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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 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.

NOTICE

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Manual Ver 1.2

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Shuttle Sound System 48 plus

Shuttle Sound System 48 wave

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Introduction

HOT-239/ HOT-233 are 16-bit stereo sound cards based on the OPTi 82C930/OPTi82C929 integrated digital sound controller chip. HOT-239/HOT-233 are compatible with the Sound Blaster™ and Sound Blaster Pro™, as well as Windows Sound System™, MPU-401 and Ad Lib™. HOT-239 also include an on-board wave table synthesizer based on OPTi82C941 which is compatible to MPU-401.

HOT-233/HOT-239 include multiple CD-ROM interfaces for SONY, Mitsumi, Panasonic and IDE CD-ROM drives, in addition, there are multiple input and output ports for the recording and playback of stereo sound.

HOT-233 Features:

The HOT-233 is a full-featured sound card which include the following:

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.

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 & Digitized voice sources. Digital stereo mixing from Microphone, Line-in, CD-audio and Line-out.

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

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

CD-ROM— Multiple CD-ROM interface support for Mitsumi, Panasonic, SONY, IDE-CD-ROM drives and CD audio-in connectors

Other Interfaces—Yamaha OPL4 and Wave Blaster Wave-table synthesizer interfaces, Speakers Out, Line Out, Line In, and Microphone In

HOT-239 Features:

The HOT-239 has all the above features plus an advanced wave table synthesizer on board.

Advanced wave table Synthesizer Features:

OPTi 82C941 advanced sound synthesizer chip

32 polyphonic play back at 44.1KHz

Advanced Time variable filter and amplitude control

Subtractive sound synthesis and dynamic voice assignment

1 MB ROM sound sources

What is in your package?

You should have the following items in your package:

HOT-233/HOT-239 Sound Card

HOT-233/HOT-239 DOS/Windows Installation Disk

HOT-233/HOT-239 User Reference Manual

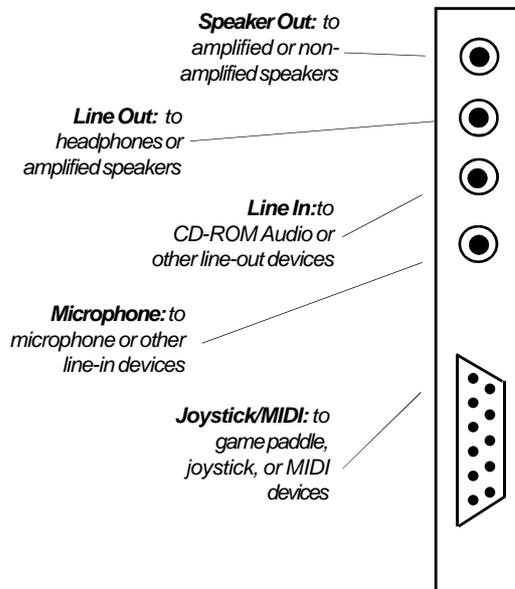
System Requirements

- IBM-compatible computers 286, 386, 486, 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 HOT-233/HOT-239 software
- MS DOS or PC DOS 3.1 or later, MS Windows 3.1
- External speakers, Microphone and Headphones (optional)

Quick Installation Guide

Hardware Installation

1. Power down your computer, remove the cover and find an empty 16-bit expansion slot.
2. **For CD-ROM Installation:** Refer to page 9 for details on CD-ROM Configuration.
3. Install the HOT-233/HOT-239 into an open slot and secure it.
4. Connect speakers to the Speaker-Out connector. Refer to the diagram listed below for connecting other external devices.
5. Replace your computer's cover. Hardware installation is complete.

