

861-807

MAD 16 PnP
Sound Card

user's manual



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I. Introduction

The MAD16 PnP Audio Controller is a 16-bit stereo sound card based on the OPTI 82C924 integrated digital sound controller chip. The MAD16 PnP is compatible with all major PC sound standards, including Sound Blaster Pro, Ad Lib MPU-401 and Windows Sound System. The MAD16 PnP provides an integrated sound solution for business audio, educational and entertainment sound, and other multimedia applications.

The MAD16 PnP Sound Controller card will let you run thousands of Sound Blaster and Sound Blaster Pro compatible games and applications, including a rapidly growing number of Windows business applications that are compatible with the Windows Sound System.

Included with full support for these popular PC sound standards, the MAD16 PnP Sound Controller card includes an IDE CD-ROM interface, which is compatible with all IDE CD-ROM drives available today. The MAD16 PnP Sound Controller card also has multiple input and output ports for recording and playback of stereo sound.

I.i Features

The MAD16 PnP Sound Controller card is a full featured sound card which includes the following:

- **ISA Plug Play (PnP)** supports the Plug Play specification 1.0a from Intel and Microsoft which allows the system to automatically detect and configure devices conforming to the standard. This eliminates the user having to know and configure the correct IRQ, DMA and I/O channel settings.
- **Wave Audio** maximum recording and playback sampling rate of up to 48 KHz stereo.
- **Sixteen-bit digital-to-analog and analog-to-digital converter** 6-bit and 8-bit digitizing in stereo and mono mode
- **20 Voice FM Music Synthesizer** Yamaha OPL3 FM Synthesizer technology. Play up to 20 instruments simultaneously to deliver a high quality of rich and crisp music
- **Digital/Analog Mixer** mix analog stereo from CD-audio, Line-In, FM music and digitized voice sources. Digital stereo mixing from Microphone, Line-in, CD-audio and Line-out Master volume control

- **Built-in Stereo Power Amplifier** -watt per channel stereo power amplifier
- **MIDI Interface/Joystick Port** built-in integrated MIDI MPU-401 interface with FIFO, IBM PC joystick/game port.
- **CD-ROM Interface** D-ROM interface connections and circuitry for IDE-CD-ROM drives and CD Audio-In connectors.
- **Interfaces** available synthesizer interface, Speakers Out, Line Out, Line In, and Microphone In.

I.ii

What is in your package?

You should have the following items in your package:

- MAD16 PnP Sound Controller Card
- MAD16 PnP Sound Controller Driver Installation Disk
- MAD16 PnP Sound Controller User Manual (this document)

I.iii

System Requirements

The MAD16 PnP Sound Controller is manufactured for IBM PC compatible computers, software, and related computer components:

- IBM - compatible computer models AT, 286, 386, 486, Pentium, PS/2 (model 25/30) and compatibles
- At least 2MB RAM (4MB RAM for Windows 3.1 applications)
- VGA or SVGA graphics adapter and monitor
- 2MB free on hard disk for installing all MAD16 PnP Sound Controller software
- MS DOS or PC DOS 3.1 or later
- Windows 3.1 for games and applications in Windows
- External speakers, microphone or headphones (optional)

I.iv

Latest Information

Please read the README.TXT file on the Installation Disk for any changes made after this manual was printed.

II. Quick Installation Guide

This section is for those who are familiar with the hardware and software installation of PC peripherals, especially PC compatible sound cards. If your system complies with the Plug Play 1.0a specification, the installation will be very simple and straightforward.

If this does not apply, please see the full instructions provided in Chapter 1 (Hardware Installation) and Chapter 2 (Software Installation). These Quick Installation instructions are intended to be brief and do not cover all of the MAD16 PnP Sound Controller options and configurations.

II.i Hardware Installation

1. Power down your computer, remove the cover and find an empty 16-bit expansion slot.
2. For details on CD-ROM installation refer to Chapter 3.
3. Install the MAD16 PnP Sound Controller into the open slot and secure it.
4. Connect a pair of speakers to the Speaker Out connector on the MAD16 PnP Sound Controller bracket. Refer to Chapter 4 for details concerning connecting other external devices.

WARNING!

To avoid temporary or permanent hearing loss or impairment due to unexpected noise or static, always hold your headphones away from your ears before turning on the computer. You should also lower your speaker's volume before testing.

5. Replace your computer's cover. Hardware installation is complete.

II.ii Software Installation

1. Insert the MAD16 PnP Sound Controller Installation disk in your floppy drive, log onto that drive and type **INSTALL** at the DOS prompt.

2. The MAD16 PnP Sound Controller menu driven installation program will appear. Follow the on-screen prompts to configure the MAD16 PnP Sound Controller for your system. If your system is Plug Play compatible, you won't have to configure the IRQ, DMA, or I/O address settings; the computer will automatically do this for you when you reboot the system.

3. If your system is not Plug Play compatible, you should test the MAD16 PnP Sound Controller by clicking on the Sound Test button. If there are any problems, check your I/O, IRQ and DMA settings.

4. Once you are satisfied with your settings, click on the Accept button at the bottom of your screen and the MAD16 PnP Sound Controller Installation program will finish setting up your system by modifying your AUTOEXEC.BAT and CONFIG.SYS files and copying appropriate driver software to your system.

5. If you are running Windows, the MAD16 PnP Sound Controller Installation program will update your Windows system files and copy Windows sound applications to your hard drive. The next time you boot Windows, you will see a prompt asking you if you want to create a Windows program group for the new MAD16 PnP Sound Controller sound applications. You can click on the various icons in the new program group to run the MAD16 PnP Sound Controller software applications.

