

HOT-245A

16-Bit 3D Stereo

PnP Sound Card

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Manual Ver 1.1

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Table of Contents

Introduction	4
Features	4
System Requirements	5
Hardware Installation	6
Default Configuration	6
Installing the OPTi931	6
Connecting External Devices	6
OPTi931 Card Layout & Devices connect	7
Windows 3.1 Software Installation	8
Device Driver Installation	8
Windows 3.1 Configuration	11
Windows 3.1 Application	14
DOS Configuration and Utilities	15
Notes on Software Installation	17
Windows 95 Software Installation	18
Windows 95 Mode	18
Real Mode DOS	19
931 Audio Uninstall	21
3D Sound in Windows 95	22
Media Rack Installation	23
Media Rack Installation under Windows 3.1x	23
Media Rack Installation under Windows 95	24
Media Rack Overview	25
Media Rack Components	25
The Alarm Clock	26
MIDI Player, Wave Player, and CD Player's Buttons	27
System Mixer	28

Introduction

The *OPTi931* is a **16-bit 3D stereo sound card** based on the OPTi 82C931 Plug-and -Play integrated Audio controller chip. The OPTi931 is compatible with the Sound Blaster™ and Sound Blaster Pro™, as well as Windows Sound System™, MPU-401 and Ad Lib™.

The OPTi931 coupled with 3D (three dimensions) stereo enhancement technology. The technology eliminates "speaker crosstalk" and increase the depth and breadth of the sound image.

The OPTi931 sound card has multiple input and output ports for recording and playback of stereo sound.

Features

The OPTi931 is a full-featured sound card which include the following:

ISA Plug-and-Play (PnP) — Support the Plug and Play Specification 1.0a which allows the system

to automatically detect and configure devices that confirm 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.

16-bit digital-to-analog and analog-to-digital converter — 16-bit and 8-bit digitizing in stereo and mono mode.

22-Voice FM Music Synthesizer — Yamaha OPL3 FM Synthesizer technology. Play up to 22 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 & Digitized voice sources. Digital stereo mixing from Microphone, Line-in, CD-audio and Line-out.

Built-in 3D Effect — Minimizes the effect of speaker crosstalk, increase the depth and breadth of the sound image.

Built-in Stereo Amplifier — About 4-watt per channel stereo amplifier.

MIDI Interface/Joystick Port — Built-in integrated MIDI MPU-401 interface with FIFO, IBM PC joystick/game port.

Other Interfaces — Wave-table synthesizer interfaces, Speaker Out, Line In, and Microphone In.

System Requirements

The OPTi931 is manufactured for IBM PC compatible computers, software, and related computer components :

IBM-compatible computers modules AT, 286, 386, 486, Pentium, PS/2 (model 25/30) and compatibles (486 for Windows 95)

At least 2MB RAM (4MB RAM for Windows 3.1 applications, 8MB for Windows 95)

VGA or SVGA graphics adapter and monitor

2MB free on hard disk for installing all OPTi931 software

MS DOS or PC DOS 3.1 or later, MS Windows 3.1 and Windows 95

Windows 3.1 for games and applications in Windows

External speakers, microphone or headphones (optional)

Hardware Installation

The hardware installation of the OPTi931 is easy and can be performed in just a few steps. The OPTi931 has no switches. The OPTi931 installation program configures all of the settings.

Default Configuration

The OPTi931 supports both Sound Blaster Pro and Windows Sound System applications. The OPTi931 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 and 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
IRQ	5
DMA Channel	1
I/O Port Address	220h

Installing the OPTi931

To install the board :

- 1 With your computer system's power off, remove the cover, find a empty 16-bit expansion slot, and remove the metal bracket.
- 2 Insert the OPTi931 into the expansion slot firmly and evenly. Take care not to force it into the slot. Once you have properly positioned the OPTi931 into the slot, secure the OPTi931 with the bracket screw.
- 3 Replace the cover of the computer.
- 4 Connect your speaker or headphones to the external output connections on the OPTi931 bracket. For more information on connecting external devices.

