

## User's Guide

- ❖ Sound Blaster 16
- ❖ CD-ROM Drive
- ❖ Creative Software

BLASTER™  
16

**CREATIVE**  
CREATIVE LABS, INC.

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## FCC Notice

This card has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 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 card 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 noncertified computers or nonshielded 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 equipment.

**NOTE** *Important warranty information for your Creative Labs product is located at the end of this document. Please take a moment to read the warranties before you install the product.*

# Introduction

*Y*our Creative Labs' multimedia kit includes:

- ❖ Sound Blaster 16: A high-quality 16-bit, 20-voice audio card that produces CD-quality sound and music through your computer. Included are Windows and DOS applications and utilities, such as:
  - Monologue for Windows: Have all or part of a document, including electronic mail and spreadsheet data, read to you
  - EnsembleAV: Control audio players (CD, MIDI, and wave) through an on-screen display that duplicates the features of the remote control for your home sound system.
  - Talking Scheduler: A computer-generated voice reminds you of appointments, or record your own voice messages
  - WaveStudio 2.0: Record, edit, and add effects to sound files
  - Soundo'LE: Link and embed sound files in a files created by applications that support OLE (object linking and embedding)
  - Sound Blaster 16 Mixer: Sophisticated control over audio input and output
  - Intelligent Organ: Learn to use your computer keyboard as a musical keyboard, add accompaniment as you play a melody
- ❖ CD-ROM Drive: Double-speed, 300 KB/second transfer rate improves viewing of Video for Windows and Quicktime multimedia presentations; multi-session photo CD compatible; play music CDs

# System Requirements

To use Sound Blaster 16, the CD-ROM drive, and the software, you need:

- ❖ An IBM-compatible 386SX or above
- ❖ 4 MB RAM (random access memory)
- ❖ 4 MB of storage space on your hard disk (for the software)
- ❖ MS-DOS 3.1 or higher
- ❖ SVGA card (640x480, 256 colors minimum)
- ❖ 3.5-inch, 1.44 MB floppy disk drive
- ❖ Mouse
- ❖ Windows 3.1 (for Windows applications)
- ❖ Available 16-bit expansion slot (for Sound Blaster 16)
- ❖ Available half-height drive bay (for CD-ROM drive)

## Disk Backup

Before you start, make backup copies of the original disks. Use the backup disks; keep the originals in a safe place.

# Conventions

The following typographical conventions are in effect throughout this document.

**Bold** Bold face type identifies words and phrases that are to be entered exactly as shown. For example:

**SET SOUND=C:\SB16**

**Italic** Italic type identifies words and phrases that are to be replaced by you. For example:

**voc2wav sample.voc**

When using this command, you must supply a value for *sample*.

Italic is commonly used to emphasize a word/phrase, or to identify a word/phrase that is being defined. In the text of this document, it is also used to identify a button or menu item that you are to select with the keyboard keys or the mouse; for example, “Select the *Play* button on the main menu.”

**[Brackets]** Brackets indicate command parameters that are optional; if you choose not to include optional values, there may be default values that are automatically inserted. For example:

**PCXDriver=[ON|OFF]**

In this command, you may choose to set PCXDriver on or off; the choice is optional because the command has a default that is substituted if you do not make a selection.

**{Braces}** Braces indicate command parameters that must be included. For example,

**SETVOL {source l-vol}[,r-vol]**

In this command, you must enter values for *source* and *l-vol*; a value for *r-vol* is optional. If required parameter

values are not included, the command is ignored or returns an error message.

- ... Ellipses indicate that the preceding parameter can be repeated. For example, in the command below, you can include any number of source values:

```
SET [RECMIX|OUTMIX]
    level source[+source] [ . . . ]
```

**ALL CAPS** A word in all capital letters identifies a key you are to press. For example, “Select the *Yes* button and press ENTER.”

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# Getting Started

# Installing Creative Multimedia Kit

*I*nstalling the Creative multimedia kit on your computer requires you to do the following:

- ❖ Install the Sound Blaster 16 card in your computer
- ❖ Install the CD-ROM drive in your computer
- ❖ Connect speakers or headphones as well as other devices to the Sound Blaster 16
- ❖ Run the installation program (to install the Creative software on your hard disk and initialize Sound Blaster 16 and the CD-ROM drive)
- ❖ Test the Sound Blaster 16 and its hardware settings, and the CD-ROM
- ❖ Set up the Windows 3.1 drivers and applications

Each of these procedures is described in detail on the following pages.

# Installing the Sound Blaster 16 Audio Card

If you currently have Sound Blaster, Sound Blaster Pro, or any audio card installed on your computer, remove it before you install Sound Blaster 16. You will need a Phillips screwdriver for removing the computer cover, for removing the slot cover, and for securing the sound card.

*To install Sound Blaster 16:*

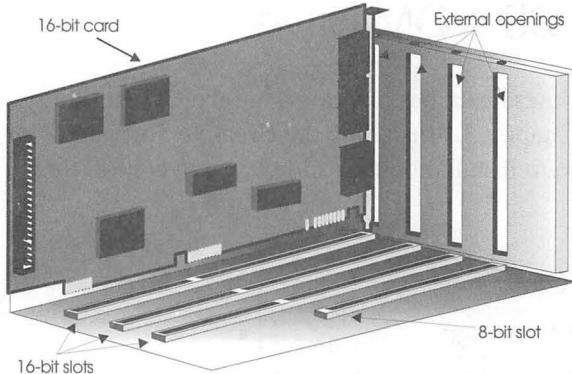
1. Turn off your computer and monitor. Disconnect the monitor from the computer and set it aside.
2. Position the computer so that you can work on the back. Remove the cover from the computer. Review your computer manual for specific instructions for removing the cover and follow them explicitly.

Most computer covers are held in place by a number of screws inserted in the back panel. After removing these screws (put them aside for replacing the cover), lift the cover carefully and pull away from the computer. If the cover does not lift away easily, do not use excessive force—look for additional screws that need to be removed or some portion of the cover that is not free of the computer.

3. If there is a game card or a card with a joystick port installed in your computer, either remove the card *or* change the JYEN jumper on Sound Blaster 16 to disable its joystick port. (Disabling the joystick port does not affect its use as a MIDI port.) For more information on the JYEN jumper, see “Changing the Joystick Port Jumper” in Appendix B, “Changing Sound Blaster 16’s Configuration.”

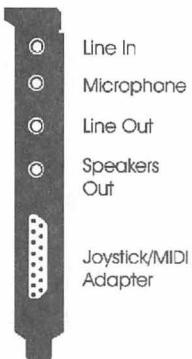
**NOTE** *For highest quality playback, an external amplifier is recommended.*

4. Choose a 16-bit slot for Sound Blaster 16 (8-bit slots are noticeably smaller); the slot must accommodate the two tabs extending from the bottom of the card (see figure 1-1). Make sure there are no installed cards or add-ons that will hinder positioning and inserting the card. If the external opening for the slot at the back of the computer is covered, remove the screw holding the cover in place, then remove the slot cover. (Keep the screw—you will need it later to secure the card.)



**FIGURE 1-1:** Position of Sound Blaster 16

5. Insert the Sound Blaster 16 card: Align the gold-striped tabs on the bottom of the card with the socket on the computer board and the metal bracket (figure 1-2) with the external opening, then push down firmly on the top of the card. You should feel the card settle into place; the top of the metal bracket should match the slot screw hole.

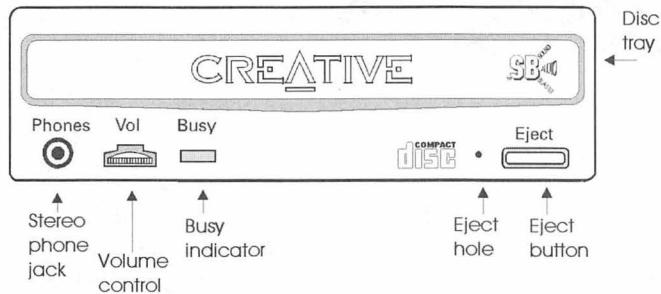


**FIGURE 1-2:** Location of the volume control, connectors, and jacks on the external end of the Sound Blaster 16

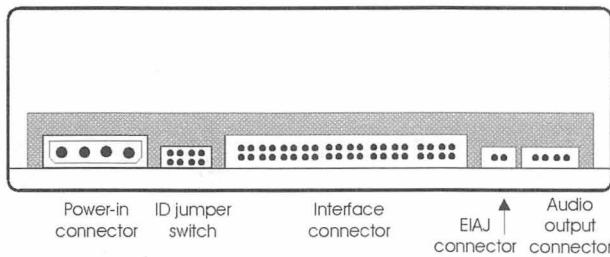
6. Use the screw from the slot cover to secure Sound Blaster 16 to the frame of the computer. (Securing Sound Blaster 16 with the screw assures it is properly grounded.)

# Installing the CD-ROM Drive

The information that follows describes how to install the CD-ROM drive in your computer. See Chapter 3, “Installing the Creative Software,” for information on the software installation that allows you to control the CD-ROM drive.



**FIGURE 1-3:** Front panel of the CD-ROM drive



**FIGURE 1-4:** Rear panel of the CD-ROM drive

**NOTE** The CD-ROM drive installation instructions that follow require that the Sound Blaster 16 card be installed. If you have not done so, install Sound Blaster 16 before proceeding.

*To install the CD-ROM drive:*

1. With the computer cover removed (see “Installing the Sound Blaster 16 Audio Card,” earlier in this chapter), remove the cover of a vacant drive bay for the CD-ROM drive. Most personal computer have vacant drive bay(s) above or below your floppy disk drive(s). The cover may pop out or require that you remove one or more screws.

2. Carefully insert the CD-ROM drive into the vacant drive bay.

Some drive bays require rails to be attached to the sides of the CD-ROM drive. If the drive does not fit the bay properly, use the rails supplied with your computer; if no rails are included, contact the manufacturer or your dealer.

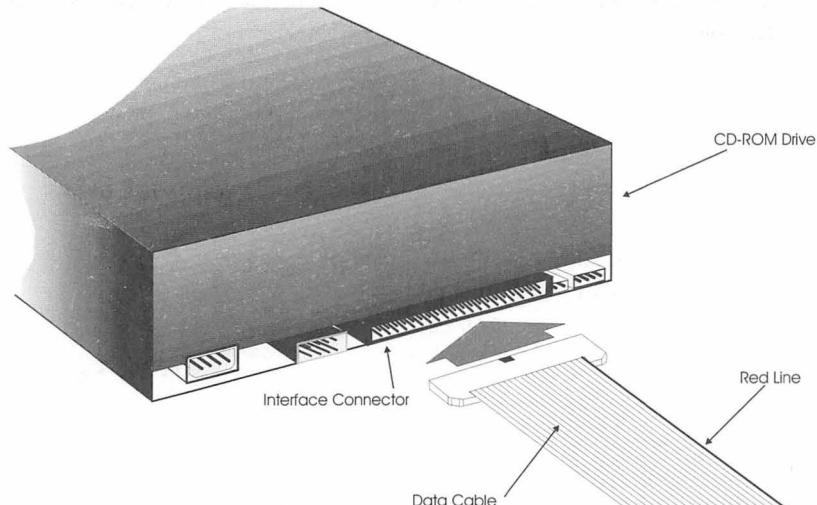
3. Secure the CD-ROM to the computer by inserting and tightening the screws on the sides of the drive bay.

# Connecting the CD-ROM Drive to the Sound Blaster 16

Your Sound Blaster 16 has the connections necessary for the control and operation of your CD-ROM drive.

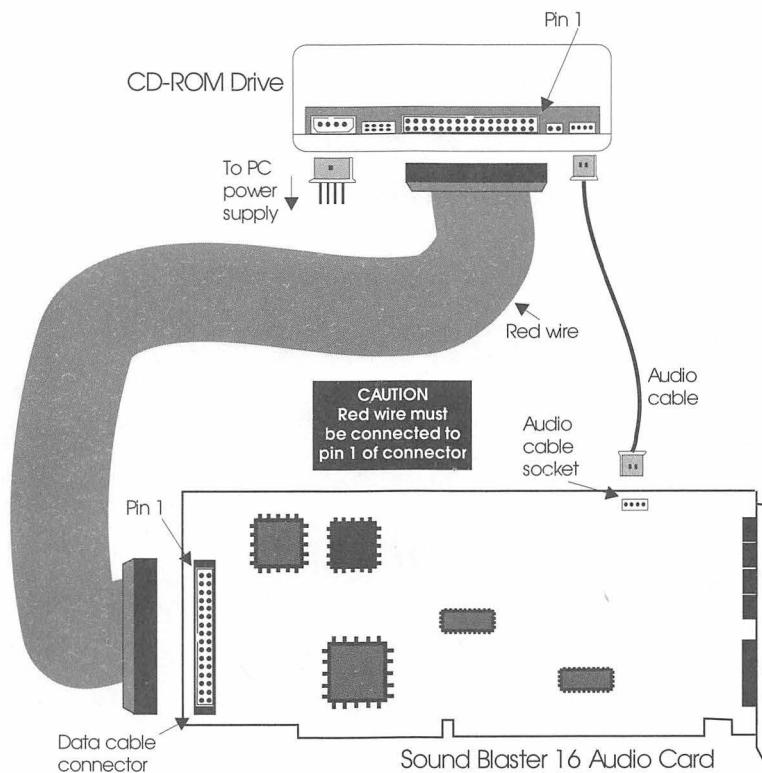
*To connect the CD-ROM drive to your Sound Blaster 16 card:*

1. Connect the data cable to the CD-ROM drive as shown in figure 1-5. The data cable connector is designed to fit into the CD-ROM connector only when inserted in the correct position; if the connectors do not match, try turning over the data cable connector and trying again.



**FIGURE 1-5:** Connecting the data cable to the CD-ROM drive

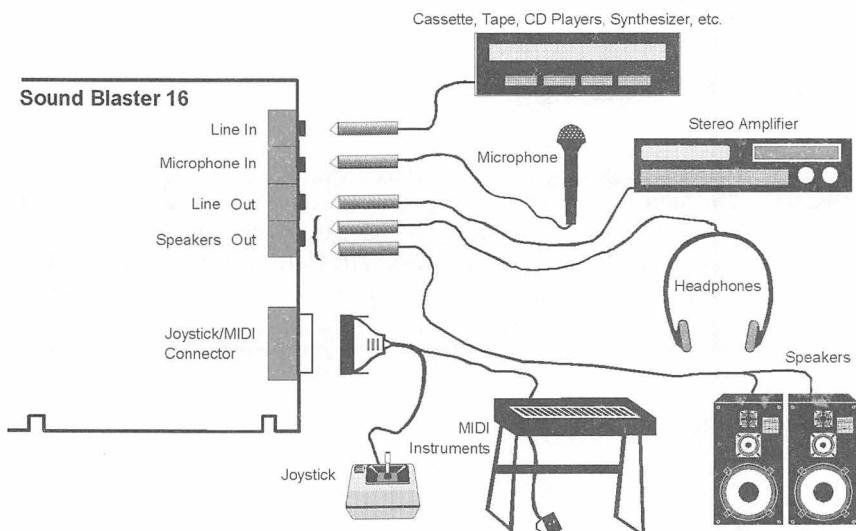
2. Connect the computer power supply cable and the audio cable to the CD-ROM drive.
3. Connect the data cable and audio cable to the Sound Blaster 16 as shown in figure 1-5.
4. Replace the cover on your computer, reconnect the monitor, and plug in and turn on the computer.



**FIGURE 1-6:** Connecting cables from the audio card to the internal CD-ROM drive

# Connecting Devices to Sound Blaster 16

You can connect a wide range of devices—such as cassette players, microphones, speakers, amplifiers, MIDI (musical instrument digital interface) instruments, and joysticks—to Sound Blaster 16, as shown in the illustration below:

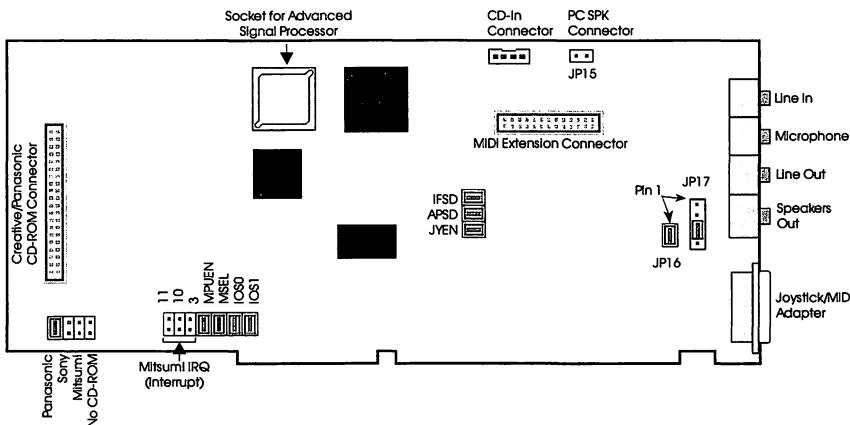


**FIGURE 2-1:** Connecting devices to the Sound Blaster 16

# Connecting Speakers to Sound Blaster 16

*To connect speakers or headphones to Sound Blaster 16:*

1. Plug the speakers or headphones into the Speakers Out jack to use the Sound Blaster 16 built-in amplifier. Use Creative Mixer to adjust the volume (see Chapter 4, “Creative Mixer”).
2. If you are using an external amplifier for your speakers or headphones, plug the amplifier into the Line Out jack.



**FIGURE 2-2: Sound Blaster 16**

## NOTE

*The built-in stereo power amplifier has a maximum output power of four watts per channel with four-ohm speakers and two watts per channel with eight-ohm speakers. DO NOT adjust the Creative Mixer volume to maximum level if your speakers or headphones cannot handle full power—the speakers may be damaged.*

# Connecting a MIDI Device

Sound Blaster 16's MIDI interface is compatible with two MIDI standards:

- ❖ MPU-401 UART
- ❖ Sound Blaster MIDI

You can use only one of the interface standards at a time. To connect a MIDI device to Sound Blaster 16, you need the Sound Blaster MIDI kit. The MIDI kit contains a cable adapter with a joystick port so you can have both a MIDI instrument and a joystick attached to the card at the same time. It also contains a MIDI sequencing application that lets you write and play MIDI music. Ask your dealer or call Creative Labs for the latest information on MIDI software for the Sound Blaster 16.

# Connecting a Joystick

The joystick port on the Sound Blaster 16 is the same as that on a standard PC game control adapter or game I/O port. You can connect any analog joystick with a 15-pin D-sub connector to the port; it works with any application that is compatible with standard PC joysticks. If you need to run two joysticks, a Y-cable is available from Creative Labs (Y-cables from other sources may not work).

If your computer has a game card or a card with a joystick port installed, either remove the card or change the JYEN jumper on Sound Blaster 16 to disable its joystick port. (Disabling the joystick port does not affect its use as a MIDI port.) For more information, see "Changing the Joystick Port Jumper" in Appendix B, "Changing Sound Blaster 16's Configuration."

# Connecting Wave Blaster

Sound Blaster 16 has a connector for Wave Blaster, a general MIDI expansion module. Wave Blaster is an add-on daughter card to Sound Blaster 16; it contains a sound generation subsystem that uses sampled wave synthesis to produce extremely high fidelity stereo sound for computer audio systems. For more information about Wave Blaster, ask your dealer or call Creative Labs.

## Connecting the Internal Speaker

You can redirect the sound from your computer's speaker to the speakers connected to Sound Blaster 16. Internal speakers in computers are installed in a number of ways. If you are not familiar with the internal speaker setup, contact a qualified service technician for help. Making the wrong connections can damage both your computer and the Sound Blaster 16 card.

*To redirect sound from the internal speaker to Sound Blaster 16:*

1. Locate the speaker connection on the computer's main board and disconnect the internal speaker.
2. Connect a wire from the speaker connector's +5Vdc pin to pin 1 of the jumper labeled JP15 on Sound Blaster 16 (see Appendix B, "Changing Sound Blaster 16's Configuration," figure B-2).
3. Connect a wire from the speaker connector's signal-out pin to pin 2 of the JP15 jumper on Sound Blaster 16.
4. Once the computer's speaker has been connected, the volume can be controlled with the Mixer (see Chapter 4, "Creative Mixer").

# Connecting an External Power Amplifier

Sound Blaster 16 has a built-in stereo amplifier that allows you to connect speakers or headphones directly to the card without the need for an external amplifier. However, an external amplifier produces a lower distortion level and a better frequency response. Simply connect the external amplifier to Sound Blaster 16 through the Line Out jack (see figure 2-2).

## Connecting Other Devices

Connecting devices such as cassette players, microphones, and speakers to Sound Blaster 16 is just a matter of plugging them into the correct jack. Here are some guidelines for using such devices:

- ❖ Check the illustration (figure 2-1) on page 2-1 to identify the correct jack for the device.
- ❖ The built-in stereo amplifier has a maximum output power of four watts per channel with four-ohm speakers and two watts per channel with eight-ohm speakers. *Do not* turn the volume up to its maximum level if your speakers or headphones cannot handle the full power.
- ❖ If you purchase a microphone to use with Sound Blaster 16, select a good quality microphone—a 600-ohm, -75db microphone that costs around \$30.00 is fine. A condenser microphone also works well.

# Installing Creative Software

*I*nstalling the Creative software on your computer requires you to do the following:

- ❖ Run the installation program to install the software on your hard disk, and initialize Sound Blaster 16 and the CD-ROM drive
- ❖ Test the card and the hardware settings
- ❖ Set up the Windows 3.1 drivers and applications

Each of these procedures is described in detail on the following pages.

**NOTE** *Installation instructions for Monologue for Windows is included in Chapter 9, “Monologue for Windows.” Creative Talking Scheduler (Chapter 10) is installed with Monologue for Windows.*

# Installing the CD-ROM Software

The installation program installs the QuickCD application and the two drivers needed to control your CD-ROM drive.

*To install the software:*

1. Insert the CD-ROM installation disk into a floppy disk drive.
2. Type **A:** or **B:** to change to the appropriate disk drive, type **INSTALL**, and press **ENTER**. A screen appears followed by the installation main menu.
3. Select *View Readme File* and press **ENTER**.
4. Select *Begin Installation* and press **ENTER**.
5. The installation program creates a subdirectory in your sound directory for the software and drivers. When prompted to select the I/O address, select the one that matches your Sound Blaster 16—default is 220.
6. The CD-ROM installation program asks for the installation directory. The default is C:SB16 for the Sound Blaster 16 software. Accept the default unless you intend to change the sound directory.
7. Enter the boot drive for your computer; the default is C.

After the CD-ROM software is installed, the program adds the driver lines to your AUTOEXEC.BAT and CONFIG.SYS files. (See “CD-ROM Drivers” later in this chapter for more information.) You must reboot your computer for the newly installed drivers to take effect.

## Windows Applications

If you have installed Windows prior to installing a CD-ROM drive, you must have the MCI CD Audio driver installed for Windows applications such as Creative EnsembleAV (see Chapter 6, “Creative EnsembleAV”).

If you receive an error message when you attempt to play an audio CD on the CD-ROM drive, install the MCI CD Audio driver in Windows. You need the Windows installation disks if the driver is not on your hard disk.

*To install the MCI CD Audio driver:*

1. From Windows Program Manager, double click the Control Manager icon.
2. Select the Drivers icon to display the Drivers dialog.
3. Scroll through the list of installed drivers to find [MCI] CD Audio.
  - ◆ If the driver is installed, your system is configured to play audio CDs from a Windows application.
  - ◆ If the driver is not installed, you must install it before running a Windows application that plays audio CDs on the CD-ROM drive.
4. On the Driver dialog, select *Add...*
5. Scroll the list to find [MCI] CD Audio. Select the driver and select *OK*.
  - ◆ If the driver is in the \WINDOWS\SYSTEM directory, it is installed.
  - ◆ If the driver is not in the \WINDOWS\SYSTEM directory, you are prompted to enter the name of the directory in which it can be found.
6. Once the driver is located, select *OK* to add the driver to your system.

See the Windows documentation for more information on adding drivers.

## CD-ROM Drivers

Two drivers are needed to control your CD-ROM drive. They are the hardware-dependent driver SBCD.SYS and MSCDEX.EXE. SBCD.SYS is the device driver for your CD-ROM drive and MSCDEX.EXE is the Microsoft CD-ROM Extensions program.

When you run the installation program, it automatically updates the CONFIG.SYS file to include a statement similar to:

```
DEVICE=C:\SB16\DRV\SBCD.SYS /D:MSCD001 /P:220
```

The AUTOEXEC.BAT file is updated to include the statement:

```
C:\SB16\DRV\MSCDEX.EXE /D:MSCD001 /V /M:15
```

## SBCD.SYS Settings

There are some SBCD.SYS parameters that can be edited. To edit the parameters listed in the table below, use any ASCII text editor. The syntax of the SBCD.SYS entry in the CONFIG.SYS file is:

```
DEVICE=C:\SB16\DRV\SBCD.SYS /D:device-name /P:xxx  
[ /N:x] [ /S:[mode] [ID] [ /A] [ /X:1]
```

Parameter	Description
/D: <i>device-name</i>	Name of the CD-ROM drive; must be identical to the device name in the AUTOEXEC.BAT file. Default is /D:MSCD001.
/P: <i>xxx</i>	Base address used by your Sound blaster 16. <i>xxx</i> can be 220, 240, 260, or 280. Default is 220.
/N: <i>x</i>	Number of CD-ROM drives connected. <i>x</i> ranges from 1 to 4. If you have more than one CD-ROM drive, <i>x</i> sets the number of drives you can access.
/S:[ <i>mode</i> ] [ <i>ID</i> ]	<i>mode</i> can be A (automatic), N (normal), and D (double speed). Default is D. For A mode, the transfer speed is dependent on the type of disk. For a data disk, the transfer speed is 300 KB/sec. For mixed mode CD containing audio and data, transfer speed is 150 KB/sec. For normal and double mode, transfer speed regardless of the type of disk is 150 KB/sec and 300 KB/sec, respectively. <i>ID</i> is the drive's ID number. Values range from 0 to 3. If it is specified after mode, the mode setting applies only to the drive specified by <i>ID</i> . For example, /S:A3 means only drive 3 is in A mode. If <i>ID</i> is omitted, the mode setting is effective for all drives connected. For example, /S:N means all connected drives are in N mode.
/A	Enables sound to be sent to both channels even when the application software sends it to one channel.
/X:1	Prevents the application from giving an error message when software eject is not available. Applies only when you use CD-ROM drive model 521 or 523 as the first drive for daisy-chaining.

## MSCDEX.EXE Settings

The syntax of the MSCDEX.EXE entry in the AUTOEXEC.BAT file is:

```
C:\SB16\DRV\MSCDEX.EXE /D:device-name /L:drive-letter  
[/E] [/M:xx] [/V] [/S]
```

Parameter	Description
/D: <i>device-name</i>	Name of the CD-ROM drive. Default is /D:MSCD001.
/L: <i>drive-letter</i>	Drive assigned to the CD-ROM drive. If not specified, the next available drive is used.
/E	Use expanded memory, if available. (Only applies to Expanded Memory Manager LIM version 3.2 or later.)
/M: <i>xx</i>	Number of buffers for temporary storage of the most recent data. <i>xx</i> ranges from 2 to 30. CD-ROM drive performance increases with the value of <i>xx</i> . Each buffer uses about 2 KB of memory; too many buffers may impact programs with large memory requirements.
/V	Displays summary of RAM and expanded memory at boot.
/S	Allows sharing of CD-ROM drives on MS-NET file servers.

## Setting Up the CD-ROM Device Driver

When you change the speed mode of your CD-ROM drive, you need to update SBCD.SYS. SETUPCD is the program that updates SBCD.SYS.

**NOTE** *SETUPCD.EXE assumes SBCD.SYS and MSCDEX.EXE are in the sound directory. Run the installation program if they are missing.*

### *To run SETUPCD:*

1. Change to the sound directory. The Sound Blaster 16 default is \SB16.
2. Type **SETUPCD** and press ENTER. Follow the CD-ROM Drive Setup instructions on each screen. To exit at any time, press the ESC key.
3. Select the base I/O address for Sound Blaster 16 and the speed mode for each drive.
4. The SETUPCD program saves the changes in your CONFIG.SYS.
5. At the prompt, enter the drive from which your computer boots.
6. Restart your system for the changes to take effect.

# Upgrading from Sound Blaster Pro

If your Sound Blaster 16 installation is replacing Sound Blaster Pro, you may want to remove the \SBPRO files and subdirectories to make the space available on your hard disk.

When you installed Sound Blaster Pro, a line similar to the following was added to your AUTOEXEC.BAT file:

```
C:\SBPRO\SBP-SET /M:12 /VOC:12 /CD:12 /MIDI:12
```

Before you install the Sound Blaster 16 software, use a text editor to remove this line from your AUTOEXEC.BAT file.

# Installing the Sound Blaster 16 Software

To complete your installation of Sound Blaster 16, install the Windows and DOS applications. The installation program automatically:

- ❖ Creates a directory, \SB16, and a number of subdirectories on your hard disk.
- ❖ Copies the Sound Blaster 16 software and the applications into the \SB16 directory and subdirectories.
- ❖ Copies the AUTOEXEC.BAT and CONFIG.SYS files, saves the old versions with the file name extension .B~K, and adds lines to the new version. (See Appendix C, "Technical Information," for more information.)
- ❖ Adds lines to the Windows system files.

**NOTE** *If you are running a disk-caching program such as SMARTDRV or PC-CACHE, remove it from memory before installing the Creative software. You may re-install the program after the Creative software, including the Windows drivers, has been installed.*

*To install the Sound Blaster 16 software on your hard disk:*

1. Insert Sound Blaster 16 installation disk into a disk drive.
2. From the DOS prompt in your root directory, type **A:INSTALL** or **B:INSTALL** to start the installation program from the appropriate disk drive; press ENTER.
3. Read the information displayed, then press the appropriate key:
  - ♦ README file, press F2.
  - ♦ Begin installation, press ENTER.
  - ♦ Learn about the installation program, press F1.
  - ♦ To exit the installation program, press F3.
4. Press F2 to display new information. When you finish reading the README file, press ESC to return to the main menu.

5. From the Sound Blaster 16 installation menu, press ENTER. Follow the instructions that appear on the screen—you are presented with two choices:
  - ◆ Full installation
  - ◆ Custom installation

The full installation includes all of the Sound Blaster 16 software and is recommended. Custom installation may be your choice if you have limited disk space or you have no need for one or more of the applications. Read the information and choose the appropriate installation.

6. The next installation screen shows the current or default path name for the Sound Blaster 16 directory. When the drive and directory are correct, press ENTER.

The following settings will be used for installing Sound Blaster 16 programs.

Proceed using the settings shown

Base I/O address	:	220
MIDI Port address	:	330
Interrupt setting	:	5
DMA setting	:	1
High DMA setting	:	5

- If these settings are correct, press ENTER.
- To change a setting, use ↑ or ↓ key to select the setting and press ENTER for the alternatives.

**FIGURE 3-1:** Hardware Configuration screen showing default settings

7. If you did not change the jumpers on the sound card, the default settings are valid for most computers. (Before making changes to the default settings, review Appendix B, “Changing Sound Blaster 16’s Configuration.”) The test program, DIAGNOSE, run after the software is installed, lets you know if the default settings are valid. Press ENTER to continue.

