

Xwave Thunder 3D™ PCI Audio Accelerator

User's Guide

© Copyright 1999

This documentation and the accompanying software are copyright © 1999 Labway Corporation. All rights reserved.

This documentation and the accompanying software are copyright © 1999 QSound Labs, Inc. All rights reserved.

Thunder 3D is a trademark of Labway Corporation.

QSound, QEM, QSound Environmental Modeling, QMSS, Q3D, QXpander and the Q logo are trademarks of QSound Labs, Inc.

EAX and Environmental Audio Extensions are trademarks of Creative Technology Ltd. in the United States and other countries.

Microsoft and Windows are registered trademarks of Microsoft Corporation. DirectX and DirectSound are trademarks of Microsoft Corporation.

All other trademarks are the property of their respective owners.

Disclaimer Statement

With respect to the information in this document, Labway Corporation makes no guarantee or warranty of its accuracy or that the use of such information will not infringe upon the intellectual rights of third parties. Labway Corporation shall not be responsible for any loss or damage of whatever nature resulting from the use of, or reliance upon it and no patent or other license is implied thereby. This document does not in any way extend or modify Labway's warranty on any product beyond that set forth in its standard terms and conditions of sale. Labway Corporation reserves the right to make changes in its products and specifications at any time and without notice.

Disclaimer Statement.....	1
1 Introduction	3
1.1 Features:	3
1.2 Card Figure	4
1.3 Connectors for Thunder 3D.....	4
1.3.1 External Connectors:	4
1.3.2 Internal Connectors:	4
1.4 Audio Connectors Pin Assignment:	5
2 Installing the Thunder 3D™ PCI Sound Card into your Computer	5
2.1 Minimum System Requirements	5
2.2 Safety Precaution	6
2.3 Installation Notes	6
3 Setting Up your Sound Card	6
3.1 Installing the Sound Card.....	6
Connecting the Sound Card	8
4 Software Driver Installation	8
4.1 Installing Driver under Real DOS.....	9
4.1.1 Installing the device driver	9
4.1.2 Launching the DOS control panel:	9
4.2 Installing Driver under Win95/98.....	9
5 Configuring the Thunder 3D Joystick Driver for Windows® 95/98:.....	14
6 Windows® NT® Installation	16
6.1 Installing Device Drivers under NT4.0	16
7 Uninstalling Thunder 3D™	16
7.1 Uninstalling Device Driver under Win95/98	17
7.2 Uninstalling Device Driver under NT4.0	17

