Installation Guide V1.0

English

CE declaration

We:

TerraTec Electronic GmbH, Herrenpfad 38, D-41334 Nettetal, Germany

hereby declare that the product:

TerraTec XLerate

to which this declaration refers is in compliance with the following standards or standardizing documents:

1. EN 55022

2. EN 50082-1

The following are the stipulated operating conditions and environmental conditions for said compliance:

Residential, business and commercial environments and small-company enviroments.

This declaration is based on:

Test report(s) of the EMC testing laboratory

CONTENTS

Preface

TerraTec XLerate

Congratulations

On your decision to buy a TerraTec sound card - and join the steadily growing group of quality-conscious multimedia users. You have made the right choice, and you will find that this User Guide contains the information you need to get your TerraTec XLerate up and running in the shortest possible time. We know that no-one enjoys ploughing through manuals (we certainly don't ☺), so a quick-reference guide has been included for experienced users. Remember, though, that it might be worthwhile glancing through the rest of the User Guide, particularly if you run into difficulties or if a problem arises, or simply if you would like some background facts and figures. You never know what useful snippets of information you might find.

Enjoy your TerraTec XLerate!

Your TerraTec Team

Introduction.

TerraTec XLerate.

PCI is the future. The days of sound cards which still use the PC ISA bus are numbered. Audio quality and realism are decisive criteria which speak for using PCI. The ISA bus has reached its performance limits, especially in 3D games with positional 3D audio and a large number of audio streams. This Plug & Play sound card with a second-generation chipset is designed to master the demands of the future.

The TerraTec XLerate is far superior to comparable PCI solutions with its high-quality professional wavetable, the outstanding A3D™ technology, as well as complete compatibility to the SoundBlaster® and SoundBlaster®Pro standards - also in real-mode DOS - thus ensuring pure audio and gaming pleasure.

In addition, the TerraTec® XLerate has a range of flexible upgrade options, such as expansion with an additional wavetable or the unique TerraTec® ReceiverSystem ActiveRadio upgrade module to upgrade the card to a complete RDS radio system.

The TerraTec XLerate supports A3D interactive technology implemented in an increasing number of new games for Windows 95. A3D-I technology provides an extremely realistic auditory experience by reproducing audio effects as experienced in a natural environment. Unlike *Surround Sound*, only two speakers are required to achieve this unique spatial audio experience using A3D-I. It is also far superior to *stereo expansion* processes, as A3D can position audio sources anywhere within a virtual 3-dimensional space.

As a result, audio sources can respond interactively to the game action - moving around the listener, with racing cars or space ships shooting by or bullets whizzing past the player's head.

The TerraTec XLerate also offers a complete hardware-based legacy audio emulation for SoundBLaster and SoundBlasterPro. In other words, there's no need to give up classic games running under DOS or in Win95 DOS boxes. In fact, the outstanding audio characteristics of our TerraTec XLerate will enhance your experience of your old favorites.

And that's not everything - the integrated wavetable offers finest-quality MIDI sounds for the most discerning listeners. This point isn't solely of interest to musicians, however - gamers will also come to appreciate it quickly, as the wavetable is available in Win95 DOS boxes as well.

TECHNICAL DATA

KEY FEATURES

- A3D™ Positional 3D Audio
- Real-mode DOS SoundBlaster™ and SoundBlasterPro™ compatible
- DirectSound™ compatible
- Integrated wavetable
- Radio port
- Wavetable port

COMPATIBILITY

- DirectSound™
- DirectSound 3D™
- A3D™
- General MIDI
- MPU-401 compatible
- Soundblaster®
- Soundblaster® Pro
- AdLib™
- OPL2/3-compatible FM synthesis
- MPC Level 3
- AC'97
- PC 98
- PCI Specification 2.1
- PCI Bus Power Management Interface Specification 1.0

DIGITAL AUDIO

- A3D Positional 3D Audio™
- 8/16-bit playback with a sample frequencies of up to 48kHz (mono/stereo)
- Enhanced full duplex stereo recording and playback
- Record and playback all audio sources

WAVETABLE

- Up to 64 simultaneous voices
- Channel-oriented stereo chorus and stereo reverb
- 4MB High Quality SoundSet

AUDIO MIXER

- Individual level controls for all mixer inputs
  - CD audio
  - MIC in
  - LINE in
  - External synthesizer
  - Digital mix
  - FM RDS radio

MIDI/JOYSTICK INTERFACE

- DirectInput™ acceleration
- MPU-401 compatible (UART mode)
- SoundBlaster® MIDI interface
- Analog/digital joystick interface

EXTERNAL CONNECTIONS

- Switchable speaker/line-OUT (3.5 mm jack)
- Line-IN (3.5 mm jack)
- Mic-IN (3.5 mm jack)
- MIDI/joystick interface (IBM 15-pin Sub-D)

ONBOARD CONNECTIONS

- WaveBlaster pin-compatible connector for optional wavetable daughterboard
- Radio connector for optional TerraTec ReceiverSystem ActiveRadio Upgrade Module
- CD-ROM ports for
  - Sony
  - IDE
- Internal pick-offs for the external audio connections (Line-OUT, Line-IN, Mic-IN)

ONBOARD AMPLIFIER

- Stereo amplifier, 2 x 1.5 watts

DRIVER

- MS-DOS 6.0® or higher
- Windows 95®
- Windows NT 4.0®

SYSTEM REQUIREMENTS

- Pentium 100 or higher, Pentium 200 MMX or higher recommended
- 16MB RAM, 32 MB RAM recommended
- One free PCI slot
- CD drive for the installation and driver CD
- 15 MB free hard disk space
- Speakers or headphones
- Windows 95® or Windows NT 4.0 ® with DirectX 5.0

INSTALLING THE SOUND CARD

Before installing the sound card, please take note of any special points pertaining to the configuration of your computer. Also refer to the handbook of your computer and other expansion cards for their settings.

Please observe the following instructions to ensure a trouble-free installation.

If difficulties arise nevertheless, please reread the relevant chapter in this handbook carefully.

Please call our service hotline if you are still having problems. The phone numbers and hours of the hotline can be found in the Annex of this documentation.

Start by making sure that nothing is missing.

You should have received:

- 1 TerraTec XLerate PCI sound card
- 1 Installation and driver CD
- 1 Documentation
- 1 Quick Start Guide
- 1 audio cable (mini-jack to cinch)
- 1 registration card with the serial number

Return the registration card to us at the earliest possible opportunity or register online at www.terratec.net/register.htm. This is important for support and hotline services.

> ***WARNING - before opening the case, unplug the mains cable from the wall socket as well as from the PC.***

Electrostatic discharge (ESD) can damage drives, circuit boards and other components. Perform the following steps at an ESD-safe workplace only. If such a workplace is not available, protect yourself against electrostatic discharge by wearing an antistatic wrist strap and attaching it to a metal part of the system case.

Please note that simply opening the case will not void your warranty provided you do not modify the hardware inside. Upgrading the PC yourself may affect the warranty, however. Please consult your dealer beforehand.

Now it's time to arm yourself with a phillips screwdriver.

And here's what to do, step by step:

- Switch off your PC and all connected periphery, in other words printer, monitor and so on. Leave the AC cord connected for the time being, so that your computer is still grounded.
- Touch the metal chassis at the rear of the PC to ground yourself and discharge static. Now unplug the cord from the AC mains socket.
- Remove the cover from the case of your PC.
- Look for a free PCI expansion slot, remove the screw holding the slot blanking plate and remove the plate. To ensure the optimal function of your sound card, look for an expansion slot that is not immediately next to an already-installed card. Some cards, such as video adapters, can send out signals which can interfere with the sound card.
- Carefully remove the sound card from its packaging and pick it up by the edges with one hand while your other hand is resting on the metal of the PC case.
- This will ensure that your body is completely discharged via your computer without affecting the sound card. Do not touch the components of the card under any circumstances.
- Set the jumper (J4) to deactivate the onboard amplifier if you are going to connect loudspeakers with integral amplifiers or your hifi stereo system to the sound card.
- Align the holder at the rear of the sound card in the expansion slot in such a way that the card's gold-colored connectors are directly in line with the slot's socket.
- Carefully seat the card in the slot. You might have to press the card firmly into the slot to make a good contact. Take care to ensure that the contacts are precisely in line, in order to avoid damaging the sound card or the mainboard in your PC.
- Insert and tighten the screw from the slot cover to secure the sound card in its slot.
- Connect the CD-ROM drive to the sound card with the audio cable which is normally supplied with the CD-ROM drive. Also see the chapter *Connecting external periphery* on page 27).
- Reinstall the cover of your PC case.
- Connect your speakers or hifi stereo system to the sound card (also see the chapter *Connecting external periphery* on page 27). Positioning your speakers for an optimal A3D acoustic image is also covered in the chapter *Connecting external periphery* (page 27).

- Reconnect the mains and all other cables. Make sure that your speakers or hifi system is set to low volume. Start your computer.
- Please continue with the chapter *Driver installation* (page 13).

DRIVER INSTALLATION

PREFACE

In the following driver installation instructions, the **<CD>** stands for the drive letter assigned to your CD-ROM drive. If you have more than one CD-ROM drive, please use the letter of the drive containing the *XLerate Driver & Software CD*.

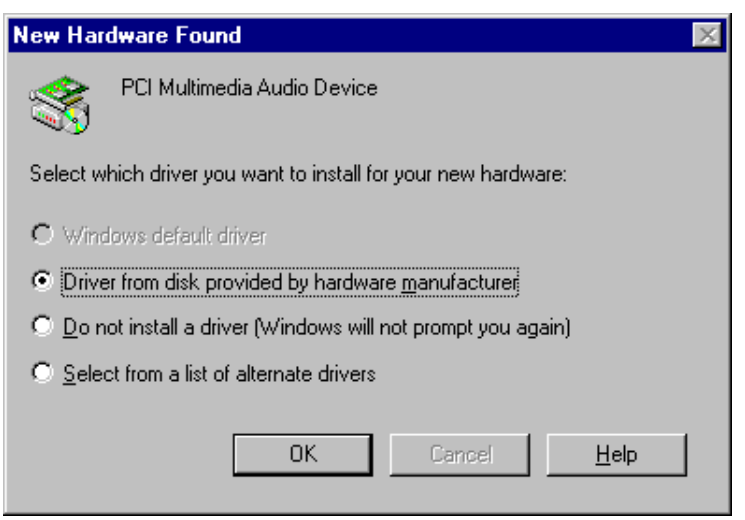
WINDOWS 95A OR OSR1

NOTE: In the event that DirectX 5.0 or higher is not present on your computer, the driver installation will be interrupted and the DirectX installation will start automatically. If the automatic installation does not work for some reason, you will be prompted for the folder containing the DirectX setup program. Enter **<CD>:\DirectX** and click *OK*. After installation has succeded, confirm the following dialog with *Yes* to restart your computer.

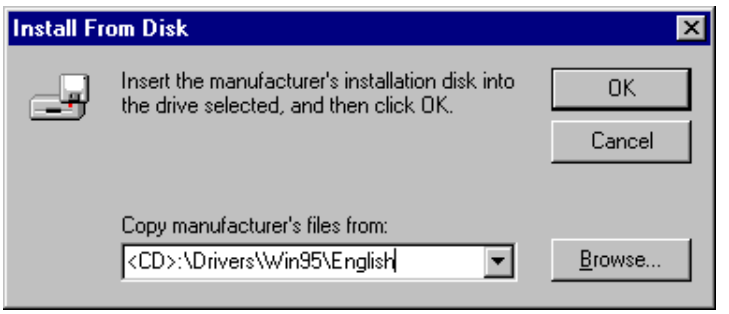
The TerraTec XLerate driver installation will continue after the DirectX installation is complete and the computer has restarted.

After you have installed the card, insert the *TerraTec XLerate Installation & Driver CD* into your CD-ROM drive and start Windows 95.

The following screen will appear.

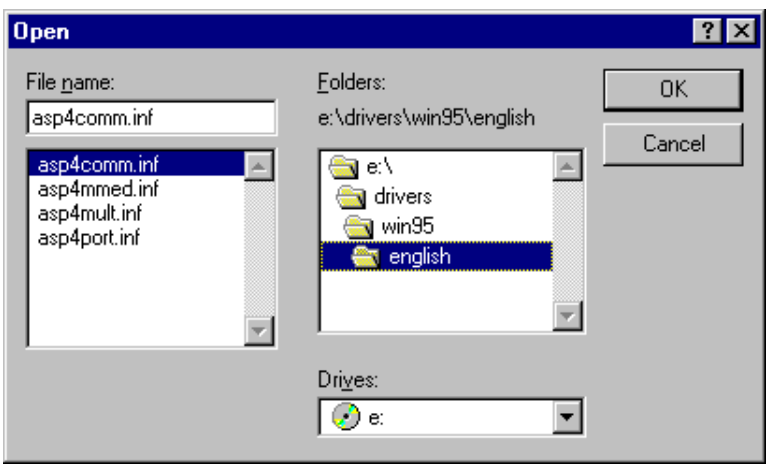


Select “Driver from disk provided by hardware manufacturer” and click *OK*.



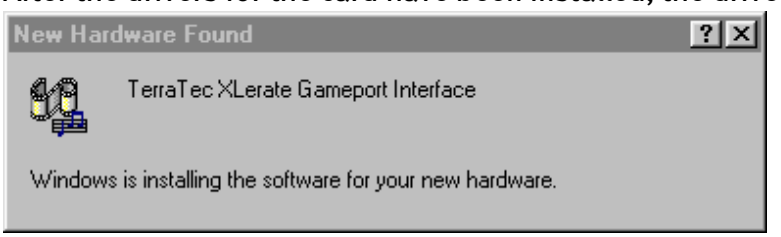
Type the path **<CD>:\Drivers\Win95\English** and click *OK*, or click *Browse* to locate the correct folder using the mouse.

If you selected *Browse*, switch to your CD-ROM drive in the following window. Next, switch to the folder **<CD>:\Drivers\Win95\English** and click *OK*.

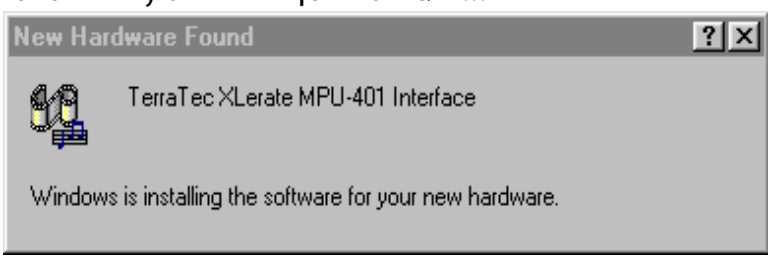


Confirm the path by clicking *OK*.

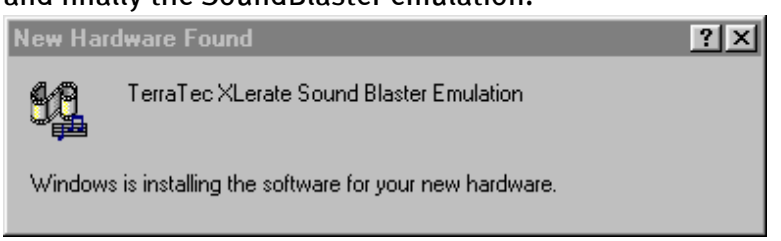
After the drivers for the card have been installed, the drivers for the gameport are next...



followed by the MPU-401 interface...



and finally the SoundBlaster emulation.



Once all hardware components have been found and the appropriate drivers have been set up, you will be asked whether you would like to install the A3D demos.

If you answer with *OK*, the A3D demos will be installed automatically. If this automatic installation fails for any reason, enter the path **<CD>:\A3DDEMOS\setup.exe** in the following dialog. The installation will then definitely start.

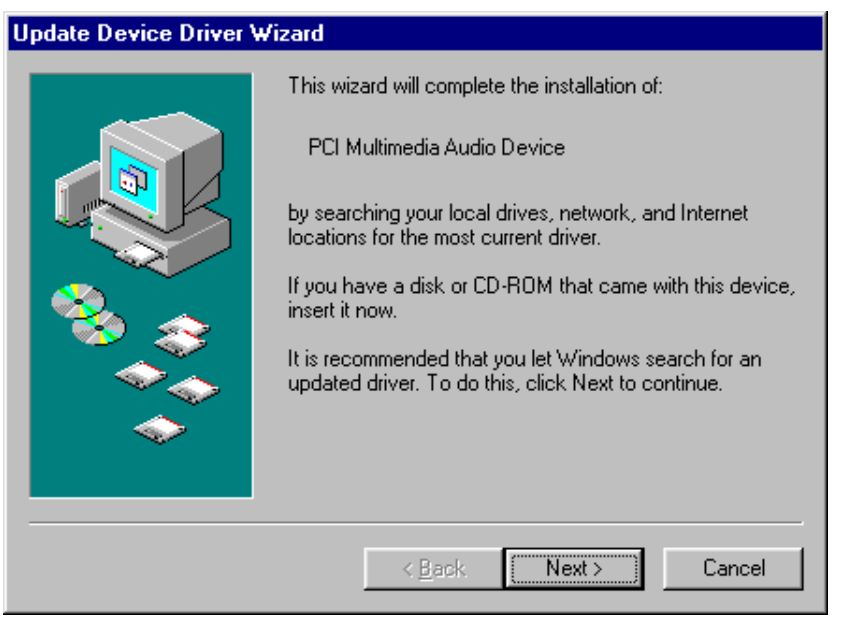
WINDOWS 95 OSR2

NOTE: In the event that DirectX 5.0 or higher is not present on your computer, the driver installation will be interrupted and the DirectX installation will start automatically. If the automatic installation does not work for some reason, you will be prompted for the folder containing the DirectX setup program. Enter **<CD>:\DirectX** and click *OK*. After installation has succeded, confirm the following dialog with *Yes* to restart your computer.