When the installation is complete, the following lines are added to your 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
C:\SB16\SB16SET /P
```

The following lines are added to your CONFIG.SYS files:

```
DEVICE=C:\SB16\DRV\CSP.SYS /UNIT=0 /BLASTER=A:220
DEVICE=C:\SB16\DRV\CTSB16.SYS /UNIT=0 /BLASTER=A:220 I:5 D:1 H:5
DEVICE=C:\SB16\DRV\CTMMSYS.SYS
FILES=40
```

The FILES line is added or modified only if it is missing or fewer than 40 files are allocated.

8. You are asked for the Windows directory. The Windows drivers and applications are installed using this directory. The Sound Blaster 16 group and icons are installed the next time you access Windows, or you may install them at any time by running the WINSETUP program from Windows.

Type the path name for the Windows directory and press ENTER.

9. When the installation program is completed, you must reboot for the settings to take effect:
  - ◆ Press F10 to reboot.
  - ◆ Press ENTER to return to the DOS prompt.

## Testing Sound Blaster 16

The Sound Blaster 16 test program checks your installation to make sure:

- ❖ There is no conflict with other components in your computer
- ❖ Music and sound are produced properly

If the program discovers a problem with any of the settings, you need to change the setup of either Sound Blaster 16 or the conflicting component.

*To test Sound Blaster 16:*

1. Type **CD \SB16** at the DOS prompt to switch to the directory in which the test program is located.
2. Type **DIAGNOSE** and press ENTER to start the test program.
3. When the Sound Blaster 16 Test Program screen appears, read the information that is displayed. Press ENTER to start the test.

The Sound Blaster 16 test program checks the I/O address, interrupt, and DMA channels that Sound Blaster 16 uses, then it displays a menu to let you test the card's sound and music output. If you discover any hardware conflicts or audio problems you cannot resolve or if you have any other problems installing Sound Blaster 16, see Appendix A, "Troubleshooting."

## Testing the CD-ROM Drive

After installing the software, run the test program TESTCD to ensure that your CD-ROM drive and drivers are installed properly.

*To test the CD-ROM drive:*

1. Load an audio disk into your CD-ROM drive.
2. Change to the sound directory, and type **TESTCD** and press ENTER.
3. Follow the instructions on the screen.

The test does the following:

- ❖ Checks whether the drive is properly setup. If you see an error message on MSCDEX, check that SBCD.SYS is properly installed. Also, ensure that the data and power cables are connected to the CD-ROM drive.
- ❖ Checks whether there is audio output. If there is no audio output, refer to Appendix A, "Troubleshooting."

## Resolving Hardware Conflicts

If the test program *hangs* or displays an error message while checking the I/O address, the interrupt setting, or the direct memory access (DMA) channels, there may be another card using the same setting. It is best not to change the Sound Blaster 16 default settings; many applications are designed to work with those settings. If you do find it necessary to change one or more settings on the sound card, see Appendix B, "Changing Sound Blaster 16's Configuration," for more information.

## Resolving Audio Problems

If you hear no sound when you run the sound and music tests, check the following:

- ❖ Speakers or headphones plugged into the correct jack (see figure 2-2); plugged in completely.
- ❖ Volume control on the Creative Mixer: Move the master control up to increase, down to decrease (see Chapter 4, “Creative Mixer”).
- ❖ Speaker or headphones volume control: Use it to increase the volume.
- ❖ External amplifier: Correctly connected to Sound Blaster 16 and turned on; speaker or headphone connections to the external amplifier.
- ❖ Powered speakers: If you are using the Sound Blaster 16 built-in amplifier, turn off the power to your speakers.

If you hear music when you run the FM music tests but no sound when you run the 8-bit and 16-bit sound tests, the interrupt or DMA channel settings may be wrong or your computer may not be able to handle 16-bit DMA transfer correctly. For information about solving either problem, see Appendix B, “Changing Sound Blaster 16’s Configuration.”

# Installing Application Group Windows

The first time you access Windows after installing the Sound Blaster 16 software, the group windows and icons are installed automatically.

*To install the Sound Blaster 16 group:*

1. At the DOS prompt, type **WIN** and press ENTER to start Windows.
2. When you first run Windows after installing Sound Blaster 16, a prompt informs you: “This program sets up the Sound Blaster 16 program group window.” Select *OK*.

The setup program creates a new Windows program group and adds the program items for each of the Sound Blaster 16 applications. (The program group appears as a window, and each application is represented by an icon.)

## Adding Drivers and Applications

If you installed the Sound Blaster 16 software prior to having Windows 3.1 on your system, you must add the Sound Blaster 16 drivers and applications.

*To add Sound Blaster 16 Windows drivers and applications:*

1. From the Windows Program Manager, open the File menu and choose *Run*. The Run window appears.
2. Type **C:\SB16\INSTALL** (substitute the correct drive letter and path name if you did not use the defaults when installing) and click on *OK*.

Select Windows Setup and follow the on-screen instructions. See “Installing the Sound Blaster 16 Software” earlier in this chapter for a more complete description of the installation process.

When Windows restarts, the drivers and applications are ready to use. The applications are described in detail in Part II, “Windows Applications.” Details of the driver setup program are explained in Appendix C, “Technical Information.”

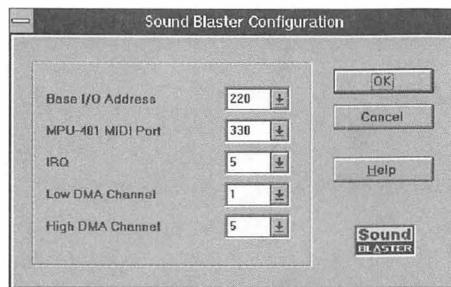


**FIGURE 3-2:** An example of a Sound Blaster 16 group

INSTALL may not install the drivers and applications properly if your SOUND and BLASTER environment lines are incorrect. You may enter the *SET* command at the DOS prompt to check the settings before you run INSTALL. (See “Sound Blaster 16 Software Installation” in Appendix C, “Technical Information,” for more information.)

You need to run INSTALL only once. If you run WINSETUP more than once, you may have one or more duplicate icons in the Sound Blaster 16 group. To remove the duplicate icons, select them one at a time and click on *Delete* in the File menu.

If you change the jumpers on Sound Blaster 16 or need to select new IRQ or DMA channel settings, use SB Configuration (Figure 3-3) in the Sound Blaster 16 group to change the settings of the Windows drivers.



**FIGURE 3-3:** Sound Blaster Configuration dialog

Changes made on the Sound Blaster Configuration dialog are written to the AUTOEXEC.BAT, CONFIG.SYS, and SYSTEM.INI files; however, you must reboot the computer before the changes take effect.

# Installing Third Party Applications

The Sound Blaster applications produced by Creative Labs work with Sound Blaster 16 automatically. Third party DOS applications (from producers other than Creative Labs) normally supply the drivers for the music and sound cards for which they are designed. Third party Windows applications use the Windows drivers when feasible.

When you are installing a new application, the program usually requests that you identify the sound card you are using. If Sound Blaster 16 appears on the list, choose it. If it is not listed, choose Sound Blaster Pro or Sound Blaster instead. If neither of those are listed, choose the Adlib Music card. (If you choose Adlib Music, the application uses Sound Blaster 16 for synthesized music, but not for digitized sound.)

If you have problems using applications you have already installed, you may need to reinstall them or run the application setup program. For information about setting up an application to work with the Sound Blaster 16 hardware settings, check the application's manual. Some applications check the settings automatically; others must be set up manually.

||

Windows  
Applications

# Creative Mixer

Creative Mixer is a Windows-based mixer that allows you to combine and manipulate sound from various audio sources. With Creative Mixer, it is possible to control the volume, tone, and gain of an audio source while running other Windows applications. You can also select and mix different audio sources during playback and recording.

## Starting Creative Mixer

*To start Creative Mixer:*

1. Double-click the Creative Mixer icon in Sound Blaster 16 group window.  
The Creative Mixer window (Figure 4-1) displays.



**FIGURE 4-1:** Creative Mixer window (LED not displayed)

## Audio Source

An Audio Source check box allows you to turn on sound from an audio source. A green dot in the box indicates a selected audio source.

There are seven Audio Source check boxes on the Mixer for the following audio sources:

- ❖ Master Control 
- ❖ Wave audio 
- ❖ MIDI audio 
- ❖ CD-audio 
- ❖ Line In 
- ❖ Microphone 
- ❖ PC Speaker 

## Recording Source

A Recording Source check box allows you to select the audio source from which you want to record. When an audio source is selected, a red dot appears in the Recording Source check box.

There are four Recording Source check boxes on the Mixer for the following audio sources:

- ❖ MIDI input 
- ❖ CD-audio 
- ❖ Line input 
- ❖ Microphone input 

## LED Display

The LED display is opened and closed from the control menu. A green dot in the LED display check box indicates that the LED Display is active.

## Volume Sliders

Vertical sliders adjust the volume and tone (bass and treble) levels of selected audio sources.

**NOTE** *Bass represents the lower range while treble the higher range of sound frequencies in the output.*

## Balance Sliders

Horizontal sliders adjust the balance of selected audio sources. Balance represents the volume, base, or treble sent to the right and left speakers.

When the slider is situated in the middle, equal distribution is given to the left and right speakers. This can be quickly achieved by double-clicking the slider.

## Control Menu

When you choose the control menu box (upper left corner of the Creative Mixer control panel), the control menu (Figure 4-2) displays listing commands for operations such as *Move* and *Restore*.

Restore	
Move	
Minimize	
Close	Alt+F4
Switch To...	Ctrl+Esc
Minimum View	Ctrl+I
• Expanded View	Ctrl+E
Custom View	Ctrl+C
✓ Title Bar	Esc
✓ LED Display	Ctrl+L
Preferences...	Ctrl+P
Recording Settings...	
Output Gain...	
Help on Creative Mixer...	
About Creative Mixer...	

**FIGURE 4-2:** Control Menu

# LED Display

The LED Display allows you to view the data of audio sources graphically.

*To invoke the LED Display:*

1. Select *LED Display* on the Control menu. The LED display appears.

With the LED display on, you can switch between the three versions:

- ❖ The *Power Spectrum* display (Figure 4-3) shows different frequency levels of the output.



**FIGURE 4-3:** Creative Mixer with the Power Spectrum display

- ❖ The *VU Meter* display (Figure 4-4) shows the intensity of the sound entering both the left and right speakers.



**FIGURE 4-4:** Creative Mixer VU Meter display

- ❖ The *Scope* display (Figure 4-5) shows the combined amplitude of waves from the selected audio sources.

**NOTE** *LED displays are not available during the playback or recording of wave files.*



**FIGURE 4-5:** Creative Mixer Scope display

## Creative Mixer Controls

Creative Mixer can be controlled using the mouse or keyboard.

### *Mouse Control*

- ◆ To select a check box, click on it with your left mouse button.
- ◆ To adjust the slider bar, click on it and hold down the mouse button as you drag it to the desired position

### *Keyboard Control*

- ◆ To display the control menu, press the F10 key.
- ◆ To advance from one option to another, press the TAB key.
- ◆ To move to the previous option, press the SHIFT+TAB keys.
- ◆ To select an option in a check box, press the SPACEBAR.
- ◆ To adjust the volume, tone, or gain of audio sources, use the UP or DOWN arrow key.
- ◆ To toggle the title bar, press the ESC key.

## Recording Sources

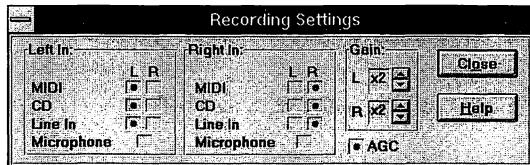
You can select recording sources by choosing the check box for the audio source(s). Or, you can use the Recording Settings dialog to select the audio source(s) for recording.

*To select a recording source:*

1. Select *Recording Settings* from the Control menu. The Recording Settings dialog (Figure 4-6) displays.
2. Select the audio source for recording from Left In and Right In.

For stereo recording, the left signal (L) of the audio source must be directed to the Left In channel and the right signal (R) to the Right In channel.

3. Use the Gain settings to amplify the level of either channel and the AGC (automatic gain control) to automatically adjust input from the microphone.



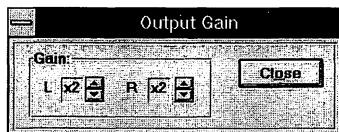
**FIGURE 4-6:** Recording Settings dialog

4. Choose *Close*.

## Output Gain

*To control the output gain:*

1. Select *Output Gain* from the Control menu. The Output Gain dialog (Figure 4-7) displays.



**FIGURE 4-7:** Output Gain dialog

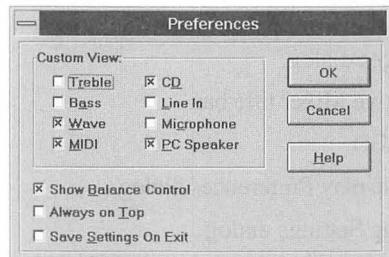
2. Change the gain setting of the left and right output channels to the desired level—click the up or down arrows in the L and R boxes.
3. Choose *Close* to close the Output Gain dialog.

# Customizing Creative Mixer

You can customize the appearance of Creative Mixer by selecting a view from the Control menu. The three choices for customizing the Mixer are:

- ❖ *Minimum* displays the master volume control only.
- ❖ *Expanded* displays all of the controls.
- ❖ *Custom* displays the customized controls only.

If you want to choose the controls to display with the Custom View setting, select *Preferences* on the Control menu.



**FIGURE 4-8:** Custom View Preferences dialog

The Preferences dialog options include:

- ❖ *Show Balance Control* displays or hides the balance sliders.
- ❖ *Always on Top* displays Creative Mixer as the topmost window.
- ❖ *Save Settings on Exit* saves all changes made to settings.

# Quitting Creative Mixer

*To quit Creative Mixer:*

1. Select *Close* from the Control menu.

Alternatively, double-click the Control menu box (in the upper left corner of the Creative Mixer control panel).

# Creative Mixer Control Menu

<b>Command</b>	<b>Description</b>
Restore	Returns Mixer control panel to previous size.
Move	Prepares Mixer control panel for repositioning.
Minimize	Reduces Mixer control panel to an icon.
Close	Close the Creative Mixer.
Switch To...	Switches to other active applications.
Minimum View	Reduces Creative Mixer to master volume control.
Expanded View	Displays complete set of controls including LED.
Custom View	Display Creative Mixer control panel in configuration specified on Preferences dialog.
Title Bar	Display/remove Creative Mixer title bar.
LED Display	Display/remove the LED.
Preferences	Displays the custom display Preferences dialog.
Recording Settings...	Displays the Recording Settings dialog.
Output Gain...	Displays the Output Gain dialog.
Help on Creative Mixer...	Displays the Help utility.
About Creative Mixer	Displays copyright information.

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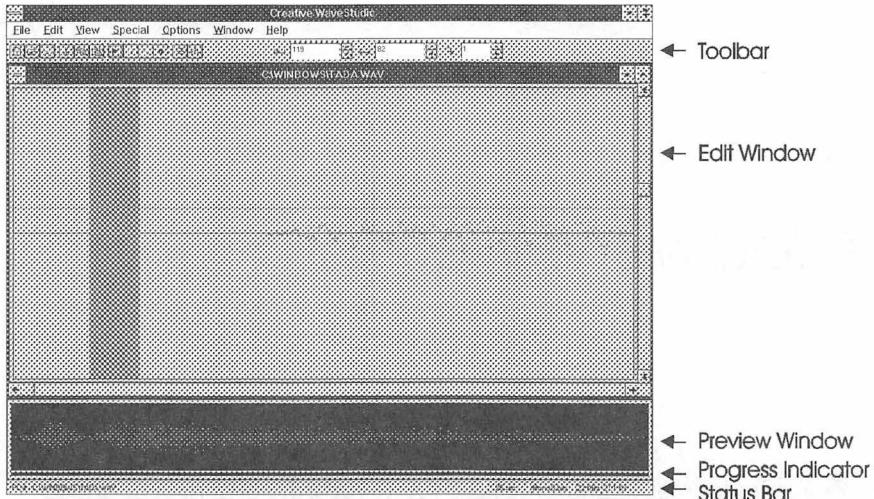
# Creative WaveStudio

WaveStudio makes it possible for you to record, play, and edit *wave forms*, a graphic representation of recorded sound. You can cut or copy a segment of a wave form and paste it back into the wave form at a different location—or cut or copy a segment of one wave form and paste it into another. You can reverse a wave form, add an echo to it, fade it in and out, change its volume, and even create “rap” effects.

## Sound Basics

Sound is represented visually by *sine waves*. A *sine wave* displays the *frequency* and *amplitude* of the sound. *Frequency* is the number of vibration cycles per second and determines the pitch or timbre of a sound; the higher the number of cycles, the higher the pitch. *Amplitude*, represented by the height of the sine wave, determines the volume or loudness of a sound; the greater the height of the sound waves, the louder the sound.

A WaveStudio wave form represents an *analog* sound as a continuous sine wave, a line. A *digitized* sine wave is translated to a series of dot patterns that resemble the shape and size of an analog sine wave line. *Sampling* is the process of converting an analog wave form to a digitized wave form. The *sampling rate* is the number of times the translator, such as Sound Blaster 16, looks at a sound to create a digitized sound wave



**FIGURE 5-1:** WaveStudio screen

image. For example, recording sound at 4 kHz creates 4,000 digitized images or samples of the sound wave in one second.

WaveStudio allows you to record at sampling rates of 11 kHz to 44.1 kHz. The sampling rate determines the quality level of the recording: The higher the sampling rate, the better the sound. For example, CD audio is high quality and has a sampling rate of 44 kHz at 16 bits.

# Starting WaveStudio

The WaveStudio icon is installed, by default, in the Sound Blaster 16 group window.

*To start WaveStudio:*

1. Double-click the WaveStudio icon.

The WaveStudio window similar to Figure 5-1 appears.

The WaveStudio interface has four main elements:

- ❖ Toolbar
- ❖ Edit Window
- ❖ Preview Window
- ❖ Status Bar

## Toolbar

The Toolbar is comprised of several buttons and boxes for initiating and controlling wave form operations.



**FIGURE 5-2:** WaveStudio Toolbar

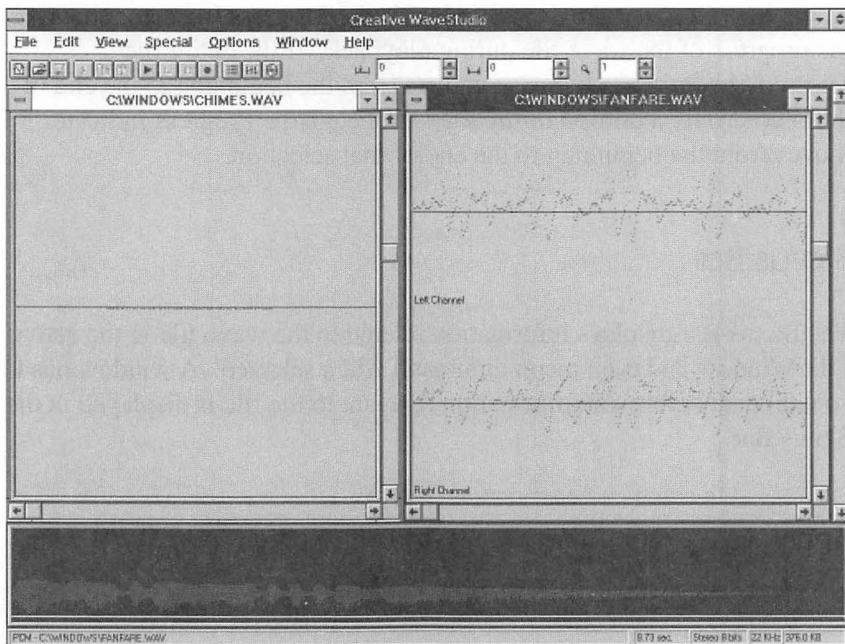
	Opens a new window containing no data.
	Opens an existing wave file.
	Saves the active wave file.
	Cuts the selected data of the wave file.
	Copies the selected data of the wave file.

	Pastes cut or copied data onto the wave file.
	Plays the wave file that is currently active in WaveStudio.
	Stops the playback of a wave file.
	Pauses/resumes the playback of a wave file.
	Records a wave file.
	Sets the default recording format.
	Activates the Creative Mixer.
	Activates the CD player. (This button will only appear if you have a CD-ROM drive installed.)
	Displays the starting position of the wave data selection. You can specify the position by typing a numerical value in the text box or use the scroll arrows to select the starting position.
	Displays the size of the wave data selection. You can type the size in the text box or use the scroll arrows to increase or decrease the size.
	Displays the zoom ratio of the wave file displayed. You can type the ratio in the text box or use the scroll arrows to increase or decrease the ratio. The smaller the value, the larger the magnification.

## Edit Window

The Edit Window is the area in which the content of a wave file is displayed. You can open several Edit Windows at a time and display them in cascades, vertical or horizontal tiles, or as icons. This allows you to perform editing functions such as copying data from one file to another easily and quickly.

For a better view of the data displayed in the Edit Window, use the horizontal scroll bar to select the data for viewing and the vertical scroll bar to zoom into (or out of) the data.



**FIGURE 5-3:** WaveStudio screen with two open Edit Windows—the Edit Window on the right is active and its entire wave form is shown in the Preview Window

## Preview Window

The Preview Window displays the entire wave data in the current active Edit Window. When you place your mouse cursor in the Preview Window, the arrow changes to the zoom icon. You can also select a portion of the file for editing in the Preview Window.

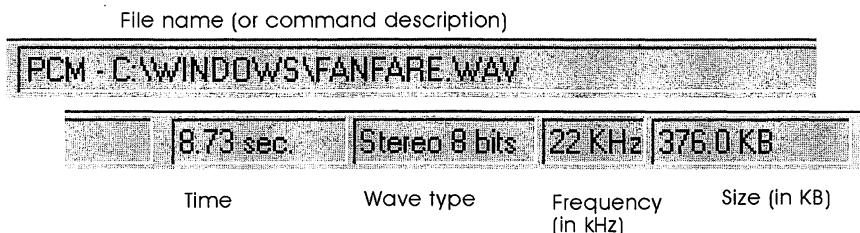


**FIGURE 5-4:** Preview Window with Progress Indicator at bottom

At the bottom of the Preview Window is the Progress Indicator showing the progress of the wave file during playback. If the entire file is selected, the Progress Indicator moves from the beginning to the end of the file. If only a portion of the file is selected, the Progress Indicator moves from the beginning to the end of that selection.

## Status Bar

The Status Bar displays information related to the wave file in the active Edit Window and each menu command when selected. A window has to contain data before the information relevant to the file is displayed in the Status Bar.



**FIGURE 5-5:** Status Bar

# Using the Mouse

A wave file or a portion of a wave file can be selected for editing by using the mouse.

*To select a portion of the data:*

Hold down the left mouse button anywhere on the Edit Window and drag the mouse. Once the desired portion of the data has been selected, release the left mouse button.

*To select the entire data:*

Double-click the wave data in the Edit Window.

*To select data from a specific position back to the beginning of the data:*

Hold down the left mouse button at the specific position and drag the mouse above the Edit Window.

*To select data from a specific position to the end of the data:*

Hold down the left mouse button at the specific position and drag the mouse below the horizontal scroll bar.

# WaveStudio Menus

WaveStudio has seven menus: File, Edit, View, Special, Options, Window, and Help. In addition, there is a context-sensitive menu that you can activate by clicking the right button of your mouse.

## File Menu

The File menu contains the following commands:

Command	Description
New	Creates a new window without data.
Open	Loads an existing wave file.
Close	Closes an open wave file.
Close All	Closes all open wave files.
Save	Saves changes made to the wave file.
Save As	Saves the wave file with a new name.
Save All	Saves all open wave files.
Exit	Quits WaveStudio.

WaveStudio keeps a record of the last four wave files you have opened by displaying them on the File menu after the *Exit* command. To open any of the files, select the file with the left mouse button.

## Edit Menu

The Edit menu contains the following editing commands:

Command	Description
Undo	Restores the wave file to the state last saved.
Cut	Copies and then removes the selected portion of the wave data.
Paste	Pastes cut or copied wave data into the Edit Window. If you have selected a portion of the data, that portion is replaced. Otherwise, Wave Studio pastes the data at the cursor.

<b>Command</b>	<b>Description</b>
Paste Mix	Mixes cut or copied wave data with the one in the Edit Window. When you play the wave file, you will hear both sounds together.
Delete	Deletes a selected portion of the data. Unlike the Cut command, the data is not copied first.
Crop to Selection	Deletes the entire data except the portion selected.
Select All	Selects the entire wave file in the Edit Window. You can also do this by double-clicking the mouse anywhere within the Edit Window.

## View Menu

The following commands on the View menu allow you to customize the WaveStudio workspace:

<b>Command</b>	<b>Description</b>
Preview	Toggles the Preview Window on or off.
Toolbar	Toggles the Toolbar on or off.
Status Bar	Toggles the Status Bar on or off.
Fit Wave In Window	Scales (adjusts the zoom ration) the wave display to fit the size of the Edit Window.
Actual Size	Resets the zoom ration of the wave display in the Edit Window to its actual size (1:1).
Cursor Position	Displays the wave file at the starting position of the wave selection.
Cursor End	Displays the wave file at the ending position of the wave selection.
Zoom	Zooms into the portion of the wave file selected. (Select a portion before using this function.)

## Special Menu

The commands on the Special menu allow you to add special effects to wave files. These commands are:

<b>Command</b>	<b>Description</b>
Reverse	Reverses the playback of the entire or selected portion of the wave file. For stereo files, there are options for reversing either channel.
Add Echo	Adds echo effect to the entire or selected portion of the wave file. For stereo files, there are options for adding echo to either channel.
Invert Waveform	Inverts the wave data for the entire or selected portion of the wave file. For stereo files, there are options for inverting either channel.
Rap!	Repeats the selected portion of the wave file.
Insert Silence	Inserts silence into the portion of the wave file selected.
Force to Silence	Silences the portion of the wave file selected. For stereo files, there are options for silencing either channel.
Fade In	Fades into the entire or selected portion of the wave file. For stereo files, there are options for fading either channel.
Fade Out	Fades out the entire or selected portion of the wave file. For stereo files, there are options for fading either channel.
Swap Channels	Swaps the entire or selected portion of the wave file between the left and right channels. For stereo files only.
Pan Left to Right	Pans the entire or selected portion of the wave file from left to right. For stereo files only.
Pan Right to Left	Pans the entire or selected portion of the wave file from right to left. For stereo files only.
Phase Shift	Shifts one channel of the entire or selected portion of the wave file to the right, causing a delay during playback. For stereo files only.
Convert Format	Converts the entire wave file between monaural and stereo, 8- and 16-bit frequencies.
Modify Frequency	Modifies the frequency (playback rate) of the entire wave file.
Amplify Volume	Changes the volume level of the entire or selected portion of the wave file.

## Options Menu

The following commands on the Options menu allow you to change WaveStudio's default settings:

<b>Command</b>	<b>Description</b>
Record Settings	Sets the default record settings.
Mixer Settings	Launches Creative Mixer.
Customize Colors	Customizes WaveStudio's display colors.
Display in Bytes	Displays wave selection information in bytes.
Display in Samples	Displays wave selection information in samples.
Display in Milliseconds	Displays wave selection information in milliseconds.
Always on Top	Toggles WaveStudio as the topmost window.

---

## Window Menu

The commands on the Window menu allow you to organize the Edit Windows when several wave files are open. For more information regarding these commands, refer to your Microsoft Windows manual.

## Help Menu

The descriptions of the commands on the Help menu are:

<b>Command</b>	<b>Description</b>
Contents	Displays contents for WaveStudio Help.
Search for Help on	Searches for a topic in WaveStudio Help.
System Info	Displays information about Windows and your system such as CPU and available memory.
About WaveStudio	Opens a window displaying copyright information.

## Context-Sensitive Menu

The context-sensitive menu appears when you click the right mouse button in the Edit Window. The commands that appear on the menu depend on the content of the Edit Window. The commands include:

<b>Command</b>	<b>Description</b>
Play	Plays the entire or selected portion of the wave file in the Edit Window.
Record	Records the wave file. If the current active window in the Edit Window is an open file, the content in the open file will be replaced by the recorded file.
Stop	Stops the playback of a wave file.
Mixer Settings	Launches Creative Mixer.
Fit Wave in Window	Scales (adjusts the zoom ratio) the wave display to fit the size of the Edit Window.
Actual Size	Resets the zoom ration of the wave display in the Edit Window to its actual size (1:1).
Cursor Position	Displays the wave file at the starting position of the wave selection.
Zoom	Zooms into the portion of the wave file selected.
New	Creates a new window.
Open	Loads an existing wave file.
Save	Saves changes made to the wave file.

# Working with Wave Files

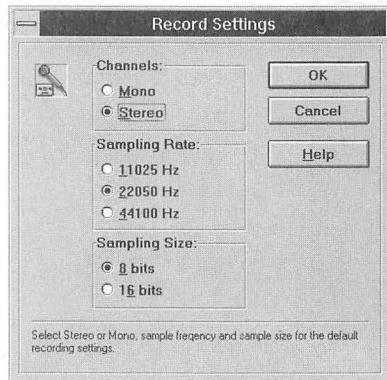
WaveStudio's interface makes working with wave files easy. The information that follows explains how to specify the format for wave files, and open, save, and mix wave data.

## Specifying Wave Formats

Before recording a wave file, you need to ensure the format of the file is specified correctly. Wave format refers to the sound channel and sampling rate and size of the file.

*To specify the wave format:*

1. Select Record Settings from the Options menu. The Record Settings dialog (Figure 5-6) appears.



**FIGURE 5-6:** Record Settings dialog

2. Select the format for the wave file.
  - ◆ Select *Mono* (monaural) for one sound channel and *Stereo* for two sound channels.
  - ◆ Select *11025 Hz* for voice, *22050 Hz* for cassette, and *44100 Hz* for CD-quality recording.
  - ◆ Select *8 bits* for cassette and *16 bits* for CD sound quality.
3. Choose *OK*.

There is a correspondence between the quality of a wave file and the amount of storage space required for the file. A wave file with better sound quality requires a larger storage space because of its high sampling rate.

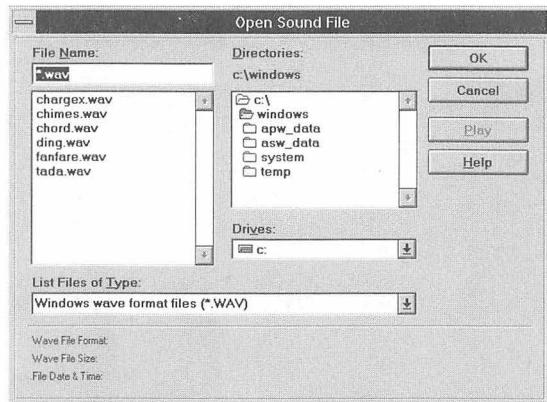
## Opening Wave Files

You can open existing wave files using the *Open* command from the File menu or the drag-and-drop method.

*To use the Open command:*

1. Select *Open* from the File menu.

The Open Sound File dialog similar to Figure 5-7 appears:



**FIGURE 5-7:** Open Sound File dialog

2. Select the file you wish to open from the File Name list. (You may have to specify the directory in which your file (.WAV) resides. To listen to the playback of the selected wave file, choose *Play*.)
3. Choose *OK*.

**NOTE** If you select a file with raw data (.RAW) or Creative's Voice format (.VOC), you are prompted to confirm the conversion of the file to .WAV format.

*To use the drag-and-drop method:*

1. Start File Manager and open the directory containing the wave file.
2. Arrange the windows to display both the file and the WaveStudio window.
3. Hold down the left mouse button as you drag the file into the WaveStudio window. The drag-and-drop icon appears while you are dragging the file.
4. Drop the file by releasing the mouse button. The file opens automatically.

You can open multiple files by using drag-and-drop: Hold down the SHIFT key and click on the files in the File Manager.

## Recording Wave Files

WaveStudio allows you to record new or over existing wave files.

*To record a new file:*

1. Choose *New* on the Toolbar.
2. Choose *Record* on the Toolbar. The New Recording dialog (Figure 5-8) displays.



**FIGURE 5-8:** New Recording dialog

3. Ensure the settings in the dialog are specified correctly.
  - ◆ Check the recording level in the Recording Level box. If the level is too low or high, adjust it using the Mixer button.

- ◆ Check the path and file name created in the Record To File group box. You can change the file name and directory by using the Browse button.
- ◆ Check the recording format shown at the bottom of the dialog. You can change the format by choosing the Settings button.
- ◆ Check your system's storage space shown at the bottom of the dialog. If there is insufficient storage space for your file, free up more disk space or choose another drive before recording the file.

4. Choose *Start*.

**NOTE**

*If you have a CD-ROM drive installed, you can choose the CD Player button to launch the CD player. Also, you can select the CD Sync check box to synchronize the start of the recording and playback of audio CDs.*

*To record over an existing file:*

1. Activate the file over which you want to record.
2. Choose *Record* on the Toolbar. The Record Over dialog (Figure 5-9) appears.



**FIGURE 5-9:** Record Over dialog

3. Choose *Start*.

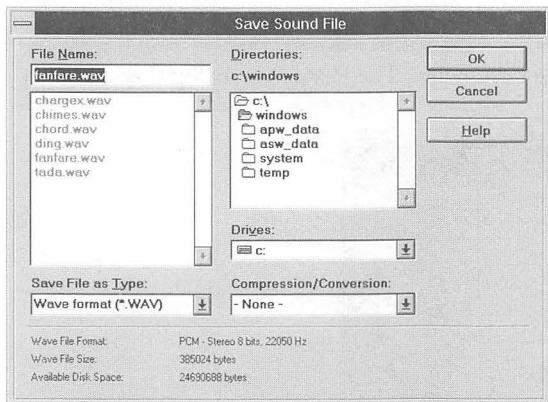
# Saving Wave Files

*To save a wave file:*

1. Choose *Save* on the Toolbar or select *Save* from the File menu.
2. Enter the name of the file and the path if prompted.
3. Choose *OK*.

*To save a wave file with a new name or format:*

1. Select *Save As* from the File menu. The Save Sound File dialog (Figure 5-10) displays.



**FIGURE 5-10:** Save Sound File dialog

2. Enter a new name for the file and the path if prompted.
3. Select the desired file format and compression method from the Save File as Type and Compression/Conversion drop-down list boxes respectively.
4. Choose *OK*.

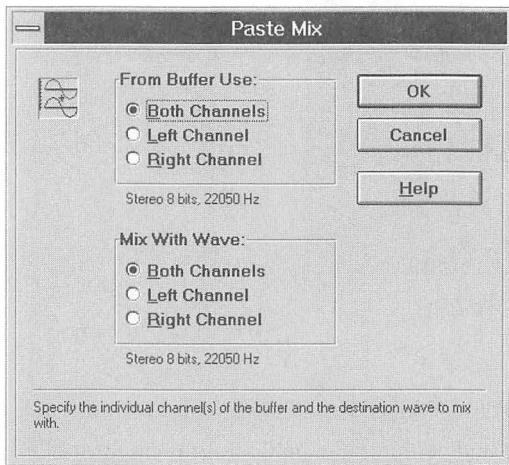
**NOTE** *Compression is not available for 8-bit files. Also, you can convert a wave file to a different format by selecting PCM Conversion from the Compression/Conversion list.*

## Mixing Data of Wave Files

When you mix the data of two wave files, you are actually adding the data of one file to another to create a new file. After mixing, you can play back the new file to hear the new sound generated.

*To mix the data contents of two wave files:*

1. Activate the first (source) file and select the desired portion of the data for mixing.
2. Select *Copy* from the Edit menu. The data copied is stored in a buffer.
3. Activate the second (target) file and select the location to which you want the copied data to be mixed.
4. Select *Paste Mix* from the Edit menu. The Paste Mix dialog (Figure 5-11) displays.



**FIGURE 5-11:** Paste Mix dialog

5. Select the desired channel(s) for copying data from the source file in the From Buffer Use box and for mixing data with the target file in the Mix With Wave box.
  - ◆ Select *Mono Channel* for monaural file.
  - ◆ Select *Left Channel*, *Right Channel*, or both channels for stereo file.
6. Choose *OK*.

If a portion of the target file is not selected, the data is mixed at the cursor position. If a portion of the target file is selected, the copied data in the buffer is mixed with the portion selected.

**NOTE** *You cannot mix 8-bit with 16-bit wave data. However, you can convert both files to the same sampling size, either 16-bit or 8-bit, before mixing them.*

## Adding Special Effects

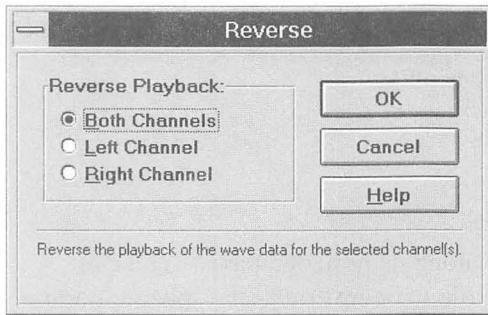
WaveStudio allows you to enhance your wave files with special effects from the Special menu. These effects include Reverse, Add Echo, Invert Waveform, Rap!, Insert Silence, Force to Silence, Fade In and Fade Out, Swap Channels, Pan Left to Right and Pan Right to Left, Phase Shift, convert Format, Modify Frequency, and Amplify Volume.

### Reverse

This effect reverses the sequence of the data in the wave file such that the sound is played from the end to the beginning. You can specify a selected portion of the file to be reversed. If a portion of the file is not selected, the entire file is reversed.

*To reverse a file:*

1. Select Reverse from the Special menu. The Reverse dialog (Figure 5-12) displays.



**FIGURE 5-12:** Reverse dialog

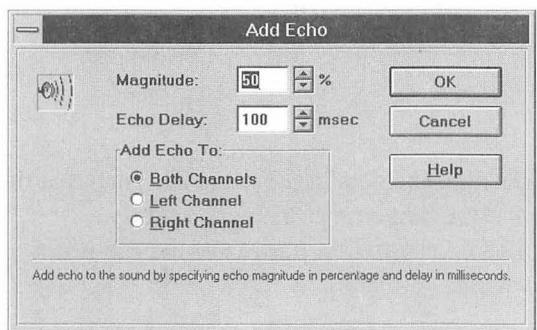
2. Select the desired channel(s): Select *Left Channel*, *Right Channel*, or both channels for a stereo file. (No options are available for editing a monaural file.)
3. Choose *OK*.

## Add Echo

This effect adds echo to the sound file. You can create a metallic sound by continually applying echo to the same wave file until you achieve the desired result.

*To add echo to a file:*

1. Select *Add Echo* from the Special menu. The Add Echo dialog (Figure 5-13) displays.



**FIGURE 5-13:** Add Echo dialog

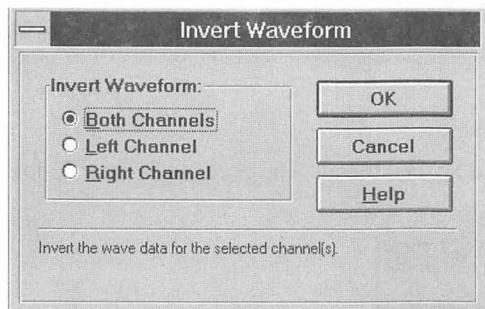
2. Enter the echo magnitude (loudness of the echo) in the Magnitude box.
3. Enter the delay (time between sound and echo) in the Echo Delay box.
4. Select the desired channel for stereo file.
5. Choose *OK*.

## Invert Waveform

This effect inverts the wave file along its horizontal axis. You can specify a selected portion of the file to be inverted. If a specific portion of the file is not selected, the entire file will be inverted. To create an unusual effect, invert only one channel of a stereo file.

*To invert a file:*

1. Select *Invert Waveform* from the Special menu. The Invert Waveform dialog (Figure 5-14) displays.



**FIGURE 5-14:** Invert Waveform dialog

2. Select the channel(s): *Left Channel*, *Right Channel*, or *Both Channels* for stereo wave file. (No options are available for editing a monaural file.)
3. Choose *OK*.

Rap!

Rap! repeats the selected portion of the wave file, creating a jerky or stuttering effect.

*To repeat a selection:*

1. Select a portion of the file.
2. Select *Rap!* from the Special menu.

Insert Silence

This feature inserts silence into a selected portion of the wave file.

*To insert silence into a file:*

1. Select a portion of the wave file. (The length of the silence depends on the length of the portion selected.)
2. Select *Insert Silence* from the Special menu.

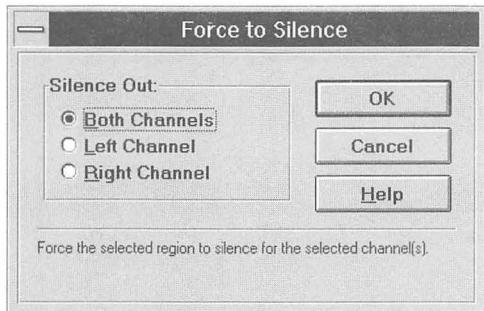
A straight line represents the silence inserted into the selected portion.

## Force to Silence

This feature mutes the selected portion of the wave file—the selected portion is not heard during playback.

*To mute a file:*

1. Select a portion of the file.
2. Select *Force to Silence* from the Special menu. The Force to Silence dialog (Figure 5-15) displays.



**FIGURE 5-15:** Force to Silence dialog

3. Select the desired channel(s): *Left Channel*, *Right Channel*, or *Both Channels* for stereo wave file. (No options are available for editing a monaural file.)
4. Choose *OK*.

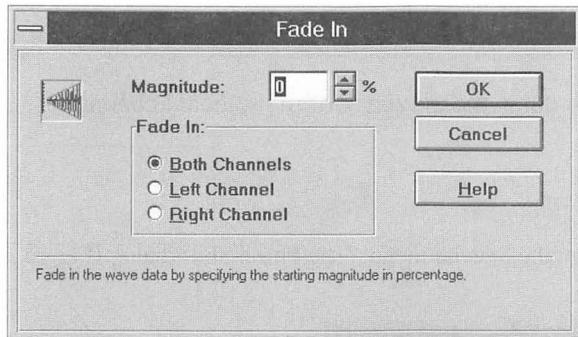
A straight line represents the silence replacing the selected portion.

## Fade In and Fade Out

You can create a fading in (soft to loud) or fading out (loud to soft) effect for your wave files.

*To use Fade In (or Fade Out):*

1. Select Fade In from the Special menu. The Fade In dialog (Figure 5-16) displays.
2. Enter the starting magnitude in the Magnitude box.
3. Select the desired channel(s) for stereo files.



**FIGURE 5-16:** *Fade In dialog*

4. Choose *OK*.

**NOTE** For *Fade In*, the file is linearly faded in from the starting magnitude (volume) to a 100 percent magnitude. For *Fade Out*, the file is linearly faded out from a 100 percent magnitude (volume) to the ending magnitude.

### Swap Channels

This feature switches the entire or selected portion of wave data between the left and right channels—only applicable to stereo files.

*To swap the channels of a wave:*

1. Select *Swap Channels* from the Special menu.

### Pan Left to Right and Pan Right to Left

The *Pan Left to Right* effect pans the data of wave files from the left to the right channel. The *Pan Right to Left* effect pans the data from the right to the left channel. This feature is useful if you want to simulate the movement of a sound source from one end of the sound stage to the other.

*To use *Pan Left to Right* (or *Pan Right to Left*):*

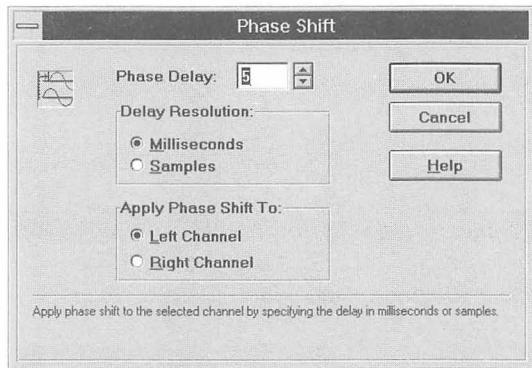
1. Select *Pan Left to Right* from the Special Menu

## Phase Shift

This effect allows you to delay the playback of the selected channel of stereo wave files.

*To create a phase shift effect:*

1. Select *Phase Shift* from the Special menu. The Phase Shift dialog (Figure 5-17) appears.



**FIGURE 5-17:** Phase Shift dialog

2. Select the desired measurement unit from the Delay Resolution box.
3. Enter the desired delay in the Phase Delay box.
4. Choose the desired channel from the Apply Phase Shift To box.
5. Choose *OK*.

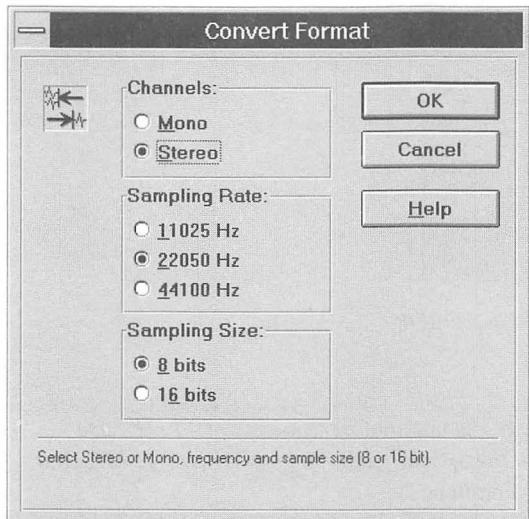
You can convert a monaural wave file to stereo by applying this effect, giving the converted monaural file a pseudo-stereo effect.

## Convert Format

This effect allows you to convert between monaural and stereo files, 8-bit and 16-bit files, and different frequencies.

*To convert the format of a file:*

1. Select Convert Format from the Special menu. The Convert Format dialog (Figure 5-18) displays.



**FIGURE 5-18:** Convert Format dialog

2. Select the desired channel from the Channels box.
3. Select the desired sampling rate and size from the Sampling Rate and Sampling Size boxes respectively.

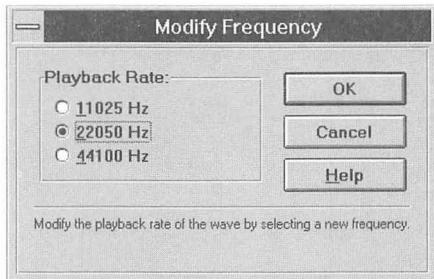
**NOTE** *Conversion is a complex process and may take a long time to complete depending on the size of the file.*

### Modify Frequency

You can modify the frequency (playback rate) of wave files by selecting from three fixed frequencies: 11 kHz, 22 kHz, or 44 kHz. Selecting a higher frequency results in a faster playback while a lower frequency results in a slower playback. This effect is applied to the entire file.

*To modify the frequency of a file:*

1. Select *Modify Frequency* from the Special menu. The Modify Frequency dialog (Figure 5-19) displays.
2. Select the desired frequency.
3. Choose *OK*.



**FIGURE 5-19:** *Modify Frequency dialog*

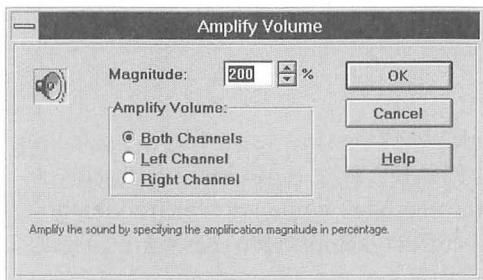
**NOTE** *If your file is already at the maximum frequency of 44 kHz, use Convert Format from the Special menu to convert it to 22 kHz first before using Modify Frequency.*

### Amplify Volume

This feature allows you to change the volume of wave files, either the entire or a selected portion of the wave file.

*To change the volume of a file:*

1. Select *Amplify Volume* from the Special menu. The Amplify Volume dialog (Figure 5-20) displays.



**FIGURE 5-20:** *Amplify Volume dialog*

2. Enter the magnitude in the Magnitude text box.
3. Select the desired channel(s).
4. Choose *OK*.

# Customizing WaveStudio

WaveStudio allows you to customize the default settings for recording, Creative Mixer, and the display color of the WaveStudio interface.

## Recording

When you customize the record settings, future recordings of wave files will be based on those settings.

*To customize the record settings:*

1. Select *Record Settings* from the Options menu. The Record Settings dialog (Figure 5-2) displays.
2. Specify the desired settings.
3. Choose *OK*.

## Creative Mixer

*To adjust the settings for Creative Mixer:*

1. Choose *Mixer* on the Toolbar. Creative Mixer appears.
2. Specify the desired settings.

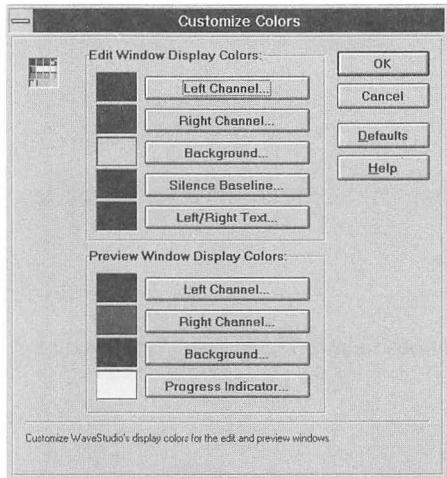
**NOTE** *For more information on using the Mixer, refer to Chapter 4, "Creative Mixer" in this document.*

## Display Color

You can customize the display color of both the Edit and Preview Windows. WaveStudio also allows you to reset the colors of both windows to their default color scheme.

*To customize the display color:*

1. Select *Customize Colors* from the Options menu. The Customize Colors dialog (Figure 5-21) displays.



**FIGURE 5-21:** *Customize Colors dialog*

2. Select the display element(s) you want to customize in the Edit Window Display Colors and Preview Window Display Colors boxes. A color dialog appears.
3. Select the color you want.
4. Choose *OK*.

*To restore the display element(s) to the original color scheme:*

1. Choose *Defaults*.

# Using WaveStudio Effectively

To use WaveStudio effectively, you need to know the amount of memory needed to run WaveStudio, how to manage your files, and how to work with compressed files.

## Memory Requirements

WaveStudio requires about 1 MB of memory. The memory requirement increases when you playback or record wave files—sufficient memory is needed for the buffers. Run WaveStudio on at least a 386-based system with 4 MB of RAM and Windows 3.1.

When you open a file for editing, WaveStudio allocate a certain amount of memory for storing the necessary information and does not load the entire file into memory. The file is edited directly from your hard disk—you can edit files as large as your hard disk can hold.

## File Management

This section explains how you can optimize your system for speed and manage your wave files effectively.

### System Optimizing

When you record wave data, WaveStudio will store recorded data directly to the hard disk. High resolution recording of data, particularly 16-bit data at 44 kHz, would take longer to write to your disk if it is not optimized for speed.

You can reduce the amount of time your system spends reading and writing data by compacting your hard disk using a disk-compacting utility such as DEFrag and installing a hard disk cache such as SMARTDrive.

## Number of Open Files

WaveStudio does not limit the number of files you can open, but the number of open files depends on how your operating system is configured. For more information, consult your operating environment's documentation.

## Use of DOS SHARE Utility

Use the DOS SHARE utility to allow proper file sharing and locking. SHARE prevents you from accidentally deleting a file while WaveStudio is accessing it. For more information on how to use this utility, consult your DOS documentation.

## Compressed Wave Files

To work effectively with compressed wave files, you need to know how compressed files are opened and edited.

### Opening Compressed Files

WaveStudio currently supports five compression formats: Microsoft ADPCM, CCITT A-Law, CCITT  $\mu$ -Law, IMA/DVI ADPCM, and Creative ADPCM.

When you open a compressed wave file, WaveStudio decompresses the file before displaying it. The file must reside on a drive that has sufficient disk space to accommodate the uncompressed data.

The amount of space required depends on the compression format adopted. For CCITT A-Law and  $\mu$ -Law, the compression ratio is 1:2 (compressed:uncompressed). For ADPCM, the ratio is 1:4. For example, if you are working with a 1 MB ADPCM file, you need to have at least 4 MB of free disk space.

## Editing Compressed Files

When you open a compressed wave file for editing, WaveStudio automatically compresses the file when you save it. This can be time consuming for large files. Save your work as an uncompressed wave (PCM) file first. Once you have finished editing, save the file with the desired compression format.

## Using CD Sync

CD Sync allows you to synchronize the start of the recording and playback of audio CDs. This option is only available if you have a CD-ROM drive installed in your system.

If you have mistakenly placed a CD-ROM disk in your drive, the program informs you of the error. But the recording will continue. To stop the recording, choose *Stop* on the Toolbar. Insert the correct audio CD and then choose *Record* on the Toolbar to record over your file. If you do not want the CD Sync option, uncheck it before proceeding with the recording.

## Quitting WaveStudio

*To quit WaveStudio:*

1. Select *Exit* from the File menu.

If changes to the file have not been saved, a dialog prompts you to save the changes.

# Creative EnsembleAV

**C**reative EnsembleAV is a set of on-screen control panels for audio components. The EnsembleRemote is a multi-control interface that resembles the remote control of a stereo hi-fi system. You can use the EnsembleRemote to play audio through different devices individually or concurrently. And, for more direct control, you can display a control panel for each of three audio devices.

The Creative EnsembleAV set of audio control panels consists of:

- ❖ EnsembleRemote: Controls any of the other three devices.
- ❖ EnsembleCD: Controls a CD-ROM drive playing audio CDs.
- ❖ EnsembleWave: Controls the recording and playback of wave (.WAV) files.
- ❖ EnsembleMIDI: Controls the playback of MIDI (.MID) files.

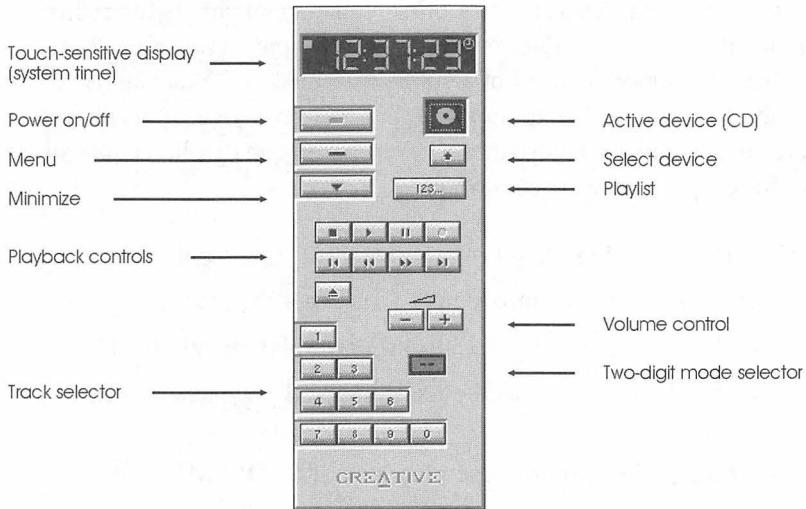
# EnsembleRemote

You can use the EnsembleRemote to control the EnsembleCD, EnsembleWave, and EnsembleMIDI. However, the remote control only allows you to control one at a time.

## Starting EnsembleRemote

*To start EnsembleRemote:*

1. Double-click the EnsembleRemote icon in your Sound Blaster 16 group window. The EnsembleRemote interface (Figure 6-1) displays.

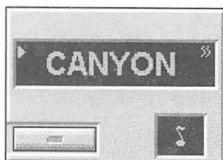


**FIGURE 6-1:** EnsembleRemote interface with EnsembleCD the active device and the system time in the touch-sensitive display

## Touch-Sensitive Display

The touch-sensitive display allows you to change the LED-like window to show:

- ❖ Current system time
- ❖ Title of the current playlist
- ❖ Title of the current track

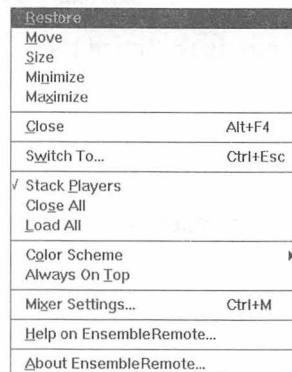


**FIGURE 6-2:** EnsembleRemote with EnsembleMIDI active and the current track in the touch-sensitive display

## Menu Button



The Menu button displays the control menu listing the commands available from EnsembleRemote.



**FIGURE 6-3:** EnsembleRemote control menu

## Minimize Button



The Minimize Button minimizes the EnsembleRemote to an icon.

## Active Device

The icon of the active device is displayed. You can click on the icon to display the icons of available devices.



(a)



(b)



(c)

**FIGURE 6-4:** Active device icons: (a) EnsembleCD, (b) EnsembleWave, (c) EnsembleMIDI

## Invoke Player Button

The Invoke Display button displays the icons for the three devices available.



(a)



(b)



(c)

**FIGURE 6-5:** *Invoke Display icons: (a) EnsembleCD, (b) EnsembleWave, (c) EnsembleMIDI*

## Playlist Button



The Playlist button allows you to compile the desired tracks/sound files for playing through the Playlist dialog.

## Playback Control Buttons

The Playback Control buttons allow you to perform the playback operations on the active player.



Stops the track/sound file.



Plays the track/sound file.



Pauses the track/sound file.



Records sound from a selected source; EnsembleWave only.



Plays the previous track/sound file.



Rewinds the track/sound file.



Forwards the track/sound file.

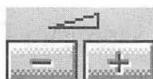


Plays the next track/sound file.



Loads or unloads the CD; EnsembleCD only.

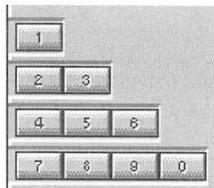
## Volume Control Buttons



The Volume Control buttons decrease and increase the volume.

## Track Selector

The track selector consists of buttons that you can press to select a track/sound file in the playlist. For example, to play track/sound file two, press button 2.



## Two-Digit Mode Selector



The Two-Digit Mode Selector allows you to select a track/sound file number above ten in the playlist. When the icon is highlighted, the track selector accepts only two-digit entries.

## Power Off Button



The Power Off button allows you to quit the EnsembleRemote.

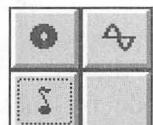
## Activating an Audio Device

Before you can control an audio device with the EnsembleRemote, you need to activate the device's control panel.

*To activate a device:*

1. Choose the Invoke Display button on EnsembleRemote..
2. Choose the button of the player you want to activate.

The selected device becomes active and its icon appears in the active device display.



## Playing Tracks/Sound Files

You can use EnsembleRemote control buttons to play tracks/sound files from the playlist for the current audio device. You can also select a track and play it using the track selector.

*To play a track/sound file using the track selector:*

1. Choose the two-digit mode selector for track numbers ten and above.
2. Choose the button(s) from the track selector that correspond to the track(s) you want to play.

**NOTE** *If you choose a track number that does not exist, the last track in the playlist is selected.*

## Compiling a Playlist

You can compile a playlist by choosing the Playlist button. The Playlist dialog allows you to create a new playlist, and add, delete, and rearrange tracks/sound files.

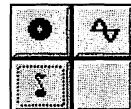
**NOTE** *For more information, refer to the playlist section for the specific device.*

## Selecting an Audio Device

You can select a device to perform operations such as playing tracks in random order and previewing the beginning of each track in the playlist. You can control the current device with EnsembleRemote.

*To select a device:*

1. Choose the Invoke Player button to display the device icons.
2. Choose the button for the audio device.



Alternatively, to display the controller for the selected device, double-click the active device icon.

# Using the Keyboard with EnsembleRemote

You can use the keyboard to perform operations from EnsembleRemote.

Key	Action
<b>A</b>	Pauses the track/sound file.
<b>B</b>	Plays the previous track/sound file.
<b>C</b>	Activates the Invoke Player icons.
<b>CTRL+D</b>	Switches the touch-sensitive display.
<b>D</b>	Decreases the volume.
<b>E</b>	Loads/ejects the CD.
<b>F</b>	Plays the next track/sound file.
<b>F1</b>	Displays on-line help.
<b>H</b>	Activates the Invoke Player button.
<b>K</b>	Rewinds the track/sound file.
<b>L</b>	Opens the playlist.
<b>N</b>	Minimizes EnsembleRemote to an icon.
<b>O</b>	Quits EnsembleRemote.
<b>P</b>	Plays the track/sound file.
<b>R</b>	Records the wave file.
<b>S</b>	Stops the track/sound file.
<b>SPACEBAR</b>	Confirms selection.
<b>T</b>	Activates two-digit mode.
<b>U</b>	Increases the volume.
<b>W</b>	Fast-forwards the track/sound file.
<b>0 to 9</b>	Selects the tracks/sound file.

# EnsembleCD

You can use EnsembleCD to perform operations such as playing audio CDs, compiling the playlist, and giving names to the tracks on your CD.

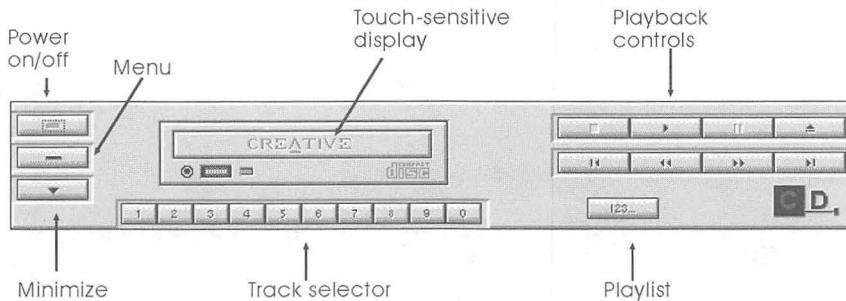
## Starting EnsembleCD

Use EnsembleCD to play audio CDs, create a playlist, and name the tracks on the CD.

*To start EnsembleCD:*

1. Double-click the EnsembleCD icon in the Sound Blaster 16 group window to start EnsembleCD from Windows, or use the Invoke Player icons on the EnsembleRemote.

The EnsembleCD interface is similar to Figure 6-8.



**FIGURE 6-6:** EnsembleCD

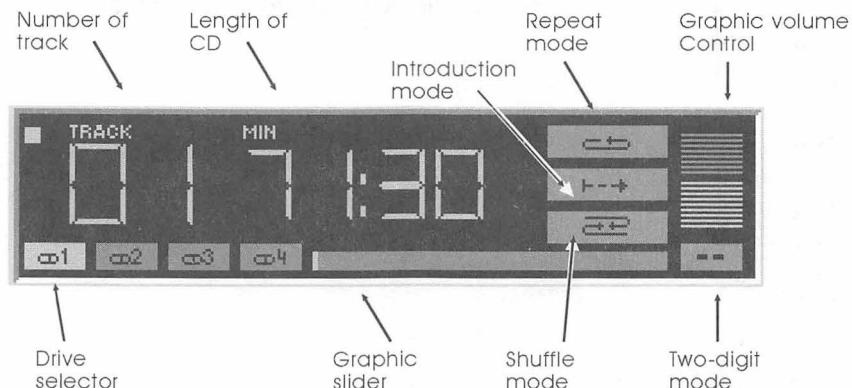
Alternatively, select the EnsembleCD icon on the EnsembleRemote.

### Touch-Sensitive Display

The touch-sensitive display allows you to switch between:

- ❖ CD-ROM drive status (indicates whether a CD is in the drive)
- ❖ CD and track titles
- ❖ Track number and duration

For CD and track titles or track number and duration display, the touch-sensitive display is similar to the following:



**FIGURE 6-7:** CD track touch-sensitive display

**Drive Selector** Allows you to control up to four CD drives—CD 1, CD 2, CD 3, and CD 4—if you have more than one CD-ROM drive installed in your system. The highlighted drive is the one currently active.

**Graphic Slider** Indicates the percentage of the current track that has been played. It also allows you to control the position of the playing track.

**Graphic Volume Control** Shows the volume level.

**Two-digit Mode** Allows you to select a track number above nine in the playlist when it is highlighted.

**Repeat Mode** Repeats the playlist after the final track is played.

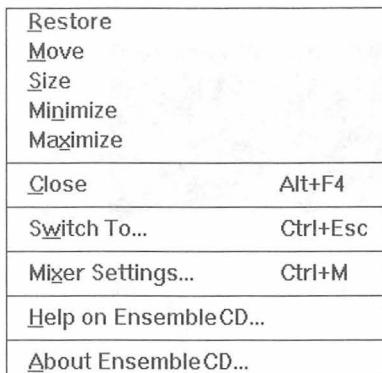
**Introduction Mode** Plays the first few seconds of each track in the playlist.

**Shuffle Mode** Randomly selects and plays tracks from the playlist.

## Menu Button



The Menu button displays the EnsembleCD control menu with the list of available commands.



**FIGURE 6-8:** EnsembleCD control menu

## Playlist Button

The Playlist button allows you to select the tracks that you want to play. Choose the Playlist button to display the CD Playlist dialog (Figure 6-9).



**FIGURE 6-9:** EnsembleCD Playlist dialog

**CD Artist/Title** Name of your CD.

**Track Title** Names of the tracks on your CD.

**Playlist** Displays the tracks in the playlist.

**Track List** Displays the tracks on your CD.

**Play** Plays selected tracks in the Playlist or Track List.

**Add** Adds selected tracks in the Track List to the Playlist.

**Adds All** Adds all the tracks in the Track List to the Playlist.

**Clear** Clears the tracks in the Playlist.

**Remove** Removes selected tracks from the Playlist.

**Done** Confirms the selection of the tracks in the Playlist.

**Cancel** Cancels changes made to the tracks in the Playlist.  
The Playlist reverts to its last saved copy.

**Help** Displays the on-line help facility.

## Playback Control Buttons

The Playback Control buttons allow you to select playback operations on EnsembleCD.



Stops the track.



Plays the track.



Pauses the track.



Plays the previous track.



Quickly rewinds the track.



Quickly forwards the track.



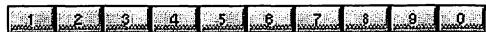
Plays the next track.



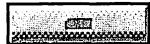
Loads or unloads the CD.

## Track Selector

The track selector allows you to select a track that you want to play.



## Power On/Off Button



The Power On/Off button allows you to quit EnsembleCD.

## Playing Tracks

You can play the tracks using the Playback Controls or Track Selector.

*To play a track using the Track Selector:*

1. Choose the two-digit mode selector if the track number is above nine.
2. Choose a button from the Track Selector that corresponds to the track you want to play.