6. The last screen of the MAD16 PnP Sound Controller Installation program will prompt you to REBOOT your system, or EXIT TO DOS. You should always reboot the system. This will insure that the MAD16 PnP Sound Controller is properly configured. The software installation is now complete.

WARNING!

If you experience compatibility problems after running through this quick installation guide, please refer to the full installation instructions and troubleshooting section in Chapter 6.

1.0 Hardware Installation

The hardware installation of the MAD16 PnP Sound Controller is easy, and can be performed in just a few steps. The MAD16 PnP Sound Controller has no switches and only one jumper (see Figure 1-1). The MAD16 PnP Sound Controller Installation program configures all of the settings. This section will describe the hardware installation and configuration options using the MAD16 PnP Sound Controller Installation program.

Note This section presumes that you are familiar with your particular PC compatible computer and with DOS and Windows terminology.

1.1 Default Configuration

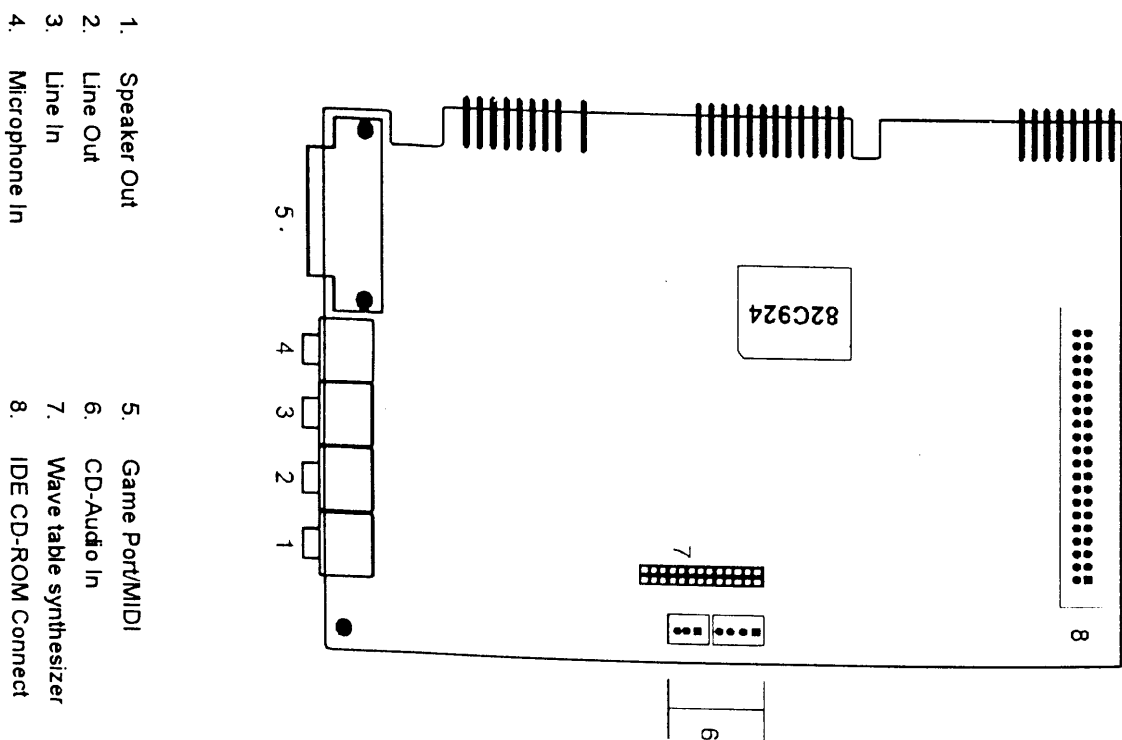
The MAD16 PnP Sound Controller sound card supports both Sound Blaster Pro and Windows Sound System applications. The MAD16 PnP Sound Controller defaults to Sound Blaster Pro mode when the system is booted up in DOS. It switches to Windows Sound System mode when Windows 3.1 is launched. The default configuration of a system that supports the Plug Play 1.0a specification will depend on the available system resources.

If your system is not PnP compatible the default configuration is as follows:

Operation Mode	Sound Blaster Pro Compatible
Interrupt Request Line (IRQ)	5
DMA Channel	1
I/O Port Address	220h
CD-ROM Interface	None

WARNING! The MAD16 PnP Sound Controller is susceptible to damage from electrostatic discharge. Please make sure you are properly grounded before proceeding with these installation instructions.

Figure 1-1 MAD16 PnP Sound Controller Layout

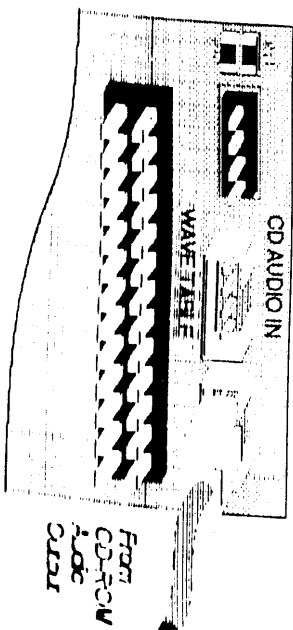


1.2 Installing the MAD16 PnP Sound Controller

To install the board:

1. With your computer system's power off, remove the cover, find an empty 16-bit expansion slot, and remove the metal bracket.
2. **CD-ROM Configuration:** The MAD16 PnP Sound Controller supports and IDE CD-ROM interface standard. If you are going to connect a CD-ROM to the MAD16 PnP Sound Controller now is a good time to look over the CD-ROM installation instructions in Chapter 3. When you are familiar with the instructions, return here and continue the MAD16 PnP Sound Controller installation.
3. Insert the MAD16 PnP Sound Controller into the expansion slot firmly and evenly. Take care not to force it into the slot. Once you have properly positioned the MAD16 PnP Sound Controller into the slot, secure the MAD16 PnP Sound Controller with the bracket screw.
4. If you are connecting a CD-ROM drive to the MAD16 PnP Sound Controller, connect the cable now. Remember to line up the color coded strip (pin 1) on the cable to pin 1 on the CD-ROM connector.
5. **CD-ROM Audio Input:** If your internal CD-ROM drive supports audio output, it can be connected to one of the three MAD16 PnP Sound Controller CD-ROM audio connectors located at the top right of the MAD16 PnP Sound Controller, see Figure 1-2.