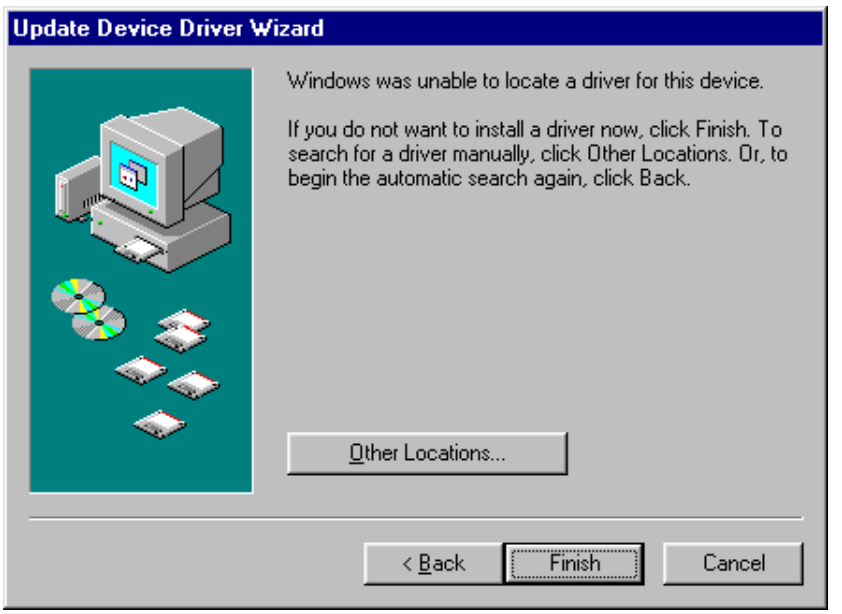
The TerraTec XLerate driver installation will continue after the DirectX installation is complete and the computer has restarted.

After you have installed the card, insert the *TerraTec XLerate Installation & Driver CD* into your CD-ROM drive and start Windows 95.

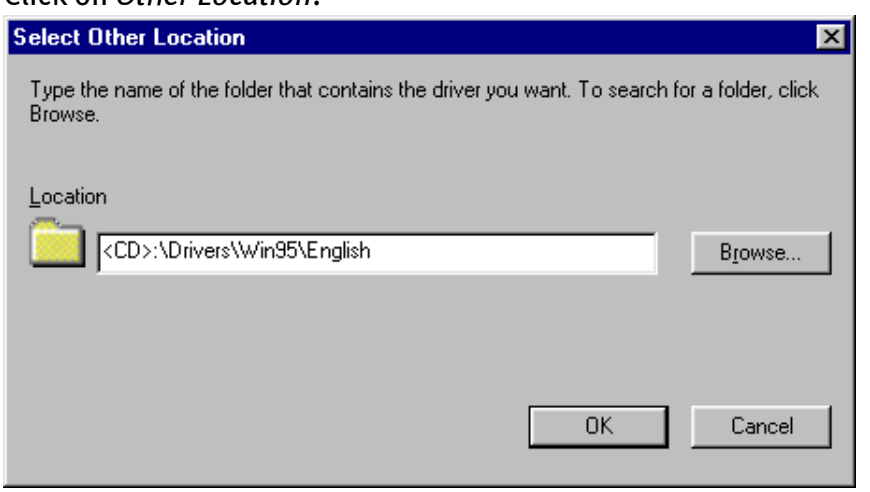
The following screen will appear.



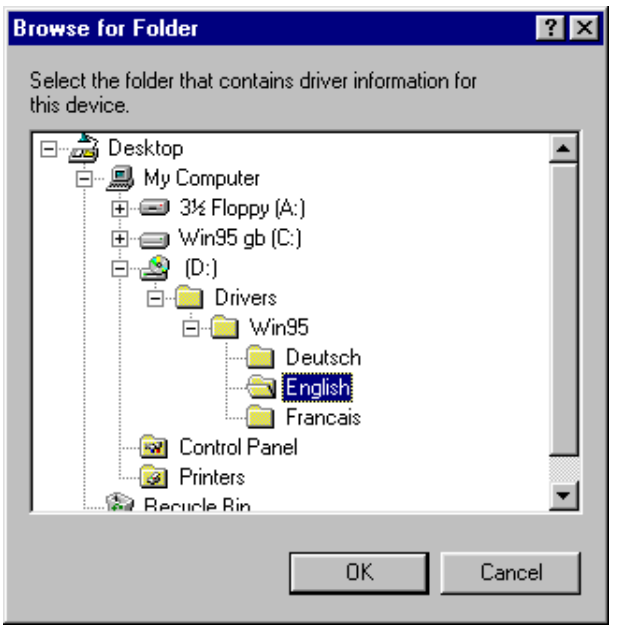
Click on *Continue* with the left mouse button.



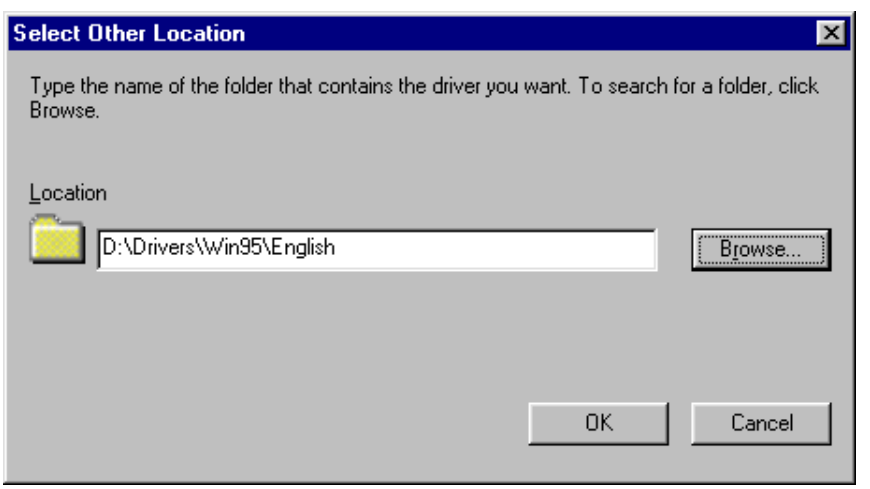
Click on *Other Location*.



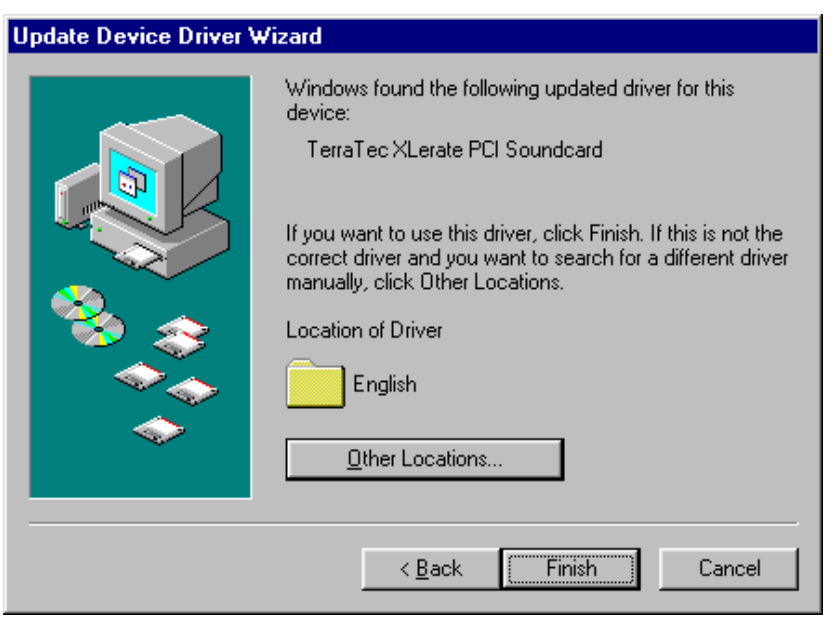
Type the path **<CD>:\\Drivers\\Win95\\English**and click *OK*, or click *Browse*to locate the correct folder using the mouse.



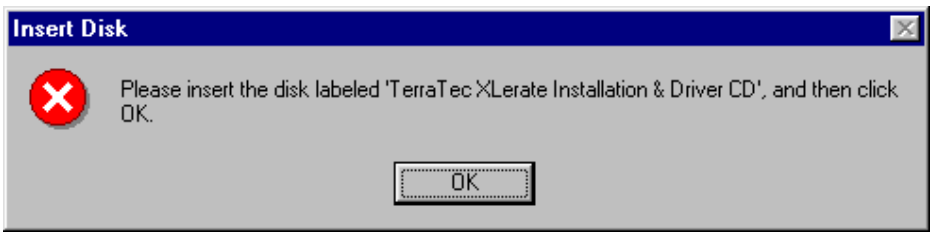
If you selected *Browse*, switch to your CD-ROM drive in the following window. Next, switch to the folder **<CD>:\Drivers\Win95\English** and click *OK*



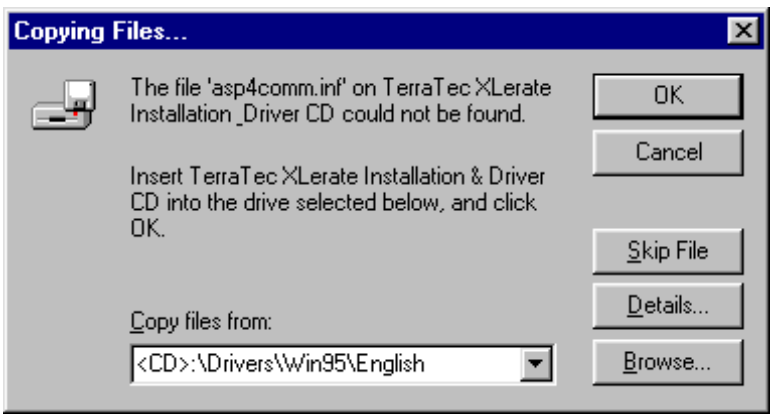
Confirm the path by clicking *OK*.



Click on *Continue* to install the drivers for the TerraTec XLerate.

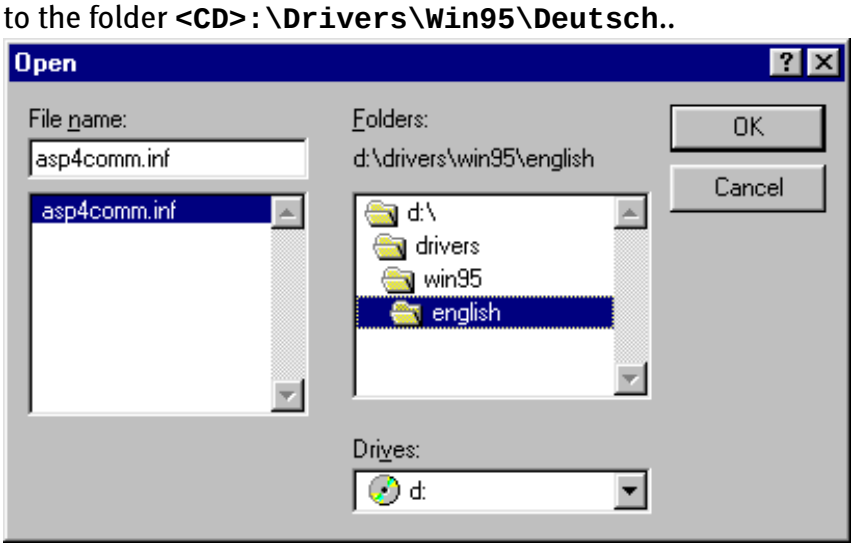


Click on *OK*.

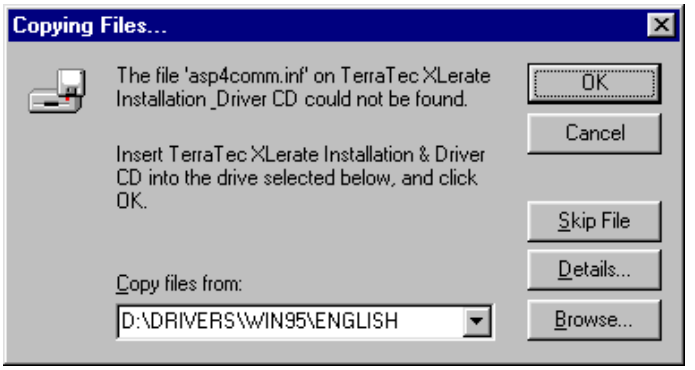


Type the path **<CD>:\\Drivers\\Win95\\English** and click *OK*, or click *Browse* to locate the correct folder using the mouse.

If you selected *Browse*, switch to your CD-ROM drive in the following window. Next, switch to the folder **<CD>:\Drivers\Win95\Deutsch**..

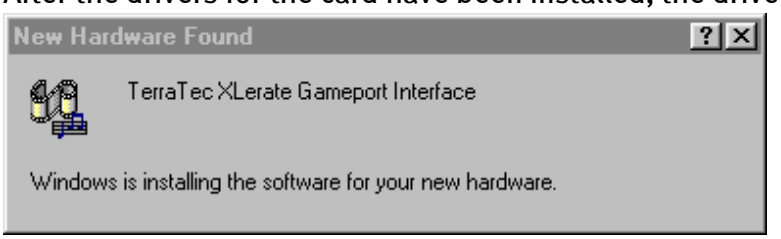


Click on *OK*



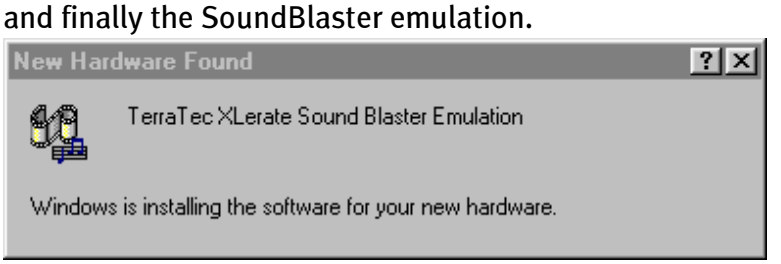
Confirm the path by clicking *OK*.

After the drivers for the card have been installed, the drivers for the gameport are next...



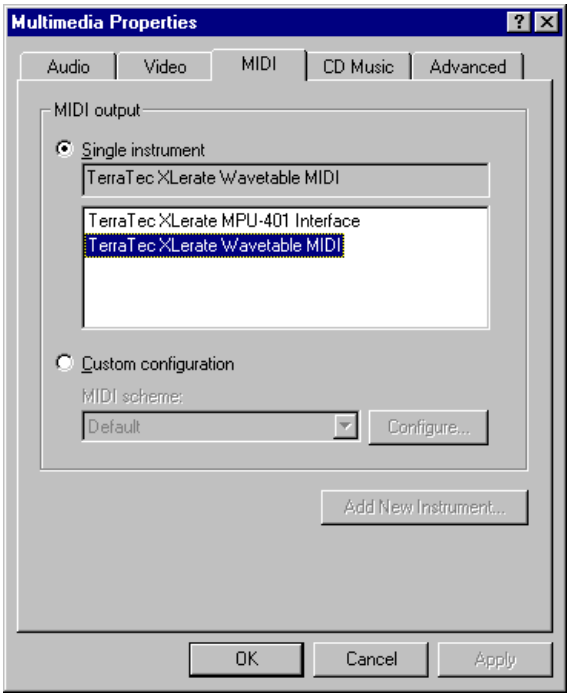
followed by the MPU-401 interface...

and finally the SoundBlaster emulation.



Once all hardware components have been found and the appropriate drivers have been set up, you will be asked whether you would like to install the A3D demos.

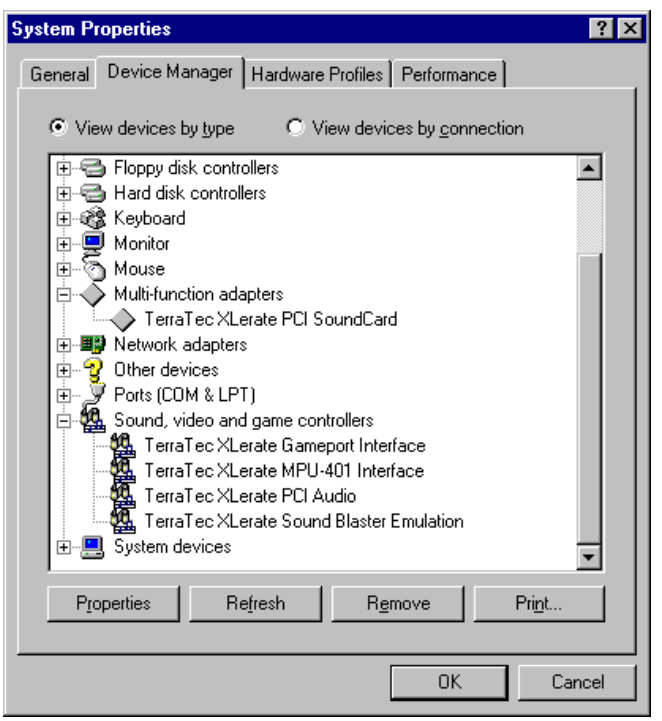
If you answer with *OK*, the A3D demos will be installed automatically. If this automatic installation fails for any reason, enter the path **`<CD>:\A3DDEMOS\setup.exe`** in the following dialog. The installation will then definitely start.



