Getting Started

Version 1.4
December 1996

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- ❑ 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

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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 world of Advanced WavEffects Synthesis.

Your 16-bit audio card allows you to obtain realistic acoustic reproduction through a wide range of digitized sound samples. With built-in Creative 3D Stereo Enhancement Technology, your audio card enriches the depth and breadth of sounds produced.

Fully Sound Blaster compatible, your card supports the following features:

- ❑ Plug and Play ISA Specification version 1.0a compliant.
- ❑ Major MIDI standards such as General MIDI, Roland GS, and MT-32.
- ❑ Compression algorithms such as A-law, Mu-law, CTADPCM, and IMA-ADPCM.

In addition, your audio card has an IDE port that allows you to connect IDE CD-ROM drives to it.

Before You Begin

Before starting on your audio exploration, you need to know and do a few important things. Please read the following sections throughly:

- ❑ Recording Model and Serial Numbers
- ❑ Checking System Requirements
- ❑ Getting Latest Information
- ❑ Making a Copy of Your Diskettes
- ❑ Using the Documentation
- ❑ Document Conventions

Recording Model and Serial Numbers

Your audio card has been assigned a model number and a serial number. After you have removed the card from its packaging, write down its model and serial numbers in Table 1 of the Technical Support leaflet.

The model number is printed near the top left edge of your audio card, while the serial number is printed on a sticker located at the back of the card.

Checking System Requirements

The system requirements are:

- ❑ An 80486 computer or higher, with a VGA card installed.
- ❑ 7.5 MB of hard disk space for your audio card's software.
- ❑ 4 MB RAM.
- ❑ Windows 95 or
  Windows 3.1x with DOS 5.0 or later and a Plug and Play Configuration Manager.

Getting Latest Information

Your package may come with a CD-ROM or diskettes to install your audio software. The README file, situated on the CD-ROM or first diskette, contains the latest information and changes not available at the time of printing. Please read the file before you continue.

To view the file in Windows 95 using the audio software's first installation diskette:

1. Start Windows 95.
2. Insert the diskette into your floppy drive.
3. Double-click the My Computer icon to see its contents.
4. Double-click the drive icon representing the drive containing your diskette.
   The README file appears in the folder.

5. Double-click the README file.
   The Windows 95 Notepad appears, displaying the contents of the README file.

If you are about to follow the steps for reading the README file on the audio software installation CD-ROM, we assume that you already have a CD-ROM drive installed.

To view the file in Windows 95 using the audio software's installation CD-ROM:

1. Start Windows 95.
2. Insert the CD-ROM into your CD-ROM drive.
   If Windows 95 automatically starts playing the CD-ROM, a dialog box prompting you to install the software or to exit the setup will appear.
3. Choose Exit.
4. Double-click the My Computer icon.
5. Right-click on the CD-ROM drive icon.
   A menu appears listing the various options available to the drive.
6. Select Readme.
   The Windows 95 Notepad appears displaying the README file.

To view the file in DOS/Windows 3.1x:

1. Start your computer.
2. If your package comes with installation diskettes, insert the first installation diskette into your floppy drive. However, if the package comes with an installation CD-ROM, insert the CD-ROM into your CD-ROM drive.
3. Change to the drive containing the file. Normally, this is drive A or B for an installation diskette and drive D for a CD-ROM.
4. Type **README** and press <Enter>.

If you want to read the file in Windows 3.1x, you can do so by going to the Windows DOS box and following steps 3 and 4.

Making a Copy of Your Diskettes

If you have not made a copy of the original diskettes that come with your package, you should do so before installing the software in your system. Store your original diskettes in a safe place.

Using the Documentation

This documentation in this guide provides information on how to install your audio card. The guide is arranged as follows:

Chapter 1, "Knowing Your Audio Card"
Contains information about the various hardware components on your audio card. For the software-configurable settings, their possible settings are also listed in this chapter. If you are new to audio cards, we recommend that you read this chapter before you set up your card.

Chapter 2, "Setting Up Your Audio Card"
Guides you through the process of installing the card and associated software in your system. If you wish to install a CD-ROM drive, this chapter also gives you a brief overview on how to connect the CD-ROM drive to your audio card.

Chapter 3, "Installing Software in Windows 95"
If you are using Windows 95, this chapter helps you install the software for the operating system.

Chapter 4, "Installing Software in DOS/Windows 3.1x"
If you are using Windows 3.1x, this chapter shows you how to install the software in this operating system.

Chapter 5, "Changing Your Audio Card Settings"
Shows you how to change the hardware settings on your audio card.

Appendix A, "General Specifications"
Describes the general specifications of your audio card.

Appendix B, "Hardware Information"
Provides information on the connectors used to redirect sound from your PC speaker to the speakers connected to your audio card. Moreover, information on the SPDIF Connector (which transfers digital audio signals from recorder to recorder) is also provided.

Appendix C, "MIDI Specifications"
Lists the MIDI specifications of your audio card.

Appendix D, “Troubleshooting”
Provides tips and strategies for some of the problems you might encounter with your audio card either during installation or normal use.

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
- ❑ Icons

Please note that in this manual, Sound Directory or path refers to the directory where your audio card’s software is stored (e.g., SB16).

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
bold	Command names, switches, and any text that must be entered exactly as it appears.
italic	Title of a book. 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 your attention (see Table ii).

Table ii: Icons.

Icon	Use
	Information or instructions that must not be taken lightly and should be noted.
	Cautions or warnings that you must pay attention to. Information highlighted by this icon tells you how to avoid situations such as the risk of not enough memory or even damages to your system.

1

Knowing Your Audio Card

This chapter helps you locate and identify the components of your audio card. The components of the audio card comprises the following categories:

- ❑ Jacks
- ❑ Connectors
- ❑ Jumpers

Place the audio card in front of you as you go through this chapter. This will help you identify the various components described.

Jacks

Jacks are one-hole connecting interfaces on your audio card. They allow you to attach other devices to your card. Jacks are found exclusively on the rear panel of your audio card as shown in Figure 1-1.

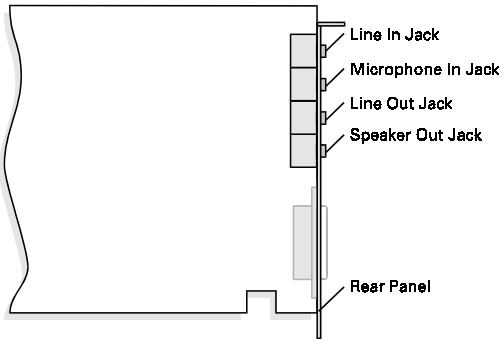

Figure 1-1: The jacks on your audio card.

Line In Jack

The Line In Jack allows you to connect devices such as a cassette, DAT, or Minidisc player to your audio card for playback or recording.

Microphone In Jack

The Microphone In Jack allows you to connect a microphone for voice input.

Line Out Jack

The Line Out Jack allows you to bypass your card's internal amplifier to connect powered speakers or an external amplifier for audio output.

Speaker Out Jack

The Speaker Out Jack allows you to connect speakers for audio output from the card's built-in power amplifier. The built-in amplifier has a maximum output power of four watts per channel from four-ohm speakers and two watts per channel from eight-ohm speakers. Do not play at maximum volume if your speakers cannot handle this power.

Connectors

Connectors are also interfaces on your audio card that allow you to attach other devices to your card. But, unlike jacks, connectors consist of many pairs of pins as shown in Figure 1-2.

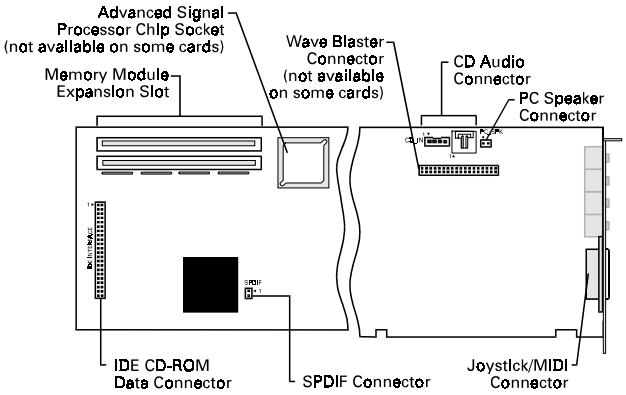

Figure 1-2: The connectors on your audio card.

Some versions of the audio card may not come with the Wave Blaster connector or Advanced Signal Processor chip socket.

Joystick/MIDI Connector

The Joystick/MIDI Connector allows you to connect a joystick or MIDI kit to your audio card.

The optional MIDI kit contains a MIDI adapter with a joystick connector so that you can plug in a joystick and a MIDI device simultaneously. The kit also comes with a sequencing software that allows you to record, playback, and edit MIDI files.

Wave Blaster Connector

Skip this section if your card does not have this connector.

Your audio card has an on-board connector for the MIDI synthesizer. This daughterboard module, called Wave Blaster, is capable of producing extremely high-fidelity stereo music for computer audio systems.

PC Speaker Connector

The PC Speaker Connector makes it possible to redirect sounds that normally come from the PC speakers to your external speakers (see the section, “Redirecting PC Sounds to External Speakers” on page B-4).

CD Audio Connector

The CD Audio Connector allows you to connect the CD audio cable from your audio card to a CD-ROM drive. With speakers connected to your audio card, you can listen to audio from the CD-ROM drive. (For more information, refer to the documentation provided with your CD-ROM drive.)

Memory Module Expansion Slot

The memory module expansion slot allows you to install SIMMs on your audio card so that you can have more RAM for your MIDI instrument samples. You can add up to a maximum of 28 MB RAM with the SIMMs (see the chapter “Changing Your Audio Card Settings”).

We recommend that you use a pair of SIMMs with the same capacity. The SIMM RAM access time must be 80 nanoseconds or faster.

SPDIF Connector

The SPDIF (Sony/Philips Digital Interface Format) Connector is an interface that allows you to transfer digital audio signals from one recorder to another. In this way, the fidelity of a transferred digital signal is preserved. You can transfer digital signals from your audio card to a recorder only through the SPDIF Connector. Refer to the “SPDIF Connector Pin Assignments” on page B-3 for the SPDIF Connector’s pin definitions.

IDE CD-ROM Data Connector

The IDE CD-ROM Data Connector allows your audio card to be connected to an IDE CD-ROM drive. Refer to the CD-ROM drive’s documentation for detailed instructions on how to install and connect the CD-ROM drive.