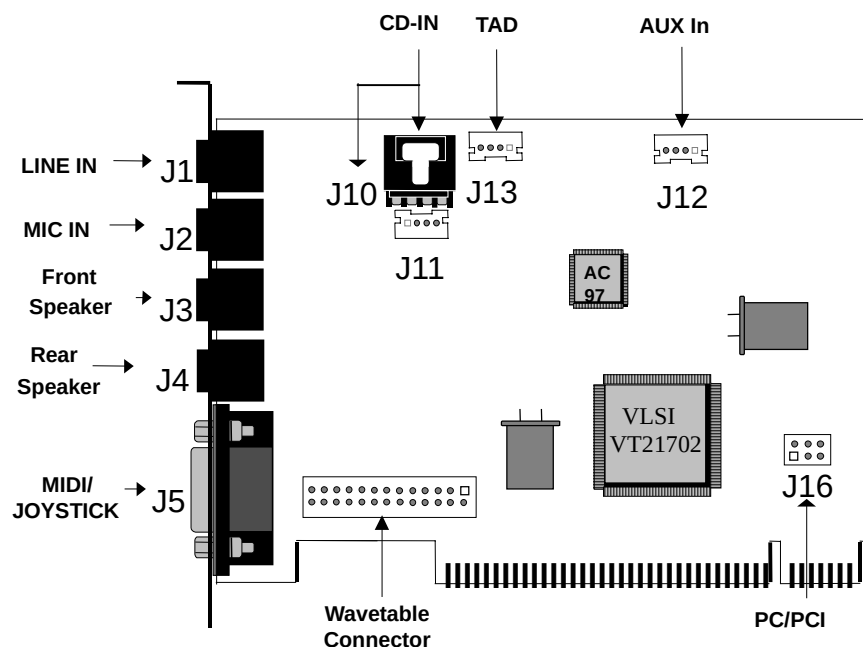
1 Introduction

Congratulations! You have just acquired a sound card based on the most advanced 3D PCI audio accelerator available today. Xwave Thunder 3D is a high performance PCI audio accelerator jointly developed by Labway Corporation. It combines the most compelling 3D, quadraphonic and music synthesis technologies available with the powerful yet cost effective ActiMedia™ DSP architecture. Full H/W acceleration of DirectSound®, 3D audio, music synthesis, and gameport functions guarantees exceptional system performance. QSound's new Q3D™ algorithms not only render exceptional 3D soundscapes for 3D applications but add a new dimension to stereo applications using their unique stereo-to-3D and stereo-to-quad remapping capabilities. Three available PCI DMA modes assure full SoundBlaster® Pro compatibility on most platforms without additional hardware. The Intel AC97 architecture provides high quality audio output using a high performance AC97 codec.

1.1 Features:

- Full H/W acceleration of 64 audio sources
- Concurrent processing of up to 384 audio sources
 - Up to 64 DirectSound®/wavetable sources processed in H/W
 - 64 plus DirectSound® sources processed on host
 - Up to 128 total DirectSound® sources
 - Up to 64 3D sources
 - Up to 64 H/W wavetable voices
 - Up to 256 host wavetable voices
- QInteractive™ interactive positional 3D
 - H/W DSP processing for maximum performance
 - Proprietary technology eliminates crosstalk cancellation and broadens "sweet spot"
- QSound Multi-Speaker System™ stereo-to-quad processing
 - Transforms ordinary stereo applications to quadraphonic
 - Non-3D games become immersive quad 3D games
 - Enhanced DVD movie playback
- True quadraphonic music playback from CD's, music DVD's, MIDI files and MP3 players
- Effective with both stereo and Dolby Pro-Logic™ encoded material
- QSound Environmental Modeling™
 - Adds reverb as an additional positional queue
 - EAX™ compatible
- QXpander™ and stereo to 3D remapping
- FM, MIDI stereo and MIDI quad music in Real Mode DOS
- Dual gameport accelerator with legacy and digital joy-stick modes

1.2 Card Figure



1.3 Connectors for Thunder 3D

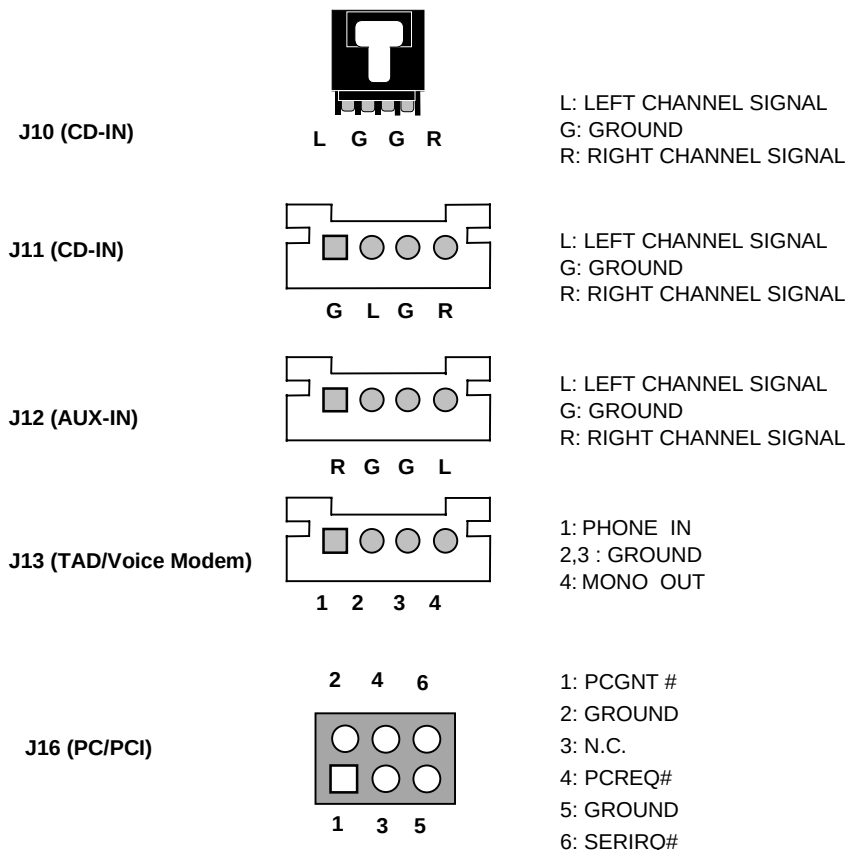
1.3.1 External Connectors:

- J1:..... Ø 3.5mm Phone Jack for **LINE IN**
 J2:..... Ø 3.5mm Phone Jack for **MIC IN**
 J3:..... Ø 3.5mm Phone Jack for **FRONT SPEAKER**.
 J4:..... Ø 3.5mm Phone Jack for **REAR SPEAKER**.
 J5:..... Connector for **MIDI/JOYSTICK**

1.3.2 Internal Connectors:

- J10:..... Connector for **CD AUDIO IN** (ATAPI)
 J11:..... Connector for **CD AUDIO IN** (JST)
 J12:..... Connector for **AUX IN**.(optional)
 J13:..... Connector for **TAD/VOICE MODEM**.
 J16:..... Connector for **PC/PCI Legacy Audio SIDEBAND SIGNAL**.
 CN2: Extension connector for hardware wavetable.(optional)

1.4 Audio Connectors Pin Assignment:



2 Installing the Thunder 3D™ PCI Sound Card into your Computer

2.1 Minimum System Requirements

Installation of your Thunder 3D requires the following hardware and operating system:

- IBM® PC or compatible Pentium® system with one available PCI slot.
- 32MB RAM
- Approximately 30MB of space on your hard disk.
- CD ROM drive
- One pair of powered speakers or headphones.
- Windows® 95, Windows® 98, or Windows® NT® 4.0 with SP3.

Other optional hardware that will enable you to take advantage of some of Thunder 3D™ additional features include:

A second set of powered speakers that will give you four speaker “quad” mode for additional 3D sound immersion.

- A microphone for external recording or karaoke.
- A joystick for gaming.
- A MIDI device for true music enthusiasts.

2.2 Safety Precaution

- Do not remove your sound card from its protective bag until you are ready to install it.
- Always try to hold your sound card by its edges. Avoid touching any electronic components on your sound card.
- Static electricity can cause permanent damage to your sound card. To prevent such damage, you must ground yourself while installing the card.
- Use a grounding strap - a coiled wire with a clip at one end and an elastic strap at the other. Wear the strap around your wrist and attach the clip to any non-painted metal surface of your computer chassis.

OR

- If you do not have a grounding strap, touch any non-painted surface of your computer chassis before you begin installation.

2.3 Installation Notes

Computers come in different shapes and sizes. The installation procedures in this manual apply generally and you should compare the illustrations here with your computer before you start your sound card installation.

A Philips screwdriver is required for your sound card installation.

The documentation for your computer should come in handy during the installation. Have it ready when you start the installation.

If you have an existing non Plug-n-Play sound card installed in your computer, you must first un-install its audio drivers before you remove the card. Refer to your existing documentation on the sound card for more details.

If your existing sound card is Plug-n-Play, you may safely proceed to install your new sound card.

3 Setting Up your Sound Card

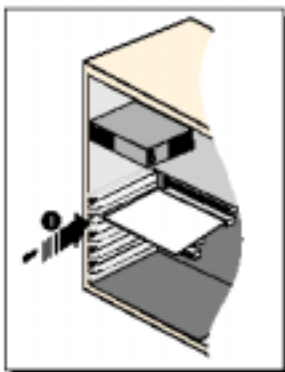
Power off your computer and any connected devices before installing your sound card!

3.1 Installing the Sound Card

You need to remove any existing sound card installed in your computer. If the sound card is non Plug-and-Play, un-install the audio drivers before you remove the card from your computer. Check your existing sound card documentation for details.

