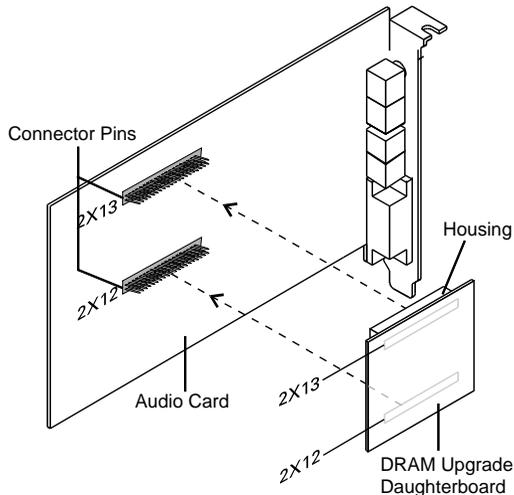
# Installing the Card and Related Hardware



If you want to install this Plug and Play (PnP) card in a non-PnP environment such as DOS/Windows 3.1x or Windows 95 MS-DOS Mode, you must first install a PnP configuration manager. For more details, refer to the documentation that comes with your PnP configuration manager.

To install the card and related peripherals:

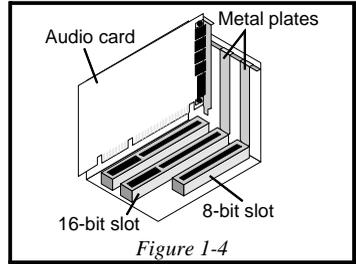
1. Switch off your system and all peripheral devices, and unplug the power cord from the wall outlet.
2. Touch a metal plate on your system to ground yourself and discharge any static electricity.
3. Remove your system's cover.
4. If you have a memory daughterboard, you may want to mount it onto your audio card now, as shown in Figure 1-3.



*Figure 1-3: Mounting the DRAM Upgrade daughterboard.*

5. Find a free 16-bit expansion slot in your system. Remove the metal plate from the slot you have chosen and put the screw aside. The screw will be used in a later step.

6. Align your card's 16-bit slot connector with the expansion slot and gently lower the card into the free slot as shown.
7. Secure the card to the expansion slot with the screw that you removed from the metal plate.



8. Connect powered speakers or an external amplifier to the Line Out jacks. Figure 1-5 shows you how to connect various devices.

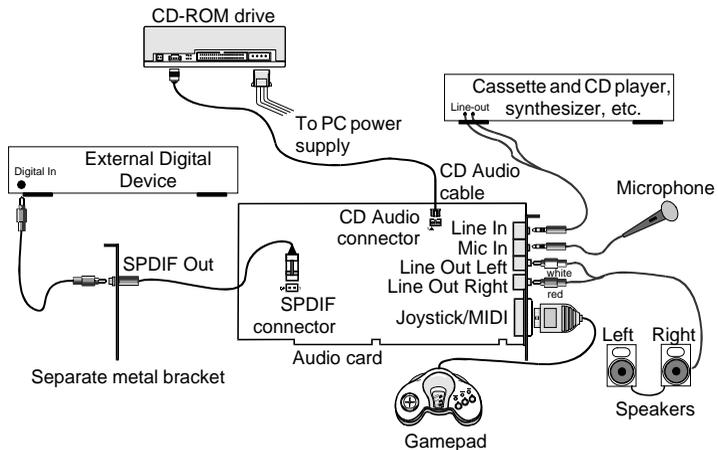


Figure 1-5: Connecting external speakers and other devices.



The joystick connector on your audio card is identical to that on a standard PC game control adapter or game I/O connector. You can connect any analog joystick with a 15-pin D-shell connector. It also works well with any application that is compatible with the standard PC joystick. To use two joysticks, you need a Y-cable splitter.

9. Replace your system's cover.
10. Plug the power cord back into the wall outlet. Switch on the system.

To test your DRAM upgrade:

1. Make sure you have installed the audio card's software. (The installation of the software will be covered in the next two chapters.)
2. Start the AWE Control Panel and download SoundFont banks. From the memory status bar, you should be able to see the changes in the available memory onboard.
3. Play your SoundFont banks to make sure your DRAM Upgrade daughterboard is working properly.

Refer to the online *User's Guide* for detailed information on how to use the AWE Control Panel.

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## Installing Software in Windows 95

This chapter shows you how to install the audio software in Windows 95 after installing your card. It comprises the following sections:

- Setting Up the Audio Card Drivers
- Installing the Applications
- Testing the Installation
- Uninstalling the Applications

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### Setting Up the Audio Card Drivers



Proceed to “Installing the Applications” on page 2-3 if your audio card’s drivers are already set up. Otherwise, have your Windows 95 CD-ROM or installation diskettes available as they may be needed during the installation.

You need device drivers to control the components on your audio card. After you have installed the card and switched on your system, Windows 95 automatically detects the components, and either installs the drivers or prompts you for the drivers. You may encounter the following messages, which may not be in the sequence shown.

