S23 Audio Card

User's Guide

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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:

1. Reorient or relocate the receiving antenna.

2. Increase the separation between the equipment and receiver.

3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

4. Consult the dealer or an experienced radio/television technician for help.

Notice 1:

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2:

Shielded interface cables, if any, must be used in order to comply with the emission limits.

About this Manual

Purpose

This user's guide aims to give you all the necessary information to enable you to operate the card properly.

Manual Structure

This user's guide consists of five chapters and two appendices:

Chapter 1   Overview

This chapter describes the S23 audio card, its major components, and special features.

Chapter 2   Getting Started

The chapter contains hardware and software installation, and other information to help you install and use the card.

Chapter 3   Windows 95 Applications

This chapter describes in detail the Windows 95 applications bundled with the sound card.

Chapter 4   DOS and Windows 3.x Applications

This chapter describes in detail all the DOS and Windows 3.x applications and utilities.

Chapter 5   Troubleshooting

This chapter lists some of the common problems that you might encounter when using the card, and their corresponding causes and corrective actions.

Appendix A   Hardware Information

This appendix lists the I/O address, interrupt and other hardware information needed to optimize the sound card.

Appendix B   Installing an IDE CD-ROM Drive

This appendix tells how to install an IDE CD-ROM drive and how to configure the drive to work with the sound card.

Conventions

The following are the conventions used in this manual:

`Text entered by user`   Represents text input by the user.

`Screen messages`   Denotes actual messages that appear onscreen.

a, e, s, etc.   Represent the actual keys that you have to press on the keyboard.

NOTE
Gives bits and pieces of additional information related to the current topic.

WARNING
Alerts you to any damage that might result from doing or not doing specific actions.

CAUTION
Gives precautionary measures to avoid possible hardware or software problems.

IMPORTANT
Reminds you to do specific actions relevant to the accomplishment of procedures.

TIP
Tells how to accomplish a procedure through little shortcuts.

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Overview

This chapter describes the basic features of the S23 audio card and shows its important components.

1.1   Features

The S23 audio card has the following features:

CD-ROM interface (option)

- Built-in interface for IDE CD-ROM drives

MIDI interface

- Built-in MIDI interface for external MIDI devices and internal Wave Table upgrade option

- Supports general MIDI and MPU-401 interface

Music synthesizer

- 4-operator, 20-voice stereo music synthesis from the enhanced FM OPL3 music chip

Software-controllable audio

- Supports various audio devices all controllable through software

- Adjusts master volume, CD audio, line-in, and microphone inputs

- Software setting of I/O address, DMA and IRQ

Overview

Stereo digitized voice channel

- 16-bit and 8-bit digitizing both in stereo and mono modes

- Programmable sampling rate from 4 KHz to 48 KHz

- Simultaneous playback and recording

Wave Table upgradeable

- Wave Blaster-compatible pin-outs

- Compatible with general MIDI and MPU-401

- Playback sequence up to 32 note polyphony

- 2MB Mask ROM sample wave

1.2 Card Components
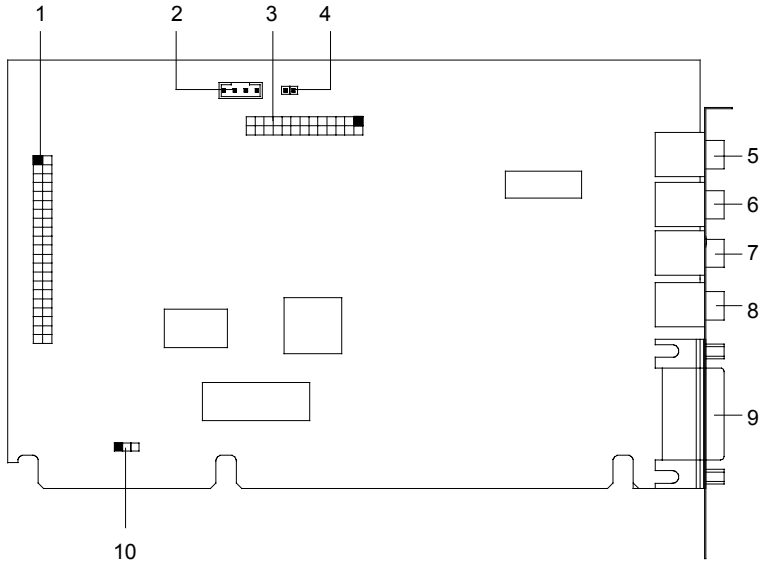
1	IDE CD-ROM connector	6 Line-out port
2	CD-ROM audio connector	7 Line-in port
3	Wave Table module upgrade	8 Microphone-in port
	connector	9 Game/MIDI port
4	PC speaker input	10 IDE CD-ROM connector
5	Speaker-out port	enable/disable jumper (J2)

Figure 1-1   S23 Audio Card Components

Chapter   2

Getting Started

This chapter tells you how to prepare the card for use. It lists the system requirements and guides you through the step-by-step installation procedures for hardware and software. It also shows you how to connect peripheral devices that the card supports.

2.1   Package Contents

The S23 audio card package contains the following items:

● S23 audio card

● Installation diskettes

● Audio cable

● Manual

2.2   System Requirements

Before installing the card, make sure your system has the following:

● 386 or higher CPU

● at least 5 MB of free hard disk space

● at least 4 MB of RAM

● one free 16-bit expansion slot

● Windows 3.x, Windows 95 or higher

● DOS 5.0 or higher

● EGA or VGA capability

2.3   Installing the Card

Follow these steps to install the card:

1. Turn off the system and all the peripherals connected to it.

2. Remove the system cover to access the expansion slots.

> *Touch an unpainted portion of the system before handling components to discharge any static electricity that you may have accumulated.*

3. Remove the metal bracket from an empty 16-bit expansion slot. Save the screw to secure the card.

4. Align the card with the slot guide and press it down into the slot. See Figure 2-1.

> *Make sure that the card is seated firmly in the slot.*
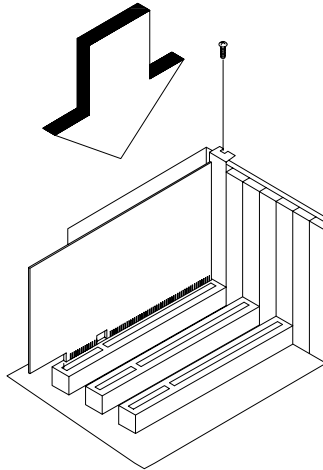
Figure 2-1   Installing the Card

5. Secure the card with a screw.

> *Do not neglect this step.   The card uses the bracket for grounding.*

6. Attach the required cables to the card.

> *If you have any internal peripheral device to install such as a CD-ROM drive, install it now. See section 2.4 and appendix B for the procedures.*

7. Replace the system cover, connect the cables, and turn on the system.

2.4 Connecting Peripherals

To fully utilize the card functions, you may connect various peripheral devices that the card supports. Figure 2-2 shows the different devices that you can connect.
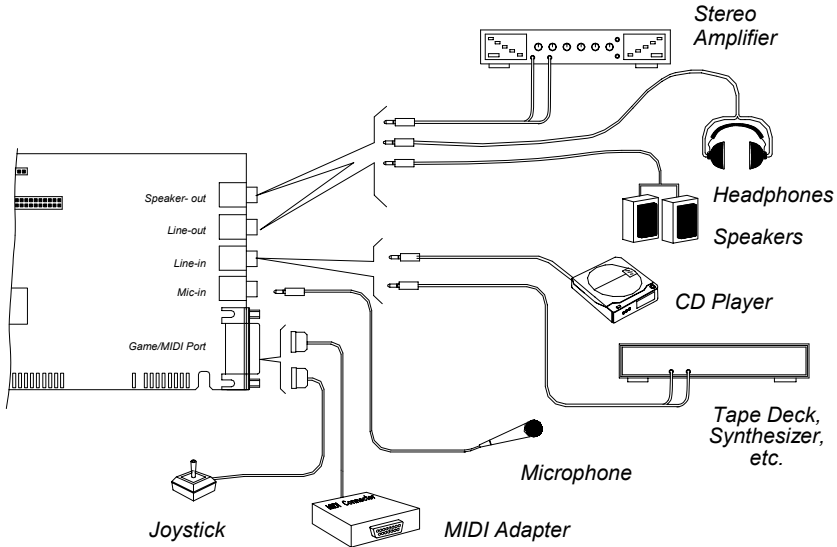
Figure 2-2   Connecting Peripheral Devices

2.4.1 CD-ROM

The onboard CD-ROM interface (option) supports IDE CD-ROM drives. A hardware jumper J2, enables (default setting) or disables this interface. Figure 2-3 shows the settings.

1-2
Enable onboard IDE

2-3
Disable onboard IDE
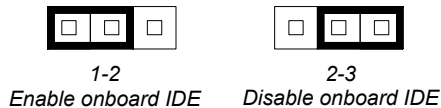
Figure 2-3   J2 Jumper Settings

Installing a CD-ROM Drive

Follow these steps to install a CD-ROM drive:

1. Install the CD-ROM drive into a 5.25-inch drive bay and secure it with mounting screws.

2. Connect the CD-ROM drive cable to the CD-ROM interface on the sound card, or to the IDE interface of your system.

   Refer to Appendix B for more details on how to install an IDE CD-ROM drive for use with the sound card.

3. Connect the CD-ROM audio connector with the card audio connector using a 4-pin audio cable.

2.4.2 Audio Output Devices

The speaker-out port and the audio line-out port are available for different audio output devices. To the speaker-out port, you can connect external speakers or headphones. You can connect stereo amplifiers to the audio line-out port.

2.4.3 Audio Input Devices

The audio line-in port and the microphone-in port are available for different audio input devices. To the audio line-in port, you can connect a CD player, cassette, synthesizer, etc. Connect an external microphone into the microphone-in port.

2.4.4 MIDI/Joystick

The Game/MIDI port on the card is compatible with the standard PC joystick. You may also choose to connect a MIDI adapter with a joystick port to use the MIDI and joystick simultaneously.

2.5 Setting Up in Windows 95

The card package comes with Windows 95 software applications which are discussed in detail in Chapter 3.