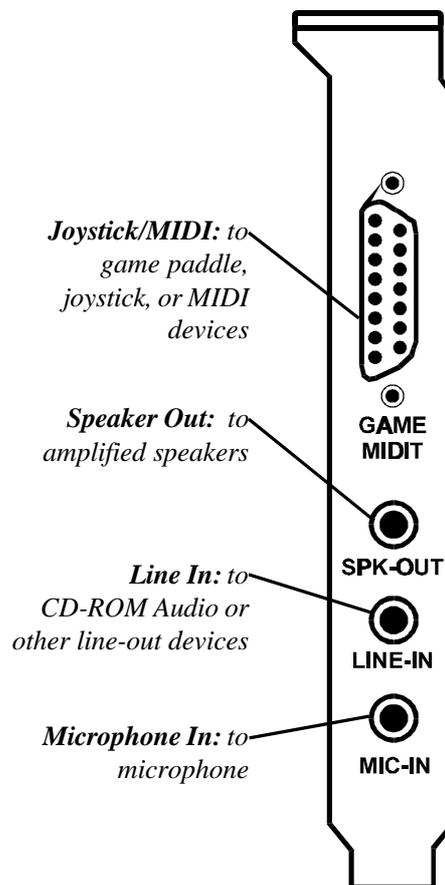
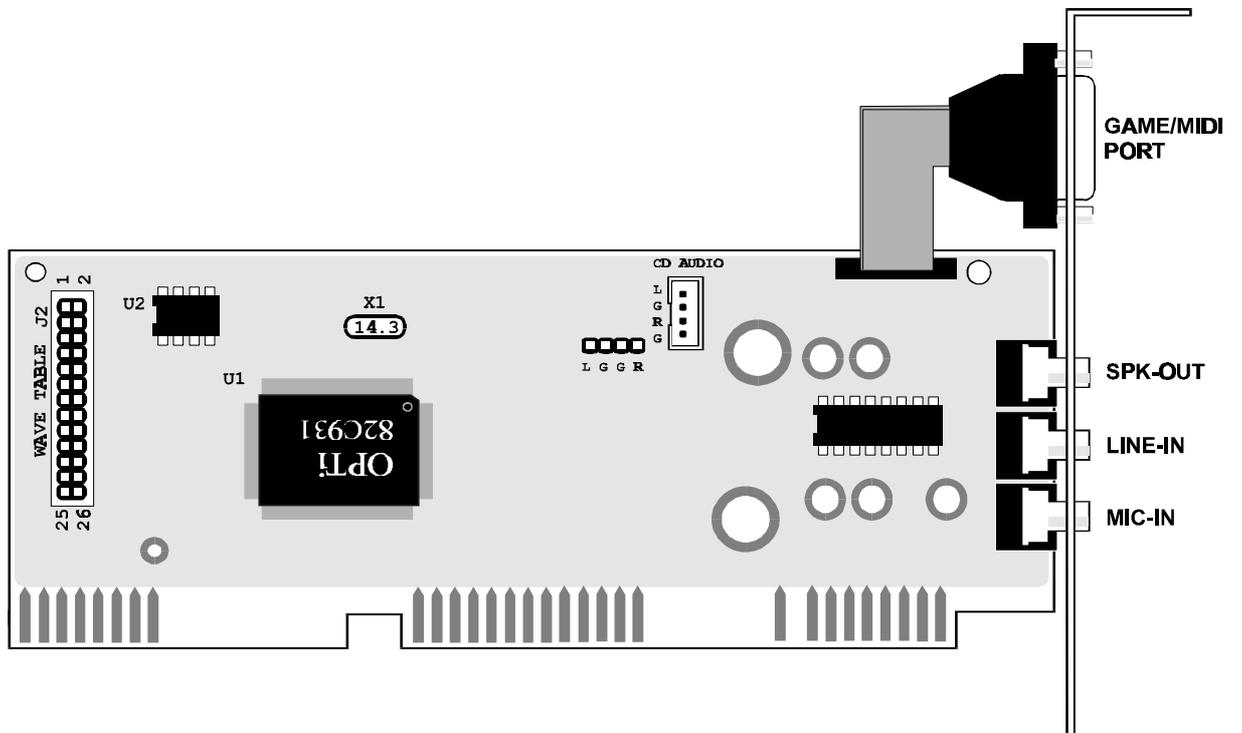
Connecting External Devices

The OPTi931 provides a number of ways for you to connect external devices to it, such as headphones, microphones and speakers. The OPTi931 supports the following external devices :

Speakers, Headphones, Power amplifier, Microphones, Joystick, MIDI Adapter

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

OPTi931 Card Layout & Devices Connect



Windows 3.1 Software Installation

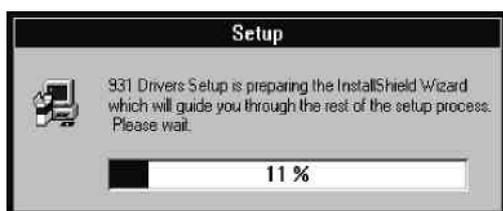
Device Driver Installation

The following steps will guide you through the full software installation and configuration for the OPTi931. We recommend that you read through them now, and become familiar with them before installing the software.