- If a message similar to Figure 2-1 appears, just take note of it and wait for the next message to appear.



Figure 2-1: Message box indicating the detection of a device.

- ❑ If a dialog box similar to Figure 2-2 appears:
  - If the device that is detected is Standard IDE/ESDI Hard Disk Controller, click the second option, and then click the OK button.
  - Otherwise, click the first option, and then click the OK button. If you are prompted for the Windows 95 installation diskette or CD-ROM, insert it into a drive and click the OK button.



Figure 2-2: Driver installation dialog box in which the Windows default driver option is available.

- ❑ If a dialog box similar to Figure 2-3 appears, click the second option, and then click the OK button.



Figure 2-3: Driver installation dialog box in which the Windows default driver option is NOT available.

- ❑ If the Install From Disk dialog box appears, and
  - If your package comes with a Drivers Disk:  
Insert it into your floppy disk drive, select the appropriate drive, and click the OK button.
  - Otherwise:
    1. Insert the installation CD-ROM into your CD-ROM drive and select the drive.
    2. Click the Browse button and look for a .INF file in the root directory.  
If you cannot find it, select the folder `\WIN95\Language\DRIVERS`, where *Language* is the language of the software that you want to install.
    3. Click the OK button.  
The required files are copied to your hard disk.

---

## Installing the Applications

Your audio card's applications can be installed from diskettes or a CD-ROM depending on which is supplied in your package.

To install from CD-ROM:

1. Ensure your CD-ROM drive is installed and working properly.  
Refer to the documentation that comes with it for more details.
2. Insert the installation CD-ROM into your CD-ROM drive.  
The CD-ROM supports Windows 95 AutoPlay mode and starts running automatically. If it does not, see Appendix D, "Troubleshooting".
3. Follow instructions on the screen to complete the installation.

To install from diskettes:

1. Insert the first installation diskette into your floppy disk drive.
2. Click the Start button, and then click Run.
3. In the Run dialog box, type `A:\SETUP` where A is the drive that you have inserted the diskette into.
4. Click the OK button and follow the instructions on the screen to complete the installation.

---

# Testing the Installation

After the applications are installed, you can use Windows 95 Media Player to test if your audio card is working properly. If you do not have Media Player, follow the instructions below to install it.

To install the Media Player:

1. Click the Start button, point to Settings, and then click Control Panel.
2. In the Control Panel window, double-click the Add/Remove Programs icon.
3. Click the Windows Setup tab.

The Windows Setup tabbed page similar to Figure 2-4 appears.

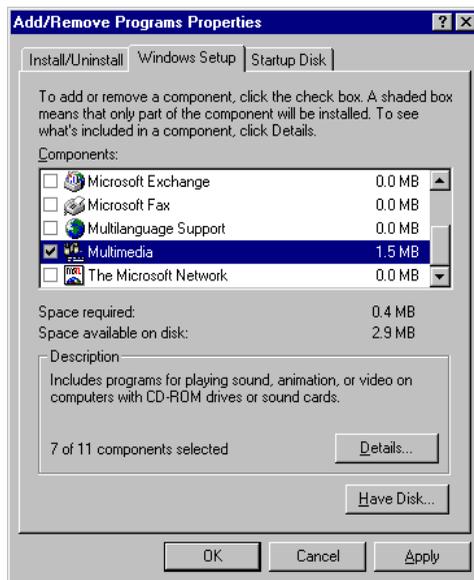


Figure 2-4: The Windows Setup tabbed page.

4. Select the Multimedia check box and click the Details button.
5. In the Multimedia dialog box, select the Media Player check box and click the OK button.
6. Follow the instructions on the screen to complete the installation.

To test the audio card:

1. Click the Start button, point to Programs, point to Accessories, point to Multimedia, and then click Media Player. The Media Player appears as shown in Figure 2-5.

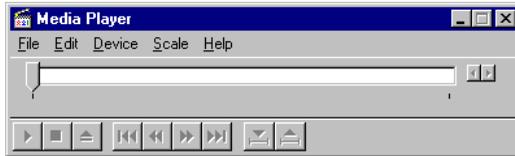


Figure 2-5: The Media Player interface.

2. On the Device menu, click Sound.
3. In the Open dialog box, select a sound from the list, and then click the Open button.
4. On the Media Player, click  .  
You should hear the selected sound being played. If you encounter any problems, see Appendix D, “Troubleshooting”.