Advanced Signal Processor Chip Socket

Skip this section if your card does not have the socket or already has the chip on board.

This socket allows you to add or plug in an Advanced Signal Processor chip to your card. This chip performs real-time compression and decompression of audio data and is available as an upgrade option. When you plug in this chip, you have to change the configuration of several jumpers. See the section below.

Jumpers

Jumpers are groups of pins that you can configure to define the hardware settings of your audio card (see Figure 1-3).

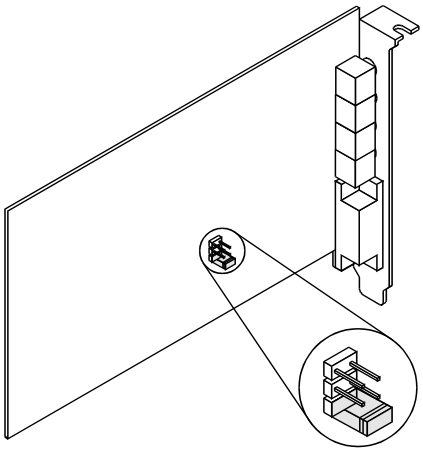

Figure 1-3: Jumpers.

A jumper exists in two states: enabled or disabled. A jumper is enabled when a plastic hood, called jumper block, is placed over the jumper's two pins as shown in Figure 1-4.

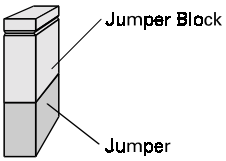

Figure 1-4: An enabled jumper.

In contrast, a disabled jumper is one with no jumper block over it or one with a jumper block over one pin as shown in Figure 1-5.

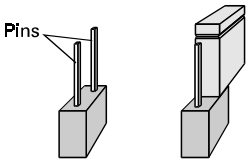

Figure 1-5: Two types of disabled jumpers.

The rest of this chapter provides you with more information on the default hardware settings and preferred software-configurable settings. If you wish to change these settings, see the chapter "Changing Your Audio Card Settings".

Knowing the Hardware Settings

The jumpers on your audio card are shown in Figure 1-6.

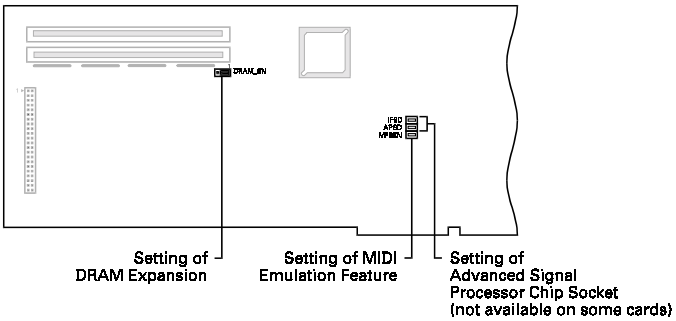

Figure 1-6: The jumpers on your audio card.

These jumpers allow you to define the following hardware attributes:

- ❑ MFBEN
- ❑ DRAM Expansion
- ❑ Advanced Signal Processor Chip Upgrade (may not be available for your card)

MFBEN

The MFBEN jumper allows you to enable or disable the MIDI Emulation feature. This feature allows most real mode games, which do not support wave table synthesis, to play wave table music from the audio card. The MIDI output from the games is directed to the wave table music synthesizer rather than the MPU-401 interface. Games that have not been designed to use the wave table synthesis features on your card can now use them. Note that you also need to install the DOS AWEUTIL utility for MIDI Emulation to function properly. For more information, refer to the "Advanced WavEffects Utility" chapter in your audio card's DOS/Windows 3.1x *User's Guide* (printed or on-line). If the *User's Guide* does not come with your package, you can refer to the AWEUTIL.TXT file found in your audio card's directory.

Protected mode software does not support MIDI Emulation. You can still play music from this type of software using the 4-operator stereo synthesizer chip.

The factory default setting for MIDI Emulation is enabled as shown in Figure 1-7. To change this setting, see the chapter “Changing Your Audio Card Settings”.

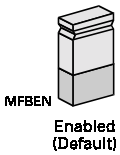

Figure 1-7

DRAM Expansion

Your audio card can support additional RAM for the expansion of the MIDI instrument maps (apart from the 512KB already on board). Single Inline Memory Modules (SIMMs) can be used to provide more RAM. If SIMMs are installed on your audio card, you can use jumper DRAM_EN to choose to use either the SIMMs or the on-board 512KB.
The factory default setting of jumper DRAM_EN, shown in Figure 1-8, is to use the on-board 512KB. Refer to the chapter “Changing Your Audio Card Settings” for more information on setting the SIMMs.

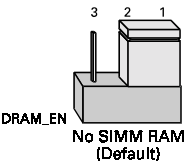

Figure 1-8

Advanced Signal Processor Chip Upgrade

If your audio card does not have the Advanced Signal Processor chip socket, the jumpers described below are not found on your card. In this case, please skip this section.

The IFSD and APSD jumpers are used to specify the presence of the Advanced Signal Processor chip on your card. This chip performs real-time compression and decompression of audio data and is available as an upgrade option. When you install the chip, you need to disable these two jumpers (see the chapter "Changing Your Audio Card Settings").

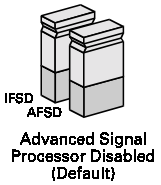

Figure 1-9

Knowing the Software-Configurable Settings

This section describes the following software-configurable settings that are set by your Plug and Play system.

- ❑ I/O Addresses
  - base I/O address of audio interface
  - base I/O address of MPU-401 UART MIDI interface
  - base I/O address of stereo music synthesizer
  - base I/O address of game port
  - base I/O address of Advanced WavEffects Synthesizer
  - base I/O address of IDE CD-ROM interface.
- ❑ IRQ Lines
  - IRQ line of audio interface
  - IRQ line of IDE CD-ROM interface
- ❑ DMA channels used by audio interface.

Your audio card supports Plug and Play. This feature allows a Plug and Play system to assign resources such as I/O addresses and interrupts to the above software-configurable settings required by your newly added audio card.

I/O Addresses

I/O addresses (or I/O address range) are areas of memory used by your computer's microprocessor to distinguish among various peripheral devices connected to your system when sending or receiving data. There are several such devices on your audio card. These devices are listed in Table 1-1 with an example of Plug and Play assigned I/O address ranges.

The base I/O address is the starting address of each I/O address range.

Table 1-1: Example I/O Addresses occupied by the Audio Card.

I/O Address Range	Usage
200H to 207H	Game Port
220H to 22FH	Audio Interface
330H to 331H	MPU-401 UART MIDI Interface
388H to 38BH	Stereo Music Synthesizer
620H to 623H	Advanced WavEffects Synthesizer
A20H to A23H	Advanced WavEffects Synthesizer
E20H to E23H	Advanced WavEffects Synthesizer
1E8H to 1EFH	IDE Port (Tertiary)

Interrupt Request Lines (IRQ)

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

Table 1-2 lists an example of IRQ lines that may be assigned to the two devices on your audio card that use IRQ lines.

Table 1-2: Possible IRQ lines assigned.

IRQ Line	Usage
5	Audio Interface
11	IDE CD-ROM Interface

Direct Memory Access Channels (DMA)

The DMA channel is the data channel your device uses to transfer data directly to the system's memory.

The audio interface allows you to transfer data through the Low and High DMA channels. Table 1-3 lists a possible combination of DMA channels that may be assigned to the audio interface which requires DMA channels.

Table 1-3: Possible DMA channels assigned.

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

2

Setting Up Your Audio Card

This chapter guides you through the process of installing your audio card. It is organized as follows:

- ❑ Installing the Card
- ❑ Connecting Other Devices

If you are installing your audio card in a system that is running Windows 3.1x, you need to install a Plug and Play Configuration Manager before you proceed with the installation. The Plug and Play Configuration Manager allows you to install your Plug and Play audio card in a non Plug and Play system.

Installing the Card

Installing the audio card in your system is simple, so please follow the instructions carefully.

To install the card:

1. Switch off your system and all peripheral devices. Unplug the power cord from the wall outlet.

   The power cord and wall outlet shown may be different in your country.

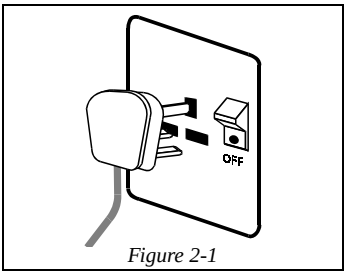

Figure 2-1

2. Touch a metal plate on your system to ground yourself and discharge any static electricity.

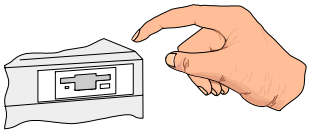

Figure 2-2

3. Remove the cover from your system.

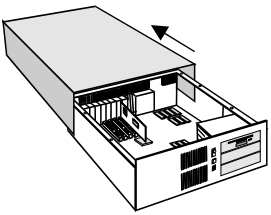

Figure 2-3

4. Find a free 16-bit expansion slot in your system.

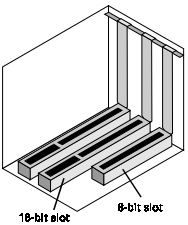

Figure 2-4

5. Remove the metal plate from the slot you have chosen and put the screw aside.

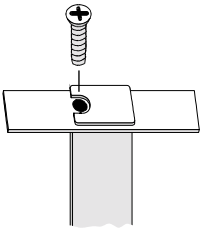

Figure 2-5

6. Align your card's 16-bit slot connector with the expansion slot and gently lower the card into the free slot as shown.

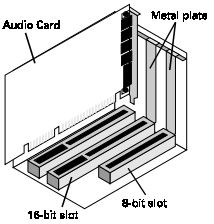

Figure 2-6

7. Secure the card to the expansion slot with the screw you removed from the metal plate.

If your package comes with a CD-ROM drive, you need to install the drive now. For more information, refer to the documentation provided with your CD-ROM drive.

8. Replace the cover of your system.

Connecting Other Devices

Once the audio card has been installed in your system, connect the speakers to your audio card's Speaker Out Jack. Figure 2-7 shows you how to connect various devices to your audio card such as a microphone and a joystick. If you want to bypass the internal amplifier, connect powered speakers or an external amplifier to the Line Out Jack.