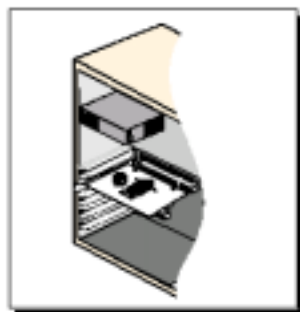


1. Remove the cover of your computer.



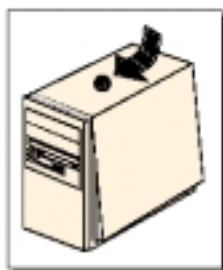
3. Align your sound card with the selected PCI Bus-Slot and firmly push it into the slot. If the sound card does not slide in, do not force it. Make sure the sound card is aligned properly and try it again.

2. Select an available PCI Bus-Slot, and if necessary, remove its cover plate. Keep the mounting screw to secure your sound card later.



4. Secure your sound card to the chassis of your computer with the mounting screw removed in Step 2.

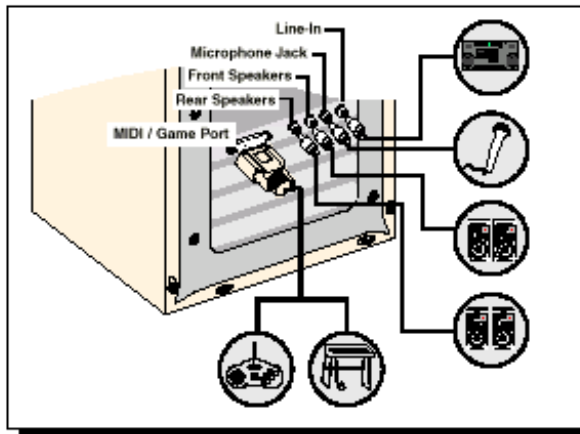
Connect one end of the CD cable to the black connector (MPCCD). Connect the other end to your CD drive.



5. Put back the cover of your computer.

3.2 Connecting the Sound Card

You may connect a variety of audio equipment to your sound card as shown in the illustration below:



Line-In:

Connect from any external sound sources, example, from the Line/Audio Out of your external Audio CD-ROM or mini-hifi. (Sound will be transmitted out from the attached speakers)

Microphone Jack:

Connect to a microphone. Example, you may want to sing Karaoke through the microphone. (Sound will be transmitted out from the attached speakers)

Front Speakers:

Connect a pair of active speakers to the front of your computer.

Rear Speakers:

Connect a pair of active speakers to the back of your computer.

MIDI/Game Port:

Connect to either your MIDI keyboard or joystick.

4 Software Driver Installation

4.1 Installing Driver under Real DOS

In real DOS mode, you must have your DOS CD-ROM drivers loaded for access to the install CD. Another way to do this is to simply run INSTALL.EXE from a DOS box in Windows.

4.1.1 Installing the device driver

1. Run INSTALL.EXE from the DOS directory on the CD. This installation program will create the **Tbird** directory on any drive you desire. Follow the screen prompts to install the files to your hard drive. The install program will edit your autoexec.bat file to perform automatic initialization of Thunder 3D for use in real mode DOS .

4.1.2 Launching the DOS control panel:

1. CD to **C:\TBird**
2. Type **TBIRDCTL** and press **ENTER**

This application allows you to adjust volume levels, balance, input levels, synthesizer modes, speaker modes, and midi effects in real DOS.

In DOS games that have music settings, if you select FM synthesis in the game, make sure the synth control in the control panel is set to **OPL3**. For games that support MIDI (mpu-401), select the **WVTBL** (wavetable) option.

NOTE: This application is for real MS-DOS mode only and should not be run under windows. In windows, use the windows mixer for adjusting playback and recording levels.

4.2 Installing Driver under Win95/98

Now that the hardware is installed, it is time to configure the drivers. Plug and Play uses your system's BIOS and the Plug and Play features of Windows 95/98 to allocate resources for Thunder 3D .

Microsoft issued a maintenance release of Windows 95 referred to as OSR2. This version shipped as the stock operating system on many PC's. Newer and recently upgraded PC's will have the Windows 98 operating system. Other systems will have the original Windows 95 or "Gold" version.