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## Uninstalling the Applications

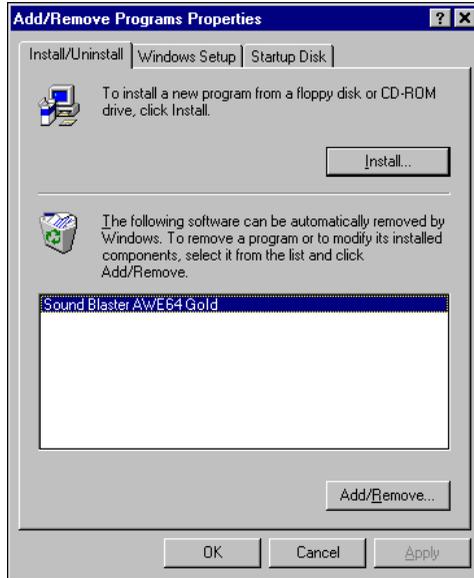
The Windows 95 Uninstall feature allows you to remove applications cleanly and then reinstall them to correct problems, change configurations, or make version upgrades.



Quit the card's applications before uninstalling. Applications that are still running during uninstallation will not be uninstalled.

To uninstall the applications:

1. Click the Start button, point to Settings, and then click Control Panel.
2. Double-click the Add/Remove Programs icon.  
The properties sheet similar to Figure 2-6 appears.



*Figure 2-6: The Add/Remove Programs Properties sheet.*

3. Select Sound Blaster AWE64 Gold and click the Add/Remove button.
4. Follow the instructions on the screen to uninstall.

---

## Installing Software in DOS/ Windows 3.1x

This chapter shows you how to install the audio software in DOS/Windows 3.1x after installing your card. It comprises the following sections:

- Installing the Software
- Testing the Installation
- Optimizing Memory Usage

---

### Installing the Software

To install the software:

1. If your package comes with installation diskettes, insert the first installation diskette into a floppy disk drive. Otherwise, insert the installation CD-ROM into your CD-ROM drive.
2. If you are in Windows, exit to DOS.  
The installation will not work if you install from the DOS prompt in Windows.
3. At the DOS prompt, change to the drive containing your diskette or CD-ROM. For example, type **D:** and press <Enter> to change to drive D.
4. Type **INSTALL** and press <Enter>.
5. Follow the instructions on the screen to complete the installation.

After you have completed the installation and rebooted your system, proceed to the next section to test if your installation works.

---

## Testing the Installation

Once you have installed the software, you can run the **DIAGNOSE** test program to test if the installation works. This program checks the base I/O addresses, IRQ line, and DMA channels used by the audio interface of your audio card. It then displays a menu to let you test the card's sound and music output.

To run the test program:

1. At the DOS prompt, change to the directory containing your audio card's software. For example, if your directory path is `C:\SB16`, type `C:\SB16` and press <Enter>.
2. Type **DIAGNOSE** and press <Enter>.
3. Follow the instructions on the screen to complete the test.

If the test program stops or displays an error message, it may be due to a conflict between the audio interface and another peripheral device. To resolve the conflict, you have to change the settings of your audio interface. For more information, see Appendix B, "Understanding the Installation" or Appendix D, "Troubleshooting".

---

# Optimizing Memory Usage

If you choose to install the low-level DOS device drivers under custom installation (see “The CONFIG.SYS File Settings” on page B-7), your system will load them into memory during system startup.

However, if you do not need these drivers (for example, you are running only Windows applications or playing DOS games), you can bypass loading these drivers. Otherwise, we recommend that you load them into high memory (for example, using memory managers).

## Using Memory Managers

You can use one of the following memory managers:

- If you are using Microsoft DOS 6.x, run MEMMAKER. (For details, refer to your DOS 6.x documentation .)
- If you have a memory manager such as QEMM or 386MAX, refer to their respective documentation for instructions.

## Bypassing the Loading of the Low-Level Drivers

You can bypass loading the low-level device drivers by using one of the these methods:

- DOS 6.x’s multiple boot sessions  
With this feature, several sessions can be made available for selection during bootup. One session can contain settings that load the drivers into memory. If you do not want to load these drivers, you can select another session that allows you to boot up the system without them.  
(Refer to your DOS 6.x documentation for instructions on how to create the multiple boot sessions.)
- Bypass the loading of the low-level device drivers
  1. During system startup, press and hold down the <ALT> key when the message “Starting MS-DOS...” appears.
  2. Release the key only when you see the DOS prompt.





---

# General Specifications

This appendix lists the general specifications of your audio card.

## **Plug and Play**

- ISA Specification version 1.0a compliant

## **Advanced WavEffects Synthesizer**

- 32-voice polyphony
- 16 parts multi-timbral
- 1 MB ROM of General MIDI samples
- 4 MB built-in DRAM

## **Stereo Music Synthesizer**

- 4-operator 11-voice or 2-operator 20-voice stereo music synthesizer
- Compatible with previous Sound Blaster and Adlib music synthesizer chips

## **Stereo Digitized Voice Channel**

- Full duplex
- 16-bit and 8-bit digitizing in stereo and mono modes
- Programmable sampling rates, 5 kHz to 44.1 kHz in linear steps. Your audio applications may support only selected ranges of sampling rates.
- High and Low DMA channels using a single interrupt for audio playback and recording
- Dynamic filtering for digital audio recording and playback

