

Getting Started

Plug and Play

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**BLASTER™**

**16**

Printed in Ireland

P/N 0422920000-1  
CAH001

**CREATIVE**  
CREATIVE LABS

## Getting Started

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September 1995

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Sound Blaster 16 software

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

## 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.

## 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.

## Compliance

This product is in conformity to the following Council Directive:

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



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## Before You Begin

## Introduction

Welcome to the next wave of multimedia computing. The 16-bit audio card allows you to obtain realistic acoustic reproduction through digitized sound samples.

Coupled with Creative 3D Stereo Enhancement Technology, the card enriches the quality of the sound you hear from mono and stereo sound samples. The technology eliminates "speaker crosstalk", a phenomenon which distorts sound from the speakers and gives you the impression that the sound is emanating from a one-dimensional plane.

Fully Adlib and Sound Blaster compatible, the card supports features like:

- ☐ 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.

In addition, your audio card can be connected to an IDE CD-ROM drive.

## Before You Begin

This section provides information you should know before using this manual. It is organized as below:

- ☐ Checking System Requirements
- ☐ Getting Latest Information
- ☐ Making a Copy of Your Diskettes
- ☐ Using the Documentation
- ☐ Document Conventions

## Checking System Requirements

The following are the system requirements for installing the audio card and accompanying software:

- ☐ An 80386 computer or higher, with an EGA or VGA card installed (VGA recommended).
- ☐ 7.5 MB of hard disk space for your audio card's software.
- ☐ 4 MB RAM.
- ☐ Windows 95 or Windows 3.1x.

## 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.



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 first installation diskette:

1. Start Windows 95.
2. Insert the diskette into your floppy drive.
3. Click the Start button on the task bar of your Windows 95 startup screen.
4. Choose Programs from the Start popup menu.
5. Choose Accessories from the Programs popup menu.
6. Choose Notepad from the Accessories popup menu.  
The Notepad user interface appears.
7. Select File from the menu bar on the Notepad user interface.
8. Choose Open from the File menu.
9. Specify the drive containing your disk.  
The Readme.txt file appears in the list box.
10. Choose the Readme.txt file.

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.  
Windows 95 automatically starts playing the CD-ROM and a dialog box prompting you to install the software or exit the setup will appear.
3. Choose Exit.
4. Open the My Computer group box.
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 text.

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 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 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 Card's 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, "Troubleshooting"

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

### Appendix D, "Technical Support"

Shows you whom to contact for technical support.

## 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                                                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>bold</b>   | Command names, switches, and any text that must be entered exactly as it appears.                                                                                                                                    |
| <i>italic</i> | 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 Card

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

- ☐ 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 on your audio card.

## 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.

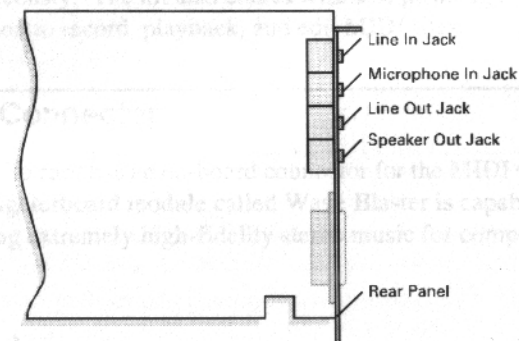


Figure 1-1: The jacks on your audio card.

---

## 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.

---

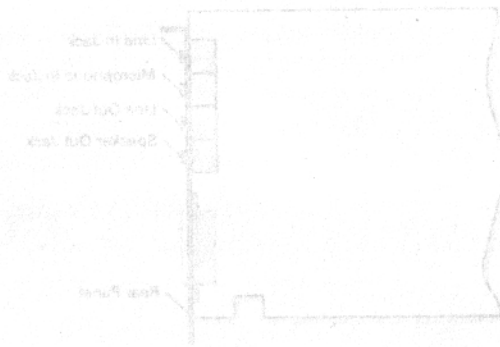
## Line Out Jack

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. However, unlike jacks, connectors consist of many pairs of pins as shown in Figure 1-2.

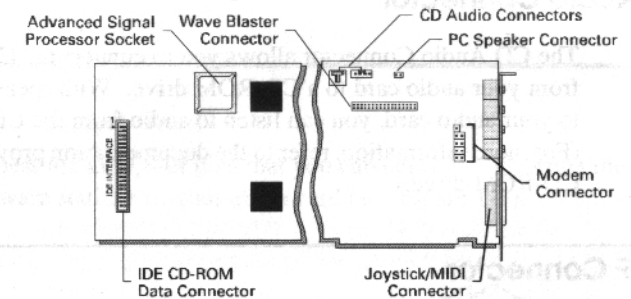


Figure 1-2: The connectors on your audio card.

---

## 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

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 appendix "Hardware Information").

---

## 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.)

---

## SPDIF Connector

The SPDIF Connector is an interface that allows you to transfer digital audio signals from recorder to recorder. In this way, the fidelity of a transferred digital signal is preserved. You can transfer these signals from your audio card to a recorder only through the SPDIF (Sony/Philips Digital Interface Format) Connector. Refer to the "Hardware Information" appendix 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 the CD-ROM drive.