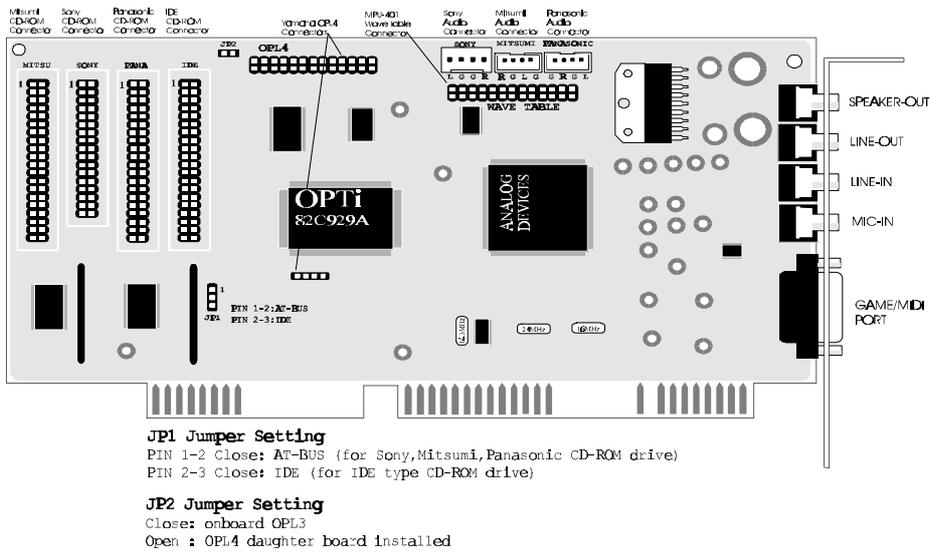


Software Installation

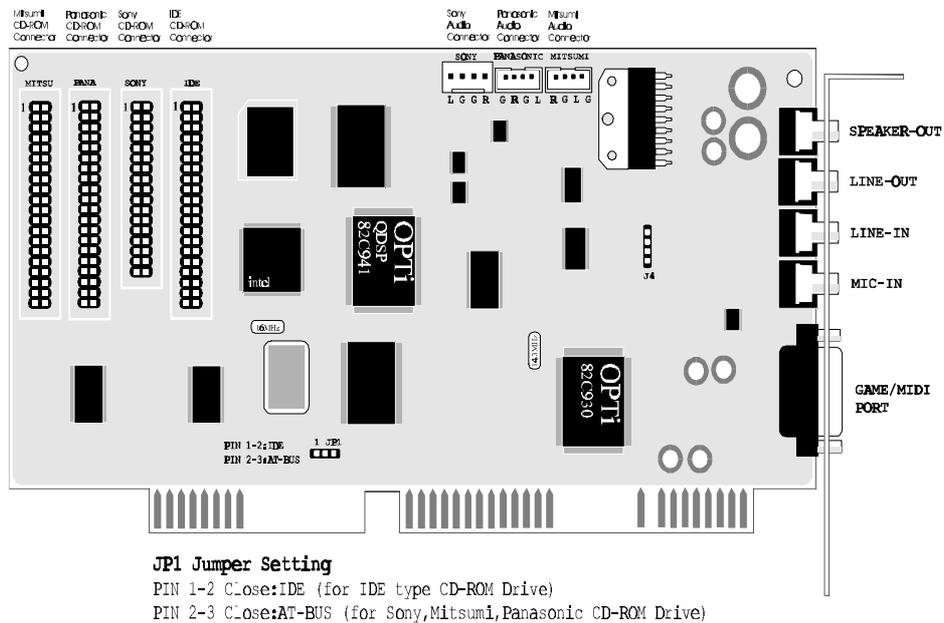
1. Insert the HOT-233/HOT-239 Installation disk in your floppy drive, log onto that drive and type **INSTALL** at the DOS prompt.
2. The HOT-233/HOT-239 menu-driven installation program will appear. Follow the on-screen instructions to configure the HOT-233/HOT-239 for your system.
3. After setup, you should test the HOT-233/HOT-239 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. The HOT-233/HOT-239 Installation program will finish setting up your system by modifying your **AUTOEXEC.BAT** and **CONFIG.SYS** files and copy the appropriate drivers to your system.
5. If you are running Windows, the **Installation** program will update your Windows system files and copy Windows sound applications to your hard drive. Next time you start Windows, a dialog box will ask if you want to create a Windows program group for the HOT-233/HOT-239 sound applications. You can run these applications by click on the various icons in the new program group.
6. The last screen of the HOT-233/HOT-239 **Installation** program will prompt you to **Reboot** your system, or **Exit to DOS**. Choose **Reboot** option, the software installation will be complete, and the sound card is now ready for use.



HOT-233 Card Layout



HOT-239 Card Layout



Software Installation

The HOT-233/HOT-239 installation program (**INSTALL.EXE**) lets you configure the IRQ, DMA channel, and I/O port address of the HOT-233/HOT-239 sound 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 set the MPU-401 interface on or off.

After you have finished making your settings, and have tested the sound to insure the HOT-233/HOT-239 is working properly, **INSTALL.EXE** will install the HOT-233/HOT-239 drivers for both DOS and Windows (if you have Windows).

Warning *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.*

Installing the HOT-233/HOT-239 Software

- 1 Place the HOT-233/HOT-239 Installation Disk in your floppy drive.
- 2 Change to drive A (assume you are using drive A).
- 3 Type **INSTALL** at the A:> prompt and press <Enter>. Follows the install procedure and enter the following settings:
 - 1) **Select Install Directory:** The full path where you want the software to be installed. Press <Enter> to accept the default path.
 - 2) **Location of Windows Directory:** The full path of your Windows 3.1 software. If you already have Windows 3.1 installed.
 - 3) **Select CD-ROM Interface:** Choose the matching CD-ROM drive interface. Then the exact model of CD-ROM drive and hardware settings.
 - 4) **MPU-401 Interface:** If MPU-401 interface is present, set to On and configure the MPU-401 I/O port and IRQ settings.