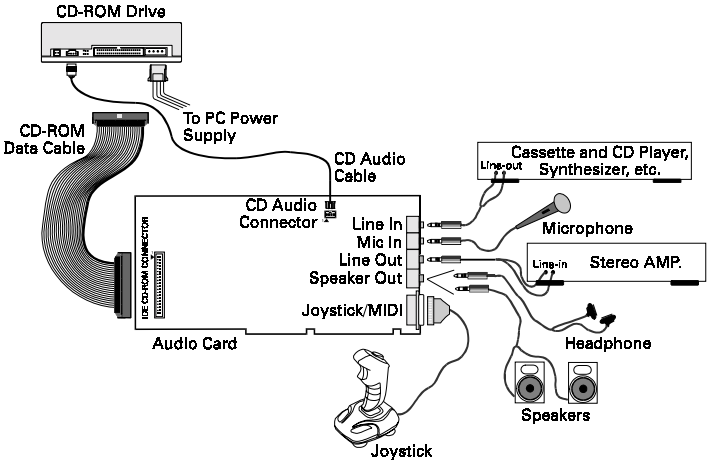

Figure 2-7: Connecting External Speakers and Other Devices.

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-sub 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.

3

Installing Software in Windows 95

After you have installed your audio card hardware, you can begin to install the software. This chapter guides you through the process of installing the audio card's software in Windows 95 and comprises the following sections:

- ❑ Setting Up Audio Card Drivers
- ❑ Installing Your Audio Card's Applications
- ❑ Testing the Installation
- ❑ Uninstalling your Audio Card Software

Before you start, make sure that you have installed Windows 95 in your system. If you don't have Windows 95 running before performing this installation, you will not be able to successfully complete the installation process outlined in this chapter.

Setting Up Audio Card Drivers

Skip to the next section, "Installing Your Audio Card's Applications", if you have just installed the CD-ROM drive that was packaged with your audio card or if your audio card's drivers are already set up.

You need software drivers to control your audio card. Installing these drivers in Windows 95 is easy as the operating system detects the existence of various audio card components, and either automatically installs the drivers or prompts you for the drivers. To set up the drivers for your audio card, you need your Windows 95 installation diskettes or CD-ROM. Your audio card drivers are in them.

After you have installed your audio card and switched on your system, Windows 95 will begin setting up your card's drivers.

The following are the boxes that may appear on the screen during the setup process.

- If a message box similar to the one shown in Figure 3-1 appears, simply take note of it and wait for the next box to appear.

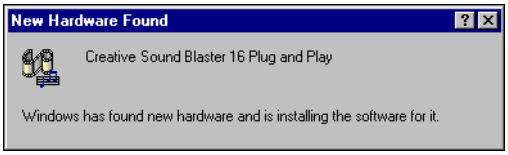

Figure 3-1: Message box announcing the detection of a device.

- If a dialog box similar to the one shown in Figure 3-2 appears, choose OK. If you are prompted for a Windows 95 installation diskette or CD-ROM, insert the indicated diskette or CD-ROM into a drive and choose OK.

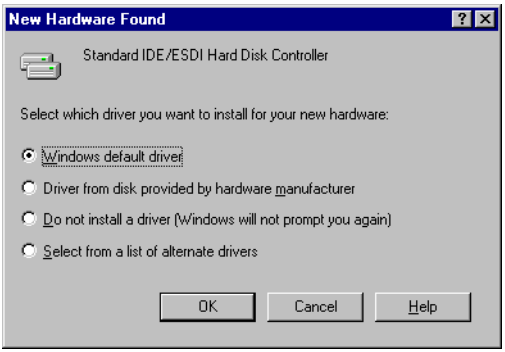

Figure 3-2: Driver installation dialog box with Windows default driver option enabled.

❑ If a dialog box similar to the one shown below appears:

Figure 3-3: Driver installation dialog box with Windows default driver option disabled.

1. Choose OK.
   An Install From Disk dialog box similar to that in Figure 3-4 appears.

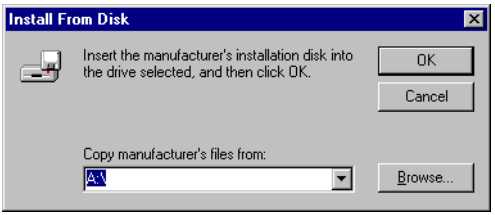

Figure 3-4: The Install From Disk dialog box.

2. Insert the audio card's Drivers Disk into your floppy disk drive.
3. Click the drop-down list box and select the drive which contains your diskette.
4. Choose OK.
   The required files are copied from the diskette to your hard disk.

After the drivers for your audio card have been set up, go on to the next section to install your card's applications.

Installing Your Audio Card's Applications

Your audio card applications can be installed from a CD-ROM or a diskette depending on whether an installation CD-ROM or an installation diskette is supplied in your package.

To install from CD-ROM:

1. Ensure that your CD-ROM drive is installed and working properly. If not, refer to your drive's documentation to troubleshoot it.
2. Load your audio card's software installation CD-ROM into your CD-ROM drive.
   The CD-ROM supports Windows 95 AutoPlay mode and starts running automatically. If it does not, refer to Appendix D, "Troubleshooting".
3. Follow the instructions on the screen to finish installing your audio card's applications.

To install the applications from diskette:

1. Insert the applications' installation diskette into the appropriate drive in your system.
2. Click Start in the taskbar.
   The Start popup menu appears
3. Select Settings from the Start popup menu as shown in Figure 3-5.

Figure 3-5: Start popup menu.

4. Select Control Panel from the Settings sub-menu.
   The Control Panel window similar to Figure 3-6 appears.

Figure 3-6: The Control Panel window.

5. Double-click the Add/Remove Programs icon.
   The Add/Remove Programs Properties sheet similar to Figure 3-7 appears.

Figure 3-7: Add/Remove Programs properties sheet.

6. Choose Install.
7. Follow the instructions on the screen to finish the installation.

Testing the Installation

When the applications have been installed, you can test your audio card to find out if it is working properly.

The testing procedure requires the Windows 95 Media Player. Follow the Start button's menus, as depicted in Figure 3-10, to see if the Media Player icon is displayed. If it is not displayed, follow the instructions below to install the Media Player. If it is displayed, jump to the instructions on the next page to test the audio card.

To install the Media Player:

1. Click the Start button.
2. Select Settings and then Control Panel.
   The Control Panel window is displayed.
3. Double-click the Add/Remove Programs icon.
   The Add/Remove Programs Properties sheet appears.
4. Click the Windows Setup tab.
   The Windows Setup tabbed page shown in Figure 3-8 appears.

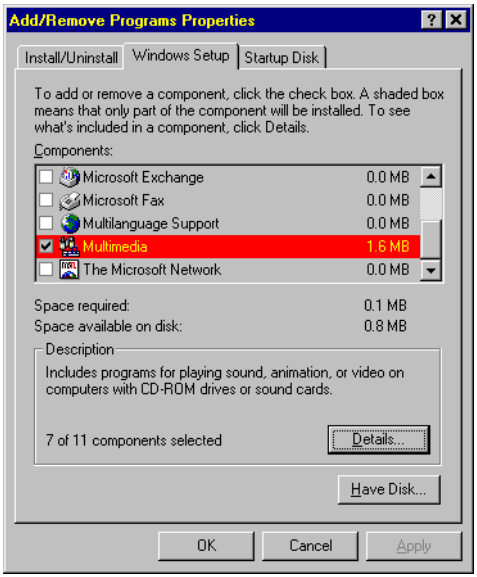

Figure 3-8: The Windows Setup tabbed page of the Add/Remove Programs Properties sheet.

5. Select Multimedia and choose Details.
   The Multimedia dialog box shown in Figure 3-9 appears.

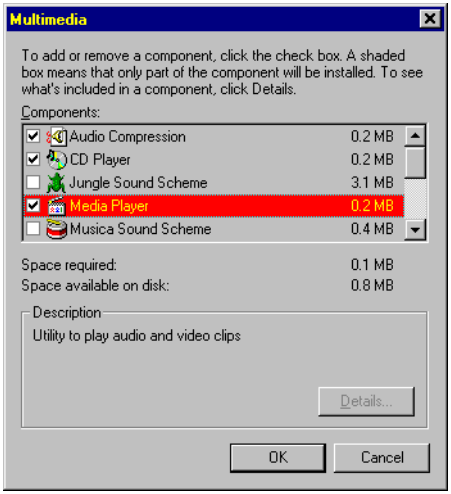

Figure 3-9: The Multimedia dialog box.

6. Click the Media Player check box and choose OK.
7. Follow the instructions on the Media Player installation.

The Media Player is now installed. Follow the instructions below to test your audio card.

To test the audio card:

1. Click Start in the taskbar.
2. Select Programs, Accessories, Multimedia, and Media Player as shown in Figure 3-10. The Media Player appears and is shown in Figure 3-11.

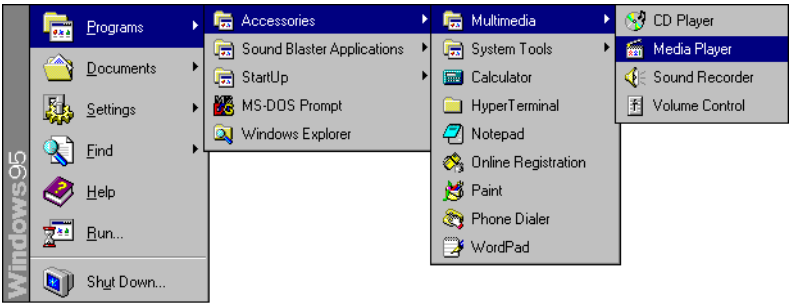

Figure 3-10: Programs popup menu.

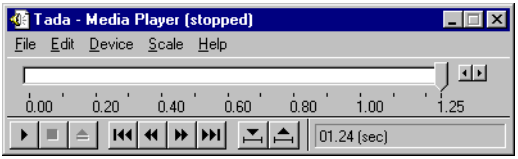

Figure 3-11: Media Player.

3. In the File menu, select the Open command.
   The Open dialog box appears with a list of sounds (see Figure 3-12).

Figure 3-12: The Open dialog.

Your list of sounds may differ from the one shown in Figure 3-12.

4. Select Tada from the list of sounds.
   If Tada is not shown, select any other available sound.
5. Choose Open.
6. Click ▶ on the Media Player.
   You should hear your sound being played.

If there is no sound during the test, check the following:

- ❑ Speakers are connected to the card's audio output connector.
- ❑ Volume control knob of the speakers (if any) is set at mid-range.
- ❑ External amplifier or powered speakers is/are connected to the card's Line Out jack if you decide not to use the card's internal power amplifier.
- ❑ No hardware conflict between the audio card and another peripheral card.