Next, check the MIDI settings. Open the control panel and double-click *Multimedia*. Go the the *MIDI* tab.

If you do not have an external wavetable or wavetable daughterboard, please ensure that the *Terratec Xlerate Wavtable MIDI* entry is active, not *Terratec Xlerate MPU-401 Interface*.

If you have an external wavetable or wavetable daughterboard installed, use this window to set the MIDI output to suit your requirements.



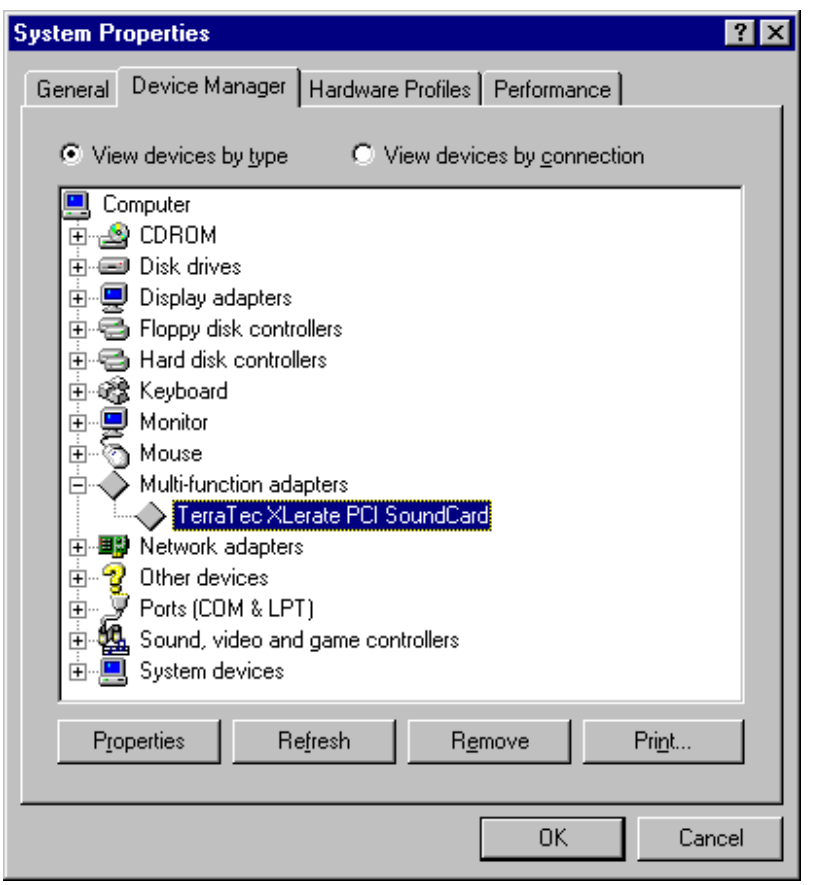
Regardless of your Windows 95 version, the XLerate should appear in the *Device Manager* as follows.

Uninstalling the drivers under Windows 95

Should it ever be necessary to uninstall the XLerate drivers, proceed as follows. The procedure is identical for Windows 95a and Windows 95b.

Open the Control Panel, for example by

Double-clicking on *My Computer* with the left mouse button. Open the *System Properties* window and select the *Device Manager* tab.

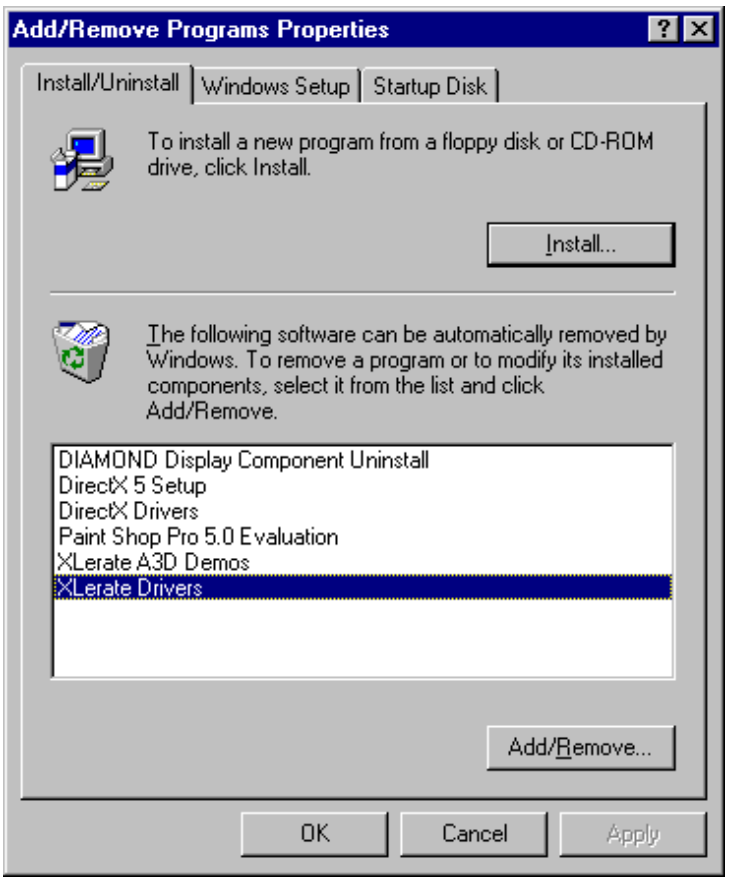


Click on the plus sign in front of the device category *Multi-function cards* and mark the *TerraTec XLerate PCI SoundCard* entry with a second click.

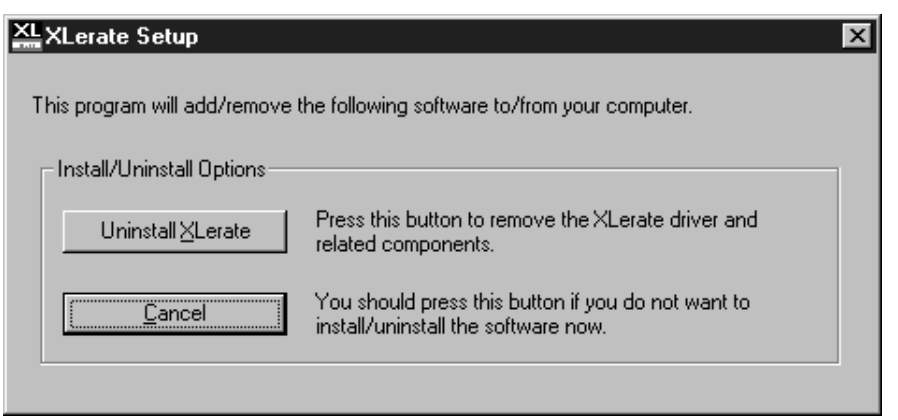
Next, click on *Remove* and confirm the following question regarding the removal of the device from the system configuration with *OK*.

Once the device has been successfully removed, please click on *Close*.

Next, please click on *Add/Remove Programs* in the *Control Panel*. On the *Install/Uninstall* tab, select the *XLerate Drivers* entry from the list of programs and drivers and click *Add/Remove*.



Select *Uninstall XLerate* to remove the drivers and other XLerate components from your system.

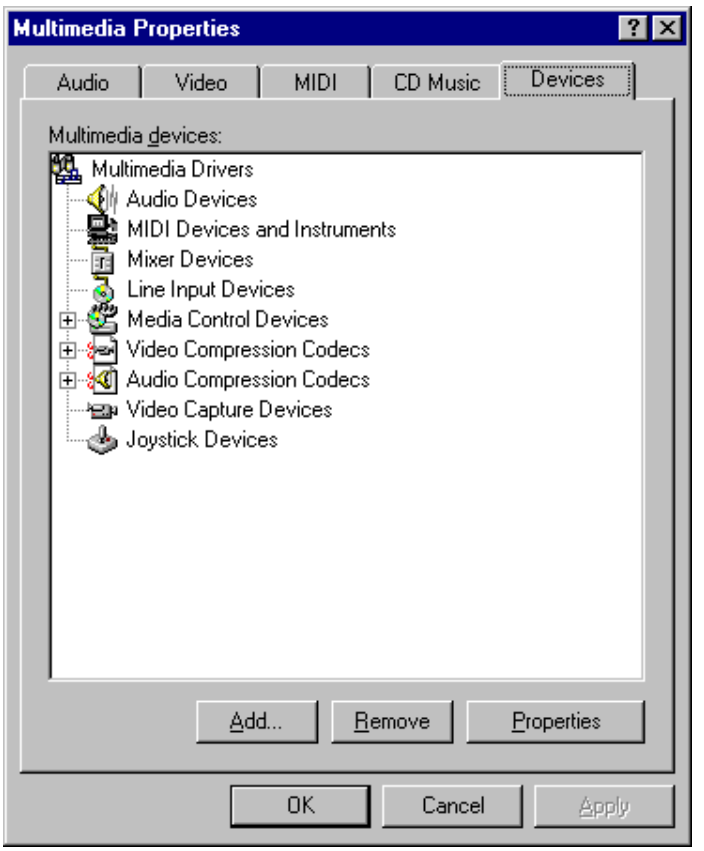


Finally, click on *OK* to complete the removal of the XLerate with its associated drivers and other components.

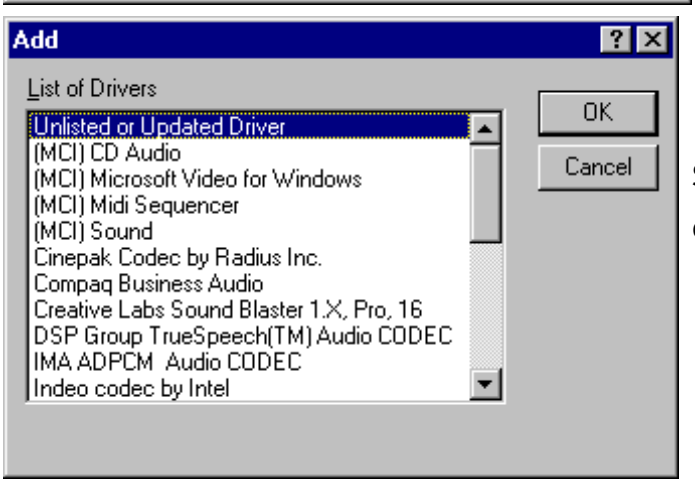
WINDOWS NT 4.0.

Please select:

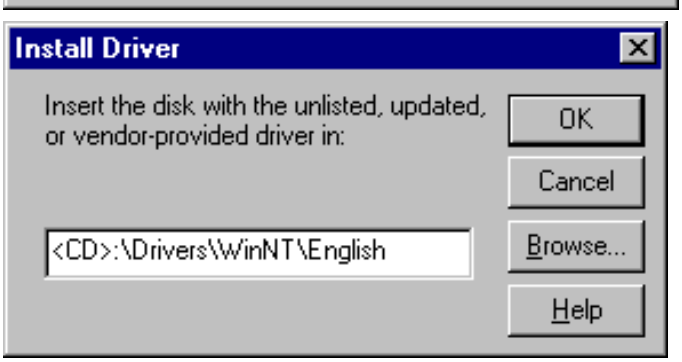
Next, double-click Multimedia.



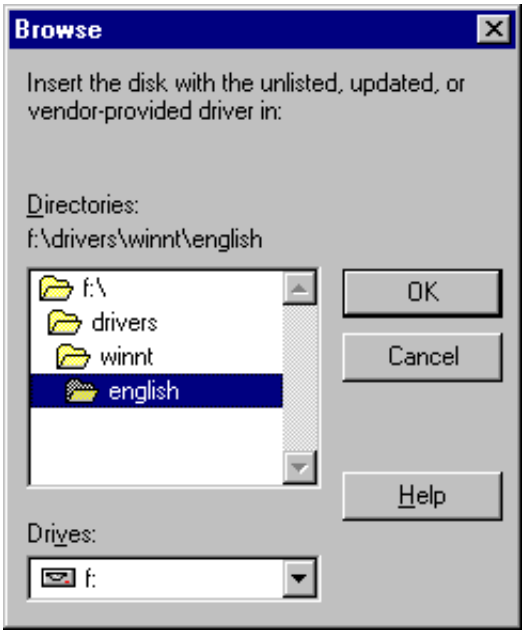
In the *Multimedia Properties* window, go to the *Devices* tab and click *Add*.



Select *Unlisted* or *Updated Driver* and click *OK*.



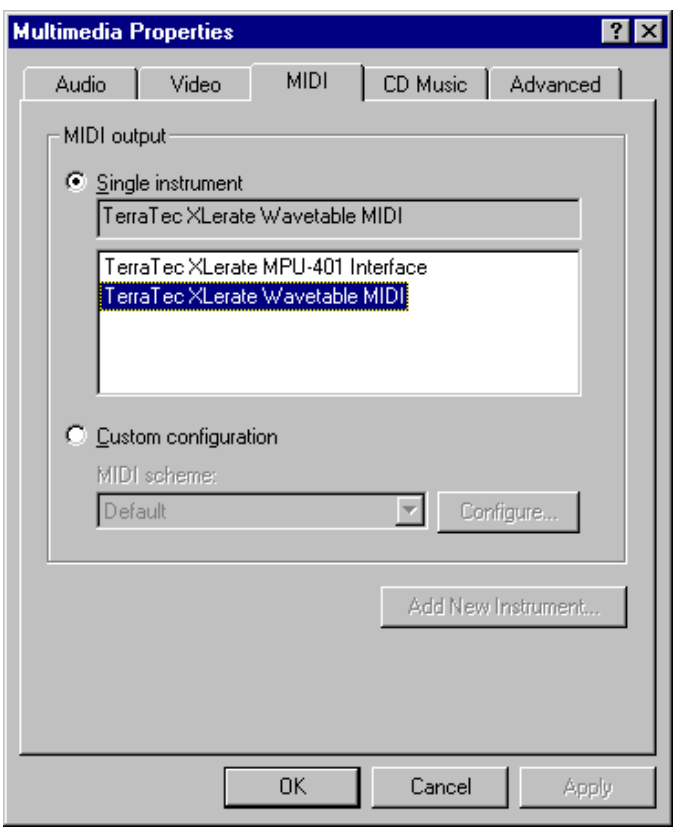
Type the path **<CD>:\Drivers\WinNT\Deutsch**and click *OK*, or click *Browse* to locate the correct folder using the mouse.



If you selected *Browse*, switch to your CD-ROM drive in the following window. Next, switch to the folder **<CD>:\Drivers\WinNT\Deutsch** and click OK.

In the following window, select *XLerate PCI Audio Drivers* and click *OK*.

Confirm that you would like to install the drivers once again in the next window.



Next, check the MIDI settings. Open the control panel and double-click Multimedia. Go the the *MIDI* tab.

If you do not have an external wavetable or wavetable daughterboard, please ensure that the *Teratec Xlerate Wavtable MIDI*entry is active, not *Terratec Xlerate MPU-401 Interface*.

If you have an external wavetable or wavetable daughterboard installed, use this window to set the MIDI output to suit your requirements.

Once the drivers have been successfully installed, please restart your computer.

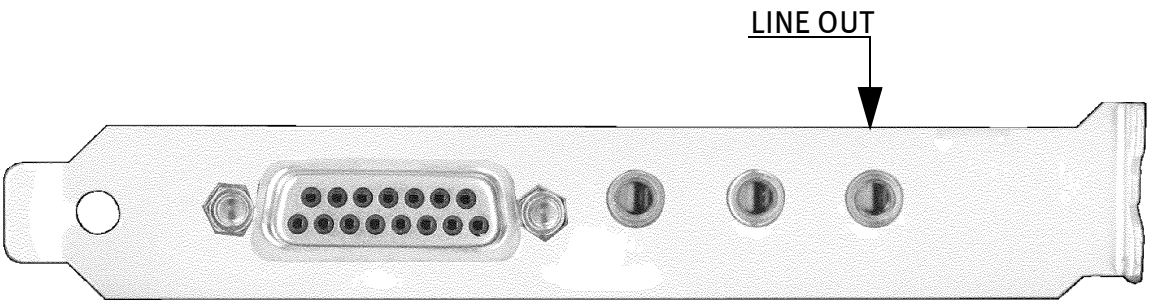
This concludes the installation.

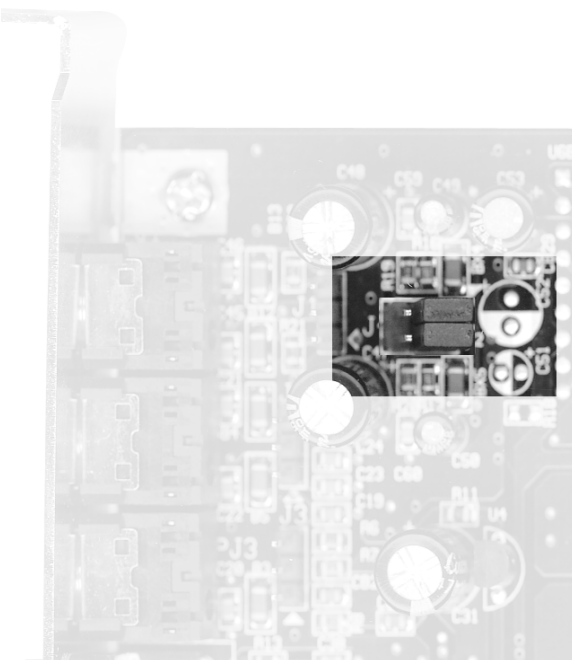
Connecting external periphery

The external peripheral devices you can connect to your XLerate include loudspeakers or headphones, a CD-ROM drive, a MIDI keyboard, a microphone, a joystick and an external audio unit (MD player, CD player, tuner, mixer, etc.).