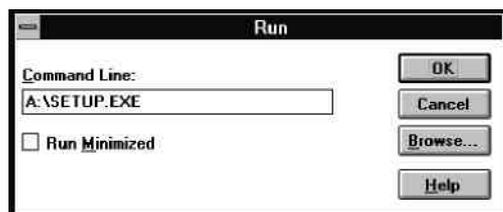
- 1 Insert the OPTi931 drivers and utilities disk in your floppy drive.
- 2 Select **File** and **Run**.
- 3 Type **a:\setup** and click **OK** as shown.
- 4 The OPTi931 menu driven installation program will copy the installation files to your hard drive.
- 5 After the install files are copied, the installation program will start. It is strongly recommended that you exit all Windows programs before running this Setup Program.



Click **Cancel** to quit and then close any programs you have running. Click **Next** to continue with the Setup program.



- 6 The next screen lets you select a directory to install the software. The default is 82C931.
- 7 If you don't want to install the files in this directory, click on **Browse** to change it. You will see the following screen.



- 8 From here, either select a directory that exists or type in the name of a new directory. If you type in a new directory you will be asked:

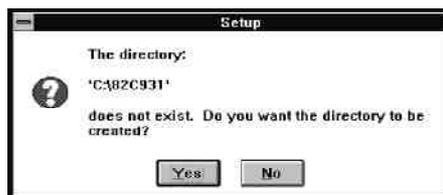
Choose **Yes**.



- 9 Select **Next** to continue the installation. The install program will begin copying the files to the directory you selected.



- 10 The next screen lets you enable the CD-ROM if you have connected one to the IDE connector on the card. If you are not connecting a CD-ROM to the card, select **NO**, otherwise select **Yes**.

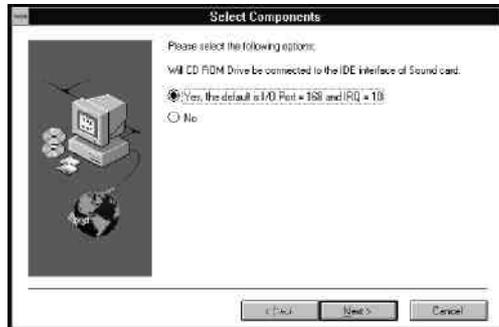


Click **Next**.

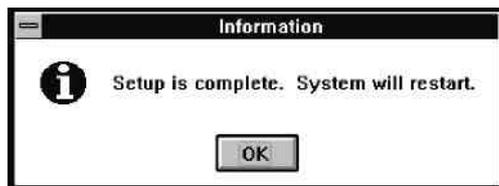
- 11 When it has finished you will be asked if you wish to view the README file. It is recommended that you select yes because this file will have the latest information available about this sound card.



- 12 This concludes the installation and the program will prompt you to REBOOT your system, be sure to select **OK** and then press **Ctrl-Alt-Del** when prompted. This will insure that the OPTi931 is properly configured.



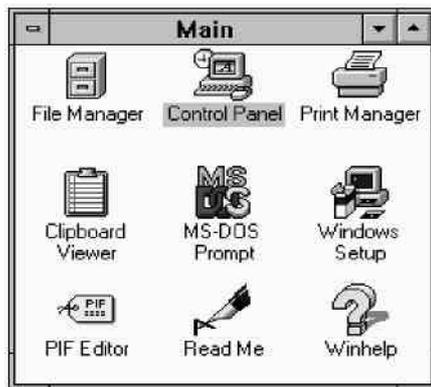
The software installation will then be completed and a new product group will be visible in Windows. The utilities in this group allow you to reconfigure the settings of the card and configure the audio mixer and karaoke features. Refer to the next section for more information.



Windows 3.1 Configuration

The OPTi931 Driver Setup menu allows you to change the settings for the OPTi Audio Driver in Windows 3.1. To access this menu, perform the following steps.

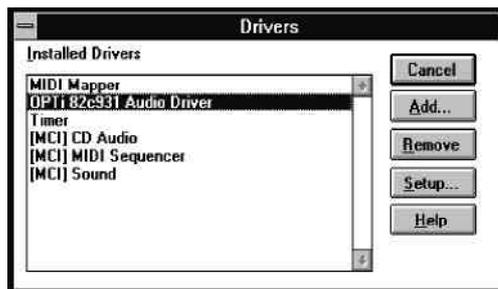
- 1 Double click the *Main* program group.
- 2 Double click the *Control Panel* icon.