### **Built-in Digital/Analog Mixer**

- Mixes sources from digitized voice and inputs from MIDI devices, CD Audio, Line In, Microphone, and PC Speaker
- Selectable input source or mixing of various audio sources for recording

### **Volume Control**

- Software volume control of Master Volume, Digitized Voice, and inputs from MIDI device, CD Audio, Line In, Microphone, and PC Speaker
- PC Speaker at 4 levels in 6 dB steps
- All sources at 32 levels in 2 dB steps
- Treble/Bass control at 15 levels from -14 dB to 14 dB in 2 dB steps
- Full software control of fade-in, fade-out, and panning

### **3D Stereo Enhancement Technology**

- Increased depth and breadth in perceived audio
- Enhances mono and stereo audio output
- Independent of speaker quality
- Independent of setup configuration (for example, placement and alignment of speakers with the listener)

### **MIDI Interface**

- Built-in MIDI interface for connection to external MIDI devices

### **Upgrade Options**

- DRAM upgrade interface for more sound samples

# B

---

## Understanding the Installation

This appendix is organized as follows:

- ❑ Understanding the Software-Configurable Settings
- ❑ Understanding the Environment Variables
- ❑ Understanding the Installation Program in Windows 3.1x

---

## Understanding the Software-Configurable Settings

Your audio card supports the Plug and Play (PnP) 1.0a standard. This allows a PnP system to assign the necessary resources such as I/O addresses, interrupt lines and DMA channels to your card when you install it.

If you are using Windows 95, its PnP configuration manager will automatically set up your card's resources. If you are using a non-PnP system such as Windows 3.1x, you must run your PnP configuration manager to configure the card. For details, refer to the documentation of your PnP configuration manager.

This section explains the following software-configurable resources of your audio card:

- ❑ Input/Output (I/O) Addresses
- ❑ Interrupt Request (IRQ) Lines
- ❑ Direct Memory Access (DMA) Channels



If your card encounters a conflict with a peripheral device, you may need to change its resource settings. If you are using Windows 95, run the Device Manager. If you are using Windows 3.1x, run the configuration utility that comes with your PnP configuration manager. For details, see Appendix D, “Resolving Conflicts”. When any resource setting is changed, ensure the environment variables (see “Understanding the Environment Variables” on page B-3) reflect the changes as well. You can view your system environment by typing **SET** at the DOS prompt.

## Input/Output (I/O) Addresses

I/O addresses are communication areas used by your computer’s central processor to distinguish among various peripheral devices connected to your system when sending or receiving data.

Table B-1 lists the default I/O address ranges assigned by the PnP system to various devices on your audio card.

*Table B-1: Possible default I/O addresses occupied by the audio card.*

<b>I/O Address Range</b>	<b>Device</b>
200H to 207H	Game/Joystick port
220H to 22FH	Audio interface
330H to 331H	MPU-401 UART MIDI
388H to 38BH	Stereo music synthesizer
620H to 623H, A20H to A23H, E20H to E23H	Advanced WavEffects synthesizer
100H	3D Stereo Enhancement device

## Interrupt Request (IRQ) Lines

An IRQ line is a signal line a device uses to notify your computer's central processor that it wants to send or receive data for processing.

Table B-2 lists an example of an IRQ line that may be assigned to the audio interface on your audio card.

*Table B-2: Possible default IRQ line assignments.*

IRQ Line	Device
5	Audio interface

## Direct Memory Access (DMA) Channels

A DMA channel is a data channel a device uses to transfer data directly to and from the system memory. Your card's audio interface transfers data through the Low and High DMA channels.

Table B-3 shows a possible combination of DMA channels that may be assigned to the audio interface.

*Table B-3: Possible default DMA channel assignments.*

DMA Channel	Usage
1	Audio Low DMA channel
5	Audio High DMA channel

---

## Understanding the Environment Variables

Environment variables are used to pass information about how your card is configured to programs in your system. This section explains the environment variables of your audio card:

- SOUND Environment Variable
- BLASTER Environment Variable
- MIDI Environment Variable

## SOUND Environment Variable

The SOUND environment variable specifies the directory location of your audio card's drivers and applications. The syntax for this variable is as follows:

```
SOUND=path
```

where *path* is the drive and directory of the card's software (e.g., C:\SB16 ). No space is allowed before and after the equal sign.

## BLASTER Environment Variable

The BLASTER environment variable specifies the base I/O address, IRQ line, and DMA channels of the audio interface. Its syntax is:

```
BLASTER=A220 I5 D1 H5 P330 E620 T6
```



The values shown earlier may be different for your system. No space is allowed before and after the equal sign. However, there must be at least a space between parameters.

The parameters in the command are described as follows.