---

## Modem Connector

The Modem Connector allows you to connect a Modem Blaster series card to your audio card. With this combination of cards, you will be able to perform voice recognition and modem functions concurrently.

---

## Advanced Signal Processor Chip Socket

If your card does not come with the Advanced Signal Processor chip, this socket allows the chip to be installed on the card. With the Advanced Signal Processor chip upgrade, you will be able to handle compression and decompression of audio data in real-time as well as to perform other tasks such as speech synthesis.

---

## Jumpers

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

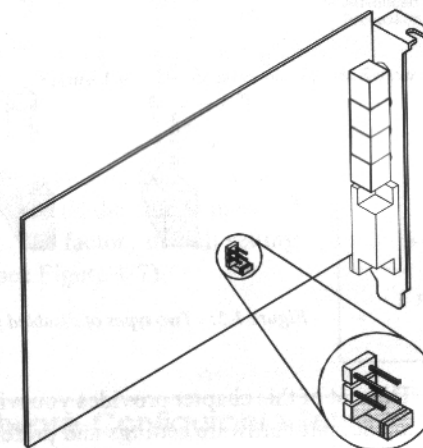


Figure 1-3: Jumpers.

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.

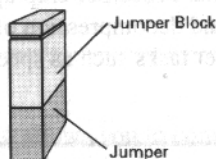


Figure 1-4: An enabled jumper.

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

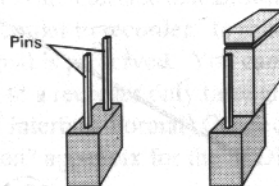


Figure 1-5: Two types of disabled jumpers.



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 Card's Settings".

## Knowing the Jumper Settings

If your audio card does not come with the Advanced Signal Processor chip socket, you will have the following jumpers as shown in Figure 1-6.

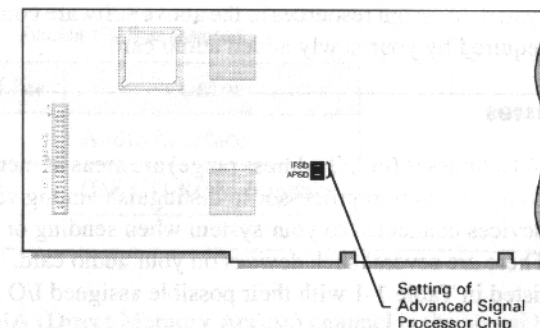


Figure 1-6: The jumpers on your audio card.

The IFSD and APSD jumpers allow you to enable the Advanced Signal Processor chip on your card (if the chip is installed on the card). The factory default setting is disabled (see Figure 1-7).

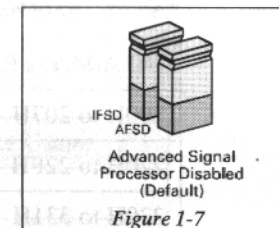


Figure 1-7

## 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 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 the system to assign resources to the above software configuration 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 their possible assigned I/O addresses range.



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

**Table 1-1: 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    |
| 1E8H to 1EFH      | IDE Port (Tertiary)         |

## IRQ Lines

The IRQ (interrupt) 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 the possible IRQ lines assigned.

**Table 1-2: Possible IRQ lines assigned.**

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

## DMA Channels

The DMA (Direct Memory Access) channel is the signal line your device uses to transfer data directly to the system's memory.

The Audio interface allows you to transfer data through Low or High DMA channel. Table 1-3 lists the possible DMA channels that you can assign.

**Table 1-3: Possible DMA channels assigned.**

| DMA Channel | Audio Interface Usage |
|-------------|-----------------------|
| 1           | Low DMA channel       |
| 5           | High DMA channel      |



## Setting Up Your Card

Installing your audio card is easy and involves three steps: inserting the card into the system, connecting devices to the card, and installing the card's software. This chapter guides you through the first two steps and is organized as follows:

- ❑ Installing the Card
- ❑ Connecting Other Devices

Chapters 3 and 4 will describe the process of installing the card's software in Windows 95 and Windows 3.1x respectively.



If you are using Windows 3.1x, you should make sure that you have a Plug and Play Configuration Manager installed before you install any software (like audio card and CD-ROM drive software) that uses the audio card's capabilities.

### Installing the Card

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.

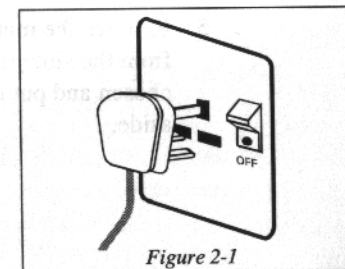
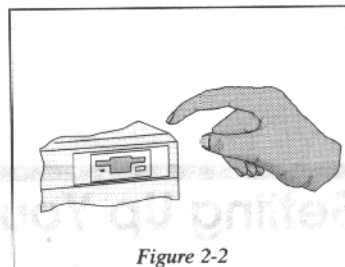
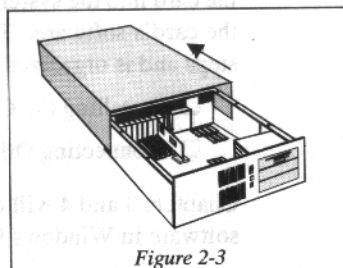


Figure 2-1

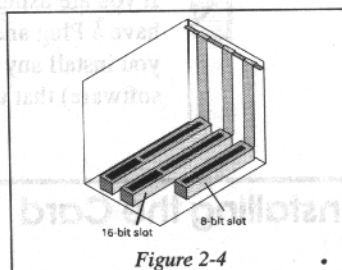
2. Touch a metal plate on your system to ground yourself and discharge any static electricity.