The built in stereo power amplifier has a maximum output power of four watts per channel for four ohm speakers. Do not play at maximum volume if your speakers cannot handle this power.

Uninstalling your Audio Card Software

Many applications share resources and make modifications throughout your system. The Windows 95 uninstall feature allows you to remove applications cleanly or re-install them to correct problems, change configurations, or make version upgrades. You can use the uninstall feature on your audio card's software.

Please quit all your audio card applications before carrying out the uninstall procedure. If a card's application is running during the uninstall procedure, that application will not be uninstalled.

To uninstall the software:

1. Click Start in the taskbar.
2. Select Settings from the Start popup menu as shown in Figure 3-13.

Figure 3-13: Start popup menu.

3. Select Control Panel from the Settings submenu as shown in Figure 3-13.
   The Control Panel window like the one in Figure 3-14 appears.

Figure 3-14: The Control Panel window.

4. Double-click the Add/Remove Programs icon.
   The Add/Remove Programs Properties sheet similar to the one in Figure 3-15 appears.

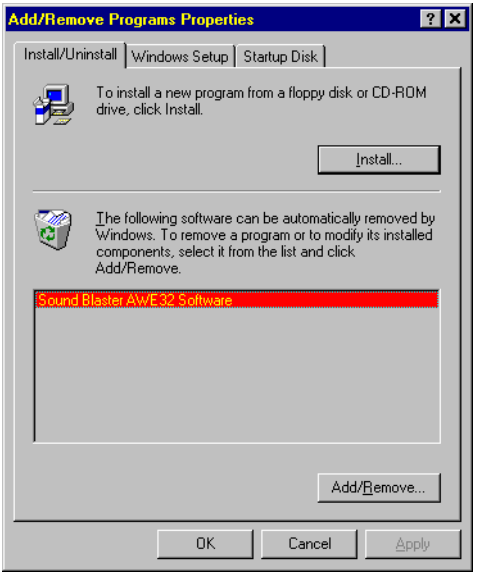

Figure 3-15: The Add/Remove Programs Properties sheet.

5. Select Sound Blaster AWE32 Software from the list and choose Remove.
   The files pertaining to your audio card applications are deleted.
6. Follow the instructions on screen to complete the uninstall process.

4

Installing Software in DOS/ Windows 3.1x

If you are using the Windows 3.1x operating system, you will need to use the Plug and Play Configuration Manager to allocate system resources to your audio card. Make sure that the Plug and Play Configuration Manager is installed before proceeding further.

This chapter provides instructions to install your audio card's software in a DOS/Windows 3.1x system. It consists of the following sections:

- ❑ Installing From CD-ROM
- ❑ Installing From Diskettes
- ❑ Testing the Installation

Your package may come with an installation CD-ROM or an installation diskette to install your audio card's software. Please use the appropriate section based on the installation media provided in your package.

Installing From CD-ROM

Before you can install the audio card's software from the CD-ROM, a CD-ROM drive must be installed and working properly in your system.

If you have not yet installed a CD-ROM drive and associated drivers, refer to your CD-ROM drive's documentation for instructions. You can use the diskette provided with the CD-ROM to install the drivers needed by your CD-ROM drive.

To install the audio card's software from CD-ROM:

1. Quit to DOS if you are in Windows.

The installation will not work if you install from the Windows DOS prompt.

2. Insert the installation CD-ROM into your CD-ROM drive.
3. At the DOS prompt, change to the drive containing your CD-ROM. For example, type **D:** and press <Enter>.
4. Type **CD WINDOWS** to change to the Windows directory in the CD-ROM.
5. Type **INSTALL** and press <Enter>.
6. Follow the instructions presented on the screen to complete the installation.

When you have completed the installation and rebooted, proceed to the section "Testing Your Installation" in this chapter to find out if your installation works.

Installing From Diskettes

If a diskette is provided, to install the audio card's software:

1. Quit to DOS if you are in Windows.

The installation will not work if you install from the Windows DOS prompt.

2. Insert your audio card's installation diskette into a drive.
3. At the DOS prompt, change to the drive containing your diskette. For example, if your diskette is in drive A, type **A:** and press <Enter>.
4. Type **INSTALL** and press <Enter>.
5. Follow the instructions presented on the screen to complete the installation.

When you have completed the installation and rebooted, proceed to the section "Testing Your Installation" in this chapter to find out if your installation works.

Testing the Installation

Once you have installed the card, run the test program DIAGNOSE to make sure the card has been installed properly. This program checks the base I/O address, IRQ line, and DMA channels used by the audio interface. It then displays a menu to let you test the card's sound and music output.

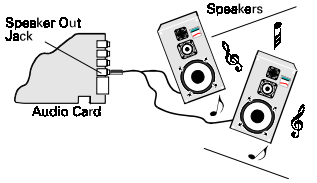

Figure 4-1

To run the test program:

1. At the DOS prompt, change to the directory containing your audio card's software (e.g. C:\SB16).
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 when it is checking the audio interface's base I/O address, IRQ line, or DMA channels, 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. (See the section "Changing Resource Settings in Windows 3.1x/DOS" in page 5-6 or Appendix D, "Troubleshooting" on how to change the settings and resolve the conflicts.)

If there is no sound output during the test, check the following:

- ❑ Speakers are connected to the card's Speaker Out jack or Speaker/Line connector.
- ❑ Volume control knob of the speakers (if any) is set at mid-range.
- ❑ External amplifier or powered speakers is/are connected to the card's Line Out jack if you decide not to use the card's internal power amplifier.
- ❑ No hardware conflicts between the audio interface and another peripheral device.

The built-in stereo power amplifier has a maximum output power of four watts per channel for four ohm speakers and two watts per channel for eight ohm speakers. Do not play at maximum volume if your speakers cannot handle this power.

Understanding the Installation Program

The installation program creates a directory you specify, and copies the software provided in 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 from the audio card's directory in 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. Details are provided in the following sections.

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 Plug and Play 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 Plug and Play Configuration Manager.

Refer to the section “Changing Resource Settings in Windows 3.1x/DOS” in page 5-6 for a description of the SOUND, BLASTER, and MIDI environment settings. For a description of the AWEUTIL utility, refer to your card’s Windows 3.1/DOS User’s Guide or the AWEUTIL.TXT file.

The CONFIG.SYS File Settings

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

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

The driver name CTSB16.SYS may be VIBRA16.SYS in your installation.

CTSB16.SYS (or VIBRA16.SYS) and CTMMSYS.SYS are low-level device drivers that provide wave playback and recording for DOS applications. These include third-party DOS applications developed using drivers (such as CTWDSK.DRV, CTWMEM.DRV, CTVDSK.DRV, and CT-VOICE.DRV) that require these low-level drivers. The drivers are found in the DRV subdirectory of your audio card’s directory.

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.

Please also refer to the section “Optimizing Memory Usage” in page 4-6 of this chapter on how to optimize your memory after you have loaded the low-level drivers.

Optimizing Memory Usage

Before you embark on loading CTSB16.SYS (or VIBRA16.SYS) and CTMMSYS.SYS into memory, you should consider whether you actually need these drivers to run your software. If you do, we recommend that you load them into high memory (e.g. using memory managers) to maximize your memory usage.

If you don't need these drivers (e.g., if you are running Windows applications or playing DOS games only), you can bypass the loading of these drivers.

Using Memory Managers

You can use one of the following memory managers:

- ❑ If you use Microsoft DOS 6.x, run MEMMAKER to optimize the memory. (Please refer to the DOS 6.x documentation for instructions on how to use the MEMMAKER.)
- ❑ If you have a memory manager like QEMM or 386MAX, please refer to the respective software's documentation for instructions on how to optimize the memory by loading the drivers into the high memory area.

Bypassing the Loading of the Low-Level Drivers

You may bypass the loading of the low-level device drivers in one of the following ways:

- ❑ Using the 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 loads the drivers into memory. When you do not wish to load these drivers into memory, you can select another session that allows you to boot up the system without these drivers. (Please refer to your DOS 6.x documentation for instructions on how to create the multiple boot sessions.)
- ❑ Using the Bypass Installation feature of the low-level device drivers. During system startup, simply press and hold down the <ALT> key after the RAM test.

CSP.SYS does not have the bypass feature as Windows applications require it.

5

Changing Your Audio Card Settings

This chapter shows you how to change the jumper settings on your audio card as well as describe the steps needed to enable or disable the Creative 3D Stereo Enhancement feature.

This chapter comprises the following sections:

- ❑ Changing Configuration of Jumpers
- ❑ Changing Resource Settings in Windows 3.1x/DOS
- ❑ Enabling/Disabling the Creative 3D Stereo Enhancement Effect

Changing Configuration of Jumpers

Jumper configurations define the hardware settings of the audio card. Before you change a jumper configuration, you should identify the current and the proposed new setting. You can then proceed to change the jumper configuration.

To change the configuration of jumpers:

1. If you have already installed your audio card, switch off your computer and all other peripheral devices, and remove the system's cover and card from your system.
2. Identify the jumpers to change.

3. Remove the jumper blocks from the jumpers as shown in Figure 5-1.

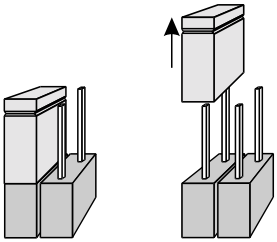

Figure 5-1: Removing the jumper block.

4. Select your desired jumper settings by placing the jumper blocks on the appropriate jumpers as shown in Figure 5-2.

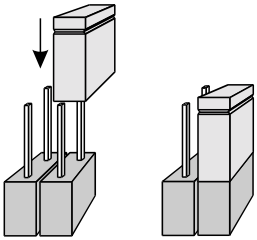

Figure 5-2: Inserting the jumper block.

Changing the Setting of DRAM

The jumper DRAM_EN configures your audio card to use the on-board 512 KB DRAM or the optional Single Inline Memory Modules (SIMMs). The factory default setting specifies use of the 512 KB DRAM.

To change the DRAM usage, enable the jumper corresponding to the setting shown in Figure 5-3.