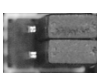
Connecting passive or active loudspeakers.

You can connect passive loudspeakers/headphones or active loudspeakers/stereo system to the sound card output. Any external device such as headphones, passive or active loudspeakers or a stereo system can be connected to the output labeled “Speaker / LINE-OUT”.





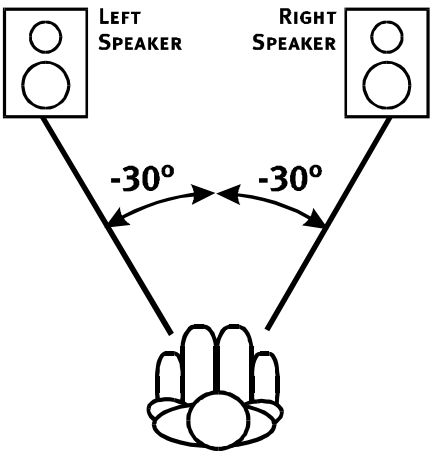
Set the jumper (J4) to enable the onboard preamplifier if you are going to connect passive speakers or headphones, i.e. devices which do not have amplifiers of their own. The preamplifier is disabled by default. Here’s how to switch the preamplifier on or off.



Line OUT
(amplifier off)

Speaker OUT
(amplifier on)

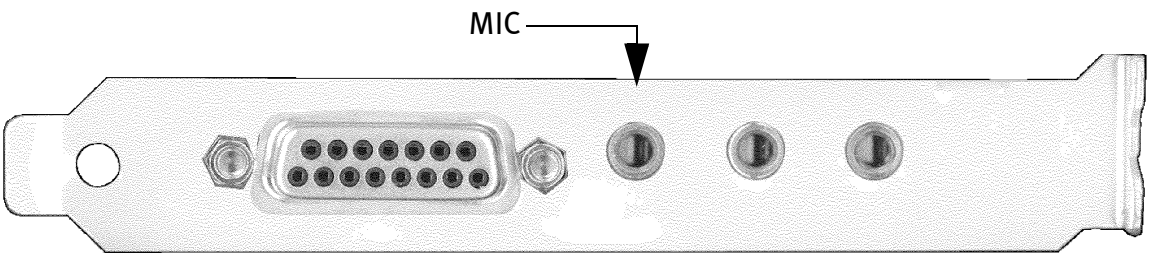
SETTING UP THE SPEAKERS FOR AN OPTIMAL A3D ACOUSTIC IMAGE



We recommend setting up the speakers as shown in the diagram to ensure optimal enjoyment of the A3D acoustic image.

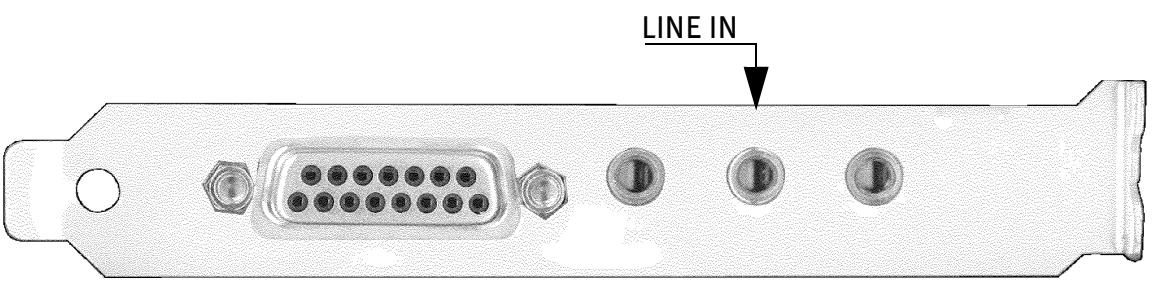
CONNECTING A MICROPHONE.

Use the input labeled *MIC* if you want to connect a microphone. The input sensitivity is adequate for most mainstream commercially available capacitor-type and dynamic micro-phones.



CONNECTING AN EXTERNAL AUDIO SOURCE.

Use the input labeled*"LINE-IN"* for connecting external periphery such as a mixer, CD player, cassette recorder or similar. These external audio sources can be mixed with the internal audio sources using the software-driven mixer, or digitally recorded.



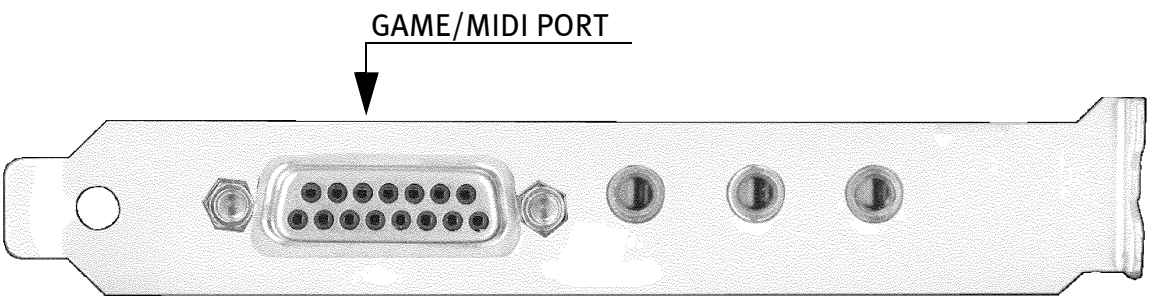
MIDI PORT

You need a special cable, available as an optional extra under the name MIDI-KIT, to connect your sound card to a MIDI keyboard, an external synthesizer or an expander (this cable is included with the TerraTec keyboards). This cable connects to the game/MIDI port to provide a combination joystick, MIDI-IN and MIDI-OUT port.

Important: Use only the MIDI cable provided by the sound-card OEM.

Connect your keyboard's MIDI Out port to the MIDI In port of the MIDI-KIT. Once connected in this way, you can use your keyboard to record music in a sequencer program. If you want to play back MIDI files via your external MIDI devices, connect the MIDI Out plug of the MIDI-KIT to the MIDI In socket of your expander, synthesizer or keyboard.

The port labeled *"MIDI/Game"* is a 15-pin socket to which you can also connect a joystick.



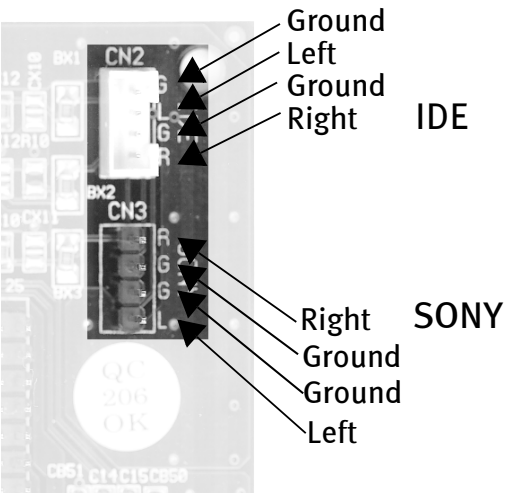
CONNECTING THE JOYSTICK

You can use this 15-pin socket to connect one or two analog joysticks. You can activate or deactivate this port by means of configuration parameters. Bear in mind that you can have only one active joystick port in your PC configuration. If you want to use the port on your sound card you will have to deactivate any other joystick port in the system.

You can use a Y-adapter cable to connect two analog or digital joysticks to a common port. This adapter assigns each of the two joystick channels to a separate connector.

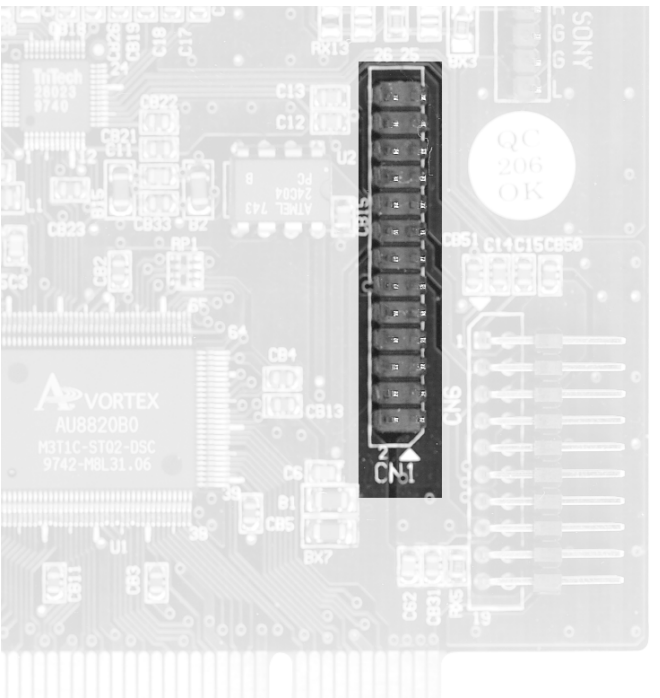
CONNECTING THE CD-ROM AUDIO CABLE

Connect the audio cable from your CD-ROM drive to one of the two audio inputs on the sound card. These connectors are labeled CN3 and CN2. You can use the connector labeled CN2 for most IDE CD-ROM drives. The CD-ROM drive should always be supplied complete with an audio cable. You will find more information in the user documentation you received with your CD-ROM drive and in the chapter “Frequently Asked Questions” (page 54) in the Appendix of this User Guide.



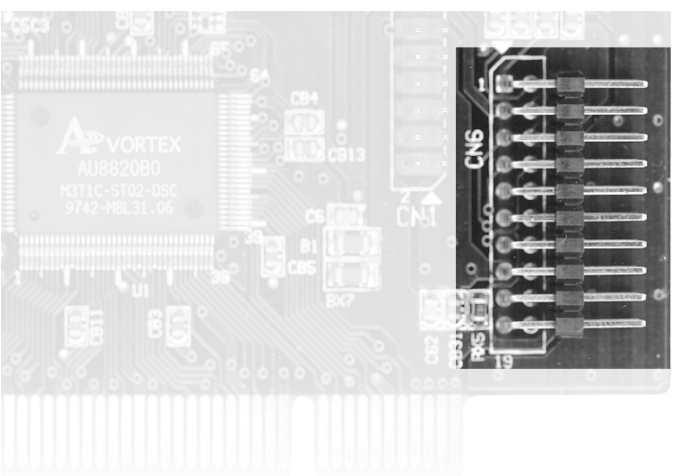
Connecting upgrade cards

Connecting a wavetable module



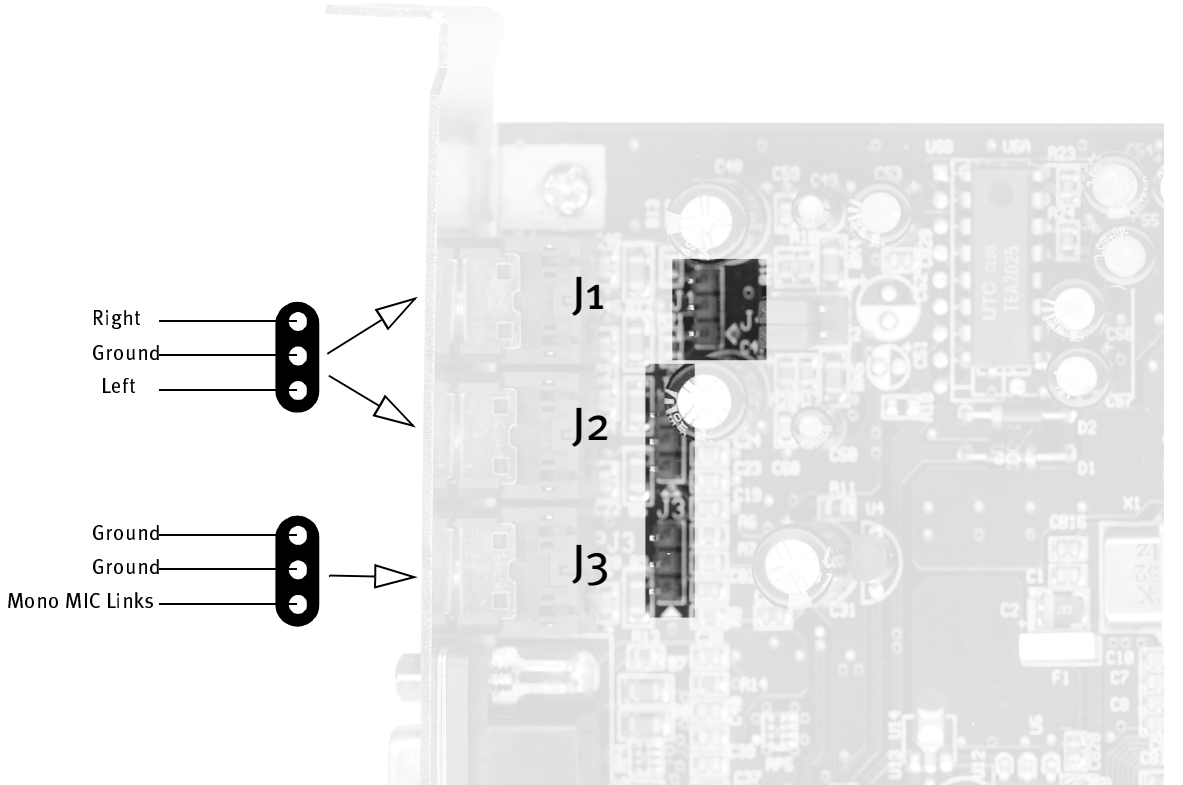
The connector labeled CN1 can be used to connect wavetable modules which are pin-compatible to Wave-blaster. Take care to connect the wavetable module correctly, i.e. pin 1 on the XLerate to socket 1 of the wavetable module. Both connector rows must be correctly aligned to one another. Please also refer to the documentation supplied by the manufacturer of the wavetable module.

Connecting a TerraTec ActiveRadio upgrade module



The connector CN6 is intended exclusively for the optional TerraTec ActiveRadio Module. Here it must also be ensured that pin 1 on the XLerate is connected to socket 1 of the radio module and that both connector rows are correctly aligned. Please also refer to the documentation supplied together with the ActiveRadio Module.

INTERNAL TAPS



Three additional internal pick-offs are available in addition to the connections described above. These are switched in parallel to the external audio connections (Spk/Line OUT, Line IN, Mic IN). The external audio connectors may no longer be used while the internal pick-offs are in operation as the parallel operation of internal and external connectors is not possible.

J1	(speaker/line OUT)
J2	Line IN
J3	Mic IN

The XLerate Control Panel

Configuring the XLerate Control Panel

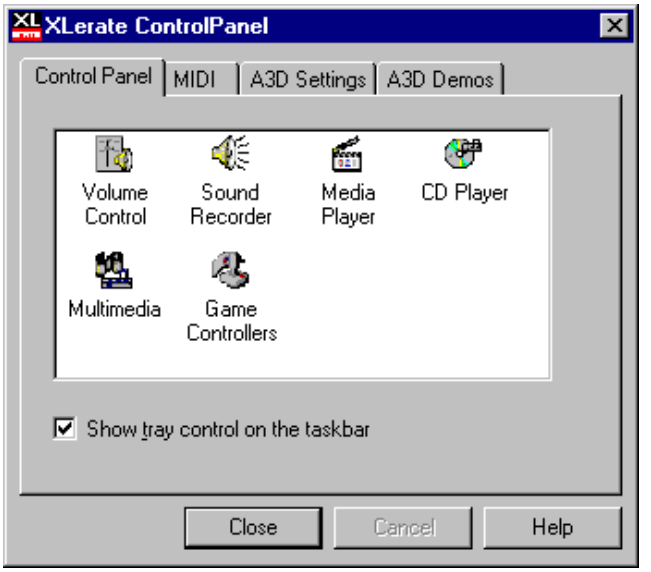
TerraTec provides a small tool to configure the functions of the XLerate sound card. The installation program adds icons to launch the XLerate Control Panel to the Windows Control Panel and Taskbar.

> ***NOTE: The XLerate Control Panel is also available under Windows NT 4.0, but is limited to the Control Panel and MIDI tabs.***

The *A3D Settings* and *A3D Demos* tabs are not available as A3D is supported by Windows 95 only.

Starting and exiting the XLerate Control Panel

The XLerate Control Panel can be launched from either the Control Panel or the taskbar.



If the XLerate icon does not appear in the taskbar, start the XLerate Control Panel from the Windows Control Panel and activate the *Show tray control on the taskbar* option.

To open the XLerate Tray Control menu, right-click on the XLerate icon in the taskbar tray.