Figure 1-2 CD-ROM Audio Connectors



The CD-ROM audio connector may require a special cable. Check with your dealer if this cable was not included with your CD-ROM drive. If you have your cable handy, connect it now.

6. Replace the cover of the computer.
7. Connect your speaker or headphones to the external output connections on the MAD16 PnP Sound Controller bracket. For more information on connecting external devices, see Section 4.0, **Connecting External Devices**.
8. Hardware installation is complete. You can turn on your computer and begin software installation.

2.0 DOS and Windows 3.1 Software Installation

The MAD16 PnP Sound Controller installation program (INSTALL.EXE) lets you configure the IRQ line (Interrupt Request), DMA channel, and I/O port address of the MAD16 PnP Sound Controller card to insure that both Sound Blaster Pro and Windows Sound System settings are compatible with your system configuration. INSTALL.EXE also lets you configure your CD-ROM settings, set the volume, test the sound and enable the MPU-401 and game port interface.

After you have finished configuring the controller card, and have tested the sound to insure the MAD16 PnP Sound Controller is working properly, INSTALL.EXE will install the MAD16 PnP Sound Controller drivers for both DOS and Windows 3.1 (if you have Windows 3.1).

2.1

Installing the MAD16 PnP Sound Controller Software

The following instructions presume that you are familiar with your own computer's configuration and your system does not support the Plug Play 1.0a specification. You will need to know what system resources (IRQ, DMA and I/O port addresses) your system uses and what address are available. If your system is PnP compatible, it will automatically determine the best settings for your card and you will not need to choose the settings yourself.

WARNING!

In a system that does not support PnP, please make selections that will not conflict with your system settings. Doing so could make your system lock-up. If this happens, reboot your computer, run INSTALL.EXE again and select settings that will not conflict.

The following steps will guide you through the full software installation and configuration for the MAD16 PnP Sound Controller. We recommend that you read through them now, and become familiar with them before installing the software.

1. Place the MAD16 PnP Sound Controller Installation Disk in your floppy drive, log onto that drive and enter INSTALL at the DOS prompt:

```
INSTALL
```

```
[press Enter]
```

2. The opening screen will appear. Click on the Continue button (or press ALT-C) to begin installation. (You can press the ALT key in combination with the highlighted letter on each screen to get that option.) You can press F3 at any time to exit the installation.

3. You are now given three options. It is recommended that you click on the View README.TXT option for the latest information about your MAD16 PnP Sound Controller. Also, check the memory detected information to see that you have enough memory.

When the README.TXT comes up on the screen, you can page up or down in the text by clicking on those options, or by pressing ALT-PGUP or ALT-PGDN respectively. When you are through reading, choose *Quit*.

Note The contents of the help file can be found in the README.TXT file in the OPT1924 directory.

4. If you chose the *Exit* option from the Installation Option menu, you will get the screen below. You can choose *OK* to exit to DOS, or *CANCEL* to return to the Installation Option menu and Start Installation. Also, pressing F3 at anytime will exit the program.
5. When you select *Start Installation*, you will be prompted to select a drive and directory. The default is C:\OPT1924. Change this if you wish by clicking on C:\OPT1924, using the backspace and delete keys to erase the current line, and typing in the new drive and path statement.
6. Also check the available disk space at this time. If you do not have enough available space you will need to exit the installation program and free up some disk space before continuing. If you have enough space and want to install to the selected directory, click *OK*.
7. The next screen will ask you where you have Windows 3.1 installed. If the default (C:\WINDOWS) is incorrect, enter the correct drive path. If Windows 3.1 is not installed, choose *NONE* and Windows 3.1 drivers will not be installed.
8. Before the driver files are copied to your drive, you are given the option to change your selections by choosing *CHANGE*. This will back you up to step 5. If the directories are correct, choose *OK* to continue.

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9. When you choose **OK** the MAD16 PnP Sound Controller Installation program will begin copying installation files to your hard drive. You may abort the installation at any time by clicking **CANCEL**.

10. Next choose your CD-ROM type from the list shown (you can scroll through the list by clicking the up and down arrow buttons). If you are not installing a CD-ROM, select **NONE**. Once you have made your selection, choose **OK**.

11. The Configuration and Sound-Test menu is now displayed. If your system does not support Plug Play, this screen lets you make all of your configuration settings (you can even change your CD-ROM setting again). The next steps will walk you through these options.

If your system supports the Plug Play 1.0a specification, most of these settings will not be user selectable. For example, the IRQ, DMA and I/O address settings for Sound Blaster, Windows Sound System (WSS), MPU-401, and CD-ROM interfaces will not be selectable (they appear as gray on the screen). You will, however, be able to select either Sound Blaster or WSS mode, game port enable, input select, MPU-401 enable, and CD-ROM type.

12. **Current Mode:** Choose either **Sound Blaster** or **Windows Sound System** to change the settings displayed.

13. **Sound Blaster Settings:** If you choose the Sound Blaster mode, you will be able to change the I/O Port, IRQ and DMA settings for the Sound Blaster. The MAD16 PnP Sound Controller will use the Sound Blaster settings.

Note This step does not apply if your installing the MAD16 PnP in a PnP compatible system.