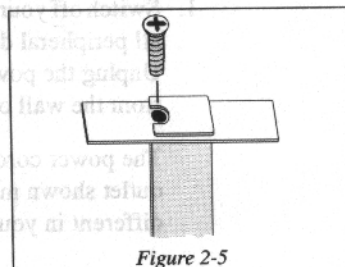
3. Remove the cover from your system.



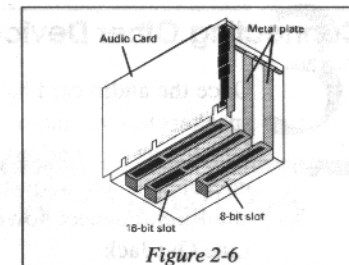
4. Find a free 16-bit expansion slot in your system.



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



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 you removed from the metal plate.
8. Replace the cover of your system if your package does not come with a CD-ROM drive.



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

## 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.

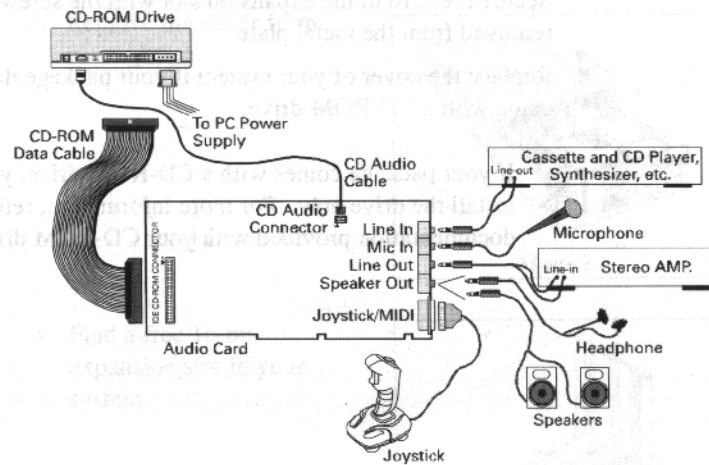


Figure 2-7: Connecting External Speakers and Other Devices.

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.

## 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:

- ☐ Installing 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 on 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.

## Installing Audio Card Drivers



Skip this section if your audio card drivers are already set up. If you want to install the audio card drivers, make sure to have the Windows 95 installation diskettes or CD-ROM ready.

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.



Some of the following dialog boxes may not appear if you have previously installed the audio card in your Windows 95 system.

To install the drivers for the audio card:

1. Switch on your system to allow the operating system to detect the audio card.

The Audio interface on your audio card is detected and a dialog box similar to the one in Figure 3-1 appears.

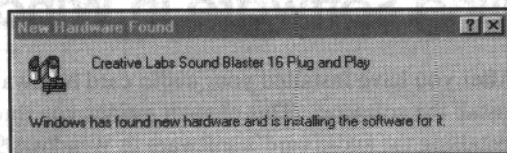


Figure 3-1: The New Hardware Found dialog box.

2. If you are prompted for a Windows 95 installation diskette or CD-ROM, insert the indicated diskette or CD-ROM in a drive and choose OK.
3. If you have Windows 95 diskettes, specify the drive containing the diskette in the Copy files from: text box (e.g. A:). If you have a Windows 95 installation CD-ROM, specify the WIN95 directory (e.g. D:\WIN95). Choose OK to continue.
4. The IDE CD-ROM interface on your audio card may then be detected. If the dialog box similar to Figure 3-2 appears, select the Windows default driver and choose OK.

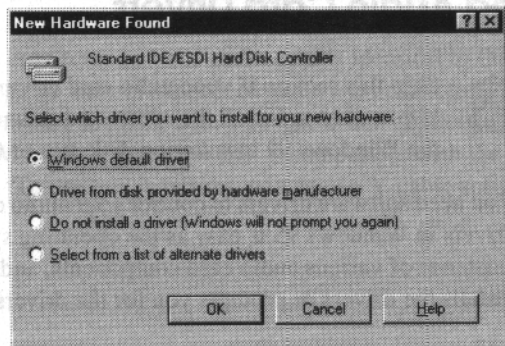


Figure 3-2: The CD-ROM drive interface found dialog box.

5. The joystick port on your audio card may then be detected. If the dialog box similar to Figure 3-3 appears, select the Windows default driver and choose OK.