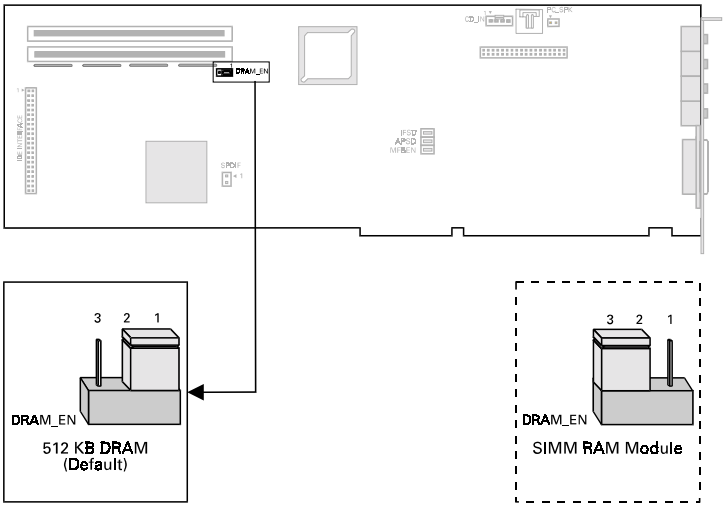

Figure 5-3: The available DRAM Expansion settings.

Changing Advanced Signal Processor Chip Setting

Read this section only if your audio card has a socket to install the Advanced Signal Processor chip.

The IFSD and APSD jumpers are used to specify the presence of the Advanced Signal Processor chip on your audio card. If your audio card comes with a socket to install the chip, you need to disable these jumpers when you install the chip. See Figure 5-4.

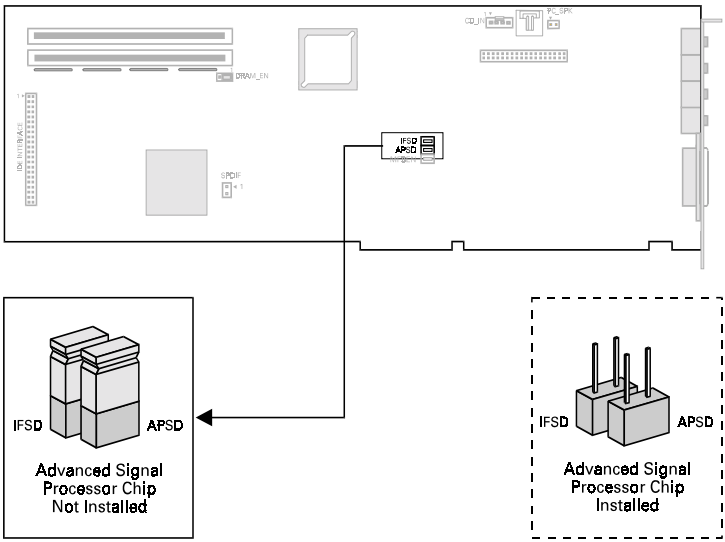

Figure 5-4: Advanced Signal Processor chip settings.

Refer to your *Advanced Signal Processor Chip Installation* leaflet for detailed instructions to install the chip.

Enabling/Disabling MIDI Emulation

Read this section only if you are using your audio card in DOS.

The MIDI Emulation mechanism on your audio card can be enabled/disabled using jumper MFBEN. The factory default setting is enabled. To change the setting, enable or disable jumper MFBEN as shown in Figure 5-5.

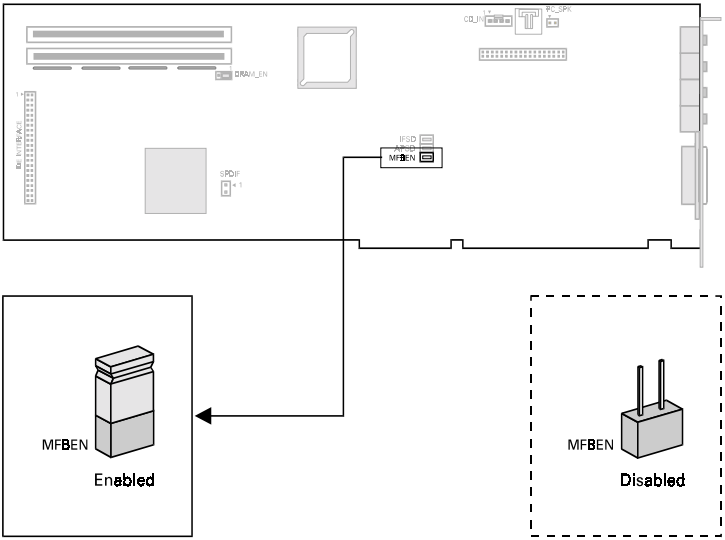

Figure 5-5: The available MIDI Emulation settings.

Changing Resource Settings in Windows 3.1x/DOS

When your audio card encounters a conflict with another peripheral device, you need to change the resource settings of your audio card. This can be done by running the ISA Configuration Utility that comes with your system's Plug and Play Configuration Manager. This utility shows you which resources are available for your audio card and allows you to choose them.

When you have changed the resource settings, you will be asked to reboot. During reboot, your system's environment will be updated with the new settings. You can view the system's environment by typing **SET** at the DOS prompt. The three environment variables that belong to your audio card are described below.

SOUND Environment Variable

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

```
SOUND=path
```

where *path* is the drive and directory of your audio card's software (e.g. C:\SB16).

There is no space before and after the equal sign.

BLASTER Environment Variable

The BLASTER environment variable specifies the base I/O address, IRQ line, and DMA channel of your audio interface. The syntax for the BLASTER environment variable is as follows:

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

The values shown above may be different for your system. Also, there is no space before and after the equal sign, but there must be at least one space between two parameters.

The settings for the parameters in the command are described below.

Parameter	Description
A*xxx*	Specifies the audio interface's base I/O address. *xxx* can be 220.
I*x*	Specifies the IRQ line used by the audio interface. *x* can be 5.
D*x*	Specifies the Low DMA channel used by the audio interface. *x* can be 1.
H*x*	Specifies the High DMA channel used by the audio interface. *x* can be 5.
P*xxx*	Specifies the MPU-401 UART interface's base I/O address. *xxx* can be 330.
E*xxx*	Specifies the Advanced WavEffects chip's base I/O address. *xxx* can be 620.
T*x*	Specifies the card type. *x* can be 6.

MIDI Environment Variable

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

Generally, there are three MIDI file formats available in the market, General MIDI, Extended MIDI and Basic MIDI. The syntax for the MIDI environment variable is as follows:

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

The parameters of the command are described below.

Parameter	Description
SYNTH:*x*	*x* can be 1 or 2. 1 (default setting) specifies the stereo music synthesizer. 2 specifies MIDI port.
MAP:*x*	*x* can be G, E, or B. G specifies General MIDI file format. E (default setting) specifies Extended MIDI file format. B specifies 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.

Enabling/Disabling the Creative 3D Stereo Enhancement Effect

The Creative 3D Stereo Enhancement effect allows you to eliminate speaker crosstalk when two speakers are placed close together. This results in sounds with increased depth and breadth, enhancing mono and stereo output from the speakers.

The Creative 3D Stereo Enhancement effect can be enabled or disabled in DOS and Windows 95.

If your pair of speakers or another device already has a built-in 3D Stereo Enhancement capability, do not activate this feature in your audio card. This is because the 3D Stereo Enhancement effect, when repeated, might become distorted.

In DOS

To enable/disable the effect in DOS:

1. At the DOS prompt, change to the directory containing your audio card's software.
2. Type **CT3DSE ON** to enable the effect or **CT3DSE OFF** to disable the effect.

In Windows 95

To enable/disable the effect in Windows 95:

1. Click  in the taskbar.
2. Select Settings and then Control Panel.
   The Control Panel window appears.
3. Double-click the System icon.
   The System Properties sheet appears.
4. Click the Device Manager tab.
   A list of devices in your system appears.
5. Double-click Sound, video and game controllers.
   Your audio card's name appears.
6. Select your audio card and choose Properties.
   Your audio card's properties sheet appears.

7. Click the Settings tab.
   The Settings tabbed page similar to Figure 5-6 appears.

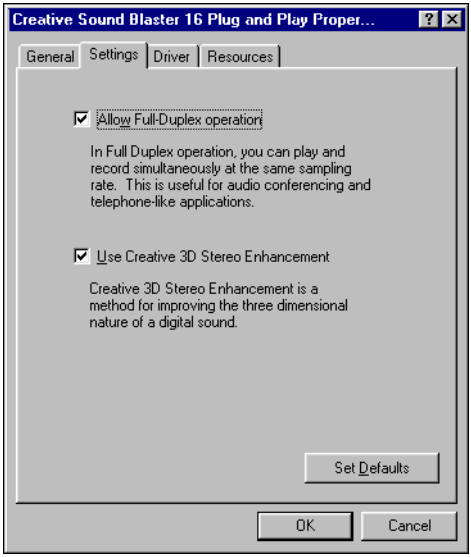

Figure 5-6: The Creative 3D Stereo Enhancement effect enable/disable tabbed page.

8. Click on the Enable/Disable check box to enable/disable the Creative 3D Stereo Enhancement effect.
9. Choose OK.

A

General Specifications

This appendix lists the general specifications of your audio card.

Plug and Play

- ISA specification version 1.0a compliant.

Advanced WavEffects 32 Music Synthesizer

- 32-voices polyphony.
- 16 parts multi-timbral.
- 1 MB ROM of General MIDI sample.
- 512 KB built-in DRAM.

Stereo Music Synthesizer

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

Stereo Digitized Voice Channel

- ❑ 16-bit and 8-bit digitizing in stereo and mono modes.
- ❑ Programmable sampling rate, 5 kHz to 44.1 kHz in linear steps.
- ❑ High and Low DMA channels using a single interrupt.
- ❑ Dynamic filtering for digital audio recording and playback.

Although the minimum programmable sampling rate is 5 kHz, your audio card applications may limit the minimum sampling rate to 8 kHz.

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 other 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.

Built-in Stereo Power Amplifier

- ❑ Four watts per channel with four ohms stereo output.
- ❑ Automatic Gain Control Amplifier/Fixed Gain Amplifier for Microphone Level.
- ❑ Internal or External Audio Output Amplifier.

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.

CD-ROM Interface

- ❑ Built-in CD-ROM interface for IDE CD-ROM drive.

Upgrade Options

- ❑ Advanced Signal Processor chip for hardware compression and decompression of audio data (not available for some cards).
- ❑ Wave Blaster daughterboard for professional-quality music (not available for some cards).
- ❑ SIMM RAM modules for more sound samples.

B

Hardware Information

You may want to internally connect your audio card to other devices on your system (such as a Creative CD-ROM drive or another audio card), or simply redirect the “beeps” that you hear from your system to your external speakers. This appendix defines the pins of internal connectors on your audio card. It also shows you how to redirect the PC sounds to your external speakers.