Parameter	Description
Axxx	Specifies the audio interface's base I/O address. <i>xxx</i> defaults to 220.
Ix	Specifies the IRQ line used by the audio interface. <i>x</i> defaults to 5.
Dx	Specifies the Low DMA channel used by the audio interface. <i>x</i> defaults to 1.
Hx	Specifies the High DMA channel used by the audio interface. <i>x</i> defaults to 5.
Pxxx	Specifies the MPU-401 UART interface's base I/O address. <i>xxx</i> defaults to 330.
Exxx	Specifies the Advanced WavEffects synthesizer chip's base I/O address. <i>xxx</i> can be 620.
Tx	Specifies the card type. <i>x</i> must be 6.

## MIDI Environment Variable

The MIDI environment variable specifies the MIDI file format used and where MIDI data is sent to. MIDI data can be sent to the internal stereo music synthesizer or MIDI port.

Generally, there are three MIDI file formats: General MIDI, Extended MIDI and Basic MIDI. The syntax for this variable is as follows:

```
MIDI=SYNTH:x MAP:x MODE:x
```

The parameters in the command are described below.

<b>Parameter</b>	<b>Description</b>
SYNTH:x	x can be 1 or 2. 1 (default setting) specifies the stereo music synthesizer. 2 specifies the MIDI port.
MAP:x	x can be G, E, or B. G specifies the General MIDI file format. E (default setting) specifies the Extended MIDI file format. B specifies the Basic MIDI file format.
MODE:x	x can be 0, 1, or 2. 0 (factory default) specifies General MIDI mode. 1 specifies General Standard mode. 2 specifies MT-32 mode.

---

## Understanding the Installation Program in Windows 3.1x

When you install the audio software, the installation program creates a directory and copies the software into it. It then allows you to set up your Windows applications by adding a command to the WIN.INI file to run WINSETUP.EXE. This command automatically creates the audio card program group and the application icons when you next run Windows.



You can also choose to set up your Windows applications at a later time by running `INSTALL` in the audio software directory on your hard disk. `INSTALL` also allows you to selectively set up components that were not installed previously.

The installation program also modifies your `AUTOEXEC.BAT` and `CONFIG.SYS` files.

## The `AUTOEXEC.BAT` File Settings

The installation program adds the following statements to the `AUTOEXEC.BAT` file:

```
SET BLASTER=A220 I5 D1 H5 P330 E620 T6
SET SOUND=C:\SB16
SET MIDI=SYNTH:1 MAP:E MODE:0
C:\SB16\DIAGNOSE /S /W=C:\WINDOWS
C:\SB16\MIXERSET /P /Q
C:\SB16\AWEUTIL /S
```

The first 3 statements set up the environment variables for your audio card. The last 3 statements run the `DIAGNOSE`, `MIXERSET`, and `AWEUTIL` utilities. The `BLASTER` statement is added by the `DIAGNOSE` utility, and the values shown above may differ from those in your system.

- Running `DIAGNOSE` with the `/S` parameter updates the `BLASTER` environment with the resource settings from the PnP configuration manager.
- Running `DIAGNOSE` with the `/W=C:\WINDOWS` parameter updates the `SYSTEM.INI` file in the Windows directory with the resource settings from the PnP configuration manager.



For a description of the `AWEUTIL` utility, refer to the `AWEUTIL.TXT` file found in the installation directory of your audio card.

## The CONFIG.SYS File Settings

If you choose to install the low-level DOS device drivers under custom installation, the installation program also adds the following statements to the CONFIG.SYS file:

```
DEVICE= C:\SB16\DRV\CTSB16.SYS /UNIT=0  
        /BLASTER=A:220 I:5 D:1 H:5  
DEVICE= C:\SB16\DRV\CTMMSYS.SYS
```

CTSB16.SYS and CTMMSYS.SYS are low-level device drivers that provide wave playback and recording for DOS applications. These applications include third-party DOS applications developed with Creative Labs' Sound Blaster Developer Kit. The applications work with the drivers (such as CTWDSK.DRV, CTWMEM.DRV, CTVDSK.DRV, and CT-VOICE.DRV) that require the low-level drivers. The drivers are found in the DRV subdirectory of your audio software directory.



See “Optimizing Memory Usage” on page 3-3 to learn how to optimize your memory.

If your system does not have enough memory when you are using Windows applications or playing DOS games, you can delete the above two statements from the CONFIG.SYS file using a text editor.

At a later time, you may discover that you need the low-level device drivers for your software application. You can load them into memory by typing **DIAGNOSE /A** at the DOS prompt and pressing <Enter>. This command adds the required statements to the CONFIG.SYS file.



---

# Changing Audio Card Settings

This chapter is organized as follows:

- Enabling/Disabling Creative 3D Stereo Enhancement Effect
- Enabling/Disabling Full Duplex Operation
- Enabling/Disabling MPU-401 MIDI Emulation
- Enabling/Disabling Joystick Interface

---

## Enabling/Disabling Creative 3D Stereo Enhancement Effect

The Creative 3D Stereo Enhancement effect allows you to eliminate speaker crosstalk which occurs when two speakers are placed close together. With this effect enabled, mono and stereo sounds produced by your speakers will have increased depth and breadth.