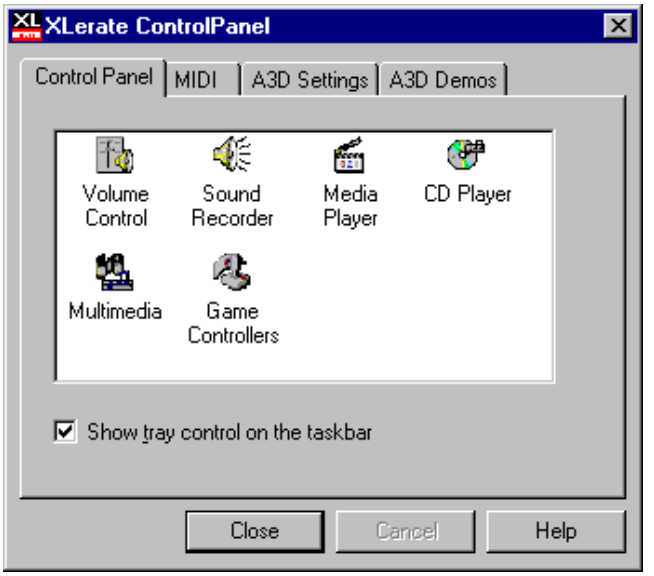
Settings can be adjusted very quickly using the opened menu.

Switching from speakers to headphone output . This setting only applies to A3D applications.

Adjust Audio Properties. The XLerate Control Panel can be launched from here as well.

Remove Tray Control. Removes the Tray Control icon from the taskbar.

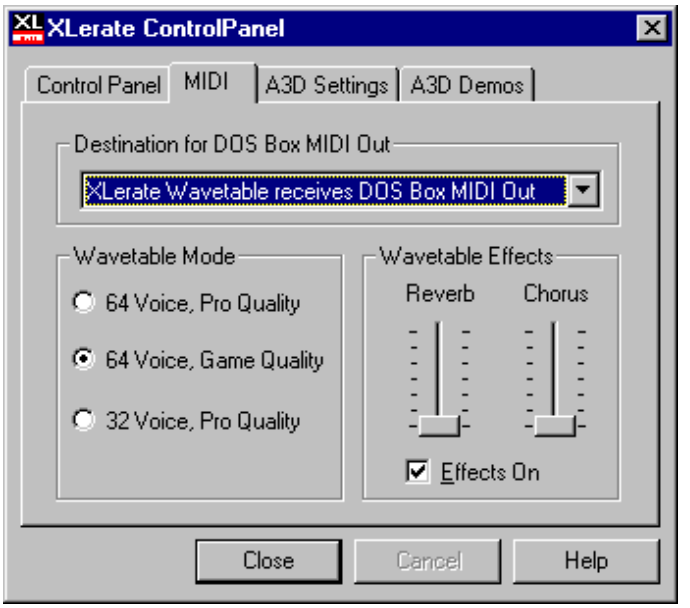
CONTROL PANEL TAB



A variety of Windows 95 or Windows NT 4.0 multimedia applications can be launched from the Control Panel tab. The *Multimedia* and *Game Controllers* Control Panels can also be launched to configure various properties of the card.

The display of the XLerate Control Panel in the taskbar can also be toggled here.

MIDI TAB



DESTINATION FOR DOS BOX MIDI OUT.

This listbox provides options for the processing of MIDI data from DOS box.

XLerate Wavetable receives DOS Box MIDI Out. MIDI data from DOS boxes are processed by the integrated wavetable.

XLerate MPU-401 receives DOS Box MIDI Out. This setting is only relevant if you are using a wavetable daughterboard or an external synthesizer with the XLerate. For more information on this, see the chapter on *Connecting external periphery* (page 27).

WAVETABLE MODE

64 Voice, Pro Quality. 64 voices in the best possible quality.

64 Voice, Game Quality. 64 voices, but with a lower CPU load. This causes only a very minor loss in quality.

32 Voice, Pro Quality. The wavetable synthesis is restricted to 32 voices and optimized. The CPU load is once again reduced significantly.

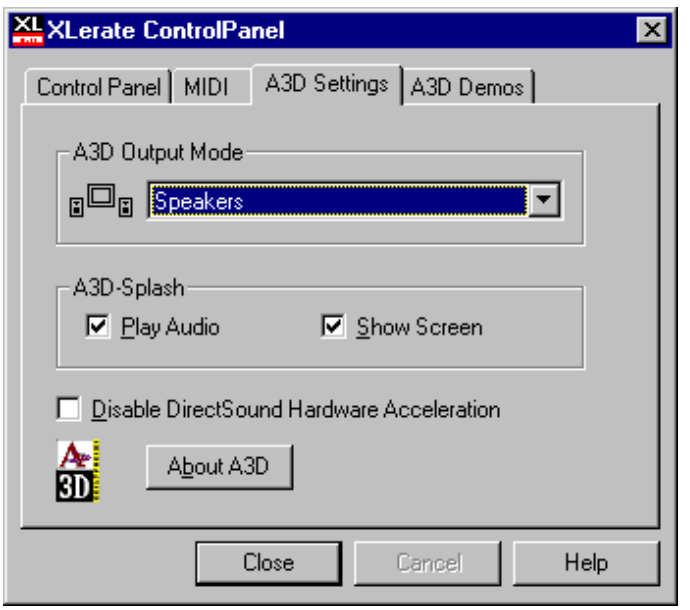
Wavetable Effects

Certain settings for chorus and reverb effects are requested at the start of some MIDI sequences. This permits the fine-tuning of chorus and reverb.

Effects Checkbox. Chorus and reverb effects can be disabled completely here. No effects are audible in the disabled state, even if requested by the sequence. The setting of the checkbox overrides the control settings.

Chorus and Reverb Controls. These controls can be used to set the chorus and reverb effects higher than that specified in the MIDI file. These settings may also be adjusted on the fly during the playback of a MIDI sequence. The settings specified in the MIDI file apply if the adjustors are set to zero. Moving the sliders upwards gradually increases the effects to the maximum level. The position of the sliders has no effect if the maximum levels have already been set in the MIDI file.

A3D Settings tab

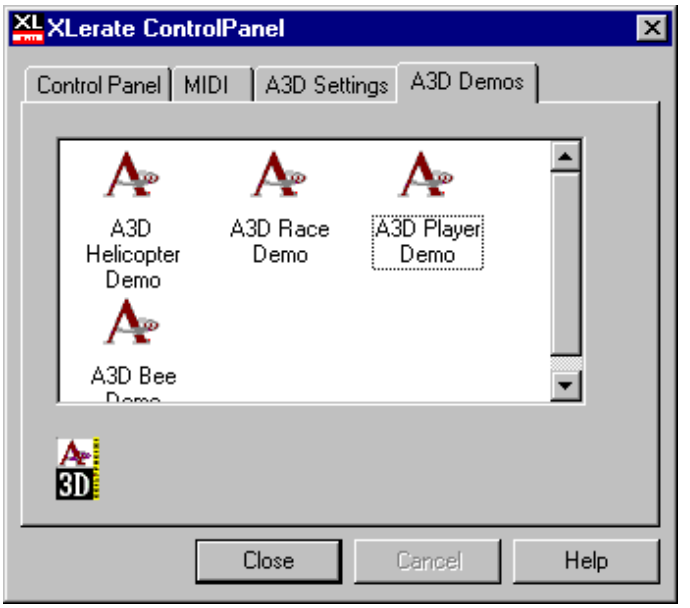


A3D Output Mode. Choice between output via *Speakers* or *Headphones*. This setting only affects A3D applications.

A3D-Splash. The selections in these checkboxes control the A3D sound and splash screen in applications in applications which support A3D.

Disable DirectSound Hardware Acceleration. When checked, this checkbox disables hardware support for DirectSound. We recommend not checking this box so that the hardware-based DirectSound support remains enabled.

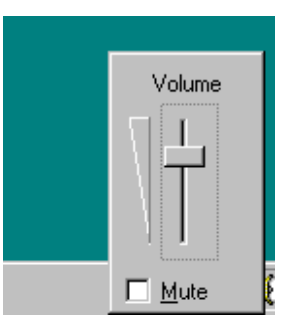
A3D Demos tab



The *A3D Demos* tab is used to launch the A3D demos and A3D player. You will be asked whether you would like to install the A3D demos towards the end of the driver installation process. If you did not install the demos at that time, you will be prompted to do so again when selecting the *A3D Demos* tab.

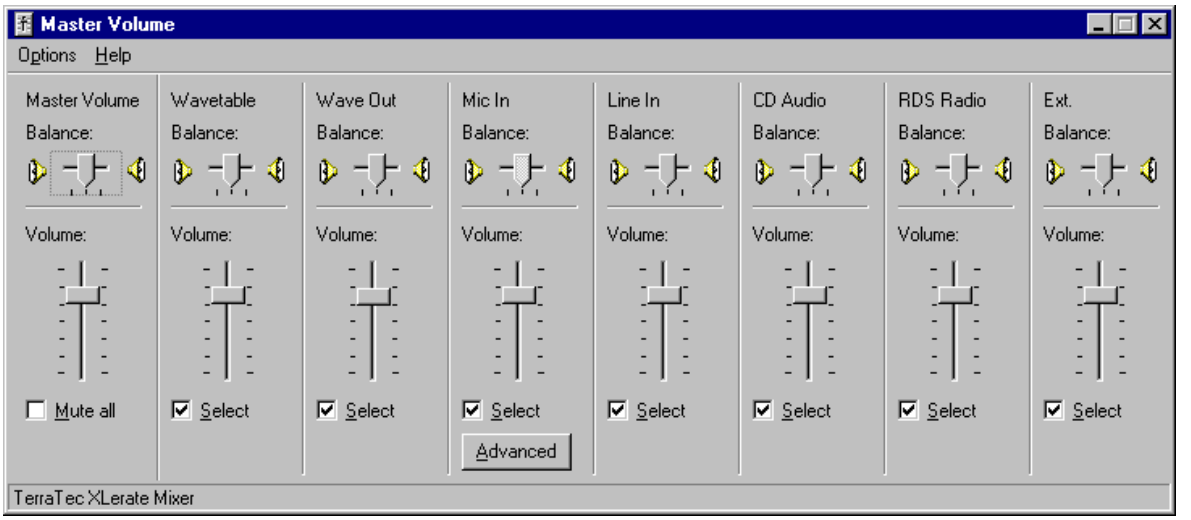
Mixer Settings

The recording and playback levels can be adjusted using the standard Windows 95 mixer. The mixer can be launched using the speaker icon in the Windows 95 taskbar. If the symbol is not present, the mixer can also be launched via the *XLerate Control Panel*. To display the speaker icon on the taskbar, go to the *XLerate Control Panel Multimedia* section and select the *Audio* tab. A checkbox which toggles the display of the speaker icon can be found there below the audio playback settings.

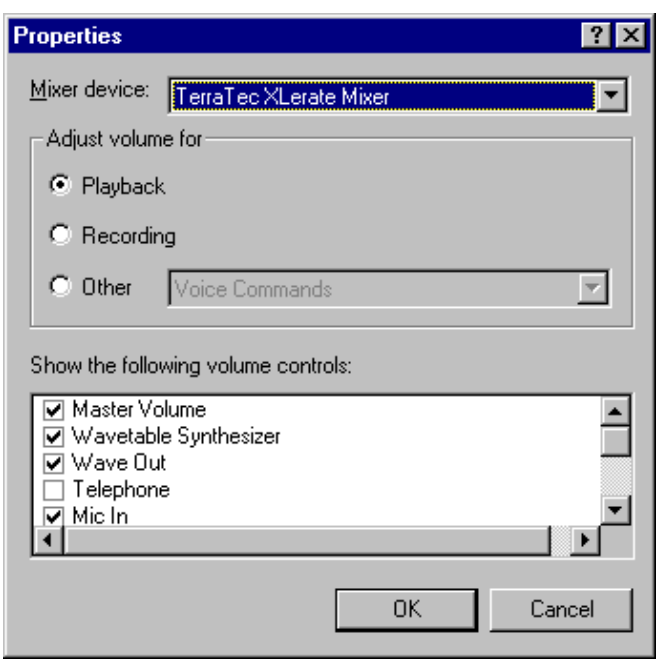


The volume control in the taskbar controls the master volume of DOS box audio output, as well as that of real-mode DOS. If the volume is too low in DOS applications, raise the master volume using the volume control.

If this results in individual audio sources being too loud, they can be adjusted separately using the mixer.



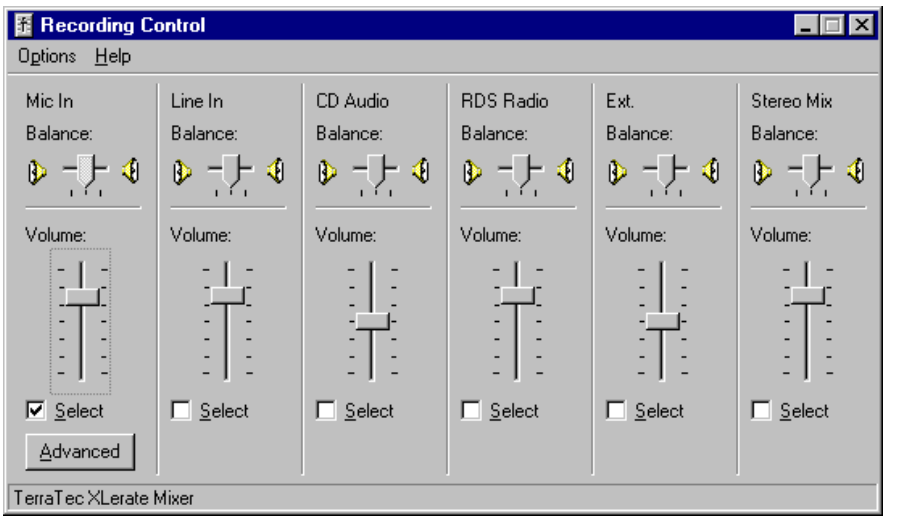
Note: the Windows mixer can also display audio sliders which are not supported by the hardware.



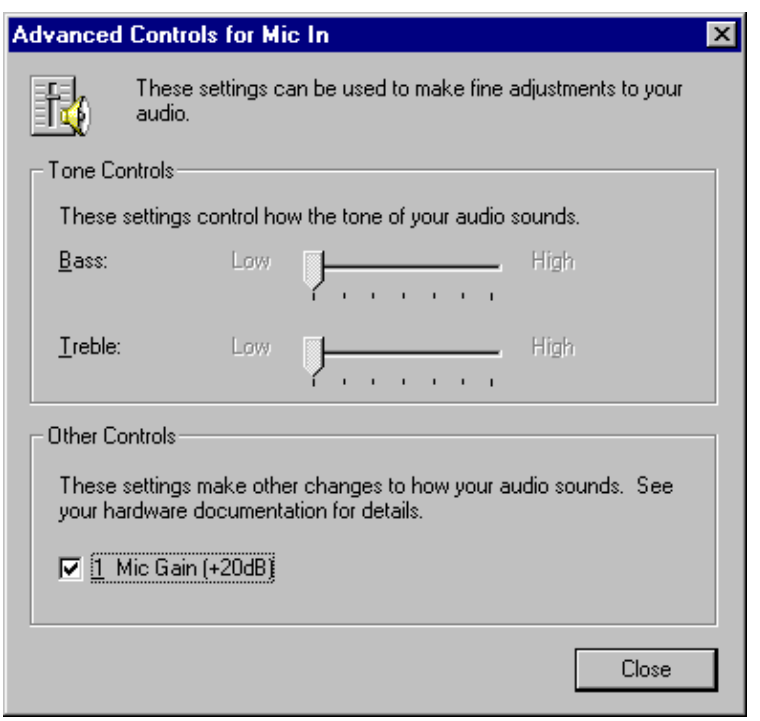
The display of the individual sliders can be selected under *Options* → *Properties*.

The settings for the recording mixer can be adjusted at the same time. The recording sensitivity of voice control software can be adjusted here independently of the recording and playback sliders, provided that the software supports this option.

To start the recording mixer, select *Recording* and click *OK*.



To record a specific audio source, select it here and adjust the slider accordingly.



Both the recording and playback mixers offer the menu item *Advanced Controls* under *Options*. If this item is checked, both mixers display an *Advanced* button. This provides a wider range of adjustment options.

Windows 95 also automatically displays sliders for the *Tone Controls*, even if these are not supported by the driver software.

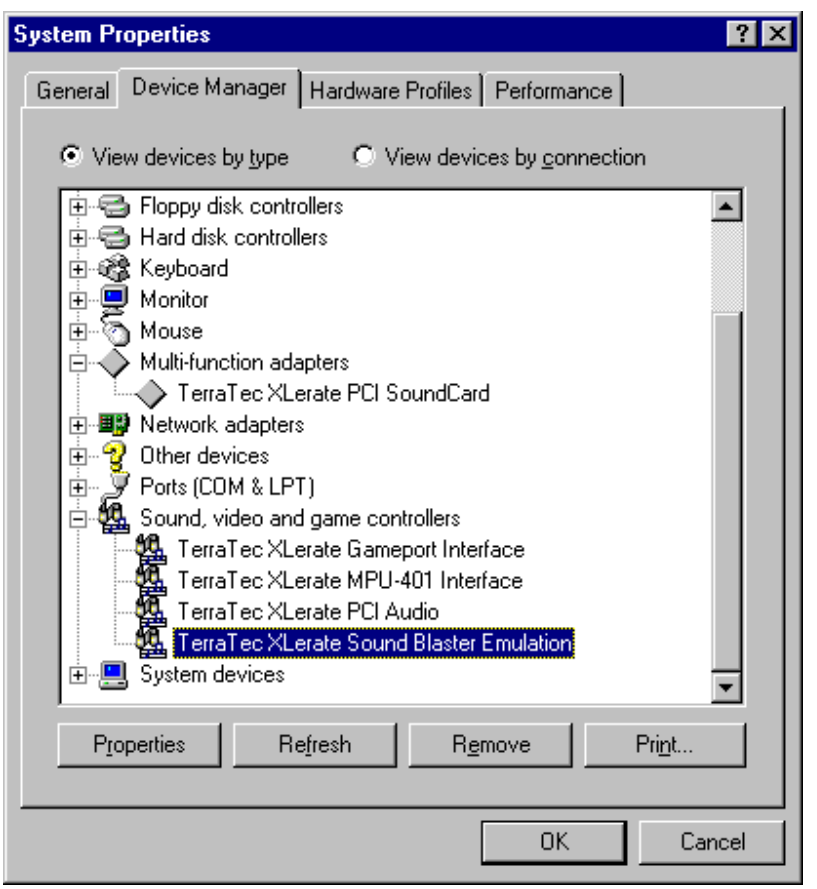
LEGACY AUDIO CONFIGURATION

In most cases it will not be necessary to modify the *Legacy Audio* settings. Should the need arise however, if a game requires settings other than the default, or you have an additional sound card in your system, refer to this section for details.