Read this section only if you are an advanced user who knows how to use the pin assignments. If you want to redirect sound, you should also be familiar with your system’s motherboard and know where to find your system’s internal speaker.

CD Audio Connector Pin Assignments

Your audio card has two CD Audio Connectors.

The CD Audio Connector  has the following pin assignments as shown in Table B-1.

Table B-1: CD Audio Connector Pin Assignments.

Pin	Signal	I/O
1	Ground	IN
2	CD Left Channel	IN
3	Ground	IN
4	CD Right Channel	IN

The CD Audio Connector  has the following pin assignments as shown in Table B-2.

Table B-2: CD Audio Connector Pin Assignments.

Pin	Signal	I/O
1	CD Left Channel	IN
2	Ground	IN
3	Ground	IN
4	CD Right Channel	IN

If you want to locate the CD Audio Connectors on the audio card, see Figure 1-2.

PC Speaker Connector Pin Assignments

The PC Speaker Connector has the following pin assignments as shown in Table B-3.

Table B-3: PC Speaker Connector Pin Assignments.

Pin	Signal	I/O
1	+5V	IN
2	PC Speaker Out	IN

If you want to locate PC Speaker Connector on the audio card, see Figure 1-2.

SPDIF Connector Pin Assignments

The SPDIF Connector has the following pin assignments as shown in Figure B-4.

Table B-4: SPDIF Connector Pin Assignments.

Pin	Signal
0	Digital Out
1	Ground

If you want to locate SPDIF Connector on the audio card, see Figure 1-2.

Redirecting PC Sounds to External Speakers

It is possible to redirect the sounds that normally come from your computer's speaker to the speakers connected to the audio card.

If you do not know how to perform this process, seek the help of an experienced technician.

To redirect PC sounds to external speakers:

1. Locate the PC Speaker connection on the motherboard.
2. Remove the speaker connection from the motherboard.
3. From the motherboard, connect a wire from the +5V DC pin on the speaker connector to pin 1 of the PC Speaker Connector on the audio card.
4. Connect another wire from the PC Speaker Out pin on the motherboard speaker to pin 2 of the PC Speaker Connector on the card.

C

MIDI Specifications

This appendix is organized as follows:

- MIDI Implementation Chart
- GS Drum Kit Map
- Instrument Organizations

MIDI Implementation Chart

The MIDI implementation chart of your audio card is shown in Table C-1. This chart displays the MIDI functions of your card. If you are not familiar with the usage of the chart, please read the following section “Using MIDI Implementation Chart” on page C-3.

Table C-1: MIDI implementation chart.

Function	Transmitted	Received	Remarks
MIDI Channel	X	1 - 16 1 - 16	
Mode	X	3	
Note Number	X	0 - 127	
Velocity Note On Note Off	 X X	9n, V = 0 - 127 8n, V = 0 - 127	
Key Aftertouch Channel Aftertouch	X X	X O	
Pitch Bend *1	X	O	+/-2 Octave PitchBend Sensitivity recognized
Control Change *1 0, 32 1 6, 38 7 10 11 64 91 93 98 99 100 101 120 121 123	 X X X X X X X X X X X X X X X X	 O O O O O O O O O O O O O O O O	 Bank select Modulation Data entry Main Volume Pan Expression Damper Pedal Reverb Depth Chorus Depth NRPN LSB NRPN MSB RPN LSB RPN MSB All Sounds Off Reset All Controllers All Notes Off
Program Change	X	O 0 - 127	
Notes: *1 : All channels respond to MIDI volume (including drums) Default power up: Bend = 2 semitones, master volume = 100, Controllers normal.			

Mode 1: OMNI ON, POLY Mode 3: OMNI OFF, POLY O: Yes
Mode 2: OMNI ON, MONO Mode 4: OMNI OFF, MONO X: No

Using MIDI Implementation Chart

A MIDI implementation chart is useful when you want to use two MIDI devices together for communication. This chart is included with every MIDI device.

To check feature compatibility between two MIDI devices:

1. Fold the MIDI implementation sheets vertically along the line between the Transmitted and Received columns.
2. Put the Transmitted column of the device you will use to send MIDI messages next to the Received column of the receiving device.
3. Compare the sending and receiving features to see if they are compatible. Please see Figure C-1 on page C-3.

If a feature is followed by matching Os, then the devices can use that feature together by means of MIDI. If either column is marked with an X, then the two devices cannot be used together. MIDI devices, which have ranges of numbers for a feature, can be used together only for overlapping values of the two ranges.

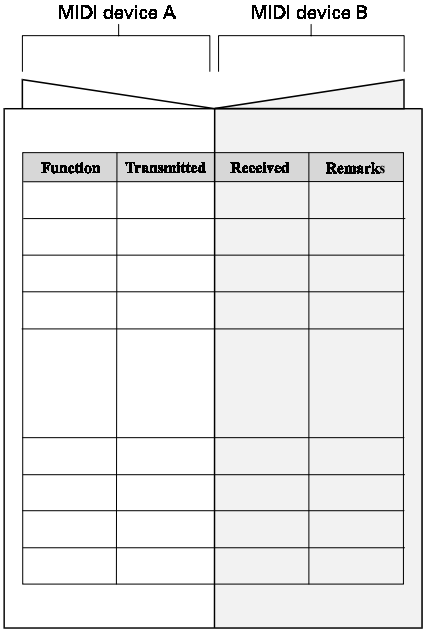

Figure C-1: Comparing your MIDI implementation charts.

GS Drum Kit Map

If your audio card does not have 512KB built-in DRAM and if your audio card has SIMM sockets without DRAM installed, skip this section. Your audio card needs DRAM to use the GS drum kit mappings described here.

The following tables list the GS drum kit mappings used by your audio card. If you are not familiar with the usage of the map, please read the following section “Using GS Drum Kit Map” on page C-10.

Table C-2: GS drum kit mappings.

Note Number \ Prog#	1:STANDARD Set 33:JAZZ Set	9:ROOM Set	17:POWER Set	25:ELECTRONIC Set
27	High Q			
28	Slap			
29	Scratch Push			
30	Scratch Pull			
31	Sticks			
32	Square Click			
33	Metronome Click			
34	Metronome Bell			
35	Kick Drum 2			
C2 36	Kick Drum 1		MONDO Kick	Elec BD
37	Side Stick			
38	Snare Drum 1		Gated SD	Elec SD
39	Hand Clap			
40	Snare Drum 2			Gated SD
41	Low Tom 2	Room Low Tom 2	Room Low Tom 2	Elec Low Tom 2
42	Closed Hi - hat			
43	Low Tom 1	Room Low Tom 1	Room Low Tom 1	Elec Low Tom 1
44	Pedal Hi - hat			
45	Mid Tom 2	Room Mid Tom 2	Room Mid Tom 2	Elec Mid Tom 2
46	Open Hi - hat			
47	Mid Tom 1	Room Mid Tom 1	Room Mid Tom 1	Elec Mid Tom 1
C3 48	High Tom 2	Room Hi Tom 2	Room Hi Tom 2	Elec Hi Tom 2
49	Crash Cymbal 1			
50	High Tom 1	Room Hi Tom 1	Room Hi Tom 1	Elec Hi Tom 1
51	Ride Cymbal 1			
52	Chinese Cymbal			Reverse Cymbal
53	Ride Bell			
54	Tambourine			
55	Splash Cymbal			
56	Cowbell			
57	Crash Cymbal 2			
58	Vibra - slap			
59	Ride Cymbal 2			

Blank : Same as the percussion sound of "STANDARD"

Table C-3: GS drum kit mappings.

	Note Number \ Prog#	1:STANDARD Set 33:JAZZ Set	9:ROOM Set	17:POWER Set	25:ELECTRONIC Set
C4	60	High Bongo			
	61	Low Bongo			
	62	Mute High Conga			
	63	Open High Conga			
	64	Low Conga			
	65	High Timbale			
	66	Low Timbale			
	67	High Agogo			
	68	Low Agogo			
	69	Cabasa			
	70	Maracas			
	71	Short Hi Whistle			
C5	72	Long Low Whistle			
	73	Short Guiro			
	74	Long Guiro			
	75	Claves			
	76	High Wood Block			
	77	Low Wood Block			
	78	Muted Cuica			
	79	Open Cuica			
	80	Mute Triangle			
	81	Open Triangle			
	82	Shaker			
	83	Jingle Bell			
C6	84	Belltree			
	85	Castanets			
	86	Mute Surdo			
	87	Open Surdo			
	88				

Blank : Same as the percussion sound of "STANDARD"

Table C-4: GS drum kit mappings.

	Note Number / Prog#	26:TR-808 Set	41:BRUSH Set	49:ORCHESTRA Set
	27			Closed Hi-Hat
	28			Pedal Hi-Hat
	29			Open Hi-Hat
	30			Hide Cymbal
	31			
	32			
	33			
	34			
	35			Concert BD 2
C2	36	808 Bass Drum		Concert BD 1
	37	808 Rim Shot		
	38	808 Snare Drum	Brush Tap	Concert SD
	39		Brush Slap	Castanets
	40		Brush Swirl	Concert SD
	41	808 Low Tom 2		Timpani F
	42	808 CHH		Timpani F#
	43	808 Low Tom 1		Timpani G
	44	808 CHH		Timpani G#
	45	808 Mid Tom 2		Timpani A
	46	808 OHH		Timpani A#
	47	808 Mid Tom 1		Timpani B
C3	48	808 Hi Tom 2		Timpani c
	49	808 Cymbal		Timpani c#
	50	808 Hi Tom 1		Timpani d
	51			Timpani d#
	52			Timpani e
	53			Timpani f
	54			
	55			
	56			
	57			Concert Cymbal 2
	58			
	59			Concert Cymbal 1

Blank : Same as the percussion sound of "STANDARD"

Table C-5: GS drum kit mappings.

	Prog# / Note Number	26:TR-808 Set	41:BRUSH Set	49:ORCHESTRA Set
C4	60			
	61			
	62	808 High Conga		
	63	808 Mid Conga		
	64	808 Low Conga		
	65			
	66			
	67			
	68			
	69			
	70	808 Maracas		
	71			
C5	72			
	73			
	74			
	75	808 Claves		
	76			
	77			
	78			
	79			
	80			
	81			
	82			
	83			
C6	84			
	85			
	86			
	87			
	88			Applause

Blank : Same as the percussion sound of "STANDARD"

Table C-6: GS drum kit mappings.