Before installing the drivers, make back-up copies of the original installation diskettes first.

> *Please refer to your Windows 95 manual or online help for any questions on Windows 95.*

2.5.1 Installing the Drivers and Utilities

After turning on the system, Windows 95 begins loading and starts detecting new hardware installed on the system.

1. When Windows 95 detects the presence of the S23 audio card, it begins to build the S23 driver database. Then the following dialog box displays.

2. Select *Driver from disk provided by hardware manufacturer* and click on **OK**. The following dialog box displays.

Install From Disk

Insert the manufacturer's installation disk into the drive selected, and then click OK.

OK

Cancel

Copy manufacturer's files from:

A:\

Browse...
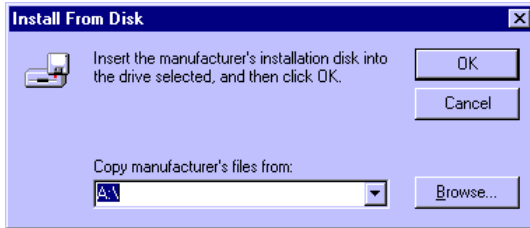
3. Insert the driver diskette in your diskette drive and specify another drive if required. Then click on **OK**. The system copies the necessary driver files to your hard disk drive.

4. Windows 95 makes changes to the system settings and begins detecting the following new hardware components:

    - Gameport Joystick

    - AcerMagic S23 Plug-N-Play Audio

    - AcerMagic S23 Audio Control Registers

    - MPU-401 Compatible Device

    If you have not installed the Windows 95 gameport joystick and MPU-401 compatible device drivers before, Windows 95 prompts you to insert the Windows 95 CD-ROM into your CD-ROM drive.

5. Upon initial installation, the setup process begins setting up the AcerMagic S23 software.

Windows 95 makes final changes to the system settings.

2.5.2   Removing the Drivers and Utilities

Follow these steps to remove or uninstall the drivers and utilities:

1. Double-click on the My Computer icon.

2. Double-click on the drive icon where the Windows 95 folder is located.

3. Double-click on the Windows 95 folder.

4. Double-click on the Rem_s23 folder.

5. Right-click on the Rem_s23.inf icon and select Install.

The uninstallation process automatically removes the drivers and changes the system registry settings.

The uninstallation program does not remove the Music Center application.

After removing the drivers, remember to remove the audio card when you shutdown from the current Windows 95 session; otherwise, Windows 95 will again detect the S23 audio card at the next startup.

2.6 Setting Up in DOS and Windows 3.x

The card package comes with DOS and Windows 3.x software applications which are discussed in detail in Chapter 4.

Before running the installation program, make back-up copies of the original installation diskettes first.

2.6.1 Installing the Drivers and Utilities

Follow these steps to install the drivers and applications:

1. Insert the first installation diskette into a diskette drive.

2. At the DOS prompt, type

   `a:\setup` e or `b:\setup` e

   depending on where you inserted the installation disk. The following screen displays.
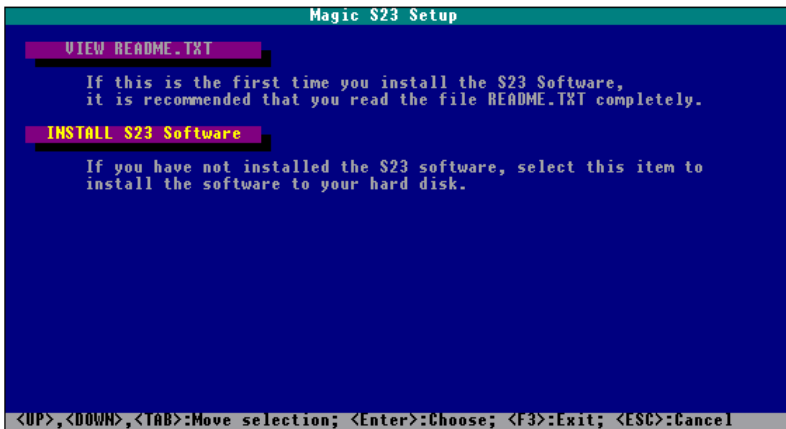
3. Select the install option to start the installation process. The following screen displays.
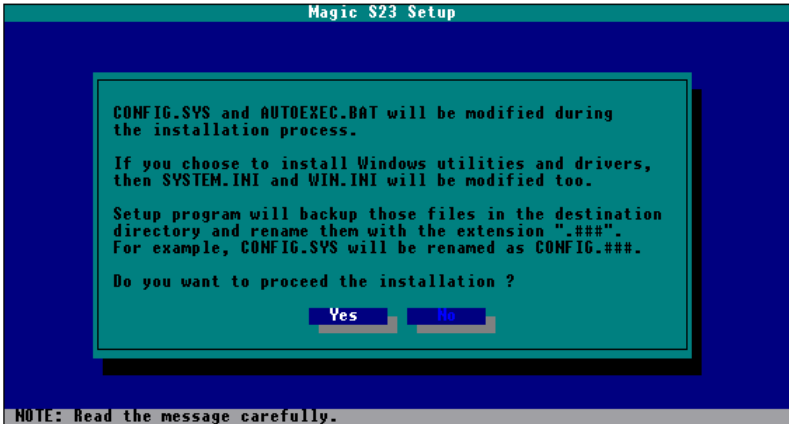
4. This screen describes the files setup will modify during installation. Read this message carefully. Select **Yes** to proceed with the installation. The following screen displays.
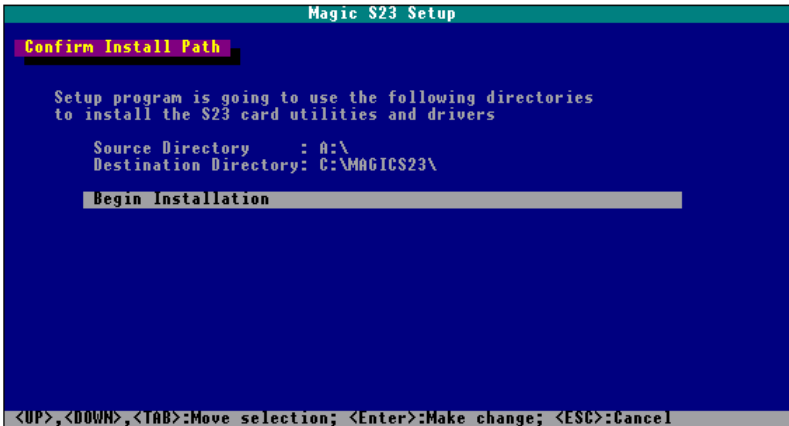
5. Confirm the installation path by selecting **Begin Installation**. You can modify the source and destination directories. The following screen displays.

```
                          Magic S23 Setup
   Install Windows Applications

       The following path will be used to install S23 Windows utilities
       and drivers.

               C:\WINDOWS\_

     * To install the S23 windows applications and drivers, input the
       path of your Windows system, then press <ENTER> to proceed the
       installation.

     * If you do not want to install S23 Windows applications now,
       press <F2> to skip this screen.


 <EDIT KEYS>:Move cursor; <ESC>:Cancel; <ENTER>:Accept
```
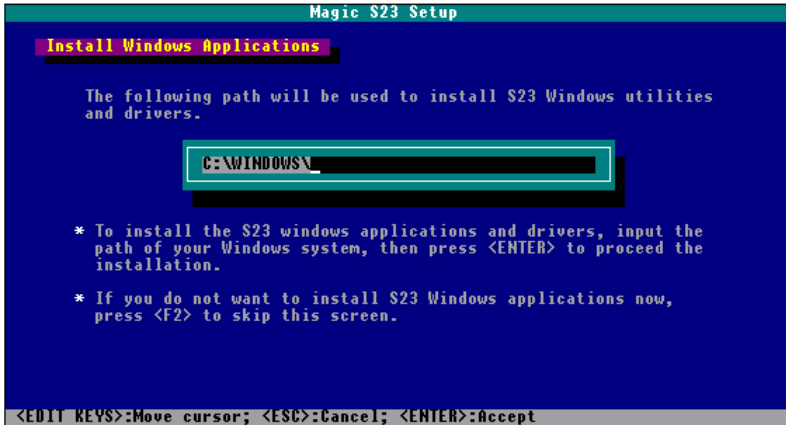
6. Press e if you want to install the Windows applications and drivers. Otherwise, press m. The following screen displays.

```
                          Magic S23 Setup
   Hardware Settings For S23 Card

   Basic audio feature settings:
     Digital Audio Interrupt                    5
     Digital Audio Main DMA Channel             1
     SoundBlaster Mode I/O Port                 220
     Windows Sound System Mode I/O Port         530
     GamePort                                   ENABLE

   MIDI Port settings:
     MPU-401 Interface                          DISABLE
     MPU-401 I/O Port                           Not Used
     MPU-401 Interrupt                          Not Used

     Accept the above settings



 <UP>,<DOWN>:Choose; <ENTER>:Change; <ESC>:Cancel; <F3>:Exit
```
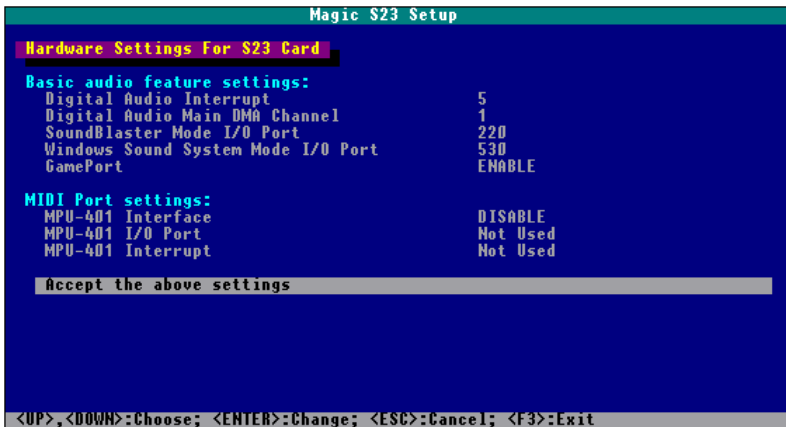
7. Select **Accept the above settings** to install the drivers and applications. You can modify any of the options before you begin installation.