The free resources of your PC are checked and recorded in a list of possible basic configurations during the installation of the XLerate. The most suitable configuration is at the head of the list.

Configuration	AdLib I/O Port	SoundBLaster Pro I/O Port	SoundBLaster Pro Interrupt	SoundBLaster Pro DMA Channel
Basic Conf. 0	388H	220h	5 or 7	1 and 3
Basic Conf. 1	388H	240h	5 or 7	1 and 3
Basic Conf. 2	388H	220h or 240h	5, 7, 9 or 10	1 and 3
Basic Conf. 3	388H	220h or 240h	5 or 7	1
Basic Conf. 4	388H	220h or 240h	5 or 7	3
Basic Conf. 5	388H	220h or 240h	5, 7, 9 or 10	0, 1, or 3
Basic Conf. 6	388H	220h, 240h, 260h or 280h	5, 7, 9 or 10	0, 1, or 3

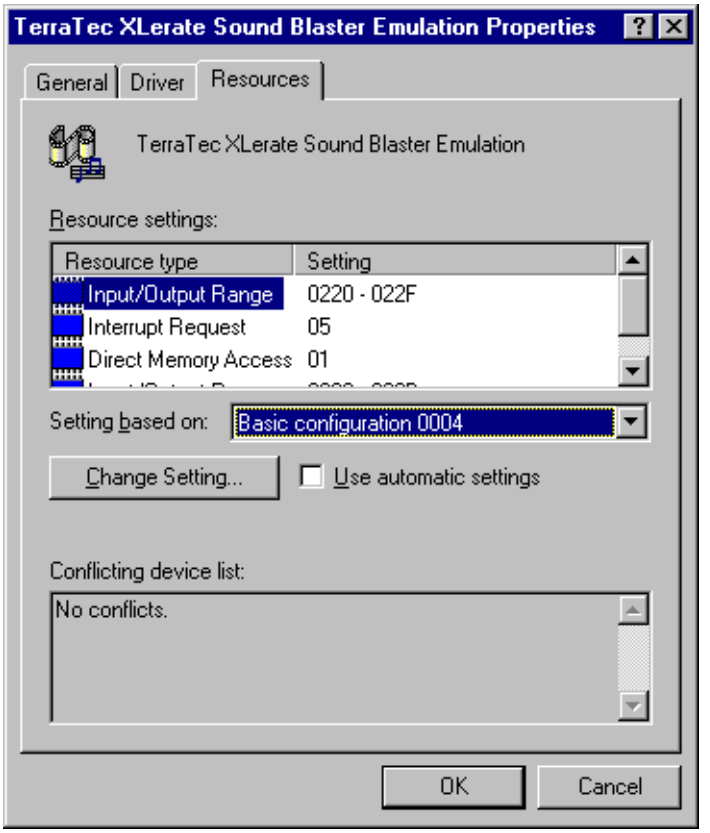
The Windows 95 *Device Manager* may indicate hardware conflicts if addresses, interrupts and DMA channels used by the SoundBlaster Pro emulation are already in use by another card. Use the following procedure to correct these conflicts manually.



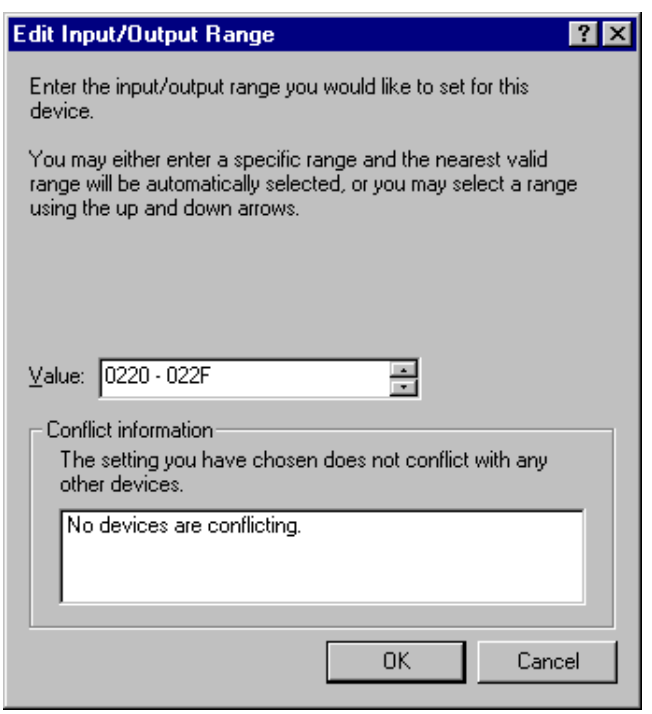
Open the Windows 95 *Device Manager*. Click on the plus sign in front of *Sound, video and game controllers* to access the properties of the SoundBlaster emulation.

Highlight the entry *TerraTec XLerate SoundBlaster Emulation*.

Click on *Properties* and on the *Resources* tab in the following window.



Remove the check mark from *Use automatic settings* to permit the manual assignment of resources. It is now possible to select one of the basic configurations which in order to set various resources. Now click on *Change settings*.... Please note that not all basic configurations permit the modification of settings. Try a number of basic configurations until you find one that permits the modification of resource settings.



You can then assign different resources once you have found such a basic configuration.

Please bear in mind that manual configuration may prevent some applications which require default settings from accessing resources. Please refer to the documentation of your application if necessary to determine which resources the program requires.

Some games also require the so-called BLASTER environment variable to be set. The appropriate modifications were made to your AUTOEXEC.BAT and DOSSTART.BAT files automatically while installing the XLerate drivers.

Your AUTOEXEC.BAT and DOSSTART.BAT should then look something like this:

```
PATH=C:\WINDOWS . . . ASP4DOS SET BLASTER=A220 I5 D3 T4
```

The last two lines were added by the XLerate installation routine. The first line installs the XLerate DOS driver, ASP4DOS.COM, which can be found in the Windows folder.

If your computer does not display the Windows 95 logo while booting, you should see the following entry.

```
VORTEX DOS AUDIO DRIVER (01.00). Copyright © Aureal Semiconductor
PCI AUDIO PRO enabled at Ports 220-22Fh, Interrupt 5, DMA 3, Joy-
stick 201h.
```

In the event that your computer does display the Windows 95 logo, use the *Escape* key to switch to the appropriate view to see which drivers and programs are being loaded.

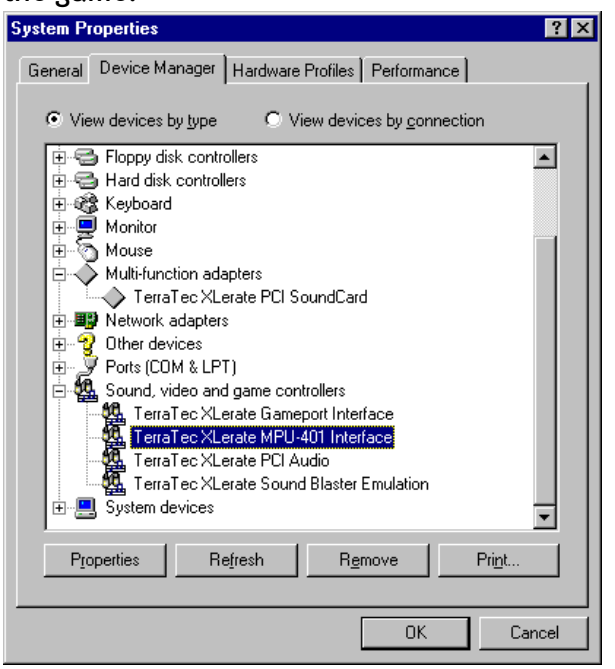
If Windows 95 is being started instead of DOS, the driver is automatically removed from the computer's memory to ensure optimum Windows 95 performance, as Windows 95 does not use the driver.

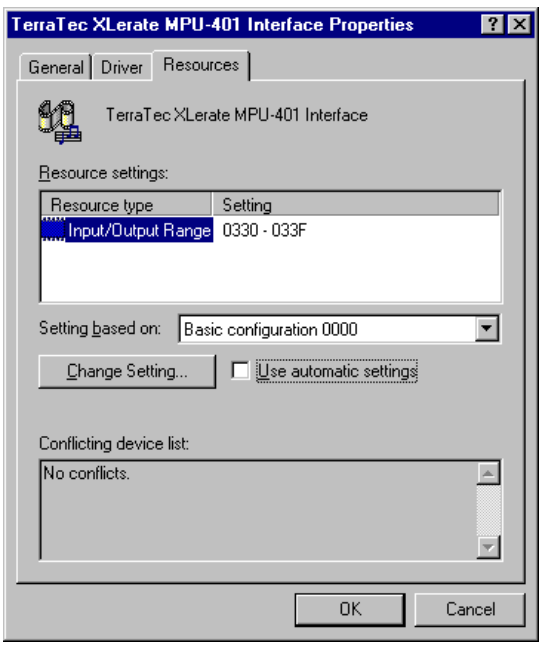
The second line added to the AUTOEXEC.BAT and DOSSTART.BAT files sets the BLASTER environment variable with the suitable values for the resources.

Detailed information on the significance of the individual entries can be found in the Appendix under *Frequently Asked Questions* (page 51).

CONFIGURING THE MIDI PORT ADDRESS MANUALLY

A number of games have the option of playing back music via MIDI. You can select the integrated wavetable for playback in Win95 DOS boxes. This has already been covered in the chapter on *The XLerate Control Panel* (page 33) in the section on the *MIDI tab* (page 36). It's possible to set the MIDI port as shown to ensure that the correct port is addressed by the game.



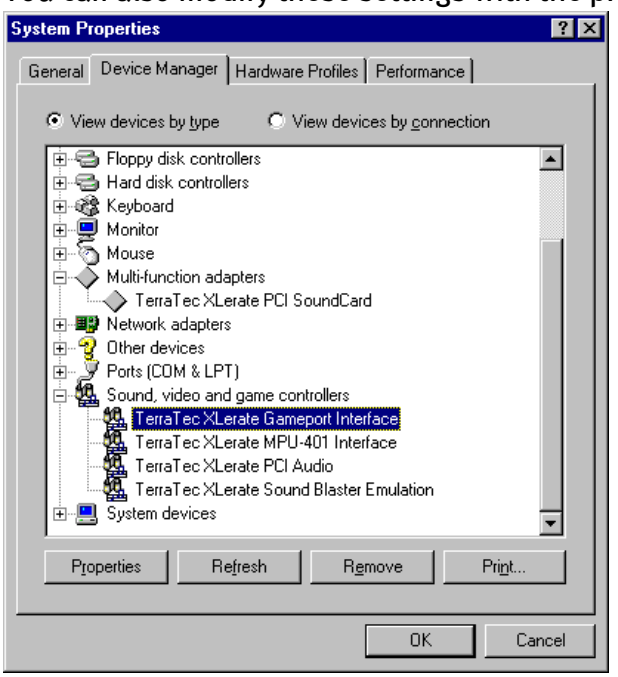


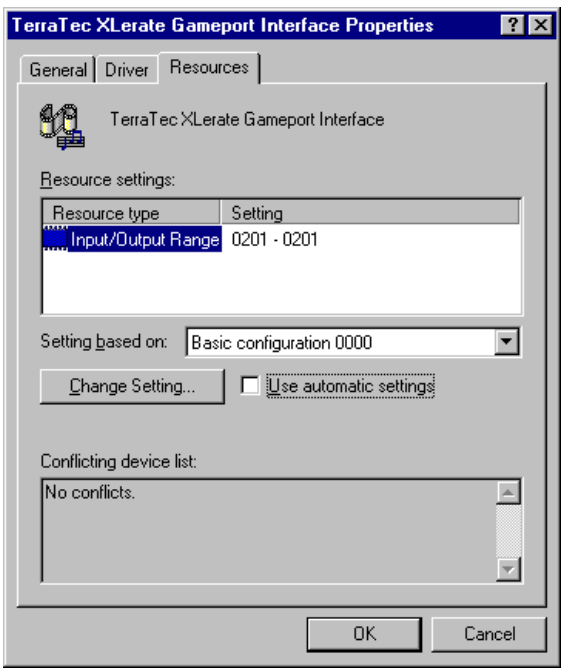
The resources for the SoundBlaster emulation can be changed manually in a manner similar to the procedure described above.

MANUAL CONFIGURATION OF THE GAMEPORT ADDRESS

As DirectX was installed during the setup of the XLerate drivers, the *joystick* driver was expanded by Windows to a *game controller* driver. Routines were added to accelerate the polling of the joystick, for example.

You can also modify these settings with the procedure described above.



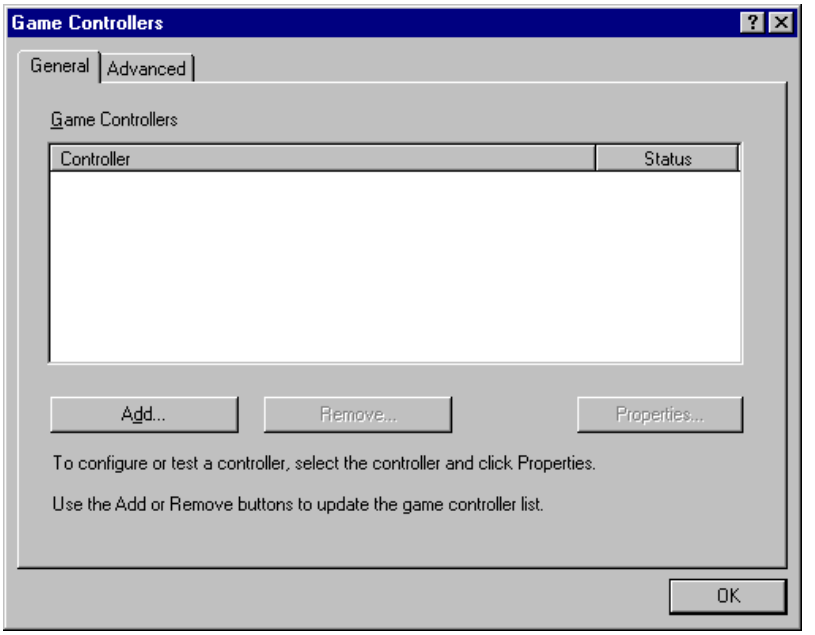


Games which run in a Windows 95 DOS box use the *gameport* address specified in the Device Manager. Games which run under real-mode DOS are not affected by this setting and continue to use the default gameport address (201h).

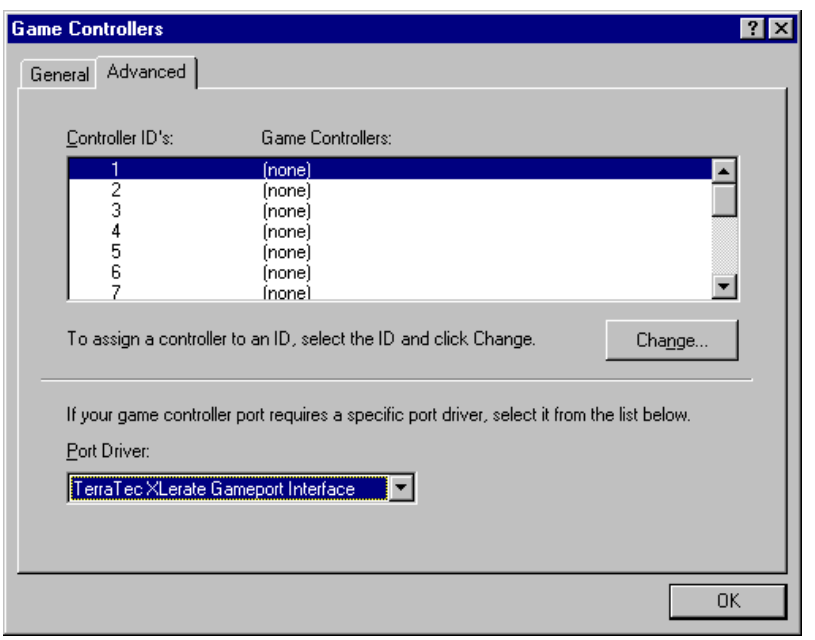
Two different gameport drivers are available for the XLerate:

the default Windows 95 gameport driver and the *TerraTec XLerate gameport interface*.

Open the *XLerate Control Panel* and start the *Game Controller*.



Click on *Add* to install joysticks and other game controllers. Please note that joysticks and game controllers are available which require a separate driver installation, such as the Microsoft *Force Feedback Pro*.



Switch to the *Advanced* tab to select a driver for the gameport interface.