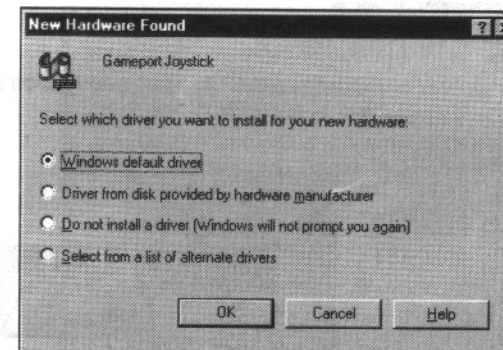


Figure 3-3: The joystick found dialog box.

6. Follow the instructions on the screen to complete the installation.

The drivers for your audio card are now set up. Go to the next section to install your card's applications.

## Installing Your Audio Card's Applications

Once you have installed the audio card's drivers, you can proceed to install the applications. The applications for your audio card can be installed from diskettes or CD-ROM.

If your package comes with a CD-ROM drive, you may receive a CD-ROM containing the applications for your audio card. Make sure that you have the CD-ROM drive installed before proceeding further. Refer to the CD-ROM drive's documentation for details.



To install the applications from diskette:

1. Insert your audio card's installation diskette into the appropriate drive in your system.
2. Click  in the task bar.  
The Start popup menu appears
3. Select Settings from the Start popup menu as shown in Figure 3-4.

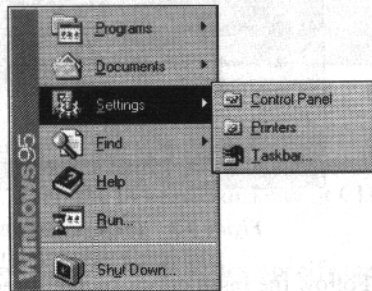


Figure 3-4: Start popup menu.

4. Select Control Panel from the Settings sub-menu.  
The Control Panel group box similar to Figure 3-5 appears.

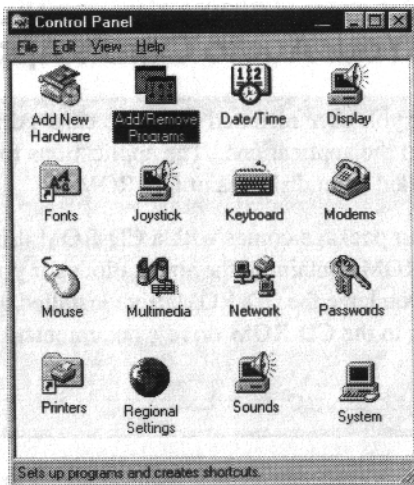


Figure 3-5: The Control Panel group box.

5. Double-click the Add/Remove Programs icon.  
The Add/Remove Programs Properties dialog box similar to Figure 3-6 appears.

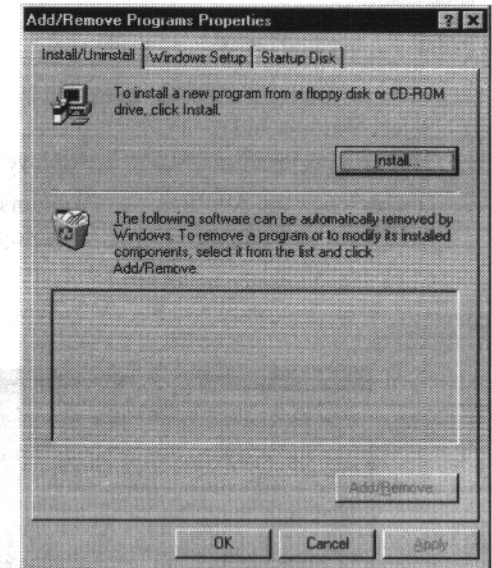


Figure 3-6: Add/Remove Programs properties dialog box.

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 menu trail after you click the Start button (shown in Figure 3-9) to see if the Media Player icon is displayed.

If the player is not displayed, install the player before attempting to test the audio card. If the player is displayed, start testing the audio card by following the test procedure described after the installation process below.

To install the Media Player:

1. Click the Start button.
2. Select Settings and then Control Panel.  
The Control Panel group box is displayed.
3. Double-click the Add/Remove Programs icon. The Add/Remove Programs Properties dialog box appears.
4. Click the Windows Setup tab.  
The dialog box shown in Figure 3-7 appears

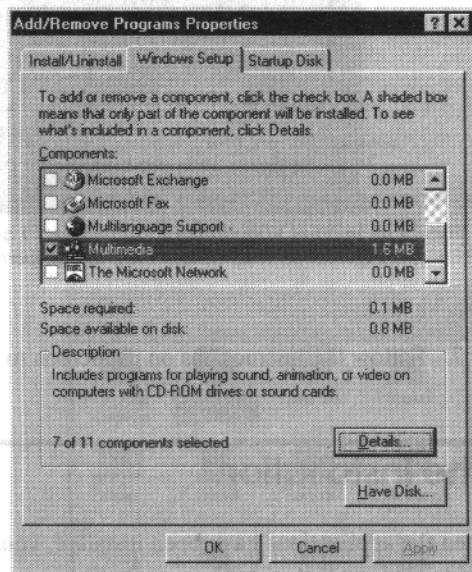


Figure 3-7: The Windows Setup, Add/Remove Programs Properties dialog box.