If you selected to install the Windows drivers and applications, the following screen displays.

```
                        Magic S23 Setup
 Hardware Settings For S23 Card

 Windows-specific audio feature settings:
    DMA Mode                                 Demand
    Duplex Mode                              Full
    Digital Audio Recording DMA Channel      0

    Accept the above settings




 <UP>,<DOWN>:Choose; <ENTER>:Change; <B>:Back; <ESC>:Cancel; <F3>:Exit
```
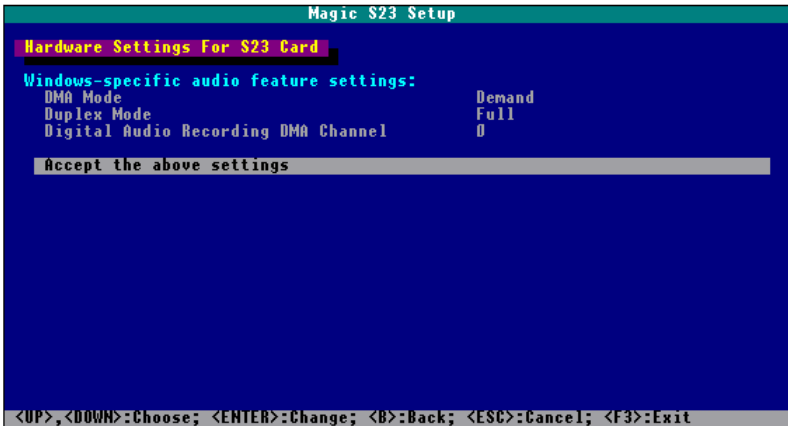
8. Select **Accept the above settings** to install the Windows drivers and applications. You can modify any of the options before you begin installation.

    Skip this step if you did not select to install the Windows drivers and applications.

    > *If you want to use an external MIDI device, or you have installed a wave device, or you have installed a wave table on the S23 card, you need to enable the MPU-401 interface option.*

9. Follow the screen instructions to complete the installation.

    The installation program automatically updates your profiles (AUTOEXEC.BAT, CONFIG.SYS, and SYSTEM.INI) so that your hardware and software work properly.

> *Before any changes are made to your AUTOEXEC.BAT, CONFIG.SYS, WIN.INI and SYSTEM.INI files, backups of your original files are copied to the MAGICS23 directory and are renamed as AUTOEXEC.###, CONFIG.###, WIN.### and SYSTEM.### respectively.*

10. Reboot the system after installation.

> *You must reboot the system. The card does not work unless you reboot.*

2.6.2   Removing the Drivers and Utilities

Follow these steps to remove or uninstall the drivers and applications:

1. Change the directory to where the S23 files are located and type the following at the DOS prompt:

    ```
    setup e
    ```

2. Select the uninstall option to start the uninstallation process. Follow the screen instructions to complete the process.

Chapter   3

Windows 95 Applications

The S23 audio card bundles applications that help you maximize use of the card features. This chapter tells how to use the Windows 95 applications.

The installation process creates a folder called "Magic S23" which contains the Music Center application icon. The Music Center allows you to play audio compact discs, MIDI sound files and waveform sound files. It also allows you to control the combination and balance of sound output from the different channels. A DOS mixer is also included that lets you adjust mixer settings in the DOS environment.

3.1 Music Center

The Music Center is an assembly of four music components that you can operate right from your computer screen.

To access the Music Center, click on the Programs folder from the Start button. Then click on Music Center in the Magic S23 folder.
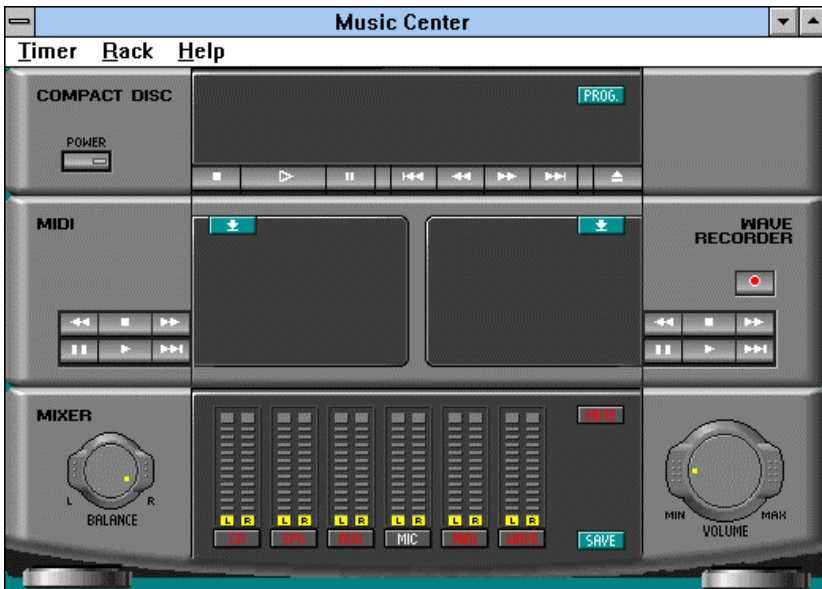
The Music Center consists of the following music components:

- **CD Player** - plays audio compact discs

- **MIDI Player** - plays MIDI sound files

- **Wave Recorder** - plays and records waveform sound files

- **Mixer** - controls the combination and balance of sound output from the different channels

Refer to the succeeding sections for detailed descriptions of the features and functions of each Music Center component.

> *The Music Center has an online help that contains quick information about the Music Center components.*

If you want to exit the Music Center, just double-click on the control-menu box on the left side of the title bar.

3.1.1   CD Player

The CD player lets you play audio compact discs the same way you play them in any other CD player. It has a programming function that allows you to customize the playing sequence of a particular CD and save the settings into a file.

CD Function Buttons
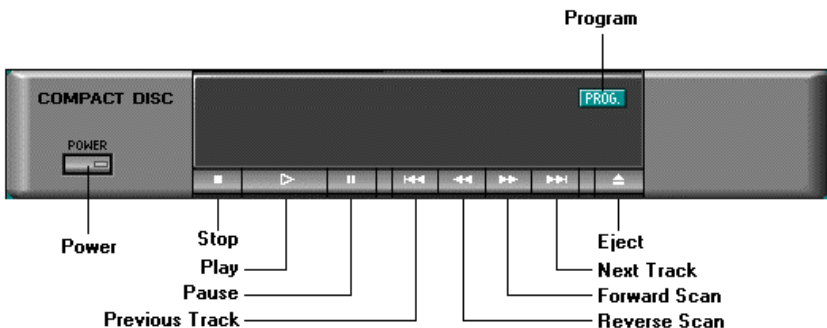
Power   Turns the CD player on or off

Stop   Stops playing a CD

The current track starts playing from the beginning when you click on the Play button.

Windows 95 Applications

Play   Starts playing a CD

Pause   Stops playing a CD temporarily

                         The current track resumes pla when you click on the Play button

Previous track   Plays the track immediately preceeding the current track

Reverse scan   Allows you to search back for a particular point in the current track

Forward scan   Allows you to search ahead for a particular point in the current track

Next track   Plays the track immediately following the current track

Program   Allows you to customize the settings of a particular CD and save the settings to a file

Playing a CD

Follow these steps to play an audio CD:

1. Gently place a CD into the CD-ROM drive or CD player with the label surface up.

   Handle the disc only by the edges or the center hole.

2. Click on the Power button on the CD player.
3. Click on the Play button to listen to the first rack on the CD.
4. Click on the other command buttons ro select and play the desired track.

> *If you encounter an error message when using the CD player, see Chapter 5 for some troubleshooting tips.*

CD Programming Feature

Follow these steps to use the CD programming feature:

1. Click on the Program button on top of the CD window. A dialog box appears.
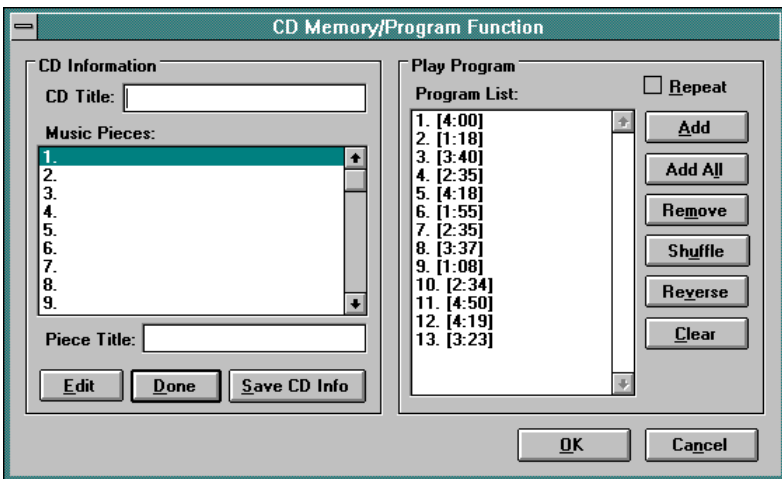
2. Enter the CD title in the CD title box.

> *You cannot save the CD information without a CD title.*

3. Click on any track number in the Music Pieces box and type in the piece title.

Windows 95 Applications

4. Click on <tt>Done</tt> or press **e** to update the piece title.

5. Follow the same steps to enter the titles of the other pieces.

> *You do not have to enter the titles of all the pieces, only the desired pieces.*

6. Click on the Save CD Info button if you want to save the CD settings that you just made.

   The next time you load that CD, the program automatically retrieves your customized settings. You may also edit your customized settings and save them again. See the section *Editing CD Information*.

7. Use the buttons under the Play program to add, remove, or change the order of the piece titles.

8. Click on OK when finished.

Editing CD Information

Follow these steps to edit your customized CD information:

1. Click on the piece title that you want to edit under the Music Pieces box.

2. Click on <tt>Edit.</tt> The piece title that you selected appears on the Piece Title box.

3. Type in your modifications

4. Click on <tt>Done</tt> or press **e** to update the piece title.

5. Do the same for any other titles that you want to edit.

6. Click on the Save CD Info box to save your new settings.

3.1.2   MIDI Player

The MIDI player can playback windows files with the extension .MID. It acts like a MIDI file jukebox so you can select and queue all the files that you want to play.