14. **Windows Sound System Settings:** When you select this option, you will be able to change the I/O Port, IRQ and DMA settings for the Windows Sound System. Be sure your settings will not conflict with your system configuration.

Note This step does not apply if your installing the MAD16 PnP in a PnP compatible system.

15. **Game Port:** If you are using a joystick, you can connect it to the MAD16 PnP Sound Controller game port. To use the

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game port, you will need to select **Enabled**. If you are not using a joystick, we recommend that you select **Disabled**.

16. **Input Select:** Select either **Mic** (microphone) or **Line** (line-in) as the source for recording.

17. **MPU-401 Interface:** If you have a daughtercard for advanced musical sound synthesis plugged into the wave table synthesizer connector, the MPU-401 interface has to be ON. The MPU-401 I/O port and IRQ settings can now be configured.

18. **CD-ROM Interface:** The CD-ROM configuration can be changed by clicking on the CHANGE OPTIONS button. This will display the CD-ROM Default/Customize Menu. Refer to step 10 for details on customizing the CD-ROM interface.

19. **Help:** There is a help button in the lower left corner that brings up a help file. Click **PageUp** or **PageDn** to scroll through the text, and then click **Quit** to return to the Configuration and Sound Test menu.

Note The contents of the help file can be found in the CONFIG.TXT file in the OPT1924 directory.

20. **Sound Test:** You can test the MAD16 PnP Sound Controller by clicking **SOUND TEST**. You will have three sound options to play: 8-bit, 16-bit and FM Synthesis sound.

Note The sound test is not available during the initial installation for PnP compatible systems because the sound controller is not initialized until the system is rebooted. If your system is PnP compatible, you can access the Sound Test program by running the SNDINIT.EXE utility after the installation is complete and the system has been rebooted.

Try each. If there are problems, you may need to change your settings. If there are no problems and you hear the sound coming from your speakers, click **OK**, then **DONE**.

21. **Volume Control:** Once you have determined your settings are correct and have successfully tested the sound, you can set the **VOLUME** controls shown below. After setting

the volume, you can click on **SOUND TEST** to check it. After you have set the volume, click **DONE** to return to the configuration menu.

22. From the Configuration and Sound Test menu, choose **ACCEPT** to accept your settings and **INSTALL** will begin updating your system. Changes will need to be made to your **CONFIG.SYS** and **AUTOEXEC.BAT** files. Choose **BACKUP** to save the changes to files named **CON-FIG.MAD** and **AUTOEXEC.MAD** so you can make the changes later.

23. After making the updates, install will need to make changes to the **SYSTEM.INI** and **MIDIMAP.CFG** files. Click **OK** to have install make the changes now. Choose **BACKUP** to save the changes to files named **SYS-TEM.MAD** and **MIDIMAP.MAD** so you can make the changes later.

Note During the installation process, **INSTALL** added applications programs to your hard drive. The next time you run Windows 3.1 you will see a prompt to create a new program group. Click **OK** to create the program group.

24. Once the installation is complete, you can choose to **EXIT TO DOS** or **REBOOT**. We recommend that you reboot the system to ensure the new settings will be loaded and the **MAD16 PnP Sound Controller** will be ready to run.

After you reboot, you should see a screen similar to the following (your values may differ depending upon your system settings).

```
Port Address: 530
IRQ Channel: 11
DMA Channel: 0
MPU-401 Interface: ON
MPU-401 Port Address: 330
MPU-401 IRQ Channel: 9
CD-ROM Interface: Disabled
Game Port Access: OFF
Input Source Select: MIC
```

Software installation is complete.

2.2

Notes on Software Installation

The notes below will provide a little more information concerning the **MAD16 PnP Sound Controller** installation software. You can also look in the Troubleshooting section in Chapter 6.0.

Read the README.TXT file

We highly recommend that you read the **README.TXT** file at the beginning of the installation program (this is also a text file located in the **OPT1924** directory). It includes any changes that might have taken place in the **MAD16 PnP Sound Controller** installation process that might not be included here.

Changes to AUTOEXEC.BAT

The installation program will need add several lines to your **AUTOEXEC.BAT** file. You can choose to have **INSTALL** make these changes for you immediately, or store the changes in a separate file called **AUTOEXEC.MAD** so you can use your own text editor and edit the system files and make the changes later.

Your path statement will have the **C:\OPT1924** subdirectory added to it (with the **PATH %PATH%;C:\OPT1924** command). The following lines also will be added:

```
SET SOUND16=C:\OPT1924
C:\OPT1924\SNDDINIT /B
SET BLASTER=A220 I5 D1 T4
```

Note These lines indicate default settings. Changes you made to the default path or **MAD16 PnP Sound Controller** configuration will be reflected accordingly. See **MSCDEX.EXE** installation in Chapter 3.0 for other changes that may take place in the **AUTOEXEC.BAT** and **CONFIG.SYS** files.

Changes to CONFIG.SYS

The installation program will also make changes to your **CONFIG.SYS** file. You can choose to have install make these changes for you immediately, or store the changes in a separate file called **CONFIG.MAD** so you can make the changes later.

Your **CONFIG.SYS** file will have lines similar to the ones below (this example assumes that the **MAD16 PnP Sound Controller** was configured for a Sony CD-ROM):

```
DEVICE=C:\OPTI924\CDSSETUP.SYS /T:1  
DEVICE=C:\OPTI924\ATAPI_CD.SYS /D:MSCD000
```

Testing the MAD16 PnP Sound Controller Sound

In a Plug Play compatible system, there is no need to test the sound configuration since it has been selected by the system itself.