5. Select Multimedia and choose Details.  
The Multimedia dialog box shown in Figure 3-8 appears.

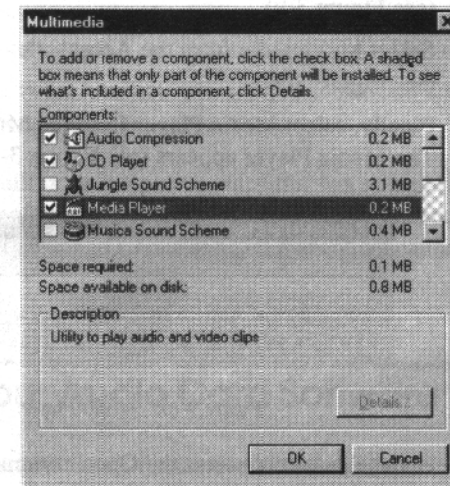


Figure 3-8: The Multimedia dialog box.

6. Click the Media Player check box and choose OK.  
The Media Player is now installed. Follow the instructions below to test your audio card.

To test the audio card:

1. Click  in the task bar.  
See Figure 3-9.

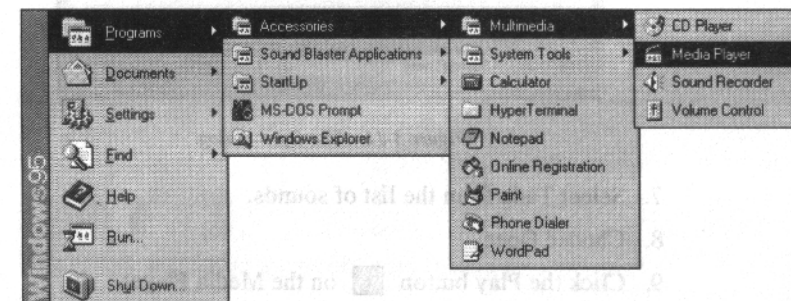


Figure 3-9: Programs popup menu.

2. Select Programs from the Start popup menu (see Figure 3-9).
3. Select Accessories from the Programs sub-menu (see Figure 3-9).
4. Select Multimedia from the Accessories sub-menu (see Figure 3-9).
5. Finally, select Media Player from the Multimedia sub-menu. The Media Player appears (see Figure 3-10).

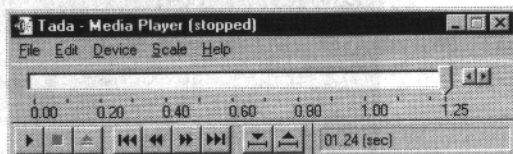


Figure 3-10: Media Player.

6. In the File menu, select the Open command. The Open dialog box appears with a list of sounds (see Figure 3-11).

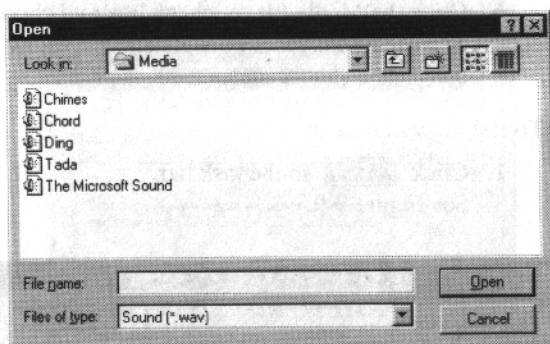


Figure 3-11: The Open dialog.

7. Select Tada from the list of sounds.
8. Choose Open.
9. Click the Play button  on the Media Player. You should hear the Tada 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.
- ☐ 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 eight 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  in the task bar.
2. Select Settings from the Start popup menu as shown in Figure 3-12.

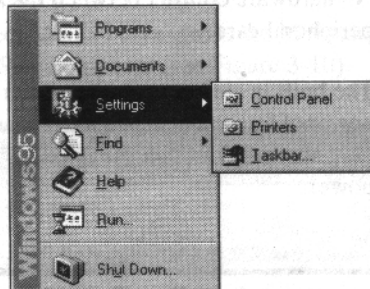


Figure 3-12: Start popup menu.

3. Select Control Panel from the Settings sub-menu as shown in Figure 3-12. The Control Panel group box like the one in Figure 3-13 appears.



Figure 3-13: The Control Panel group box.

4. Double-click the Add/Remove Programs icon. The Add/Remove Programs Properties dialog box similar to the one in Figure 3-14 appears.

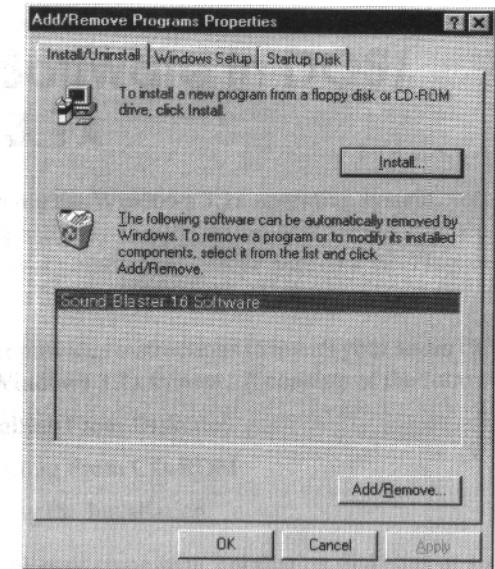


Figure 3-14: The Add/Remove Programs Properties dialog box.