MIDI Function Buttons
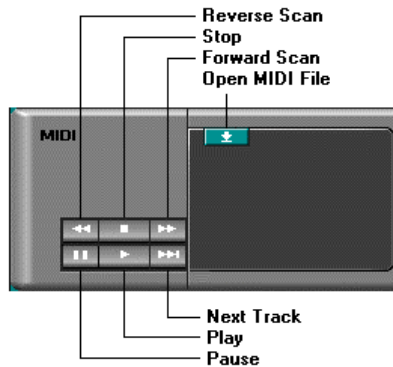
Reverse scan	Allows you to search back for a particular point in the current MIDI file
Stop	Stops playing a MIDI file
Forward scan	Allows you to search ahead for a particular point in the current MIDI file
Open MIDI file	Allows you to open MIDI files
Pause	Stops playing a MIDI file
	The current MIDI file resumes play when you click on the Play button.
Play	Starts playing a MIDI file
Next track	Plays the MIDI file immediately following the current file on the play list

Windows 95 Applications

Playing a MIDI File

Follow these steps to play a MIDI file:

1. Click on the drop-down arrow on top of the wave recorder screen. A dialog box appears.
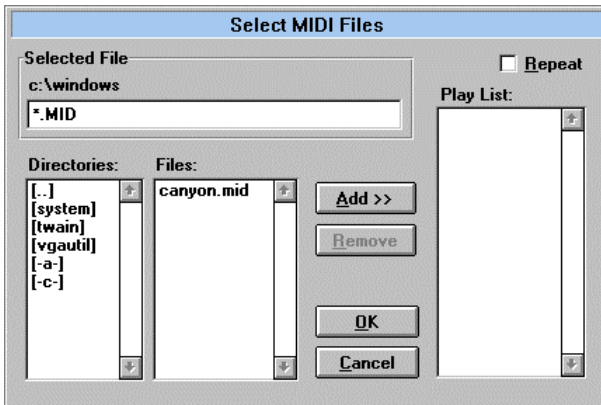
2. Choose a MIDI file or files from the files list.

3. Click on the Add>> button to add the file or files to the play list.

4. Click on OK. The dialog box disappears, but now the MIDI screen displays the MIDI files that you selected.

5. Click on the Play button to play the first file.

6. Click on the Stop button to stop playing a MIDI file.

> *The program repeatedly plays the selected files in the play list until you click on the Stop or Pause button.*

3.1.3 Wave Recorder

The wave recorder can playback and record digitized sound files with the extension .WAV.

Wave Recorder Function Buttons
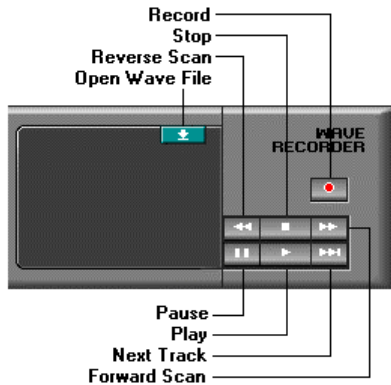
Record	Allows you to record audio files from other input channels like CD or MIDI players
Stop	Stops playing a wave file
Reverse scan	Allows you to search back for a particular point in the current wave file
Open wave file	Allows you to open wave files
Forward scan	Allows you to search ahead for a particular point in the current wave file
Pause	Stops playing a wave file temporarily
	The current wave file resumes play when you click on the Play button.
Play	Starts playing a wave file

Next track   Plays the wave file immediately following the
                        current file on the play list

Playing a Wave File

Follow these steps to play a wave file:

1. Click on the drop-down arrow on top of the wave recorder screen.
    A dialog box appears.
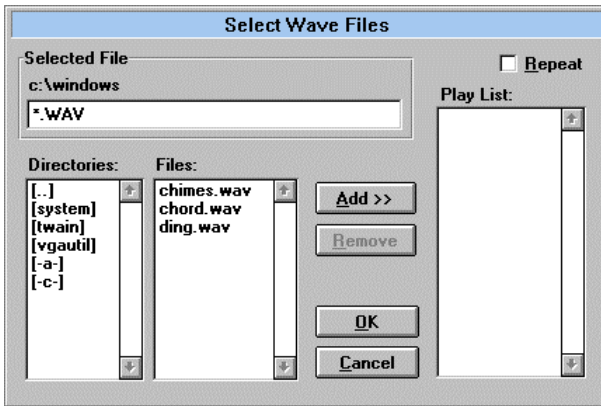
2. Choose a wave file or files from the files list.

3. Click on the Add>> button to add the file or files to the play list.

4. Click on OK. The dialog box disappears, but now the wave
    screen displays the wave files that you selected.

5. Click on the Play button to play the first file.

6. Click on the Stop button to stop playing a wave file.

> *The program repeatedly plays the selected
> files in the play list until you click on the Stop
> or Pause button.*

Recording and Saving a Wave File

Follow these steps to record and save a wave file:

1. Choose a recording source by clicking on any input channel label in the Mixer. The channel label turns red when selected.

2. Click on the Record button on the right of the wave recorder screen. A dialog box appears.
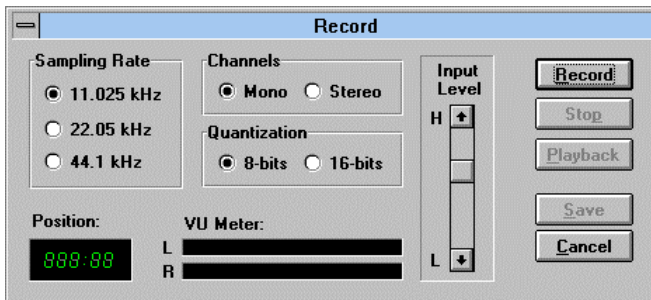
3. Select an option from the Sampling Rate box. If your system supports all the sampling options, choose the highest rate for better sound output.

> *The system does not support the gray-colored option.*

4. Specify your choices in the Channels and Quantization boxes.

5. Set the input level on the Level scroll bar.

> *It is better to set the input level to H (high) when recording to achieve maximum output.*

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6. Start playing an audio output from the channel that you selected. It may be from the CD or MIDI players, or even your own voice through a microphone.

7. Adjust the left and right channel volume controls for the desired loudness.

8. Click on the Record button to start recording. During the recording, the VU meter displays the current input volume.

VU Meter
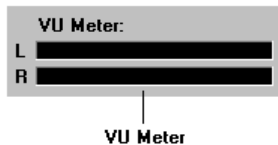
9. Click on the Stop button to stop recording.

10. Click on the Save button to save the audio output to a file.

3.1.4 Mixer

The mixer dynamically controls the volume and balance for each of the input channels to achieve the desired sound effect. Using the mixer functions, you can select the channels that you want to be mixed and recorded.

The mixer controls the following sound sources:

●   CD player

●   Speaker

●   Auxiliary input

●   MIDI player

●   Wave recorder

●   Microphone

During recording, note that the current recording source is the channel labeled red.

Mixer Function Buttons
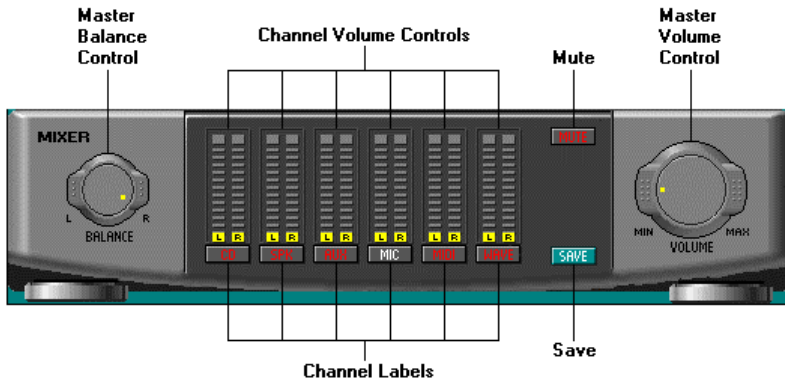
Master balance control	Adjusts the output balance for the left and right speakers
Channel volume controls	Adjust the volume of a channel by sliding the left/right buttons up or down.
Mute	Suppresses the sounds coming from all channels making them inaudible. Click on the button again to return to th normal sound level.
Master volume control	Adjusts the left and right speaker volume
Channel labels	Allow you to choose a recording source by clicking on it. The channel label turns red when selected.
Save	Saves the mixer settings

Using the Mixer Controls

Follow these steps to use the mixer controls:

1. Make sure that there is a sound output from either the CD player, MIDI player, or wave recorder.

2. Click on the right or left side of the master balance control to adjust the balance between the left and right speakers.

3. Click on the right or left side of the master volume control to increase or decrease the master volume.

> *The master volume simultaneously controls the sound output from all the channels.*

4. Adjust the volume of a particular channel by clicking on its left (L) or right (R) volume control and dragging it up or down.

5. Click on the Save button to save the current mixer settings.

3.1.5   Menu Bar Functions

The Menu Bar of the Music Center has three additional function items: Timer, Rack, and Help.

Timer

The Timer allows you to set a particular time when you want to activate any of the music components and play a track or an audio file. If a music component, such as the CD Player, is currently playing, you can also set a time when you want it to stop playing.

> *You can set more than one timer for the different music components. You just have to give them different filenames. For example: Timer 1, Timer 2, etc.*

Follow these steps to set a timer:

1. From the menu bar, click on Timer then on Music Timer to display the following screen.
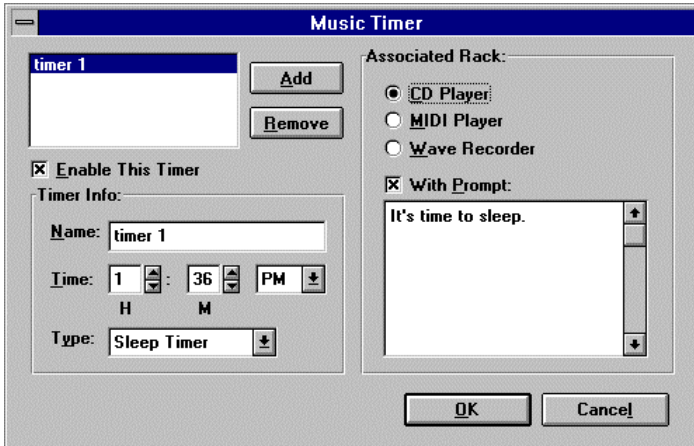
2. Fill in the boxes under the Timer Info section.