In a non-PnP system, however, it is important that you test the MAD16 PnP Sound Controller sound when you are in the installation program. This will insure that your settings are correct and working properly. If you do not hear any sound, you can try adjusting the volume. If you still do not hear any sounds, you will need to make sure your settings are correct. Check the Sound Blaster or Windows Sound System settings first. If your system locks up during the sound test, you will need to reboot, run the SNDINIT.EXE program, and check your settings.

2.3 Testing and Re-Configuring the MAD16 PnP Sound Card

You can run the SNDINIT.EXE program at anytime to make changes to your MAD16 PnP Sound Controller configuration. When re-configuring the MAD16 PnP Sound Controller, you can use the following parameter lines:

- SNDINIT /B** Runs the SNDINIT program using the values specified in the SOUND16.CFG configuration file.
- SNDINIT /?** Displays help on how to use SNDINIT.
- SNDINIT** Runs the SNDINIT program to let you change your MAD16 PnP Sound Controller configuration. You will see the Configuration and Sound Test menu you used in the installation program.

2.4 Memory Resident Volume Control Utility

Volume TSR programs are memory resident programs that allow you to change the volume dynamically by using OT KEYS during an application. This provides a very convenient and useful way to control the loudness of your applications on the fly.

To make use of this feature for the MAD16 PnP Sound Controller sound card, you need to load the program into the memory first, by typing VOLTSR at the DOS prompt. You can then use the following hot keys to change the volume while you are in a application:

- ALT + CTRL + U** To turn the volume UP.
- ALT + CTRL + D** To turn the volume DOWN.
- ALT + CTRL + M** To toggle MUTE.

To remove the program from the memory, type VOLTSR /U at the DOS prompt.

Some applications do not allow this TSR to take effect and you will not be able to access these hot keys through the keyboard. If this is the case, you will not be able to use these hot keys to control the volume. You can exit the program, and run SNDINIT.EXE to adjust the volume or use an external amplifier with its own volume control adjustments.

WARNING! To avoid temporary or permanent hearing loss or impairment due to unexpected noise or static, always hold your headphones away from your ears before turning on the computer.

2.5 Karaoke Utility

There is a file on the disk called KARAOKE.EXE. The program is a TSR program that redirects input from the microphone input line directly to the Speaker Out line. This will let you talk or sing directly to your speakers.

To run the program, enter KARAOKE ON at the DOS prompt. This will make the program resident in memory and will begin redirecting your microphone input to your speaker output. To turn it off, enter KARAOKE OFF at the DOS prompt. This will turn off the KARAOKE program and remove it from memory. When you use KARAOKE with the VOLTSR program, you can adjust the microphone volume with the following keys:

- ALT + CTRL + PGUP** To turn UP MIC input volume.
- ALT + CTRL + PGDN** To turn DOWN MIC input volume.

3.0 CD-ROM Configuration

This chapter will help you setup your MAD16 PnP Sound Controller supported CD-ROM to work properly with the MAD16 PnP Sound Controller. The first section will explain how to connect the CD-ROM interface cable and the CD-ROM audio cable (optional) to the MAD16 PnP Sound Controller. The next section will show you how to setup the CD-ROM using the SNDINIT.EXE configuration program. The last section describes the installation of the correct MSCDEX.EXE driver for the CD-ROM.

The MAD16 PnP Sound Controller supports all IDE CD-ROM drive models. You can configure and setup these CD-ROM drives when you first setup the MAD16 PnP Sound Controller, using the INSTALL.EXE program, or later with the SNDINIT.EXE program.

Before proceeding, make sure you have installed your CD-ROM Drive hardware into your computer system as well as the CD-ROM Drive device driver and related software successfully.

3.1 CD-ROM Hardware Installation

The CD-ROM interface connector is located on the back end of the MAD16 PnP Sound Controller.

Note You should have your CD-ROM drive user guide handy during this installation. It may have information not covered here.

Your internal CD-ROM drive should have come with an appropriate CD-ROM ribbon cable. The cable will connect to the MAD16 PnP Sound Controller.

If you have a separate CD-ROM controller card, and you do not wish to use the built-in CD-ROM interface on the MAD16 PnP Sound Controller, you do not have to make any changes to your existing environment. Make sure that you choose one from the configuration list for the CD-ROM drive.

3.1.1 Connecting an IDE CD-ROM Drive

To connect an IDE CD-ROM:

1. Install the CD-ROM drive into your system. Refer to the documentation that comes with your CD-ROM drive for installation.
2. Connect the interface cable from the CD-ROM drive to the 40-pin IDE CD-ROM interface connector on the sound card.

WARNING!

Make sure that the color coded line on your CD-ROM interface cable is connected to Pin 1 of the interface connector on the sound card.

3. If an audio cable is included with your CD-ROM drive, determine which audio connection interface (Sony, Mitsumi or Panasonic) it conforms to. You will need to contact your IDE CD-ROM drive dealer or manufacturer for that information. Once you know connect it from the CD-ROM drive to the correct audio input connector on the MAD16 PnP Sound Controller.
4. When everything is securely connected, put the cover of your computer back on and power on your computer and start installing your IDE CD-ROM drive device driver and related software as instructed by your IDE CD-ROM drive user manual.
5. After you have installed your IDE CD-ROM drive software, you will need to install the OPTI MAD16 PnP Controller software.

If you have already run the OPTI MAD16 PnP device driver installation program, skip to Section 3.2, **CD-ROM Software Installation**, to install the CD-ROM drivers.

If you have not already installed the OPTI MAD16 PnP device drivers, refer to Chapter 2.0 for instructions on running the installation program.

3.2 CD-ROM Software Installation

The following steps will help you setup your CD-ROM drive with the SNDINIT.EXE program.

1. Run SNDINIT.EXE and choose **CONFIGURE..**.
2. Choose **CHANGE OPTIONS** in the CD-ROM Interface section.
3. Select the correct CD-ROM from the CD-ROM Drive List and click **OK**.