This effect can be enabled or disabled in Windows 95 and MS-DOS.



If your pair of speakers or another device already has a built-in 3D sound technology, do not activate this feature in both devices. The 3D Stereo Enhancement effect, when activated with another 3D sound technology, may distort the audio output.

### In Windows 95

To enable or disable the effect in Windows 95:

1. Click the Start button, point to Settings, and then click Control Panel.
2. In the Control Panel window, double-click the System icon.
3. In the System Properties sheet, click the Device Manager tab.

4. In the Device Manager tab, double-click Sound, Video And Game Controllers.
5. Select Creative Sound Blaster 16 Plug and Play and click the Properties button.
6. In the properties sheet, click the Settings tab.
7. To enable the Creative 3D Stereo Enhancement effect, select the Enable Creative 3D Stereo Enhancement check box in the Settings tabbed page.  
To disable the effect, click to clear the check box.
8. Click the OK button.

## In MS-DOS/Windows 3.1x

To enable or disable the effect in MS-DOS:

1. At the MS-DOS prompt, change to the directory containing your audio card's software; for example C:\SB16.
2. To enable the effect, type **CT3DSE ON**.  
To disable the effect, type **CT3DSE OFF**.

---

## Enabling/Disabling Full Duplex Operation

Full duplex is a feature in your audio card that allows you to record and play back audio data simultaneously. It is useful for audio conferencing and telephone-like applications. When it is enabled, you can play back and record at the same time. However, there are some limitations:

- You can start only one session of simultaneous playback and recording.
- You must use the same sampling rate for both playback and recording.  
For example, since Creative WaveSynth/WG does a Wave playback at 22 kHz, you can record at only 22 kHz.
- You cannot play other Wave files when using Creative WaveSynth/WG.
- You cannot add reverb effect when you play back Wave files.

When full duplex is disabled, you can play a Wave file (or other sounds) together with Creative WaveSynth/WG, or add reverb to the playback but you cannot record at the same time. The full duplex feature can be enabled or disabled in Windows 95 and Windows 3.1x.

## In Windows 95

To enable or disable full duplex in Windows 95:

1. Repeat steps 1 - 7 of “In Windows 95” on page C-1 under “Enabling/Disabling Creative 3D Stereo Enhancement Effect”.
2. To enable full duplex, select the Allow Full Duplex Operation check box in the Settings tabbed page.  
To disable the feature, click to clear the check box.
3. Click the OK button.

## In Windows 3.1x

To enable or disable full duplex in Windows 3.1x:

1. Launch your File Manager.
2. Locate the SYSTEM.INI file in your Windows directory.
3. Double-click the file.  
A text editor appears, displaying the contents of the file.
4. Under the section [**sndblst.drv**], look for the line **FullDuplex=1** or **FullDuplex=0**.  
To enable the feature, make sure **FullDuplex=1**.  
To disable it, make sure **FullDuplex=0**.
5. Save the file.
6. Restart your system for the drivers to be updated.

---

## Enabling/Disabling MPU-401 MIDI Emulation

The MPU-401 MIDI Emulation feature allows most real mode games, which do not support wavetable synthesis, to play wavetable music from the audio card. The MIDI output from the games is directed to the wavetable synthesizer rather than the MPU-401 interface. Games that have not been designed to use the wavetable synthesis features on your card can now use them.



You must install the DOS AWEUTIL utility for the MIDI Emulation feature to function properly. For more information, refer to the AWEUTIL.TXT file in your audio card's installation directory.

Protected mode software does not support MIDI Emulation. You can still play music from such software by using the 4-operator synthesizer chip.

The MIDI Emulation feature can be enabled or disabled in Windows 95 and MS-DOS/Windows 3.1x.

## In Windows 95

To enable or disable the feature in Windows 95:

1. Start the AWE Control Panel.
2. In the AWE Control Panel, click the Device button.
3. In the Device Selection dialog box, select the Allow MPU401 Emulation On This Device check box, and then click the Select button.
4. In the AWE Control Panel, click the Quit button to close the AWE Control Pane.

## In MS-DOS/Windows 3.1x

To enable or disable the feature in MS-DOS:

1. If your audio card is already installed, switch off your computer and all other peripheral devices. Then remove your system's cover and the audio card.