Name	Type in a name for the timer
Time	Type in your desired time or simply click on the up- or down-arrow
Type	Click on the down-arrow to select the type of timer
Sleep Timer	Stops playing a music component, such as the CD player, at the specified time
Play Timer	Starts playing a music component at the specified time

The timer works only if you have entered the Music Center program.

3. Under the Associated Rack section, select the music component for which you set the timer.

4. Click on the box With Prompt, and type a message on the space provided. At the specified time, the message appears in a pop-up window similar to the following:

Timer Message
Timer 1
It's time to sleep.
OK
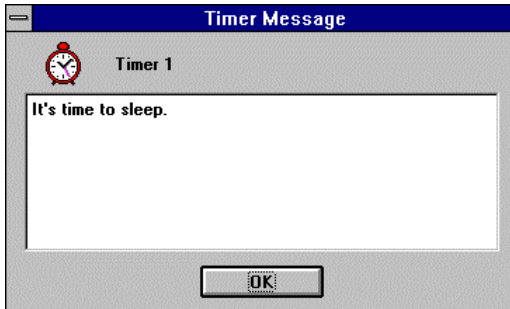
5. Click on the Add button, then on OK to save the settings.

> *If you want to delete any timer setting, simply select the timer from the list, click on the Remove button then on OK.*

Rack

This feature allows you to change the Music Center desktop appearance. From the menu bar, click on Rack to display a drop-down menu as follows:

Rack   Help
√ CD Player
√ MIDI Player/Wave Recorder
√ Mixer
Always on Top
Full Screen
√ Window
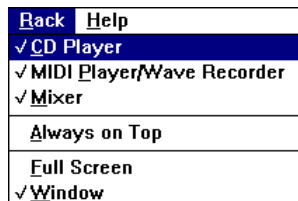
Select the item that you want to display by clicking on it. The selected items appear with a check mark before them. To deselect an item, simply click on it again.

- CD Player   Shows or hides the CD player

- MIDI Player/   Shows or hides the MIDI player and the
  Wave Recorder   wave recorder

- Mixer   Shows or hides the Mixer

- Always on Top   Puts the Music Center window on top of all
  other windows

- Full Screen   Sets the Music Center on the whole screen

- Window   Sets the Music Center windowed

Help

The Help item on the Menu Bar displays the Music Center online help.

3.2 Onscreen Sound Mixer

The DOS graphic interface and command line sound mixer utility, CS32MIX.EXE controls similar features as the Windows sound mixer.

3.2.1 Running the Sound Mixer

There are two ways to run the graphic interface:

● Click on the Mixer item in the Magic S23 folder

● Click on the MS-DOS Prompt item in the Programs folder and type the following at the DOS prompt:

```
CS32MIX    e
```

The Mixer is displayed in a graphical interface that is controlled by the keyboard or mouse (if mouse driver is installed).
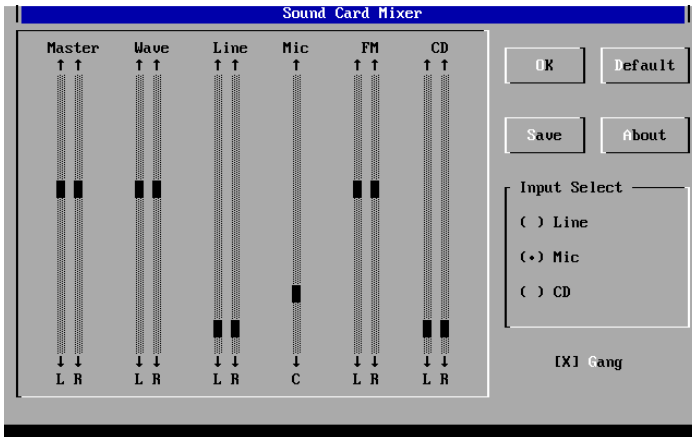
3.2.2 Using the Sound Mixer

The sound parameters may be controlled by using hot keys (a + highlighted letter), and v and xzyw (arrow keys) to increase/ decrease left/right channels for each input. Tab to the Gang option and press k to toggle off (unchecked); allowing the left and right channels to be adjusted separately. The Default button will reset inputs to the system default settings. The Save button will save your mixer settings until the next time you change and save the settings.

3.2.3 Using the Sound Mixer in Command Line Mode

Type the following at the DOS prompt to display command line options:

```
CS32MIX /?
```

The options include:

```
/M= (left), (right) <0-15>  ; Master Volume
/W= (left), (right) <0-15>  ; Wave Volume
/L= (left), (right) <0-15>  ; Line Volume
/X= (mono)          <0-7>   ; Microphone Volume
/F= (left), (right) <0-15>  ; FM Volume
/C= (left), (right) <0-15>  ; CD Volume
/I= (L, X or C)             ; Input Select=Line, Mic or CD
/D                          ; Use Default values
/S                          ; Show mixer settings
```

For example, to change the master volume by the same amount for both channels enter:

```
CS32MIX /M=8,8 or CS32MIX /M=8
```

DOS and Windows 3.x Applications

This chapter discusses the bundled Windows 3.x and DOS applications.

> *The Windows applications described in this chapter are available under Windows 3.x only.*

If the audio card is configured for use under DOS and/or Windows 3.x environments, the installation process described in section 2.6 creates a program group called Magic S23. This program group contains icons for each of the applications and utilities in the audio package. The program group and its items are displayed below.

The program items include the following applications and utilities:

● Business Audio Input - allows you to control the source and volume of sound coming into your system.

● Business Audio Mixer - allows you to control the volume of the audio channels.

● Business Audio Transport - acts like a cassette recorder, allowing you to record and play back sound from single or multiple audio devices and make use of Windows OLE features.

● Alarm Clock - lets you set the time and the alarm.

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- Music Center - allows you to play audio compact discs, MIDI sound files and waveform sound files. It also allows you to control the combination and blaance of sound output from the different channels.

- Audio Card Configuration - lets you configure the hardware settings of your sound card and CD-ROM drive.

In addition, the audio card includes these DOS applications:

- Onscreen Sound Mixer

- Hot-Key Sound Mixer

- Setup Utility

- Audio Initialization Utility

The following sections describe the functions and features of these audio utilities.

> *The Music Center and Onscreen Sound Mixer are described in Chapter 3.*

4.1   Business Audio Input

The Business Audio Input control panel allows you to adjust recording volume. To access this utility, double-click on the Audio Input icon in the S23 program group. The following dialog box displays:

You can also access this utility by clicking on the Inputs... button in the Business Audio Mixer control panel.

Business Audio Input Control Panel Items

Input Selector   Selects the source of the audio input

MIDI   Selects MIDI as the input source

Aux   Selects the aux/line as the input source

Output   Selects the mixed output as the input source

Mic   Selects the microphone as the input source

Boost   Allows you to increase the volume of weak microphone signals by adding 20db of additional gain to the microphone input. Use together with the input boost control to set the optimum recording level of microphone input.

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AGC   Automatic gain control adjusts the volume of the audio input, so that all of the input into the system is level. This option is useful for microphone input, because loud and soft voices are heard at an even level.

Dither   Improves the playback sound of 8-bit recording. When testing your recording quality in 8-bit format, toggle dither on and off to determine the desired recording quality.

Vrms/db   Selects the unit of measure (volts or decibels) to be displayed

Input Boost   Allows you to adjust the input volume to the optimum recording level

Gang   Select to adjust both channels together

Volume Meter   Displays the level of the input signals. If any of the clip boxes at the top of the meter lights up during recording or playback, some of the input has been clipped.

VU On   Toggles the volume meter on and off

Buttons

About...   Displays an information window describing the Audio Input utility

Mixer...   Displays the Business Audio Mixer control panel

Save...   Saves the current control settings. The last settings saved are used the next time Windows is executed.

OK   Exits the Audio Input control panel and saves
                        the settings for the current Windows session.
                        When you restart Windows, the settings
                        revert to the previously-saved settings.

Cancel   Exits the Audio Input control panel without
                        saving and restores the device settings that
                        were present when you opened the control
                        panel or the last time you saved (whichever is
                        most recent).

4.2 Business Audio Mixer

The Business Audio Mixer allows you to control the volume levels of audio input. When you select Mix Out in the Audio Input control panel, the Audio Mixer control panel allows you to select the volumes of multiple recording input sources such as microphone, CD and line-in.

To access this utility, double-click on the Audio Mixer icon in the S23 program group. The following dialog box displays.
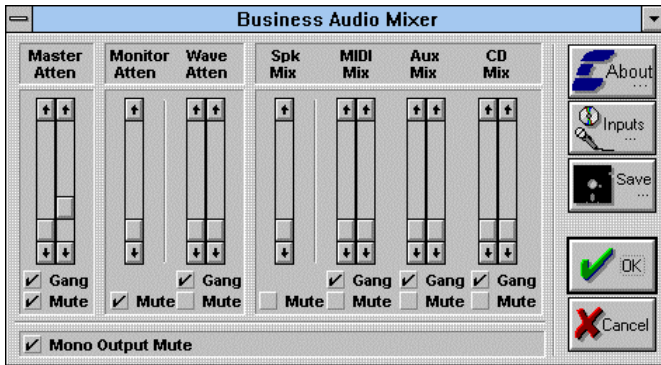
You can also access this utility by clicking on the Mixer... button in the Audio Input control panel.

Business Audio Mixer Control Panel Items

Master Atten   Allows you to adjust all of the input lines at one time. Adjust each input individually with the Spkr Mix, MIDI Mix, Aux Mix and CD Mix sliders, and then adjust the overall volume with Master Atten.