A line similar to the following has been added:

```
DEVICE=C:\OPTI924\CDSETUP.SYS /T:1
```

4. You must now exit the program and reboot your computer for the settings to take effect.

If you decide to change your CD-ROM options again, you need to run SNDINIT.EXE again. Each time you make changes to your configuration, your CONFIG.SYS file must be updated.

The SNDINIT.EXE program will only make changes to the CONFIG.SYS line that begins with:

```
DEVICE=C:\OPTI924\CDSETUP.SYS . . .
```

If you have changed your CD-ROM drive, your CD-ROM manufacturer will have recommended changes for its own CD-ROM device drivers that you must follow. Refer to your CD-ROM drive user manual for more information.

3.3

Installing the MSCDEX Driver

Your CD-ROM will require that the proper MSCDEX driver is loaded on system boot-up. During installation, the MAD16 PnP Sound Controller installation program will take several steps to insure that the proper MSCDEX is used for your system.

1. First, the MAD16 PnP Sound Controller installation program will look at your AUTOEXEC.BAT file for an existing MSCDEX driver. If it finds one, it will use it.

2. If it doesn't find it there, it will scan your hard drive to find the MSCDEX.EXE program. Usually this will be found with you DOS operating system programs. If the MAD16 PnP Sound Controller installation program finds the MSCDEX.EXE program it will use it. If more than one copy of MSCDEX.EXE exist on your system, the MAD16 PnP Sound Controller installation program will display all known files on your system, and ask you to select the one you want to use.

3. If the MAD16 PnP Sound Controller installation program determines that your DOS version is earlier than 5.0 or there is no MSCDEX.EXE installed in your system, it will request that you use the MSCDEX program that came with your CD-ROM drive (available from your CD-ROM manufacturer). The following line will be added to your AUTOEXEC.BAT file:

```
REM C:\OPTI924\MSCDEX.EXE
```

4. When you copy the proper MSCDEX.EXE program that works with your CD-ROM into the C:\OPTI924 subdirectory, edit the above line in your AUTOEXEC.BAT file by removing the word **EM** so that the line looks as follows:

```
C:\OPTI924\MSCDEX.EXE
```

5. The proper MSCDEX.EXE program will then be loaded when you reboot your system.

4.0 Connecting External Devices

The MAD16 PnP Sound Controller provides a number of ways for you to connect external devices to it, such as headphones, microphones and speakers. This chapter will describe the MAD16 PnP Sound Controller connectors and the process of connecting external devices. The MAD16 PnP Sound Controller supports the following external devices:

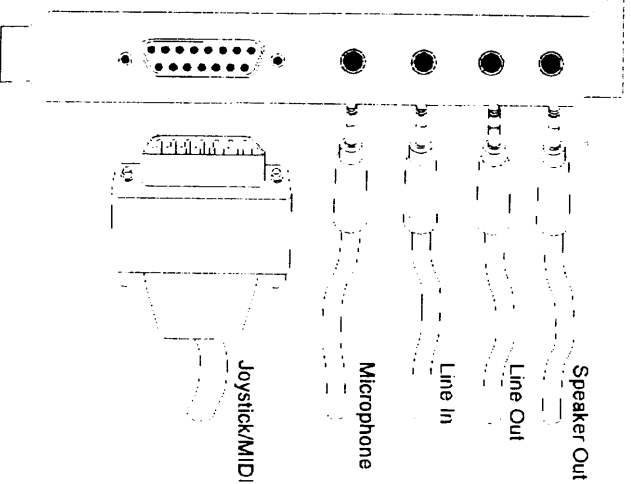
Speakers	Headphones	Power amplifier
CD Player	Microphone	Joystick
MIDI adapter	CD-ROM audio	

Please have the user reference manuals of the external devices on hand for reference.

4.1 MAD16 PnP Sound Controller Connectors

Figure 4-1 shows the different external device connectors on the sound card.

Figure 4-1 External Connector Locations



WARNING!

Use the configuration program, SNDNITEXE, to adjust the volume to mid-range before connecting any speakers to the sound card to avoid damaging your hearing or your equipment.

Speaker Connection: Speakers are connected to the Speaker Out connector. This is the top most connector on the right side of the sound card.

Line-Out/Headphones Connector: The Line-Out connector is located below the Speaker Out connector. You can connect this to the Line-In connector of any external amplified speakers or to a set of headphones.

CD-Player/Hi-Fi Connection: Below the Line Out connector is the Line-In connector. Connect this to the Line-Out connector of any hi-fi set, radio set, CD-player, synthesizer, Walkman etc.

Microphone In Connection: A microphone can be connected to the Microphone In connector on the sound card. Use a dynamic monaural or stereo microphone with a resistance of not more than 600 ohms.

Joystick Connector: The Joystick/MIDI port is a 15-pin female connector located just below the Microphone In connector. This port can be connected to any IBM PC compatible joystick with a 15-pin D-sub connector. Disable the joystick port on the sound card (using the SNDNITEXE program) if you already have a game port or game card.

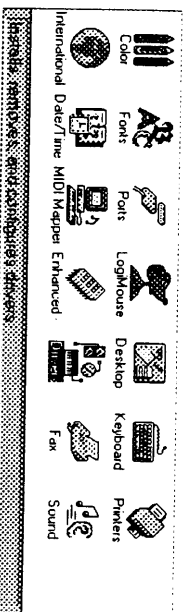
MIDI Instrument Connection: You need a MIDI adapter to connect a MIDI instrument to the sound card. The MIDI adapter can be connected to the Joystick/MIDI port. You will also need MIDI sequencing software to run MIDI instruments with your computer.