Windows uses the *standard gameport interface* by default. The regular polling of the joystick is performed by the CPU when using this driver, which of course reduces the system performance somewhat.

On the other hand, the *TerraTec XLerate gameport driver* runs DirectX DirectInput routines on the XLerate hardware to reduce the CPU load.

Appendix

Wavetable Instrument Table

Program	Instrument Name	Voices	Program	Instrument Name	Voices	Program	Instrument Name	Voices
0	(Grand) Piano 1	1	43	Contrabass	1	86	Lead 7 (fifths)	2
1	(Bright) Piano 2	1	44	Tremolo Strings	1	87	Lead 8 (bass+lead)	2
2	(El. Grd) Piano 3	1	45	Pizzicato Strings	1	88	Pad 1 (new age)	3
3	Honky-tonk Piano	2	46	Orchestral Harp	2	89	Pad 2 (warm)	1
4	El. Piano 1	1	47	Timpani	1	90	Pad 3 (polysynth)	2
5	El. Piano 2	1	48	String Ensemble 1	1	91	Pad 4 (choir)	2
6	Harpsichord	1	49	String Ensemble 2	1	92	Pad 5 (bowed)	2
7	Clavi	2	50	Synth Strings 1	2	93	Pad 6 (metallic)	2
8	Celesta	1	51	Synth Strings 2	1	94	Pad 7 (halo)	2
9	Glockenspiel	1	52	Choir Aahs	1	95	Pad 8 (sweep)	2
10	Music Box	2	53	Voice Oohs	2	96	FX 1 (rain)	2
11	Vibraphone	1	54	Synth Voice	1	97	FX 2 (soundtrack)	2
12	Marimba	1	55	Orchestra Hit	1	98	FX 3 (crystal)	2
13	Xylophone	1	56	Trumpet	1	99	FX4 (atmosphere)	2
14	Tubular Bells	1	57	Trombone	1	100	FX 5 (brightness)	2
15	Dulcimer (Santur)	1	58	Tuba	1	101	FX 6 (goblins)	2
16	Drawbar Organ	1	59	Muted Trumpet	1	102	FX 7 (echoes)	1
17	Percussive Organ	2	60	French Horn	2	103	FX 8 (sci-fi)	2
18	Rock Organ	1	61	Brass Section	1	104	Sitar	1
19	Church Organ	1	62	Synth Brass 1	1	105	Banjo	1
20	Reed Organ	1	63	Synth Brass 2	1	106	Shamisen	1
21	Accordion (french)	2	64	Soprano Sax	2	107	Koto	1
22	Harmonica	1	65	Alto Sax	1	108	Kalimba	1
23	Tango Accordion	2	66	Tenor Sax	2	109	Bag pipe	1
24	Ac. Guitar (Nylon)	1	67	Baritone Sax	1	110	Fiddle	1
25	Ac. Guitar (Steel)	1	68	Oboe	1	111	Shanai	1
26	El. Guitar (jazz)	2	69	English Horn	2	112	Tinkle Bell	2
27	El. Guitar (clean)	1	70	Bassoon	1	113	Agogo	1
28	El. Guitar (muted)	1	71	Clarinet	1	114	Steel Drums	1
29	Overdriven Guitar	1	72	Piccolo	1	115	Woodblock	1
30	Distortion Guitar	1	73	Flute	1	116	Taiko Drum	1
31	Guitar harmonics	1	74	Recorder	1	117	Melodic Tom	1
32	Acoustic Bass	2	75	Pan Flute	2	118	Synth Drum	1
33	Elec. Bass (finger)	2	76	Blown Bottle	2	119	Reverse Cymbal	1
34	Elec. Bass (pick)	2	77	Shakuhachi	2	120	GuitarFretNoise	1
35	Fretless Bass	1	78	Whistle	1	121	BreathNoise	2
36	Slap Bass 1	2	79	Ocarina	2	122	Seashore	2
37	Slap Bass 2	1	80	Lead 1 (square)	1	123	BirdTweed	1
38	Synth Bass 1	1	81	Lead 2 (sawtooth)	1	124	TelRing	1
39	Synth Bass 2	3	82	Lead 3 (calliope)	3	125	Helicopter	1
40	Violin	1	83	Lead 4 (chiff)	1	126	Applause	2
41	Viola	1	84	Lead 5 (charang)	1	127	Gunshot	1
42	Cello	1	85	Lead 6 (voice)	1			

WAVETABLE PERCUSSION TABLE

.

Note	Key	Instrument	Note	Key	Instrument	Note	Key	Instrument
C2	36	Rock Bass Drum	F#3	54	Tambourine	C5	72	Long Whistle [EXC2]
C#2	37	Side Stick	G3	55	Splash Cymbal	C#5	73	Short Guiro [EXC3]
D2	38	Snare Drum 1	G#3	56	Cowbell	D5	74	Long Guiro [EXC3]
D#2	39	Hand Clap	A3	57	Crash Cymbal 2	D#5	75	Claves
E2	40	Snare Drum 2	A#3	58	Vibraslap	E5	76	Hi Wood Block
F2	41	Low Floor Tom Tom	B3	59	Ride Cymbal 2	F5	77	Low Wood Block
F#2	42	Closed HiHat [EXC1]	C4	60	Hi Bongo	F#5	78	Mute Cuica [EXC4]
G2	43	High Floor Tom	C#4	61	Low Bongo	G5	79	Open Cuica [EXC4]
G#2	44	Pedal HiHat [EXC1]	D4	62	Mute Hi Conga	G#5	80	Mute 3angle [EXC5]
A2	45	Low Tom	D#4	63	Open Hi Conga	A5	81	Open 3angle[EXC5]
A#2	46	Open HiHat [EXC1]	E4	64	Low Conga	A#5	82	Shaker
B2	47	Low-Mid Tom	F4	65	High Timbale	B5	83	Jingle Bell
C3	48	Hi Mid Tom	F#4	66	Low Timbale	C6	84	BellTree
C#3	49	Crash Cymbal 1	G4	67	High Agogo	C#6	85	Castanets
D3	50	High Tom	G#4	68	Low Agogo	D6	86	Mute Surdo [EXC6]
D#3	51	Ride Cymbal 1	A4	69	Cabasa	D#6	87	Open Surdo [EXC6]
E3	52	Chinese Cymbal	A#4	70	Maracas	E6	88	-
F3	53	Ride Bll	B4	71	Short Whistle[EXC2]	F#3		

MIDI IMPLEMENTATION CHART

Message Type	Function	Status [b] (D7-Do)	Data (D7-Do) (D7-Do)	Description	RX	TX
Channel Messages	Note Off	1000cccc	0kkkkkkk 0vvvvvvv	(kkkkkkk) = key (note) number. (vvvvvvv) = velocity.	O	X
	Note On	1001cccc	0kkkkkkk 0vvvvvvv	(kkkkkkk) = key (note) number. (vvvvvvv) = velocity.	O	
	Control Change	1011cccc	0nnnnnnn 0vvvvvvv n = 1 n = 5 n = 7 n = 10 n = 11 n = 64 n = 91 n = 93 n = other	(nnnnnnn) = controller number. (vvvvvvv) = new value. Mod wheel. Data entry. Volume. Pan. Expression. Sustain. Reverb send. Chorus send. Other.	 O O O O O O O O X	
	Mode Change	1011cccc	0nnnnnnn 0vvvvvvv n = 122, v = 0/ 127 n = 123, v = 0 n = 124, v = 0 n = 125, v = 0 n = 126, v = cccc n = 127, v = 0	(nnnnnnn) = controller number. (vvvvvvv) = new value. Local control off/on. All notes off. Omni mode on. [c] Omni mode off. [c] Mono mode on. [c] Poly mode on. [c]	 **X** O X X X X	
	Program Change	1100cccc	0ppppppp	(ppppppp) = new program number.	**O**	
	Pitch Bend Change	1110cccc	0mmmmmmm 0nnnnnnn	(mmmmmmm) = LSBs. (nnnnnnn) = 7 MSBs. 200H = Center.	O	
	Pitch Bend Sensitiv-ity	1011cccc	01000000 00000000 01000001 00000000 vvvvvvvv	(vvvvvvvv) = pitch bend sensitivity in 0-24 semitone range. default setting: 2 semitones.	X	
	Channel Aftertouch	1101cccc	0vvvvvvv	–	**O**	
	Polyphonic Aftertouch	1010cccc	0kkkkkkk 0vvvvvvv	(kkkkkkk) = key (note) number. (vvvvvvv) = pressure value.	**X**	
System Messages	System Exclusive.	11110000	–	Vortex 1.0 does not support any system exclusive messages.	**X**	
	End of Exclusive	11110111			X	
	Song Pos.Ptr.	11110010	0lllllll 0mmmmmmm	Wavetable support does not require support for sequencer control messages.	**X**	
	Song Select	11110011	0sssssss		**X**	
	Tune Request	11110110	–		X	
	Timing Clock	11111000	–		**X**	
	Start	11111010	–		**X**	
	Continue	11111011			X	
	Stop	11111100			X	
	Active Sense	11111110	–	–	**X**	
	Reset	11111111	–	–	**X**	

a. O = recognized, X = not transmitted/not recognized. b.cccc = MIDI channel 1~16. c.Causes all notes off.

Frequently Asked Questions

This section contains brief instructions on how to solve problems that may crop up during installation or operation of your sound card.

Please ensure that you are using the latest *TerraTec XLerate* driver versions.

The latest versions are available from the following sources:

TerraTec ReActor BBS: **02157 (2157) 8179-24** (analog)
02157 (2157) 8179-42 (ISDN)

TerraTec in the Internet: **http://www.terratec.net**

or simply send a self-addressed envelope to the TerraTec Support Department. Please specify the product name and your registration number.

Please refer to this chapter if you encounter problems, as most can be resolved easily.

The joystick doesn't work.

Only one joystick can be active at a time in a PC. Ensure that either the joystick port of your motherboard/controller or that of the sound card is switched off.

When using certain programs, I get error messages similar to "Environment variable not found" and/or my sound card remains silent.

Some programs expect a DOS environmental variable when in Soundblaster or Soundblaster Pro mode. This environment variable is defined in a line of the **AUTOEXEC.BAT**. Here's the format of the variable:

```
SET BLASTER=Awww Ix Dy Tz
```

in which the lower-case letters stand for the following values:

"www"	= Soundblaster port address	(default: 220)
"x"	= Soundblaster interrupt level	(default: 5)
"y"	= Soundblaster DMA channel	(default: 1)
"z"	= card type	(2 for Soundblaster or 4 for Soundblaster Pro

A typical line could look like this:

```
SET BLASTER=A220 I5 D1 T4
```

Please note that some programs also need this variable in their own **AUTOEXEC.BAT** in the DOS box under Windows 95.

A keyboard connected to the sound card does not react when I hit a key.

1. First, ensure that the driver for communications with the keyboard has been installed.

2. With the driver installed, make sure that the appropriate sequencer software is selected as MIDI input device. Consult the user documentation for your sequencer for details. Most sequencer programs have a menu item labeled “Setup/MIDI Devices”, where you can select MIDI input and MIDI output devices.

If both these conditions are satisfied and the problem persists, in other words the software does not react when you hit a key or no sound is audible, the MIDI connecting cable is almost certainly the cause of the trouble.

There are very many different MIDI connecting cables available on the market, and unfortunately they all look exactly the same. The cable should have an integral optocoupler tuned to the level of the sound card. There is no way to check this simply by looking at the cable, so you must always use a MIDI cable supplied by the sound-card manufacturer. We have included a cable of this type in our product range precisely on account of this difficulty; you

THE TERRATEC HOTLINE

If you still have problems or questions, please review all of the instructions in this handbook first. If you have questions related to MIDI or wavetable synthesis, please refer to the MIDI guide on the setup CD.

Questions related to settings of the included software are covered in the online software handbook which permits the quick resolution of a wide range of problems.

If you are certain that you can't solve your problem without assistance, please call our hotline.

Our friendly support team is available from Monday through Friday from 13:00 PM to 20:00 PM Central European Time under the number 02157 (2157) 817914. Please have the following information handy to ensure that your call is processed quickly:

- Your registration number
- The handbooks
- A printout of your configuration files
- The handbook of your motherboard
- A screenshot of your BIOS configuration.

If possible, call while seated at your running computer. Please also make a note of the name of the support staff member, as you will be needing it if the card is defective and needs to be sent in.

Another source of help is our Internet support page:

http://www.terratec.net/support.htm

When using the Internet support page, it is also useful to have all of the information related to your computer within reach. Providing detailed information about your problem increases the chances of getting quick assistance.

Please do not send us calls for help by snail mail, fax or carrier pigeon. For organizational reasons we will not be able to respond.

TerraTec service

TerraTec offers direct service, in other words if a malfunction occurs you can contact us instead of going through a retailer.

Your advantages are:

- Shorter lines of communication: straight to us instead of going though retail, wholesaler and distributor.
- Better hands-on supervision: The more intermediaries involved the bigger the chance of shipments going missing or suffering damage.
- Faster handling: Shipments are processed in the order in which they are received and not held back by a wholesaler or distributor who waits until a bulk shipment cuts costs.
- Direct feedback: If we have any queries we can contact you quickly and directly.

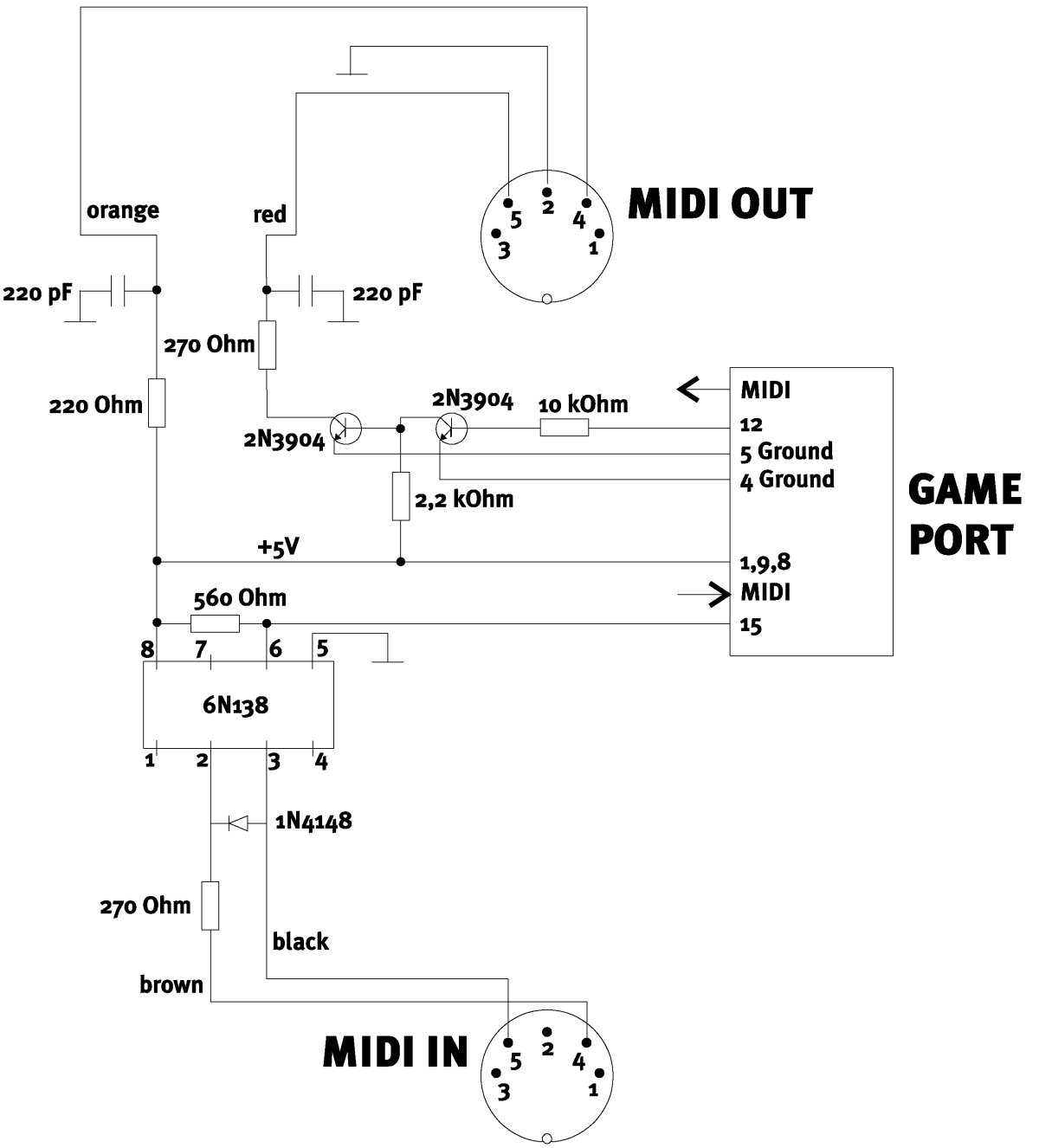
If you run into a problem you cannot solve please phone our hotline and note the name of the person who takes your call, because this will ensure that your card is not sent in vain.

This precaution will help save unnecessary cost (see customer service card). Experience shows that the chances of solving a problem on the phone are very high. The number of cards that are actually defective, on the other hand, is negligible by comparison.