Gang   Select to adjust both channels together

Mute   Select to mute the output

Monitor Atten   Allows you to listen to the audio input in the input format you selected. This option can be used to review audio quality or to time recording starts before and during recording. Toggle the Mute check box as desired.

Wave Atten   Adjusts the volume of digital output from the disk drive. Toggle the Gang and Mute check boxes as desired.

Spkr Mix   Adjusts the volume of the PC speaker input. Toggle the Mute check box as desired.

MIDI Mix   Adjusts the volume of the MIDI input. The input signal may be generated by the FM synthesizer or Wave Table. Toggle the Gang and Mute check boxes as desired.

Aux Mix   Adjusts the volume of the line input. Toggle the Gang and Mute check boxes as desired.

CD Mix   Adjusts the volume of the CD audio input. Toggle the Gang and Mute check boxes as desired.

Mono Output Mute   When selected, this turns mute on when you are playing back a recording, so you can hear what is being recorded without the interference of the input audio. This option automatically turns the input back on (turns mute off) during recording.

Buttons

About...   Displays an information window describing the Audio Mixer utility

Inputs...   Displays the Business Audio Input Control Panel

DOS and Windows 3.x Applications

Save...   Saves the current control settings. The last settings saved are used the next time Windows is executed.

OK   Exits the Audio Mixer Control Panel and saves the settings for the current Windows session. When you restart Windows, the settings revert to the previously-saved settings.

Cancel   Exits the Audio Mixer control panel without saving and restores the device settings that were present when you opened the control panel or the last time you saved (whichever is most recent).

4.3   Business Audio Transport

The Business Audio Transport (BAT) looks like and operates like a
typical cassette recorder. It lets you record input from single or
multiple audio devices, play back recorded sounds, and use the
Windows object linking and embedding (OLE) feature to embed audio
files into Windows applications.

To access the BAT control panel, double-click on the Audio Transport
icon in the S23 program group. The following dialog box displays.
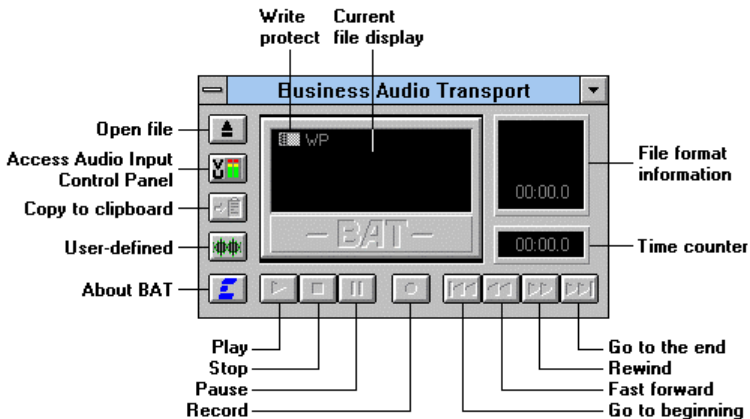
Business Audio Transport Control Panel Items

Buttons

Open file   Allows you to select an audio file or open a
                       new audio file

Access Audio Input   Allows you quick access to the Audio Input
Control Panel   control panel

Copy to clipboard   Copies the file you selected for play into the
                       clipboard. Use this option to select audio files
                       to place in another Windows application.

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User-defined   Goes to the application or utility of your
                        choice. See section on *Defining the User-
                        Defined BAT Button*.

About BAT   Displays information about BAT

Play   Plays the selected audio file

Stop   Stops play of the selected audio file

Pause   Pauses play or record

Record   Starts and stops recording of the selected
                        audio file

Go to beginning   Goes to the beginning of the selected audio
                        file

Rewind   Goes backwards in the selected audio file
                        until it reaches the beginning of the file, or
                        until you stop the rewind operation

Fast forward   Goes forward in the selected audio file until it
                        reaches the end of the file, or until you stop
                        the fast forward operation

Go to end   Goes to the end of the selected audio file

Write protect   When the dot is displayed in this box, you can
                        overwrite the data in the file. When the dot is
                        not displayed, the file is write-protected —
                        you cannot overwrite new data on this file.
                        Click on this button to toggle between write-
                        protected and not write-protected.

Current file display After you select a file with the open file
                        command, the selected file is displayed in this
                        window section

File format information	Displays the encoding method, sample rate, channels, number of bits, and length (in time) of the selected file
Time counter	Displays the current position in the file (in time)

4.3.1　Defining an Audio File

When you select the open file button and identify a new audio file, the Select Tape Format dialog box displays, allowing you to select the attributes of the new audio file.
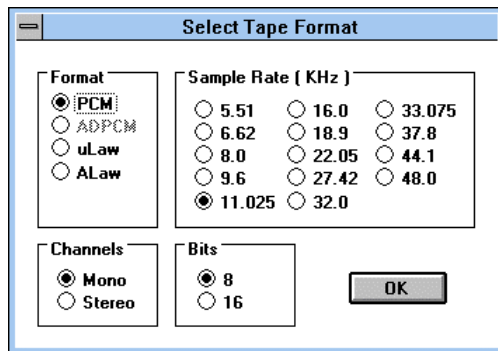
4.3.2　Select Tape Format Dialog Box Items

Format	Selects the type of formatting to use during recording
PCM	PCM in 16-bit format provides the best sound quality and uses the most disk space. 8-bit recording requires half the disk space and provides less sound quality.

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ADPCM	Provides 4:1 compression compared to 16-bit PCM format. The compression means this format uses less disk space with minimal degradation in playback quality.
µLaw	Provides 2:1 compression compared to PCM format
ALaw	Provides 2:1 compression compared to PCM format
Channels	Mono requires half the disk storage space as stereo, and usually provides sufficient quality for voice recordings. When you record stereo input, stereo recording may be called for, depending upon your preferences.
Sample Rate (KHz)	Higher sample rates provide better sound quality and require more disk storage space. Typical sample rates are 11 (for voice), 22 (for medium fidelity) and 44 (for high-fidelity CD-quality recording).
Bits	Select 16 bit for higher quality recording. Recording in 8-bit format may cause distortion (e.g. a hissing sound) during playback. The dither option in the Audio Input control panel may help reduce distortion caused by 8-bit recording.
OK button	Accepts the settings

Alaw and µLaw are CCITT data compression standards. ADPCM is the IMA data compression standard.

The Bits category applies to PCM format only.

The formatting you select depends on what you are recording and your personal preferences. Higher quality recordings require more disk space; lower quality recordings require less disk space. If you are recording voice input, a lower quality recording generally plays back with acceptable quality. If you are recording high-fidelity input such as a music CD and want the highest quality recording, select the highest quality recording attributes that your disk storage space can support.

With experience, you will learn what attributes best suit your recording needs. Refer to Table 4-1 for disk space requirements for some typical recording formats.

Table 4-1   Hard Disk Requirements for Typical Recording Formats

Format	Channel	Sample Rate	Bits	Disk Space per Minute	Typical Use
PCM	stereo	44 KHz	16	10 MB	high-fidelity, music-CD quality
ADPCM	stereo	44 KHz	na	2.5 MB	music
ADPCM	mono	11 KHz	na	165 KB	voices

> *If you want to record under the PCM format, use the Music Center Wave Recorder. Please refer to section 3.1.3.*

4.3.3   Defining the User-Defined BAT Button

To define an application or utility to start up when you click on the User-Defined BAT button, follow these steps:

1. Open the CSACBAT1.INI file with the DOS edit program, the Windows Notepad program, or any other text editor.

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2. Under the [APPLETS] category, insert the following lines:

```
UserAppPath=pathname
UserApp=filename
```

Where pathname is the path to the application file and *filename* is the name of the file.

3. Save and close the file.

The following is an example of the command lines in CSACBAT1.INI file that would cause MS-Write to start up when you click on the user-defined button:

```
[APPLETS]

UserAppPath=c:\windows
UserApp=write.exe
```

4.4   Alarm Clock

The Alarm Clock control panel allows you to set the time and the alarm. To access this utility, double-click on the Alarm Clock icon.
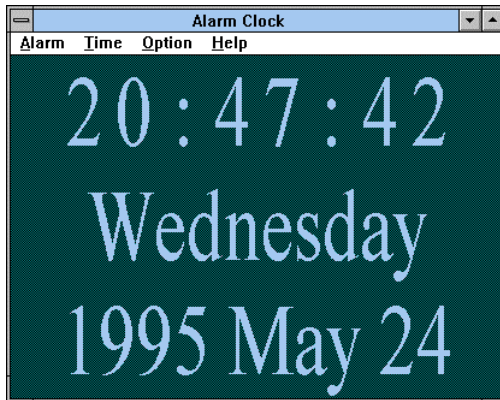
Menu Items

Alarm   Allows you to set the alarm, and enable or disable it. To set the alarm, choose the Set Alarm option. The alarm setting box displays.
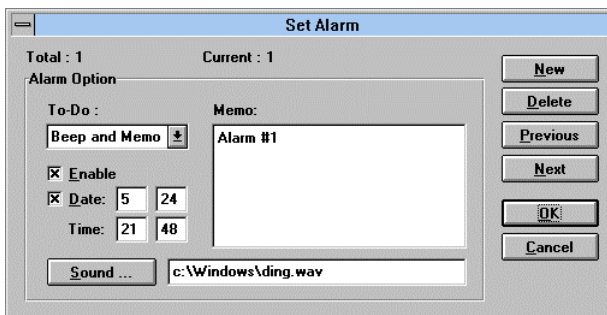
This box lets you configure the alarm and features an option to flash special reminders.

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Time   Allows you to adjust the time

Option   Lets you customize your clock. It allows you to set the color, fonts and type of your clock display.

Help   Shows information about the alarm clock utility

4.5   Audio Card Configuration

This utility lets you configure the hardware settings of your sound card and CD-ROM drive.

To access the utility, double-click on the Audio Card Configuration icon and follow the screen instructions.

4.6 Hot-Key Sound Mixer

CS32HMX.EXE is a DOS level TSR utility, that lets you control the Master, FM, and Voice volumes and muting. During the Setup procedure, this file was copied into the C:\CRYSTAL default directory. The utility works in either Sound Blaster Pro emulation mode or Windows Sound System modes. It works while most games are running.