	Prog# / Note Number	57:SFX Set
	39	High Q
	40	Slap
	41	Scratch Push
	42	Scratch Pull
	43	Sticks
	44	Square Click
	45	Metronome Click
	46	Metronome Bell
	47	Guitar sliding finger
C3	48	Guitar cutting noise (down)
	49	Guitar cutting noise (up)
	50	String slap of double bass
	51	Fl. Key Click
	52	Laughing
	53	Screaming
	54	Punch
	55	Heart Beat
	56	Footsteps1
	57	Footsteps2
	58	Applause
	59	Door Creaking
C4	60	Door
	61	Scratch
	62	Windchime
	63	Car-Engine
	64	Car-Stop
	65	Car-Pass
	66	Car-Crash
	67	Siren
	68	Train
	69	Jetplane
	70	Helicopter
	71	Starship
C5	72	Gun Shot
	73	Machine Gun
	74	Lasergun
	75	Explosion
	76	Dog
	77	Horse-Gallop
	78	Birds
	79	Rain
	80	Thunder
	81	Wind
	82	Seashore
	83	Stream
C6	84	Bubble

Table C-7: GS drum kit mappings.

	Note Number / Prog#	128:CM-64/32L Set
	34	
	35	Acoustic Bass Drum
C2	36	Acoustic Bass Drum
	37	Rim Shot
	38	Acoustic Snare Drum
	39	Hand Clap
	40	Electronic Snare Drum
	41	Acoustic Low Tom
	42	Closed High Hat
	43	Acoustic Low Tom
	44	Open High Hat 2
	45	Acoustic Middle Tom
	46	Open High Hat 1
	47	Acoustic Middle Tom
C3	48	Acoustic High Tom
	49	Crash Cymbal
	50	Acoustic High Tom
	51	Ride Cymbal
	52	- - -
	53	- - -
	54	Tambourine
	55	
	56	Cowbell
	57	- - -
	58	- - -
	59	- - -
C4	60	High Bongo
	61	Low Bongo
	62	Mute High Conga
	63	High Conga
	64	Low Conga
	65	High Timbale
	66	Low Timbale
	67	High Agogo
	68	Low Agogo
	69	Cabasa
	70	Maracas
	71	Short Whistle
C5	72	Long Whistle
	73	Quijada
	74	- - -
	75	Claves
	76	Laughing
	77	Screaming
	78	Punch
	79	Heartbeat
	80	Footsteps 1
	81	Footsteps 2
	82	Applause
	83	Creaking
C6	84	Door
	85	Scratch
	86	Windchime
	87	Engine
	88	Car-Stop
	89	Car-Pass
	90	Crash
	91	Siren
	92	Train
	93	Jet
	94	Helicopter
	95	Starship
C7	96	Pistol
	97	Machine Gun
	98	Lasergun
	99	Explosion
	100	Dog
	101	Horse-Gallop
	102	Birds
	103	Rain
	104	Thunder
	105	Wind
	106	Waves
	107	Stream
C8	108	Bubble

- - - = No Sound

Using GS Drum Kit Map

This section helps you to understand what a drum kit is and learn how to use the GS drum kit map.

In the GS synthesizer mode, you can select any drum kit out of a selection of 10 drum kits (which includes the Standard Drum Kit) to play through MIDI channel 10. The choice of more drum kits offers you the flexibility to listen to songs with a wider variety of percussive instruments. These drum kits are shown in Table C-8 on page C-11.

Each drum kit is essentially an instrument that you can select in the same way you select a melodic instrument. For example, to select the TR-808 drum kit, all you need to do is specify the Prog# as 26 in MIDI channel 10. All percussion sounds will then be played back using the TR-808 drum kit.

Table C-8: Drum kits for GS synthesizer mode.

Name	Prog#	Description
Standard/Jazz	1/33	Standard General MIDI drum kit. Jazz is similar to the Standard drum kit.
Room	9	Similar to that of the Standard kit except that it has more room ambience.
Power	17	Similar to that of the Standard kit, but with more powerful kick and snare drums.
Electronic	25	Electronic drum kit. Most of the percussion instruments in this drum kit are reminiscences of old analogue and digital rhythm machines (e.g., the Roland TR-707 and TR-909 rhythm machines).
TR-808	26	Electronic drum kit, a reminiscence of the Roland TR-808 rhythm machine.
Brush	41	Similar to the Standard kit except that brushes have been added. This kit is mostly used for Jazz MIDI pieces.
Orchestra	49	An immense collection of concert drums and timpani.
SFX	57	A collection of sound effects.
CM-64/32L	128	Same as the MT-32 drum kit. This drum kit contains standard percussion at the lower range of the keyboard, and sound effects at the higher range of the keyboard.

Instrument Organizations

This section lists the various instrument organizations of your audio card.

GM and GS Instruments (Capital Tones)

This section lists the GM instruments and capital tones of GS instruments.

Table C-9: GM and GS instruments (capital tones).

	Prog#	Instrument	Prog#	Instrument
Piano	1	Acoustic Grand Piano	2	Bright Acoustic Piano
	3	Electric Grand Piano	4	Honky-tonk Piano
	5	Electric Piano 1	6	Electric Piano 2
	7	Harpsichord	8	Clavi
Chromatic Percussion	9	Celesta	10	Glockenspiel
	11	Music Box	12	Vibraphone
	13	Marimba	14	Xylophone
	15	Tubular Bells	16	Dulcimer
Organ	17	Drawbar Organ	18	Percussive Organ
	19	Rock Organ	20	Church Organ
	21	Reed Organ	22	Accordion
	23	Harmonica	24	Tango Accordion
Guitar	25	Acoustic Guitar (nylon)	26	Acoustic Guitar (steel)
	27	Electric Guitar (jazz)	28	Electric Guitar (clean)
	29	Electric Guitar (muted)	30	Overdriven Guitar
	31	Distortion Guitar	32	Guitar Harmonics
Bass	33	Acoustic Bass	34	Electric Bass (finger)
	35	Electric Bass (pick)	36	Fretless Bass
	37	Slap Bass 1	38	Slap Bass 2
	39	Synth Bass 1	40	Synth Bass 2

Table C-10: GM and GS instruments (capital tones).

	Prog#	Instrument	Prog#	Instrument
Strings / orchestra	41	Violin	42	Viola
	43	Cello	44	Contrabass
	45	Tremolo Strings	46	Pizzicato Strings
	47	Orchestral Harp	48	Timpani
Ensemble	49	String Ensemble 1	50	String Ensemble 2
	51	SynthStrings 1	52	SynthStrings 2
	53	Choir Aahs	54	Voice Oohs
	55	Synth Voice	56	Orchestra Hit
Brass	57	Trumpet	58	Trombone
	59	Tuba	60	Muted Trumpet
	61	French Horn	62	Brass Section
	63	SynthBrass 1	64	SynthBrass 2
Reed	65	Soprano Sax	66	Alto Sax
	67	Tenor Sax	68	Baritone Sax
	69	Oboe	70	English Horn
	71	Bassoon	72	Clarinet
Pipe	73	Piccolo	74	Flute
	75	Recorder	76	Pan Flute
	77	Blown Bottle	78	Shakuhachi
	79	Whistle	80	Ocarina
Synth lead	81	Lead 1 (square)	82	Lead 2 (sawtooth)
	83	Lead 3 (calliope)	84	Lead 4 (chiff)
	85	Lead 5 (charang)	86	Lead 6 (voice)
	87	Lead 7 (fifths)	88	Lead 8 (bass + lead)

Table C-11: GM and GS instruments (capital tones).

	Prog#	Instrument	Prog#	Instrument
Synth pad etc.	89	Pad 1 (new age)	90	Pad 2 (warm)
	91	Pad 3 (polysynth)	92	Pad 4 (choir)
	93	Pad 5 (bowed)	94	Pad 6 (metallic)
	95	Pad 7 (halo)	96	Pad 8 (sweep)
Synth SFX	97	FX 1 (rain)	98	FX 2 (soundtrack)
	99	FX 3 (crystal)	100	FX 4 (atmosphere)
	101	FX 5 (brightness)	102	FX 6 (goblins)
	103	FX 7 (echoes)	104	FX 8 (sci-fi)
Ethnic	105	Sitar	106	Banjo
	107	Shamisen	108	Koto
	109	Kalimba	110	Bag Pipe
	111	Fiddle	112	Shanai
Percussive	113	Tinkle Bell	114	Agogo
	115	Steel Drums	116	Woodblock
	117	Taiko Drum	118	Melodic Tom
	119	Synth Drum	120	Reverse Cymbal
SFX	121	Guitar Fret Noise	122	Breath Noise
	123	Seashore	124	Bird Tweet
	125	Telephone Ring	126	Helicopter
	127	Applause	128	Gunshot

GS Instruments (Variation Tones)

If your audio card does not have 512KB built-in DRAM and if your audio card has SIMM sockets without DRAM installed, skip this section. Your audio card needs DRAM to use the GS instruments (variation tones) described here.

Tables C-12 and C-13 list the variation tones for GS instruments. If you are not familiar with the usage of the tables, please read the following section on “Using Variation Tones of GS Instruments” on page C-17.

Table C-12: GS instruments (variation tones).

Prog#	Bank#	Instrument	Prog#	Bank#	Instrument
5	8	Detuned EP 1	32	8	Gt. Feedback
6	8	Detuned EP 2	39	8	Synth Bass 3
7	8	Coupled Hps.	40	8	Synth Bass 4
15	8	Church Bell	49	8	Orchestra
17	8	Detuned Or. 1	51	8	Syn. Strings3
18	8	Detuned Or. 2	62	8	Brass 2
20	8	Church Org. 2	63	8	Synth Brass3
22	8	Accordion It	64	8	Synth Brass4
25	8	Ukulele	81	8	Sine Wave
26	8	12-str. Gt	108	8	Taisho Koto
	16	Mandolin	116	8	Castanets
27	8	Hawaiian Gt.	117	8	Concert BD
28	8	Chorus Gt.	118	8	Melo. Tom 2
29	8	Funk Gt.	119	8	808 Tom
31	8	Feedback Gt.			

Table C-13: GS instruments (variation tones).