Notes on Software Installation

README.TXT file

The README.TXT file on the installation disk contains the most updated information after the printing of this installation guide. Please read it before you start the installation procedure.

Changes to AUTOEXEC.BAT

The installation program will make several changes to your **AUTOEXEC.BAT** file. You can choose to have **INSTALL** make these changes for you, or store the changes in a separate file called **AUTOEXEC.MAD**. Then you must edit the **AUTOEXEC.BAT** and make the changes yourself.

The **AUTOEXEC.BAT** file shall have the following changes:

Syntax:	Example:
SET SOUND16=<DRIVE:\PATH>	SET SOUND16=C:\SOUND16
<DRIVE:\PATH>\SNDINIT /B	C:\SOUND16\SNDINIT /B
SET BLASTER=AN IN DN TN	SET BLASTER=A220 I5 D1 T4

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 shall have the following changes:

Syntax: DEVICE=<drive:\path>\CDSETUP.SYS /T:n /P:n

Example: DEVICE=C:\SOUND16\CDSETUP.SYS /T:S /P:340

Syntax: DEVICE=<drive:\path>\SLCD.SYS /D:MSCD000 /B:340

Example: DEVICE=C:\SOUND16\SLCD.SYS /D:MSCD000 /B:340

CD-ROM Configuration

You must set the exact hardware settings that match to your CD-ROM drive. For IRQ, DMA channel, and I/O base address.

Testing the HOT-233/HOT-239 Sound

Use the **TEST** option to test the setting that you specified. If you do not hear any sound, check the volume setting, then try changing the settings until you can hear the sound from your speakers. If system locks up during sound test, please reboot, run the **SNDINIT.EXE** program and check for setting conflict.

Testing and Re-Configuring the HOT-233/HOT-239

You can run the **SNDINIT.EXE** program at anytime to make changes to your HOT-233/HOT-239 con-

figuration. When re-configuring the HOT-233/HOT-239, 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 information to explain how to use SNDINIT .
SNDINIT	Runs the SNDINIT program to let you change your HOT-233/HOT-239 configuration. You will see the main configuration screen you had when you first setup the HOT-233/HOT-239 with the installation program.

VOLTSR.EXE -- Volume Control Utility

The installation disk comes with an TSR volume control utility, **VOLTSR.EXE**. You can use this utility to control the volume in the DOS environment. Load the program by typing **VOLTSR** at DOS prompt. Then use the following hot keys to change the volume:

CTRL-ALT-U	Raise the volume
CTRL-ALT-D	Lower the volume
CTRL-ALT-M	Mute the volume

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

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

KARAOKE.EXE -- Karaoke Utility

The installation disk contains a karaoke **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:

CTRL-ALT-PgUp	Raises the volume
CTRL-ALT-PgDn	Lowers the volume

CD-ROM Configuration

This chapter will help you set up your CD-ROM to work properly with the HOT-233/HOT-239. The first section will explain how to set up the CD-ROM using the **SNDINIT.EXE** configuration program. The next section will discuss the connectors and proper CD-ROM interfacing to the HOT-233/HOT-239.

The HOT-233/HOT-239 supports Sony, Panasonic, Mitsumi and IDE CD-ROM drives. You can configure and set up these CD-ROM drives when you first set up the HOT-233/HOT-239 using the **INSTALL.EXE** program, or later with the **SNDINIT.EXE** program.

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

The following steps will help you set up your CD-ROM drive with the **SNDINIT.EXE** program. We will be using a Mitsumi drive in these examples:

1. Run **SNDINIT.EXE** and choose Configure.
2. Select Customize for the CD-ROM Interface.
3. We are using the Mitsumi CD-ROM for these steps. Choose Mitsumi for the CD-ROM model. The configuration box for the Mitsumi CD-ROM will appear.
4. At this point, you should have the CD-ROM Drive's hardware options which you have used to set up your CD-ROM Drive while running the CD-ROM drive's installation program.
5. Select the I/O Port Address, IRQ, and DMA options that match with your CD-ROM drive's options.
6. Select **OK** to accept your settings. You will be notified that your **CONFIG.SYS** file will be updated. Select **OK** and a line similar to the following will be added to your **CONFIG.SYS** file

DEVICE=C:\SOUND16\CDSETUP.SYS /T:M /P:340 /I:10 /D:X

This assumes you configured the CD-ROM to use I/O Port Address 340H, Interrupt 10 with DMA disabled. The "T:M" stands for Mitsumi.