> *Some games are not compatible with the DOS Hot-Key Sound Mixer. Also, this utility will not operate with Microsoft Windows.*

4.6.1 Running the Hot-Key Sound Mixer

To run the hot-key sound mixer, type the following at the DOS prompt:

```
CS32HMX    e
```

The following message appears on your monitor when the Hot Key Mixer program starts:

```
CrystalWare (tm) Crystal Audio Card Hot Key Mixer, Ver. 1.13
Copyright (c) 1993-1995 Crystal Semiconductor Corp.
All rights reserved.
```

The following message is displayed on your monitor if the appropriate hardware is not detected:

```
Crystal Audio card not detected
```

DOS and Windows 3.x Applications

If the appropriate hardware is detected, and the program is installed into memory, the following message describing the hot-key combinations is displayed:

```
Voice     Loud/Soft  = Alt+Gray Ins/Del
FM        Loud/Soft  = Alt+Gray Home/End
Master    Loud/Soft  = Alt+Gray PgUp/PgDn
Mute      On/Off     = Scroll Lock

Crystal Audio Card Hot Key Mixer is installed.
```

The term "gray" in the above message refers to the fact that many keyboards have more than one g d h c { and }. To obtain the hot-key effect, you should press a and the version of the hot-key whose keycap is dark gray as opposed to light gray plastic.

4.6.2   Using the Hot-Key Sound Mixer

Once the mixer utility has been loaded into memory, the sound parameters can be controlled by holding down a and pressing hot-keys on your keyboard, even from within another application. There are four mixer options that can be controlled with the use of hot-keys: Voice (Loud/Soft), FM (Loud/Soft), Master (Loud/Soft) and Mute (On/Off). The options are shown in Table 4-2.

Table 4-2   Hot-Key Sound Mixer Options and Controls

Mixer Option	Hot-Key Control	Control Effect
Voice (Volume)	a + h a + c	Incremental Increase Incremental Decrease
FM (Volume)	a + g a + d	Incremental Increase Incremental Decrease
Master (Volume)	a + { a + }	Incremental Increase Incremental Decrease

Mute	[	Toggle On/Off

The Voice volume option is the volume control for digital audio on your sound card.

- While holding down a, press h to incrementally raise the volume of a digital audio source.

- While holding down a, press c to incrementally lower the volume of a digital audio source.

The FM volume option is the volume control for the FM Synthesizer on your sound card.

- While holding down a, press g to incrementally raise the volume of the FM Synthesizer.

- While holding down a, press d to incrementally lower the volume of the FM Synthesizer.

The Master volume option controls the master volume on your sound card.

- While holding down a, press { to incrementally raise the volume.

- While holding down a, press } to incrementally lower the volume.

The Mute option mutes all sound on your sound card.

- Press [to toggle the Mute off and on.

4.6.3   Hot-Key Command Line Arguments

You can do more than load the hot key utility at the DOS command line. The utility is subject to the following command line format and arguments:

```
CS32HMX /<ARGUMENT>
```

DOS and Windows 3.x Applications

For example:

```
CS32HMX /ON
```

With this command and argument you have just turned the hot key utility on. The CS32HMX command line arguments are listed in Table 4-3.

Table 4-3   Hot-Key Command Line Arguments

Argument	Value
None	Install CS32HMX
/ON	Turn On CS32HMX, remains resident
/OFF	Turn Off CS32HMX, remains resident
/U	Un-install CS32HMX
/Q	Query installation and operational status

4.7   Setup Utility

The S23 setup utility is called SETUP.EXE. It has the following functions:

● displays the S23 readme file

● installs the S23 software

● uninstalls previously-installed S23 software

● re-configures hardware settings

Follow these steps to run the setup utility:

1. Change your directory to where you installed the S23 files and type the following at the DOS prompt:

   ```
   setup e
   ```

   The following screen displays.
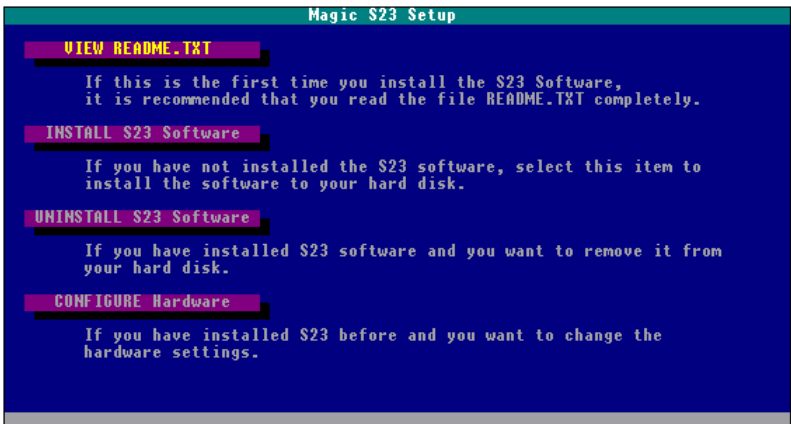
2. Select which option you want to execute and follow the screen instructions to complete the operation.

DOS and Windows 3.x Applications

You can also configure hardware settings in Windows by accessing the Audio Card Configuration utility in the S23 program group.

Please refer to section 2.6 on how to install and uninstall the software.

4.8   Audio Initialization Utility

The S23 audio initialization utility is called CS4232C.EXE. This needs to be run in order to use the card. During the S23 sound card setup, a line is added to your CONFIG.SYS file that executes this file on every boot-up.

Syntax in CONFIG.SYS

```
DEVICE=<PATH>\CS4232C.EXE <OPTIONS>
```

Syntax as executable

```
CS4232C <OPTIONS>
```

where <OPTIONS>

```
/O      Override Plug N Play <In CONFIG.SYS Only>

/V      Verbose Mode

/N      No Blaster Download

/H, /?  Help <As Executable Only>
```

Troubleshooting

This chapter discusses some of the common problems that may occur when you use the card. These are classified into two categories: (1) audio driver problems and (2) Music Center problems. After each problem is a list of possible causes and corrective measures.

5.1   Audio Driver Problems

1. The installation program does not run properly

Windows 3.x

- The system RAM might be less than 300 KB. SETUP.EXE requires 300 KB of free memory to run properly.

- Check available memory by typing MEM at the DOS prompt.

  The "largest executable program size" message on the screen should be more than 307200 bytes. If you do not have the available memory, delete some of your memory resident programs before running SETUP.EXE.

2. No sound comes out when running the audio card's Windows applications

Windows 3.x

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

- Follow these steps to check the SYSTEM.INI file:

  1.   Run Notepad in the Accessories Program Group.

  2.   Load the file SYSTEM.INI from your Windows directory.

  3.   Click on OK.

Troubleshooting

You should see the following:

```
[boot]
....
DRIVERS=... MSMIXMGR.DLL

[drivers]
....
;** S23 audio drivers - added by S23 Setup
WAVE=CS32BA11.DRV
AUX=CS32BA11.DRV
MIXER=CS32BA11.DRV
MIDI=OPL3.DRV
; this entry is commented if MPU401 is disabled
MIDI1=MPU401.DRV

[386Enh]
....
;** S23 audio VxD - added by S23 Setup
DEVICE=VSNDSYS.386

[SNDSYS.DRV]
UsePnP=0
;** S23 audio configuration - added by S23 Setup
Duplex=Full
SingleModeDMA=0
DMABufferSize=36
OldMSDosGameCompatibility=1
WatchMSDosExec=1
BlasterSupport=CS4232
Msft Hardware=0
Msft Support=1
Auto Select=0
Midi Play=1
EnableAutoAcquireOPL3=1
Default DMA=1
Default I/O=530
Default IRQ=5
IOAddress=530
DMAADC=0
DMADAC=1
Interrupt=5
OldMSDOSGameIOAddress=220

[MAGICS23]
;** Added by S23 Setup
S23path=C:\MAGICS23

; this section is removed if MPU-401 is disabled
[mpu401.drv]
port=330
int=9

[opl3.drv]
port FM=388
int=disable
```

It is not recommended that you modify the above entries manually.

- If one or more of the drivers are missing, run SETUP again to ensure the integrity of the S23 sound system.

Windows 95

- Open the Control Panel folder, then open the System folder. Click on the Device Manager to see if a yellow asterisk appears before the audio driver. If this symbol appears, follow these steps:

    1. Double-click on Sound, video and game controllers to display the installed drivers.

    2. Delete the following items — AcerMagic S23 Plug-N-Play Audio, AcerMagic S23 Audio control registers, Gameport joystick and MPU-401 compatible device, by selecting each item and pressing delete.

    3. Restart Windows 95 or execute Add New Hardware in the Control Panel to repeat the hardware detection.

3. The volume control icon does not appear on the taskbar

- Under Windows 95, a volume control icon appears on the taskbar. Follow these steps to enable the volume control icon if it is not present after installation:

    1. Click on the Start button, then Settings..., then the Control Panel folder.

    2. Double-click on Multimedia.

    3. Select the Audio tab and enable the *show volume control on the taskbar* check box.

    4. Click on OK to accept.

    You can click or double-click on the volume control icon on the taskbar to adjust the volume.

Troubleshooting

4. There is no sound output during sound test

- Check that the speakers are connected properly to the speaker-out connector on the card.

- The volume setting is too low. Try adjusting the volume.

- Make sure that the card is properly installed.

- There might be a conflict between the card and other interface cards in the computer. Check the I/O address, interrupt, and DMA assigned to the card and other devices.

5. A device in your computer does not work after the card was installed

- There is a conflict between the card and the device. Check the I/O address, interrupt, and DMA assigned to the card and the other device. See Appendix A for information on the settings.

6. Joystick does not work

- There is a conflict between the game port on the card with the game port in your computer. Disable the game port on the card.

7. The sound is distorted during the sound test or during the sound test or during normal usage

- Your speakers might be defective or the quality of the speakers is poor. Try another set of speakers (amplified).

- The volume setting is too high. Try adjusting the volume.