The following procedure describes installation using Windows 98.

If you have older versions of Windows 95 then the installation will be slightly different than described below. However, the installation will go smoothly if you simply follow the on screen instructions and in most cases where the system is looking for a file just browse to the install directory of the Thunder 3D CD.

1. Turn on the computer and place the Thunder 3D CD in your CD-ROM drive. When the Add New Hardware Wizard dialog box reports that it sees a PCI Multimedia Audio Device, click **NEXT**.



2. Select **Search for the best driver for your device (Recommended)**. Click **NEXT**.



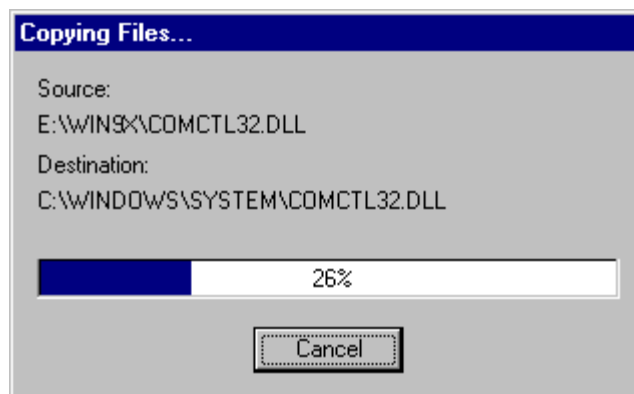
3. Please select **Specify a location** and browse to your directory where the driver files are located, click **Next>**.



4. As the figure shown below which indicates windows has found the driver at the specified location, please select **NEXT** to install the drivers.



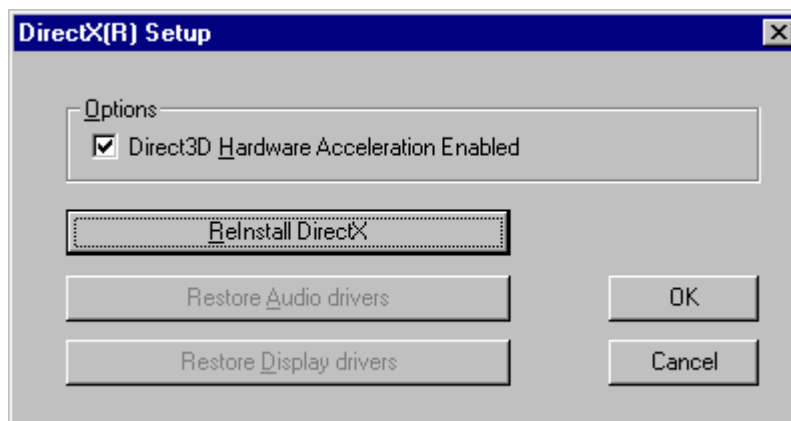
5. Windows then copies the files. You may be prompted to insert your Windows system CD, as the core sound components of the operating system may need to be copied as well. These include audio Codecs, the Mixer and the Sound Recorder program.