- 3 Double click the *Drivers* icon.



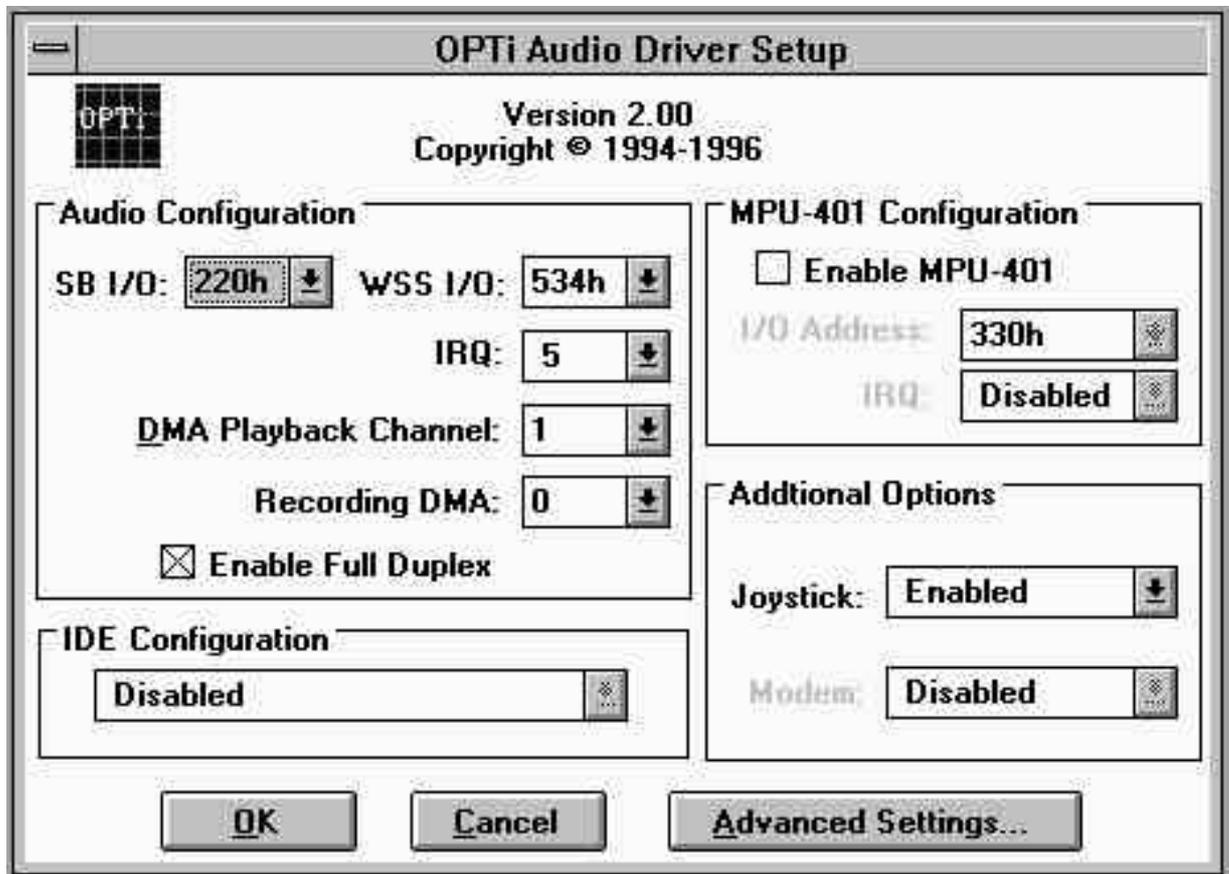
- 4 Highlight the OPTi82C931 Audio Driver and choose *Setup*.



This will display the all of the configuration settings for the sound card.

Audio Configuration

The Audio Configuration section allows to set the I/O address (for both Sound Blaster and Windows Sound System configurations), IRQ settings, DMA Channels, and Full Duplex. To change any of these settings click on the arrow next to the selection and use the scroll bars to choose another settings.