Connecting a Wavetable Synthesizer: The MAD16 PnP comes with the Yamaha OPL3 FM synthesis for MIDI music built-in. However, you can obtain a wavetable board upgrade that connects to the MAD16 PnP. See your dealer for details.

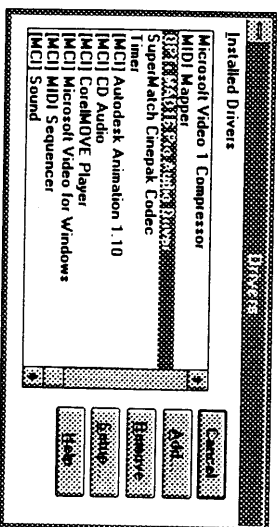
5.0 Windows 3.1 Configuration

During the Software installation process, the MAD16 PnP Sound Controller Installation program added Windows 3.1 sound drivers to your system. This section will describe how to change the DMA channel, IRQ, I/O Port Address, and Advanced Settings of the MAD16 PnP Sound Controller in Windows 3.1. To change settings under Windows 3.1, please follow the steps below:

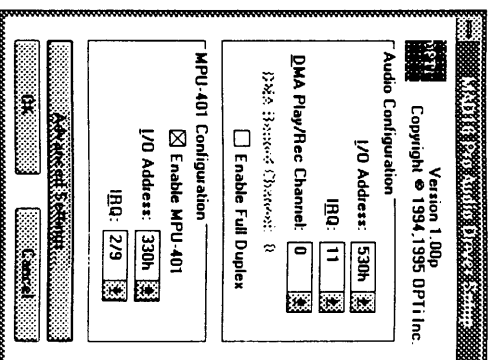
1. Start Windows 3.1.
2. Select the Main file group.
3. Click on the Control Panel icon. When the Control Panel appears, Click on the Drivers icon.



4. When the Drivers Dialog Box appears, highlight the OPT 82C924 Audio Driver, then click on the Setup button.



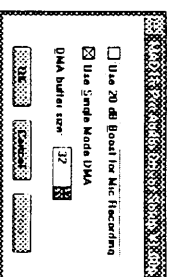
5. The MAD16 PnP Sound Controller Audio Device Driver Configuration Dialog Box will appear. Make the necessary changes by clicking on the selections.



Note This dialog box appears for non-PnP systems only. In a PnP system, there is no need to change the I/O address, IRQ, or DMA.

6. **Enable Full Duplex:** The Enable Full Duplex option allows you to select two DMA channels to enable simultaneous Playback and Record. When disabled, the DMA channel will operate as both Playback and Record, and you can do either digital wave record or playback at the same time.
7. **MPU-401 Configuration:** The Enable MPU-401 option allows you to use the on-board 82C941DSP for advanced sound synthesis. The I/O Address and IRQ settings can only be modified once the option is enabled.

8. **Advanced Settings**
If you wish to modify the advance settings, click on Advance Settings and a Window will appear.



Make the necessary changes and click OK.

Boost for Microphone Recording

Enables you to enable a 20dB boost to the record level for the microphone input (MIC IN). This allows you to compensate for less powerful microphones and increase the record signal.

Use Single Mode DMA

Your computer system may support both Single Mode DMA as well as Demand Mode DMA. Demand Mode DMA provides a more efficient means of transferring chunks of data between memory and a device. However, if your system does not support Demand Mode DMA, you must select Single Mode DMA instead.

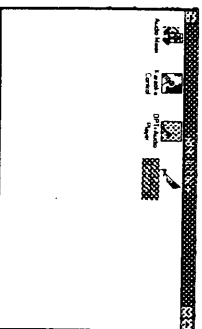
DMA Buffer Size

Setting the DMA buffer size tells the CPU how much data to transfer between memory and a device at one time. If you specify a larger size, it allows the CPU to complete the transfer of data faster but increases the memory consumption. The default size should be 32 Kilobytes (32K). If you decide to change the buffer size, be sure to make it multiples of 4K.

- When you are done, click OK to accept the changes. A dialog box will appear asking if you would like to restart windows. Select the Restart Now button to restart Windows.

5.1 Windows 3.1 Applications

The OPTI 82C930 Installation program will install applications for use in Windows 3.1. The first time you run Windows 3.1 after running the Install program you will be asked if you want to create a Program Group for the OPTI 82C930 applications. Answers to this question to install the applications.

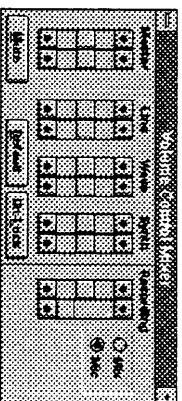


The current applications are shown below. Be sure to check the README.TXT file for information on any applications that may have been installed since this manual was published.



5.1.1 Audio Mixer

The Audio Mixer applet lets you adjust the volume settings for each of the individual audio sources that the 82C930 supports.



The following table describes each of the controls.

Control	Definition
Master	This sets the volume level of all the combined audio sources.
Mute	Will mute all the available audio sources.
Line	Sets the volume level for the line-in source.
Wave	Sets the volume level for playback of .WAV files (internal files).
Synth	Sets the volume level for the auxiliary source (synthesizer).
Recording	Sets the record level for each of the possible recording sources: line-in, microphone and CD-ROM. Mix sets the master volume (as a subset of the record levels of all the available recording sources).
Default	Resets all the volume levels back to the original default values.

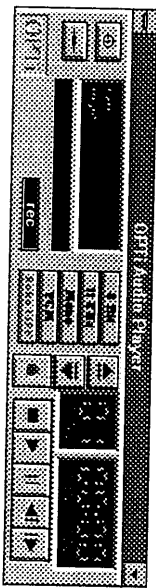
Control	Definition
Un-Lock/ Lock	Lock will keep the left and right channels at the same volume level. Un-Lock allows you to set the left and right channels to different volume levels.