- There might be interference from another card in the system. Try installing the card in another expansion slot.

- If the sound is distorted in the Windows environment, try changing the DMA mode from demand to single-byte.

8. **The computer hangs during voice output**

   - There is a conflict between the card and the device. Check the I/O address, interrupt, and DMA assigned to the card and the other device. See Appendix A for information on the settings.

9. **CD-ROM does not operate, no sound outputs from the drive, and the busy indicator does not light up**

   - Make sure that the card is properly installed.

   - Make sure that the CD-ROM cables are properly connected.

   - See to it that the device drivers and support software are properly installed.

   - Be certain that the device driver settings are correct.

   - Make sure that the CD is properly placed in the CD-ROM drive. Put the CD on the drive plate with the label up.

10. **The device driver does not load or is not found**

    - Check for I/O address conflicts and change the settings if necessary.

    - Make sure that the device driver and support software have been copied into the correct directory.

11. **CD-ROM disc cannot be read**

    - The disc may be defective. Try using another disc with the system to see if it works.

    - The disc or drive may be dirty. Clean the disc or drive following the instructions in the CD-ROM manual.

    - The disc is not ISO-9660/High Sierra Standard. Check this with the disc manufacturer or your dealer.

5.2   Music Center Problems

1. The error message "Sorry, your Windows MCI CD audio driver is not properly installed..." appears when turning on the CD player

- Follow these steps:

   1. Open the Main program group and double-click on the Control Panel.

   2. Find the item "Drivers" and open it.

   3. Click on the "Add..." button.

   4. Choose the item [MCI] CD Audio, then click on OK. Windows prompts you to insert the Windows setup disk. Follow the screen instructions to complete the setup.

2. The error message "Error occurred while opening the CD device!" appears when turning on the CD player

- Make sure the CD-ROM driver is installed by checking if any command line in the CONFIG.SYS is calling the CD-ROM driver. For example, if your CD-ROM drive is a Panasonic CR-57X, the following command line should be in the CONFIG.SYS:

   ```
   C:\MAGICS23\CDROM\CR_ATAPI.SYS /D:MSCD0001
   ```

- Make sure that the Microsoft CD Extension driver is installed by checking if any command line in the AUTOEXEC.BAT is calling the CD extension driver. For example, you should find the following command in the AUTOEXEC.BAT file:

   ```
   C:\MAGICS23\CDROM\MSCDEX /D:MSCD001 /M:10
   ```

- Check if the power connector of the CD-ROM drive is firmly connected.

- Check if the cable between the CD-ROM drive and the card is properly connected.

- Check if the CD is properly placed in the CD-ROM drive.

3. **The error message "Error occurred while opening CD device..." appears even without turning on the CD player**

- You must have an auto-play timer for the CD Player, but there is no audio CD on the drive during the auto-play time. Check the timer setting by selecting the menu "Menu Timer...".

4. **Selected MIDI files won't play even after clicking the Play button**

- Check if the sound sources are muted.

- There may be an improper setting in the MIDI Mapper. Follow these steps to check the settings:

   1. Go to the Windows Main Menu and execute the Control Panel.

   2. Open the item "MIDI Mapper".

   3. Make sure that the content of the "Name" box is "FM(1-16)" or "FM(13-16)" for FM synthesizer.

   4. Click on the button "Setup", then on "Edit...". Another dialog box appears.

   5. Make sure that the "Port Name" field of each channel is "Yamaha OPL3", and the "Active" field has an "X" mark to show that is selected.

   6. Close the dialog box, MIDI Mapper, and the Control Panel.

   7. Try to play the MIDI file again.

5. **Wave files won't play**

- Make sure that the audio drivers for the card are properly installed.

Troubleshooting

- Make sure that the MCI waveform driver is properly installed.

6. Sound output from the CD player cannot be recorded

- Make sure that you selected the CD channel as a recording source in the Multimedia Mixer.

- Check the cable connection between the audio output at the back of the CD-ROM drive and the CD audio output on the card.

- If you do not have the proper cable to directly connect the CD-ROM to the card, do the following:

   1. Find an ordinary audio cable with a 1/8-inch miniconnector.

   2. Plug one end of the cable into the headphone jack on the front panel of the CD-ROM drive, and plug the other end into the line-in jack of the card.

   3. Select the AUX channel as the recording source.

> *The volume control on the CD-ROM drive affects the volume of the recorded output.*

7. Microphone does not work

- Make sure that the microphone cable is firmly attached to the microphone jack on the card. NEVER plug the microphone jack into the line-in jack.

8. The auto-play feature of the MIDI player does not work even after setting the timer

- Check if the PC clock time is correct.

- Make sure that you have selected MIDI files on the MIDI player screen.

- There may be an improper setting in the MIDI Mapper. Refer to the steps in #4 of section 5.2.

Hardware Information

This appendix gives information on the I/O addresses, interrupts, and DMA channels that you can assign to the S23 audio card. It also lists some corrective actions in case of conflicts between the card and other devices.

A.1   I/O Addresses

Device	Hexadecimal Range	Default Setting
Sound Blaster™ (SB base)	220H, 240H	220H
MPU-401 UART mode MIDI interface	330H, 320H, 310H, 300H	330H
Game Port	200H~270H	200H~207H
FM Music Synthesizer	SB base + 0~3 SB base + 8~9	SB base + 0~3 SB base + 8~9
Windows Sound System™	530H, E80H, F40H, 604H	530H

A.2   Interrupts

Device	Interrupt	Default Setting
Sound Blaster™	IRQ 5, 7, 10	IRQ 7
Windows Sound System™	IRQ 7, 9, 10, 11	IRQ 7

A.3   DMA Channels

Device	DMA Channel	Default Setting
Sound Blaster™ (8-bit data transfer)	DMA 0, 1, 3	DMA 1
Windows Sound System™	DMA 0, 1, 3	DMA 1

A.4   Solving Hardware Conflicts

Hardware conflicts result when there are signals or channels assigned to two or more devices at the same time. These conflicts may be caused by either I/O addresses, interrupts, or DMA channel assignments on the card and other system devices.

The card has I/O address, IRQ, and DMA settings as listed in the preceding sections. If these settings conflict with the settings of other devices on your machine, run the Setup program again and reconfigure the card based on the recommended settings.

Recommended Settings

Item	Setting
Sound Blaster™ Base Address	220H
Sound Blaster™ Base Address	220H~233H
Windows Sound System ™ Base Address	530H
Secondary Enhanced IDE CD-ROM Address	170H
MPU401 / MIDI Address	330H IRQ 9
Sound Blaster™	IRQ 7 DMA Channel 1
Windows Sound System ™ (Enhanced/Full duplex mode)	IRQ 7 DMA Channel 1 (playback) DMA Channel 0 (recording)
Windows Sound System ™ (Half duplex mode)	IRQ 7 DMA Channel 1

Should there be address conflicts after you have tried the recommended settings, see your dealer for assistance.

Hardware Information

The following tables indicate the commonly-used I/O addresses, interrupts, and DMA channels in most PCs.

Table A-1   I/O Address Map

Address Range (in Hex)	Description
000-01F	DMA controller -1
020-021	Interrupt controller -1
022-023	System chip configuration register
040-044	System timer
061	System control port
060-064	Keyboard controller
070-071	Real-time clock, NMI mask
080-08F	DMA page register
0A0-0A1	Interrupt controller - 2
0C0-0DF	DMA controller - 2
1F0-1F7	Fixed disk drive controller
200-207	Game port
220-22F	Sound Blaster™ (default setting)
240-24F	Sound Blaster™
278-27A	Parallel port - 3
280-2DF	Free
2E8-2EF	COM4
2F8-2FF	COM2
330	MPU-401 MIDI (default setting)
320	CD-ROM
378-37A	Parallel port - 2
388-38F	FM synthesizer OPL-3 (default setting)
3B0-3D0	Video subsystem
3E8-3EF	COM3
3F0-3F7	Diskette drive controller
3F8-3FF	COM1
530	Windows Sound System™ (default setting)

Hardware Information

Table A-2   Hardware Interrupts

Interrupt	Description
IRQ0	System timer
IRQ1	Keyboard controller
IRQ3	COM2, COM4
IRQ4	COM1, COM3
IRQ5	Sound Blaster™ (default setting)
IRQ6	Diskette drive controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9 (2)	MPU-401 (default setting)
IRQ10	Windows Sound System™
IRQ11	Free
IRQ12	PS/2 mouse
IRQ13	Math coprocessor
IRQ14	Fixed disk drive controller
IRQ15	Free

Table A-3   DMA Channels

DMA Channel	Description
DMA 0	Free
DMA 1	Sound Blaster™ (default setting)
DMA 2	Diskette drive controller
DMA 3	Free
DMA 4	Cascade
DMA 5	Free
DMA 6	Free
DMA 7	Free

Installing an IDE CD-ROM Drive

This appendix provides information on how to install an IDE CD-ROM drive for use with the sound card.

There are two ways to install an IDE CD-ROM drive:

- using the IDE connector of the system

- using the IDE connector of the sound card

B.1 Using the System IDE Connector

B.1.1 Configuring as Primary IDE Slave Device

Follow these steps:

1. Configure your CD-ROM drive as a slave device (e.g., using jumpers). Refer to your CD-ROM drive manual.
2. Connect the second slot of an IDE cable from the primary IDE connector of the system to the CD-ROM drive.
3. Set the J2 jumper on the sound card to 2-3 to disable the sound card's IDE interface.

B.1.2 Configuring as Secondary IDE Device

Follow these steps:

1. Configure your CD-ROM drive as a master or slave device. Refer to your CD-ROM drive manual.
2. Connect the first slot (for master) or second slot (for slave) from the secondary IDE connector of the system to the CD-ROM drive.

3. Set the J2 jumper on the sound card to 2-3 to disable the sound card's IDE interface.

B.2   Using the Sound Card IDE Connector

Follow these steps:

1. Configure your CD-ROM drive as a master device. Refer to your CD-ROM drive manual.

2. Connect an IDE cable from the sound card to the CD-ROM drive.

3. Set the J2 jumper on the sound card to 1-2 to enable the sound card's IDE interface.