Possible settings are :

	Option	Default	Other Settings
	SB I/O	220h	240h
	WSS I/O	534h	608h, E84h, F44h
	IRQ	5	7, 9, 10, 11
	DMA Playback Channel	1	0, 3
	Recording DMA*	0	1, 3

IDE Configuration

This selection the I/O address and IRQ setting for the IDE controller. Possible selection are

I/O Address	IRQ
Disabled	Disabled
168	10
170	15
1E8	11

MPU-401 Configuration

This enables the MPU-401 interface and selects the I/O Address and IRQ settings. Possible selection are :

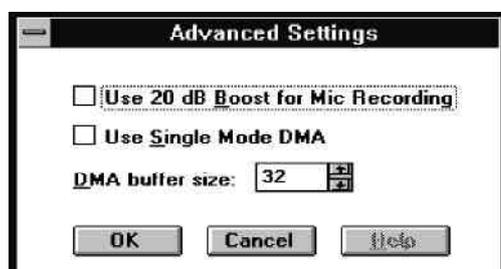
I/O Address	IRQ
300h	Disabled
310h	5
320h	7
330h	2/9
340h	10
350h	11
360h	

Additional Options

This allows you to set up the joystick and modem options.

Advanced Settings

Another selection on configuration menu is advanced settings. If you wish to modify the advance settings, click on *Advance Settings* and the following will appear.



Make the necessary changes as described below and click *OK*.

Boots 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 large 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.

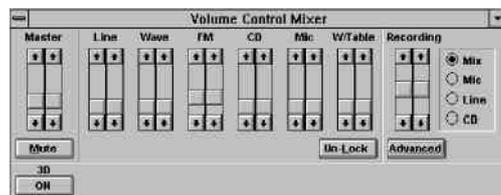
Windows 3.1 Application

After the installation is complete and you have rebooted Windows 3.1, you will see a new program group on your desktop.



Audio Mixer

The Audio Mixer applet lets you adjust the volume settings for each of the individual audio sources and 3D controller that the OPTi931 supports.



The 3D (Three Dimensions) stereo enhancement effect allows you to minimize speaker crosstalk and increase the depth and breadth of the sound image when two speakers are placed close together.

The 3D stereo enhancement effect can be on/off by click on the *Advanced* and 3D *off/on* button.

Karaoke Control

The karaoke enables you to direct the microphone input directly to the speaker output so that you can sing along with the CD audio or other audio sources.

Read Me Files

This will display an ASCII text file that contains all of the latest information on the device drivers. If you did not read this file during the installation procedure, please take a moment to do so now in case there is pertinent information.

931 Uninstall

Double clicking on this icon will remove the audio device drivers from Windows.

DOS Configuration and Utilities

Once you have installed the sound drivers in Windows 3.1, there are three utilities that are accessible from DOS if you wish to enable and use sound in any DOS based application.

SNDINIT.EXE

The sound initialization program (SNDINIT.EXE) allows you to select many of the options that are available in the Windows Configuration program.

You can run the SNDINIT.EXE program at anytime to make changes to your OPTi931 Sound card configuration. When re-configuring the OPTi931 Sound card, you can use the following parameter lines:

- SNDINIT /B Runs the program using the values specified in the SOUND16.CFG configuration file.
- SNDINIT /? Displays help on how to use SNDINIT.
- SNDINIT Runs the program to let you change your OPTi931 configuration. You will see the Configuration and Sound Test menu you used in the installation program.



Sound Device Settings Selection

<i>Selection</i>	<i>Settings</i>
Current Mode	Sound Blaster Pro, Windows Sound System
Sound Blaster Pro I/O Port	220, 240
Windows Sound System I/O Port	534, E84, F44, 608
IRQ	5, 7, 2/9, 10
Play DMA	0, 1, 3
Record DMA	0, 1, 3

MPU-401 Interface

<i>Selection</i>	<i>Settings</i>
Select	OFF, ON
I/O Port	300, 320, 330
IRQ	OFF, 5, 7, 2/9

Additional Options

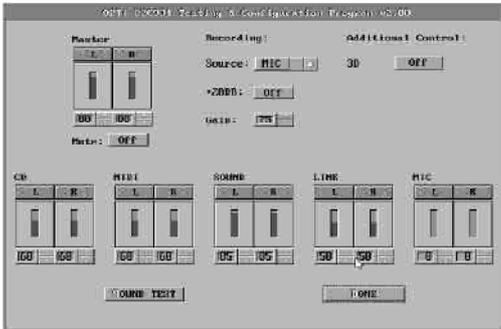
<i>Selection</i>	<i>Settings</i>
Joystick	Enabled, Disabled
Modem	Disabled

At the bottom of the menu are three selections.