2. Enable or disable the MFBEN jumper according to the settings shown in Figure C-1.

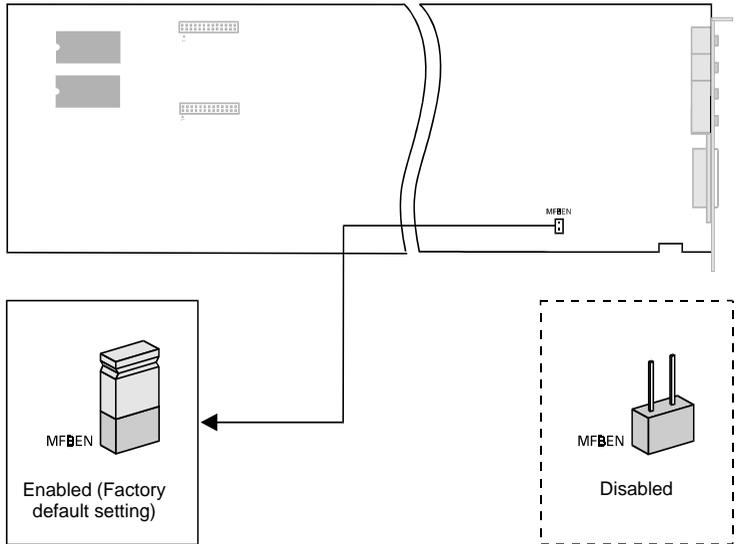


Figure C-1: The available MPU-401 MIDI Emulation settings.

---

## Enabling/Disabling Joystick Interface

The Gamepad Joystick interface can be enabled or disabled in Windows 95 and MS-DOS/Windows 3.1x.

### In Windows 95

To enable or disable the interface in Windows 95:

1. Click the Start button, point to Settings, and then click Control Panel.
2. In the Control Panel window, double-click the System icon.
3. In the System Properties sheet, click the Device Manager tab.
4. To enable or disable the Joystick interface, double-click Sound, Video And Game Controllers and select Gameport Joystick in the Device Manager tabbed page.
5. Click the Properties button.

6. To disable the interface, clear the Original Configuration (Current) check box in the General tabbed page of the properties sheet.  
To enable it, select the check box.
7. Click the OK button and restart Windows 95 for the change to take effect.



After restarting Windows 95 to effect the interface disabling, please disregard the information displayed in the Resource Settings box on the Resources tab of the Properties sheet.

The *only* indicator that your interface has indeed been disabled is the cleared Original Configuration (Current) check box.

When you re-enable the interface for use by another device, Windows 95 might warn you that there is a conflicting device or that the resource area associated with the interface is already in use. Ignore this warning. The new device should function perfectly despite the warning.

## In MS-DOS/Windows 3.1x

To enable or disable the interface in MS-DOS:

1. Exit to MS-DOS if you are in Windows 3.1x.
2. Change to the directory where your CTCM and CTCU programs are installed. The default directory is C:\CTCM. Type **CTCU** and press <Enter>.
3. On the Menu menu of the Creative Plug and Play Configuration Utility screen, click PnP Cards.
4. In the List of PnP Cards list, click your Creative Plug and Play card. In the List of Devices list, click Gameport.
5. Click the Resources button.  
The current resources assigned to the interface are displayed.
6. To disable the interface, select the Disable check box in the Resources window.  
To enable it, click to clear the check box.
7. Click the OK button twice.
8. On the Menu menu, click Exit. Type the path of your Windows 3.1x directory (for example, C:\Windows) and press <Enter>.
9. Restart your system for the change to take effect.

# D

---

## Troubleshooting

This appendix provides some tips for solving some problems you may encounter with your audio card during installation or normal use.

---

### Problems Installing Audio Card Software from CD-ROM

- |                 |  |
|-----------------|--|
| <b>Problem</b>  | In Windows 95, the installation program does not run automatically when you insert the CD-ROM into the drive.  |
| <b>Cause</b>    | The AutoPlay notification setting in your Windows 95 system may not be enabled.  |
| <b>Solution</b> | Try one of the following: <ul style="list-style-type: none"><li><input type="checkbox"/> Select the Auto Insert Notification check box.<br/>To do this:<ol style="list-style-type: none"><li>1. Click the Start button, point to Settings, and then click Control Panel.</li><li>2. In the Control Panel window, double-click the System icon.</li><li>3. In the System Properties sheet, click the Device Manager tab and select your CD-ROM drive.</li><li>4. Click the Properties button.</li><li>5. In the properties sheet, click the Settings tab and select the Auto Insert Notification check box.</li></ol></li></ul> |

- ❑ Alternatively, if you do not want to select the Auto Insert Notification check box, perform the following
  1. Double-click the My Computer icon on your Windows 95 desktop.
  2. In the My Computer window, right-click the CD-ROM drive icon.
  3. On the shortcut menu, click AutoPlay and follow the instructions that appear.