5.1.2




Audio Player

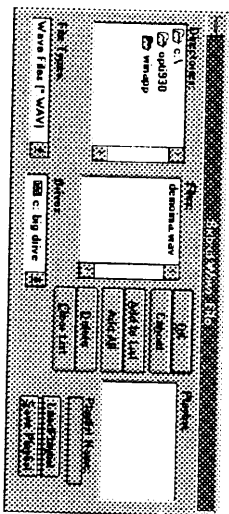
The Audio Player applet allows you to play and record .WAV files from your hard drive, or play music CDs from your CD-ROM drive. Click on the Audio Player icon to bring up the OPTI Audio Player.



Loading .WAV Files or CDs

To play either a .WAV file or a CD you must first load the media. To load a CD, simply load the CD into the CD-ROM drive as you would normally. The you can use CD player interface to play the CD (see the Using the Player section).

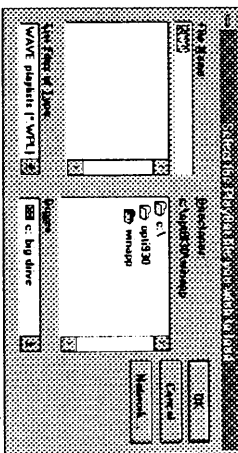
To load a .WAV file, click on the Select Wave button  to access your hard drive (see figure).



From this menu, you can select a .WAV file from a particular drive and directory, load a play list if file names, or create your own play list.

Building and Using Play Lists

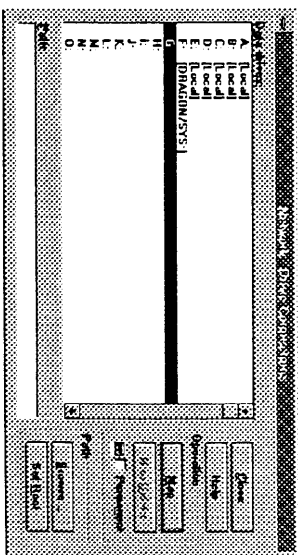
To use an existing play list, click on the Load Playlist button and then select the list from the available file names, or change the directory to point to the available play lists.



Once loaded, go the Using the Player section for information on playing the files.

The build your own play list, add the .WAV files that you want to appear on the list, then save the list using the Save Playlist button. Once you have created a play list, you can then load that list as described in the previous section.

Another feature of the play list load menu is the Network connection.

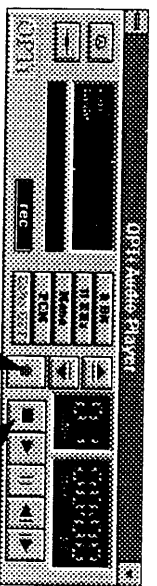


This connection allows you to map network drives to easily access files for addition to the play list. Refer to the online help for more information on the options in this menu.

Recording .WAV Files

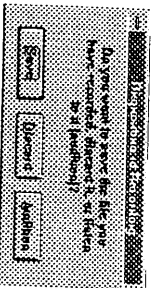
Another feature of the Audio player is recording your own wave files. If you have an audio input device (such as a microphone or a CD player), you can record and save your own wave files. These can then be used for things like error beeps.

To record your own wave file, click on the record button (the red circle).



The will begin the recording. You will be able to track the minutes seconds the recording has been active. When you are finished, press the stop button.

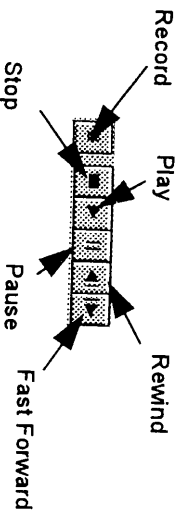
When you press stop you will be given the choice of saving, discarding, or playing the wave file.



Choose Audition to replay the wave file, or save to save it to disk or discard to delete it.


5.1.3 Using the Player

The audio player interface is similar to the interface of most CD players. It includes stop, play, rewind, and fast forward buttons.



The buttons work the same way they do on CD players, once the CD or the wave file has been loaded.

5.1.4 Exiting

To exit the Audio Player, click on the Off button 

6.0 Windows 95 Software Installation

The MAD16 PnP supports the Plug n Play specification 1.0a from Intel and Microsoft which makes installation into a Windows 95 system fast and easy.

Note You must already have Windows 95 installed on your computer and running properly before installing the hardware.

To install the MAD16 PnP Sound Controller into a systems that is running Windows 95:

1. Turn your computer on. The system will boot the Windows 95 operating system.
2. The Windows 95 Plug-and-Play capabilities will detect the MAD16 PnP card and ask you to install the driver. Select Driver from disk provided by hardware manufacturer and click OK.
3. Insert the driver diskette into the diskette drive (A or B) and click OK
4. After reading the diskette, Win95 will find the installation information for the OPTI 82C924 installation and the following screen will appear. With OPTI Plug-N-Play 82C924 installation highlighted, click OK. Win95 will copy the driver file to your hard drive.
5. After the files are copied, Win95 will ask you to restart your computer. Click Yes to restart the computer.
6. After Win95 restarts, it will detect the six logical devices that are available with the OPTI 82C924 Sound Controller. The standard sound devices; the audio device, the MPU-401 device, and the Master Controller will be installed using the drivers copied from the OPTI diskette. For examples, you will see the following screen as the MPU-401 device is installed.

7. The MAD16 PnP uses the standard Windows 95 drivers for the remaining three devices: game port(joystick), IDE hard drive controller, and communication port(modem). You will be prompted to either select the Windows 95 default driver, select a driver from the diskette, select not to install the device, or select from an alternative list. If you wish to install