7. You must now exit the program and REBOOT your computer for the settings to take effect.

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

The **SNINIT.EXE** program will only make changes to the **Config.sys** line that begins with:

```
DEVICE=C:\SOUND16\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's user manual for more information.

Installing the MSCDEX Driver

Your CD-ROM will require that the proper MSCDEX driver is loaded on system boot-up. During installation, the HOT-233/HOT-239 installation program will take several steps to insure that the proper MSCDEX is used for your system.

1. First, the HOT-233/HOT-239 installation program will look at your **Autoexec.bat** file for an existing MSCDEX driver. If it finds it 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 your DOS operating system programs. If the HOT-233/HOT-239 installation program finds the **MSCDEX.EXE** program it will use it. If more than one copy of **MSCDEX.EXE** exist on your system, the HOT-233/HOT-239 installation program will display all known files on your system, and ask you to select the one you want to use.
3. The HOT-233/HOT-239 comes with three MSCDEX drivers. If **MSCDEX.EXE** is not found on your system, the HOT-233/HOT-239 installation program will check your DOS version (DOS 5.0, 6.0 and 6.2), then copy and install the **MSCDEX.EXE** program which will work best with your system.
4. If the HOT-233/HOT-239 installation program determines that your DOS version is earlier than 5.0, 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:\SOUND16\MSCDEX.EXE (or REM C:\OPTi930\MSCDEX.EXE )
```

When you copy the proper **MSCDEX.EXE** program that works with your CD-ROM into the **C:\SOUND16** subdirectory, edit the above line in your **AUTOEXEC.BAT** file by removing the word "REM" so that the line looks as follows:

```
C:\SOUND16\MSCDEX.EXE (or REM C:\OPTi930\MSCDEX.EXE )
```

The proper **MSCDEX.EXE** program will then be loaded when you re-boot your system.

The HOT-233/HOT-239 CD-ROM Interface

There are four CD-ROM interface connectors on the HOT-233/HOT-239, supporting Sony, Mitsumi, Panasonic and IDE CD-ROM drives.

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 HOT-233/HOT-239.

The HOT-233/HOT-239 supports I/O Port Addresses 320H, 330H, 340H and 360H. You should make note of this when you select the I/O Port Address during your CD-ROM drive's installation process.

If you have a separate CD-ROM controller card, and you do not wish to use the built-in CD-ROM interface on the HOT-233/HOT-239, you do not have to make any changes to your existing environment. Make sure that you enter the configuration list "None" for the CD-ROM drive.

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

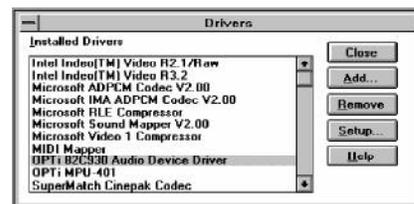
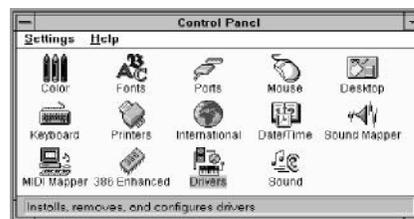
Microphone Connection: A microphone can be connected to the Microphone-In connector on the sound card located below the Line-In connector. Use a dynamic monaural or stereo microphone with a resistance of not more than 600 ohms.

Joystick Connection: 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 SNDINIT.EXE program) if you already have a game port or game card.

Windows Configuration

During the Software installation process, the HOT-233/HOT-239 installation program added Windows 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 HOT-233/HOT-239 in Windows 3.1. To change settings under Windows, please follow the steps below:

1. Start Windows.
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 OPTi HOT-233/HOT-239 Audio Driver (OPTi 82C929 or OPTi 82C930), then double click the Setup button. If you are configuring the options for the OPTi External MIDI Driver click on it instead and click the Setup button.
5. The HOT-233/HOT-239 Audio Device Driver Configuration Dialog Box will appear. Make the necessary changes by clicking on the selections.



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

7. If you wish to modify the advance settings, click on Advance Settings and a Window will appear. Make the necessary changes and click OK. You will be prompted again to restart Windows.

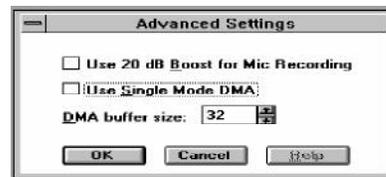
8. Advanced Settings: Use Single Mode DMA

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.

Advanced Settings: 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 in multiples of 4 K.



HOT-233/239

16-Bit Stereo Sound Card

User's Manual