If you choose a track that does not exist, the last track on the playlist is played.

If you want to play a track starting at a certain point, use the Graphic Slider to change the track's playing position. You can reposition the Graphic Slider before playing the track or while it is playing.

*To play a track from a chosen point:*

1. Click and hold down the left mouse button on the Graphic Slider and move it to the point at which you want to start playing the track.
2. When the Graphic Slider reaches the chosen point, release the mouse button.

If your CD is already playing, the track immediately moves to the point you chose and starts playing.

If your CD is not playing, choose *Play* to start playing the track at the point you chose.

## Adjusting the Volume

You can adjust the volume with the Graphic Volume Control.

*To adjust the volume:*

1. Click and hold down the left mouse button on the Graphic Volume Control.
2. While holding down the mouse button, adjust the volume to the level you want by moving the Graphic Volume Control up or down.

## Editing the CD Playlist

A *playlist* is a set of audio CD tracks organized for playing in a particular order. You can compile the tracks by using the CD Playlist dialog.

*To compile and edit the playlist:*

1. Choose the Playlist button on EnsembleCD. The CD Playlist dialog displays (see Figure 6-10).



**FIGURE 6-10:** EnsembleCD Playlist dialog

2. Perform the desired operations to the playlist.
  - ◆ Preview tracks
  - ◆ Add tracks
  - ◆ Remove tracks
  - ◆ Rearrange tracks
  - ◆ Name the tracks and playlist

3. Choose *Done* when you are satisfied with the playlist.

Choose *Cancel* to cancel all changes made to the playlist.

## Adding Tracks to the Playlist

*To add track(s) to the playlist:*

1. Select the track(s) to add to the playlist from the Track List.
2. Choose *Add* to add the track(s) to the Playlist.

Choose *Add All* to add all the tracks in the Track List to the Playlist.

## Previewing Tracks

*To preview track(s):*

1. Select the track(s) from the Playlist or Track List.
2. Choose *Play*. The track starts playing.

**NOTE** You can also preview a track by double-clicking the track in Playlist or Track List.

## Removing Tracks from the Playlist

*To remove track(s) from the Playlist:*

1. Select the track(s) to be removed from the Playlist.
2. Choose *Remove*.

Choose *Clear* to remove all tracks from the Playlist.

## Selecting Tracks from the Playlist

You can select multiple tracks for previewing, adding, or removing by:

- ❖ Pressing the CTRL key to randomly select the tracks.
- ❖ Pressing the SHIFT key to select a set of adjacent tracks.

## Rearranging Tracks in the Playlist

If you are not in Shuffle Mode, you can rearrange the tracks in the playlist in the order you like by using the right mouse button. *Shuffle* mode directs your computer to randomly arrange tracks in the playlist.

*To rearrange a track in the playlist:*

1. Click and hold down the right mouse button on the track in the Playlist and drag it to the new position.

The track is moved to the new position and the preceding tracks rearranged below it in the Playlist.

**NOTE** *If you are in Shuffle Mode, rearranging the order does not change the original playing order of the tracks.*

## Naming the Playlist

Once you have one or more titles in the Playlist, you can save the Playlist by giving it a name.

*To give your Playlist a title:*

1. Select the CD Artist/Title box and type the title of the Playlist.

## Naming the Tracks

*To name a track on your CD:*

1. Select the track in the Track List. The track title is placed in the Track Title box.
2. Select the Track Title box and type the new name.
3. Press ENTER.

## Using the Keyboard with EnsembleCD

You can use the keyboard to initiate EnsembleCD operations.

Key	Action
<b>A</b>	Pauses the track.
<b>B</b>	Plays the previous track.
<b>CTRL+D</b>	Changes touch-sensitive display.
<b>E</b>	Loads/ejects the CD.
<b>F</b>	Plays the next track/sound file.
<b>F1</b>	Activates on-line help.
<b>G</b>	Activates the Graphic Volume Control.
<b>H</b>	Activates Shuffle Mode .
<b>I</b>	Activates Introduction Mode.
<b>K</b>	Rewinds the track.
<b>L</b>	Accesses the Playlist dialog.
<b>M</b>	Activates Repeat Mode.
<b>N</b>	Minimizes EnsembleCD to an icon.
<b>O</b>	Quits EnsembleCD.
<b>P</b>	Plays the current track.
<b>S</b>	Stops the current track.
<b>SPACEBAR</b>	Confirms selection.
<b>T</b>	Activates the Two-digit Mode.
<b>W</b>	Fast-forwards the track.
<b>0 to 9</b>	Selects tracks.

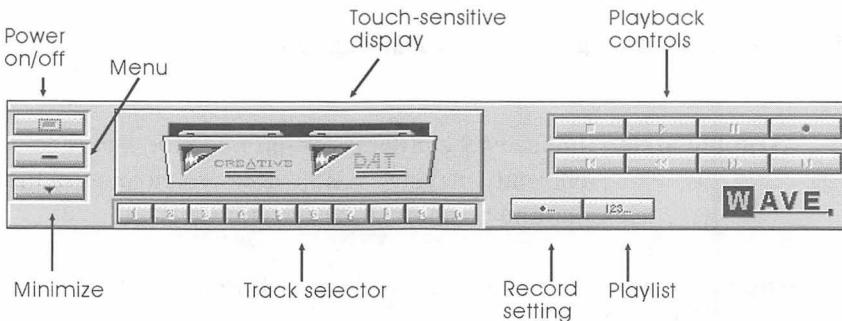
# EnsembleWave

You can use EnsembleWave to perform operations such as playing wave files, compiling a playlist, and recording a MIDI file or audio CD into wave format.

## Starting EnsembleWave

*To start EnsembleWave:*

1. Double-click the EnsembleWave icon in your Sound Blaster 16 group window. The EnsembleWave controller (see Figure 6-11) is displayed.



**FIGURE 6-11:** EnsembleWave

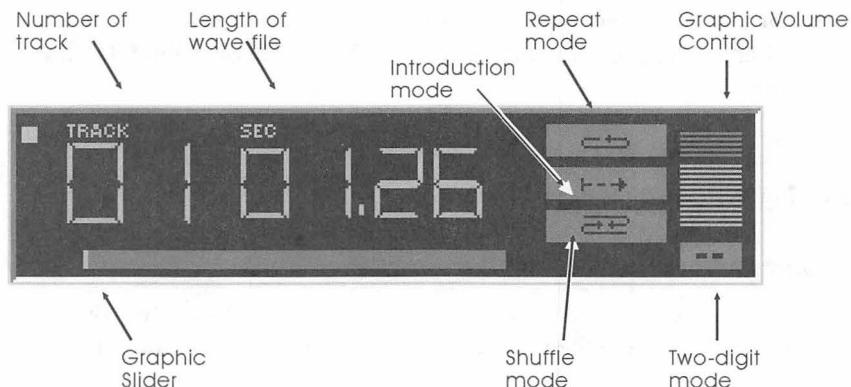
Alternatively, start EnsembleWave from EnsembleRemote.

### Touch-Sensitive Display

By selecting the touch-sensitive display, you can switch among the following:

- ❖ Wave file playing status (showing whether a selected wave file is currently playing)
- ❖ Titles of the wave file and playlist
- ❖ Number and elapsed time of the current wave file

The following touch-sensitive display shows the wave file and playlist titles, or wave file number and length.



**FIGURE 6-12:** EnsembleWave track touch-sensitive display

**Graphic Slider** Indicates the progress of the wave file that is currently playing. Also, allows you to control the starting position of the current wave file.

**Graphic Volume Control** Shows the volume level of EnsembleWave

**Repeat Mode** Repeats the whole playlist when the final wave file is played.

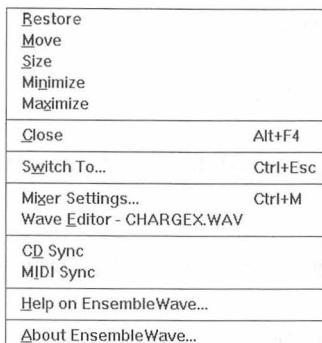
**Introduction Mode** Plays the first few seconds of each wave file in the playlist.

**Shuffle Mode** Randomly plays the wave files in the playlist.

Menu Button



The Menu button displays the EnsembleWave control menu with the list of available commands.



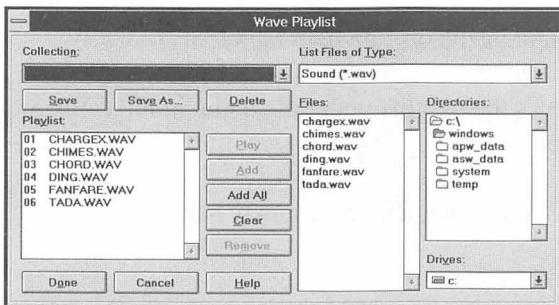
**FIGURE 6-13:** EnsembleWave control menu

### Minimize Button

The minimize button minimizes the EnsembleWave to an icon.

### Playlist Button

The Playlist button allows you to compile the desired wave files for playing. When you choose this button, the Wave Playlist dialog (see Figure 6-14) appears:



**FIGURE 6-14:** EnsembleWave Playlist dialog

**Collection** Title of your current playlist.

**List Files of Type** Only files of the selected type are included in the Files list.

**Drives** Displays the selected drive.

**Directories** Displays the directory search path.

**Files** Displays files of the type specified in List Files of Type.

**Playlist** Displays the files you have included in the playlist.

**Play** Plays the selected wave files.

**Add** Adds selected wave files to the Playlist.

**Add All** Adds all the wave files to the Playlist.

**Clear** Clears the wave files in the Playlist.

**Remove** Removes selected wave files from the Playlist.

**Done** Confirms the wave files in the Playlist.

**Cancel** Cancels changes made to the Playlist. The playlist reverts to its last saved copy.

**Help** Displays the on-line help facility.

**Save** Saves the playlist under the name in the Collection box.

**Save As** Saves the playlist under a new name.

## Playback Control Buttons

The Playback Control buttons allow you to perform the playback operations.



Stops the wave file.



Plays the wave file.



Pauses the wave file.



Records a wave file from a selected source.



Plays the previous wave file in the playlist.



Quickly rewinds the wave file.



Quickly forwards the wave file.

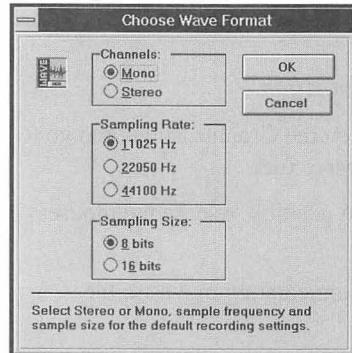


Plays the next wave file in the playlist.

Record Setting Button



The Record Setting button displays a dialog that allows you to define the settings for recording.



**FIGURE 6-15:** EnsembleWave Choose Wave Format dialog

Fast Track Selector

The Fast Track Selector allows you to select and play a wave file from the playlist.



Power Off Button



The Power Off button closes the EnsembleWave controller.

## Playing Wave Files

You can play wave files by using the Playback Control buttons and Track Selector.

*To play a wave file using the Track Selector:*

1. Choose Two-Digit Mode if your wave file number is more than nine.
2. Choose a button from the Track Selector corresponding to the wave file you want to select.

**NOTE** *If you choose a wave file number that does not exist, the last wave file in the playlist is selected.*

To start playing a wave file from a specific point, use the Graphic Slider to change the wave file's playing position. You can reposition the Graphic Slider before playing the track or while it is playing.

*To start playing the wave file at a different position:*

1. Click and hold down the left mouse button on the Graphic Slider and go to the position at which you want to start the wave file.

When the Graphic Slider reaches the chosen position, release the mouse button.

If your player is already playing, the track immediately moves to the position you chose and starts playing.

2. If your player is not playing, choose *Play* to start playing the wave file from the position you chose.

## Adjusting the Volume

You can adjust the volume of EnsembleWave using the Graphic Volume Control.

*To adjust the volume:*

1. Click and hold down the left mouse button on the Graphic Volume Control.
2. Adjust the volume to the level you want.

## EnsembleWave Playlist

A *playlist* is a set of wave files that is organized for playing in a particular order. You can compile the files in the playlist using the EnsembleWave Playlist.

### Compiling and Editing the Playlist

*To compile/edit a playlist:*

1. Choose the Playlist button. The EnsembleWave Playlist dialog (Figure 6-14) is displayed.
2. Perform the desired operations on the playlist:
  - ◆ Preview wave files
  - ◆ Add wave files
  - ◆ Remove wave files
  - ◆ Rearrange or name wave files
3. Choose *Done* when you are satisfied with the compilation of the playlist.

Choose *Cancel* to cancel all changes made to the playlist.

### Adding Wave Files to the Playlist

*To add wave file(s) to the playlist:*

1. Select the wave file(s) to add to the playlist from the Files.
2. Choose *Add* to add the wave file(s) to the Playlist.

Choose *Add All* to add all the wave files in the Files list to the Playlist.

### Previewing Wave Files

*To preview wave file(s):*

1. Select the wave file(s) from the Playlist or Files list.
2. Choose *Play*. The wave file starts playing.

**NOTE** You can also preview a wave file by double-clicking the wave file in the Playlist or Files list.

## Removing Wave Files from the Playlist

*To remove Wave file(s) from the playlist:*

1. Select the Wave file(s) from the playlist.
2. Choose *Remove*.

Or choose *Clear* to remove all Wave files from the Playlist.

## Selecting Wave Files in the Playlist

You can select multiple Wave files for previewing, adding, or removing by holding down the CTRL or SHIFT key while you choose them.

- ❖ Pressing CTRL allows you to randomly select the Wave files.
- ❖ Pressing SHIFT allows you to select a group of adjacent tracks by choosing the first and last Wave file in the group.

## Rearranging Wave Files in the Playlist

If you are not in shuffle mode, you can organize the Wave files in the playlist in the order you like using the right mouse button. Shuffle mode plays Wave files randomly from the playlist.

*To rearrange a Wave file in the playlist:*

1. Click and hold down the right mouse button on the Wave file in the Playlist and drag it to a new position.

The Wave file moves to that position and the preceding Wave files are rearranged following it in the Playlist.

**NOTE** *If you are in shuffle mode, rearranging the order does not change the playing order of the Wave files.*

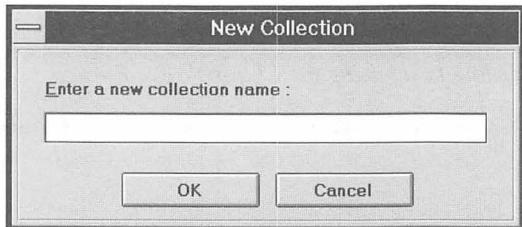
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## Naming the Playlist

You may want to save an edited playlist under a new name.

*To give your playlist a title:*

1. Choose *Save As*. The New Collection dialog (Figure 6-16) is displayed.



**FIGURE 6-16:** EnsembleWave New collection dialog

2. Enter the title of the playlist.
3. Choose *OK*.

If you choose *Cancel*, you are returned to the Playlist dialog without saving the title.

## Defining Recording Settings

*To define the settings of a recording:*

1. Choose the Record Setting button. The Choose Wave Format dialog (Figure 6-15) is displayed.
2. Enter the wave format for the recording.
  - ◆ Mono (monaural) or stereo channel
  - ◆ 11025 Hz, 22050 Hz, or 44100 Hz sampling rate
  - ◆ 8- or 16-bit sampling size
3. Choose *OK*.

## Recording a Wave File

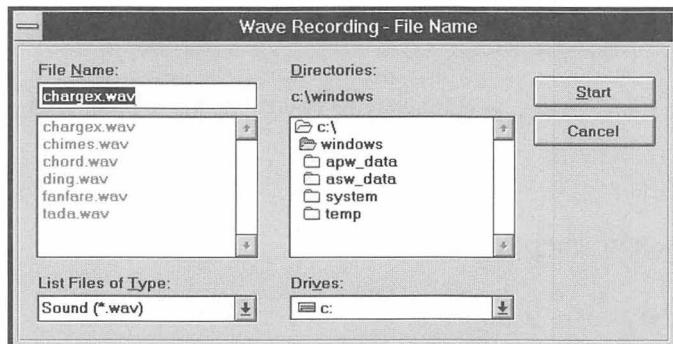


You can record from various audio sources as defined by Creative Mixer. If you want to record from CD or MIDI audio, you can use the Sync options in the Control menu to synchronize your recording with the playing of the audio. The audio is recorded in wave format and saved as a wave file.

**NOTE** *The format of the recording is set using the Choose Wave Format dialog.*

*To record a wave file:*

1. Select *CD Sync* or/and *MIDI Sync* from the Control menu.
2. Choose the *Record* button. The Wave Recording dialog (Figure 6-17) is displayed.



**FIGURE 6-17:** EnsembleWave Wave Recording dialog

3. Enter the directory path and name of the file to which you want to record.
4. Choose *Start*. The recording starts.

**NOTE** *When using the Sync options, the playing of the audio is synchronized with the recording only if the audio player is activated. For example, if you choose CD Sync from the Control menu, then either EnsembleCD or EnsembleRemote running audio CD is activated.*

## Using the Keyboard

You can use the keyboard to operate the EnsembleWave control panel.

Key	Action
<b>A</b>	Pauses the wave file.
<b>B</b>	Plays the previous wave file.
<b>CTRL+D</b>	Changes the touch-sensitive display.
<b>F</b>	Plays the next wave file.
<b>F1</b>	Activates on-line help.
<b>G</b>	Activates the graphic slider.
<b>H</b>	Activates shuffle mode.
<b>I</b>	Activates introduction mode.
<b>K</b>	Rewinds the wave file.
<b>L</b>	Invokes the playlist.
<b>M</b>	Activates repeat mode
<b>N</b>	Minimizes EnsembleWave to an icon.
<b>O</b>	Quits EnsembleWave.
<b>P</b>	Plays the wave file.
<b>R</b>	Records the wave file.
<b>S</b>	Stops the wave file.
<b>SPACEBAR</b>	Confirms selection.
<b>T</b>	Activates the two-digit mode selection.
<b>W</b>	Fast-forwards the wave file.
<b>0 to 9</b>	Selects wave files.

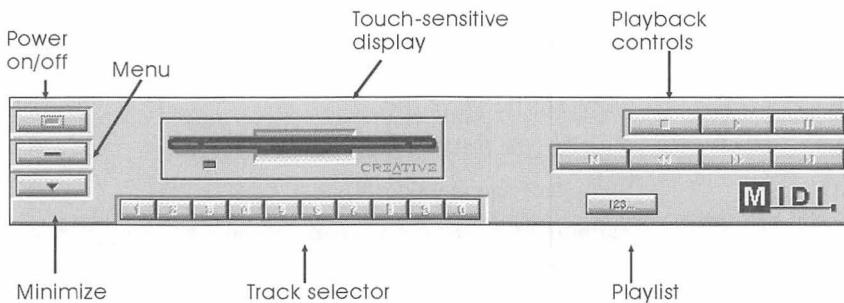
# EnsembleMIDI

You can use EnsembleMIDI to perform operations such as playing a MIDI file and compiling a playlist.

## Starting EnsembleMIDI

*To start EnsembleMIDI:*

1. Double-click the EnsembleMIDI icon in your audio card's group window.  
The EnsembleMIDI control panel (Figure 6-18) is displayed.



**FIGURE 6-18:** EnsembleWave control panel

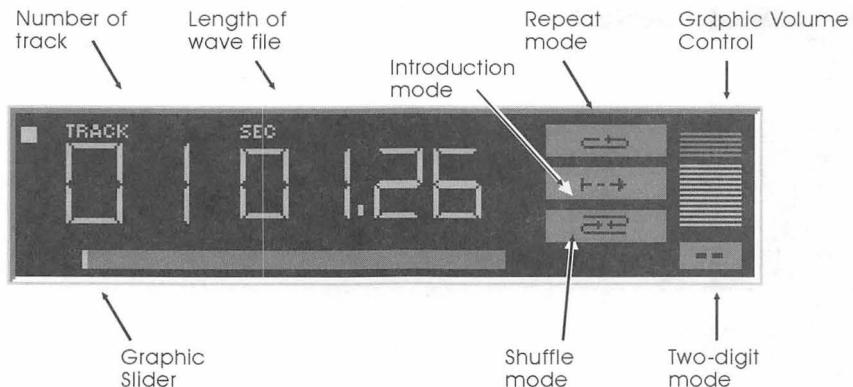
Alternatively, select EnsembleMIDI from EnsembleRemote.

### Touch-Sensitive Display

By clicking the touch-sensitive display, you can change between:

- ❖ MIDI file play status (showing whether a selected MIDI file is currently playing)
- ❖ MIDI file number and elapsed time of the playing MIDI file
- ❖ Titles of the MIDI file and playlist

The following touch-sensitive display, gives the file and playlist titles or file number and length:



**FIGURE 6-19:** EnsembleMIDI track touch-sensitive display

**Graphic Slider** Indicates the percentage of the current MIDI file that is playing. It also allows you to control the position of the playing MIDI file.

**Graphic Volume Control** Shows the volume level of the MIDI player.

**Two-Digit Mode Selector** Allows you to select a MIDI file number higher than ten in the playlist when it is highlighted.

**Repeat Mode Selector** Repeats the whole playlist when the final MIDI file is played.

**Introduction Mode Selector** Plays the first few seconds of all the MIDI files in the playlist.

**Shuffle Mode Selector** Randomly arranges MIDI files in the playlist.

Menu Button



The Menu button displays the Control menu showing the following list of commands:



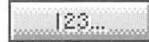
**FIGURE 6-20:** EnsembleMIDI control menu

Minimize Button



The Minimize button minimizes the EnsembleMIDI to an icon.

Playlist Button



The Playlist button allows you to compile a selection of MIDI files that you want to play. When you choose the Playlist button, the Playlist dialog (Figure 6-21) is displayed.



**FIGURE 6-21:** EnsembleMIDI Playlist dialog

**Collection** Allows you to name your playlist.

**List Files of Type** Allows you to specify the types of files you want to view in the Files list.

**Drives** Displays the selected drive.

**Directories** Displays the directory search path.

**Files** Displays the files specified in List Files of Type.

**Playlist** Displays the files you include in the playlist.

**Play** Plays the selected MIDI files.

**Add** Adds the selected MIDI files to the Playlist.

**Add All** Adds all the MIDI files to the Playlist.

**Clear** Clears the MIDI files in the Playlist.

**Remove** Removes selected MIDI files from the Playlist.

**Done** Confirms the compilation of MIDI files in the Playlist.

**Cancel** Cancels changes made in the Playlist. The Playlist reverts to its last saved copy.

**Help** Displays the on-line help facility.

**Save** Saves the playlist using the name provided in Collection.

**Save As** Saves the Playlist under a new name.

## Playback Control Buttons

The Playback control buttons allow you to perform playback operations.



Stops the MIDI file.



Plays the MIDI file.



Pauses the MIDI file.



Plays the previous MIDI file in the playlist.



Quickly rewinds the MIDI file in the playlist.



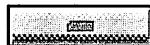
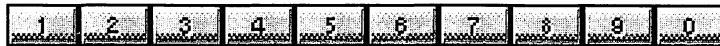
Quickly forwards the MIDI file.



Plays the next MIDI file.

## Fast Track Selector

The Fast Track Selector allows you to select and play a MIDI file in the Playlist.



## Power On/OFF Button

The Power On/Off button closes the EnsembleMIDI control panel.

## Playing MIDI Files

You can play MIDI files using the Playback control buttons and Fast Track Selector.

*To play a MIDI file using the Fast Track Selector:*

1. Choose the Two-Digit Mode Selector if your MIDI file number is higher than nine.
2. Choose a button from the track selector corresponding to the MIDI file you want to select.

### NOTE

*If you choose a MIDI file number that does not exist, the last MIDI file in the playlist is selected.*

If you want to start playing a MIDI file from a certain position, you can use the Graphic Slider to change the MIDI file's playing position. You can do this before playing it or while it is playing.

*To start playing the MIDI file at a different position:*

1. Click and hold down the left mouse button on the Graphic Slider and move the pointer to the position at which you want to start the MIDI file.
2. When the highlighted portion of the Graphic Slider has reached the position you have chosen, release the mouse button.  
If the MIDI file is already playing, it immediately changes to the position you have chosen. If your player is not playing, choose *Play* to start playing the MIDI file from the position you have chosen.

## Adjusting the Volume

You can use the Graphic Volume Control to adjust the EnsembleMIDI volume.

*To adjust the volume:*

1. Click and hold down the left mouse button on the Graphic Volume Control.
2. Adjust the volume to the level you want.

## EnsembleMIDI Playlist

A *playlist* is a set of MIDI files organized in a particular order. You can organize the files in the playlist using the EnsembleMIDI Playlist dialog.

### Compiling the Playlist

*To compile and edit the playlist:*

1. Choose the Playlist button. The MIDI Playlist dialog (Figure 6-20) displays.
2. Perform the desired operations in playlist:
  - ◆ Preview MIDI files
  - ◆ Add MIDI files
  - ◆ Remove MIDI files
  - ◆ Rearrange MIDI files
  - ◆ Name the playlist

3. Choose *Done* when you are satisfied with the compilation of the playlist.

Choose *Cancel* to cancel all changes made to the playlist.

## Adding MIDI Files to the Playlist

*To add MIDI file(s) to the playlist:*

1. Select the MIDI file(s) to add to the playlist from the Files list.

2. Choose **Add** to add the MIDI file(s) to the Playlist.

Choose *Add All* to add all the MIDI files in the Files list to the Playlist.

## Previewing MIDI Files

*To preview MIDI file(s):*

1. Select the MIDI file(s) from the Playlist or Files list.

2. Choose **Play**. The MIDI file starts playing.

You can also preview a MIDI file by double-clicking the file name in the Files list.

## Removing MIDI Files from the Playlist

*To remove MIDI file(s) from the playlist:*

1. Select the MIDI file(s) from the Playlist.

2. Choose *Remove*.

Choose *Clear* to remove all MIDI files from the Playlist.

## Selecting MIDI files from the Playlist

You can select multiple MIDI files for previewing, adding, or removing by holding down the CTRL or SHIFT key while you choose them:

- ❖ Pressing CTRL allows you to randomly select the MIDI files.
- ❖ Pressing SHIFT allows you to select a group of adjacent tracks when you select the first and last MIDI file in the group.

## Rearranging MIDI Files in the Playlist

If you are not in shuffle mode, you can rearrange the MIDI files in the playlist in the order you like using the right mouse button. (In *shuffle mode*, MIDI files in the playlist are randomly arranged and played.)

*To rearrange a MIDI file in the playlist:*

1. Click and hold down the right mouse button on the MIDI file in the Playlist and drag it to the new position.

The MIDI file moves to the new position and the preceding MIDI files are rearranged following it in the Playlist.

**NOTE** *If you are in shuffle mode, rearranging the order does not change the playing order of the MIDI files.*

## Naming the Playlist

Once you have compiled your playlist, you may want to give the playlist a title.

*To give your playlist a title:*

1. Choose *Save As*. The New Collection dialog (Figure 6-22) displays.



**FIGURE 6-22:** *New Collection dialog*

2. Type the title of the playlist in the dialog.
3. Choose *OK*.

If you choose *Cancel*, you are returned to the Playlist dialog without saving the title.

## Using the Keyboard

You can use the keyboard to perform operations from EnsembleMIDI.

Key	Action
<b>A</b>	Pauses the MIDI file.
<b>B</b>	Plays the previous MIDI file.
<b>CTRL+D</b>	Changes the touch-sensitive display.
<b>F</b>	Plays the next MIDI file.
<b>F1</b>	Activates on-line help.
<b>G</b>	Activates the graphic slider.
<b>H</b>	Activates shuffle mode.
<b>I</b>	Activates introduction mode.
<b>K</b>	Rewinds the MIDI file.
<b>L</b>	Invokes the playlist.
<b>M</b>	Activates repeat mode
<b>N</b>	Minimizes EnsembleMIDI to an icon.
<b>O</b>	Quits EnsembleMIDI.
<b>P</b>	Plays the MIDI.
<b>S</b>	Stops the MIDI.
<b>SPACEBAR</b>	Confirms selection.
<b>T</b>	Activates the two-digit mode selector.
<b>W</b>	Fast-forwards the MIDI.
<b>0 to 9</b>	Selects MIDI files.

# Creative Soundo'LE

Creative Soundo'LE records and plays both compressed and uncompressed sound files. Soundo'LE allows you to insert sound files into other applications by linking and embedding (OLE). For more information on OLE, refer to your Microsoft Windows manual.

## Starting Soundo'LE

*To start Soundo'LE:*

1. Double-click the Soundo'LE icon in the Sound Blaster 16 group window. The Soundo'LE window (Figure 7-1) displays.



**FIGURE 7-1:** Soundo'LE window

Button	What it does
Play	Plays the sound file.
Pause	Pauses the playback of the file. You can click either the Pause button or the Play button to resume playing the file.
Reverse	Moves toward the beginning of the file a step at a time.
Forward	Moves toward the end of the file a step at a time.
Stop	Stops the playback of the file.
Record	Records a new sound file. For more information, see "Recording a Sound File."

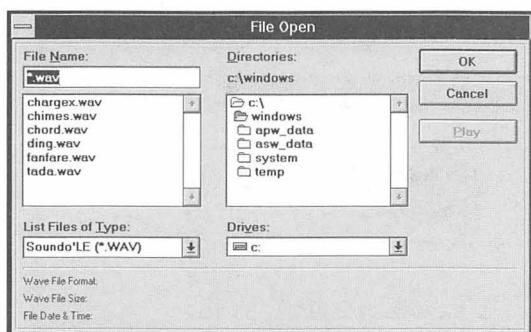
To use the keyboard to press the buttons, use the TAB key to select a button, then press the SPACEBAR to initiate the action.

## Opening a Sound File

You can open files in Soundo'LE identified by the file name extension .WAV.

*To open a sound file:*

1. Choose *Open* from the File menu. The File Open dialog displays:



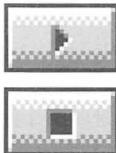
**FIGURE 7-2:** File Open dialog

2. Select the file you want from the File Name list, then choose *OK*. The name of the file appears in the title bar at the top of the Soundo'LE window.

# Playing a Sound File

*To play a sound file:*

1. Open the file you want to play.
2. Click the play button.
3. To stop playing the sound file, click the stop button.



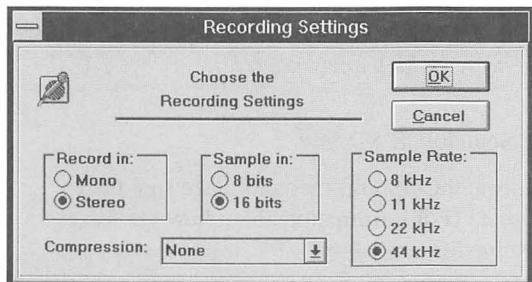
# Recording a Sound File

You can make a sound recording from:

- ❖ Microphone plugged into Sound Blaster 16
- ❖ Device such as a cassette or CD player connected to the line-in jack
- ❖ CD-ROM drive

Soundo'LE saves the recording to your hard disk; the size of the recording you can make depends on the amount of space available on your hard disk.

The higher the audio quality the more space the recording requires on your hard disk. As a rule of thumb, a 16-bit recording consumes space at twice the rate of an 8-bit recording; a sample rate of 22 kHz requires twice the space as an 11 kHz sample rate. As an example, recording at settings of 16 bits and 44 kHz requires four times the storage space as recording at settings of 8 bits and 22 kHz.



**FIGURE 7-3:** Recording Settings dialog

*To record a sound file:*

1. If there is a sound file currently open, choose *New* from the File menu.
2. Choose *Recording Settings* from the Options menu. The Recording Settings dialog (Figure 7-3) displays.
3. Select the settings you want to use:

<b>Record In:</b>	<b>Mono</b>	User for monaural recording (for example, voice recording using a single microphone).
	<b>Stereo</b>	Use for stereo recording (for example, tape cassette or CD).
<b>Sample in:</b>	<b>8 bits</b>	Use for normal recording.
	<b>16 bits</b>	Use for high-quality recording.
<b>Sample Rate:</b>	<b>11 kHz</b>	Suitable for voice recording.
	<b>22 kHz</b>	Equivalent to the quality of AM radio; suitable for voice or low-quality musical recording.
	<b>44 kHz</b>	Equivalent to the quality of a compact disc; with 16-bit sample-in, suitable for musical recordings.
<b>Compression:</b>	<b>None</b>	Records without compressing the sound data.
	<b>ADPCM</b>	Adaptive Differential Pulse Code Modulation (ADPCM) is a 16-bit compression technique. The compression is 4 to 1 for 16-bit files and 2 to 1 for 8-bit files.
	<b>CCITT A-Law</b>	Follows the CCITT standard for compression. The level of compression is 2 to 1.
	<b>CCITT <math>\mu</math>-Law</b>	Follows the CCITT standard for compression. The level of compression is 2 to 1.

**NOTE** *The differences between CCITT A-Law and CCITT  $\mu$ -Law are subtle. Experiment with them to see which one you prefer.*

4. Choose *OK* to return to the Soundo'LE window.
5. Choose the Mixer Settings from the Options menu to make sure the appropriate settings are correct. (For information about how the mixer works, see Chapter 4, "Creative Mixer.")

**NOTE** If the Creative Mixer is currently active, you can use it for mixing multiple audio sources in Soundo'LE.

6. Cue up the source if necessary.
7. Click the *Record* button. The Recording display appears showing you the progress of the recording.



**FIGURE 7-4:** Recording display

8. Choose *Stop* to end the recording. The length of the recording is shown below *Total* on the Soundo'LE window. For information about saving the new file, see “Saving a Sound File” later in this chapter.

You may record or playback compressed wave files using Soundo'LE, however, the loudness indicator is not updated for compressed files.

# Linking and Embedding Sound Files

When you use Soundo'LE to link or embed a sound file in a document, you can start Soundo'LE from inside the document. You can link or embed a sound file in a document only if the application used to create the document supports object linking and embedding. (For details on linking and embedding, see the *Microsoft Windows User's Guide*.)

*Embedding* copies a sound file and makes the copy part of the document. The embedded file is physically separate from the original sound file. If you make changes to the embedded file, the original is not affected. If the document is copied to another computer, an embedded file is included in the copy.

*Linking* places a pointer in the document. The pointer gives the name of the sound file and its location. Any change you make to the sound file affects the original. If the document containing a linked sound file is copied to another computer, the sound file must be located in the same directory path as the original in order to properly link to the copy.

## Embedding a Sound File from Soundo'LE

*To embed a sound file starting from Soundo'LE:*

1. Open the sound file you want to embed, or create a new one.
2. From the Edit menu, choose *Copy Sound as an Object*. A copy of the sound file is placed on the clipboard.
3. Start the application that created the document in which you want to embed the sound file, then open the document. Place the cursor at the point at which you want to embed the sound file.
4. Choose *Paste* from the application's Edit menu.

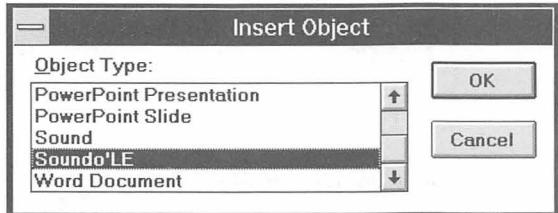
A Soundo'LE icon is placed in the document to indicate that a sound file has been embedded there. To play the embedded sound file, double-click the Soundo'LE icon.



# Embedding a Sound File from the Target Application

*To embed a sound file in the document currently open:*

1. Open the document in which you want to embed the sound file.
2. Choose the menu command in the application that lets you embed an object in a document. (For example, in Write, choose *Insert Object* from the Edit menu; in Word for Windows, choose *Object* from the Insert menu.) The *Insert Object* dialog displays.



**FIGURE 7-5:** *Insert Object* dialog

3. Select Soundo'LE and choose *OK*. The Soundo'LE window appears.

**NOTE** *If Soundo'LE does not appear on the list, it means it has not been registered properly as an OLE application. See Windows online help for the Registration Information Editor (REGEDIT.EXE.)*

4. Open an existing sound file, or record a new one.
5. From the Soundo'LE File menu, choose *Exit & Return* to application.

A Soundo'LE icon appears in the document to indicate that a sound file has been embedded there. To play the embedded sound file, double-click the Soundo'LE icon.

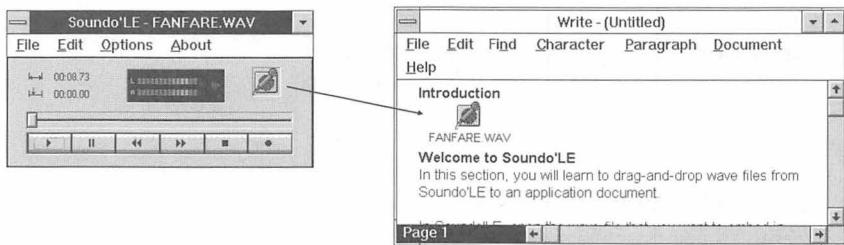


## Embedding a Sound File Using Drag-and-Drop

*To embed a sound file using drag-and-drop:*

1. Open Soundo'LE and the application. Position the Soundo'LE and the application windows so that both are in view.

2. In Soundo'LE, open the wave file that you want to embed in the application document. Alternatively, you can create a new recording before you include it in the document.
- Soundo'LE displays its icon when a wave file is opened; no icon is displayed if there is no available wave file.
3. Open a document in the application.
4. Use the mouse cursor to select the Soundo'LE icon. Holding the mouse button down, drag the icon to the document.



**FIGURE 7-6:** Drag-and-drop icon from Soundo'LE window to application document

5. Release the mouse button to place the wave file in the document.

## Linking a Sound File

*To link a sound file to a document:*

1. Open the sound file you want to link, or create a new one.
2. From the Edit menu, choose *Copy Sound as an Object*. A copy of the sound file is placed on the clipboard.
3. Start the application that contains the document in which you want to link the sound file, then open the document. Place the cursor at the point at which you want to link the sound file.
4. Choose *Paste Link* from the application's Edit menu. A Soundo'LE icon appears in the document to indicate that a sound file has been linked to it.



To play the linked sound file, double-click the Soundo'LE icon.

# Saving a Sound File

*To save a sound file:*

1. Choose *Save* from the File menu. If you have named and saved the file, Soundo'LE saves the changes. If you are saving the file for the first time, the Save As dialog displays:



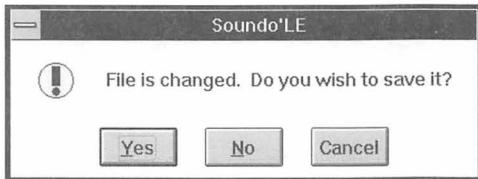
**FIGURE 7-7:** File Save As dialog

2. Select the directory in which you want to save the file, give it a name, then choose *OK*. Soundo'LE saves the file.

# Quitting Soundo'LE

*To quit Soundo'LE:*

1. Choose *Exit* from the File menu. The Soundo'LE window closes. If you have made changes to a sound file that you have not saved, a message appears that asks if you want to save the changes.



2. Choose *Yes* if you want to save the changes, or choose *No* to discard the changes and quit Soundo'LE.

# Soundo'LE Menus

<b>File Menu</b>	<b>Description</b>
New	Removes the current sound file from memory so you can record a new wave form; you are prompted if the current sound file has unsaved changes.
Open	Displays the Open dialog for opening an existing sound file.
Save	Saves the sound file.
Save As	Saves the sound file with a new name.
Exit	Quits Soundo'LE.

---

<b>Edit Menu</b>	<b>Description</b>
Copy Sound as an Object	Makes a copy of the sound file and places it on the clipboard. You can then embed or link the sound file to a document from any application that supports OLE.

---

<b>Options Menu</b>	<b>Description</b>
Wave Info	Displays information about the current sound file.
Mixer Settings	Displays the Sound Blaster 16 Mixer so you can adjust the settings that control volume, tone, gain, and source.
Recording Settings	Sets the recording mode (mono or stereo), sample size (8- or 16-bit), sample rate, and compression.

---

<b>About Menu</b>	<b>Description</b>
About Soundo'LE	Displays the version number of Soundo'LE you are using and the application's copyright information.

---

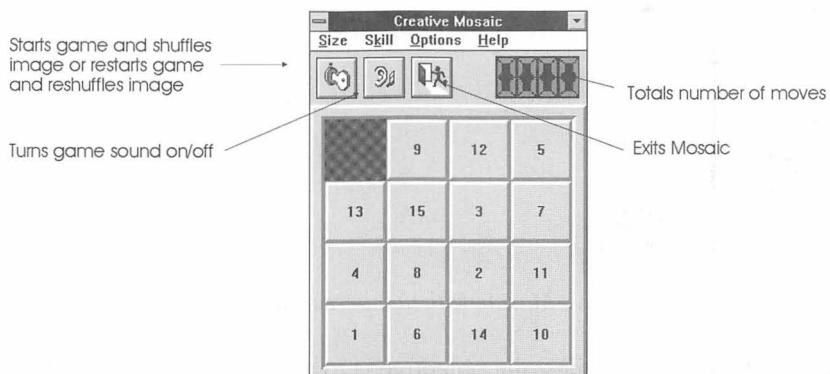
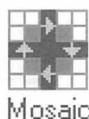
# Creative Mosaic

**C**reative Mosaic is a tile game that challenges your mental agility. You must analyze the tile locations and plan your moves carefully in order to arrange them in correct numerical order or complete the image. You can change the skill level and customize the image.

## Starting Mosaic

### *To start Mosaic:*

1. Double-click the Creative Mosaic icon in the Sound Blaster 16 group window. The Creative Mosaic game board (Figure 8-1) is displayed:



**FIGURE 8-1:** Mosaic window

2. Choose the number of tiles from the Size menu. The choices give the dimensions, such as 4x4 for a 16-tile puzzle.
3. Choose a level from the Skill menu. (The higher the skill level, the more the tiles are shuffled.)
4. From the Options menu, choose to play with numbered tiles or a picture.

If you choose *Picture* from the Options menu, a dialog lists pictures you can choose for Mosaic. (You can use any image having a file name extension of .BMP, .DIB, or .RLE.)

When you choose a picture rather than numbered tiles, you can choose *Hints* from the Help menu to display the complete picture next to the puzzle grid.

5. Click the *Start* button to scramble the tiles and begin the game.



## Playing Mosaic

In a grid with numbered tiles, the objective is to arrange the tiles in the correct numeric sequence. You arrange the tiles by moving them around the grid. A move is made by clicking a tile adjacent to the empty square—the tile on which you click moves into the vacant square. You continue repositioning the tiles until you have successfully arranged the tiles in numeric sequence.

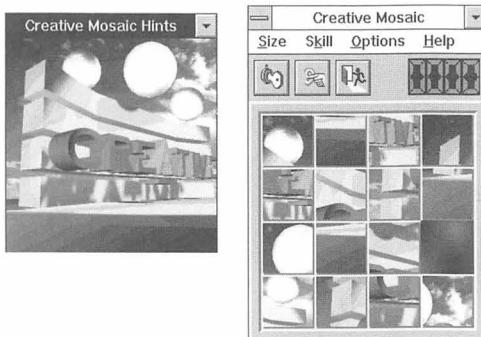


**FIGURE 8-2:** Creative Mosaic with numbered tiles, 4x4 grid, in sequence

In a grid with picture tiles, the objective is to arrange the tiles so that the image is correct. To select a bitmap image, choose *Picture* on the

Options menu—the Open dialog is displayed to allow you to select a picture file. You can use any bitmap image file having the file name extension of .BMP, DIB, or .RLE.

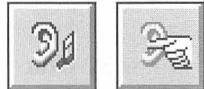
The image puzzle includes an option on the Help menu, Hint, that allows you to display the completed image alongside the scrambled tiles, see Figure 8-3.



**FIGURE 8-3:** Creative Mosaic with picture tiles, 4x4 grid, and completed picture in Hints window

The four-digit counter in the upper right corner of the game board counts the total number of moves during the current game.

Each move on the board is accompanied by a sound. If you do not want sound, select this icon—a finger appears to plug the ear. When sound is active, a musical note appears with the ear.

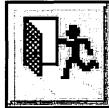


# Exiting Mosaic

*To quit Mosaic:*

1. Click the *Exit* button.

The Creative Mosaic window disappears from the screen.



## Mosaic Menus

### Size Menu

Displays available sizes, in number of tiles, for Mosaic:

3x3

4x4

5x5

6x6

7x7

8x8

---

### Skill Menu

Displays the list of skill levels from which you can choose:

Beginner

Intermediate

Advanced

---

### Options Menu      Description

Number      Displays numbered tiles.

Picture      Displays a picture broken up into tiles.

---

### Help Menu      Description

Mosaic Help      Displays the list of topics for which you can get on-line help.

Hints      Displays the completed picture you are trying to reconstruct.

About      Displays the version number of Mosaic you are using and the application's copyright information.

---

# Monologue for Windows

*M*onologue for Windows allows you to add the element of speech to virtually every Windows application:

- ❖ Any application that can express data as text can have that data spoken.
- ❖ Data transferred to the clipboard can be spoken, or the DDE or DLL interfaces can be used to customize spoken data from your Windows applications.
- ❖ Resource management ensures that Monologue for Windows can work with even your most memory-intensive Windows applications.
- ❖ You can use your ears to assist you in providing an extra degree of confidence in data entry/retrieval—your data is read exactly as it is entered or retrieved.
- ❖ A software approach eliminates the need for additional hardware.

To fully utilize Monologue for Windows, you must understand its basic concepts. Familiarize yourself with the information in this section and refer to it before using Monologue for Windows' more advanced features.

# Uses of Monologue for Windows

Monologue for Windows' is the perfect addition to many of your Windows applications. Your applications can use spoken data to improve productivity and efficiency during hand-eye coordination tasks:

- ❖ Speech can be added to your Windows applications such as Ami Pro, Word for Windows, and Excel.
- ❖ Monologue for Windows' easy-to-use interface makes it readily available to all users.
- ❖ Proofreading of text and data can be improved by having Monologue for Windows read data as you compare it to the printed version. You can select a row, column, paragraph, or total document to be read.
- ❖ You can add Monologue for Windows speech capability to enhance word processing, the use of spreadsheets, electronic mail, etc.
- ❖ Important parts of speech or grammar are often incorrectly used or accidentally omitted in a document. Hearing the document spoken can be an invaluable aid in ensuring it is grammatically correct—your ears assist your eyes in proofreading the document.
- ❖ Your computer can read any document while you perform other activities. For example, use Monologue for Windows to read your electronic mail while you perform other tasks.
- ❖ Programmers can make calls to the DLL interface, and define macros to interface with either the DDE or DLL to interface with the speech engine. You can, for example, have Monologue for Windows locate and read a spreadsheet value that changed as the result of a formula value change.
- ❖ Programmers can add speech by interfacing with the programming tools used to create Windows applications. Monologue for Windows technology allows you to call the speech engine as a Windows function (see "Programming with Monologue" later in this chapter).

- ❖ Monologue for Windows allows you to select the pitch, speed, and volume at which selections are spoken. The Dictionary Manager allows you to save preferred pronunciations in several dictionaries; you may select any one as the active dictionary.

## Multimedia Extensions Environment

Monologue for Windows uses the capabilities of Sound Blaster 16 with Multimedia Extensions for Windows. This configuration provides optimal functionality with hardware independence, coordinated allocation of system resources, and time synchronization capabilities.

Using Monologue for Windows with Multimedia Extensions for Windows requires:

- ❖ Standard PC environment plus properly installed and configured Windows 3.1 or Multimedia Extensions for Windows 3.0.
- ❖ Properly installed and configured Sound Blaster 16.

**NOTE** *Documentation and software in this release of Monologue for Windows precede the general availability of the Multimedia Extensions for Windows. While efforts have been made to assure that the software functions properly with the release version, it is possible that changes may render Monologue for Windows inoperative. Contact First Byte for an updated version of the drivers and libraries.*

# Speech Generation Techniques

The two commonly used techniques for generating speech are:

- ❖ Table-based: Each word is stored in both a text version and a sound version. A search is performed to locate the text version and the corresponding sound is spoken.
- ❖ Rule-based: No text is stored and no voice recording is necessary; rules are used to convert text to speech. The rules, or *sound descriptors*, are converted to digital patterns that you hear as speech.

## How Monologue for Windows Works

Monologue for Windows generally uses the rule-based method to generate speech, and can pronounce each word it encounters. However, English words that do not follow the rules are often mispronounced. For this reason, Monologue for Windows uses the table-based method for exceptions. You can enter your own exceptions that do not follow the phonetic rules or pronunciation by using the Dictionary Manager.

Monologue for Windows has three distinct modes of operation:

- ❖ Clipboard
- ❖ Excel
- ❖ DDE Server

### Clipboard Mode

When Monologue for Windows is in Clipboard mode, all text input is spoken from the Windows clipboard. The *clipboard* is an area in memory in which data can be placed and later read by the same or another application.

Clipboard mode is the default mode of operation for Monologue for Windows. Data can be placed on the clipboard by selecting the data,

then choosing the *Copy* command. This command is located on the Edit menu of most Windows programs. When Monologue for Windows receives the command to begin speech, the contents of the clipboard are retrieved, converted to speech, and speech output begins.

### Excel Mode

When Monologue for Windows is in Excel mode, input data is extracted from the current Microsoft Excel. This mode bypasses the process of copying the selected data from the application to the clipboard. In this mode, the currently selected cells are retrieved from Excel when Monologue for Windows receives the command to begin speech, the data is converted to speech, and speech output begins.

### DDE Server Mode

When Monologue for Windows is in DDE Server mode, all input data is extracted from the DDE message stream. This advanced capability allows various macro languages to initiate a DDE conversation with Monologue for Windows. Once a conversation is initiated, Monologue for Windows speaks any data sent to it by the other application.

## Applications Using Monologue for Windows

Monologue for Windows is capable of speaking any text that is made available to it through any of the mechanisms described above. This means that it works with any application that has the ability to place data in text format on the Windows clipboard or any application that has the ability to initiate a DDE conversation. Once installed, the speech capability is available whenever you want it.

# Getting Started

To run Monologue for Windows, complete the following steps:

- ❖ Make a backup copy of the Text-to-Speech disk.
- ❖ Install Monologue for Windows using the INSTALL program.
- ❖ Start the speech interface.

## Disk Backup

Make a copy of your original disk. To copy the disk, start the Windows File Manager and use the *Copy Disk...* command from the Disk menu. Alternately, you may use the DOS command *DISKCOPY*. Consult Windows on-line help or refer to your Microsoft Windows manual.

## Using the INSTALL Program

The Text-to-Speech disk contains a program, INSTALL, to install Monologue for Windows, SBTalker, and Talking Scheduler on your system. The installation program requires Windows; if you have not started Windows, do so before proceeding. To start the installation program, insert the disk in the disk drive and use the *Run...* command from the Program Manager's File menu. Enter the drive letter and name of the install program—for example, A:INSTALL—and press the ENTER key.

The installation program recommends a configuration for your system. You may override the recommendation by making an alternate choice as offered by the INSTALL program. After the installation is complete, the INSTALL program creates a Monologue for Windows program group. This step occurs only if you are using the Windows Program Manager.

**NOTE** *If you are using another shell program, consult its documentation for information about making applications available.*

If you are installing the standard environment for Monologue for Windows, you may be presented with a dialog alerting you to restart Windows. Failure to restart Windows at this point may result in unpredictable behavior of Windows.

Exit Windows—immediately restart Windows. The installation procedure installs the driver Monologue for Windows requires to access the system hardware when running in 386 Enhanced Mode. If you are not running in enhanced mode, the message does not appear.

## Using a RAM Disk

If you are running Monologue for Windows from a network file server, the slower disk access times may result in either excessive latency as the speech data is being constructed or output occurring in a halting, broken cadence. If your system is equipped with enough memory, you may find that devoting a small portion of that memory to a RAM disk substantially improves performance. For best results, be sure to use the RAMDRIVE.SYS utility provided with Windows or another Windows-compatible RAM disk utility.

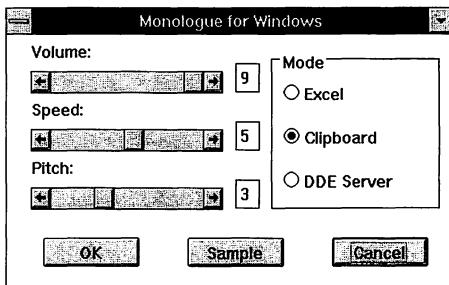
# Using Monologue for Windows

The operation of Monologue for Windows is divided into two steps:

- ❖ Starting Monologue for Windows
- ❖ Converting text/data to speech

## Starting Monologue for Windows

Double click the Monologue for Windows icon to start the speech interface. The Monologue for Windows screen is displayed. You may make selections for Speed, Pitch, Volume, and Mode. The operational mode selection is very important—it determines the mechanism used for speech requests. The selection must be correct for the type of work you will be doing.



**FIGURE 9-1:** Preferred Speech dialog

Refer to “How Monologue for Windows Works” earlier in this chapter for help in selecting the correct operational mode. At any time, you may hear the results of the current settings by pressing the *Sample* button. Once you are satisfied with the settings, press the *OK* button. This saves the current settings as the defaults and makes your selections active. Pressing the *Cancel* button restores the settings to the last saved values.

**NOTE** *Changes do not become effective until the OK button is pressed.*

If your use of Monologue for Windows does not require frequent setting of the Volume, Speed, Pitch, and Mode, start Monologue for Windows as an icon automatically when Windows loads. This can be accomplished by modifying the “LOAD= ” line in your WIN.INI file. If, on the other hand, you wish to start Monologue for Windows as a window, modify the “RUN= ” line in your WIN.INI file. In either case, append “C:\MONOLOGW\MONOLOGW.EXE” to the appropriate line of the WIN.INI file.

**NOTE** *The example above assumes that the Monologue for Windows program files are located on drive C: in the MONOLOGW directory. Use the correct drive and path for your system.*

Before going any further, perform the following simple checks to make sure your hardware and software are functioning properly together:

- ❖ Restart Windows and start Monologue for Windows as the only Windows application and press the *Sample* button. If you are able to hear the “Testing: 1, 2, 3” message, it is safe to assume that the installation of Monologue for Windows is correct.
- ❖ If, on the other hand, either no output was heard, or the program or Windows failed, it is likely that the installation options were chosen incorrectly:
  - If your system is running Windows with the Multimedia Extensions, you must not have installed Monologue for Windows using either the *Sound Blaster* or *Standard Environment* options.  
You can determine whether your system is equipped with the Multimedia Extensions by starting Windows and observing whether the Windows logo screen includes the line “Windows 3.0 with Multimedia Extensions.” If this message displays, you must install Monologue for Windows using the Multimedia Extensions Environment option.
  - If your installation options are in error, simply run the INSTALL program again, making the correct selections.

Once Monologue for Windows has been configured, you can reduce its icon by either:

- ❖ Pressing the minimize button; the minimize button is the small box with the downward pointing arrow in the upper right corner of the Monologue for Windows window.
- ❖ Selecting *Minimize* from the Monologue for Windows System menu.

Monologue for Windows is reduced to an icon and is available for use.

## Converting Text/Data to Speech

### Identify the Data

In most applications, you can use the mouse to identify the data to be read:

1. Place the pointer/cursor on the data at the point you want to begin speech.
2. Mark the text by moving the mouse while holding down the left mouse button.

The selected data is highlighted.

(Some applications use different methods to select a data block—consult the application's documentation.)

### Make the Data Available

If you have selected Clipboard mode, you must copy the selected data to the Windows clipboard. In most cases, this is done by using the *Copy* command from the application's Edit menu. Your application may have a different method for performing this step. Consult your application's documentation for specific information.

If you have selected Excel mode and your data selection has been made within an Excel spreadsheet, you can skip this step. Note that Excel mode is only designed for use with Microsoft Excel and, when Monologue for Windows is in this mode, only data selected from the current Excel spreadsheet is spoken.

## Command the Data to Be Spoken

Move the mouse cursor to the Monologue for Windows icon. Press the right mouse button to start speech. Once speech output is complete, control is returned to your application.

Applications that run maximized use the full screen by default, obscuring the Monologue for Windows icon. To access Monologue for Windows, resize the application window to uncover the icon.

## Steps for Clipboard Use

When Monologue for Windows is in Clipboard mode, the content of the Windows clipboard can be converted to speech. However, if you are running Excel, Clipboard mode speaks the current selection within Excel. You must be in Clipboard mode to speak text from applications other than Excel—use Excel mode only when Microsoft Excel is the primary Windows application from which speech will be used.

### *To use Clipboard mode:*

1. On the Monologue for Windows dialog, select Clipboard mode.
2. Open the application and select the data.
3. Select *Copy* on the Edit menu to place the data on the Clipboard.
4. Click the right mouse button over the Monologue for Windows icon to have the Clipboard data spoken.

## Steps for Excel Use

The Excel mode is provided as a convenience to users whose primary Windows application is Microsoft Excel. Excel mode does not require that you copy the selected data to the clipboard. However, to use Monologue for Windows with Excel and other applications, you need to switch between Clipboard and Excel modes.

When Monologue for Windows is in Excel mode, the contents of the Windows clipboard are not evaluated. However, if Excel is running Monologue for Windows, the current selection within Excel is spoken no matter what the mode. This may lead to confusion and speech output

that was not intended. For this reason, Excel mode should only be used when Microsoft Excel is the primary Windows application for which speech is used.

*To use Excel mode:*

1. On the Monologue for Windows dialog, select Excel mode.
2. Open an Excel worksheet and mark the cells.
3. Click the right mouse button over the Monologue for Windows icon to have the Excel data spoken.

## Steps for DDE Server Use

*To use DDE Server mode:*

1. On the Monologue for Windows dialog, select DDE Server mode.
2. Start the application that is to be the DDE Client.
3. Run the macro or script that initiates the DDE conversation.

# Programming with Monologue for Windows

Monologue for Windows provides both DDE and DLL programming interfaces. Using these interfaces, you can easily add the power of speech to your own or existing Windows applications. The application must provide a mechanism for either DDE messaging or DLL calls.

Select the interface that meets your requirements and the capabilities of your programming environment. Generally, the DLL interface provides the fastest, most reliable link to Monologue for Windows speech. While Windows programming is beyond the scope of this manual, the following may help you select the most appropriate interface for your use.

## DDE Speech Example

The Monologue for Windows DDE Server interface allows applications to initiate a DDE conversation and send data to Monologue for Windows for speaking. The DDE Server acts as an agent for the DDE Client application. The following table demonstrates a conversation between a DDE Client application and the Monologue for Windows DDE Server.

<b>DDE Client</b>	<b>Direction</b>	<b>DDE Server</b>
DDE Initiate (Client seek conversation)	==>	
	<==	DDE Acknowledge (conversation starts)
DDE Poke (data is sent to server)	==>	
	<==	DDE Acknowledge (speech begins)
DDE Terminate	==>	
	<==	DDE Acknowledge (conversation ends)

To initiate a conversation, the client must supply an application name and topic. This information is used to locate the appropriate Windows application. Monologue for Windows uses the application name MONOLOG and the topic TALK.

Once the conversation begins, Monologue for Windows speaks any data received in subsequent DDE poke messages. When the client is finished, it sends a DDE terminate message to signal the end of the conversation.

## Creating Macros

If your frequently used Windows applications provide a macro language, you can create macros to perform the task of speaking selected text. Using either the DLL or DDE interfaces, you can create macros that eliminate the need to locate the Monologue for Windows icon. This is handy for applications that usually operate in full-screen mode.

The following Ami Pro 1.2 macro illustrates the steps to initiate, maintain, and terminate a DDE conversation :