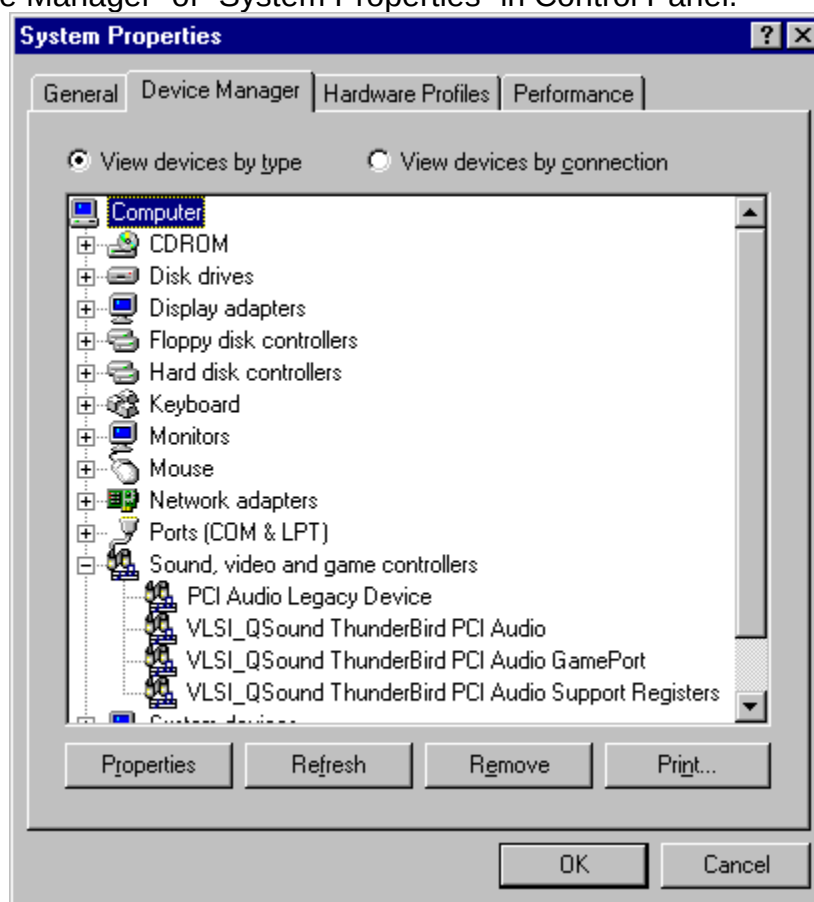
6. Please click FINISH to continue installing the driver. The installation will continue detecting devices and retrieving the necessary files to your system. The second device is the **PCI Audio Support Registers** device. Last will be the **PCI Audio Gameport Device**. Windows will finish installing the drivers for Thunder 3D automatically.



Note: When the "DirectX® Setup" dialog box appears, please click **OK** to enable the DirectSound3D Hardware Acceleration.

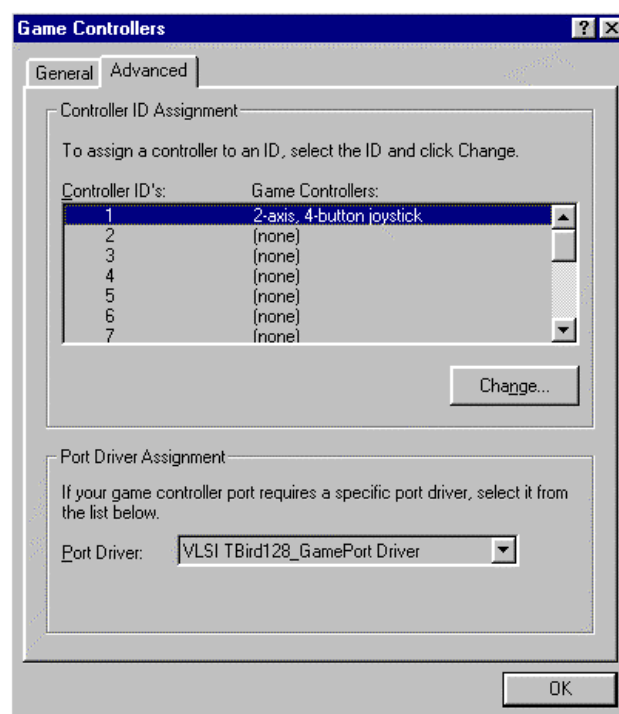


7. To check if you have successfully installed the Thunder 3D™ driver, please go to the "Device Manager" of "System Properties" in Control Panel.