The **Help** option displays a help file that shows you how to navigate through the menus and save information.

The **Accept** option loads the settings as they appear on the screen and exits the program.

The *Mixer* option displays the following screen:



This menu allows you to set the recording playback levels for the audio mixer as well as select the input sources for recording.

The volume level all range from 0 to 99 and can be changed by clicking on the up and down arrows next to the level or by clicking on the gauge that shows the current level. You can also turn on the mute to silence all audio level.

There is also a button that allows you to test the sound. Press this button and you will here a sample wave sound. If the it sound correct and the volume is *OK*, press *Done* to return to the Configuration Menu.

Windows 95 Software Installation

Windows 95 Mode

The OPTi931 supports the Plug and Play Specification 1.0a which makes installation into a Windows 95 system fast and easy.

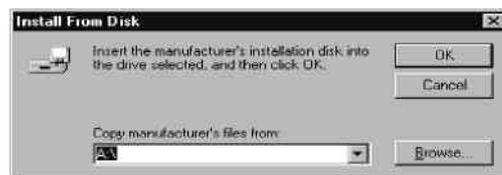
Note: You must already have Windows 95 installed on your computer and running properly before installing the hardware.

To install the OPTi931 into a systems that is running Windows 95 :

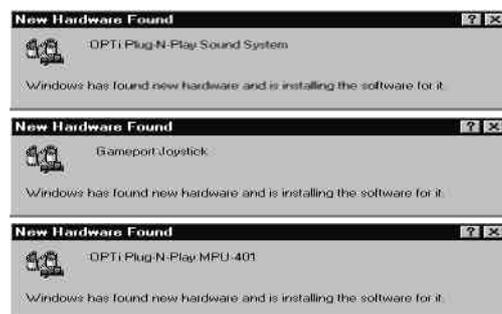
- 1 Turn your computer on. The system will boot the Windows 95 operating system.
- 2 The Windows 95 Plug-and-Play capabilities will detect the OPTi931 card and ask you to install the driver. Select "Driver from disk provided by hardware manufacturer" and click **OK**.



- 3 Insert the driver diskette into the diskette drive (A or B) and click **OK**.



- 4 After Windows 95 restarts, it will detect the logical devices that are available and you will see each device as it is found, first the Windows Sound System, then the Game Port and Joystick, and finally the MPU-401.



- 5 After the files are copied, Windows 95 will ask you to restart your computer.



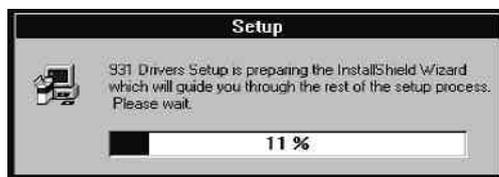
Click **Yes** to restart the computer.

This will complete the Windows 95 installation. The program will continue to load and when it is complete, you should hear the Windows 95 start up wave file.

Real Mode DOS

After you have successfully installed the drivers for Windows 95 and the system has booted correctly, you can install the drivers for audio applications that run in DOS mode. To do this,

- 1 Insert the device driver diskette into drive A (or B).
- 2 From the Windows 95 desktop select **Start** then **Run**.
- 3 Type **a:\setup** and press Enter.
- 4 The OPTi931 Sound Card menu driven installation program will copy the installation files to your hard drive.



- 5 After the install files are copied, the installation program will start.

It is strongly recommended that you exit all Windows programs before running this Setup Program.



Click **Cancel** to quit Setup and then close any programs you have running. Click **Next** to continue with the Setup program.

- 6 The next screen lets you select a directory to install the software. The default is OPTi931.



- 7 If you don't want to install the files in this directory, click on **Browse** to change it. You will see the following screen.



- 8 From here, either select a directory that exists or type in the name of a new directory. If you type in a new directory you will be asked:

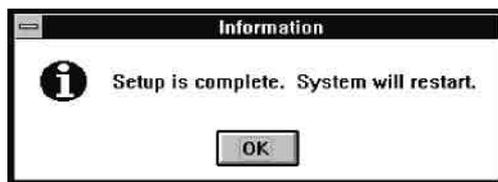


Choose **Yes**.

- 9 Select **Next** to continue the installation. The install program will begin copying the files to the directory you selected.



- 10 When it has finished you will be asked if you wish to view the README file. It is recommended that you select yes because this file will have the latest information available about this sound card.
- 11 This concludes the installation and the program will prompt you to REBOOT your system, be sure to select **OK** and then press Ctr-Alt-Del when prompted. This will insure that the OPTi931 Sound Card is properly configure.