```
FUNCTION DDESAY()
'Macro demonstrating the Monologue DDE interface with Ami Pro.
child=DDEInitiate("MONOLOG","TALK")
IF (child=0)
  message("Cannot Initiate DDE Conversation")
  EXIT FUNCTION
ENDIF
>Note the space in the Location field.
'The space is required for some reason.
DDEPoke(child,"","Ami Pro calling Monologue via DDE link")
DDETerminate(child)
END FUNCTION
```

Here is a functionally identical macro for Microsoft Excel 3.0:

	A	B
1		Excel calling Monologue via DDE link.
2		
3	SendChnl	SpeakData
4		=INITIATE("MONOLOG","TALK")
5		=POKE(SendChnl,"",B1)
6		=TERMINATE(SendChnl)
7		=RETURN()

While the internal function names will be different for your application's macro language, the examples demonstrate the basic characteristics of a macro that utilizes the Monologue for Windows DDE Server.

## DLL Speech Example

The DLL interface is preferred for adding speech to programs that permit calls to external libraries and any personally developed Windows applications:

- ❖ The interface is much more straightforward and inherently more reliable. The DLL interface is a direct call to the Monologue for Windows speech engine. The DLL interface is direct to the speech engine; Monologue for Windows does not need to be started to access the speech engine, thus reducing memory requirement.
- ❖ Macros or programs using the DLL interface have the ability to control the pitch, volume, and speed values used. Since this is accomplished without the intervention of Monologue for Windows, changes made in this way are local to the caller and independent of Monologue for Windows' settings.

Macro languages supporting a DLL call need to be given the syntax of the function that is to be called. The following C language prototypes define the parameters and return values for the speech engine functions:

```
int FAR PASCAL Say(LPSTR lpEnglishString);
```

The **Say** function requires a far pointer to a null-terminated string and returns an integer result code.

```
int FAR PASCAL SetSayGlobals(int Reserved1, int
Reserved2, int Pitch, int Speed, int Volume);
```

The **SetSayGlobals** function requires five integer parameters and returns an integer result code. Note that the first two parameters are reserved for future use and must be passed as 0. The other parameters must be integer values in the range of 0 to 9.

The following Ami Pro 1.2 macro implements a DLL call to the speech engine:

```
FUNCTION DLLTALK()
'Macro demonstrating the Monologue DLL interface
DLL1d=DLLLocate("SPEECH.DLL", "Say", "IC")
result=DLLCall(DLL1d, "Ami Pro calling Say via DLL
interface")
END FUNCTION
```

Note, that in both cases, there is a coded parameter used to define the return type and the parameter type expected by the DLL function. In both Excel 3.0 and Ami Pro, the codes happen to be the same. Refer to the documentation for your application's macro language for the appropriate codes.

**NOTE** *Use of the DLL interface when Monologue for Windows is NOT loaded requires that Windows be able to locate SPEECH.DLL. To assure this, you may either (1) add the drive and directory in which the Monologue for Windows files are located to the PATH statement in your AUTOEXEC.BAT file or (2) copy the Monologue for Windows files to the Windows directory. Placing Monologue for Windows files on a shared disk (network) may result in unexpected behavior.*

**NOTE** *C PROGRAMMERS: You may call the speech engine directly by simply including the function prototypes included in this section. Be sure to add the functions to the IMPORTS section of your .DEF file.*

## Distribution Restrictions

While you may use Monologue for Windows and the speech engine with your developed applications, you may NOT distribute these applications for profit or non-profit without securing a Speech Distribution license from First Byte. For information, contact First Byte at (310) 793-0610.

# Using the Dictionary Manager

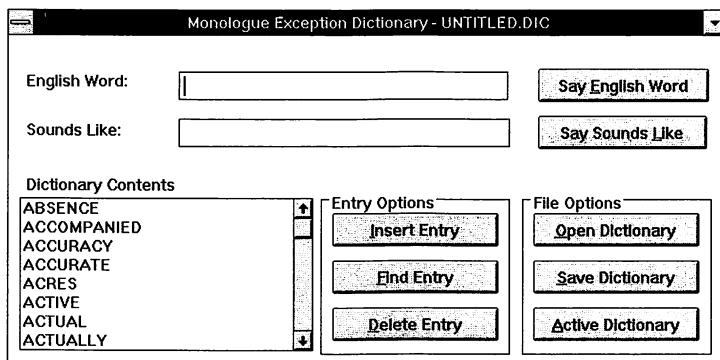
The Monologue for Windows Dictionary Manager manages the Monologue for Windows Exception Dictionary. With this tool, you can add, delete, and modify entries in the dictionary while interactively trying various combinations of English and phonetic constructs.

## Dictionary Concepts

Before using the Monologue for Windows Dictionary Manager, it is important to have an understanding of some basic concepts.

### Exception Dictionary

An *exception* dictionary consists of English words and a string of characters. The character strings are not English, they are *phonetic strings*. Exercise care when manipulating phonetics since they are a defined set of characters that cannot necessarily be strung together in an arbitrary sequence. When you supply the Dictionary Manager with a *Sounds Like* string that is composed of misspelled English, the string is converted to phonetics prior to storage. See “First Byte Phonetic Codes” later in this chapter for a list of the valid phonetic codes and modifiers.



**FIGURE 9-2:** Exception Dictionary dialog

## Kernel Dictionary

Monologue for Windows uses both the rules and tables to convert English text into phonetic codes. The *kernel* dictionary holds the table of words commonly used in English that the rule system does not convert correctly to phonetic codes. In addition, the kernel dictionary is the repository of words that contain special stress codes for improved naturalness of output. The kernel dictionary is located in the file KERNEL.DIC. All dictionaries are based on the master dictionary, its contents *should not be modified* or deleted—making changes to the master dictionary is *not recommended*.

## Active Dictionary

As the speech engine is loaded, it looks for and loads a dictionary file. By default, this is KERNEL.DIC. The Dictionary Manager allows you to specify your own dictionary. The dictionary you specify becomes the active dictionary until another selection is made.

## Starting the Dictionary Manager

Start the Dictionary Manager by double-clicking on its icon in the Monologue for Windows program group. Upon startup, the Kernel Dictionary is loaded as the basis for a new dictionary.

## Browsing the Dictionary

The list box on the left side of the window allows you to browse through the entries in the dictionary. Selecting a word from the list box causes it to be placed in the *English Word* edit frame and its phonetic string is placed in the *Sounds Like* edit frame.

## Finding an Entry

Enter the word you want to find in the *English Word* edit frame. Click *Find Entry* to find the word in the current dictionary file. If the word is found, it is displayed in the *English Word* edit frame and its phonetic string is displayed in the *Find Entry* edit frame.

## Editing an Entry

You can change the pronunciation of a word in the *English Word* edit frame by selecting the *Insert Entry* button. Double click on the word in the Dictionary Contents list. The word is displayed in the *English Word* edit frame and the begin/end symbols for the word's phonetic string are displayed in the *Sounds Like* edit frame. Use the tables in “First Byte Phonetics” at the end of this chapter to complete the phonetic string.

## Testing an Entry

You may test the pronunciation of a selection by pressing either the *Say English Word* or *Say Sounds Like* button. *Say English Word* causes the word to be pronounced based on the rules table. *Say Sounds Like* causes the phonetic string to be pronounced.

## Adding an Entry

If a word is not found in the dictionary, you can add it by typing the word in the *English Word* edit frame. Select the *Say English Word* button to hear the word spoken from the rules table.

The word's phonetic string can be created in the *Sounds Like* edit frame. Once you are satisfied with the *Sounds Like* entry, add the word to the dictionary by pressing the *Add Entry* button.

## Deleting an Entry

A word can be deleted from the dictionary by pressing the *Delete Entry* button when a dictionary entry is in the *English Word* edit frame. An entry may be brought into the edit frame by either using the *Find Entry* button or by selecting the word from the dictionary list box.

## Saving Your Work

You can save changes to your dictionary by pressing the *Save Dictionary* button. On the File Save dialog, enter the file name in the edit frame or select the name of an existing file from the files list. Press the *OK* button to save the dictionary file to disk.

**NOTE** *KERNEL.DIC is rejected as a name for your dictionary file. This protects the master dictionary from inadvertent changes.*

## Setting the Active Dictionary

Monologue for Windows opens a dictionary file upon loading. The *Active Dictionary* button allows you to choose the dictionary file to use. Press the *Set Active Dictionary* button to display the dialog and select a dictionary file. Press *OK* to load the dictionary file; the file is loaded and saved as the dictionary to use the next time Monologue for Windows is loaded.

## Loading Another Dictionary

Press the *Load Dictionary* button to edit another dictionary file. A File Open dialog is displayed from which you can select a dictionary file. Press *OK* to load the selected dictionary file into memory.

## Changing Your Mind

If you find that some of the changes you made to the exception dictionary were not satisfactory, you may undo the changes by reloading the same dictionary file by selecting the *Load Dictionary* button. The Dictionary Manager does not modify the disk files until an explicit *Save Dictionary* command is given.

## Dictionary File Location

The *Load Dictionary*, *Save Dictionary*, and *Active Dictionary* options do not facilitate saving dictionary files in any directory other than the one in which Monologue for Windows was installed. All files related to speech generation need to be located in this directory.

## Leaving the Dictionary Manager

You may exit the Dictionary Manager by selecting *Close* on the System menu. You are prompted to save any changes that have not been written to disk at the time you exit the application.

# Problem Resolution

The following information should assist you in solving any problems you may encounter with Monologue for Windows.

## Common Problems

**PROBLEM:** The installation completed successfully but there is no apparent way to start Monologue for Windows.

**Cause:** The installation program creates a program group only if you are using the Windows Program Manager.

**Solution:** If you are using another shell program, consult the shell documentation for instructions to make Monologue for Windows available for execution.

**PROBLEM:** No speech is audible but the system does not hang or fail.

**Cause:** Your audio hardware volume level is inadequate.

**Solution:** Adjust the volume control on the audio card.

**PROBLEM:** Speech is audible but pauses occur at intervals.

**Cause:** Monologue for Windows is installed on a disk that cannot transfer data rapidly enough to maintain audio output. Monologue for Windows should not be installed on either a floppy drive or a network drive. The transfer rates on these devices may not be adequate for maintaining speech continuity.

**Solution:** Reinstall Monologue for Windows on a local hard drive.

**PROBLEM:** An audible click occurs at a regular frequency during speech output.

**Cause:** Your CPU's speed is not quite fast enough to permit buffering with a drop-out. This problem occurs most often with slower 386 and 386SX systems running in Enhanced Mode.

**Solution:** Run the system in Standard Mode in which the interrupt latency is considerably shorter.

**PROBLEM:** Monologue for Windows seems to cause a problem with a network connection or serial communications in another Windows program.

**Cause:** This problem is most frequent when you use the Standard Environment option. When this option is selected, all other system activity is halted. This can cause serious problems for most communication software.

**Solution:** Using either the Sound Blaster or Multimedia Environments should eliminate this problem.

**PROBLEM:** Speech is audible but seems to *stutter* or *hiccup*, but seems to improve as speech goes on.

**Cause:** This problem occurs when any of the following conditions exists:

- ◆ Speech resources are not present in memory and the disk is unable to keep up with the speech output.
- ◆ Other applications are forcing an excessive amount of data movement to and from disk.
- ◆ A marginal memory situation exists.

**Solution:** This problem usually fixes itself as the speech engine is repeatedly accessed. If you have loaded several large applications, close the less frequently used.

# First Byte Phonetics

You can edit or create a phonetic string associated with a word in a dictionary file. The following example gives the phonetic string for *primary*:

**<<~pr'AYmEHr-IY>>**

Without the editing, *primary* is pronounced:

**<<~prEHm'AXrIY>>**

The phonetic string is enclosed in double more-than (<<) and less-than symbols. The tables below describe the phonetic codes and modifiers used by First Byte's Monologue for Windows.

## Phonetic Codes

The following table lists all the phonemes used by Monologue for Windows along with examples of the sound they represent.

Phoneme	Sample	Phoneme	Sample
IY	<u>beet</u>	r	<u>red</u>
IH	<u>bit</u>	w	<u>wed</u>
IX	<u>decide</u>	b	<u>bed</u>
EH	<u>bet</u>	d	<u>dead</u>
AE	<u>bat</u>	g	<u>get</u>
AH	<u>but</u>	v	<u>vet</u>
AX	<u>about</u>	DH	<u>then</u>
AA	<u>cot</u>	z	<u>zen</u>
UH	<u>book</u>	ZH	<u>usual</u>
UW	<u>boot</u>	f	<u>fit</u>
OW	<u>boat</u>	TH	<u>thin</u>
ER	<u>bird</u>	s	<u>sin</u>
AY	<u>bite</u>	SH	<u>shin</u>
EY	<u>bait</u>	h	<u>him</u>

Phoneme	Sample	Phoneme	Sample
OY	<u>boy</u>	p	<u>pin</u>
AW	<u>bout</u>	PX	<u>spin</u>
LX	<u>fall</u>	t	<u>top</u>
I	<u>low</u>	TX	<u>stop</u>
m	<u>mow</u>	DX	<u>butter</u>
n	<u>no</u>	k	<u>kite</u>
NG	<u>sing</u>	KX	<u>sky</u>
y	<u>yes</u>		

## Phonetic Modifiers

In addition to the phonemes listed in the table, the following symbols are also supported.

Symbol	Meaning
[	Shorten the phoneme that follows.
]	Lengthen the phoneme that follows.
/	Increase the pitch by 20 percent.
,	Increase pitch by 30 percent and lengthen.
"	Increase pitch by 20 percent and lengthen.
-	Increase pitch by 30 percent and shorten.
nn	Target pitch to this level (two digits).
Sn	Set speed to this level (one digit).
Vn	Set volume to this level (one digit).

The pitch changes are propagated backward so that placing a pitch digit at the end of a phrase defines the ending pitch. The pitch change is distributed backward to the last pitch target definition.

# Creative Talking Scheduler

**T**alking Scheduler automatically reminds you of appointments you have scheduled by displaying the appointment information on the screen and by telling you about it. Sound Blaster 16's voice synthesizer tells you the time of the appointment, who it is with, and any information about the appointment you have entered. You can record your own message about the appointment; and you can attach related information to the appointment—a copy of a memo, a spreadsheet, or an E-mail message.

## Starting Talking Scheduler

*To start Talking Scheduler:*

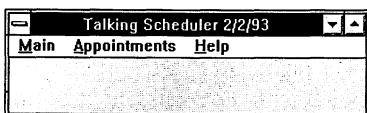
1. Double-click the Talking Scheduler icon in the Text-to-Speech group window.



Scheduler

The first time you start Talking Scheduler, a message appears telling you that no existing appointments have been found and Talking Scheduler is creating a new appointment file.

2. Choose *OK*. The Talking Scheduler window appears:



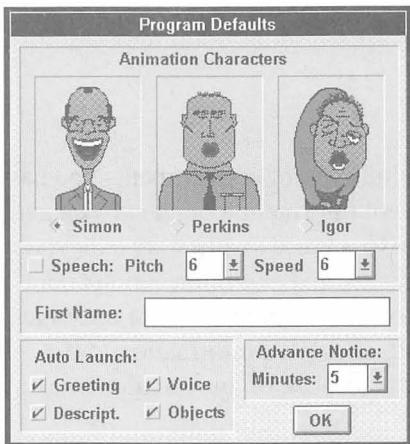
**FIGURE 10-1:** Talking Scheduler window

# Setting Up Talking Scheduler

Before you start entering appointments, set up Talking Scheduler by selecting the options that meet your needs.

*To set up Talking Scheduler:*

1. Choose *SetUp* from the Main menu. The Program Defaults dialog appears:



**FIGURE 10-2:** Program Defaults dialog

2. Choose the settings you want to use:

- ◆ Animation Characters: Choose either *Simon*, *Perkins*, or *Igor* as the character you want to appear to announce your appointments.
- ◆ Speech: Click the box next to Speech to hear the voice-synthesized speech of the character you have selected.

You can change the speech settings in the Pitch and Speed boxes:

- ◆ Pitch: A number between 1 and 9. The lowest pitch is 1, the highest is 9.
- ◆ Speed: A number between 1 and 9. The slowest speed is 1, the fastest is 9.
- ◆ First Name: Type your first name. The animated character uses your first name when it announces an appointment. For example, it begins

an announcement by saying something like, “Sandra, you have an appointment with . . .”

- ◆ Auto Launch: Select the elements you want for the appointment reminder:
  - ◆ Greeting: Your name, time of the appointment, and the person with whom you have the appointment. For example, “Martin, you have an appointment with Deborah from 9:00 a.m. to 9:30 a.m.”
  - ◆ Description: Information about the appointment.
  - ◆ Voice: Automatically plays the voice message you recorded when you entered the appointment.
  - ◆ Objects: Automatically opens any *objects*—memos, spreadsheets, E-mail messages—linked with the appointment announcement.
- ◆ Advance Notice: Sets the announcement of an appointment to happen before the appointment’s scheduled time.

3. Choose *OK* to save the settings you have chosen. The dialog disappears.

# Running Talking Scheduler

When Talking Scheduler is running, it is minimized to an icon. The icon appearing on the Windows desktop indicates that Talking Scheduler is ready to remind you of any appointments.

## *To run Talking Scheduler:*

1. Open the Talking Scheduler window and choose *Run* from the Main menu (or click the *Minimize* button). The Talking Scheduler window disappears, and an icon appears on the desktop.

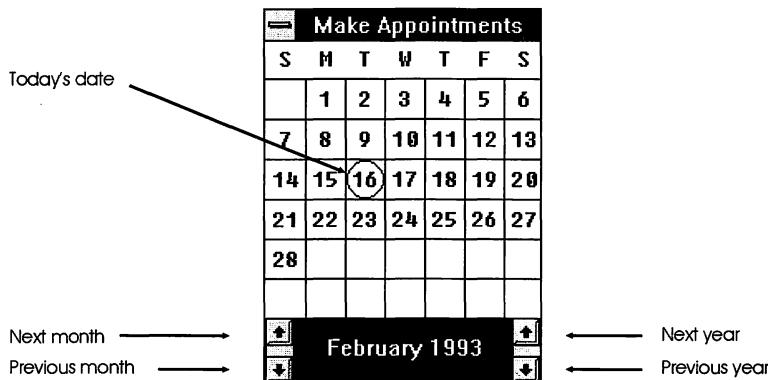
To start Talking Scheduler when you start Windows, move or copy the Talking Scheduler icon to the StartUp window.



## Entering an Appointment

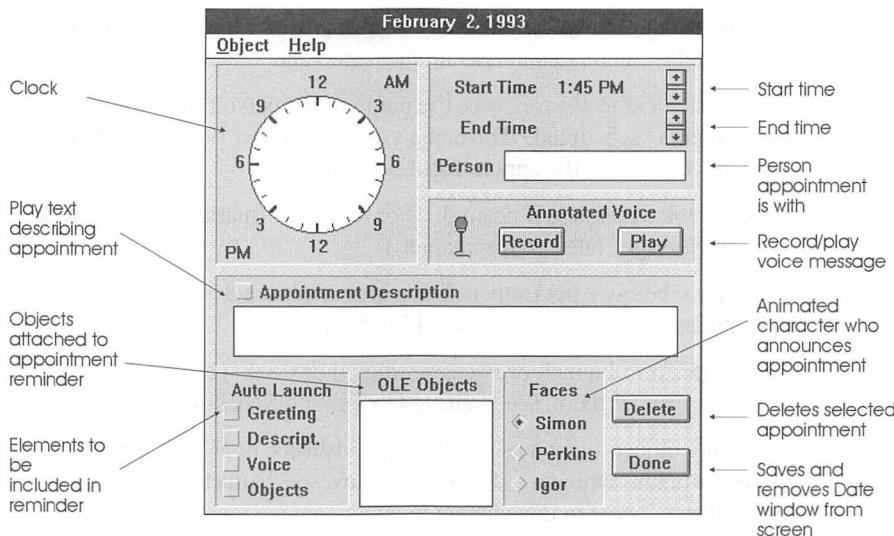
### *To enter an appointment:*

1. Open the Talking Scheduler window and choose *Add/Modify* from the Appointments menu the Make Appointments window appears:



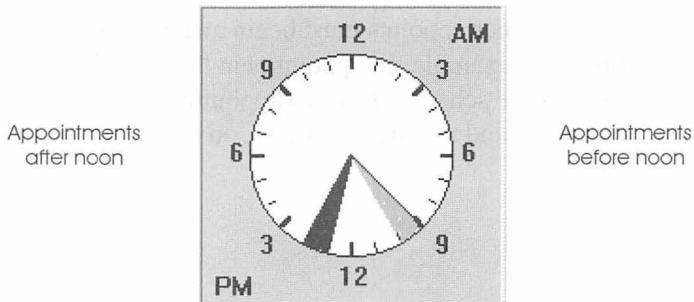
**FIGURE 10-3:** Make Appointments window: Click the mouse button with the pointer on the date on which you want to enter an appointment

2. Click the date for the appointment you want to enter. The window for the date appears:



**FIGURE 10-4:** Date window

3. Move the pointer to the time on the clock at which the appointment starts, click and drag the line from the time the appointment starts to the time the appointment ends. Release the mouse button. The appointment is marked on the clock by a red *time slice*.



**FIGURE 10-5:** Clock: Drag to select time slice; time slice appears in red; previously selected time slices appear in blue.

An appointment has to be at least 15 minutes long. Talking Scheduler does not allow you to schedule an appointment during a period that is already scheduled.

You can use the arrows next to Start Time and End Time to adjust the starting and ending times in five-minute intervals.

4. In the space next to *Person*, type the name of the person with whom the appointment is scheduled. The name you enter, up to 19 characters, is used in the greeting when the appointment is announced.
5. Record a voice message if desired. (For more information, see “Recording a Voice Message” later in this chapter.)
6. In the space below Appointment Description, enter a description of the appointment. (You can enter up to 127 characters.)
7. Change the Auto Launch or Faces settings if desired. (For more information about them, see “Setting Up Talking Scheduler.”)
8. Attach any objects—such as memos, spreadsheets, or E-mail messages—to the appointment reminder. (For instructions, see “Attaching an Object to an Appointment,” later in this chapter.)
9. If you want to add another appointment, repeat steps 4 through 9; or choose *Done* to return to the Make Appointments calendar.

Remember that Talking Scheduler is ready to remind you of your appointments only when it is minimized to an icon. When you have finished adding appointments, click the *Minimize* button or choose *Run* from the Main menu.

Your Talking Scheduler appoints must begin and end within the same 24-hour period. For example, an appointment that begins at 11 p.m. and ends at 1 a.m. must be scheduled as two appointments—11 p.m. to midnight on one day and midnight to 1 a.m. on the following day.

# Reviewing Appointments

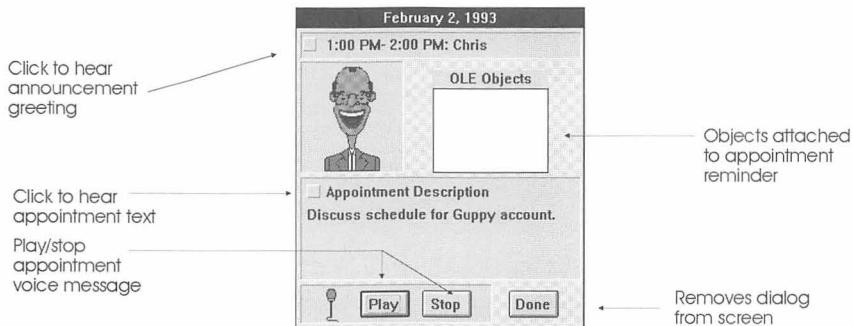
To review the appointments you have set:

1. Open the Talking Scheduler window and choose *Review* from the Appointments menu. The Review Appointments dialog appears:
2. Click the date for the appointments you want to review. The appointments set for that date are listed on the right side of the window.



**FIGURE 10-6:** Review Appointments dialog

3. Select the appointment you want to review, and choose the *Review* button. The Reminder dialog appears:



**FIGURE 10-7:** Reminder dialog

4. When you are finished reviewing the appointment, choose *Done*. The Review Appointments dialog reappears.
5. Choose *Done* to close the Review Appointments dialog.

# Making Changes to an Appointment

*To make a change to an appointment:*

1. Open the Talking Scheduler window and choose *Add/Modify* from the Appointments menu. The Make Appointments window appears.
2. Click the date for the appointment you want to change. The window for the date appears.
3. Select the appointment time slice. The slice changes from blue to red.
4. Make whatever changes you want to the information about the appointment.
5. When you are finished, if you want to change another appointment, select it; or choose *Done* to remove the window from the screen.



# Deleting an Appointment

There are three ways to delete appointments:

- ❖ Using the appointment clock
- ❖ Single appointments on the Review Appointments dialog
- ❖ Appointments for an entire day with the *Delete Days* command

## Using the Appointment Clock

*To delete an appointment on the appointment clock:*

1. Select the time slice that represents the appointment you want to delete.
2. Choose the *Delete* button. The time slice disappears from the clock.

## Using the Review Appointments Dialog

*To delete an appointment on the Review Appointments dialog:*

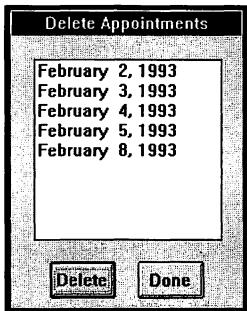
1. Open the Talking Scheduler window.
2. Choose *Review* from the Appointments menu. The Review Appointments dialog appears.
3. Click the date for the appointment you want to delete. The appointments for that date appear on the right side of the dialog.
4. Select the appointment you want to delete, and choose the *Delete* button. The appointment is removed from the list.
5. Choose *Done* to remove the dialog from the screen, or repeat step 4 to delete another appointment.

## Using the Delete Days Command

*To delete all the appointments scheduled on a date:*

1. Open the Talking Scheduler window and choose *Delete Days* from the Appointments menu. The Delete Appointments dialog appears:





**FIGURE 10-8:** Delete Appointments dialog

2. Select the date for which you want to delete appointments, and choose the *Delete* button. The date is removed from the list.
3. Choose *Done* to remove the dialog from the screen, or repeat step 3 to delete the appointments for another date.

## Recording a Voice Message

*To record a voice message for an appointment:*

1. Open the Talking Scheduler window and choose *Add/Modify* from the Appointments menu to display the Make Appointments window.
2. Click the appointment date and, when the dialog for the date appears, select the time slice for the appointment or create a new appointment.
3. Make sure the microphone is plugged into the microphone jack on the Sound Blaster 16.
4. Choose the *Record* button, and record the message.

The Record Voice Annotation dialog appears. The dialog shows you how many seconds of recorded voice the hard disk can hold. Voice messages use a lot of disk space—11 KB per second—so keep them short.

5. Choose the *OK* button to end the recording. The dialog disappears.
6. Choose *Play* to review the message you have just recorded.

Voice messages take up a lot of disk space. Delete appointments with voice messages once they are past, to free up the space.

# Attaching an Object to an Appointment

You can link or embed an object—memo, spreadsheet, E-mail—in an appointment. Placing an object in an appointment allows you to start the object directly from the Reminder dialog, instead of switching from Talking Scheduler to the application used to create the object. For details about object linking and embedding (OLE) works, see the *Microsoft Windows User's Guide*.

The primary difference between linking and embedding is that *linking* adds a pointer to the appointment and selects the object each time the appointment is accessed, while *embedding* makes a copy of an object and attaches it to the appointment. If you *embed* a copy of an object, the embedded copy is physically separate from the original object. If you make changes to the embedded copy, the original is not affected. If you *link* an object, the pointer gives the location of the orginal object. Any change you make to the linked object is actually made to the original.

## Embedding an Object in an Appointment

You can embed an object in an appointment using either the *Embed* command or the *Paste* command:

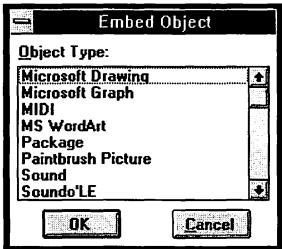
- ❖ Use *Embed* when the object's application is not running.
- ❖ Use *Paste* when the object's application is running or when you want to embed just part of an existing object.

*To embed an object using the Embed command:*

1. If the Talking Scheduler window is not on the screen, double-click the Talking Scheduler icon to display it, then choose *Add/Modify* from the Appointments menu to display the Make Appointments window.



2. Click the date for the appointment and, when the window for the date appears, select the time slice for the appointment or create a new appointment.
3. Choose *Embed* on the Object menu. The Embed Object dialog appears:



**FIGURE 10-9:** *Embed Object dialog*

4. Select the appropriate application for the object, then choose *OK*. The application starts.

5. To embed a new object, create the object and choose *Update* from the application's File menu; exit the application.

To embed an existing object, open the object and exit the application. A message appears asking if you want to update the object—choose *Yes*.

The application window disappears. An icon representing the object you embedded appears in the OLE Objects area.

*To use the Paste command to embed an object:*

1. On the object's application window, select all or part of the object.
2. Choose *Copy* from the application's Edit menu.
3. If the Talking Scheduler window is not on the screen, double-click the Talking Scheduler icon to display it, then choose *Add/Modify* from the Appointments menu to display the Make Appointments window.
4. Click the appointment date and, when the window for the date appears, select the time slice for the appointment or create a new appointment.
5. Choose *Paste* from the Object menu. An icon representing the object you embedded appears in the OLE Objects area.

## Linking an Object to an Appointment

*To link an object to an appointment:*

1. Go to the object's application window, and select all or part of the object.
2. Choose *Copy* from the application's Edit menu to place a copy of the object on the Clipboard..

3. If the Talking Scheduler window is not displayed, double-click the Talking Scheduler icon. Choose *Add/Modify* on the Appointments menu to display the Make Appointments window.
4. Click the date on which the appointment falls. When the window for the date appears, select a time slice or create a new appointment.
5. Choose *Paste Link* from the Object menu. An icon representing the embedded object appears in the OLE Objects area.

To check or update appointment links, choose *Links* on the Object menu. For information about linking, see the *Microsoft Windows User's Guide*.

## Detaching an Object from an Appointment

*To detach an object from an appointment:*

1. Open the Talking Scheduler window. Choose *Add/Modify* from the Appointments menu to display the Make Appointments window.
2. Click the date on which the appointment falls and, on the window for the date, select the time slice for the appointment.
3. Select the icon of the object you want to detach and choose *Clear* from the Object menu. The icon disappears from the OLE Objects area. You can detach all objects linked/embedded in an appointment by choosing *Clear All* on the Objects menu.



## Quitting Talking Scheduler

*To quit Talking Scheduler:*

1. Choose *Quit* from the File menu.

Choosing *Quit* deactivates Talking Scheduler—it will no longer remind you of any appointments. To remove the Talking Scheduler window from the screen, but keep it active, choose *Run* from the File menu.

# Talking Scheduler Menus

Main Menu	Description
SetUp	Displays the Program Defaults dialog. See “Setting Up Talking Scheduler.”
Clock	Displays the Windows clock.
Run	Minimizes Talking Scheduler to an icon and sets it to announce appointments.
Quit	Quits Talking Scheduler.

## Appointments

Menu	Description
Review	Review the appointments you set up.
Add/Modify	Add or change an appointment.
Delete Days	Delete all of the appointments scheduled for a given day.

## Help Menu

Help Index	List topics for which you can get on-line help.
About	Version number and copyright information for Talking Scheduler.

## Date Window Menu

Object Menu	Description
Paste	Copies all or part of an object and attaches it to an appointment.
Paste Link	Creates a link with all or part of an object and attaches the link to an appointment.
Links	Displays the links set up with an appointment. For more information, see the <i>Microsoft Windows User's Guide</i> .
Embed	Creates an object and attaches it to an appointment.
Clear	Detaches the selected object from an appointment.
Clear All	Detaches all the linked or embedded objects from an appointment.
Object	Edits the selected object.

## Help Menu

Each item is a topic. Select the item for information about the topic.



# DOS Applications

# SB16SET Utility

The SB16SET utility allows you to control the Sound Blaster 16 Mixer settings interactively. With the Mixer, you can control volume, gain, and tone of the audio sources.

You can enter commands at the DOS prompt or invoke the SB16SET interface to control the mixer settings.

## SB16SET Command

The syntax for using the SB16SET command and Mixer settings is:

```
SB16SET [/H | /?] [/Q] [/P] [/MA:vol[,bal]]
          [/VO:vol[,bal]] [/MI:vol[,bal]] [/CD:vol[,bal]]
          [/LI:vol[,bal]] [/MIC:vol] [/SP:vol]
          [/TR:vol[,bal]] [/BA:vol[,bal]]
          [/OPS:dev{+|-} [ dev{+|-} [ ... ] ]
          [/IPL:dev{+|-} [ dev{+|-} [ ... ] ]
          [/IPR:dev{+|-} [ dev{+|-} [ ... ] ]
          [/IPG:lgain[,rgain] [/OPG:lgain[,rgain]]
          [/AGC:{+|-}]
```

Options	Description
/H or /?	Displays help messages.
/Q	Runs SB16SET without displaying the setting information.

Options	Description
/P	Configures the Mixer according to the Preset settings in the CTMIX.CFG file.
/MA:vol;bal	Sets the MAster volume (0-255) and balance (-5 to +5) of left and right channels.
/VO:vol;bal	Sets the VOice volume (0-255) and balance (-5 to +5) of left and right channels.
/MI:vol;bal	Sets the MIDI volume (0-255) and balance (-5 to +5) of left and right channels.
/CD:vol;bal	Sets the CD volume (0-255) and balance (-5 to +5) of left and right channels.
/LI:vol;bal	Sets the LIne-in volume (0-255) and balance (-5 to +5) of left and right channels.
/MIC:vol	Sets the MICrophone volume (0-255).
/SP:vol	Sets the PC SSpeaker volume (0-255).
/TR:vol;bal	Sets the TReble level (0-255) and balance (-5 to +5) of left and right channels.
/BA:vol;bal	Sets the BAss level (0-255) and balance (-5 to +5) of left and right channels.
/OPS:dev	Sets the audio ouput switches (OPSW) on or off. <i>dev</i> is one or more of the following: CD LI MIC Each <i>dev</i> must be followed by either + (on) or - (off).
/IPL:dev	Turn left input switches (IPLSW) on or off. <i>dev</i> represents one or more of the following: CDR CDR MDL MDR LIR LIR MIC Each <i>dev</i> must be followed by either + (on) or - (off).
/IPR:dev	Turns right input switches (IPRSW) on or off. See /IPL.
/IPG:lgain,rgain	Sets input gain (IPGAIN) of left ( <i>lgain</i> ) and right ( <i>rgain</i> ) channels. Valid entries for either channel is 1, 2, or 4.
/OPG:lgain,rgain	Sets output gain (OPGAIN) of left ( <i>lgain</i> ) and right ( <i>rgain</i> ) channels. Valid entries for either channel is 1, 2, or 4.
/AGC:{+/-}	Turns automatic gain control (AGC) on (+) or off (-).

Options that can accept volume and balance settings may include either or both. If volume is not included, the balance value must be preceded by a semicolon ( ; ). Values for volume range from 0 to 255; for balance the range is -5 to +5. For example, /MA:200;5 sets the master volume to 200 and the balance decreases volume in the left channel.

If you enter multiple MI, IP, or OP switches, the order of precedence is MI (MIDI), IP, and OP.

## SB16SET Command Examples

The following are examples of how you can use the SB16SET command:

*To set the PC speaker volume to 200:*

1. Type **SB16SET /SP:200** and press ENTER.

*To set the master volume to 200 with balanced output through left and right channels:*

1. Type **SB16SET /MA:200** and press ENTER.

If balance is not specified, both channels are set equally.

*To set all from the two examples above in a single command:*

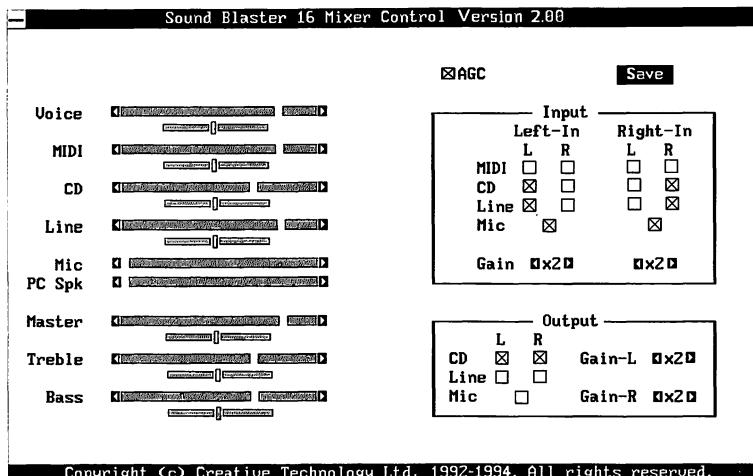
1. Type **SB16SET /SP:200 /MA:200;0** and press ENTER.

## SB16SET Control Screen

The SB16SET control screen gives you interactive access to the mixer controls in DOS.

*To display the SB16SET control screen:*

1. Change to your sound directory.
2. Type **SB16SET** and press ENTER. The SB16SET control screen (Figure 11-1) displays.



**FIGURE 11-1:** SB16SET control screen

## Volume Control

The sliders for each of the audio sources—Voice, MIDI, CD, Line, Microphone, PC Speaker, Master, Treble, and Bass—control the volume or level for each source. The volume control slider is the larger; the smaller, immediately below, is the balance control slider.

## Balance Control

The balance control sliders are used to adjust the balance of right and left speakers for audio sources with stereo capability. Moving the slider to the left decreases the volume of the right speaker; the left speaker volume remains the same. Moving the slider to the right decreases the volume of the left speaker; the right speaker volume remains the same.

## Automatic Gain Control (AGC)

The automatic gain control (AGC) box, when filled, automatically adjusts input gain from the microphone to a level suitable for recording.

## Save Button

The Save button writes all changes made to the control screen to the CTMIX.CFG file. The new settings are used the next time you set the Mixer with the SB16SET /P command.

## Input Box

The Input box enables you to select the audio sources you want to control as input to the Mixer. The audio sources available are MIDI, Line, and Microphone input, and CD-ROM. You can direct these audio sources through the left and/or right input channels of the Mixer.

For stereo, the left channel of the audio source must be directed to the Left-In channel and the right channel of the audio source to the Right-In channel.

The arrow buttons can be used to manually increase/decrease the input gain. (*Gain* increases or decreases the amplification of an audio source.)

## Output Box

The Output box enables you to select the audio sources you want to control as output from the microphone, Line-in, and CD-ROM to the left and right speakers. You can select one or a combination of the above audio sources playing through the card.

# Mixer Controls

You can adjust the Mixer control settings by using the mouse or the keyboard.

## *Mouse Control*

- ◆ To change a check box, position the mouse pointer on the box and click the left mouse button.
- ◆ To adjust a volume or balance slider, use the mouse pointer to click-and-drag the slider. Release the mouse button when the slider is at the desired point.

Alternatively for the volume control, use the mouse pointer to click on the arrows at either end of the volume scale. Continue to click the slider until it reaches the desired point.

- ◆ To quit the Mixer control screen, click on the box in the upper left corner.

## *Keyboard Control*

- ◆ To move from one group of controls to another, press the TAB key.
- ◆ To move backwards through control groups, press SHIFT+TAB.
- ◆ To move from one control to another within a group, press the up or down arrow key.
- ◆ To adjust volume or gain, press the left or right arrow key.
- ◆ To change a check box, use the TAB or arrow keys to select the box and press the SPACEBAR or ENTER key.
- ◆ To quit the Mixer control screen, press the ESC key.

# PLAY Utility

The PLAY utility allows you to play audio CDs and a wide range of sound files. By simply entering a command, you can now play Microsoft Wave (.WAV), Creative Voice (.VOC), MIDI (.MID), and Creative Music (.CMF) files. And, if you want to play a set of files with the same file name extension, the utility gives you the flexibility to play them in sequence without requiring you to specify each file individually.

## Playing Sound Files

The syntax for the PLAY command to play sound files is:

**PLAY** *file1* [*file2* . . .] [/Q] [/H] [/?]

Option	Description
CD /T: <i>xx</i>	Play CD beginning with track number <i>xx</i> .
<i>file1</i>	Name of the first file you want to play.
<i>file2</i> . . .	Name(s) of additional file(s) of the same type you want to play.
/Q	Disables display of playback information (file format, play time, file names, key menu, and the copyright messages) while a file is playing.
/H or /?	Displays description for using the PLAY command.

When using the PLAY command:

- ❖ If you enter the PLAY command without parameters, a description for using the command is displayed.
- ❖ If you enter a file name without specifying an extension, PLAY will search the current directory for that file name. If more than one file name extension exists for the file name, the utility plays only one file in the following order of preference: .WAV, .VOC, .MID, and .CMF.
- ❖ Before you play a Creative Music (.CMF) file, you have to load the SBFMDRV.COM driver into memory. This is done by typing SBFMDRV in the directory in which the driver is found.
- ❖ When you enter a file name, you can specify part of the file name and use an asterisk ( \* ) or question mark ( ? ) to represent the remaining missing characters. The asterisk represents one or more characters while the question mark represents only a single character but can be used repeatedly.

For example, if you enter PLAY \*.WAV, all wave files are played. If you enter PLAY TEST\*.WAV, all wave files with the file name beginning with TEST are played. If you enter PLAY TEST?.WAV, all wave files with a file name containing five characters beginning with TEST are played.

PLAY \*.\* or PLAY TEST.\* are not valid commands. The PLAY command only works with files of one type collectively.

- ❖ When you play a MIDI file, the program searches for the MIDI environment variable.

The MIDI environment variable specifies the MIDI file format used and the destination of MIDI data. The MIDI data can be sent to the FM chip, Sound Blaster MIDI, or MPU-401 port. Generally, there are three MIDI file formats available: General MIDI, Extended MIDI, and Basic MIDI.

The command for setting the MIDI environment is:

**SET MID=SYNTH:x MAP:y**

Option	Description	
SYNTH:x	x =	1 Internal synthesizer (default) 2 MIDI port
MAP:y	y=	G General MIDI file format E Extended MIDI file format (default) B Basic MIDI file format

---

## Playing Audio CDs

The syntax for the PLAY command to play audio CDs is:

**PLAY CD [/T:xx] [/Q] [/H] [/?]**

Option	Description
CD	Specifies CD-ROM drive as the source of audio input.
/T:xx	Specifies the CD track with which you wish playing to start (xx is the track number).
/Q	Disables display of playback information (current track, total tracks, playing time, and the key menu) while a track is playing.
/H or /?	Displays description for using the PLAY command.

---

**NOTE** *If you do not specify the track number (/T:xx) option, you must press the P key to start playing the CD.*

# PLAY Command Examples

The following are examples of how you can use the PLAY command to play sound files and audio CDs in DOS:

*To play a Creative music file (for example, SONG.CMF):*

1. Type **SBFMDRV.COM** and press ENTER to load the FM driver into memory.
2. Type **PLAY SONG.CMF** and press ENTER.

*To play three voice files (for example, TEST1.VOC, TEST2.VOC, and TEST3.VOC) in sequence:*

1. Type **PLAY TEST1.VOC TEST2.VOC TEST3.VOC** and press ENTER.

**NOTE** *If a file specified does not exist or cannot be found, the PLAY command is not executed.*

*To play a voice file (for example, TEST1.VOC) without displaying the playback information.*

1. Type **PLAY TEST1.VOC /Q** and press ENTER.

*To play a CD without specifying the starting track:*

1. Type **PLAY CD** and press ENTER.

*To play a CD starting at track 5:*

1. Type **PLAY CD /T:5** and press ENTER.

*To play a CD starting at track 5 without displaying the CD key assignments:*

1. Type **PLAY CD /T:5 /Q** and press ENTER.

# Controlling Playback

You can control the playback of files using the keyboard. A menu of available keys appears when you enter the PLAY command without the /Q switch.

## Wave (.WAV) File Control Keys

The following control keys are available while playing wave files:

<b>Key</b>	<b>Description</b>
C	Resumes playing the wave file.
ESC	Stops the wave file and exits the program.
N	Plays the next wave file.
P	Plays the previous wave file in a specified set.
SPACEBAR	Pauses the wave file.
< or > and ENTER	Selects and plays another wave file if more than one file is specified.

---

## Voice (.VOC) File Control Keys

The following control keys are available while playing voice files:

<b>Key</b>	<b>Description</b>
B	Stops a repeating section of the voice file and proceeds to the next section.
C	Resumes playing the voice file.
ESC	Stops the voice file and exits the program.
N	Plays the next voice file in the set.
P	Plays the previous voice file in the set.
SPACEBAR	Pauses the voice file.
< or > and ENTER	Selects and plays another wave file if more than one file is specified.

---

## MIDI (.MID) File Control Keys

The following control keys are available while you are playing MIDI files:

<b>Key</b>	<b>Description</b>
C	Resumes playing the MIDI file.
ESC	Stops the MIDI file and exits the program.
Left or right arrow	Reproduces the sound in a different key by raising or lowering the pitch.
M	Changes to a different set of musical instruments based on the Basic, General, and Extended standards on the MIDI mapper.
N	Plays the next MIDI file in the set.
P	Plays the previous MIDI file in the set.
SPACEBAR	Pauses the MIDI file.
Up or down arrow	Changes the tempo of the MIDI file.
< or > and ENTER	Selects and plays another MIDI file if more than one file is specified.

---

## Creative Music (.CMF) File Control Keys

The following control keys are available while you are playing .CMF files:

<b>Key</b>	<b>Description</b>
C	Resumes playing the .CMF file.
ESC	Stops the .CMF file and exits the program.
Left or right arrow	Reproduces the sound in a different key by raising or lowering the pitch.
N	Plays the next .CMF file.
P	Plays the previous .CMF file in a specified set.
SPACEBAR	Pauses the .CMF file.
< or > and ENTER	Selects and plays another .CMF file if more than one file is specified.

---

## Audio CD Control Keys

The following control keys are available while you are playing an audio CD:

<b>Key</b>	<b>Description</b>
C	Resumes playing the track.
ESC	Stops the track file and exits the program.
F	Fast forwards the track.
L	Plays the previous track.
N	Plays the next track.
P	Plays the track.
R	Rewinds the track.
S	Stops the track.
SPACEBAR	Pauses the track.
X	Exits the program.

---

# RECORD Utility

The RECORD utility allows you to record sound to a file by specifying the file type and recording parameters such as sampling rate and recording mode.

Sound is recorded into a sound file in Microsoft Wave (.WAV) or Creative Voice (.VOC) file format.

## Recording Sound Files

The syntax for using the RECORD command to record wave or voice files is:

```
RECORD file [/A:xx] [/C:xx] [/M:xx] [/R:xx] [/S:x]  
      [/Q] [/H] [?]
```

Option	Description
<i>file</i>	Specifies the name of the file including the file name extension (.WAV or .VOC) to which you want to record sound data.

Option	Description
/A:xx	Sets the recording source:
	xx =      MIC      Microphone
	CD      Audio CD
	LINE      External device using line-in jack on Sound Blaster 16
	FM      FM file
	You can record from more than one source.
/C:xx	Sets the compression format:
	xx =      ALAW
	MULAW
	CTADPCM
/M:xx	Sets the recording mode:
	xx =      MONO
	STEREO
/R:xx	Sets the sampling resolution:
	xx =      8 bits
	16 bits
/S:xx	Sets the sampling rate:
	.VOC format:      xx =      5000 to 44100 Hz
	.WAV format:      xx =      11025 Hz
	22050 Hz
	44100 Hz
	The higher the sampling rate, the better the recording quality.
/Q	Disables display of recording information.
/H or /?	Displays a description on using RECORD.

When using the RECORD command:

- ❖ If you enter the RECORD command without parameters, the online description for the command displays.
- ❖ If you do not specify the recording mode, sampling rate, and resolution, the sound is recorded in monaural, 8-bit wave file format with a 11025 Hz sampling rate.
- ❖ If you want to stop the recording, press the ESC key.
- ❖ The recording stops when the disk is full.
- ❖ A new file is created or an existing file overwritten during recording.

# RECORD Command Examples

The following are examples of how you can use the RECORD command to record sound files in DOS:

*To record from an audio CD to a sound file (for example, SONG.VOC) in .VOC format:*

1. Play the audio CD in the background.
2. Type **RECORD SONG.VOC /A:CD** and press ENTER.

*To record a sound file without displaying the recording information:*

1. Type **RECORD SONG.VOC /A:CD /Q** and press ENTER.

*To record a stereo sound file from a line-in source in .WAV format with MULAW compression:*

1. Type **RECORD SONG.VOC /A:LINE /M:STEREO /C:MULAW** and press ENTER.

## Text-to-Speech

The text-to-speech program uses phonetic rules to translate the text and is able to speak virtually any word. It reads ASCII text, outputting it vocally through the audio card speakers or headphones.

### SBTALKER

SBTALKER is the speech synthesizer that converts typed text to speech. You must have the Sound Blaster 16 software installed and SBTALKER in memory before using the READ command.

#### Installing SBTALKER

SBTALKER is installed at the end of the Monologue for Windows (see Chapter 9) installation. (Review the Monologue for Windows instructions if you did not elect to install SBTALKER at that time.)

##### *To install SBTALKER:*

1. Insert the Text-to-Speech diskette in the disk drive.
2. Type **A:\INSTALL** following the Windows Program Manager *Run* command.
3. Press ENTER.

## Starting SBTALKER

To run SBTALKER, exit Windows and change to the \SB16\SBTALKER directory.

*To start SBTALKER:*

1. Change to the \SB16\SBTALKER directory.
2. Type **SBTALK** and press ENTER.

SBTALK is a batch file (SBTALK.BAT) located in the \SB16\SBTALKER directory.

## Creating Echo Effect

With SBTALKER, you have the ability to create an echo effect for any of the applications you are reading.

*To set echo effect:*

1. Type **SET-ECHO [dddd]**
2. Press ENTER. *dddd* Sets the delay time for the echo effect. The range is from 0 to 4,000. Entering 1,000 provides a good echo effect with a 0.1 second delay. A delay setting of 500 produces a reverb effect.

## Extended Memory Specification

SBTALKER automatically loads itself into expanded memory specification (EMS), if the proper EMS driver is installed in the system. The usage of expanded memory is advantageous because it can hold a larger amount of text, allowing for faster access of data and minimizing breaks between various text. SBTALKER is compatible with most EMS drivers available. However, if you have one that does not work properly with SBTALKER, it may be necessary to remove the EMS driver to run SBTALKER.

## Removing SBTALKER

SBTALKER stays in memory until you remove it or reboot the system. You may not be able to run other applications with SBTALKER in memory.

*To remove SBTALKER from memory:*

1. Change to the \SB16\SBTALKER directory.
2. Type **REMOVE** and press ENTER.

**NOTE** *To remove SBTALKER, it must be the last program loaded into memory.*

## Read

The Read program can read ASCII text files or text typed from the keyboard. Text can be entered in either upper or lower case. The three ways of reading text are:

- ❖ DOS command
- ❖ Text reader
- ❖ ASCII text files

### Reading from the DOS Command

*To read text from DOS command:*

1. At the DOS prompt, type:

**READ any-text**

2. Press ENTER. The READ command converts *any-text* to speech. Once the text is read, it returns to the DOS prompt

For example, to have the program say, “Hello, how are you?”:

At the DOS prompt, type **READ “HELLO, HOW ARE YOU?”**

3. Press ENTER. You will hear, “Hello, how are you?” from your speakers. Now, try typing “READ “HELLO, HOW ARE YOU?”” (without the quotation marks) and press ENTER. Notice any difference in the output?

**NOTE** *You do not have to include the quotation mark when typing the text.*

## Reading from the Text Reader

*To read from the Text Reader:*

1. Type **READ** at the DOS prompt.
2. Press ENTER. The Text Reader waits for text to be entered from the keyboard before sending it to the speakers.

To stop the program, press CONTROL+Z or CONTROL+C, followed by ENTER. You immediately return to the DOS prompt.

## Reading from ASCII Text Files

*To read text from ASCII text files:*

1. At the DOS prompt, type:

**READ > input-file [/w]**

2. Press ENTER. The READ command gets its input from *input-file*—an ASCII text file. The program reads any text within this file and terminates when it reaches the end.

**NOTE** *The /w option displays the text as it is being read.*

For example, type the following command at the DOS prompt, in the \SB16\SBTALKER directory, and press ENTER:

**READ > SBTEST.TXT /w**

The program begins reading the text that is in the file SBTEST.TXT and display the text on the screen. To stop reading the file, press ESC.

**NOTE**

*SBTEST.TXT is an ASCII text file supplied with the software. You can ask SBTALKER to read any ASCII text by including the path in which the file is located. ASCII text files can also be accessed from the COM1 communications port:*

*To read an ASCII text file from the COM1 communications port:*

1. Type **READ > COM1**.
2. Press ENTER.

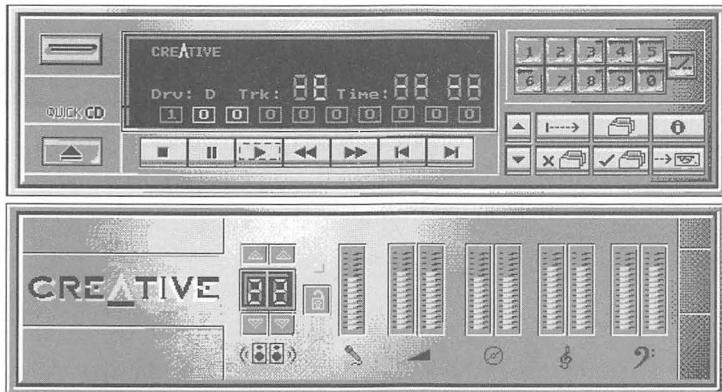
# QuickCD

QuickCD is a DOS interface that allows you to play audio compact discs (CDs) in your computer's CD-ROM drive.

## Starting QuickCD

*To start QuickCD:*

1. Change to the Sound Blaster 16 directory. For example, type **CD \SB16** (for the default installation) and press ENTER.
2. Type **QCD** at the DOS prompt and press ENTER. The QuickCD control panel appears.



**FIGURE 15-1:** DOS QuickCD control panel

## QuickCD Control Panel

QuickCD has the same controls found on most CD players as well as some additional features.

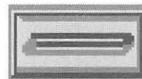
### Display Panel

The display panel shows the current operating mode. It provides you with information on the playing track and the time the track has been playing.



**FIGURE 15-2:** QuickCD display panel

### Power Button



The power button allows you to quit QuickCD by clicking with the mouse button.

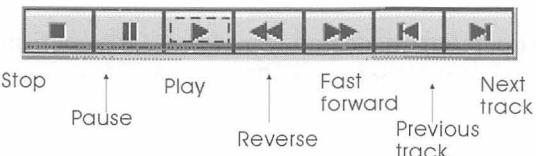
### CD Load/Unload Button



The CD load/unload button allows you to load or unload a CD from a caddy-less CD-ROM drive. The CD-ROM tray opens (unload) and closes (load) when you click on the button.

## Playback Control Buttons

The playback control buttons allow you to command the audio CD in the CD-ROM drive.

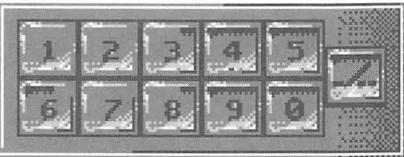


**FIGURE 15-3:** Playback control buttons (Play is currently selected)

Button	Description
Stop	Stops playing the current track.
Pause	Pauses playing the current track; press again to resume.
Play	Begins playing the current track.
Reverse	Quickly returns to the beginning of the current track.
Fast forward	Quickly advances the current track.
Previous track	Begins playing the previous track.
Next track	Begins playing the next track.

## Track Selector

The track selector consists of buttons that allow you to select a track on your audio CD by entering its number.



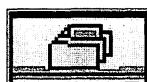
**FIGURE 15-4:** Track selector buttons

To play a track numbered 1-10, press the appropriate number. 0 plays track 10.

To play a track number 11 or higher, press the “...” button before entering the two-digit track number.

## Function Buttons

The function buttons allow you to view and select sets of tracks that you want to play.



Selects the operating mode you want to use. To confirm selection, choose the Set button. The modes of operation are:

*Normal* plays tracks in the order in which they are arranged on the CD.

*Random* plays tracks in random order.

*Programmable* allows you to arrange the tracks in any sequence. You are prompted to enter the track number and press the Set button. When you have completed ordering the tracks, push the Play button to listen to the tracks as arranged.

*Repeat Track* continuously repeats the track that is currently playing.

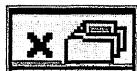
*Repeat Disk* repeats the entire audio CD when the last track is finished.



Confirms the operating mode you selected.



Plays from ten seconds of each track on the CD in Normal mode.



Cancels any functions and incorrectly entered track number.



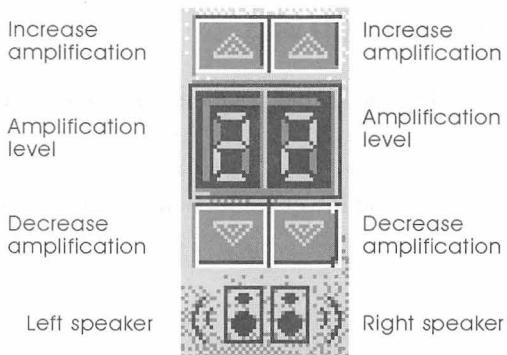
Shows credits and copyright notices from the audio CD.



Allows you to go to another CD-ROM drive if more than one is installed. Does not disrupt a drive that is currently playing.

## Gain Controls

The gain increases or decreases the amplification of your audio source.

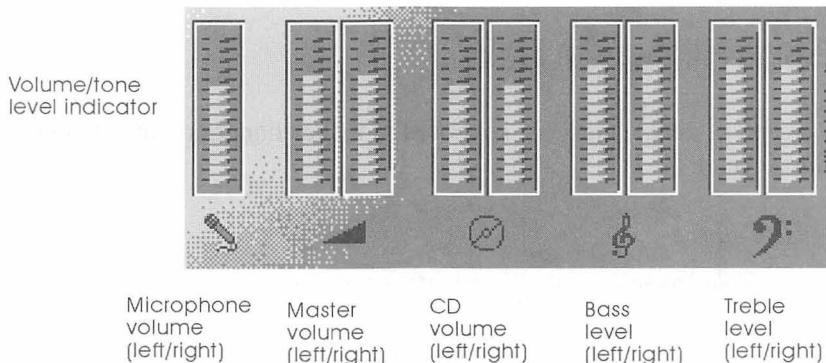


**FIGURE 15-5:** Gain controls

You can increase the gain levels by two, four, or eight times.

## Volume/Tone Controls

The volume/tone controls allows you to adjust the volume and tone levels of the microphone, master, and CD sources.



**FIGURE 15-6:** Volume/tone controls

**Microphone** Controls the microphone volume.

**Master** Controls the master volume for both left/right speakers.

**CD** Controls the volume for CD input.

**Treble** Controls the level of the higher frequencies of an audio source.

**Bass** Controls the level of the lower frequencies of an audio source.

## Channel Lock

The Channel Lock allows you to lock together the left and right channels of audio sources—when the channels are locked, they move together whenever you adjust volume or tone level.



The box above the lock indicates the status.

## Controlling QuickCD

You can use either mouse or keyboard to make changes on the QuickCD control panel.

### *Mouse Control*

- ♦ To increase/decrease the volume or tone level, click-and-drag or click on the indicator.
- ♦ To increase to maximum level, click above the volume or tone level indicator.
- ♦ To decrease to minimum level, below the volume or tone level indicator.

## *Keyboard Control*

- ◆ To advance to an option, press the TAB key.
- ◆ To move backwards through the controls, press SHIFT+TAB.
- ◆ To increase/decrease volume, tone level, or gain, press the up or down arrow key.
- ◆ To begin an operation (press a button), select the button and press ENTER.
- ◆ To quit QuickCD, press the ESC key.

In addition, the following key combinations can be used to operate the QuickCD control panel.

<b>Key(s)</b>	<b>Description</b>
ALT+A	Scan mode: Preview tracks on the current audio CD.
ALT+B	Select the bass tone level indicator.
ALT+C	Select the CD volume indicator.
ALT+E	Select additional CD-ROM drive.
ALT+I	Display information about QuickCD.
ALT+M	Select master volume indicator.
ALT+N	Cancel current program mode.
ALT+O	Toggle through program modes.
ALT+P	Select microphone volume indicator.
ALT+T	Select the treble tone level indicator.
SPACEBAR	Press the currently selected button.
0 to 9	Select a track from 0 to 9.
/	Set track selector to accept only two-digit track number.

## **Quitting QuickCD**

*To quit QuickCD:*

- ◆ Select the Power button.
- ◆ Press the ESC key.

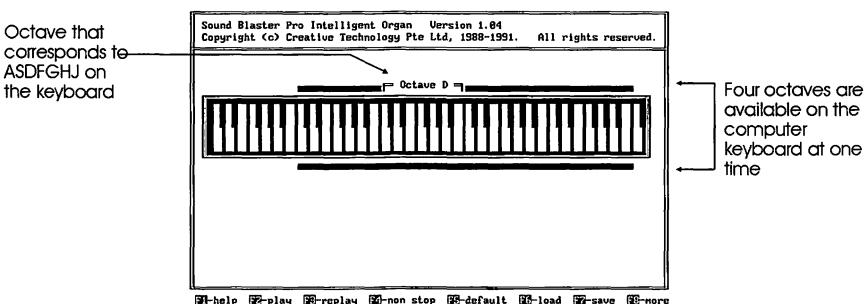
# Intelligent Organ

Sound Blaster 16's Intelligent Organ transforms your computer keyboard into an organ keyboard. You can play musical pieces on your computer keyboard—and Intelligent Organ helps you learn them. Or, you can use a MIDI keyboard with Intelligent Organ by connecting it through Sound Blaster 16's MIDI interface.

## Loading Intelligent Organ

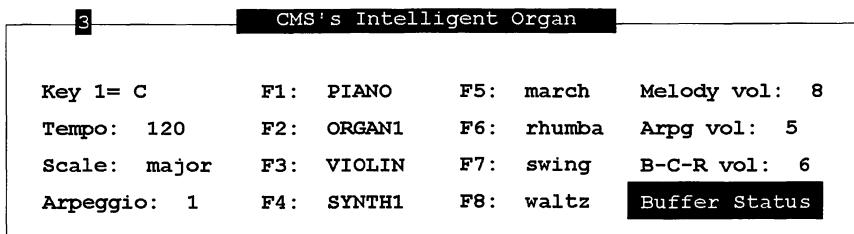
*To load Intelligent Organ:*

1. At the DOS prompt, type **CD \SB16\PRO\_ORG** and press ENTER to switch to the directory in which Intelligent Organ is located.
2. Type **PRO\_ORG** and press ENTER. The main screen appears:



**FIGURE 16-1:** Intelligent Organ main screen

3. Press the F2 key. The play mode screen is displayed:



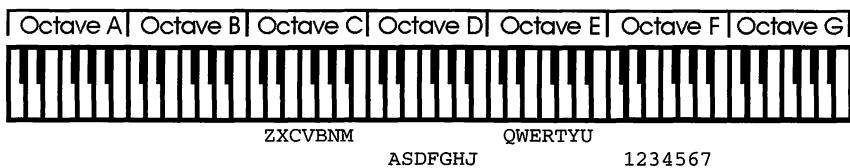
**FIGURE 16-2:** Intelligent Organ play mode screen

For more information, see “Playing Intelligent Organ” later in this chapter.

## How the Keyboard Works

Intelligent Organ’s keyboard covers a total of seven octaves (in figure 16-3, they are labeled A, B, C, D, E, F, and G). The first note of octave D is middle C.

You can assign a block of either two or four octaves to the computer keyboard. In two-octave mode, you have access to the notes that correspond to both black and white keys of Intelligent Organ’s keyboard.



**FIGURE 16-3:** Seven octaves; keyboard equivalents are shown for four octaves (white keys only)

In four-octave mode, you have access only to the notes that correspond to the white keys. Four-octave mode is the default.

## Four-Octave Mode

In four-octave mode, each octave in the block is assigned to one row on the computer keyboard (see figure 16-3).

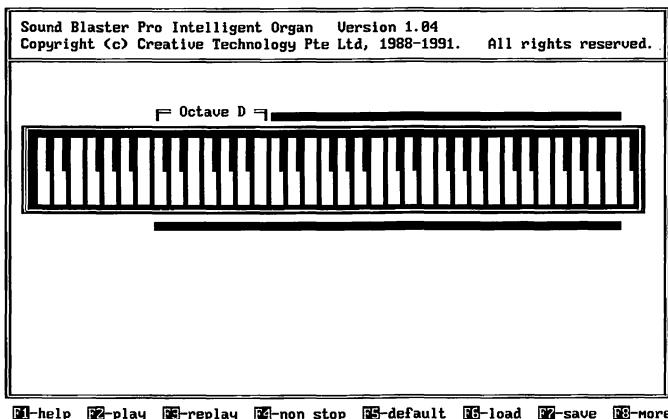
The green bars above and below the keyboard on the screen indicate which four octaves are currently selected.

*To select a different block of octaves:*

1. Press the left or right arrow key in play mode.

The green bars shift to indicate the block that is selected.

If you press the right arrow key to shift the block one octave higher, octave D shifts from computer keys ASDFGHJ to ZXCVBNM:



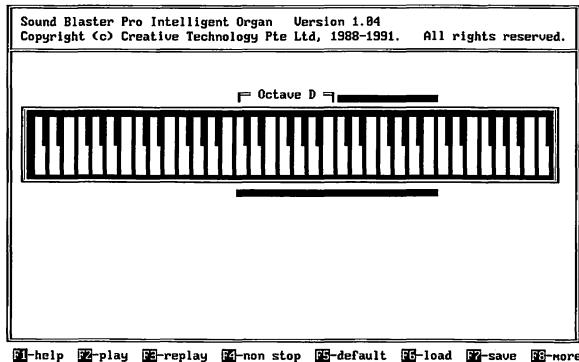
**FIGURE 16-4:** Four octaves shifted right

If you press the left arrow key to shift the block one octave lower, octave D shifts from computer keys ASDFGHJ to QWERTYU.

## Two-Octave Mode

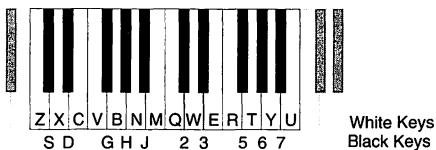
*To switch to two-octave mode:*

1. Press the TAB key. The green bars shorten to indicate the two octaves that are selected.



**FIGURE 16-5:** Two octaves active

In two-octave mode, each octave in the block is assigned to two rows on the computer keyboard:



**FIGURE 16-6:** Two octave mode showing keyboard equivalents

*To select a different set of two octaves:*

1. Press the left or right arrow key. The green bars shift to indicate the block that is selected.

Press the right arrow key to shift the block one octave higher, octave D shifts off the computer keyboard and octave E and F shift to computer keys ZXCVBNM and ASDFGHJ.

Press the left arrow key to shift the block one octave lower, octave D and E shifts to computer keys QWERTYU and 1234567.

# Learning to Play a Song

Intelligent Organ helps you learn a song by playing the song and showing you which keys on the computer keyboard correspond to the notes of the song and then by cueing you to press the right keys at the right time.

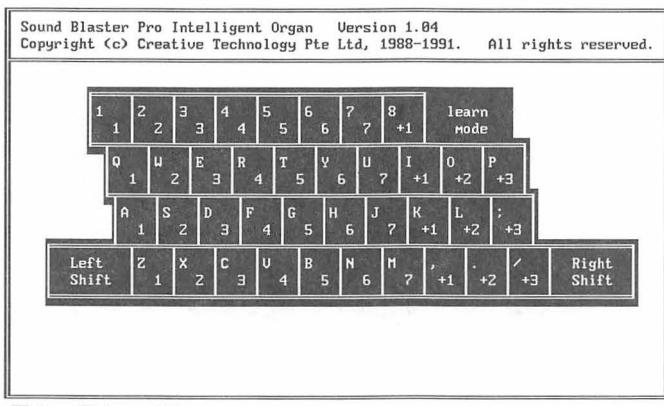
*To learn a song:*

1. Press F6.

A list of the available songs is displayed.

2. Select the song you want and press ENTER.

The list disappears from the screen, and Intelligent Organ loads the song into memory.



**FIGURE 16-7:** Learn mode screen: Numbers on the bottom of the keys correspond to the numbers above each note on the music (see figures 16-9 and 16-10)

3. Press F8 then F1 to switch to learn mode.

4. Press F1 to have Intelligent Organ play the song for you.

As the song plays, Intelligent Organ highlights the key that corresponds to each note.

5. Press F2 to have Intelligent Organ lead you through the song as you play.

Intelligent Organ begins playing the accompaniment for the song. It cues you to prepare to press a key by highlighting the letter on the key in brown,

then signals you to press the key by highlighting the number that represents the note in magenta.

Intelligent Organ accommodates your skill level by pausing if you do not press the key on time and waits until you do so.

*To stop the lesson at any point:*

1. Press ESC.

*To exit learn mode and return to the main screen:*

1. Press ESC.

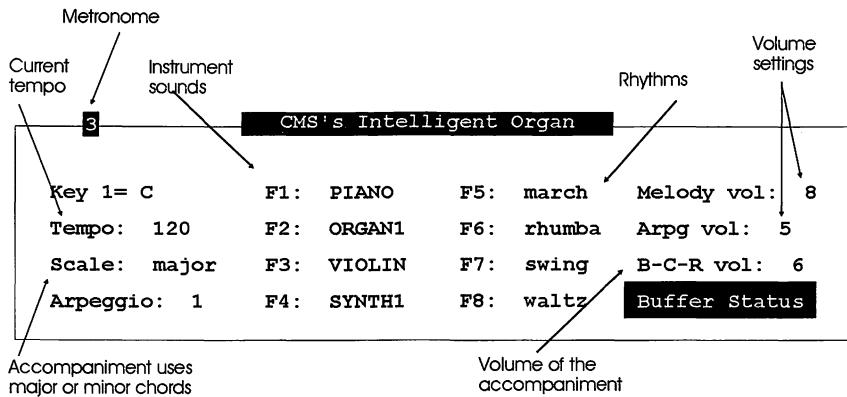
# Playing Intelligent Organ

*To play Intelligent Organ:*

1. Return to the main screen if necessary.
2. To return Intelligent Organ to its default settings, press F5, and, on the Default Setting window, type **O** (original values), and press ENTER.

Each time you load a song, Intelligent Organ alters the settings on the play mode screen for the song. The default settings allow you to start a new song with standard settings.

3. Press F2 to start playing Intelligent Organ. The screen changes to:



**FIGURE 16-8:** Intelligent Organ play mode screen

In play mode, everything you play is recorded. “Buffer Status” flashes red when memory is nearly full. The instrument and rhythm currently selected are shown in red. Each of the function keys, F1 through F4, can be pressed to select from five different instruments; each of the second four function keys, F5 through F8, can be pressed to select from four different rhythms.

*To change the volume:*

1. Press the HOME key to increase the volume.
2. Press the END key to decrease the volume.

*To change the key:*

1. Press the + (plus) key or the - (minus) key on the numeric keypad.

Music to “Twinkle, Twinkle, Little Star” and “When the Saints Go Marching In” appears below. The number above each note corresponds to the number shown on the learn mode keyboard (see figure 16-7). You can play either song on any row of the keyboard.

### **Twinkle, Twinkle, Little Star**

(File name: TWINKLE)

4/4 time signature, treble clef. The music is divided into four staves. The first staff has notes with values 1, 1, 5, 5, 6, 6, 5, 4, 4, 3, 3. The second staff has notes with values 2, 2, 1, 5, 5, 4, 4, 3, 3, 2. The third staff has notes with values 5, 5, 4, 4, 3, 3, 2, 1, 1, 5, 5. The fourth staff has notes with values 6, 6, 5, 4, 4, 3, 3, 2, 2, 1.

**FIGURE 16-9:** *Twinkle, Twinkle, Little Star*

### **When the Saints Go Marching In**

(File name: SAINTS)

4/4 time signature, treble clef. The music is divided into four staves. The first staff has notes with values 1, 3, 4, 5. The second staff has notes with values 1, 3, 4, 5, 3, 1, 3, 2. The third staff has notes with values 3, 3, 2, 1, 3, 5, 5, 4. The fourth staff has notes with values 3, 4, 5, 3, 1, 2, 1.

**FIGURE 16-10:** *When the Saints Go Marching In*

# Changing Instruments

Intelligent Organ can reproduce the sound of 20 different instruments. The instrument that is currently selected is highlighted on the control panel.

The function keys F1 through F4 can be pressed to select an instrument:

<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>
Piano	Organ 1	Violin	Synthesizer 1
Harp	Trumpet	Oboe	Bass Synthesizer
Electric Guitar	Saxophone	Flute	Sitar
Marimba	Trombone	Harmonica	Javaican
Alien	Mars	Clarinet	Bells

*To select an instrument:*

1. Press the function key to which the instrument you want is assigned.
2. Keep pressing the function key until the instrument you want appears.

# Adding Accompaniment

Intelligent Organ can add rhythmic accompaniment to whatever you play. The rhythm that is currently selected is highlighted in the control panel.

The function keys F5 through F8 control which rhythm is in effect:

<b>F5</b>	<b>F6</b>	<b>F7</b>	<b>F8</b>
March	Rumba	Swing	Waltz
March 1	Samba	Swing 1	Waltz 1
March 2	Bosanova	Rock & roll	Waltz 2
March (6/8)	Tango	Disco	Jazz waltz

*To select a rhythm:*

1. Press the function key to which the rhythm you want is assigned.
2. Keep pressing the function key until the rhythm you want appears.

*To turn accompaniment on and off:*

1. Press the SPACEBAR.
2. Press ENTER to end the accompaniment at the end of the phrase that is currently playing.

*To change the accompaniment volume:*

1. Press the PgUp or up arrow key to increase the volume.
2. Press the PgDn or down arrow key to decrease the volume.

*To change the accompaniment tempo:*

1. Press the INS key to increase the tempo.
2. Press the DEL key to slow down the tempo.

*To switch between major and minor chords:*

1. To switch from major to minor chords, press F10.
2. To switch from minor to major chords, press F9.

*To transpose a melody:*

1. To transpose a melody *up* one semitone, press the + (plus) key on the numeric keypad.
2. To transpose a melody *down* one semitone, press the - (minus) key on the numeric keypad.
3. To transpose a melody *up* four full tones, hold down SHIFT and press the + (plus) key on the numeric keypad.
4. To transpose a melody *down* five full tones, hold down SHIFT and press the - (minus) key on the numeric keypad.

## Adding an Automatic Arpeggio

You can have Intelligent Organ add an automatic arpeggio as you play (an arpeggio is the notes of a chord played in succession rather than simultaneously). There are six arpeggios to choose from.

*To play an arpeggio:*

1. Press the left bracket ( [ ) or right bracket ( ] ) key to select and play an arpeggio.
2. Intelligent Organ plays the selected arpeggio (the number of the arpeggio is shown at the bottom of the first column on the control panel).

*To select an arpeggio:*

1. Keep pressing the [ key or the ] key until you hear the arpeggio you want to use.

*To turn off the arpeggio:*

1. Press the apostrophe ( ' ) key.

*To change the arpeggio volume:*

1. Press the up arrow key to increase the volume.
2. Press the down arrow key to decrease it.

The current volume setting is shown in the last column on the column panel, next to *Arpg vol.*

## Playing an Artificial Melody

You can have Intelligent Organ improvise an artificial melody based on what you are playing.

*To play an artificial melody:*

1. Press one of the following keys: 9, 0, -, =.

The volume is controlled by the same keys that control the volume of the arpeggio.

*To change the volume:*

1. Press the up arrow key to increase the volume.
2. Press the down arrow key to decrease it.

The current setting is shown in the last column on the column panel, next to **Arpg vol.**

# Saving, Loading, and Replaying a Song

Intelligent Organ automatically stores whatever you play in a *buffer* in memory. (When the buffer is nearly full, the Buffer Status indicator in the lower right corner of the control panel begins to flash). Intelligent Organ records everything from the moment you press F2 to enter Play mode until you press ESC to return to the main screen. It records even if you are not playing, as though the silence were a rest in the music.

## Saving a Song

*To play the music in the buffer before you save it:*

1. Press ESC to return to the main screen.
2. Press F4. The control panel reappears on the screen, and Intelligent Organ plays the music in the buffer over and over until you press ESC to exit.

**NOTE** *Intelligent Organ clears the buffer when you press F2 to enter Play mode. If you want to save what is in the buffer, save it before you re-enter Play mode.*

*To save the music in the buffer:*

1. Press ESC to return to the main screen.
2. Press F7. The message below is displayed:

**Enter organ file to save:**

3. Type the name you want to give the file, then press ENTER.

*To clear the buffer:*

1. Press ESC to return to the main screen if you need to.
2. Press F2 to enter Play mode.

## Loading and Replaying a Song

*To load a song:*

1. Press ESC to return to the main screen if necessary.
2. Press F6. A list of the available songs is displayed.
3. Select the song you want, and press ENTER.

*To play the song:*

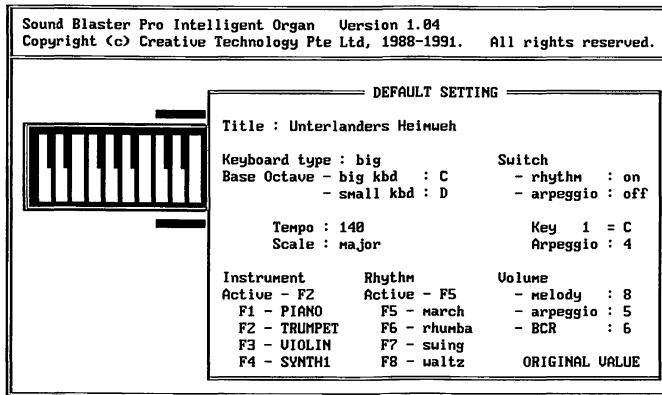
1. Press F3 to play the song once. You can add to the song after it plays and save those additions. Follow the steps as though it were a new song.
2. Press F4 to play the song over and over until you press ESC.

# Changing Default Settings

You can change the default settings for the Intelligent Organ or for individual songs.

*To change the default settings:*

1. Return to the main menu if necessary.
2. Press F5. The Default Settings window appears:



**FIGURE 16-11:** Intelligent Organ default settings window

3. Press the T key and type either of the following:
  - ♦ The line below to set the default title for Intelligent Organ:  
**CMS's Intelligent Organ**
  - ♦ The name of the song for which you want to set defaults.
4. To go to the setting you want to change, press the up or down arrow key, or press the key that matches the letter in red.
5. To change the setting, press the left or right arrow key until the setting you want appears.
6. To change all the settings to the factory defaults, press the O key.
7. When you are finished, press ENTER.
8. If you set defaults for a song, save the song. (See "Saving a Song" earlier in the chapter.)

# Quitting Intelligent Organ

*To quit Intelligent Organ and return to DOS:*

1. Press F8 (more), then F4 (quit). The following message is displayed:

**Exit to DOS (y/n)?**

2. Press the Y key.

The Intelligent Organ screen disappears and the DOS prompt returns to the screen.

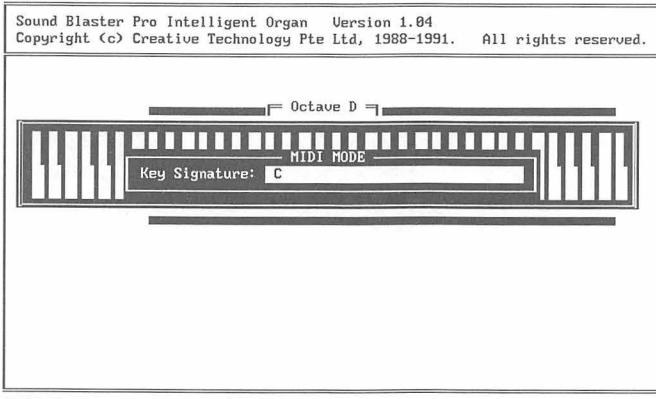
# Using a MIDI Keyboard

If you have a MIDI keyboard, you can use it instead of your computer keyboard with Intelligent Organ.

*To use a MIDI keyboard:*

1. Connect the Sound Blaster MIDI adapter to the joystick connector on Sound Blaster 16, if you have not already done so.
2. Connect the MIDI cable to the MIDI-in connector on the MIDI adapter and the MIDI-out on the MIDI keyboard.
3. Turn on the MIDI keyboard and set it to MIDI mode.
4. Start Intelligent Organ.
5. When the main screen appears, press F8 then F5.

The MIDI mode window appears:



**FIGURE 16-12:** MIDI mode window

Intelligent Organ is now ready to receive MIDI code from the MIDI keyboard. You can continue to use the computer keyboard to play a melody or select any function.

6. Select the key signature you want to use (so Intelligent Organ can add the correct accompaniment). Press:
  - ♦ Up or *left arrow* to increase key by one semitone
  - ♦ Down or *right arrow* to decrease key by one semitone

7. Press ENTER to record the key signature, then press F2 to enter Play mode.

*To quit MIDI mode:*

1. Press ESC to return to the main screen, then press F8 and F5.

If the key signature of the song you are playing changes in the middle, use Intelligent Organ's transpose functions to match the key used by the MIDI keyboard (see "To transpose a melody" in "Adding Accompaniment," earlier in this chapter for more information). You can save a song you have played on the MIDI keyboard and replay it. You will not, however, hear the tune from the MIDI keyboard.

# Appendix

# Troubleshooting

## Sound Blaster 16

**PROBLEM:** The installation program does not run properly, locks up, or does not complete.

**Cause:** You probably have less than 420KB of free memory in your system.

**Solution:** INSTALL.EXE requires 420KB of free memory to run properly. Make sure you have 420KB of free memory before you run INSTALL.EXE.

To check the amount of memory that is free, type **MEM** at the DOS prompt and press **ENTER**. (If you are using DOS version 5.0 or earlier, type **CHKDSK**.) The system displays the memory that is available. The value for the largest executable program size must be more than 430080 bytes.

If you do not have enough memory, remove any memory-resident programs that are running before you try to run INSTALL.EXE again.

**PROBLEM:** The system cannot find the SOUND and/or BLASTER environment parameter values, or the settings are invalid.

**Cause:** The SOUND and/or BLASTER environment parameter values are not set correctly.

**Solution:** Type **SET** at the DOS prompt and press ENTER to list the current environment settings. (Check your DOS manual for information on the *Set* command.)

If the two environment strings are listed on the screen, call technical support for help.

If the two environment settings are not listed:

1. Type **CD\** and press ENTER to change to the root directory.
2. Type **TYPE AUTOEXEC.BAT** and press ENTER.

Your AUTOEXEC.BAT file appears on the screen.

If the two environment strings are listed, it means they are not being executed. The two statements probably come after a DOS shell or menu software command. Such commands prevent SET SOUND and SET BLASTER from being executed. Move the SET SOUND and SET BLASTER statements to the first two lines of the file.

If the two environment strings are not listed in the AUTOEXEC.BAT file, add them. To do so, use the Sound Blaster 16 configuration program. For instructions, see "Running the Configuration Program" in Appendix B, "Changing Sound Blaster 16's Configuration."

After you have run the Sound Blaster 16 configuration program, restart the computer, then type **SET** at the DOS prompt and press ENTER to list the current environment settings. If the two environment strings still are not listed, call technical support for help.

**PROBLEM:** The message “Out of environment space” appears.

**Cause:** The system environment allocation is too small.

**Solution:** Add or modify the following line in the CONFIG.SYS file:

```
SHELL=C:\COMMAND.COM /E:512 /P
```

The switch /E sets a size for the system environment space. If the message displays again after you have increased the size to 512, change the size from 512 to 1024. Check your DOS manual for information about the *Shell* command.

**PROBLEM:** The system hangs during the 16-bit digitized sound test. The 8-bit test works fine.

**Cause:** Your system is not handling 16-bit DMA transfer properly.

**Solution:** Have the system transfer 16-bit data using the 8-bit DMA channel. You can do that by running the Sound Blaster 16 configuration program. For instructions, see “Running the Configuration Program” in Appendix B, “Changing Sound Blaster 16’s Configuration.”

# CD-ROM Drive

**PROBLEM:** There is no sound from speakers.

**Cause:** The audio cable may not be connected properly or the volume is not adjusted to an audible level.

**Solution:** The problem may be corrected by:

- ◆ If your speakers are connected to the jack on the front of the CD-ROM drive, adjust the volume control on the drive.
- ◆ If your speakers are connected to Sound Blaster 16, adjust the volume through the mixer or volume control on the back of the card.
- ◆ Connect headphones to the jack on the front of the CD-ROM drive. If there is no sound from your headphones, check the audio cable connection to the Sound Blaster 16 (see Chapter 1, "Installing Creative Multimedia Kit").

**PROBLEM:** No valid CD-ROM driver is detected.

**Cause:** MSCDEX.EXE or SBCD.SYS is not loaded or could not be found.

**Solution:** Your CD-ROM drive requires MSCDEX.EXE and SBCD.SYS to access the drive. Check your AUTOEXEC.BAT file for the following line:

`C:\SB16\DRV\MSCDEX.EXE /V /D:MSCD001 /M:15`

Check the CONFIG.SYS file for the following line:

`DEVICE=C:\SB16\DRV\SBCD.SYS /D:MSCD001 /P:220`

# Windows Applications

**PROBLEM:** Windows refuses to install a device driver, or the error message “Device not found” appears when you try to play a wave form or MIDI file or use CD audio.

**Cause:** SYSTEM.INI may not include the necessary drivers.

**Solution:** Display the SYSTEM.INI file:

1. In Windows, open the Program Manager and select the Control Panel icon.
2. On the Control Panel, double click the Drivers icon.  
Your drivers list must include:

```
[MCI] Sound
[MCI] MIDI Sequencer
[MCI] CD Audio
```

Add any of the three that is missing.

3. Make sure you have the following settings in the [mci] section of the SYSTEM.INI file:

```
WaveAudio=mciwave.drv
Sequencer=mciseq.drv
CDAudio=mcicda.drv
```

**PROBLEM:** There is no sound when Windows starts up.

**Cause:** The drivers are not installed properly, or sound is disabled.

**Solution:** Make sure the sound driver is installed:

1. Start Windows if it is not already running.
2. Display the Program Manager, then go to the Main window and double-click the Control Panel icon. The Control Panel window appears.
3. Double-click the Drivers icon. The Drivers dialog appears.
4. Make sure the following drivers are listed in the dialog:

```
Creative Sound Blaster 16 Auxiliary Audio
Creative Sound Blaster 16 Wave and MIDI
MIDI Mapper
Timer
Voyetra /Sound Blaster SuperSAPI FM Driver
[MCI] CD Audio
[MCI] MIDI Sequencer
[MCI] Sound
```

5. Make sure the following settings appear in the [sndblst.drv] section of your SYSTEM.INI file:

```
Port=220
MidiPort=330
Int=5
DmaChannel=1
HDmaChannel=5
```

The values shown above are the factory settings. The values that appear in your SYSTEM.INI file must match the settings you have chosen for the Sound Blaster 16.

**PROBLEM:** Duplicate icon items appear in the Sound Blaster 16 group window.

**Cause:** If you have run the WINSETUP program (in the \SB16 directory) a second time, one or more of the icons in the Sound Blaster 16 program group may have been duplicated.

**Solution:** Delete any duplicate icons from the program group. Refer to your Windows manual for instructions.

**PROBLEM:** Sound Blaster 16 drivers are not installed when Windows starts.

**Cause:** Drivers for another Sound Blaster audio card may be installed when you start up Windows.

If Windows 3.1 was installed using “Express Installation,” your hard disk was scanned for programs to be installed. Older versions of the Sound Blaster applications may have been installed if they were on your hard disk.

**Solution:** Remove all existing Sound Blaster drivers from the “Installed Drivers List” and restart Windows. Add the drivers for Sound Blaster 16 and restart Windows.

The following settings should appear in the [drivers] section of SYSTEM.INI:

```
Timer=timer.drv
Midimapper=midimap.drv
Aux=sb16aux.drv
MIDI=sb16fm.drv
Wave=sb16snd.drv
MIDI1=sb16snd.drv
Super SAPI=sap!sb3.drv
```

**PROBLEM:** The playback sounds jerky.

**Cause:** Your Windows swap file may be fragmented.

**Solution:** A temporary swap file tends to become fragmented. If possible, use a permanent swap file for Windows. Refer to your Windows manual for instructions on creating a permanent swap file.

**PROBLEM:** You do not get output after recording in Talking Scheduler.

**Cause:** The recording source in Windows Mixer is not set up correctly.

**Solution:** Select both the left and right audio source of the left input channel.

**PROBLEM:** You do not hear any MIDI output.

**Cause:** MIDI mapper may not be set up correctly.

**Solution:** In the Windows Control Panel, MIDI Mapper redirects MIDI output to various devices. Sound Blaster 16 has two MIDI devices:

External MIDI port  
Internal MIDI synthesizer

Normally, MIDI output is mapped to the internal MIDI synthesizer; if MIDI output is mapped to the external MIDI port, you need to connect external MIDI equipment or Wave Blaster. Before you make any changes to MIDI Mapper, refer to the Windows 3.1 documentation.

# DOS Applications

**PROBLEM:** The message “No interrupt vector available” appears when you are running SBFMDRV.

**Cause:** All the DOS software interrupt vectors (INT 80H to 0BFH) have been taken by a resident program.

**Solution:** The SBFMDRV driver needs an interrupt vector ranging from INT 80H to INT 0BFH.

Usually those interrupt vectors are free. To solve the problem, you can do either of the following:

- ◆ Use a DOS start-up disk to reboot the computer.  
Install SBFMDRV from the SB16 directory.
- ◆ Install SBFMDRV before running the program that is causing the problem.

**PROBLEM:** The system hangs during voice output.

**Cause:** There is a hardware conflict between Sound Blaster 16 and another adapter card.

**Solution** If the interrupt setting on Sound Blaster 16 is IRQ7, you may have to change it to another setting. To help you identify the card that is in conflict with Sound Blaster 16 and aid in resolving the conflict, see Appendix B, “Changing Sound Blaster 16’s Configuration.”

**PROBLEM:** There is no sound.

**Cause:** The volume is not turned up or speakers are not connected.

**Solution:** Adjust the volume control on the back of the card. Use SB16SET to adjust the volume (for instructions, see Chapter 11, “SB16SET Utility”).

Check the speaker connections.

# Joystick

**PROBLEM:** The joystick port is not working.

**Cause:** Sound Blaster 16's joystick port conflicts with another joystick port in the system.

**Solution:** Change Sound Blaster 16's joystick port jumper, and use the joystick port that is in the system. For instructions, see "Changing the Joystick Port Jumper" in Appendix B, "Changing Sound Blaster 16's Configuration." (Disabling the joystick port does not affect its use as a MIDI port.)

**PROBLEM:** The joystick is not working properly in some programs.

**Cause:** This is a classic problem with programs that use CPU timing to calculate the joystick position. When the CPU is very fast, the program may not be able to determine the position of the joystick correctly because the program assumes the position of the joystick is out of its acceptable range.

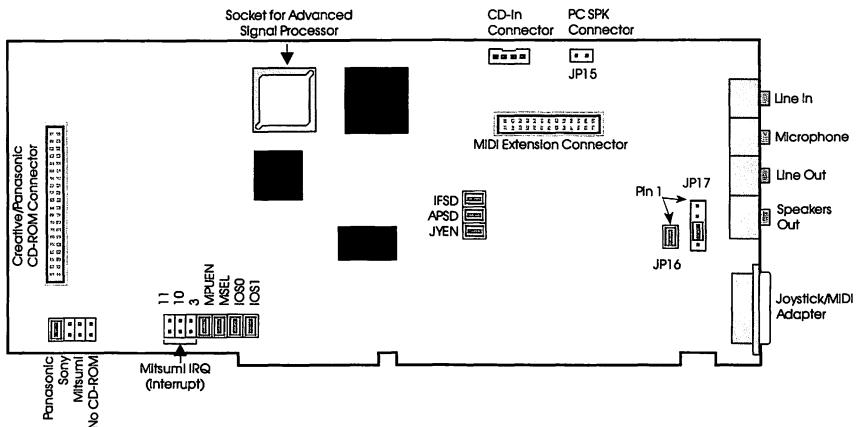
**Solution:** Switch the computer to its lowest possible speed. If the problem persists, try a different joystick.

# Changing Sound Blaster 16's Configuration

*I*nstalling Sound Blaster 16 with the default settings is desirable and successful for most computer configurations. If you are unable to successfully run the Sound Blaster 16 test program (DIAGNOSE), the problem may be one of the following:

- ❖ BLASTER setting in the AUTOEXEC.BAT file does not match the jumper settings on the Sound Blaster 16.
- ❖ One of the settings on the card is already being used by another card in your computer.

When the installation program adds the BLASTER setting to the AUTOEXEC.BAT file, it uses the factory settings that are preset on the Sound Blaster 16. Before you change any of the jumper settings, make sure the card is set correctly with the factory defaults.



**FIGURE B-2:** Sound Blaster 16 showing location of the jumpers and connectors



**FIGURE B-1:** A closed jumper is shown on the left, an open jumper on the right

The Sound Blaster 16 factory settings are shown in the following table.

Feature	Setting	Jumper Setting
Base I/O address	220H	IOS0 closed IOS1 closed
MIDI port base I/O address	330H	MSEL closed
Interrupt line	IRQ5	N/A
Low (8-bit) DMA channel	Channel 1	N/A
High (16-bit) DMA channel	Channel 5	N/A
Joystick port	Enabled	JYEN closed
Audio output amplifier	Audio output amplified internally; no external amplifier needed	N/A

If any of the jumpers on your card do not match the factory settings, change them to the settings shown in the table, then run the Sound Blaster 16 test program again. (See “Changing the Jumper Settings,” later in this appendix for instructions.)

# Identifying a Card with a Conflicting Setting

If the Sound Blaster 16 test program indicates one of the setting is being used by another card in your computer, you need to change either the Sound Blaster 16 setting or the card with which it is in conflict. The Sound Blaster 16 initial settings are designed to work with many applications. Before you make changes to the Sound Blaster 16, try changing the settings of the card causing the conflict.

*To identify the card that is causing the conflict:*

1. Turn off the computer.
2. Remove the cover from the computer.
3. Remove the nonessential cards from your computer one at a time. (Remove only *nonessential* cards—do not, for example, take out the hard disk controller or the video adapter card to which the monitor is attached.) To remove a card, remove the screw holding the card to the computer's frame, then pull up on the card to remove it from the slot.
4. Turn on the computer.
5. Run the Sound Blaster 16 test program (DIAGNOSE).

If the Sound Blaster 16 test program runs without hanging or displaying any errors, the card you removed is the one causing the conflict. If the card has another setting you can use, make the changes and replace the card in the computer. Run the Sound Blaster 16 test program again to make sure changing the setting resolved the conflict.

If the card does not have an alternate setting or if the alternate setting causes a conflict with yet another card, you need to change the Sound Blaster 16 settings.

# Changing the Jumper Settings

The jumpers on the Sound Blaster 16 control the following:

- ❖ Base I/O address
- ❖ MIDI port base I/O address
- ❖ Joystick port

*To change the position of one or more of the jumpers:*

1. Turn off the computer.
2. Remove the cover from the computer.
3. Remove the screw holding the Sound Blaster 16 to the computer's frame, then pull up on the card to remove it from its slot.
4. Change the position of the jumpers as described in the following sections. The location of the jumpers is shown in figure B-2 on page B-2.

Write down the address that corresponds to the jumper settings you choose. You need that information when you run the configuration program.

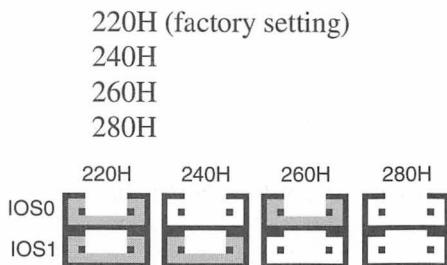
5. When you finish changing the jumpers, replace Sound Blaster 16 in the computer. Replace the screw that holds the card to the computer's frame.
6. Turn on the computer.

If you changed the jumpers for the base I/O address, an error message may appear because the I/O address in the CONFIG.SYS file no longer matches the I/O address set for the card.

7. Run the configuration program (DIAGNOSE) to update the CONFIG.SYS file.

## Changing the Base I/O Address Jumpers

Four base I/O addresses are available:



**FIGURE B-3:** I/O address settings; 220H is the default

To select an address, set the jumpers as follows:

Address	Jumper Settings	Notes
220H (factory setting)	IOS0 closed IOS1 closed	Uses addresses 220H to 233H
240H	IOS0 open IOS1 closed	Uses addresses 240H to 253H
260H	IOS0 closed IOS1 open	Uses addresses 260H to 273H
280H	IOS0 open IOS1 open	Uses addresses 280H to 293H

**NOTE** *I/O address 280H is a new address unavailable on Sound Blaster and Sound Blaster Pro. It is not recognized by applications designed for those cards.*

## Changing the MIDI Port Base I/O Address Jumpers

Two MIDI port base I/O addresses are available:

300H

330H (factory setting)



**FIGURE B-4:** MIDI port I/O address settings; 330H is the default

To select an address, set the jumper as follows:

Address	Jumper Setting	Notes
330H (factory setting)	MSEL closed	Uses addresses 330H and 331H
300H	MSEL open	Uses addresses 300H and 301H

**NOTE** *Most software written for MPU-401 (see "MPU-401" in Appendix C, "Technical Information") only works if the MIDI port base I/O address is set to 330.*

*The MIDI port I/O address setting 330 and the DMA channel setting 5 may conflict with the settings for Adaptec SCSI controllers.*

## Changing the Joystick Port Jumper

If there is a game card or a card with a joystick port installed in your computer, you need either to remove the card or to change the JYEN jumper on the Sound Blaster 16 card to disable its joystick port. To enable or disable the joystick port, set the jumper as follows:

Joystick Port	Jumper Setting	Notes
Enabled (factory setting)	JYEN closed	Port works both as a joystick port and a MIDI port
Disabled	JYEN open	Port works only as a MIDI port

# Running the Configuration Program (DIAGNOSE)

The configuration program:

- ❖ Verifies your Sound Blaster 16 hardware settings
- ❖ Performs audio functionality test
- ❖ Updates system files with corrected settings

*To run the configuration program:*

1. On the disk drive on which the Sound Blaster 16 software is installed, type **CD \SB16** to switch to the directory in which the configuration program is located.
2. Type **DIAGNOSE** and press ENTER to start the program.
3. When the Sound Blaster 16 Configuration screen appears, read the information displayed, then press ENTER. The Base I/O Port menu appears.

**NOTE** *You can exit the DIAGNOSE program at any time by pressing F3.*

## Base I/O and MIDI Port I/O

The DIAGNOSE program verifies the base I/O address and MPU-401 MIDI port.

*To set up and test the base I/O address and the MIDI port I/O address:*

1. Highlight the base I/O address you have set the jumpers to use, or choose *Auto Scan*, then press ENTER. (Auto Scan selects the first address that is available and checks to see if it is already in use.)

The program displays a message: "If other peripheral cards on your system are using the same address that you have chosen, the system might halt due to hardware setting conflicts."

If the address you choose is available, the program displays a message that confirms the I/O address.

If the system hangs, turn off the computer, change the jumpers on the card, and run the configuration program again.

2. Press ENTER. The MIDI Port menu appears.
3. Highlight the address you set the jumper to use, or choose *Auto Scan*, then press ENTER.

If the system hangs, turn off the computer, change the jumpers on the card, and run the configuration program again.

If the address you choose is available, the program displays the new MIDI port address.
4. Press ENTER. A screen appears that explains how to test and select interrupt and DMA settings.
5. Press ENTER again. The Interrupt (IRQ) menu appears.

## Interrupt and DMA Channels

*To set up and test the interrupt:*

1. The option with the word *current* next to it is the interrupt currently set in the AUTOEXEC.BAT file.

**IRQ 2**

**IRQ 5 (Current)**

**IRQ 7**

**IRQ 10**

**Auto Scan**

Choose an interrupt setting and press ENTER.

If the interrupt you choose is available, the program displays a message that tells you the interrupt is detected.

If the system hangs, reboot the computer and run DIAGNOSE again. This time choose a different setting for the interrupt (or select Auto Scan to have the program choose a setting).

2. Press ENTER. The program displays a message confirming the interrupt setting.
3. Press ENTER again. The Low DMA Channel menu appears.

### NOTE

*If you must switch from IRQ 5 to a different interrupt and you mainly use Windows applications, try IRQ 10 (applications designed for Sound Blaster 16 do not recognize IRQ 10).*

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*To set up and test the Low (8-bit) DMA channel:*

1. The option with the word *current* next to it is the channel currently set in the AUTOEXEC.BAT file.

**Channel 0**

**Channel 1 (Current)**

**Channel 3**

**Auto Scan**

2. Press ENTER.

If the channel you choose is available, the program displays a message that tells you the channel is detected.

If the system hangs, turn off the computer and run DIAGNOSE again. This time change a different setting for the low DMA channel (or select Auto Scan to have the program select a setting) and press ENTER.

The program displays a message confirming the low DMA channel setting.

3. Press ENTER to display a high DMA information screen.

*To set up and test the High (16-bit) DMA channel:*

1. Information about the high DMA channel settings is displayed. Read the information and press ENTER to display the High DMA Channel menu:

**Channel 5 (Current)**

**Channel 6**

**Channel 7**

**Use Low DMA**

**Auto Scan**

The option with the word *current* next to it is the channel currently set in the AUTOEXEC.BAT file and press ENTER.

If the channel you choose is available, the program displays a message that tells you the channel is detected.

If the system hangs, turn off the computer and run DIAGNOSE again. This time change a different setting for the low DMA channel (or select Auto Scan to have the program select a setting) and press ENTER.

Press ENTER. The program displays the new configuration settings and requests the boot drive for the CONFIG.SYS and AUTOEXEC.BAT files. Enter your boot drive and press ENTER.

2. The program asks for the WINDOWS directory. Type the path of your WINDOWS directory and press ENTER. The settings you select are written to the BLASTER environment line in AUTOEXEC.BAT. The default settings are:

**SET BLASTER=A220 D1 I5 H5 P330 T6**

<b>Letter</b>	<b>Setting</b>	<b>Example</b>
A	Base I/O address	A220 is I/O address 220H
D	Low DMA channel	D1 is channel 1
I	Interrupt	I5 is IRQ 5
H	High DMA channel	H5 is channel 5
P	MIDI port base I/O address	P330 is I/O address 330H
T	Type of Sound Blaster card	T6 is Sound Blaster 16

3. Press ENTER. The program asks if you want to restart your system so the new settings can take effect.
4. Press the Y key. The computer restarts. The new settings are now in effect.

The AUTOEXEC.BAT and CONFIG.SYS files have been modified. The originals are saved with the file name extension .B~K.

If changing the 16-bit DMA channel setting does not solve the problem you are having with 16-bit digitized sound, your computer is not handling 16-bit DMA transfer properly. If that is the case, the system may hang, or you may get a memory parity error. You can solve the problem by having the system transfer 16-bit data using the 8-bit DMA channel. For instructions, see "Running the Configuration Program" later in this appendix.

**NOTE** *The DMA channel setting 5 and the MIDI port I/O address setting 330 may conflict with the settings for Adaptec SCSI controllers.*

# Resetting the BLASTER Environment

The Sound Blaster 16 configuration program—DIAGNOSE—lets you reset the interrupt and DMA channel options and write the changes to the BLASTER environment line in the AUTOEXEC.BAT file.

*To reset the interrupt and DMA channel options:*

1. Type **CD \SB16** to switch to the Sound Blaster 16 directory.
2. Type **DIAGNOSE** and press ENTER to run the configuration program.
3. Read and follow the instructions in the program. Only the settings for the interrupt and DMA channel options can be changed—the I/O addresses must be changed by resetting the jumpers on the audio cards (see “Changing the Jumper Settings” earlier in this appendix).

At the end of the configuration program, the BLASTER environment line is updated in your AUTOEXEC.BAT file. And, the line below is added to the AUTOEXEC.BAT file to ensure that Sound Blaster 16 reads the BLASTER environment for the interrupt and DMA channel settings:

**C:\SB16\DIAGNOSE /S**

4. Restart your computer for any change in the settings to take effect.

**NOTE** *If the BLASTER settings are not in the AUTOEXEC.BAT file, DIAGNOSE /S returns an error message when the computer is started.*

# Connecting Additional CD-ROM Drives

The following information explains how to change the ID jumpers on the back of your CD-ROM drive and use a daisy chain cable to connect additional drives.

**NOTE** *The following information applies to Creative CD-ROM drive model 563 only.*

## Changing the ID Jumper

When you connect or daisy-chain more than one CD-ROM drive, each drive must have a unique ID setting. The ID jumper on the back of the CD-ROM drive allows you to set four different IDs.

*To change the configuration of the jumpers:*

1. Turn off your computer and other connected devices.
2. Remove the computer cover and CD-ROM drive from your computer.
3. Select the ID for the drive by placing the jumper block on the desired set of pins (see figure B-5). A jumper block is a removable plastic hood that fits over a pair of pins.



Drive ID 0



Drive ID 1



Drive ID 2



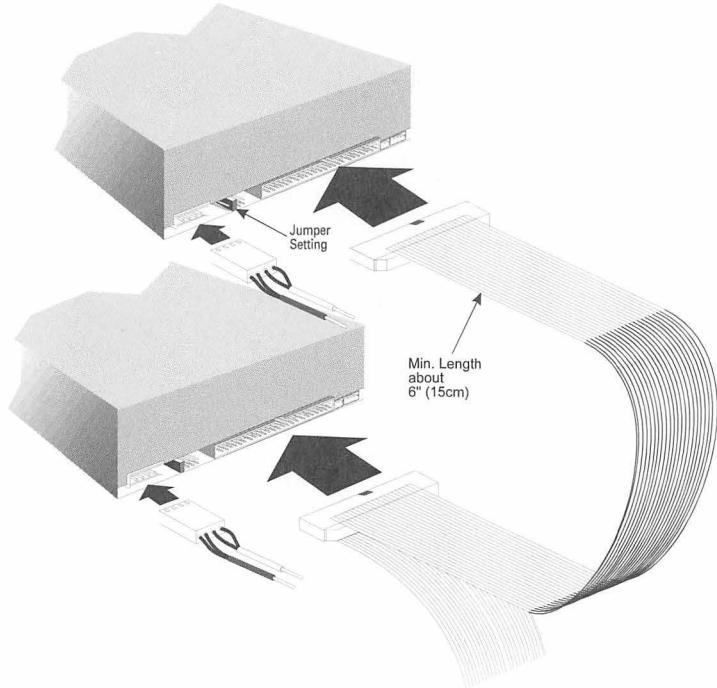
Drive ID 3

**FIGURE B-5:** *ID settings for each of four CD-ROM drives*

**NOTE** *If you use model 52x CD-ROM drive for daisy-chaining, its ID is not changeable and is assumed to be 0.*

## Connecting the Drives

You need a daisy-chain cable to connect the drives as shown in figure B-6. Connect the audio cable to drive ID 0.



**FIGURE B-6:** Daisy-chaining the CD-ROM drives

# Technical Information

## Sound Blaster 16

### Music Synthesizer

- ❖ Enhanced FM OPL3 synthesizer using four operators
- ❖ Frequency modulation (FM) sound generation
- ❖ Compatible with previous Sound Blaster versions and Adlib FM
- ❖ Two-operator mode: 20 voices (15 melodies and 5 percussion)
- ❖ Four-operator mode: 11 voices (6 melodies and 5 percussion)

### Stereo Digitized Voice Channel

- ❖ 16-bit and 8-bit digitizing in stereo and monaural
- ❖ Standard format for PCM data
- ❖ Programmable sampling rate: 5 kHz to 44.1 kHz in 228 linear steps in DOS
- ❖ 16-bit and 8-bit DMA channels using a single interrupt
- ❖ FIFO buffer for high speed data transfer
- ❖ Dynamic filtering for digital audio recording and playback

## Built-in Digital/Analog Mixer

- ❖ Analog mixing of six audio sources:
  - ◆ Digital audio (stereo)
  - ◆ CD audio (stereo)
  - ◆ Synthesized music (stereo)
  - ◆ Extra line level audio (stereo)
  - ◆ Microphone level audio (monaural)
  - ◆ PC speaker (monaural)
- ❖ Software programmable volume control:
  - ◆ Master volume (stereo, 32-level attenuation in 2-dB steps)
  - ◆ Digital audio (stereo, 32-level attenuation in 2-dB steps)
  - ◆ CD audio (stereo, 32-level attenuation in 2-dB steps)
  - ◆ Synthesized music (stereo, 32-level attenuation in 2-dB steps)
  - ◆ Extra line level audio (stereo, 32-level attenuation in 2-dB steps)
  - ◆ Microphone level audio (monaural, 32-level attenuation in 2-dB steps)
  - ◆ PC speaker (monaural, 4-level attenuation in 6-dB steps)
- ❖ Master treble and bass control (left and right channels)
  - ◆ 16 levels from -14 dB to +14 dB in 2-dB steps
- ❖ Recording source control: Independent selection of input sources for both channels or a combination of the following:
  - ◆ CD audio left channel
  - ◆ CD audio right channel
  - ◆ Synthesized music left channel
  - ◆ Synthesized music right channel
  - ◆ Line level audio left channel
  - ◆ Line level audio right channel
  - ◆ Microphone level audio
- ❖ Output and input gain control

## Built-in Stereo Power Amplifier

- ❖ Four watts per channel (PMPO) with four ohms stereo output
- ❖ Automatic gain control or fixed gain amplifier for microphone level

## MIDI Interface

- ❖ Built-in MIDI interface for connection to external MIDI devices
- ❖ Sound Blaster compatible or MPU-401 UART mode
- ❖ MIDI specification fixed at 31.2 kHz
- ❖ FIFO for smooth operation
- ❖ Internal expansion option for Wave Blaster daughter board

# CD-ROM Drive

## Performance

❖ Storage Capacity	680 MB (12 cm disk) 180 MB (8 cm disk)
❖ Buffer Memory	64 KB
❖ Transfer Rate	150 KB/sec (normal) 300 KB/sec (double speed)
❖ Access Time	320 ms (double speed)
❖ Audio Specifications	
♦ Headphone Out	0.6 Vrms (RL:32W)
♦ Line Out	0.8 Vrms (RL:50W)
♦ Number of Channels	2
♦ Frequency Response	100 Hz to 20 kHz (headphones) 20 Hz to 20 kHz (line out)
♦ Dynamic Range	80 dB (headphones) 80 dB (line out)
♦ Signal-to-Noise Ratio	80 dB (headphones)
♦ Distortion	0.2% at 1 kHz
♦ Stereo Separation	45 dB (headphones) 60 dB (line out)

# Sound Blaster 16 Software Programs

The Sound Blaster 16 software includes the installation program (INSTALL.EXE), and the Windows setup program (WINSETUP.EXE).

## Sound Blaster 16 Software Installation

The installation program first creates a directory and a number of subdirectories on your hard disk. It then copies the software on the disks into the directory and subdirectories. It adds lines to the CONFIG.SYS and AUTOEXEC.BAT files.

The installation program adds four lines to the AUTOEXEC.BAT file similar to the following:

```
SET BLASTER=A220 D1 I5 H5 P330 T6
SET SOUND=C:\SB16
SET MIDI=SYNTH:1 MAP:E
C:\SB16\DIAGNOSE /S
C:\SB16\SB16SET /P
```

SET SOUND specifies the location of drivers used by Sound Blaster 16. SET BLASTER specifies the hardware settings. (SET SOUND and SET BLASTER are described in Appendix B, “Changing Sound Blaster 16’s Configuration.”) The third line executes the DIAGNOSE program that programs the card’s settings. (For more information, see Appendix B, “Changing Sound Blaster 16’s Configuration.”) The final line sets the master, voice, CD-audio, and MIDI (FM) music volume settings to preset values (see Chapter 11, “SB16SET Utility,” for more information).

# Windows Driver and Application Setup Program

The INSTALL program:

- ❖ Copies the following files into the \WINDOWS\SYSTEM directory:

**sb16aux.drv**  
**sb16fm.drv**  
**sb16snd.drv**

- ❖ Adds the lines in the left column to the [**drivers**] section of the Windows system initialization file, SYSTEM.INI:

<b>Aux=sb16aux.drv</b>	Auxiliary driver
<b>MIDI=sb16fm.drv</b>	Internal MIDI synthesizer
<b>MIDI1=sb16snd.drv</b>	External MIDI port driver
<b>Wave=sb16snd.drv</b>	Wave driver

- ❖ Adds a new section named [**sndblst.drv**] to the SYSTEM.INI file. The section contains the information in the left column:

<b>port=220</b>	Base I/O address
<b>int=5</b>	Interrupt setting
<b>dmachannel=1</b>	8-bit DMA channel
<b>MidiPort=330</b>	Base MIDI port I/O address
<b>HDmaChannel=5</b>	16-bit DMA channel

The WINSETUP program in the \SB16 directory does the following:

- ❖ Creates a new program group for Sound Blaster 16 and TextAssist, and adds, to the group windows, an icon for each of the applications.

# I/O Address Map

The following is an overview of the I/O addresses used in Sound Blaster 16. For information about the jumper settings, see Appendix B, "Changing Sound Blaster 16's Configuration." For information about programming specifications, refer to the Developer Kit available to application developers registered with Creative Labs. (For more information, call Creative Labs' Developer Relations at (408) 428-2345, or FAX at (408) 432-6717.)

The four functional blocks using I/O addresses are:

- ❖ Sound Blaster 16
- ❖ MPU-401 UART mode
- ❖ Game port
- ❖ FM music synthesizer

## Sound Blaster 16

Sound Blaster 16 uses 20 consecutive I/O addresses. The I/O addresses selectable from 220H, 240H, 260H, and 280H are as follows:

Base Address	I/O Address Used
220H	220H to 233H
240H	240H to 253H
260H	260H to 273H
280H	280H to 293 H

The description of each port is as follows:

Address	Port	Read/Write
Base + 0H	FM music status port	Read
Base + 0H	FM music register address port	Write
Base + 1H	FM music register data port	Write
Base + 2H	Advanced FM music register address port	Write
Base + 3H	Advanced FM music register data port	Write
Base + 4H	Mixer and I/O setup register address port	Write
Base + 5H	Mixer and I/O setup data port	Read/write

<b>Address</b>	<b>Port</b>	<b>Read/Write</b>
Base + 6H	DSP reset port	Write
Base + 8H	FM music register address port	Write
Base + 9H	FM music register data port	Write
Base + 0AH	DSP read data	Read
Base + 0CH	DSP write data or command	Write
Base + 0CH	DSP write buffer status	Read
Base + 0DH	DSP timer interrupt clear port	Read
Base + 0EH	DSP data available status	Read
Base + 0FH	16-bit voice interrupt clear port	Read
Base + 10H	Reserved	
Base + 11H	Reserved	
Base + 12H	Reserved	
Base + 13H	Reserved	

## MPU-401

MPU-401 UART mode uses two consecutive addresses:

<b>Base Address</b>	<b>I/O Address Used</b>
330H	330H to 331H
300H	300H to 301H

The description of each port is as follows:

<b>Address</b>	<b>Port</b>	<b>Read/Write</b>
MPUBase + 0	MPU-401 data port	Read/write
MPUBase + 1	MPU-401 status port	Read
MPUBase + 1	MPU-401 address port	Write

## Game Port

The I/O address used by the game port is similar to a game or joystick port.

<b>Address</b>	<b>Port</b>	<b>Read/Write</b>
200H—207H	Game port	Read/write

## FM Music Synthesizer

The following I/O addresses used by the FM music synthesizer are compatible with other synthesizer cards such as Adlib.

Address	Port	Read/Write
388H	FM music status port	Read
389H	FM music register address port	Write
389H	FM music register data port	Write
38BH	Advanced FM music register address port	Write
38BH	Advanced FM music register data port	Write

# Pin Definitions

## Audio Connector Pin Definitions

### PC Speaker Connector

Pin	Signal	I/O
1	+5V	In
2	SPK	In

### CD-IN Connector

Pin	Signal	I/O
1	Ground	In
2	CD left channel	In
3	Ground	In
4	CD right channel	In

## Audio Extension Pin Definitions

Pin	Definition	Description
1	LIN IN	Line input
2	MICGND	Input ground
3	MIC IN	Microphone input
4	SPKGND	Speaker output: ground
5	SPKR	Speaker, right channel maximum output: 0.8 Vrms at 10k ohms (pins 1-2 on jumper OPSR: Line out) 3 Vrms at 4 ohms (pins 1-2 on jumper OPSR: Speaker out)
6	SPKL	Speaker, left channel maximum output: 0.8 V rms at 10k ohms (pins 1-2 on jumper OPSR: Line out) 3 V rms at 4 ohms (pins 2-3 on jumper OPSR: Speaker out)
7	SPKRL	Speaker output return signal: Left channel
8	SPKRR	Speaker output return signal: Right channel

## Internal Extension Pin Definitions

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	Digital ground	2	NC
3	Digital ground	4	MIDI output
5	Digital ground	6	VCC
7	Digital ground	8	NC
9	Digital ground	10	VCC
11	Digital ground	12	NC
13	NC	14	VCC
15	Analog ground	16	NC
17	Analog ground	18	+12V
19	Analog ground	20	Line in left
21	Analog ground	22	-12V
23	Analog ground	24	Line in right
25	Analog ground	26	ResetB

# Technical Support

At Creative Labs, we are committed to giving our customers the best product possible as well as excellent technical support. The information below is correct as this manual goes to press; check the software disks for a README file that will give any changes.

## Technical Support

When you contact us, be prepared with the following information:

- ❖ Computer's CPU type and speed (for example, 486/33), and memory available
- ❖ Name of memory management utility, if any (for example, QEMM, HIMEM, or EMM386)
- ❖ Type of video card and any add-in cards (for example, SCSI controller)
- ❖ Version of DOS and Windows

## North, Central, and South America

If you need technical assistance, call **405-742-6622**. Technical support is available seven days a week from 8:00 a.m. to midnight, Central time.

You can get the latest program and driver updates from Creative Labs' bulletin board, 24 hours a day. Call **405-742-6660**; use modem settings:

Baud rate	<b>300 to 14400</b> (V.32/V.42 bis)
Data bits	<b>8</b>
Parity	<b>none</b>
Stop bits	<b>1</b>

You can also send us a FAX at **405-742-6633** or write us at:

**Technical Support  
Creative Labs, Inc.  
1523 Cimarron Plaza  
Stillwater, OK 74075**

If you write or FAX us, include a description of your problem and the information listed above.

## **Europe**

In Europe, the telephone, FAX, and bulletin board numbers are:

- ◆ France: Telephone: **(33) 1.39.20.04.21**
- ◆ Germany: Telephone: **(49) 2131-102838**  
Bulletin Board: **(49) 2131-919820**
- ◆ Ireland: Telephone: **(353) 1-820-7555**  
FAX: **(353) 1-820-5052**
- ◆ United Kingdom: Telephone: **(44) 734-344744**  
Bulletin Board: **(44) 743-360287**

Direct all FAXs to Ireland. You can also write us at:

**Creative Labs (Ireland) Ltd.  
Blanchardstown Industrial Park  
Blanchardstown, Dublin 15  
Ireland**

If you write or FAX us, include a description of your problem and the information listed above.

## Asia

For locations throughout Asia, call Creative in Singapore at **65-773-4048** for technical support. Operating hours, Singapore time, are:

Monday-Friday	9:00 a.m.-6:00 p.m.
Saturday	9:00 a.m.-1:00 p.m.
Sunday and holidays	Closed

You can also send us a FAX at **65-773-0353** or write us at:

**Technical Support Department  
Creative Technology Ltd.  
Blk 75, #01-04  
Ayer Rajah Crescent  
Singapore 0513**

If you write or FAX us, include a description of your problem and the information listed above. You can get copies of software and driver updates from Creative Technology's bulletin board; call **65-776-2423**.

## Compuserve

The Creative Labs Forum on Compuserve allows you to address questions directly to our company representatives, and receive new product information and software updates.

If you are a member of Compuserve, use the following command at the Compuserve prompt to access the Forum:

**GO BLASTER**

If you are not a member of Compuserve, receive a free introductory membership by calling **1-800-524-3388**, ask for representative #228.

# Product Return

In order to return a Creative Labs product for factory service, you must have a Return Merchandise Authorization (RMA) number. You can obtain an RMA number by calling the Technical Support office nearest you (see above for locations and telephone numbers). *Creative Labs will not accept a return without an RMA number.*

When returning a product for factory service:

- ❖ Shipment to Creative Labs is at your expense—you assume all risk. Ship the package through a carrier that provides proof of delivery; insure the shipment at full product value.
- ❖ Place the RMA number on the outside of the package.
- ❖ Use proper materials for packing the product for shipment.
- ❖ You must include a copy of a dated proof of purchase (store receipt), proving that the product is within the warranty period.

Creative Labs may replace or repair the product with new or reconditioned parts, and the replaced parts or product become the property of Creative Labs. Creative Labs warrants the repaired or replaced product to be free from defect in material and workmanship for a period of the greater of: (1) ninety (90) days from the return shipping date, or (2) the period of time remaining on the original one-year warranty.

## Outside the United States

When shipping a product to Creative Labs in the United States from another country, you must obtain and complete an official customs form before shipping the product to avoid any tariffs. *Creative Labs may include charges for return shipment to ensure delivery of the product.*

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## Software Warranty

CREATIVE LABS, INC., warrants that the physical disks and the physical documentation enclosed herein to be free of defects for a period of 60 days from the date of purchase. In the event of a defect in material or workmanship during the warranty period, Creative Labs will replace the defective media or documentation when the defective product is returned to Creative Labs by the owner. The remedy for this breach of warranty is limited to replacement only and shall not cover any other damages, including but not limited to the loss of profit, special, incidental, consequential, and other similar claims.

## Hardware Warranty

Creative Labs warrants that the product enclosed herein to be free of defects for a period of one year from the date of purchase. In the event of a defect in material or workmanship during the warranty period, Creative Labs, at its discretion, will repair or replace the defective product when the defective product is returned to Creative Labs by the owner. The remedy for this breach of warranty is limited to servicing or replacement only and shall not cover any other damages, including but not limited to the loss of profit, special, incidental, consequential, and other similar claims.

Creative Labs specifically disclaims all other warranties, expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose with respect to the defects of the products and program license granted herein. With respect to the use of this product, in no event shall Creative Labs be liable for any loss of profit or any commercial damage, including but not limited to special, incidental, consequential, or other damages. Some states/countries do not allow the exclusion of limitation of liability for consequential, or incidental damages, in which case the above limitation may not apply to you.

If the product is found to be defective, Creative Labs, at its option, agrees to replace or repair the product at no charge except as stated below, provided that you deliver the product with a return material authorization (RMA) number and a dated proof of purchase. If you ship the product to Creative Labs, you must assume the risk of damage or loss in transit. You must use the original container (or the equivalent) and pay the shipping charge.

Creative Labs may replace or repair the product with new or reconditioned parts, and the replaced parts or product become the property of Creative Labs. Creative Labs warrants the repaired or replaced product to be free from defects in material and workmanship for a period of the greater of: (1) ninety (90) days from the return shipping date, or (2) the period of time remaining on the original container one-year warranty.

Before returning any product, contact Creative Labs' Technical Support (for telephone numbers and addresses, see the Technical Support section of this document). If Creative Labs' Technical Support verifies that the product is defective, the Return Authorization Department will issue an RMA number to place on the outer package of the product. Creative Labs cannot accept any product that does not include an RMA number on the package.

## Sound Blaster® Compatibility Logos

Sound Blaster is synonymous with high quality, industry standard audio cards for the IBM personal computer and compatibles. The Sound Blaster compatibility logos you see below are an extension of this commitment to quality from Creative Labs to you, our valued customer. Products bearing any of these logos have been tested by Creative Labs for compatibility with the Sound Blaster line of audio cards.\* Look for these logos as your assurance of compatibility on software and peripherals that you purchase for use with your Sound Blaster audio card.



*Products bearing this logo work with the Sound Blaster line of audio cards.*



*Products bearing this logo work with the Sound Blaster line of audio cards and contain 16 bit audio files.*



*Products bearing this logo work with the Sound Blaster line of audio cards and have direct MIDI support for the AWE32 and/or use the downloadable SoundFont capabilities of the AWE32.*

- \* Some software and peripheral products require specific IRQ, DMA, and I/O settings on the Sound Blaster audio card to function properly.

**Creative Labs, Inc.**

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