If a problem crops up, always adopt the following procedure:

1. Consult the appropriate part of the User Guide, just in case you missed something.
2. Call our hotline support (see above).
3. Complete the customer service card, describing the problem as accurately as possible.
4. Note the name of the hotline support specialist you talked to on the customer service card.
5. Carefully pack the sound card in its original packaging, complete with your address and the customer service card and send it to us. Please note that for organizational reasons we cannot accept shipments for which postage is not prepaid in full.

SWITCHING OF THE MIDI INTERFACE



Glossary

µ-law

Compression and decompression algorithm in compliance with US telephone standard. Non-linear compression means that the dynamic range can be extended to 72 dB with a sampling resolution of 8 bits.

3D algorithms

Processing rules designed to achieve a spatial audio effect using only two speakers. Unlike AudioRendering, the exact positioning of acoustic events within a virtual space is not possible. In principle, this process "only" involves delays and frequency-dependent phase shifts of the audio material as a whole.

4OP+

Special algorithm for generating FM sounds with 4 operators.

5,25" module

Modular insert for the EWS64 XL AudioSystem (optionally available for the EWS64 L) in the format of a 5.25" PC drive. This module contains 4 5-pin DIN connectors (2 MIDI In/Out) for the connection of devices to the two MIDI interfaces, as well as 1 switchable optical/coaxial digital input, 2 coaxial digital outputs and a headphone socket. It also contains the connector for an optional wavetable module.

8 Mbit

ROM memory for PCM samples for wavetable synthesizing, corresponds to 1 Mbyte.

16-bit expansion slot

Slot accommodating an expansion card for the ISA bus. Two contact arrays are arranged in parallel to permit parallel 16-bit data transfer via the bus.

AdLib

One of the earliest manufacturers of sound cards, not to be confused with a current manufacturer of sound cards of the same name. The Adlib standard defines the address for the generation of FM sounds.

ADPCM

Adaptive Differential Pulse Code Modulation. Compression and decompression algorithm with a 4 : 1 compression ration. In other words, a 16-bit sample is compressed to 16 bits so that samples can be transferred at high quality via networks and telephone lines.

A-law

Compression and decompression standard in compliance with the European telephone standard. Non-linear compression means that the dynamic range can be extended to 72 dB with a sampling resolution of 8 bits.

Analog

Stepless transition between two states. All phenomena of the natural environment are analog.

Applications

Another name for programs through which the user communications with the computer.

ATAPI-IDE

Advanced Technology Attachment Packet Interface. Further development of the IDE standard for faster data communications between the processor and mass storage devices such as hard disks and CD-ROM drives, also known as Enhanced IDE.

AudioRendering

A process introduced by TerraTec for the exact positioning of acoustic events in a virtual 3-dimensional space in real time. The result can be experienced using two or four speakers, or with headphones.

Audio streams

Streams of digital audio data. They are sent from the hard disk to the sound card by the CPU, processed to an analog signal and played back over speakers.

Beeper

Signaling device on the PC motherboard which generates one or more *beeps* to signify a variety of conditions, generally configuration faults. This device is normally directly connected to the internal PC speaker.

Operating system

The level above BIOS for communication with the computer. The operating system provides the user with basic functions for organizing the workflows on the computer. It is the interface between the BIOS and the applications.

Screenshot

A printout of the screen contents obtained by hitting the *Print key* on the computer's keyboard.

BIOS

Basic Input Output System, the program which controls the low-level processes in the computer. The BIOS establishes the means of communication within the computer and thus provides the connections between the individual system components.

BIOS configuration

The BIOS settings parameterized with the aid of one or more screen pages. It is usually possible to access these settings by pressing and holding down the Delete key at some point during the system boot process.

Boot

The start or run-up procedure of a computer. A distinction is drawn between warm starts, triggered by pressing the key combination *Ctrl + Alt + Del*, and cold starts triggered by pressing the reset button or switching the computer off and on again.

Burst mode

Fast data transfer mode via the PC's ISA bus which, unlike DMA transfer, requires processor activity but does not reserve DMA channels.

Cache

RAM-chip buffer in which command and data are stored temporarily for fast access by the CPU.

CD-ROM

Storage medium based on the same technology as audio CDs. The difference is in the structure of the data, to which on a CD-ROM only a computer has access and not a CD player.

Chip

Another name for integrated circuit (IC).

CODEC

An integrated circuit for both analog-to-digital coding and digital-to-analog decoding.

Controller

Subprocessor which controls data traffic between various interfaces and the bus. The most popular controllers are those for SCSI and Enhanced-IDE.

CPU

Central Processing Unit, the main processor in a computer.

Creative Labs
Manufacturer of the *Soundblaster* and *Soundblaster Pro* sound cards often considered de facto standards by games manufacturers.

DAC
Digital Analog Converter

DAT recorder
A cassette recorder which records digital audio data on media similar to regular compact cassettes by means of a rotating recording and playback head (similar to that of a VCR). In addition to analog inputs and outputs, DAT recorders also have digital inputs and outputs. The S/PDIF or AES/EBU formats are used, depending on the class of the unit.

Digital
States represented by means of differentiated digital values. A status change involves a number of steps, with the sampling rate and the resolution defining the size of the steps. A computer can process only digital, in other words coarse-resolution information, but it does so very quickly.

Digital input and output
Interface for the interconnection of digital audio units. From the physical standpoint, it is necessary to differentiate between optical, coaxial, and symmetrical XLR connections. The XLR connection is used only on professional units in conjunction with the AES/EBU protocol for the transfer of audio data using symmetrical copper conductors. The other two connector types use the S/PDIF protocol with optical fiber or asymmetrical copper conductors.

DIN connectors
5-pin connectors for standard MIDI connections.

Direct Memory Access
DMA - Direct access to the RAM, bypassing the CPU.

DirectSound
A standard software interface developed by Microsoft to provide more direct access to sound hardware under Windows 95. DirectSound is a component of DirectX, which also relates to hardware such as graphics boards, 3D accelerators, joysticks, modems, etc.

DirectSound static buffer
A memory range on a sound card which can be used for a variety of recurring sounds, such as in games. These sounds generally include shots, explosions, engine noises or similar sounds.

DMA
Direct Memory Access.

DMA channels
Signal lines for direct memory access.

Double-speed
Double rotational speed of CD-ROM drives as opposed to audio CD players, used to achieve a higher data transfer rate from the CD-ROM. Modern CD-ROM drives operate at considerably higher rotational speeds.

Download
1. The process of transferring data from a remote computer, generally a BBS system or Internet server, to a local computer.

2. The transfer of information from the main memory or hard disk to the memory of an expansion card. In the case of a sound card such as the EWS64 L/XL, these especially include samples and instrument definitions for wavetable sounds.

Drumkit
A set of matched percussion instruments

Dual DMA
Use of two separate DMA channels for simultaneous recording and playback of audio data in a computer. This mode, also known as full duplex, is important for hard-disk recording and acoustic data transfer via telephone lines or network connections.

dynamic microphone
Principle of an acoustic converter which employs a thin wire coil moving in a magnetic field to convert the sound waves stimulating a thin diaphragm into electric voltages.

EEPROM
Electrically Erasable Programmable Read-Only Memory.

Input/output address
Address of a memory area reserved for input and output devices. Each input/output device requires a defined area addressed directly by means of the I/O address.

Enhanced Full Duplex
mode which permits a different sampling frequencies to be used for each mode in simultaneous recording and playback of audio data.

Enhanced IDE
Expansion of the IDE standard for faster data communication between CPU and mass storage media such as hard disks and CD-ROM drives, also known as Enhanced IDE.

Equalizer
Adjustable multiband filter which can be used to adapt the frequency response of a signal to an existing audio system.

Expander
Unit such as a MIDI generator such as a synthesizer or sampler, or the keyboard. These expanders can be controlled only via MIDI from a separate keyboard or a sequencer/computer.

Extended Full Duplex
Extended option for the simultaneous playback and recording of audio data. In this case, several stereo audio files can be played back during a stereo recording.

FM
Frequency Modulation, in this case an algorithm for synthetically generating sounds. Complex waveforms are generated with the aid of sinusoidal generators which can mutually influence their respective frequencies.

Full duplex
Simultaneous recording and playback of audio data in a computer. Important for hard-disk recording and for computer-aided telephony applications.

Gameport
Interface for connecting one or two joysticks to a PC for controlling games.

Game/MIDI port
Combination interface for connecting one or two joysticks and MIDI I/O. This port is usually integrated in the end panel of the sound card.

General MIDI
Standard for the assignment of instruments to the 127 program numbers of a MIDI channel. It additionally defines Channel 10 as the drum channel and the assignment of percussion instruments to MIDI note numbers.

General Synthesizer
Extension of the General MIDI standard to include sounds that can be reached with the aid of the bank change commands and an effects processor for diverse echo and chorus programs.

Hard disk recording
A multi-track recording process which uses a hard disk as a recording medium instead of tape. The advantage of this process is direct access to any part of the recorded audio material without tape forwarding or rewind times. The disadvantages of this process are the relatively high costs of the recording medium and difficult interchange with other systems.

Mainboard
Motherboard on which the main components of the computer are mounted, including power supply unit, CPU, RAM, BIOS, bus system and expansion slots.

Main processor
CPU, central processing unit.

Input/output address
Address of a memory area reserved for input and output devices. Each input/output device requires a defined area addressed directly by means of the I/O address.

Internet
Worldwide, non-hierarchical network which is gaining ever more importance for global communications. The World Wide Web (WWW) is the multimedia-based part of the Internet.

Interrupt
Instruction which tells the CPU that a process has to be interrupted so that data from a system component or an external device can be accepted.

IRQ
Interrupt request, see above.

ISA bus
Industry Standard Architecture, the most common bus system in the PC industry for data transfer between expansion boards and the CPU or the storage medium.

Joystick
Device for fast, convenient control of movements in games, usually equipped with diverse fire-control buttons for firing at will.

Jumper
Small, two-pole short-circuit bridge used for configuring the mainboard or expansion cards.

Keyboard
Input device, alphanumeric in the case of a computer, or in musical parlance the piano-like set of keys for generating the MIDI control signals.

Capacitor microphone

Principle of an acoustic converter which converts the sound waves stimulating a thin diaphragm of an electrically polarized material (electret) into electric voltages.

Configuration files

The start files CONFIG.SYS and AUTOEXEC.BAT, as well as the Windows 3.x initialization files SYSTEM.INI and WIN.INI are the files which control the configuration of the computer and its software with the aid of drivers. The registry, which can be edited with the program REGEDIT.EXE, performs these functions in Windows 95.

Loop

When wavetable sounds are played back the middle pat of the sound is looped so that the sound can be prolonged for any length of time.

BBS

A computer which can be accessed via telephone lines using a modem. BBSs (bulletin board systems) are used by companies to provide users with fast access to new drivers, utilities and information. BBSs are also maintained by private operators, offering shareware, bulletin boards and other forms of communication to the system's users.

Motherboard

The mainboard on which the major components of the computer are mounted, including power supply unit, CPU, RAM, BIOS, bus system and expansion slots.

MCI

Media Control Interface. A software interface for controlling diverse media devices. This non-device-specific interface provides a command set for indirectly addressing the device drivers from within a program or multimedia application.

Microsoft Sound System

A package consisting of a sound card plus diverse applications formerly produced by Microsoft. The 16-bit sound card used special resources now established as a standard especially under Windows. Some games now support MSS for audio output.

MIDI

1. Specialist term from the world of ladies' fashion, referring to a hemline between Mini and Maxi.

2. Musical Instruments Digital Interface. The interface for standardized data interchange between synthesizers, computers, samplers and keyboards. This is usually a serial interface, so the only data carried is the control information which causes the target, signal-producing MIDI devices to play back music in the desired form (which often works).

MIDI kit

A special cable for connecting the game/MIDI port and MIDI devices. The cable has special electronics enabling it to emulate the MIDI standard on the one hand and a joystick port on the other.

MIDI keyboard

A piano-like keyboard for driving MIDI sound generators

MOD

A song format originally designed for Commodore Amiga computers. This format contains a variety of samples in several tracks as well as the instructions for the playback thereof and the associated effects.

MPC

Hardware standard for PCs satisfying certain minimum requirements for running multimedia applications.

MPEG
Motion Picture Expert Group. Committee for developing standards for digitizing motion pictures, generally films. Modern films on video CDs are compressed in accordance with the MPEG-1 standard.

MPU-401
Hardware interface for MIDI-compatible PCs. Today, this interface is an established standard for GM/GS music playback in games under DOS as the games require direct access.

Multimedia PC
MPC. Hardware standard for PCs satisfying certain minimum requirements for running multimedia applications.

PCI
Peripheral Component Interconnect. Bus system for fast data transfer between the processor and expansion cards. The bus rate is 32- MHz with 32- or 64-bit data blocks.

Pentium
Intel processor family, the successor of the 486 processor.

Plug and Play
A standard developed by Microsoft and Intel which aims at optimized, conflict-free automatic assignment of system resources when the computer boots. The frequently troublesome assignment of resources using jumpers is thus no longer necessary.

PnP
Plug and Play (see above).

Polyphonic
Multiple voices. The expression refers to the number of voices which instruments can produce simultaneously. A flute, for example, is monophonic (one voice). A guitar is generally polyphonic with six voices (six strings), and a piano with eight octaves is polyphonic with 96 voices (8 x 12 keys).

PS/2 SIMM module
RAM module on a small board with 72 contacts for socket mounting. These sockets are present on all modern mainboards to allow the RAM to be upgraded.

Buffer
Temporary intermediate memory to facilitate continuous, fast data flows.

Resources
Number and type of data lines and size of memory areas that can be utilized by the system and expansion cards.

ROM
Read Only Memory; memory medium which permits read accesses but not writes.

Sample format
File format for digitized audio data. It generally consists of a header with information pertaining to the sample size, resolution, sample rate, etc. In professional samplers these also include instrument definitions such as loop points, keyboard mapping, filter and envelope settings, etc.

Sampler
An expression used in the music sector for an electronic musical instrument which uses digitized audio data as its basic sound source. This can be produced in the sampler itself. In a sample player this audio material is

hard-wired in ROM and cannot be overwritten with user sounds. These are often referred to among musicians as “romplers” (ROM samplers).

Sample RAM
Memory in which samples, instrument definitions and sound banks can be loaded to produce sounds via MIDI.

Sampler rate
Frequency at which the analog signal is registered and converted into a digital value. The higher the frequency the better the result of subsequent digital-to-analog conversion to restore the original signal.

Sampling
Conversion of analog information to digital. This term is generally used for audio information digitized by means of sampling and then made available for processing in the computer.

SB Pro
Soundblaster Pro. A model of the Creative Labs Soundblaster series with digital recording and playback in 8-bit stereo and OPL3 FM synthesis for music playback.

SCSI
Small Computer System Interface. Internal and external bus system for data transfer between the PC and peripherals such as hard disks and removable media, CD-ROM drivers, scanners, etc.

Sequencer program
Software for recording, editing and playing back MIDI information. In this way music can be composed on a computer.

SFX kit
A drumkit program which maps various acoustic effects to keys on the computer keyboard.

Signal-to-noise ratio
The ratio between data signal and interference signal for audio devices. Stated in dB, the higher the value the lower the intrinsic noise level of the device.

Slot
1. Bay accommodating an expansion card in a PC. Slots are of different types, depending on the bus system.

2. Processor unit in the synthesizer section of the EWS64 L/XL AudioSystem. 64 of these units provide the sound card with a variety of audio editing options.

Soundblaster
One of the first sound cards from Creative Labs which, because of its popularity, established itself as the first de facto standard for sound cards. Even today, the Soundblaster standard is still supported by virtually all manufacturers of games.

Soundblaster Pro
A model of the Creative Labs Soundblaster series with digital recording and playback in 8-bit stereo and OPL3 FM synthesis for music playback.

S/PDIF
Sony/Philips Digital Interface. Used for the interconnection of digital audio devices. The interface is physically specified as an optical or asymmetrical coaxial connection in this format. The protocol is similar to data transfer as per AES/EBU.

Start files

Files which are automatically processed by the operating system during the boot to configure and initialize the computer system. The start files in DOS are CONFIG.SYS and AUTOEXEC.BAT, in Windows 3.1 and 3.11 the SYSTEM.INI and WIN.INI, and in Windows 95 the registry with the SYSTEM.DAT and USER.DAT files.

Synthesizer

Electronic musical instrument which creates sounds by means of analog or digital synthesis.

TerraTec Electronic GmbH

German manufacturer of professional multimedia products; headquarters in Nettetal. TerraTec played a major role in the rapid spread of wavetable technology for sound cards.

Driver

Driver Software which establishes the connection between the operating system and the hardware. The driver is responsible for resource accessibility and hardware initialization. There is a set of drivers for each operating system.

Environment variable

A variable added to the environment memory of the COMMAND.COM command interpreter by means of the DOS command SET. Programs can fetch the value of this variable when needed.

Wavetable

Name of a sound generation technology based on the reproduction of digitized natural sounds. The sounds are generally stored in ROM as samples.

Web page

A document page which can be accessed via the World Wide Web, the multimedia section of the Internet. A web page can contain text, graphics, sound, animation and other multimedia events.

Windows 95

32-bit operating system from Microsoft, which, unlike its predecessors, is no longer based on the DOS operating system.

WSS

Windows Sound System. A package consisting of a sound card plus diverse applications formerly produced by Microsoft. The 16-bit sound card used special resources now established as a standard especially under Windows. Some games now support MSS for audio output.

Y-adapter

A cable with three connectors connecting the joystick port to two joysticks and thus enabling two-player mode in games.