931 Audio Uninstall

If you want to remove OPTi931drivers from Windows 95, clicking on *Settings* and *Control Panel*, then select *Add/Remove Program* icon, The dialog box of Add/Remove Programs Properties will show up.



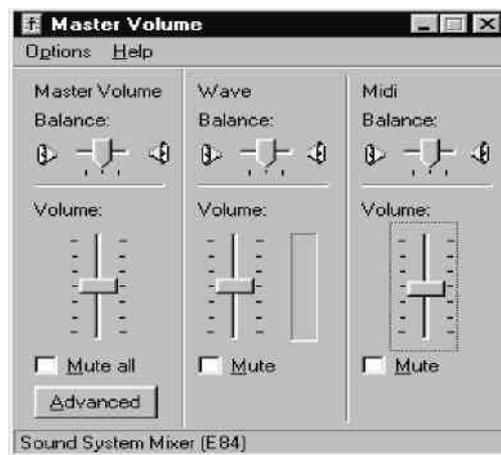
Highlighting "931 Audio Uninstall" and clicking on *Add/Remove* button will remove the audio device drivers from Windows 95.

3D Sound in Windows 95

The 3D (Three Dimensions) stereo enhancement effect allow you to eliminate speaker crosstalk and increase the depth and breadth of the sound image when two speakers are placed close together.

To enable or disable the 3D stereo effect in Windows 95 :

- 1 Click **Start** in the task bar. 
- 2 Select **Program** and then **Accessories**.
- 3 Select **Multimedia** and then **Volume Control**.



- 4 The dialog box of Master Volume will show up.
- 5 Click on the **Advanced** button.
- 6 The dialog box of Advanced controls for Master Volume will show up.



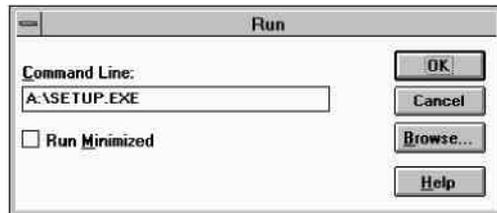
- 7 Click on the **SF-3D** check box to enable the 3D stereo enhancement effect.
- 8 Choose **Close** to leave Advanced controls for Master Volume dialog box.

Media Rack Installation

Media Rack Installation under Windows 3.1x

The following steps will guide you Media Rack installation under Windows 3.1x. We recommend that you read through them now, and become familiar with them before installing the software.

- 1 Insert the Media Rack disk in your floppy drive.
- 2 Select **File** and **Run**.
- 3 Type **a:\setup** and click **OK** as shown.



- 4 The next screen lets you select a directory to install the software. The default is Audio. If you don't want to install the files in this directory, you may change it by now.



- 5 The Media Rack driven installation program will copy the Media Rack files to your hard drive.
- 6 After the installation are finished, the installation program will create a Willow Pond Audio group and ask for a windows restart.

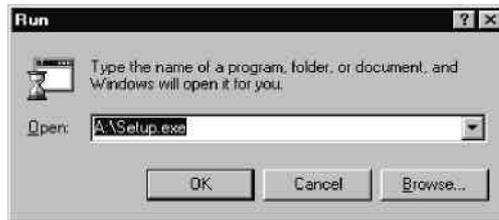


Choose **Yes** to restart Windows.

Media Rack Installation under Windows 95

The following steps will guide you Media Rack installation under Windows 95. We also recommend that you read through them now, and become familiar with them before installing the software.

- 1 Insert the Media Rack disk in your floppy drive.
- 2 Select *Start* and *Run*.
- 3 Type **a:\setup** and click **OK** as shown.



- 4 The next screen lets you select a directory to install the software. The default is Audio. If you don't want to install the files in this directory, you may change it by now.



- 5 The Media Rack driven installation program will copy the Media Rack files to your hard drive.
- 6 After the installation are finished, the installation program will create a Willow Pond Audio group.



Media Rack

Media Rack Overview

Media Rack gives you control over your PC's audio functions through a user interface as simple to use as a home stereo system.



Media Rack Components

Media Rack consists of several major components :

Control Center: Controls the display of Media Rack's components.

Alarm Clock: Speaker aloud the time and date, and plays your wave files as reminder alarms at times you set.



MIDI Player: Plays MIDI music files. Lets you create song playlists and use MIDI editors to modify the song files.