---

## Problems with Sound

- |                 |   |
|-----------------|---|
| <b>Problem</b>  | No output from both the 8-bit and 16-bit digitized sounds when running the test program.  |
| <b>Causes</b>   | <ol style="list-style-type: none"><li>1. The volume knob on the speakers is not set properly.</li><li>2. The external amplifier or speakers are connected to the wrong jack.</li><li>3. The speaker amplifiers are in the On position.<br/>If you are using powered speakers in a non-powered state, turn off their amplifiers.</li><li>4. There is hardware conflict.</li></ol>  |
| <b>Solution</b> | Verify the following: <ul style="list-style-type: none"><li>❑ Volume control knob of the speakers, if any, is set at mid-range.</li><li>❑ External amplifier or powered speakers are connected to the card's Line Out jacks.</li><li>❑ No hardware conflict between the card and another peripheral device. For details, see "Resolving Conflicts" on page D-5.</li><li>❑ Amplifiers on speakers are in the Off position.</li></ul> |

---

## Problems in MS-DOS

**Problem** SOUND or BLASTER environment could not be found.

**Cause** The command to set up the SOUND or BLASTER environment might not be included in the AUTOEXEC.BAT file.

When you install your audio card's software, the commands are automatically added to the AUTOEXEC.BAT file so that both environment strings are set up when your system restarts.

**Solution** To add the command to set up the BLASTER environment in the respective system files, run DIAGNOSE (See "Understanding the Installation" on page B-1.).

To set up the SOUND environment, insert the statement **SET SOUND=C:\SB16** into the AUTOEXEC.BAT file using a text editor. Reboot your system.

**Problem** Error message "Out of environment space".

**Cause** The system environment space is used up.

**Solution** Add the statement **SHELL=C:\COMMAND.COM /E:512 /P** to the CONFIG.SYS file. /E defines a new size for the system environment space. You can choose a higher value if the environment size is already 512 bytes. (Normally, the next value is 1024 bytes.) For details, refer to your DOS manual.

**Problem** System hangs during the 16-bit digitized sound test, but it works fine during the 8-bit test.

**Cause** Your system's motherboard cannot handle High DMA at full speed. On some machines, the DMA controller on the motherboard does not function properly during High DMA transfers. High DMA transfers on such machines might corrupt the data in main memory and cause the system to hang or encounter a parity error.

**Solution** Run the Plug and Play configuration utility and select Low DMA in place of the High DMA channel. 16-bit audio data will then be transferred through the Low DMA channel.



When you set your High DMA channel to Low DMA, you will lose the full-duplex operation, which requires two separate DMA channels.

---

## Problems in Windows 3.1x

The following are problems you might encounter when in Windows 3.1x:

**Problem** No sound is heard when running your audio card's Windows applications.

**Cause** One or more of the sound drivers might not be included in the SYSTEM.INI file.

**Solution** Check the SYSTEM.INI file. To do so:

1. On the File menu in Program Manager, click Run.
2. Type **SYSEEDIT** in the Command Line box and click the OK button.

3. Make sure the following statements are present:

```
[boot]
drivers=mmsystem.dll msmixmgr.dll

[386enh]
device=vsbpd.386
device=vsbawe.386

[drivers]
timer=timer.driv
midimapper=midimap.driv
Aux=sb16snd.driv
Mixer=sb16snd.driv
Wave=sb16snd.driv
MIDI=sbawe32.driv
MIDI1=sb16fm.driv
MIDI2=sb16snd.driv

[sndblst.driv]
Port=220
MIDIPort=330
Int=5
DmaChannel=1
HDmaChannel=5
```



The values shown in the [sndblst.driv] group may be different in your system.

If one or more of the statements are missing, run **INSTALL** in DOS. **INSTALL** rewrites **SYSTEM.INI** to set up the drivers and the Windows applications.

---

## Resolving Conflicts

Conflicts occur when two or more peripheral devices contend for the same resources. Conflicts between your audio card and another peripheral device may occur if your card and the other device are set to use the same I/O address, IRQ line, or DMA channel.

## Resolving Conflicts in Windows 95

To resolve conflicts in Windows 95, run Device Manager to change the resource settings of your audio card or the conflicting peripheral device in your system.

To change the resource setting:

1. Click the Start button, point to Settings, and then click Control Panel.
2. In the Control Panel window, double-click the System icon.
3. In the System Properties sheet, click the Device Manager tab.
4. In the Device Manager tab, double-click Sound, Video And Game Controllers.
5. Select your audio card and click the Properties button.
6. In the properties sheet, click the Resources tab.
7. Select the Use Automatic Settings check box.  
If this check box is already selected, open the properties sheet of the conflicting device and select the same check box there.
8. Reboot your system to allow Windows 95 to reassign resources to your audio card and/or the conflicting device.



The Conflicting Device List box shows you which peripheral device is conflicting with your audio card. This box is displayed on the Resources tab of your audio card's properties sheet.

## Resolving Conflicts in MS-DOS/Windows 3.1x

To resolve conflicts in MS-DOS/Windows 3.1x:

1. Run your Plug and Play configuration utility.
2. Reselect the resource settings of your audio card that are in conflict. For more details, refer to the documentation that comes with your Plug and Play configuration utility.