Prog#	Bank#	Instrument	Prog#	Bank#	Instrument
121	0	Gt. FretNoise	126	0	Helicopter
	1	Gt. Cut Noise		1	Car-Engine
	2	String Slap		2	Car-Stop
122	0	Breath Noise		3	Car-Pass
	1	Fl. Key Click		4	Car-Crash
123	0	Seashore		5	Siren
	1	Rain		6	Train
	2	Thunder		7	Jetplane
	3	Wind		8	Starship
	4	Stream		9	Burst Noise
	5	Bubble	127	0	Applause
124	0	Bird		1	Laughing
	1	Dog		2	Screaming
	2	Horse-Gallop		3	Punch
125	0	Telephone 1		4	Heart Beat
	1	Telephone 2		5	Footsteps
	2	DoorCreakin	128	0	Gun Shot
	3	Door		1	Machine Gun
	4	Scratch		2	Lasergun
	5	Windchime		3	Explosion

Using Variation Tones of GS Instruments

This section helps you understand what variation tones are and how they relate to the GS instruments shown in Table C-12 on page C-15 and Table C-13 on page C-16.

Your audio card offers Sound Canvas compatibility by including the variation bank instruments found in Sound Canvas. The instruments in a variation bank are similar to GS instruments. They vary slightly in sound from the capital tones of GS instruments, and are known as the variation tones of GS instruments.

For example, the capital tone of GS Prog# 25 is Acoustic Guitar (nylon) in Table C-9 on page C-12. Its variation tone is Ukulele (in Table C-12 on page C-15), which is similar in sound to Acoustic Guitar (nylon).

Assume that you are editing a MIDI file using a sequencer and one of the tracks uses Acoustic Guitar (nylon). Upon the playback of that track, you find that Acoustic Guitar (nylon) does not produce the sound that you want. You can choose to use Ukulele, the variation tone for Acoustic Guitar (nylon).

To do this, you need to send MIDI controller 0 to the sequencer and insert Bank# 8 (the bank number of Ukulele) into that track, followed by Prog# 25 to select Ukulele as the instrument.

At a later stage, you may wish to use Acoustic Guitar (nylon) again. To do this, you need to send MIDI controller 0 to the sequencer and insert Bank# 0 (the bank number of Acoustic Guitar (nylon)) into that track, followed by Prog# 25 to select Acoustic Guitar (nylon) as the instrument.

A sequencer is a computer program or electronic device that stores a series of musical notes it can send to a synthesizer. In addition, variation tones are available only in the GS mode of your audio card. You can switch to GS mode via the Advanced WavEffects Control.

MT-32 Instruments

If your audio card does not have 512KB built-in DRAM and if your audio card has SIMM sockets without DRAM installed, skip this section. Your audio card needs DRAM to use the MT-32 instruments described here.

The following tables list the MT-32 instruments.

Table C-14: MT-32 instruments.

Prog#	Instrument	Prog#	Instrument	Prog#	Instrument
1	Acou Piano 1	25	Syn Brass 1	49	Str Sect 1
2	Acou Piano 2	26	Syn Brass 2	50	Str Sect 2
3	Acou Piano 3	27	Syn Brass 3	51	Str Sect 3
4	Elec Piano 1	28	Syn Brass 4	52	Pizzicato
5	Elec Piano 2	29	Syn Bass 1	53	Violin 1
6	Elec Piano 3	30	Syn Bass 2	54	Violin 2
7	Elec Piano 4	31	Syn Bass 3	55	Cello 1
8	Honkytonk	32	Syn Bass 4	56	Cello 2
9	Elec Org 1	33	Fantasy	57	Contrabass
10	Elec Org 2	34	Harmo Pan	58	Harp 1
11	Elec Org 3	35	Chorale	59	Harp 2
12	Elec Org 4	36	Glasses	60	Guitar 1
13	Pipe Org 1	37	Soundtrack	61	Guitar 2
14	Pipe Org 2	38	Atmosphere	62	Elec Gtr 1
15	Pipe Org 3	39	Warm bell	63	Elec Gtr 2
16	Accordion	40	Funny Vox	64	Sitar
17	Harpsi 1	41	Echo Bell	65	Acou Bass 1
18	Harpsi 2	42	Ice Rain	66	Acou Bass 2
19	Harpsi 3	43	Oboe 2001	67	Elec Bass 1
20	Clavi 1	44	Echo Pan	68	Elec Bass 2
21	Clavi 2	45	Doctor Solo	69	Slap Bass 1
22	Clavi 3	46	School Daze	70	Slap Bass 2
23	Celesta 1	47	Bellsinger	71	Fretless 1
24	Celesta 2	48	Square Wave	72	Fretless 2

Table C-15: MT-32 instruments.

Prog#	Instrument	Prog#	Instrument	Prog#	Instrument
73	Flute 1	92	Trombone 2	111	Bottleblow
74	Flute 2	93	Fr Horn 1	112	Breathpipe
75	Piccolo 1	94	Fr Horn 2	113	Timpani
76	Piccolo 2	95	Tuba	114	Melodic Tom
77	Recorder	96	Brs Sect 1	115	Deep Snare
78	Pan Pipes	97	Brs Sect 2	116	Elec Perc 1
79	Sax 1	98	Vibe 1	117	Elec Perc 2
80	Sax 2	99	Vibe 2	118	Taiko
81	Sax 3	100	Syn Mallet	119	Taiko Rim
82	Sax 4	101	Windbell	120	Cymbal
83	Clarinet 1	102	Glock	121	Castanets
84	Clarinet 2	103	Tube Bell	122	Triangle
85	Oboe	104	Xylophone	123	Orche Hit
86	Engl Horn	105	Marimba	124	Telephone
87	Bassoon	106	Koto	125	Bird Tweet
88	Harmonica	107	Sho	126	One Note Jam
89	Trumpet 1	108	Shakuhachi	127	Water Bell
90	Trumpet 2	109	Whistle 1	128	Jungle Tune
91	Trombone 1	110	Whistle 2		

As your audio card and MT-32 use different wavetable synthesis engines, your audio card cannot completely emulate the operations of the MT-32 sound module.

For example, when you change the sound of an instrument using features such as velocity, modulation, and aftertouch, these delicate changes in the sound may be different from those of MT-32.

In addition, your audio card cannot recognize MT-32 exclusive messages. Therefore, if your audio card receives MT-32 exclusive messages, they will be ignored.

D

Troubleshooting

This appendix provides some tips and strategies for some of the problems you might encounter with your audio card either during installation or normal use.

Problems Installing Audio Card Software from CD-ROM

The following are problems that you may encounter when installing your audio card's software from CD-ROM.

Problem The CD-ROM does not automatically run after you insert it in the drive.

Cause The AutoPlay notification setting in your Windows 95 system may not be enabled.

Solution

1. Enable the "Auto Insert Notification" check box. This check box can be found in your CD-ROM drive's properties sheet. To display this page:
    1. Click the Start button.
    2. Select Settings and then Control Panel.
    3. Double-click the System icon.
    4. Click the Device Manager tab and select your CD-ROM drive.
    5. Choose Properties.
    The properties sheet for your CD-ROM drive appears.

2. Alternatively, if you do not want to enable the “Auto Insert Notification” check box, perform the following steps:
    1. Double-click the My Computer icon on your Windows 95 desktop.
    2. Using your right mouse button, click the icon representing your CD-ROM drive.
       A popup menu appears.
    3. Select AutoPlay in the menu.
    4. Follow the instructions that appear.

Problems with Sound

The following are general problems you might encounter when trying to use sound.

Problem No output from both the 8-bit and 16-bit digitized sounds when running the test program.

Causes
1. Volume knob on your speakers is not set properly.
2. Your speakers are connected to the wrong jack.

Solutions
1. Check that the volume knob or any other volume control found on the speaker is not set to zero.
2. Make sure the speakers are connected to the Speaker Out jack on your audio card.

Problems in DOS

The following are problems you might encounter in 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. The SOUND environment specifies the directory location of your audio card's software while Blaster environment specifies the I/O address, IRQ line, and DMA channel settings of your audio interface. Both environment strings need to be set up in the DOS environment. When you install your audio card's software, the commands to set up the environments are automatically added to the AUTOEXEC.BAT file so that both environment strings are set up whenever your system is started or restarted. Whenever you make changes to the environment strings, it is advisable that the changes be reflected in the AUTOEXEC.BAT file.

Solution To add the command to set up the BLASTER environment in the respective system files, run DIAGNOSE (see the section "Changing Resource Settings in Windows 3.1x/DOS" in page 5-6). To set up the SOUND environment, use a text editor to insert the statement SET SOUND=C:\SB16 or SET SOUND=C:\VIBRA16 into the AUTOEXEC.BAT file. Remember to reboot for the changes to take effect.

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 more information on the above statement, refer to your DOS manual.

Problem System hangs during 16-bit digitized sound test. But 8-bit works fine.

Cause Your system's mother board 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 To solve this problem, run the ISA Configuration Utility and select to use Low DMA in place of the High DMA channel. 16-bit PCM data will then be transferred through the Low DMA channel.

Problems in Windows 3.1x

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

Problem No sound 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 by following the steps below:

1. Choose Run from the File menu in Program Manager.
2. Type **SYSEDIT** in the Command Line text box and choose OK.

3. Make sure the following statements are present:

```
[boot]
drivers=msmixmgr.dll

[drivers]
timer=timer.drv
midimapper=midimap.drv
Aux=sb16aux.drv
Wave=sb16snd.drv
MIDI=sbawe32.drv
MIDI1=sb16fm.drv
MIDI2=sb16snd.drv

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

The values shown in the [sndblst.drv] 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. It also sets up 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 addresses, 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 peripheral card in your system.

To run Device Manager:

1. Click Start on the taskbar of your Windows 95 screen.
2. Select Settings from the Start popup menu.
3. Select Control Panel from the Settings popup menu.
4. Double-click the System icon in the Control Panel window.
5. Click the Device Manager tab from the System Properties dialog box.
6. Select Sound, video and game controllers.
7. Select your audio card's name and choose Properties.
8. In your audio card's Properties sheet, click the Resources tab.
9. Click the Use automatic settings check box.
   If this check box is already enabled, you need to go into the Properties sheet of the conflicting peripheral device and click the same check box there.
10. Reboot your system to allow Windows 95 to reassign resources to your audio card and/or the conflicting peripheral card.

You can see which peripheral device is conflicting with your audio card in the Device Status box in the General tab of your audio card's Properties sheet.

Resolving Conflicts in DOS/Windows 3.1x

To resolve conflicts in DOS/Windows 3.1x:

1. Run the ISA Configuration Utility of your system's Plug and Play Configuration Manager. The peripheral devices that conflict with your audio card are noted.
2. Reselect the resource settings of your audio card that are in conflict.