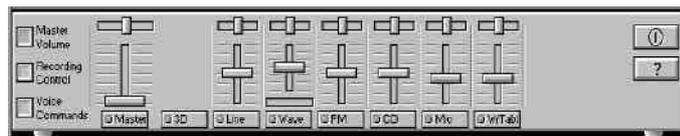
Wave Player: Records and plays digital audio (wave) files. Lets you create wave file playlists and use editors to modify the wave files.



CD Player: Plays standard audio CDs. Allows you to create playlist collections of CD tracks (songs).



System Mixer: Sets the volume level of your audio inputs and outputs.



The Alarm Clock

The Alarm Clock announces the time and date in a clear human voice, and can play a digital audio (wave) file at an alarm time you set.

Alarm Clock Configuration Preferences

The Clock menu offer several choices:

Say Time: Makes Alarm Clock immediately say the current time.

Preferences: The Options portion of the preferences box lets you select how Alarm Clock tells you the time. The Alarm portion lets you set an audible reminder, using a .WAV file. The Color button lets you select the color in which Alarm Clock will display the time. Options include:

Hour Format: In 12 hour format, Alarm Clock will say, e.g. : "The time is six-twenty-one-PM.". In 24 hour format, you will hear "The time is eighteen-twenty-one."

Say Date: If you enable this, Alarm Clock will follow the time by announcing, e.g., "Today is Thursday, January 12, 1996".

- Say Greeting:** Causes Alarm Clock to precede the time and date with greeting such as "Good Morning".
 - Only When Asked:** If selected, Alarm Clock will only say the time when you double-click on it or select Say Time from the Clock menu.
 - On the Hour:** Makes Alarm Clock speak at the start of the hour.
 - On the Half Hour:** Causes Alarm Clock to speak at the start of every hour as well thirty minutes past the hour.
 - On the Quarter Hour:** Causes Alarm Clock to speak at the start of every hour as well as every fifteen minutes after that.
- Color:** Lets you select the color in which Alarm Clock displays the time.

MIDI Player, Wave Player, and CD Player's Buttons



Shuffle/Repeat Button: When the Shuffle button is pressed, the selections in your playlist or CD will play in "shuffled" (random) order.



When the Repeat button is pressed, the selections in your playlist or CD (or the currently loaded file, if there is no playlist) will play repeatedly until stopped.

Choose File: Lets you select and load a single file.



Open/Close CD: Opens or closes the door of your CD driver. Of course your DOS and Windows CD drivers must be properly installed.



Previous/Next Selection: Moves to the beginning of the previous or next selection in your playlist or CD.



Play: Plays the current selection until: 1) the selection, playlist, or CD has finished, 2) you press the Stop or Pause button, 3) you load a different file, 4) you move to another selection, or 5) you close the program.



Pause: Temporarily stops playing the current selection. You can resume playing at the current location by pressing the button again.



Stop: Stops playing the current selection and "rewinds" to the start.



Scan: Moves your position ahead or back one second. Holding down a button shifts the position by ten seconds for every second you hold it.



Help: Shows the On-line User Guide for the selected components.



Format: Shows a list of formats in which you can record wave files.



Record: Lets you record a wave audio file through your microphone or other current



input device. (only on Wave Player)



Power: Stop play, and hides the selected component from display.



Playlist: Lets you create your own custom collections of audio selections, and specify the order in which selections play.



Edit: Launches an editor program, if available, so you can edit the current file.

System Mixer

System Mixer Overview

System Mixer lets you control all audio output and input levels.

The System Mixer's Controls

System Mixer displays the volume controls that your audio drivers make available. The names for these controls may vary.

Note: *A choice of mixer control styles may be available through the Choose Style menu item of the Mixer menu.*

Volume Control: Clicking on this button shows and lets you use the output level controls.

Recording Control: Clicking on this button shows and lets you use the input level controls. (Note: many voice recognition applications use the Voice Commands input levels instead.)

Voice Commands: Clicking on this button displays and lets you use the input level controls reserved for voice recognition programs.

Input and Output Level Sliders and Buttons: For each input or output signal type, a control (for example, a vertical slider, or "fader") controls the loudness, a horizontal slider controls balance between the two speakers, and the mute button temporarily stops input or output without changing slider position.

FCC Notice:

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 properly. In strict accordance with the manufacturer's 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 interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

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

Consult the dealer or an experienced radio/television technician

for help and for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock o. 004-000-00345-4

FCC Warning

The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Note : In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables and power cord must be used.