5. Select the Sound Blaster 16 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.



## 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 Diskette
- ☐ Installing From CD-ROM
- ☐ Testing the Installation

Your package may come with installation diskettes or an installation CD-ROM and a diskette. Please use the appropriate section based on the installation media provided in your package.

### Installing From Diskette

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

1. Start your system.
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:**.
4. Type **INSTALL** and press <Enter>.
5. Follow the instructions presented on the screen to complete the installation.



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

When you have completed the installation and restarted your system, proceed to the "Testing Your Installation" section.

## 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. Start your system.
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:**.
4. Change to the DOS or WIN31 directory (e.g. type **CD WIN31**).
5. Type **INSTALL** and press <Enter>.
6. Follow the instructions presented on the screen to complete the installation.



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

When you have completed the installation and rebooted, proceed to the "Testing Your Installation" section.

## 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.

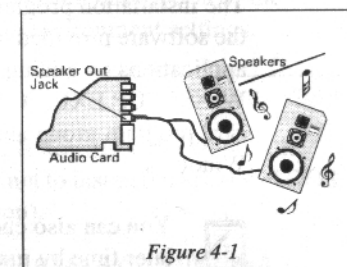


Figure 4-1

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 Chapter 5, "Changing Your Card's Settings" or Appendix C, "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 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 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 T6
SET SOUND=C:\SB16
SET MIDI=SYNTH:1 MAP:E
C:\SB16\DIAGNOSE /S /W=C:\WINDOWS
C:\SB16\MIXERSET /P /Q
```

The first 3 statements set up the environment variables for your audio card. The last 2 statements run the DIAGNOSE and MIXERSET 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 setting from the Plug and Play Configuration Manager.



Refer to the section "Changing the Resource Settings in Windows 3.1x/DOS" in page 5-4 for a description of the SOUND, BLASTER, and MIDI environment settings.

### The CONFIG.SYS File Settings

The installation program also adds the following statements to the CONFIG.SYS file (unless you choose not 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 with Creative Lab's Sound Blaster Developer Kit. These applications work with 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 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 on how to optimize your memory after you have loaded the low-level drivers.



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## 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.

---

## Changing Your Card's Settings

Your audio card is installed with the Creative 3D Stereo Enhancement feature. This feature allows you to eliminate speaker crosstalk and to enhance the quality of the sounds that you hear from your speakers.

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 Your Jumper Settings
- ☐ Changing the Advanced Signal Processor Chip Setting
- ☐ Changing the Resource Settings in Windows 3.1x/DOS
- ☐ Enabling/Disabling the Creative 3D Stereo Enhancement Effect

---

## Changing Your Jumper Settings

If you intend to change the jumper settings of your audio card, you should first become more familiar with the jumpers on the card shown in Figure 1-6.

Jumper settings define the some of the settings required for the audio card to function properly. Before you change the settings of a jumper, you should identify the current setting and the new setting that you wish to have. You can then proceed to change the jumper setting.

To change the settings of jumpers:

1. Switch off your computer and all other peripheral devices.
2. Remove the system's cover and card from your system.



- Identify the jumpers to change.  
For more information on how to identify the jumpers, refer to Figure 1-6.
- Remove the jumper blocks from the jumpers as shown in Figure 5-1.

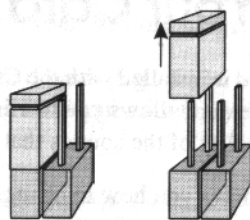


Figure 5-1: Removing the jumper block.

- Select the settings for the card by placing the jumper blocks on the desired jumpers as shown in Figure 5-2.

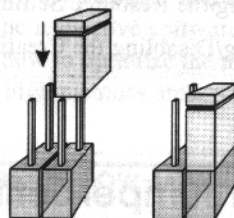


Figure 5-2: Inserting the Jumper Block.

## Changing the Advanced Signal Processor Chip Setting



Read this chapter 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 5-3.

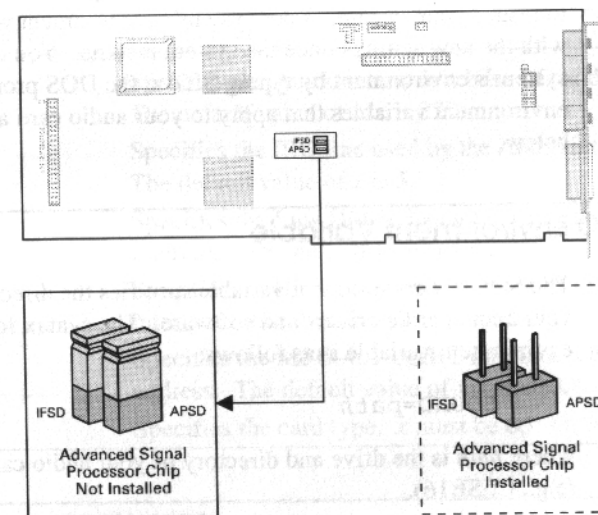


Figure 5-3: The available Advanced Signal Processor chip settings.

## Changing the 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 the card. This can be done by running the ISA Configuration Utility that come with your system's Plug and Play Configuration Manager.

The ISA Configuration 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 prompted to restart your system. Your system's environment will be updated with the new settings once the system restarts. You can view the system's environment by typing SET at the DOS prompt. The three environment variables that apply 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 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                                                                               |
|-----------|-------------------------------------------------------------------------------------------|
| Axxx      | Specifies the Audio interface's base I/O address. The default value of xxx is 220.        |
| Ix        | Specifies the IRQ line used by the Audio interface. The default value of x is 5.          |
| Dx        | Specifies the Low DMA channel used by the Audio interface. The default value of x is 1.   |
| Hx        | Specifies the High DMA channel used by the Audio interface. The default value of x is 5.  |
| Pxxx      | Specifies the MPU-401 UART interface's base I/O address. The default value of xxx is 330. |
| Tx        | Specifies the card type. x must 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 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**

The parameters of the command are described below.

| Parameter | Description                                                                                                                                                       |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYNTH:x   | x can be 1 or 2.<br>1 (default setting) specifies stereo synthesizer, and 2 specifies MIDI port.                                                                  |
| MAP:x     | x can be G, E, or B.<br>G specifies General MIDI file format.<br>E (default setting) specifies Extended MIDI file format, and B specifies Basic MIDI file format. |

## 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. The results are sounds with increased depth and breadth, thereby giving you enhanced mono and stereo output from the speakers.

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

### In DOS

To enable or 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 or disable the effect in Windows 95:

1. Click  in the task bar.
2. Select Settings and then Control Panel.  
The Control Panel group box appears.

3. Double-click the System icon.  
The System Properties dialog box appears.
4. Click the Device Manager tab.  
A list of devices in your system appears.
5. Double-click Sound, video and game controllers.  
The audio card's name appears.
6. Select your audio card and choose Properties.  
The audio card's properties dialog box appears.
7. Click the Effects tab.  
The dialog box shown in Figure 5-4 appears.

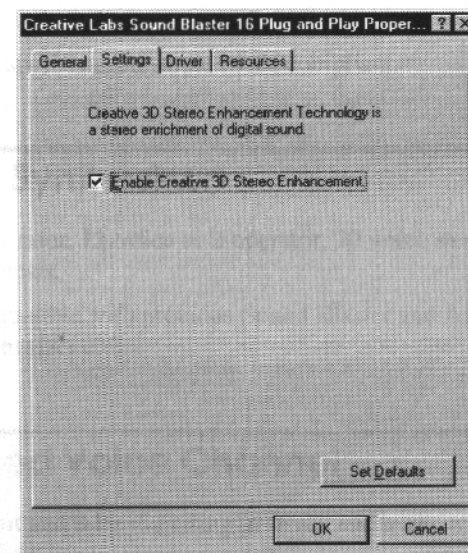


Figure 5-4: The Creative 3D Stereo Enhancement effect enable/disable dialog box.

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

## General Specifications

This appendix lists the general specifications of your audio card.

### Plug and Play

- ☐ ISA specification version 1.0a compliant.

### Stereo Music Synthesizer

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

### Stereo Digitized Voice Channel

- ☐ 16-bit and 8-bit digitizing in stereo and mono modes.
- ☐ Programmable sampling rate, 5 kHz to 45 kHz in 228 linear steps.
- ☐ High and Low DMA channels using a single interrupt.
- ☐ 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 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.

## MIDI Interface

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

## CD-ROM Interface

- ☐ Built-in CD-ROM interface that supports IDE CD-ROM drive.

## Upgrade Options

- ☐ Wave Blaster daughterboard for professional-quality music.
- ☐ Advanced Signal Processor chip if your audio card comes with a socket to install the chip.

Your audio card has two CD Audio Connectors.

The CD Audio connector [207] has the following pin assignments as shown in Table B-1.

Table B-1. CD Audio Connector Pin Assignments

| Pin | Signal           |
|-----|------------------|
| 1   | Ground           |
| 2   | Left Channel IN  |
| 3   | Ground           |
| 4   | Right Channel IN |

## 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.

## Modem Connector Pin Assignments

The Modem Connector has the following pin assignments shown in Table B-4.

Table B-4: Modem Connector Pin Assignments.

| Pin | Description                                                                      |
|-----|----------------------------------------------------------------------------------|
| 1   | AGND: Analog Ground.                                                             |
| 2   | KEY WAY: Keyed pin for placing the cable correctly on the connector.             |
| 3   | LINE-IN: Connected to disconnected part of the left channel on the line-in jack. |
| 4   | AGND: Analog Ground.                                                             |
| 5   | LINE-LEFT: Left channel line level audio output.                                 |
| 6   | AGND: Analog Ground.                                                             |
| 7   | LINE-RIGHT: Right channel line level audio output.                               |
| 8   | MODEM-SPK: Input from modem audio.                                               |
| 9   | AGND: Analog Ground.                                                             |
| 10  | MIC-IN: Connected to disconnected part of microphone jack.                       |

## 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.

## 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 with 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.

- |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Problem</b>  | The CD-ROM does not automatically run after you insert it in the drive.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Cause</b>    | The AutoPlay notification setting in your Windows 95 system may not be enabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Solution</b> | <ol style="list-style-type: none"><li>1. Enable the "Auto Insert Notification" check box. This check box can be found in your CD-ROM drive's properties page. To display this page:<ol style="list-style-type: none"><li>1. Click the Start button.</li><li>2. Select Settings and then Control Panel.</li><li>3. Double-click the System icon.</li><li>4. Click the Device Manager tab and select your CD-ROM drive.</li><li>5. Click the Settings tab. Under Options ensure the Auto Insert Notification check box is enabled.</li></ol></li></ol> |



## 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.

## Resolving Hardware Conflicts

Hardware conflicts occur when two or more peripheral devices contend for the same resources. Conflicts between your audio card and another peripheral device might be due to the settings of the I/O addresses, IRQ line, or DMA channel.

To resolve hardware conflicts:

1. Change the resources settings of your audio card or the peripheral card in your system if the peripheral card is using your audio card's setting. To change the resources settings, run Device Manager.

To run Device Manager :

1. Click the Start button on the task bar of your Windows 95 startup screen.
2. Choose Settings from the Start popup menu.
3. Choose Control Panel from the Settings popup menu.
4. Click the System icon within the Control Panel group box.
5. Choose Device Manager from the System Properties dialog box.

To view audio card's current resources:

1. Choose Sound, Video and Game Controllers from Device Manager.
2. If you are unsure of the settings of the peripheral cards, you can isolate the source of the problem by temporarily removing all cards except your audio card and other essential cards such as disk controller. After that, add the card back one at a time until the card that is causing the conflict is found.

## Technical Support

We are committed to giving you the best product as well as the best technical support. When you contact us, please have the following information:

- ☐ Hardware configuration information such as the base I/O address, IRQ, or DMA channel used.
- ☐ Error message on the screen and how it came about.
- ☐ Information on the adapter card that conflicts with your card.

This section shows where you can contact us:

- ☐ Inside U.S.A., Canada and South America
- ☐ Inside Europe
- ☐ Inside Asia
- ☐ Through Compuserve

### Inside U.S.A., Canada and South America

#### CREATIVE LABS, INC. Technical Support

1523 Cimarron Plaza  
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#### Operating Hours (U.S.A. Central Time)

Mon-Sun : 8:00 am-12:00 am (16 hours)  
Public Holidays : Closed

## Inside Europe

### CREATIVE LABS (IRELAND) LTD. Technical Support

Ballycoolin Business Park  
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**Ireland** Tel : +353 1 820 7555  
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: +33 1 39 20 90 47 (v32bis)  
Minitel : 3615 CREATIVE and  
3617 CREATIVE

**UK** Tel : +44 01734 344 744  
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**Belgium** Tel : +32 03 281 35 70  
**(for Benelux)** Fax : +32 03 281 35 80

**Germany** Tel : +49 089 9579081  
**(for Central and** Fax : +49 089 9577453  
**Eastern Europe)** BBS : +49 089 9557274

**Scandinavia** Tel : +45 4824 4322  
Fax : +45 4824 4323

**Spain** Tel : 900 953536 (Freephone)

**Operating Hours**  
**Mon-Fri** : Business Hours  
**Sat-Sun** : Closed

FaxBack is a facility that allows you to obtain product and technical information through facsimile services. In Europe, use the following number: +353 1 820 3667



Throughout the rest of Europe, please direct all faxes to Ireland.

## Inside Asia

### CREATIVE TECHNOLOGY LTD. Technical Support

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Singapore 139953

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**Operating Hours (Singapore Time)**  
**Mon-Thu** : 9:00 am-6:30 pm  
**Fri** : 9:00 am-6:00 pm  
**Sat, Sun & Public Holidays** : Closed

## Through Compuserve

To serve you better, we have created a Creative Labs Forum on Compuserve. Through this forum:

- ☐ You have direct access to our company representatives who are there to answer your questions.
- ☐ You will be part of an interactive community of Creative's product users. Here you can share experiences and ideas and also seek solutions to problems.
- ☐ We keep you up-to-date on the latest product information, software updates, and fixes to common problems.
- ☐ We welcome your recommendations and suggestions for new products and for improving our products in future releases.

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## If you are already a member of CompuServe

All you need to do to access the forum is:

- ☐ At the CompuServe prompt,  
Type **Go Blaster** and press <Enter>.

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## If you are not a member of CompuServe (valid only in U.S.A.)

We have arranged for you to receive a free introductory CompuServe membership which includes:

- ☐ One free month of CompuServe's Basic Services,
- ☐ A \$15 introductory usage credit to explore the Creative Forum and CompuServe's other Extended Services,
- ☐ A private User ID Number and Password, and
- ☐ A complimentary copy of CompuServe Magazine, CompuServe's monthly computing publication.

To receive this special offer:

- ☐ Call 1-800-524-3388 and  
Ask for Representative #228.