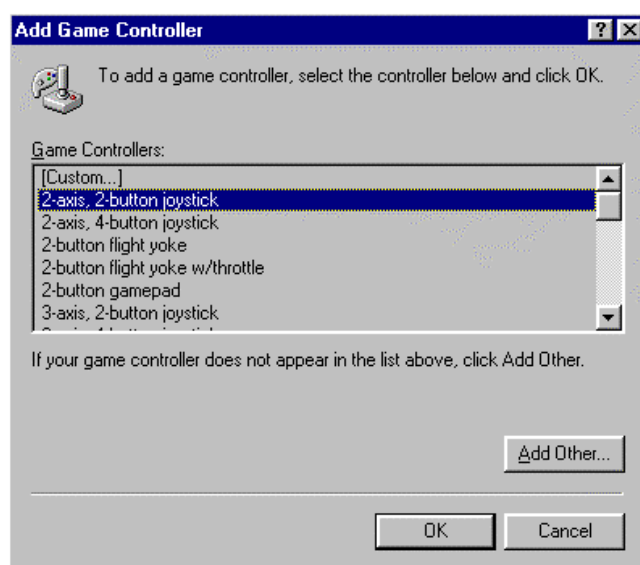


5 Configuring the Thunder 3D Joystick Driver for Windows® 95/98:

1. Open the Control Panel and double-click on the **Game Controllers** icon. Select the **Advanced** tab and under **Port Driver Assignment** select **VLSI Tbird128_GamePort Driver**.



2. Select the **General** tab and click the **Add...** button. You may select any one of the **Game Controllers** listed, then click **OK**.



3. After making your selection, highlight the selected controller in **Game Controllers** and click the **Properties...** button. Select **Calibrate...** and calibrate your joystick. Your joystick should be installed and ready for flight!



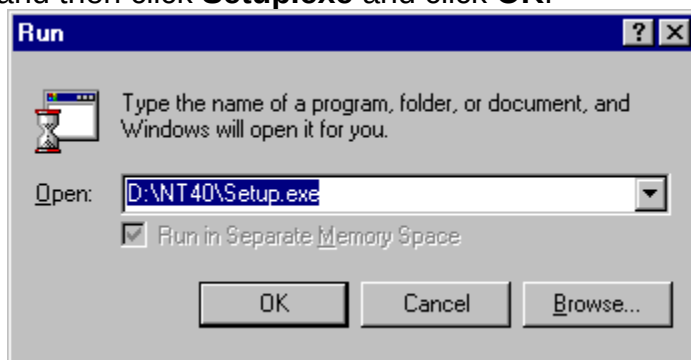
6 Windows® NT® Installation

6.1 Installing Device Drivers under NT4.0

This section describes the necessary procedures for installing the Thunder 3D™ device driver under NT4.0. Please follow the steps described below to properly install the driver.

Note: you must have the appropriate privileges in order to install the drivers.

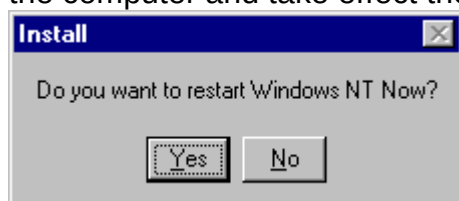
1. Boot the system to the Windows NT desktop.
2. Click START, select RUN, In the Run dialog box browse to the NT folder NT40 on the driver CD and then click **Setup.exe** and click **OK**.



3. Wait a couple of minutes while the data transfers. When the "Welcome" dialog box appears, click **Next>** to continue.



4. The Setup program will copy the necessary files to the system, click Yes to restart the computer and take effect the Thunder 3D™ driver.



7 Uninstalling Thunder 3D™

7.1 Uninstalling Device Driver under Win95/98

1. Select Control Panel, Add/Remove Programs and select Thunder 3D Audio Support Files. Click the Add/Remove... button.
2. You will be prompted to shutdown your computer after uninstalling for the changes to take effect. Click Yes to shutdown your computer and then remove Thunder 3D™ from your system.

7.2 Uninstalling Device Driver under NT4.0

1. In Control Panel, double click the **Add/Remove Programs** icon, select "**VLSI ThunderBird 128 Windows NT Driver**" and click **Add/Remove** to remove the chosen driver.
2. Browse to the Multimedia page in the Control Panel, click on the "**Devices**" tab, under "**Audio Devices**" select "**Audio for VLSI ThunderBird128**", and then click the "**Remove**" button. Shutdown and restart your computer to remove Thunder 3D™ from your system.

FCC COMPLIANCE STATEMENT:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

INFORMATION TO USER:

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation; if this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 1. Reorient / Relocate the receiving antenna.*
- 2. Increase the separation between the equipment and receiver.*
- 3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- 4. Consult the dealer or an experienced radio/TV technician for help.*

CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment