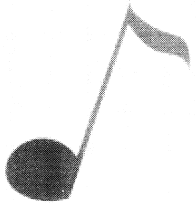
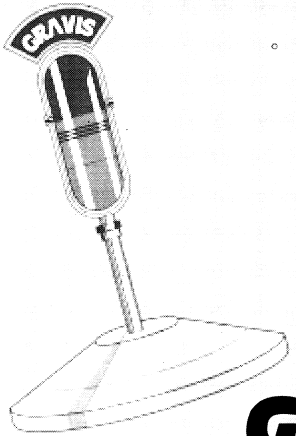
ULTRA SOUND™





Advanced
GRAVIS

16 Bit - Wave Table - 32

GRAVIS ULTRASOUND™

User's Guide

UltraSound Designed & Engineered By:

Advanced GRAVIS

Advanced Gravis Computer Technology Ltd.
Burnaby, British Columbia, Canada

FORTE
-Leaders in Computer Audio Technology-

Forte Technologies Inc.
Rochester, New York, USA

Printed In Canada

Part No. 901-0023-04

CONTENTS

Inside the Gravis UltraSound™ User's Guide

Chapter 1- Introduction

Informs you about UltraSound™ and gives you a brief overview of computer sound history from FM synthesis to UltraSound's new Focal Point 3-D technology. And it introduces MIDI (Musical Instrument Digital Interface).

Chapter 2- DOS Software

Details the DOS software that comes with UltraSound. Shows you how to use Playfile and Playmidi. Playfile lets you play back or record digital audio sound files, and Playmidi lets you play back MIDI songs and sequences.

Chapter 3 - Windows® Software

Outlines the Windows software that comes with UltraSound. Shows you how to use the UltraSound Mixer to control UltraSound's mixer facilities. Explains the Windows Drivers and how they are set up with UltraSound. UltraSound's performance options and issues are highlighted. The Driver Initialization File and Patch Caching are explained briefly.

This chapter also explains how to use Patch Manager, a patch loading and audition program. And it tells how to make and edit patches with Patch Maker Lite

Chapter 4 – Patch Manager™ and Patch Maker Lite

Includes program requirements and quick tutorials for Patch Manager™ , a patch loading and audition program, and Patch Maker Lite, a patch making and editing program.

Chapter 5 - Joystick Support

Describes UltraSound's joystick support programs including Joycomp, GravUtil™ (Find Card™), and UltraJoy. Joycomp helps you determine the proper speed compensation value for your computer, and automatically launches the GravUtil program. FindCard, which is part of GravUtil, helps locate game port circuit conflicts. Finally, UltraJoy lets you change the Speed Compensation Setting right from the DOS prompt.

Chapter 6 - Game Support

UltraSound support comes in four flavors: Native, Audio Interface Libraries (AIL)/Ultramid Drivers, Mega–EM Emulator, and Sound Board Operating System (SBOS™), our Sound Blaster™ emulator. This chapter explains each type of support. In addition, it gives you tips and hints for sounds in games.

Chapter 7 - Troubleshooting

Provides both DOS and Windows troubleshooting. Lists common problems you may encounter and tries to help you solve them on your own.

Chapter 8 - Customer and Technical Support

Tells you how to Register and how to contact Technical Support personnel. Information about Gravis' warranty policy is found in this chapter also.

Chapter 9 - UltraSound Hardware Options/Accessories

Briefly describes some of the available UltraSound accessories.

Appendix A - Jumpers

Information on the Base Port Address and reserved jumpers.

Appendix B - Playfile & Playmidi Parameters

More advanced command line parameters for Playfile and Playmidi, as well as some information about the Playmidi Configuration File, and .CFG Files.

Appendix C - Mega–Em User's Reference

A brief reference for Mega–Em. UltraSound's mega emulator solution lets you emulate the Roland® MT-32, Roland® Sound Canvas, and Sound Blaster™ (digital only).

Appendix D - Ultrinit.exe

Ultrinit is a required utility to set up and configure your UltraSound every time you turn on your computer or change UltraSound's settings.

Appendix E - Manually Installing UltraSound's Windows Drivers

UltraSound's installation program automatically installs the Windows Drivers, but you can still manually install them if you choose. This Appendix shows you how to manually install both the Windows Drivers and the UltraSound Mixer.

Appendix F - Shareware - What is it?

A description of shareware from "What is Shareware?" by the Association of Shareware Professionals (ASP).

Appendix G - General Information

License Agreement, Trademarks, and FCC and DOC statements.

INTRODUCTION

Thank you for choosing UltraSound™ , the ultimate sound solution for IBM® compatible personal computers.

UltraSound is a full-featured sound card capable of providing 16-bit, CD quality sound from your desktop personal computer, as well as giving you the latest in audio technology—3D sound. Whether you plan to use UltraSound for adding zip to your business applications or zap to your entertainment software, UltraSound will meet your sound needs for years to come. UltraSound is many products rolled into one:

- A real Waveform music synthesizer with a full 16-bit General MIDI sound set;
- A Microsoft Windows® 3.1 MPC sound card for music, multimedia, and business applications;
- A sound card for games;, compatible with Roland® MT-32, Roland ®Sound Canvas, Adlib®, and Sound Blaster™ .
- A digital play/record sound card, with up to 32 simultaneous digital channels.

COMPUTER SOUND—A HISTORY

The world of computer sound reproduction began simply, as a bit which toggled voltage on and off at a set frequency. Although crude, this served its purpose: to produce a simple beep.

The beep was improved by the development of additive synthesis, or the creation of sound by adding different types of waveforms to create a new sound. Subtractive synthesis, the creation of sound through filtration, followed shortly after. Unfortunately, both techniques produced inaccurate sounding instruments.

FM Synthesis departed from previous technology. FM synthesis creates an instrument by frequency

modulating one waveform against another to produce the sound of the desired instrument. Variables like wave shape, wave form, and modulation are manipulated until the sound closely mimics the sound of the actual instrument.

UltraSound's wave table synthesis is superior to FM synthesis sound. Wave table synthesis recreates the sound of an instrument by first recording the actual instrument, then playing it back. The result of this process is an accurate electronic reproduction of real instruments . Wave table synthesis gives you the ability to create an unlimited number of sounds with incredible accuracy.

ULTRASOUND AND WINDOWS

Your UltraSound's capacity to play up to 32 real or digitally synthesized voices or 'patches' simultaneously opens up a whole world of musical expression. When coupled with Windows based music creation and editing software, musicians and non-musicians alike can put together the kind of amazingly real sounding songs that were previously the domain of music systems costing hundreds or thousands of dollars more.

MIDI - What is it?

MIDI, or Musical Instrument Digital Interface, is a standard created in 1983 by music equipment manufacturers. MIDI is a digital communication standard which allows electronic musical devices to communicate with each other. The MIDI Standard lets you connect any MIDI -equipped music device to other MIDI devices for transferring music and performance data. This gives you the ability to control various devices such as keyboards, synthesizer modules, drum machines, etc., from your UltraSound-equipped computer, and vice versa.

For example, connecting an inexpensive MIDI-equipped keyboard synthesizer to your UltraSound via the (optional) MIDI connector port will allow you to "play" any of your UltraSound's instruments (patches) selected, from a real piano patch to a real drum kit, to any of the myriad of digitized sounds supplied. Of

course, you don't need a keyboard to "play" your UltraSound: it is a self contained music studio you can "play" from your computer sequencer or MIDI player.

MIDI Files

MIDI is also a file format that records music or sound "events" such as a note being played, what instrument the note is playing, how long the note plays, how loud, etc. These events can then be reproduced exactly as they were entered, with the flexibility to change things if desired, such as the instrument, the loudness, or the note. MIDI music files also conserve disk space: only the events are recorded, not the actual sounds.

The sounds that UltraSound uses to play back the MIDI events are full 16-bit CD quality voices (patches) digitized from real musical instruments (or synthesized using digital wave table synthesis) so that what you hear through your stereo or headphones is incredibly real and dynamic.

FOCAL POINT 3-D SOUND—WHAT IS IT?

3-D sound is what people with two healthy ears hear all the time, every day. For computer programs and games, however, Audio Virtual Reality is now at the cutting edge of sound technology.

Your UltraSound is engineered to take full advantage of Focal Point's new breakthrough 3-D Audio Virtual Reality system. Unlike other "3-D Surround Sound" systems, the Focal Point system allows 360x360 degree audio which can place sounds above and below the listener, as well as to the left, right, front, and back, all with just two speakers (headphones recommended) and with no additional hardware such as extra speakers, amplifiers, etc.

How does it work? A process called *binaural convolution* is used to generate what each ear would actually hear in relation to the position of the sound source. UltraSound's 32 independent digital channels are used to manipulate the apparent sound source in real time!

Game and program developers are excited at the prospects. The addition of 3-D sound will take games and programs to a new level of realism. Look for games and demos supporting UltraSound 3-D. Check out the 3-D Demo that came with your UltraSound.

- **Type:** `C:\ULTRASND\DEMO3D`

SYSTEM REQUIREMENTS

IBM compatible AT, 286, 386 or 486.
MS DOS 5.0 or greater

System Recommendations

- 486 or greater
- MS DOS 5.0
- VGA (Video Graphics Array) monitor and video card
- Hard disk drive (28 milliseconds or better seek time)
- Microsoft® or Logitech™ compatible mouse
- Gravis Analog Joystick, Gravis Analog Pro, or Gravis PC GamePad™
- For Windows applications, Windows 3.1 in 386 Enhanced mode is required

The requirements for bonus software programs may vary from the basic system requirements listed above.

TYPE CONVENTIONS

To help you get the most from this User's Guide, certain type and notation conventions are used:

USER ACTIONS

If you are to perform an action, it will be proceeded by a diamond (♦) in the margin. Example:

♦ **Turn on your computer.**

KEYBOARD KEY CHARACTERS

The less than and greater than brackets are used to enclose keyboard key characters.
Example: **<enter>** indicates that you should press the Enter or Return key, **<esc>** means you should press the Escape key.

KEY COMBINATIONS AND SEQUENCES

A plus sign (+) used between key names or characters indicates that you must press both keys at the same time. For example: Press **<Alt>+<F>** means you should press the **<Alt>** and hold it down while pressing the **<F>** key.

TEXT ENTRY

Text or commands you should enter through your keyboard are displayed like the following example:

♦ **Type:** `COPY A:*.*` **<enter>**

Variable Text Entry

Items that you must enter using the keyboard, but which require you to choose from a number of parameters like numbers for example, will be enclosed in square brackets ([ ]). Do not type the brackets, only the items between them.

SPECIAL NOTATIONS

Items or notations of special interest are displayed in a box, and use a different type face. For example:

Read the note in this box; it's important!

DOS Software

Advanced Gravis provides a number of DOS utilities and software applications for you to use with your UltraSound.

DOS UTILITIES

Joycomp

A utility for adjusting your UltraSound's speed compensating game port to the speed of your computer.

Gravutil

A joystick and game card testing and calibration program.

DOS PROGRAMS

Playfile

A DOS program for playing or recording digital audio sound files.

Playmidi

A DOS program for playing back MIDI songs or sequences.

PLAYFILE AND PLAYMIDI

Playfile and Playmidi have a basic full-screen interface. The interface provides a screen for you to perform actions with a mouse or keyboard.

Summary of keyboard commands for full-screen interfaces

Tab: move cursor to next item
Shift + Tab: move cursor back one item
Left arrow: move cursor left
Right arrow: move cursor right
Up arrow: move cursor up one line
Down arrow: move cursor down one line
Backspace: delete character to left of cursor
Del: delete character under cursor
Ctrl + A: move cursor to beginning of line
Ctrl + E: move cursor to end of line
Ctrl + U: erase all characters to left of cursor
Page Up: move up one page at a time
Page Down: move down one page at a time
Space bar: select an item or drop down menu on a window with an arrow box in it.
Esc: void entry

PLAYFILE

Playfile is a stand-alone program for playing and recording digital audio (.SND or .WAV) files on your computer. With Playfile's full-screen interface, selection is easy and convenient. Playfile also supports command line instructions and options.

To use the UltraSound Playfile Full-Screen Interface:

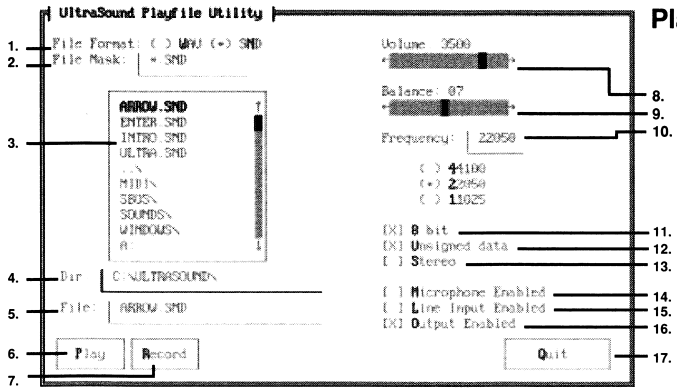
- **Type:** `PLAYFILE` **<enter>**
- **On the playfile utility screen, select a File Format ( ) .WAV or ( ) .SND. The File Mask displays the selection. Selections are made using the mouse or keyboard.**
- **Select a sound file (.WAV or .SND) in the file window. Only files with the extension shown in the file mask will appear.**

The (DIR:) edit box displays the directory for the file. You may type into the DIR edit box to enter a directory. The (FILE:) edit box displays the file.

- Set the Volume control. You can set this anywhere from 0—4095. The default is 3095, and should be loud enough.
- Set the Balance control. This is like the balance control on your stereo, which controls the loudness of left and right speakers. You can set it from 0—15; the default is 7, the center position.
- Select the Frequency of the .WAV or .SND file (44kHz, 22kHz, or 11kHz).

Frequency means the speed at which the sound file will play, so if you lower the frequency, the sound will play more slowly. The default setting is 22050 Hz, or 22kHz. You can set the frequency anywhere from 0—44100Hz. UltraSound programs use 22kHz as a default.

Playfile



1. File Format: The type of file format you can choose; .WAV, or .SND.
2. File Mask: DOS wildcards supported. The File Mask shows the extension (.SND in this case) of the file you want to play.
3. File Window: Lists the files to choose from.
4. Directory: The files' directory, or the path selected.
5. File: Displays the file you select.
6. Play: Plays the file you select.
7. Record: Records a file.
8. Volume: Adjusts the volume setting.
9. Balance: Sets the balance control.
10. Frequency: Sets the speed for your file; 44100 Hz, 22050 Hz, or 11025 Hz.
11. 8 bit: Set for 8 bit (X) or 16 bit ( ).
12. Unsigned Data: Sets the type of data required; unsigned (x) or signed ( ).
13. Stereo: Sets for a stereo file play back, on or off.
14. Microphone Enabled: Enables your microphone to record a sound.
15. Line Input Enabled: Sets your CD or stereo input, on or off.
16. Output Enabled: Sets your amplified output, on or off.
17. Quit: Quits Playfile.

- **Select 8-bit (on) or 16-bit (off).**
- **Select Unsigned Data if required. (See the Glossary for a definition of Unsigned Data)**
- **Select Stereo to play a stereo file.**
- **Select Microphone Enabled to record sound from a microphone connected to the microphone jack.**
- **Select Line Input Enabled to record from a CD player or stereo device attached to the Line In connector on your UltraSound.**
- **Select Amplified Output Enabled to play back through the speakers.**
- **Select Play to play the file.**

To Use Playfile from a Command Line

To play a sound using Playfile:

- **Go to the ULTRASND directory.**

  Type: `CD\ULTRASND` **<enter>**

- **Type:** `PLAYFILE`**, then a space, followed by the path and filename for the sound you want to play.**

  For example, try to play a sound using Playfile and the ENTER.SND sound file, which was put into the ultrasnd directory during installation . Type: `PLAYFILE C:\ULTRASND\ENTER.SND` **<enter>**

The sound will play using Playfile's default settings. If you want to change the way the sound plays, you must use a series of parameter switches. The basic parameters are found in the following section. More advanced parameters are found in Appendix B, "Playfile and Playmidi Parameters.

Playfile's Basic Parameters for command line use

If you use the DOS command line for Playfile, the following parameters are probably all you'll need to modify your digital sound files. For a more in depth list of Playfile's commands, see Appendix B.

The previous instructions for Playfile's full-screen interface explained Playfile's basic parameters; therefore, only some of the following commands are defined. The following commands are the same as the parameters located on Playfile's full-screen interface.

To Set:	**Type Command:**	
Balance	`-B [ ]`	0—16; 7 default
Volume	`-V [ ]`	0—4095; 3095 default
Frequency	`-F [ ]`	0—44100; 22000 default
Loop:	Loop stands for the number of times the file will repeat, or "loop." The default is once, but you can loop the file as many times as you like. When using Playfile, remember you can't use your computer for anything else, so if you loop a sound many times, all you can do is listen to it until it's finished. You can, however, press the Escape key to exit from Playfile at any time.	
Stereo	`-S`	
Record	`-R`	

Microphone	`-M1`	The -m1 command allows you to record sound using a microphone in the microphone jack. In play mode, -m1 defaults to "off," and in record mode, -m1 defaults to "on." **Type:** `-m0` to turn it off.
Line In	`-N1`	Turns on line in for CD Player or Stereo recording. **Type:** `-N1` into the command line to record a sound from your CD or stereo (attached to the Line In Connector on your UltraSound card). In play mode, this defaults to {off," and in record mode this parameter defaults to "on." **Type:** `-N0` to turn it off.

Try Playfile's parameters. Try playing the ENTER.SND file, experimenting with some of these parameters. The audio may sound strange as you change the default parameters, but it will give you an idea of how you can modify sound using Playfile. You can enter the parameters in any order you like. In both playback and recording mode, enter only the parameters you want to change.

- **Go to your UltraSound directory**

  Type: `CD\ULTRASND` **<enter>**

- **Type:** `PLAYFILE`**, then a space, followed by the path for ENTER.SND.**

```
PLAYFILE  -V4095  -F44100  -B0  -12  C:\ULTRASND\ENTER.SND  <enter>
```

Playfile will play the enter sound at top volume, at twice its normal speed, only out of the left speaker, twice.

Recording with Playfile

Playfile can record and play sound files. To record a file using Playfile:

- **Connect your input device (CD player, microphone, etc.) to the appropriate UltraSound connector.**

- **Go to your UltraSound directory.**

  Type: `CD\ULTRASND` **<enter>**

- **Type:** `PLAYFILE`**, a space, the path where you would like to store your sound on your hard disk, and a name for your sound. It will look something like this:**

```
PLAYFILE  -R  C:\ULTRASND\TEST.SND
```

- **Press <enter> and begin recording. UltraSound starts to record instantly.**
- **Press the space bar to stop recording.**

All parameters and commands are the same for recording as they are for playing back sound, so a default sound will be recorded at 22kHz, 8-bit mono.

How to assign a Startup sound for your computer

Another way you can use Playfile is to add a startup sound to your computer. With Playfile, you can add a command that plays your favorite sound through your AUTOEXEC.BAT file. Then, that sound will play every time your machine is turned on or rebooted. This is useful because it shows you whether UltraSound is working every time you start your machine. Here's how:

- **Using any text editor, add the following lines to your AUTOEXEC.BAT file. These lines must be added after the SET ULTRASND line:**

```
PLAYFILE  C:\ULTRASND\ENTER.SND
```

You may use any sound you like, and change any parameters if you wish.

PLAYMIDI

UltraSound's installation program installed your MIDI sound files in a separate directory called MIDI, and the MIDI player, called Playmidi, was placed directly into your ULTRASND directory. Also located in the MIDI directory are patches, or individual instruments, which were used to compose the MIDI sounds. The patches are identified by their .PAT extension. The .MID files are a standard MIDI file format.

Playmidi also has a basic full-screen interface that is similar to Playfile's. Included with UltraSound are several songs recorded as MIDI files. These are identified by .MID extensions. Playmidi also supports command line options.

A demonstration of Playmidi was installed with your UltraSound software.

If you would like to hear the MIDI demo:

- **Go to your ULTRASND directory:**

  Type: `CD\ULTRASND` **<enter**

- **Run the Demo :**

  Type: `MIDIDEMO`

Another MIDI demo is provided for those who have expanded their UltraSound to its full 1 Megabyte capacity. To Run the 1 Megabyte MIDI demo:

- **Type:** `MIDI1MB.BAT`

To use the UltraSound MIDI File Player full-screen interface:

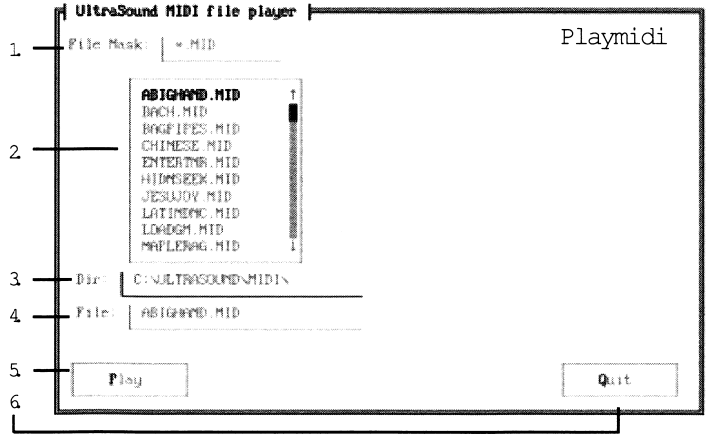
- **Type:** `PLAYMIDI <return>`
- **On the Playmidi screen, the File Mask displays *.MID.**
- **Select a sound file in the text window. Selections are made using the mouse or keyboard.**

  The DIR: displays the directory for the file; (.mid) files are in the MIDI directory. The FILE: displays the file.
- **Select Play to play the file.**

To use the UltraSound MIDI File Player from the command line

- **Change to the UltraSound directory.**

  Type: `CD C:\ULTRASND` **<enter>**



1. `File Mask:` DOS wildcards supported. The `File Mask` shows the extension (.MID in this case) of the file you want to play.
2. `File Window:` Lists the MIDI files to choose from.
3. `Directory:` The files' directory, or the path selected.
4. `File:` Displays the file you select.
5. `Play:` Plays the file.
6. `Quit:` Quits Playfile.

- **Type Playmidi, followed by the filename for the MIDI song you want to play. For example:**

  Type: `PLAYMIDI  LATINDNC.MID` **<enter>**

- **To stop the MIDI sound from playing, press any key.**

The .CFG file for each MIDI song, like LATIN.MID for example, is used to set up the appropriate instruments to their respective channels. MIDI songs without .CFG files will default to the industry standard General MIDI set.

ULTRASOUND WINDOWS FEATURES

- Supports 8- and 16-bit playback in all Windows 3.1 Wave formats (i.e., 8-bit, 16-bit, Mono, Stereo, 11025 Hz, 22050 Hz, and 44100 Hz).
- Supports 8-bit recording in all formats; 16-bit recording is available with an optional add on card (the Gravis 16-bit Recording Option).
- Support for the onboard 32-voice wave table synthesizer is provided.
- Provides a full General MIDI patch set comprised of 192 instruments, drums, and sound effects for playing MIDI files.
- Able to cache, or preload, patches from the General MIDI set into its onboard DRAM. For applications that do not yet use patch caching, the capability to load a small General MIDI set is provided. The Patch Manager applet has the ability to load, unload, and audition patches.
- Provides an option to conserve patch memory which increases the number of patches you can load and effectively increases the onboard DRAM. (Conserve patch memory causes minimal sound reduction to a patch's sound quality when used.)
- Full MIDI IN and MIDI OUT capabilities are supported.

WINDOWS® SOFTWARE

UltraSound provides a number of Windows® utilities and software applications for you. The utilities include the Windows Sound Converter and the UltraSound Mixer applet.

WINDOWS UTILITIES

Sound Converter

The Windows Sound Converter is a utility that converts .SND, .WAV, and .VOC file formats.

UltraSound Mixer

The UltraSound Mixer applet (installed in Windows) allows you to control the mixer facilities of your UltraSound card. Mixer facilities include input/output enable, Wave and MIDI playback volume, plus CD and Microphone control.

The UltraSound Mixer functions allow you to modify the state of the inputs, output, and playback volumes of UltraSound. Simply click on the appropriate check box to enable the Microphone and Line inputs. Click on the Output Enabled to simultaneously enable the amplified and non amplified outputs. Click on any combination you need for mixing. Note that any combination of inputs is possible. For instance, you are not excluded from simultaneously enabling the Microphone and Line inputs. The scroll bars allow you to adjust the playback volumes of both .WAV and MIDI files.

Note! The UltraSound driver is designed to work with Windows 3.1 in 386 enhanced mode only.

WINDOWS PROGRAMS

Patch Manager™

Patch Manager™ makes loading and auditioning patches easy and fun. If you have a MIDI keyboard and the Gravis MIDI Adapter, plug it in and play your UltraSound through Patch Manager!

Patch Maker Lite

Patch Maker Lite allows you to make your own patches, or edit existing patches.

See Chapter 4, "Patch Manager and Patch Maker," for instructions for using these programs.

WINDOWS DRIVERS

Driver Configuration

The Driver Configuration dialog window lets you customize different aspects of the UltraSound Windows driver. Any items in the dialog that are changed will be saved in the Windows SYSTEM.INI file when the OK button is pushed. Therefore, the next time Windows is started, the new selections will be in effect. A change in any of the following items will require that Windows be restarted: Base Port, DMA, IRQ, or the Active Voices.

To access the Driver Configuration dialog window, locate and open the Windows Control Panel, usually found in the Main or Accessories program group. Select and click on the Drivers icon. If the UltraSound driver has been installed, there will be an entry in the Installed Drivers list box named UltraWave and MIDI

Synth. Activate the Driver Configuration dialog window by double-clicking the left mouse button on UltraWave and MIDI Synth.

ULTRASOUND SETUP

In the Drivers box, click on the Setup button to access the following items:

Hardware Configuration

You'll notice there are four items in the configuration dialog pertaining to hardware setup: Base Port, DMA, GF1 IRQ, and MIDI IRQ.

The Base Port Address must be set to the same Base Port Address that is set on your UltraSound board, which is factory preset to 220Hex. The DMA and IRQ selections are programmable, and thus may be set to any of the available options, as long as there is no conflict with another adapter in your system.

Under this option there are three items: Linear Volume, Active Voices, and Verify Patches.

Linear Volume

You can click the Linear Volume either on or off. Selecting "off" will base MIDI volumes on a logarithmic scale.

Active Voices

The valid range of active voices is 14 to 32. There are always two voices reserved for play back of stereo wave files; thus, the number of voices available for MIDI is two less than the number chosen. Note that a change in the number of active voices will not take effect until after the current Windows session is restarted. For an explanation of the significance of selecting a certain number of voices, see the section "Performance Issues."

Verify Patches

When Verify Patches is on, all General MIDI patches located in ULTRASND.INI will be verified to make sure that they exist when Windows starts up.

Patch Memory Options

Patch Memory refers to the onboard memory used for storing patches. You may load patches at their original resolution by choosing High Fidelity (16-bit), or at a lower resolution by selecting Conserve Memory (8-bit). See the section "Performance Issues" for additional information regarding this option. Patch files contain the sound data used by the driver to play MIDI notes.

Performance Issues

You have the ability to change certain aspects of UltraSound's performance via the Performance Options section of the Driver Configuration Dialog Window.

For example, Active Voices affects the number of active voices used by UltraSound to play MIDI and Wave files. The number of active MIDI voices in Windows is selectable to allow you to 'reserve' voices for digital playback. In High Fidelity mode there is a barely discernible loss of fidelity from 44.1K starting at 15 voices. Normally, you should set the number of active voices somewhere around the default of 22.

The Patch Memory option affects the use of onboard patch memory. Choosing the option Conserve Memory effectively doubles the amount of memory available for patches, as the majority of the patches are created at a high resolution. In general, there is minimal degradation in sound quality for choosing to load patch files at a lower resolution, because the UltraSound hardware always deals with the sound internally at a high resolution.

PATCH CACHING

Patch caching is one of the distinguishing features of the Windows 3.1 Multimedia extension. In short, patch caching loads patches for use in applications. Patch Caching allows the most efficient use of onboard UltraSound memory, since a sequencer, or other application, only needs to load the patches required for a particular set of MIDI data.

Patch files contain the sound data used by the driver to play MIDI notes. Patch Caching allows you to add additional sounds simply by obtaining new patch files. Many applications already take advantage of this feature, including the Windows Media Player, Power Chords, Midisoft Recording Session, Studio, Music Mentor®, MCS Stereo Rack™ , and DigiVox's Multimedia Sound Studio™ .

If, however, you have an application that does not use patch caching, you can load a subset of the General MIDI set before running the application:

- **Click on the Drivers icon under the Control Panel, and select the UltraWave and MIDI Synth or the UltraSound audio driver.**
- **Click on the Setup button. Then click on Performance Options to access the Conserve Memory button.**
- **Click on the MIDI Mapper (also under the Control Panel) to select the appropriate setup for the amount of memory on your UltraSound. For example, select Ultra 256K in the name box if you have 256K of RAM on your card.**
- **Using Patch Manager, load patches from the MIDI file that corresponds to the amount of memory on your UltraSound. The MIDI files used are LOAD256.MID, LOAD512.MID AND LOAD1024.MID.**
- **You may also load all the patches for a particular MIDI file by using the Get from MIDI File option in the File menu of Patch Manager.**

To revert to normal operation, select UltraSound Setup in the MIDI Mapper, and enable the High Fidelity option of the driver.

PATCH MANAGER™ AND PATCH MAKER LITE

INTRODUCTION

Early synthesizers achieved different sounds by connecting voltage-controlled oscillator filters and amp modules with patch cords. Because the cables were used to patch together the modules, the resulting sounds were called *patches*. For this reason, we use the word *patch* to refer to the instruments and digital audio data used by your UltraSound's internal waveform synthesizer to create sounds.

UltraSound patches are stored in disk files that must be loaded into onboard memory before a sound can be produced. This patch loading is normally done automatically by application software, but there may be times when you want to do it yourself. With the UltraSound Patch Manager™ , you can control which instrument patches are loaded into your UltraSound's on-board RAM memory, and you can audition them. These patches will then be available for use with your favorite Windows music composition or sequencer software. Patch Manager also adds MIDI input capability so you can play your Gravis UltraSound from any MIDI input or device.

PROGRAM REQUIREMENTS

A correctly installed Gravis UltraSound card, Windows 3.1 in 386 Enhanced Mode, and the current Windows driver in this disk set.

PATCH MANAGER INSTALLATION NOTES

Patch Manager may not work correctly with earlier versions of the UltraSound Windows driver. Use with the Windows driver supplied on your new UltraSound disks only.

- Patch Manager is installed automatically during UltraSound installation.
- Run Patch Manager; select Quick Tour in the Help Index menu for an overview of operation. Explore the various menu options.
- Patch Manager comes complete with an 88-key synthesizer keyboard. Note that many patches can be played well beyond their intended range but will sound weird.
- Patch Manager's "Memory Remaining" gauge shows how much memory is remaining to hold patches. (Note that 8K of memory is reserved for digital audio and is not available for patches.)
- An upgrade to 512K or the full 1 Mb of RAM on the card is recommended if you intend to use your UltraSound card for MIDI music compositions using more complex orchestration.

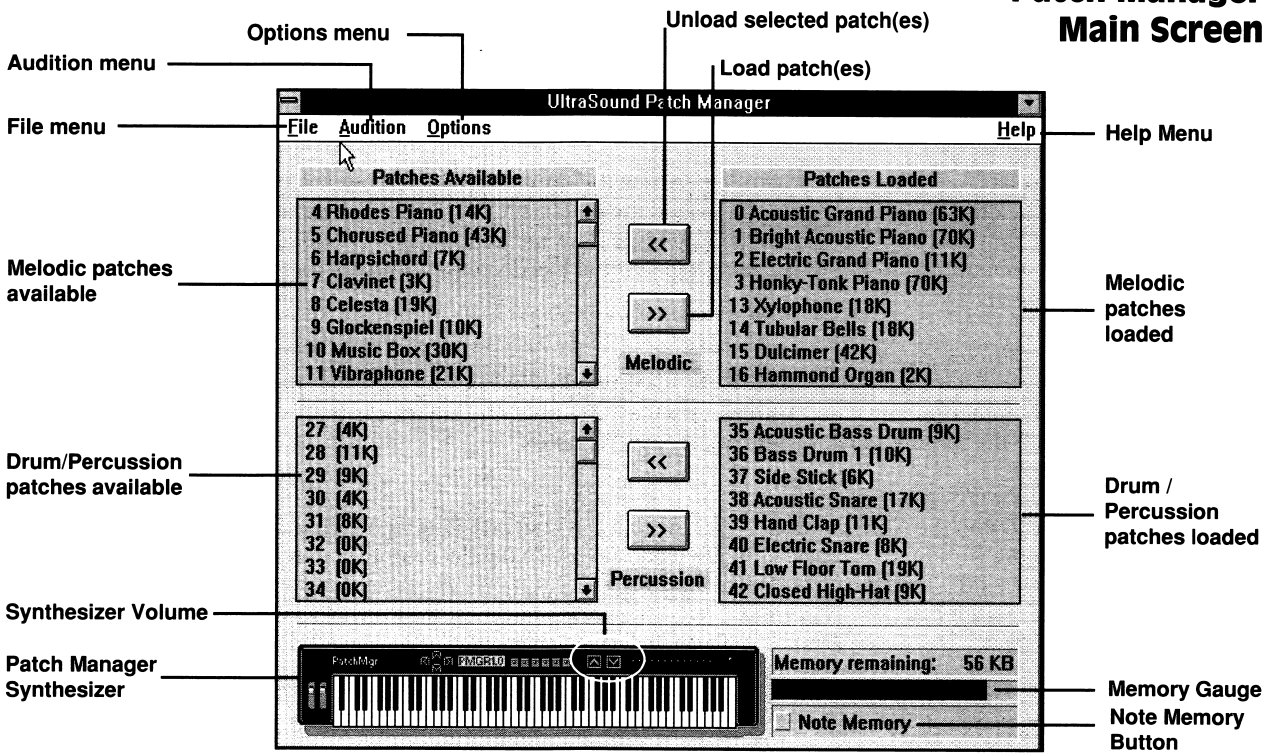
QUICK TUTORIAL

This quick tutorial tour will acquaint you with many of Patch Manager's features. To start Patch Manager, launch Windows and double-click on the Patch Manager icon, found in the Program Manager window in the Gravis UltraSound group.

1. Start Patch Manager

When you start Patch Manager, you will see four main windows which display patch numbers, names and sizes. (Some percussion instruments are not in the General MIDI set, so their names are blank.) The

Patch Manager Main Screen



two left windows show which patches are available for melodic and percussion instruments. The two right windows show which melodic and percussion patches are currently loaded into UltraSound's memory.

2. *Load a patch*
   Select Acoustic Grand Piano (patch 0) in the upper left window by clicking on it with the mouse. Press the double right arrow button to load the patch (see the Patch Manager Main Screen diagram). This patch now appears in the upper right window, indicating that it is loaded. Notice that the Memory Remaining number in the lower right corner has decreased, and the memory gauge below it is starting to fill up.

3. *Audition a patch*
   Select the patch name in the right-hand window by clicking on it with the mouse. Then move the mouse pointer onto the Patch Manager synthesizer. Press the left mouse button to play a note. Drag the pointer on the synthesizer keyboard to play several notes.

4. *Audition a group of notes*
   Click on the Note Memory button so that it is checked. Play a note on the synthesizer keyboard. Each note auditioned is now highlighted and saved. To deselect a note, and remove it from Note Memory, click on it with the right mouse button.

   Select a few notes, then click on the patch name in the upper right window. The group of selected notes now plays with the patch name selected.

5. *Audition other patches*
   Load a few more melodic patches (as in Step 2) and click on each one in the Patches Loaded window.

Each patch will play the notes selected on the synthesizer.

6. Audition drums

Load a few percussion patches as described in Step 2, and click on one of these. The Patch Manager synthesizer keyboard now displays a gray keyboard with some white keys. Each white key corresponds to an individual drum sound. Try some! The Note Memory option does not work for drum patches.

7. Adjust the volume on the synthesizer

Press one of the buttons with an up or down arrow, in the middle top of the synthesizer. This will adjust the audition volume. Note that the red LEDs to the right of the buttons show the current volume.

8. Display several audition keyboards

Choose All under the Audition menu. A group of audition keyboards will be displayed, one for each melodic patch loaded and one that contains all the percussion sounds you have loaded. Any of the audition keyboards can be played with the left mouse button. Notes will play as long as the left mouse button is held down.

ULTRASOUND PATCH MAKER LITE

Welcome to Patch Maker Lite, the UltraSound patch creator. Now you can create new patches, or take an existing patch and modify it to use in your MIDI music compositions or games.

QUICK TUTORIAL

Patch Maker Lite's easy and quick tutorial will acquaint you with many of its features, and take you step-by-step through the creation of a new patch.

The tutorial will take about 15 minutes to complete. You can stop the tutorial at any time and resume it later. Make sure you save the patch you are working on before closing Patch Maker Lite. To resume working on your patch, open the saved patch.

Starting the tutorial

In the tutorial, it is assumed that you have installed Patch Maker Lite in the directory C:\ULTRASND\PMAKER. If you have chosen to install Patch Maker Lite in a different directory, use your directory name instead whenever you see C:\ULTRASND\PMAKER.

To start the tutorial, double-click on Patch Maker Lite's icon. When Patch Maker Lite starts, you'll see an empty window with a menu bar at the top and a toolbar just below the menu bar.

In the menu, under the Help file, select Contents. Click on Quick Tour and Tutorial to start the tutorial.

From this point, please follow the tutorial instructions on screen. To keep the instructions handy, reduce the tutorial window so you can interactively read and do the tutorial. Don't be afraid to experiment!

After the tutorial...

By now you should have completed the Quick Tour and Tutorial, and you should be familiar with Patch Maker Lite's features. Are you ready do your own patches? Sure you are. The tutorial is a great way to jump

in, but you'll need some references to the Menu Commands, Tool Bar, and some definitions to help you out when you are on your own. Please note that you will also find the following information under the Patch Maker Lite on-line help, which you can access from the Help menu or by pressing F1 while you are running Patch Maker Lite.

MENU COMMANDS

Before you put the Menu Commands to use, we're going to show you how to load an existing patch for editing.

There are three methods for loading a patch file into Patch Maker Lite.

1. Use the File/Open command.

2. Drag and drop a patch file (like you did in the Quick Tour and Tutorial) from the Windows File Manager into Patch Maker Lite's main window. (Please see your Windows documentation for more information about drag-and-drop.) The patch file extension must be .PAT. You can drop several files at the same time.

3. Include the name of the patch file in the command that is used to start Patch Maker Lite. For example, to load the patch file HELLO.PAT when Patch Maker Lite starts, you could create an icon with the command line PMAKER.EXE HELLO.PAT

File Menu

New
The New command creates an empty patch. Use New if you want to create a new patch from scratch using waveforms. To edit an existing patch, use the File Open... command.

Open...
Brings an existing patch into Patch Maker Lite's window in order to test or modify it. You can also open patches by specifying them on the command line or by dragging and dropping them onto the Patch Maker Lite window.

Open .WAV File...
Opens a waveform file. Later, this can be added to a patch by dragging and dropping it onto a patch keyboard.

You can also open a waveform file by specifying its name on the command line when you run Patch Maker Lite, or by dragging and dropping a file with the extension .WAV from the File Manager onto Patch Maker Lite.

Save
Saves a patch that you've created or modified. After you save your file, any changes you've made to the patch will be permanent.

Save As...
Lets you save the current patch into a file with a different name.

Exit
Lets you leave Patch Maker Lite. If you've modified any patches since they were last saved, you'll be asked if you want to save them.

Edit Menu

Delete
Removes the current waveform from the current patch.

Remove Silence
Eliminates periods of silence from the beginning and end of a waveform. It works on the current waveform by doing an analysis to find the first and last sample points that are louder than a threshold (which is determined automatically). You are then given the option to delete the sample points outside that range.

Maximize Volume
If the current waveform is too quiet, you can use the Maximize Volume command to increase its volume. The sample data is analyzed to find the minimum and maximum values, then all points are multiplied by a factor which ensures that the maximum allowed range is used. At the same time, the average value of the samples is arranged to be zero (i.e., any DC offset is removed). Maximize Volume can help the patch sound better and avoid pops and clicks.

Windows Menu

Tile
Arranges the patch windows so that they do not overlap.

Cascade
Arranges the patch windows so they overlap in an orderly fashion.

Arrange Icons
Spaces icons evenly in the main window.

Close All
Closes all patch keyboard windows, patch keyboard icons, and waveform icons.

Help Menu

Contents
Contains the Table of Contents for the UltraSound Patch Maker Lite on-line help.

About
Tells you the version number of your copy of Patch Maker Lite.

Tool Bar

Display Patch Information
Shows some information about the patch data. None of this information is necessary to make patches, but it is provided for the curious.

Total Patch Size is the total amount of UltraSound memory the patch uses. It is usually a little larger than the sum of the sizes of each waveform in the patch, because the size of each waveform is rounded up to the next

multiple of 32.

Waveform size is the size in bytes of the current waveform.

Waveform rate is the sampling rate of the current waveform.

Type of Data. Waveform data can be 8-bit or 16-bit, signed or unsigned.

Edit Patch Descriptions & Names
This dialog lets you view and modify descriptions of patch elements.

Patch description lets you enter text to describe the patch.

Instrument Name can hold the name of the instrument for the patch. Instrument Name can be used by other applications (for example, UltraSound Patch Manager) to help identify the patch.

Waveform Name can hold any name you wish to give to the waveform. By default, Patch Maker Lite uses the name of the .WAV file that the waveform came from.

Edit Loop Region
A waveform in a patch often has a loop region defined. Edit Loop Region dialog lets you interactively modify the loop region values to obtain high-quality sound that can have a long duration.

Defining the Loop Region
A loop region has a start point and a length, which can be set by their respective sliders, marked coarse and fine. Coarse lets you set the value to an approximate position on the loop; Fine lets you fine tune the value

more precisely to get the best sound. You can't have a start point and loop length combination that would put the end of the loop region past the end of the sample data. Thus the sliders may refuse to move beyond a certain point when you are dragging them to the right.

Getting loop parameters that result in a good sound can be tricky. For many waveforms, the Suggest button can help. When you press this button, the sample data is analyzed (this may take a few seconds), and a minimum loop length is suggested. The Suggest button changes to a Use button after it is pressed.

Here's an example. Lets say the suggested minimum loop is 127.909. You could use this value, but you can sometimes get better results by using a multiple of the loop's minimum length. For example, a multiplier of 4 will give a loop length of 511 10/16. If you press the Use button now, the loop length will be set to 511 10/16 samples, and the loop start point will be set as close to the end of the waveform as possible. Some fine tuning may still be needed, but the above procedure will often get you into the right ballpark.

Setting the loop type
The loop region can be played forward, backward, or in both directions. The check boxes labeled Forward, Backward, Unidirectional and Bidirectional let you choose these options.

Enabling looping
When you bring up this dialog, the Enable Looping checkbox is checked by default. If you do not want the patch to play the loop region repeatedly, uncheck this box.

Loop Region
A loop region is a portion of a waveform that is played repeatedly. This enables a note to be played for a long time, even if the waveform is short.

Choose Envelope
The Envelope dialog lets you view or modify the envelope options for the current sample.

The Sustain option lets you have control over the volume of a note while it is playing, before you turn it off. Sustain keeps the rate of change of volume at a constant level (see the figure below).

For most percussion instruments, the notion of turning the note off does not apply, and you just want the waveform to play through. For melodic instruments, you typically want the note to continue playing (although perhaps at decreasing volume) until "note off " is sent.

The While note is on... options let you choose whether a note maintains a constant or decreasing volume until "note off "is sent. Note that if looping is not enabled, the note sound will play only for the duration of the sample in any case.

The When note is turned off... options let you choose how quickly the note volume decreases when a "note off "is sent.

Use Choose Envelope to interactively explore the effects of these options. You may need to stop and re-start the note to hear the effect of some options.

Adjust Tuning
Adjust Tuning lets you tune the current waveform. When you press the Adjust Tuning button, you will hear your waveform and a reference tone (which is at the correct pitch for the waveform to be in tune). By using the reference tone, you can tune your waveform accurately.

You can interactively set the pitch while the note is playing by adjusting the slider labeled Sample Pitch. You

can play either the waveform note or reference tone alone, or play them together by choosing the appropriate option under the Play/Stop button.

In many cases, you can press the Adjust Tuning button to get some help getting the patch in tune. When you press the Adjust Tuning button, the sample data is analyzed (this may take a few seconds), and a frequency is suggested to put the sample in tune. The label of the button changes to Use. If you press the Use button, the suggested frequency is applied to the patch to affect its pitch.

Edit Vibrato/Tremolo
This dialog lets you view or modify the vibrato (pitch variation) or tremolo (volume variation) characteristics of the current waveform. The effects of vibrato and tremolo are determined by the sweep, rate and depth of the effect.

Sweep
The sweep value for vibrato or tremolo determines how soon after the note is turned on that the effect takes place. The larger the value of sweep, the longer the delay.

Rate
The rate value of tremolo or vibrato determines how quickly the pitch or volume varies.

Depth
The depth value for tremolo or vibrato determines how large the variation is.

You can interactively set these values by pressing the Edit Vibrato/Tremolo button and adjusting the sliders. In some cases, you need to stop and re-start the note in order to hear the effect.

Adjust Balance
This dialog lets you adjust the balance of the current waveform. Each waveform in a patch can have its own balance.

Panic Button
The Panic Button reloads all patches that you are working on into UltraSound memory. There are two situations where you may want to use the Panic Button:

1. A note will not stop playing, no matter what you do. (We've tried to prevent this from happening, but have provided the panic button, just in case.)

2. No sound, or incorrect sound, is heard when you play a patch note. This incident can happen, for example, if you run another program which uses your UltraSound while Patch Maker Lite is running. The other program may have loaded its own patches.

DEFINITIONS

Patch

A patch is a file that contains sound waveforms and associated information, such as note length and volume, that is used to define a sound (i.e., instrument) for the UltraSound.

Sweep

Sweep determines how soon after the note is turned on that the effect takes place. The larger the value of sweep, the longer the delay.

Rate

The rate value determines how quickly the pitch or volume varies.

Depth

The depth value for tremolo of vibrato determines how large the variation is.

Waveform

A waveform is a collection of samples of a sound. In Windows, waveforms are usually stored in a file with a .WAV extension. A patch for the UltraSound contains one or more waveforms which contain the sampled sounds of an instrument.

The terms sample and waveform are sometimes used interchangeably.

Sample

A sample is a single number representing one point in a digitized sound. Again, sometimes the words sample and waveform are used interchangeably.

Envelope

The envelope of a waveform is a set of numbers that describe what volume each part of the waveform should be played at and whether the volume increases or decreases in each part.

Sustain

If a waveform's envelope has sustain selected, a note will play through the first part of the envelope and then maintain a constant rate of increase or decrease of volume for as long as it is on. When the note is turned off, the note plays through the remainder of the envelope.

If sustain is not selected, then a note will play through the envelope values without stopping until the end of the sample is reached.

Root Frequency

The root frequency of a waveform in a patch determines the pitch at which a note will play. The root frequency is normally the frequency that the note was played at when it was sampled. It might be different to allow for fine tuning of the note.

The note corresponding to the root frequency is shown as a red rectangle on the patch keyboard. It can be changed in the Adjust Tuning dialog.

Note Range

A single waveform in a patch is normally used to play several different notes into a range. The notes that a particular waveform applies to are known as a note range and are shown as colored regions (yellow or blue) of the patch keyboard.

Suggest

When you press the Suggest... button in the Edit Loop Region or Adjust Tuning dialogs, Patch Maker Lite analyzes the current waveform to determine what values to use for the root frequency and the length of the loop region. The name of the button changes to Use.

Use

If you have pressed the Suggest... button in the Edit Loop Region or Adjust Tuning dialogs, then the name of that button changes to Use. If you press Use, the suggested value is used.

JOYSTICK TEST AND CALIBRATION

Your joystick must be in good working order and correctly calibrated (aligned) in order to work with the UltraSound game port. Calibration is the process of lining up the joystick's electrical center with its mechanical center. Once the joystick is calibrated, the game port can be adjusted to the speed of your specific computer system.

Some joystick manufacturers call calibration "trim."

- **Start your computer with your joystick plugged into the game port.**
- **Go to your UltraSound directory:**

  Type: `CD\ULTRASND` **<enter>**

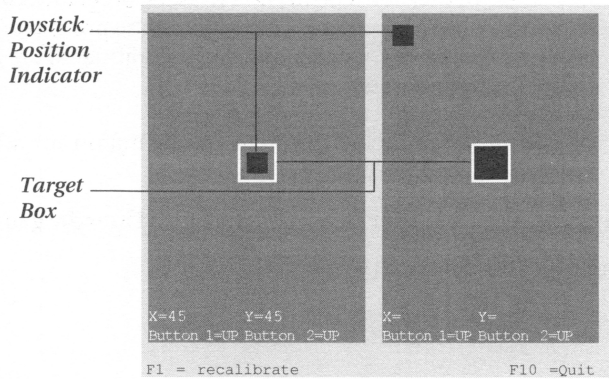
To run the JoyComp program:

- **Type:** `JOYCOMP` **<enter> and choose GravTest from the onscreen menu.**
- **GravTest will lead you through its Joystick Test Program, requesting you to rotate your joystick in a complete circle. Press the spacebar when you are finished.**
- **With the joystick handle(s) centered, adjust your joystick's calibration (trim) adjusters to move the Joystick Position Indicator into the Target Box (see Fig. 6). See your joystick's manual for the location of the Calibration Adjusters. (Some joysticks can't be adjusted.)**

The Indicator may not center exactly in the target box and may jitter. This is caused by a combination of the setting, screen resolution, and power supply noise — it is OK.

- **Press "F1" and repeat the previous step until the Joystick Position Indicator is positioned in the Target Box, without additional adjustment of the Calibration Adjusters.**

Gravis Analog Joysticks have 3 buttons (Gravis Analog Pro has 5 buttons), each with adjustable functions. The Button Status Indicators can be used to confirm the function you have assigned to each of your Gravis Analog Joystick buttons, and to test whether they are working properly.



GravTest Screen

The Indicator may not center exactly in the target box and may jitter. This is caused by a combination of the setting, screen resolution and power supply noise.

ULTRASOUND GAME PORT SPEED ADJUSTMENT

Once your joystick is correctly calibrated:

- **Press "F2" to enter the Speed Adjustment portion of GravTest.**
- **Press the up and down arrows on your keyboard until the Analog To Digital Conversion Index is approximately 1.0.**
- **Press <esc> to exit GravTest.**
- **Press <esc> or select option [C] Exit to leave the program.**

JoyComp will display a number on your screen. This number is the Speed Compensation Value for your computer.

- **Add the line "`ULTRAJOY` [# displayed]" to your AUTOEXEC.BAT file after the SET ULTRASND= line.**

  For example: `ULTRAJOY 8`

Your game port is now set to the correct speed compensation setting for your computer system.

FINDCARD™

FindCard™ locates game port circuit conflicts. All game ports use a common address (201 Hex) and will not function properly if there is another device (Multi I/O card, other sound card, etc.) using that address. If you are experiencing problems with games behaving erratically, you may have a circuit conflict. To determine if this is the case, follow these steps.

To accurately find conflicting game card circuits, FindCard must be run WITHOUT the UltraSound Card installed, or with its game port disabled.

- **Remove your UltraSound card from your computer.**
- **Turn your computer's power off for one minute, then restart.**

  FindCard will only work accurately if run immediately after a cold boot (power turned off for 30 seconds or longer).

  If your AUTOEXEC.BAT file runs any TSRs (memory resident programs), start your computer with a boot disk that does not run these programs.

- **Start your computer.**
- **Run FindCard. Type:** `GRAVUTIL` **<enter> and select FindCard from the menu.**

You must run GravUtil, not JoyComp, when using FindCard.

- **Press any key to allow FindCard to check for conflicting game cards or game card circuits.**

  If a conflict is unlikely, FindCard will display a "Technical Reference Number (1)" or "(8)" message. If FindCard locates a conflicting card, it will display a message stating that it has verified a conflict.

  To correct a conflict, either remove or disable the conflicting device, or disable the UltraSound game port by running Ultrinit using a -d, switch (OFF); i.e., ULTRINIT -d,. Again, please refer to the README or see DOS Troubleshooting in Chapter 7 if you have any problems.

ULTRAJOY

If you experience problems with a particular game, you can change the Speed Compensation Setting right from the DOS prompt. To change the setting:

- **Change to your ULTRASND directory.**

  Type: `CD\ULTRASND` **<enter>**

- **At the DOS prompt:**

  Type: `ULTRAJOY` **[1—31]<enter>**

Values entered can range from two to thirty-one. Faster machines require lower numbers. To determine the proper Speed Compensation Value for a problem game, try the following:

- **Run UltraJoy; substitute a number other than the one in your AUTOEXEC.BAT for the Speed Compensation Value.**
- **Run the game and test joystick performance.**
- **Quit and return to your ULTRASND directory.**
- **Adjust the speed with UltraJoy and repeat the above steps until you are satisfied with the control of your game.**

You can start problem games you have identified more easily if you write a batch file to run UltraJoy with the adjusted Speed Compensation Value, then start the game. To do this, in any text editor:

- **Type:** `ULTRAJOY` **[correct value] [game's name and path]<enter> . For example:**

```
ULTRAJOY  8

CD\GAMESDIR

REVENGE OF THE GRAVOIDS
```

<enter>

- **Save your work as "[whatever].BAT."**

ULTRASOUND GAME SUPPORT

UltraSound is unique among sound cards. Other cards use FM synthesis to create instruments, resulting in "computery" and indistinct sound. UltraSound uses a more advanced technology—wave table synthesis— to produce sound. Wave table synthesis samples real instruments to create patches for games. The result? Clear, natural and more realistic sound.

UltraSound can be supported 4 ways in software:

1) Native (direct support).
2) Audio Interface Libraries(AIL)/Ultramid.
3) Mega-Em (Emulator) to support the Roland MT32 or SCC1 compatibility (General MIDI) and Sound Blaster DAC.
4) SBOS (Sound Blaster emulation) to support Sound Blaster or Ad Lib games.

NATIVE SUPPORT

Games that directly support UltraSound do not require any TSR programs (Terminate and Stay Resident programs—they stay resident until you turn your computer off) or other emulators.

With these types of games you don't have to do anything except start the game. If you have any problems, please refer to the game's documentation.

AUDIO INTERFACE LIBRARIES (AIL)/ULTRAMID SUPPORT)

AIL

The AILs are a set of interface drivers which enable software developers, mostly game developers, to integrate sound capabilities into their programs (without programming the game for one specific sound card). Once a developer integrates his program into the AIL drivers, the game or application will work with most sound cards on the market.

AILs support the MIDI standard as well as the digital sound interface of a sound card. These library drivers allow developers to use UltraSound's wave table synthesizer and digital interface to play 8- or 16-bit audio in either mono or stereo mode.

Ultramid

Ultramid is a TSR utility that uses the AIL drivers. Ultramid activates the AIL Drivers so that they can take advantage of UltraSound's advanced features.

Game publishers should ship the AIL drivers and the Ultramid utility with their games; but, if they don't, these drivers are provided on your UltraSound disks.

For games that require a large amount of memory, Ultramid will attempt to load itself partially or fully into upper memory, depending on the amount of upper memory you have available.

How to use the AIL Drivers and Ultramid

Check to see whether your game came with the AIL Drivers and Ultramid:

- **After installing the game, check the game's directory to see if there are any files with the extension .ADV. If there are, the game probably uses the AIL drivers.**

  If your game came with the AIL Drivers and Ultramid, please refer to the game's documentation for further information.

  If your game DID NOT come with the drivers:

- **If the game came with the files SBDIG.ADV and SBMID.ADV, make backups, then:**

  Type: `COPY C: \ULTRASND\ULTRAMID\GF1DIG.ADV C:\GAMEDIR\SBDIG.ADV` **<enter>**

  `COPY C:ULTRASND\ULTRAMID\GF1MID.ADV C:\GAMEDIR\SBMID.ADV` **<enter>**

- **Load Ultramid from DOS :**

  Type: `ULTRAMID`

Mega-Em and SBOS must not be loaded when you run Ultramid.

- **Run the game's setup again and configure it for SoundBlaster™ .**

If you still can't get the drivers to work, try one of the following alternative methods.

MEGA-EM (EMULATOR) SUPPORT

Mega-Em is an emulator solution for games that do not directly support UltraSound, but use General MIDI, Roland MT 32 or Roland SCC1 and Sound Blaster.

One real benefit of Mega-Em is that it doesn't use any conventional memory. It loads itself completely into expanded memory (EMS). However, it requires a memory manager to run, such as QEMM, EMM386, 386MAX etc. If your game will not allow you to use one of these memory drivers, or if it was written in protected mode, Mega-Em may not work.

SBOS™

The Sound Board Operating System (SBOS) is a driver that allows your UltraSound to emulate a Sound Blaster™ or Ad Lib® sound card. The SBOS directory contains: SBOS library; SBOSLIB.SBS; the SBOS driver SBOSDRV; a loader, LOADSBOS; a data file SBOS.CFG to store SBOS's defaults; and a batch file that loads and runs the driver, called SBOS.BAT.

To configure UltraSound into a Sound Blaster compatible or equivalent sound card mode:

- **At the C:> prompt:**

  Type: `SBOS` **<enter>**

Mega-Em and Ultramid must not be loaded when you run SBOS.

If SBOS loads successfully, you will hear "SBOS installed."

SBOS configures your UltraSound to run in Sound Blaster or AdLib mode.

With SBOS loaded, you can play any game that is compatible with Sound Blaster or Ad Lib. Be sure to choose the appropriate sound card from the game's configuration menu. Choose Sound Blaster (NOT Sound Blaster Pro, Ad Lib Gold, Pro Audio Spectrum, for example) in order to take advantage of UltraSound's digital audio capabilities.

SBOS Help

An onscreen quick reference guide is available for SBOS. To access this information:

- **At the C:> prompt:**

  Type: `SBOS -H`

Unloading SBOS from Memory

Sbosdrv is a TSR program that stays resident until you turn your computer off or free the Sound Board Operating System from memory.

- **To free SBOS:**

  Type: `SBOS -F` **<enter>**

SBOS can load into high memory for games that require a lot of memory.

SBOS 3rd Party Support

SBOS supports Sound Blaster's compressed data (ADPCM) formats.

Drivers from Creative Labs (CT-VOICE.DRV) and Ad Lib (SOUND.EXE) are not supplied with the UltraSound card. If an application requires these drivers and you do not have them, the application will not run. You must get these drivers from the game's publisher, or another source, if you want to play games that require them.

TIPS AND HINTS

Record your Settings

When you installed your UltraSound, you accepted or selected the settings for IRQ, DMA, and Base Port Address in the UltraSound setup. You can check or change your settings at any time by running the setup:

- **Type:** `SETUP`

In the "Quick Installation Guide" there is a chart to record your settings. This chart is very important. Often, you need to know these settings when you install new games, or set up sound for existing games.

Sound for New Games

A game's installation program may ask you for the type of sound board you are using.

If UltraSound is in the menu: **Choose UltraSound.**

If UltraSound is NOT in the menu:
Choose **General MIDI, Roland MT 32, SCC 1, or Sound Canvas**, if they are available. If you choose any of these, you should have preloaded the Mega–Em emulator. Remember, the Mega-Em drivers must be installed for these games to work. See Appendix C for information on Mega-Em.

For games written for Sound Blaster you'll need to load the Sound Board Operating System (SBOS) and select **Sound Blaster**.(Remember you must have SBOS loaded for these games to work.)

The game's installation may ask you for the UltraSound or Sound Blaster settings (IRQ, DMA, and Base Port Address). Refer to your record chart and enter the values you accepted or selected in UltraSound Setup.

Sound for Games Already Installed on Your Computer

You may have to reconfigure games already installed on your computer before you can use them with UltraSound.

Refer to the game's documentation to find how to run its installation or setup. You may need to reinstall the game and enter the new/appropriate settings (IRQ, DMA, Base Port Address) so that the game will work with UltraSound.

Volume Control

You can control the volume in Native Support games by changing the external volume on your speakers or stereo.

Volume control for Ultramid

- **Type:** `ULTRAMID -Mxxx` **(0-127) (where xxx stands for the volume number).**

Volume control for Mega-Em

- **Type:** `EMUSET -Vxxx` **(1-16) (where xxx stands for the volume number). The default is 16.**

Volume control for SBOS

Volume Adjustment/SBOS.CFG File

You can adjust the volume in SBOS at any time, even in the middle of a game. To do this:

- **Type:** `9` **to raise the volume.**
- **Type:** `0` **to lower the volume.**

The volume will change instantly, each time you press one of these keys.

Some games take control of the keyboard; therefore, the volume adjustment feature will not work.

Adjusting the Master Volume for SBOS

You can also adjust the master volume for all your applications that use the SBOS mode to generate sound. You can set the master volume at any level from 0—32; 0 is quietest and 32 is loudest. The default is 28. To adjust the master volume:

- **Type:** `SBOS -V[0-32]`

For example: SBOS -V32 would raise the master volume to its maximum.

You can also change the "SBOS installed" message to any other sound you would like using the SBOS.CFG file. To do this:

- **Open the SBOS.CFG file (with any text editor).**
- **Type the full name of the sound file you would like to play instead of "SBOS installed," a comma, and the speed (in Hz) at which the file should play. For example:**

  Type: `ARROW.SND, 20050`

  Make sure it is the last line in your text file.

- **Make sure the .SND file is in the C:\ULTRASND\SBOS directory**
- **Save your work.**

Games Requiring Large Amounts of Memory

If a game you want to install uses a lot of conventional memory, your best bet is to clean up your system's memory to make room. Refer to your memory manager's documentation in your DOS manual on how to free conventional memory. However, if you have problems with games that require a lot of memory, please refer to the "DOS Troubleshooting" section in Chapter 7.

If Your Game Doesn't Make Any Sounds

If your game remains silent, try looking in the game's documentation for answers. Also, please refer to the DOS Troubleshooting section in this User's Guide.

TROUBLESHOOTING

Please refer to the README for the most up-to-date technical information.

DOS TROUBLESHOOTING

Problem	Cause	Solution
My UltraSound isn't producing sound.	Your UltraSound isn't connected securely, and is not seated properly in the bus slot.	Reset the card, or try a different bus slot. Make sure the peripherals (CD player, microphone, etc.) are plugged all the way into their respective connectors.
	Conflict with another hardware device or card.	We recommend changing the settings of the conflicting card. To identify conflicts, remove all the non-essential cards from your machine one by one. After removing each card, run the software that is giving you trouble, and note whether the problem occurs. When you find the card causing

Problem	Cause	Solution
		the problem, check its DMA channel, IRQs, and Base Port address, and see where it conflicts with UltraSound. Once you have identified the conflict, change the appropriate setting. Be careful not to cause a conflict with any other card in your system.
I can't record sounds from my microphone.	Your microphone is plugged into the wrong connector.	Check that the microphone is plugged into the Microphone Line In connector, that it is a dynamic microphone, and that it is turned on.
My sound is playing in starts and stops. It sounds jerky.	Your hard disk is fragmented, or your hard disk is too slow.	To correct fragmentation problems, obtain and run a de-fragmenting utility.
I'm having trouble with my game using SBOS. It either makes no sound at all, or sounds garbled and funny.	Something is not connected properly.	First, make sure that your stereo is working correctly and everything is connected properly.
	There may be a problem with your stereo inputs.	Ensure that you have selected the correct input at the back of your stereo and that the correct input selector

Problem	Cause	Solution
		switch is set at the front panel of your stereo. You can use any input on your stereo except the phono input — it will sound terrible and could damage your speakers and your phono input!
	Some important files weren't loaded.	Second, make sure that SBOSDRV and LOADSBOS were loaded successfully. **Type:** `SBOS`. You should hear "SBOS installed" when they load properly.
	You forgot to load SBOS.	If you are trying to use a game in Sound Blaster or Ad Lib mode, make sure that you run SBOS first.
	You didn't choose a sound card in your game's setup.	Most games have a specific configuration step where you have to "tell" the game to use the sound card. Usually, this step is called *Setup* and is available from the game's main menu. See your game's documentation for details on configuring your game with UltraSound in SBOS mode.

Problem	Cause	Solution
		Some games require you to enter an additional parameter for sound board support when starting the game. For example, you may have to type C:\KILLERCOWS SBLASTER. (Killer Cows is not a real game.) If your game requires this, load SBOS first, then start your game with this additional parameter.
	The wrong MIDI IRQ was set.	This problem could also indicate that the MIDI IRQ variable (the last one) in the SET ULTRASND string in your AUTOEXEC.BAT file is incompatible with SBOS. You must change that number to either 2, 3, 5, or 7 using any text editor. **CAUTION:** You could mistakenly change it to an interrupt used by one of your other devices.
		Some programs require IRQ 7 as the default IRQ. Re-setup install disks to

Problem	Cause	Solution
		change your MIDI IRQ to 7. Make sure that the UltraSound card is in a 16-bit slot in your computer.
	Your game or application does not have enough memory.	Check that the application has enough conventional memory to run with audio after loading SBOS. You may need to change your system configuration (i.e., by loading drivers high, removing drivers, etc.) to free more memory. Loading SBOS high saves 20K of memory. See your DOS manual for more information on memory management. If you are using QEMM, you may run Optimize to locate more free memory.
I keep getting a "Bad or missing SBOSLIB.SBS file" message.	Another device in your computer is using DMA channel 1.	Make sure that their are no devices using DMA Channel 1 in your machine. If there are, change their DMA chan-

Problem	Cause	Solution
		nels. Why can't another device use DMA Channel 1? Because it's *always* used for the Sound Blaster default.
My sound plays, but it has lots of static.	Poor wiring connections.	Check the connections.
	Some computers may have "noisy" power supplies or hard drives. These "noises" are picked up and amplified through UltraSound's amplifier.	Either turn down the volume, or use an external amplifier.
I'm having trouble printing a document.	A potential conflict may occur if you have a printer connected on printer 1 (LPT1) because LPT1 also uses IRQ 7 (the UltraSound and Sound Blaster IRQ default).	Disable your UltraSound card while you print the document.
	A conflict occurs when you have two devices trying to access the same IRQ at the same time.	

Problem	Cause	Solution
I receive the warning "NMI Procedure on this PC is disabled" when I load SBOS.	Don't panic. It may mean that the NMI functions were not implemented correctly.	Make sure that the parity check circuitry on your PC is enabled. You do this by checking whether PARITY is enabled in your extended CMOS setup or by setting jumpers on the motherboard. Here's an example for the Tandy 4850EPs (486DX2/50): Under the power supply, there is a bank of four DIP switches. According to the *Tandy Technical Manual*, DIP 1 is marked "Reserved for factory use...." In fact, this switch enables parity checking for onboard memory. Replace the motherboard. NOTE: You don't need to replace the CPU or memory. A new motherboard will range from $100 to $200 on average if the motherboard is no longer under warranty.

Problem	Cause	Solution
	What's an NMI?	NMI stands for Non Maskable Interrupt. When an NMI is generated, the PC will finish executing its current instruction, then interrupt the current program procedure and handle whatever called the NMI. The PC services the NMI, then returns to the current program procedure. The NMI is usually caused by the parity-checking circuitry of your PC when an ONBOARD PARITY ERROR has occurred.
	So how does this relate to SBOS?	SBOS requires a way of latching onto the PC in such a way that games will not interfere with it. By hooking onto the NMI, SBOS has a chance to run. The SBOS emulation works well for any games that don't try to do strange things with the NMI.

Problem

I'm having problems with the 16-bit DMA Channels.

Cause

The default DMA channel has been changed to an 8-bit channel because a few (not all) motherboards do not have 16-bit DMA channels that operate properly. However, the 16-bit DMA channels may work fine on your computer.

The 8-bit channels are 0—3. The 16-bit channels are 4—7.

Stereo recording *will* be better on 16-bit channels.

Solution

Try to run UltraSound on a 16-bit channel because performance is better. By switching to a 16-bit channel, UltraSound can transfer data twice as fast.

If strange things happen with the 16-bit channel, switch back to a free 8-bit channel.

Problem	Cause	Solution
I get no MIDI sound or inappropriate sound.	The application may not be using patch caching. (See "Patch Caching" in Chapter 3 for a definition.)	If you have an application that does not use patch caching, you can load a subset of the General MIDI set before running that application. With applications that do not use patch caching, do the following: ♦ Click on the Drivers icon under the Control Panel, and select the UltraWave and MIDI Synth or the UltraSound audio driver (whichever one you have). ♦ Click on the Setup button. Then click on Performance Options to access the Conserve Memory button. ♦ Click on the MIDI Mapper (also under the Control Panel) to select the appropriate setup for the amount of memory on your UltraSound. For example, select Ultra 256K in the name

Problem	Cause	Solution
		box if you have a 256K card. ♦ Load patches from the MIDI file that corresponds to the amount of memory on your UltraSound. The MIDI files used are LOAD256.MID, LOAD512.MID, and LOAD1024.MID. To revert to normal operation: ♦ Select UltraSound Setup in the MIDI Mapper, and enable the High Fidelity option of the driver.
I received a Windows Initialization Error.	An error occurred in the GRVSULTR.386 driver.	Make certain that the line DEVICE=GRVSULTR 386 is in the [386ENH] section of the SYSTEM.INI. Also ensure that the GRVSULTR386 file is in your WINDOWS\SYSTEM directory.

Problem	Cause	Solution
	The UltraSound driver requires enhanced mode Windows to run.	The current driver supports Windows 3.1 enhanced mode. Check the Windows User's Guide to ensure that your computer meets the requirements of enhanced mode Windows. (A 386 or greater with at least 4Mb of RAM is recommended.)
	The UltraSound driver cannot be initialized because of a DRAM failure or a Base Port Address (I/O) conflict.	During Windows initialization, the driver was unable to validate the UltraSound hardware. Exit Windows and execute SETGUS in the UltraSound installation directory. This diagnostic tool will verify that your hardware settings are correct and report any hardware failures.
	The following initialization file cannot be opened... \xxx\ULTRASND.INI The driver needs this file to locate MIDI patches for use with Windows. (The driver needs ULTRASND.INI to	Take the following steps to correct this problem: ♦ Exit Windows. ♦ Set the DOS environment variable

Problem	Cause	Solution
	initialize itself for playback of MIDI files.) ULTRASND.INI should exist in the ULTRASND directory (or whatever directory you installed UltraSound into).	ULTRADIR to the UltraSound installation directory. For example: **Type:** `SET ULTRADIR=C:\ULTRASND` **<enter>** (This is only set until you turn off your computer.) ♦ Verify that the ULTRASND.INI file exists in the UltraSound installation directory. ♦ Restart Windows.
I can't open a patch file. For example, GUITAR.PAT.	During initialization, the driver scans the ULTRASND.INI file to get the names of the patch files that will be used to play MIDI data. Two problems could cause this error message to appear:	Three options are presented when this error occurs: Retry, Ignore, and Abort. Pressing Retry will cause the driver to continue scanning subsequent patch names and to continue reporting errors. Pressing Ignore causes the driver to continue scanning, but not to report further errors. Pressing Abort causes the driver to skip the rest of the MIDI

Problem	Cause	Solution
		initialization.
	1) The PATCHDIR entry in the [UltraSound] section of ULTRASND.INI does not point to a directory containing all of the patch files listed in the [Melodic Patches] and [Drum Patches] sections of ULTRASND.INI;	♦ Edit the ULTRASND.INI file, and correct any errors in the PATCHDIR entry. For example: [ULTRASOUND] PATCHDIR= \ULTRASND\MIDI\
	2) The patch file listed in the error message, GUITAR.PAT, for example, has been misspelled, damaged, or does not exist.	♦ Check the spelling and existence of the patch identified in the error message. Note that the file extension, .PAT, is not included: [MELODIC PATCHES] 0=ACPIANO . . .[DRUM PATCHES] 27=HIGHQ
I have problems playing MIDI and .WAV Files	No sound occurs when playing MIDI files, or instruments seem to be missing.	♦ Make certain that the UltraSound setup in the MIDI Mapper is selected.

Problem	Cause	Solution
The volume increases after I pause and restart some MIDI files using Media Player.	The Media Player only sends MIDI controller messages the first time a MIDI file begins to play. Since the MIDI controller messages that affect volume are not sent when playback is resumed, a default volume is used, and this may	♦ Set the MIDI Volume scroll bar to the far right (the highest volume). This scroll bar can be found in the Mixer Options in the Setup section of the Drivers dialog box. ♦ Pause or stop playing the MIDI file, stop any .WAV file that is playing, and restart the MIDI file.

Problem	Cause	Solution
	be louder than the composer intended. This is a bug in Media Player.	
	If you have installed Windows for Workgroups, note that it typically requires twice as much PC memory to regain the performance that you had with a standard Windows installation.	An option is available to disable resource sharing under Windows for Workgroups. This option will conserve memory.
	.WAV files use extended RAM. For example, a 2Mb .WAV file uses 2Mb of extended RAM.	
No sound occurs when I play a .WAV file.	If you don't have enough extended RAM available — which varies with the number of applications you have open — you'll have problems.	♦ Quit as many applications as possible to free extended RAM.
	The Wave Volume may be set too low.	♦ Set the Wave Volume scroll bar to the far right (highest volume). This scroll bar can be found in the Mixer Options in the Setup section of the Drivers dialog box.

Problem	Cause	Solution
	Another sound card may be conflicting with the UltraSound card.	♦ If another audio card is installed, check that the UltraSound is set up as the first Wave device in the SYSTEM.INI. The [DRIVERS] section of SYSTEM.INI should have the following line: WAVE=ULTRASND.DRV Other audio cards will be designated as WAVE1, WAVE2, etc.
Some .WAV files seem to contain unexpected pauses and clicks.	386SX class machines are unable to play .WAV files from Video for Windows without pauses in the audio. See the topic "Performance Issues" in Chapter 3 for more information.	

CUSTOMER AND TECHNICAL SUPPORT

Advanced Gravis is proud of the quality, design, and workmanship that goes into all of our products. However, occasionally a customer has difficulty installing or using a product. This section will put you in touch with our technical support personnel for professional guidance. Information about our warranty is also available in this section.

REGISTRATION

It is important that you fill out and mail the enclosed registration card. Registration is important because it ensures that your name is added to our customer data base. If you are in our data base, you are eligible for:

- Access to FREE technical support.
- Notification of significant upgrades.
- Access to special offers and discounts available only to registered users.

Both the software and hardware components of this product may be updated from time to time. We can only tell those who have completed and mailed their registration cards about such changes and notify them of special upgrade offers.

TECHNICAL SUPPORT

Technical support is available to all registered owners of Advanced Gravis products. But it is recommended that you first read the README file included on your UltraSound installation disks (it will probably save you

time and money).

There is no charge for technical support, aside from possible long distance charges.

Technical Support Tips

To keep your costs to a minimum, here are a few hints:

- If only certain programs are affected, read their manuals for information relating to sound cards and game cards.
- It's best to call from a phone where you have access to your computer. You will then be able to immediately test suggestions and provide any additional information that may be required.
- Please prepare the following information:

  –Your name, address and telephone number

  –The Gravis product are you calling about

  –The make and model of your computer

  –The system software and version you are using

  –The version number of your Gravis software

  –The software affected by this problem

  –The symptoms of the problem, and what led to them

Technical Support—Telephone

Telephone: (604) 431-1807
Fax: (604) 451-9358
Support hours are 9AM—4:30PM Pacific Time.

Technical Support—Electronic Mail

Advanced Gravis can be contacted electronically via your modem on CompuServe® , Gravis' Bulletin Board System, Internet, FidoNET, and America On-line.

CompuServe Support Forum:	GO PCVENB area #14
Advanced Gravis BBS:	(604) 431-5927
GRAVIS BBS modem setting:	14,400 V32 bis baud N81
Internet:	tech@gravis.com
FidoNET:	1:153/978
FTP:	archive.epas.utoronto.ca pub/pc/ultrasound
Internet Mail List:	gus-general-request@dsd.es.com subscribe
AOL(America On-line):	email Adv/Gravis go keyword Gravis
Genie:	GamesRT Category 1 Topic 6

When contacting Gravis via electronic mail, it is very important that you provide all the information described in the Technical Support Tips. Otherwise, it will take longer to get back to you with an answer.

WARRANTY INFORMATION

Advanced Gravis Computer Technology Ltd. (Hereinafter referred to as GRAVIS) warrants to the original purchaser of the Gravis UltraSound (hereinafter referred to as ULTRASOUND) manufactured by GRAVIS that it will be free of defects in materials and workmanship for a period of 1 year from the original date of purchase.

Information on obtaining warranty services is provided in the Warranty Claim Instructions section. You must provide proof of purchase when requesting repairs during the warranty period. All warranty claims must be sent to GRAVIS—do not return your ULTRASOUND to the place of purchase.

GRAVIS is not responsible for any indirect, special, incremental, consequential or similar damages or lost data or profits to you or any other person or entity regardless of the legal theory, even if we have been advised of the possibility of such damage. Some states do not allow the exclusion or limitation of consequential damages, so the above limitation or exclusion may not apply to you. Our liability for any damage to you or any third party in the event that any of the above limitations are held unenforceable shall not exceed three times the fee you paid for ULTRASOUND regardless of the form of any claim.

During the warranty period, GRAVIS will repair (or at its option replace with a reconditioned ULTRASOUND at no extra charge) components that are defective, provided ULTRASOUND is returned with proof of purchase and shipped prepaid to:

Advanced Gravis Computer Technology Ltd.

Canada and International
101-3750 North Fraser Way
Burnaby, BC V5J 5E9
Canada

US Customers
1790 Midway Lane
Bellingham, WA 98226
USA

Items being returned to the Canadian address from the US will be returned due to customs, importation and tax regulations.

Warranty Claim Instructions

Carefully read the warranty section and provide a detailed description of the problem including the make and model of your computer system, and the name, version and publisher of the software you are using.

Include the following information:

- Your name and address.
- Home and business telephone numbers.
- Fax number (if applicable).
- A copy of your original sales bill.

US customers are to send warranty claims to the Bellingham, Washington address. Canadian and all other International customers are to send warranty claims to the Canadian address. When sending claims internationally, please state on your customs form that it is a Canadian made product you are returning for warranty repairs.

The means of product shipment to GRAVIS is at your cost and discretion. We suggest that you insure your Gravis ULTRASOUND in case of loss or damage during shipment. GRAVIS is not responsible for product lost or damaged in shipment..

ULTRASOUND HARDWARE OPTIONS

16-bit Recording Option

In its current configuration, UltraSound can play back, but not record, 16-bit sound. The 16-bit Recording Option from Advanced Gravis allows you to upgrade to 16-bit recording capabilities. UltraSound Studio comes with the 16-bit Recording Option, so you can edit 16-bit sound.

CD ROM Add-on cards

Connect UltraSound to your CD ROM. Daughter cards allowing you to connect an LMSI (Phillips), Sony, or Mitsumi CD ROM player to UltraSound are available.

Please note that your UltraSound card has 3- and 4-pin connectors for CD ROM audio input.

Gravis Joystick "Y" Cable

Because the joystick connector on your UltraSound card can also be used as a MIDI connector, regular Y-cable joystick adapters do not work with UltraSound. This is because some of the pins on the port are reserved for MIDI functions. We recommend the special Joystick "Y" Cable made by Advanced Gravis that lets you connect two joysticks to your UltraSound.

UltraSound MIDI Adaptor

Only the UltraSound MIDI Adaptor Box from Advanced Gravis is truly Advanced.

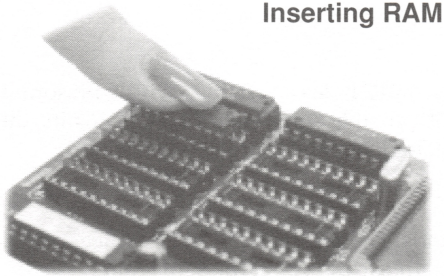
Features MIDI IN, OUT, and THRU connectors, two 15-pin joystick connectors, 4-foot cable, MIDI activity LEDs, and a bonus 6 foot cable. Works with any sound card with a 15-pin "D" connector UART/MPU 401 type MIDI interface including Sound Blaster, Pro Audio Spectrum, and of course, UltraSound!

RAM Upgrade

Upgrade your UltraSound card's memory from 256K RAM to 512K, 768, or 1 Megabyte. All you need are 256K memory chips.

When you install your RAM upgrade, UltraSound will automatically detect the amount of RAM you have installed. No jumper settings need to be changed. See the Check DRAM option in the Diagnostics section of the Advanced mode SETGUS to test your UltraSound's DRAM.

Inserting RAM



Ground yourself to a metal part of your computer's chassis or wear a wrist strap when installing DRAM.

Please call, write or fax Gravis or your dealer for pricing and availability on these items.

To place orders, please call Gravis Sales/Technical Support: at (604) 431-1807.

604 -431-5020

GLOSSARY

3-D sound

Focal Point 3-D Sound technology allows audio to place sounds above, below, and to the right, left and back of the listener with just two speakers.

3-D sound is created by UltraSound's unique hardware and software. The software enables UltraSound to use Focal Point's 3-D sound technology.

16-bit

A single binary unit (1 or 0) is 1 bit. One byte is 8 bits, and 2 bytes are 16 bits. With 1-bit sound, there are two possibilities: on or off. With 8-bit sound there are 256 possible combinations. With 16 bits, there are more than 65,000 possible digital configurations, resulting in richer and more detailed sound.

32-voice

UltraSound is capable of producing a variety of sounds. These sounds are called voices or patches. UltraSound can play up to 32 voices – or synthesized music notes – at the same time.

ADC

Analog to Digital Converter. The ADC converts electrical signals into digital data. UltraSound has one ADC.

Applet

This is a Windows term for a small program. Applets are visually represented by icons in Windows.

CD Quality

The standard measure of CD quality is a frequency of 44.1 kHz, at a depth of 16 bits. UltraSound is capable of, and conforms fully to, these specifications.

CD ROM

A personal computer compact disc drive. CD ROM is an affordable way to store lots of data

Contiguous

A file is contiguous if the whole file is located in one area on the drive and all blocks are adjacent to each other in order from beginning to end.

DAC

An acronym for Digital to Analog Converter. The DAC converts digital information to electrical signals (voltages), and sends the sound through the speakers. All CD players and synthesizers contain a DAC. UltraSound has one DAC.

DMA Channel

An acronym for Direct Memory Access Channel. UltraSound can use 2 DMA channels – one for recording, the other for playing – but both must be set in the AUTOEXEC.BAT file. (The AUTOEXEC.BAT file is set automatically with the Install program.)

Direct Memory Access is used by UltraSound to transfer sound data directly, without using the CPU. This allows, for example, simultaneous play of sounds and graphics in a game. UltraSound supports full 16-bit DMA transfers if plugged into a 16-bit ISA bus slot.

FM Synthesis

An outdated technology which recreates or mimics an instrument's sound by manipulating a wave (sound) shape or form until the sound is close to the actual instrument.

General MIDI

A standard that specifies the basic capabilities of a music synthesis device. It maps instruments sounds into MIDI codes.

IRQ

An acronym for Interrupt Request. This is how UltraSound checks and updates information sent to it through your computer. When you set the IRQ, it tells UltraSound how and where to look for information. If two devices share the same IRQ, UltraSound will not work properly.

MIDI

Musical Instrument Digital Interface. A digital communication standard which lets electronic musical instruments talk or communicate with each other. Think of MIDI as a language for electronic musical instruments. MIDI conveys many different things at once: for example, when you play a note MIDI sends the information on what note is being played, how loud, and when it starts and stops.

MIDI Channels

Sixteen separate channels which send or receive MIDI data.

MIDI Files

MIDI Files or *MIDI song files* identified by the .MID extension. MIDI song files contain instructions that allow

your PC to play the synthesizer on your sound board, or to control external MIDI synthesizers or sound modules.

MIDI Mapper

A Windows tool that allows you to change MIDI data being sent through Window's MIDI software drivers.

Mixer

Allows you to change audio levels in a sound card. The UltraSound Mixer lets you control UltraSound's audio levels.

MPC

Multimedia PC or *MPC* is an equipment specification standard for personal computers. MPC currently has two standards: MPC Level 1 or MPC Level 2. MPC Level 2 is a higher level specification with stricter specifications than MPC Level 1.

MPU-401

A board interface that allows personal computers to connect to MIDI devices like keyboards or drum machines.

Offset

Offset refers, in general, to where information begins.

Patch

A *patch* is one voice, typically an instrument or a digital sound. UltraSound can play up to 32 voices at once

and comes with a number of patches for playing MIDI songs, as well as separate patches for use in games with the Sound Board Operating System (SBOS).

Sampling Rate

The number of digital audio samples recorded per second. A sampling rate of 22 kHz means that 22,000 digital samples are recorded each second of audio. The higher the sampling rate, the better the sound quality. One drawback to using a high sampling rate, for instance 44 kHz is that it uses more disk space.

SCSI

Small Computer Systems Interface. A hardware and software standard for sending data between computers or computer peripherals and devices.

There are two types of SCSI: SCSI 1 and SCSI 2. The essential difference is that a device with SCSI 2 transfers data faster. Therefore, it is ideal to have two SCSI 2 devices connected together for fast data transmittal. If a SCSI 1 device is connected to another SCSI or even a SCSI 2, data transfer will be slower.

Sequencing

A method whereby a computer, or hardware sequencer, records MIDI information. Sequencing is also achieved by sequencer software like Power Chords for UltraSound and Midisoft's Recording Session included with your UltraSound Software. With sequencer software you can compose you own MIDI files or modify MIDI songs.

Twos Complement (Signed) Data

A specific data format used by most sound cards to store and record digital information. UltraSound's GF1 automatically converts unsigned binary data to Twos Complement data, so if you have REAL twos comple-

ment data, you must "tell" the chip, to prevent it from attempting conversion.

Unsigned Data

The most common type of digital data for sound. Most Sound Blaster and compatible sounds are unsigned data, as are UltraSound sounds and Macintosh sounds. You don't have to enter any parameters when playing these types of sounds with Playfile.

VOC Files

A format for storing digital audio, .VOC files can be converted into .WAV format by software. For example, WinConvert, which came with your UltraSound software, can convert .VOC files to .WAV.

WAV Files

Waveform audio is digitized sound that is stored in a file with a .WAV extension. A format for storing digital audio, standardized by Microsoft.

Wave Table Synthesis

Also know as *waveform synthesis*, wave table synthesis creates sounds by recording the actual instruments to get natural and realistic sound files, or patches, for applications and games. The result of this process is an accurate electronic reproduction of real instruments.

APPENDIX A - JUMPERS

SETTING JUMPERS

Jumpers are like switches. They are small plastic clips covered with metal strips that connect two small gold-colored pins together. By placing a plastic clip (provided) over one pair of pins, you are setting those jumpers on.

BASE PORT ADDRESS

The default (factory set or preset) Base Port Address (Base Port or I/O Address) for UltraSound is 220Hex, as shown in the illustration on the following page.

Much like the Game Port Address, the Base Port Address cannot be the same as another device in your computer. You must either change UltraSound's or the conflicting device's

Base Address Ports

Pin Pair: 4	5	6	7		Addresses Used at 200 Range	Addresses Used at 300 Range	Ad Lib Range (always)
*off	on	on	on	210	$210_H...21F_H$	$310_H...31F_H$	$388_H...389_H$
on	off	on	on	220	$220_H...22F_H$	$320_H...32F_H$	$388_H...389_H$
off	off	on	on	230	$230_H...23F_H$	$330_H...33F_H$	$388_H...389_H$
on	on	off	on	240	$240_H...24F_H$	$340_H...34F_H$	$388_H...389_H$
off	on	off	on	250	$250_H...25F_H$	$350_H...35F_H$	$388_H...389_H$
on	off	off	on	260	$260_H...26F_H$	$360_H...36F_H$	$388_H...389_H$

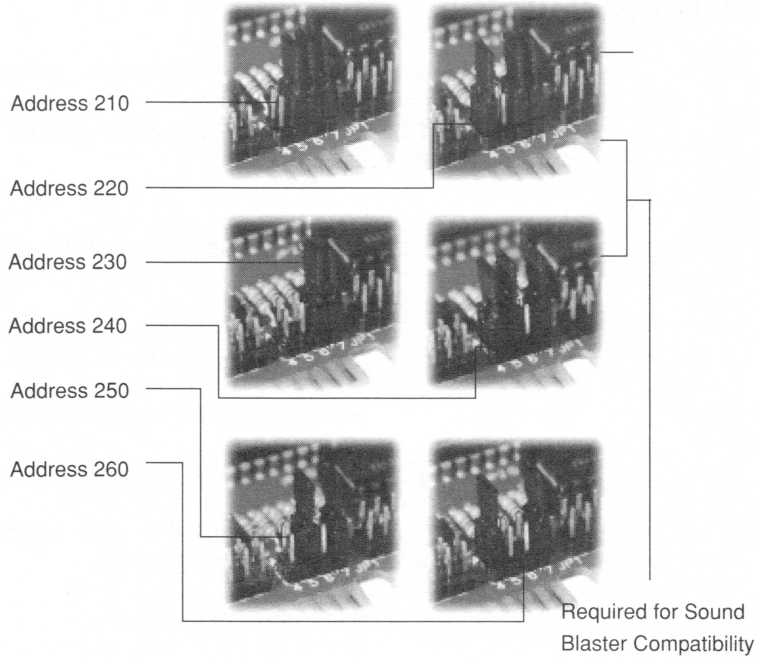
*Off indicates that no jumper clip is used on that jumper pin set.

base address. For Sound Blaster compatibility, your base address for the UltraSound must be 220 or 240Hex.

RESERVED JUMPERS

Several additional jumper pin sets are provided on the UltraSound card. These are for the addition of optional Add-on cards and should not be changed.

Common Base Address Jumper Settings



APPENDIX B – PLAYFILE AND PLAYMIDI PARAMETERS

PLAYFILE PARAMETERS

Playfile has a number of parameters that let you modify the way you play sound(s) from the command line.

You don't need to type the square bracket characters ([ ]); they are merely a warning that you need to enter a number after the letter.

-P	Play a file. -P allows you to play a .SND file. -P is a default setting and doesn't have to be entered.
-R	Record a file. This parameter lets you record a sound. To record a sound, enter -R, plus the full name (path) for the sound you wish to record, and save it in the command line.
-B[ ]	Set the balance for the digital channel. (Enter 0-15). The default setting is 7, or in the center. To change it, enter -B plus the desired balance in the command string. (Mono playback only.)
-V[ ]	Set the volume of the digital channel. (Enter 0-4095). The default setting is 3095.
-L[ ]	Set the number of repeats. The default for this setting is once. If you would like a sound to play more than once,

include -L[ ] plus the number of desired repeats in the command string. The maximum number of repeats is 65,535.

-F[ ] Set the frequency (speed) of the digital channel in Hz. (Enter 4000-44100 Hz) The default setting is 22050 Hz, which is usually adequate. If your sound was recorded at a different frequency, it may sound strange at this frequency. Increasing the frequency will make it sound faster; decreasing it, slower. Add -F[ ] plus the desired frequency to the command line if a speed other than the default is required. 4000 Hz is the lowest recommended setting, although you can set the frequency lower if you want.

-S Specify a stereo digital file.
The default setting is for mono, so if you wish to record a sound in stereo, or play a sound recorded in stereo, you must enter -S in the command line.

-O[ ] Supply the starting offset into the digital file.
You can tell the program to start playing your sound file X number of bytes into the sound. Enter -O plus the number of bytes in the command line.

-T[ ] Length (in bytes) of how long to play/record.
The only limit to this parameter is the size of your hard drive. -T[ ] is also useful when used with -O, because by entering a starting offset, and a value for -T, you can play just a portion of a sound.

-I Information Display about the status of a channel.
The -I switch, when typed while a sound is playing using Playfile, displays the status of UltraSound's channels on your monitor. By default there is no display.

-D[1/0] Enables or disables the UltraSound GF1 DAC output.
Turn on or off the Gravis chip's (GF1) Digital to Analog converter by typing -D while a sound is playing; 1 enables output and 0 disables output.

-N[1/0] Enables or disables the line level input.
This turns on or off the inputs from the UltraSound card; 1 enables line input and 0 disables line input.

-m[1/0] Microphone enable or disable.
Enables or disables the microphone; 1 enables the microphone and 0 disables the microphone.

-16 Specify a 16-bit digital file.
The default is an 8-bit file. If you want to play a 16-bit file, be sure to enter -16 into the command line.

-2 Specify twos complement (signed) data.
Most sound files use unsigned (offset binary) data, so this parameter is usually unnecessary. Most Sound Blaster and compatible sound cards, Forte boards, and Mac sounds use unsigned data. If a sound will not play, and you don't know its source, try entering this parameter into the command line.

These parameters do not have to be entered in order, but the way the sound was recorded determines which parameters you enter. The only rule is that you must enter the file name last if it is required. Not all sounds require you to enter all parameters, and most files will play using UltraSound's default settings.

PLAYMIDI PARAMETERS

Playmidi, like Playfile, has several options, or parameters, that can be entered to control MIDI playback. These options are:

-C[ ]	Removes a MIDI channel. Enter the channel number you wish to remove in place of the square brackets.
+C[ ]	Adds a MIDI channel. Enter the channel number you wish to add in place of the square brackets.
-DEBUG	Displays debugging and text information.
+D[ ]	Increases the delay between MIDI events.
-D[ ]	Decreases the delay between MIDI events.
-8	Forces patches to 8-bit to conserve UltraSound dram.
+GS	This parameter makes channel 10 play from the rhythm set.
-GS	This parameter makes channel 10 play from the tone set.
-H	Help. **Type:** `PLAYMIDI -H` for Playmidi's on screen help file.

-ICHANNEL	Entering this parameter will cause UltraSound to ignore channel information and play all channels on channel 0.
-IPROGRAM	Entering this parameter will cause UltraSound to ignore all instrument changes.
-ICONTROL	Causes UltraSound to ignore all control changes.
-IPITCHBEND	Entering this parameter will cause UltraSound to ignore all pitchbend information.
-IAFTERTOUCH	Entering this parameter will cause UltraSound to ignore aftertouch information.
-T[ ]	Removes a track. Enter the track number you wish to remove after the T.
+T[ ]	Adds a track. Enter the track number you wish to add after the T.
-TSR	Play MIDI files in background. This option may conflict with SBOS. Free SBOS (SBOS -F), if you use this option. Press both shift keys simultaneously to stop MIDI playback.
-P	Allows you to play whatever can fit into on-card memory, ignoring all errors.
-DEBUG	Turns UltraSound debug on.
-V	Displays the version number of your Playmidi software.

-V[ ] This parameter allows you to set the master volume anywhere from 0–4095. The default is 3095.

-VERBOSE Displays text information about what you are playing.

-VIDEO Disable graphic display.

Playmidi Configuration File

Playmidi will look for a configuration file called xxxxxxxx.CFG in the following way: first, Playmidi looks in your current directory; second, it looks in the MIDI subdirectory for the environment variable called ULTRADIR; and finally, playmidi goes through your specified path to find the .CFG file.

Playmidi will also look for a default configuration file called DEFAULT.CFG. If it does not find both the .MID AND .CFG files, it will quit.

After Playmidi finds the files, it looks for the instrument patch files. Playmidi uses the same search as noted above to find DEFAULT.CFG. Once it finds all the necessary files, it passes the configuration file, downloads the appropriate patches and starts the MIDI sequence. The .CFG file has different types of lines to aid Playmidi in playing a file. A line starting with a # is ignored.

Here's an example:

```
CHANNEL  10  RYTHM_SET
or
CHANNEL  10  TONE_SET
```

Tells a MID channel to pick instruments from either the tone-set or rhythm-set. The configuration file also has lines like the following:

[instrument #]	[patch name]	[% of max volume]	[de-tune parameters]
:	: :	:	:
:	: :	:	:
:	: :	:	:
:	: :	:	:

There should be one line per instrument. The instrument number is defined inside the specific MIDI sequence file (XXXXXX.MID). Instrument #0 is the default instrument for tone-set that will be used if a patch isn't found. If the correct patch is not found, Instrument #129 is the default instrument that's used for the rhythm-set. Instruments #1-#128 are the tone instruments for programs #1-#128. Instruments #129-#256 are the rhythm instruments (drums) for programs #1-#128.

The patch name is the file that contains the patch information for that particular instrument. It is recommended that the instrument # be mapped to the patch using the General MIDI set ID numbers. If a patch does not exist for that instrument, choose one that is as close as possible. Many sequences were not written following the General MIDI set; for these, you must select a patch file by trying to figure out what instrument the MIDI file was using. This feature makes it easy to play a piece that was written for one instrument on another.

The next parameter is to raise or lower the volume of that instrument relative to the others. This is used to lower the volume of a particularly loud instrument, like a percussion, or raise the volume of a softer instrument. The number is used as a percentage of the maximum volume. Therefore, 100 is 'normal' volume,, 50 would be half volume, etc. The default setting for this volume parameter is 100. This parameter is optional.

The next parameter is to de-tune an instrument. This is the number of semitones that will be added to each note played. This parameter is also optional.

DEFAULT.CFG FILES

The configuration files included for each MIDI song on your disk tell the computer which instruments to use on what channel. When Playmidi plays a file, it looks for this .CFG file using the ULTRADIR application. You can change instruments by rearranging the instruments assigned to the program numbers. A typical file looks something like this:

```
1           MIRACLE.PAT
129-256     PERCS.PAT      60
13          MARIMBA.PAT    80
32          ACOUSTIC.PAT
74          WOODFLUT.PAT
66          TENORSAX.PAT   80
```

The first number is the instrument that will play. The instrument number is defined inside the specific MIDI sequence file. Instrument 0 is the default instrument for tone set that will be used if a patch isn't found. Instrument 129 is the default instrument that will be used for the rhythm set.

The next parameter in the .CFG file is the patch name.

After the patch name is a parameter for changing the volume of a MIDI instrument. The default is 100, and 50 is half volume. This parameter is optional.

The final optional parameter "detunes" the instrument. The number you enter here is the number of semitones that will be added to each note played.

If you swapped the program numbers for flute and marimba, the flute would play where the marimba did in the original version, and vise-versa. You can create interesting effects this way, but remember to note the original configuration or make a copy of it, or you could wreck your original song. If no .CFG file is found, Playmidi will use DEFAULT.CFG, a standard MIDI set.

For more information, open one of the .CFG files, using any text editor, and read the information displayed on screen.

APPENDIX C - MEGA–EM USER'S REFERENCE

INTRODUCTION

Mega–Em is a software program that allows you to emulate sound devices not installed your system. With Mega–Em you can emulate the Roland MT-32, Roland Sound Canvas, General MIDI and the Sound Blaster (Digital Only) using your Gravis UltraSound. Sound Blaster Music and Roland MPU-401 MIDI interface emulation through the UltraSound MIDI port may be available in future releases of Mega–Em.

MEGA-EM FEATURES

- High Quality Roland Sound Canvas and MT-32 music emulation
- Sound Blaster Digital emulation, with generally improved sound quality over a real Sound Blaster card
- Loads entirely into the EMS memory space - uses no lower or upper DOS memory.
- Fast – entirely written in assembler, using the Windows 386 instruction set
- High level of customization, while still retaining ease of use

MEGA-EM REQUIREMENTS

- 386 or better AT class personal computer
- Hard drive
- Gravis UltraSound card
- Expanded Memory Manager, such as EMM386.EXE, QEMM386 or 386MAX
- Approximately 80K of free Expanded Memory (EMS). Mega–Em uses no low DOS memory (i.e., no conventional memory)

IMPORTANT NOTES

Mega–Em does not work with most protected mode software. Protected mode software includes Windows, Commanche and Privateer.

Mega–Em is constantly improved and updated. Please read the README file supplied with the Mega–Em software for the latest information regarding usage, features, command line options and problem solving.

USING MEGA–EM

To load Mega–Em, type the following:

- `MEGAEM` **[options] <enter>**
- `EMUSET` **[options] <enter>**

All options are up to you to choose. Valid options for MEGAEM and EMUSET are listed below.

* Future versions of Mega–Em may incorporate EMUSET into the MEGAEM program.

Valid options for Mega–Em

For each option **type:** `MEGAEM` [option] **<enter>**. For example:

- **Type: MEGAEM -U <enter> to unload MEGAEM. You must do this to use other UltraSound software.**

-H or -? Displays the Mega–Em help screen, which is basically a shortened version of this section of the manual.

-U or -F Unloads Mega–Em from memory. You must do this to use other UltraSound software.

-ROFF Turns off Roland emulation.

-SBOFF Turns off Sound Blaster emulation.

-RIRQx Specifies Roland IRQ number. By default, Mega–Em will not generate any Roland IRQs since very little software requires it. If your software fails on Roland initialization,

you should use this option, preferably using IRQ 2. Valid IRQ values are x=2,3,5 or 7.

-NOEMS Forces Mega–Em to load when EMS services are disabled (for example, when the NOEMS option is used in your EMM386 command line). Note that you must still have a memory manager loaded to run Mega–Em.

Valid options for EMUSET

-H or -? Displays the EMUSET help screen, which is basically a shortened version of this section of the manual.

-MT Emulates a Roland MT-32/LAPC1. The default is to emulate a Roland Sound Canvas. However, if your software does not have Sound Canvas/SCC1/General MIDI support, use MT-32/LAPC1/Roland support ("Roland" alone usually refers to the MT-32/LAPC1 devices).

-L	Enables the UltraSound line input.
-Mxx	Specifies music volume level. The default level is 12. The valid range is xx =1—16.
-Vxx	Specify master volume level. The default level is 16. The valid range is xx =1—16.
-COx	Coexists with real MPU-401 MIDI interface. While Mega-Em will function correctly with a real MPU-401 MIDI interface installed in the system, no software will be able to access the real interface while emulation is active. This option allows Mega–Em to be used together with a real MPU-401 MIDI interface. This can be useful for DOS -based MIDI sequencers.
X=1	Allows both input and output to real MPU-401. With this option music will play through both the external MIDI device(s) and the UltraSound synthesizer.
X=2	Only allows input from real MPU-401. Music will only play through the UltraSound. Using this option may also increase Mega–Em's compatibility on systems with a real MPU-401.

CONFIGURING SOFTWARE FOR MEGA–EM

Software programs are configured for different sound devices in many different ways. Some will attempt to auto-detect sound devices and use the best one they find; others will prompt you during the running of the program or require you to delete a configuration file, so you can change the configuration. Most common is the use of a setup program, usually called SETUP, INSTALL or CONFIG. For the correct procedure for a specific program, you should consult the program's manual.

OK, I know how to configure my software; now what?
First make sure Mega–Em is loaded and emulation is on. If the program has auto-detect, simply running the program should detect the devices you are emulating. If you are prompted to select a sound device, select the one you have your emulation set up for.

But there are too many options there. What do I choose?
For the Roland MT-32 emulation you should look for 'MT-32' or 'LAPC1'. Some software just has 'Roland' as an option. This usually refers to the MT-32. Remember that if you select this option you must run EMUSET -MT; otherwise Mega–Em will emulate a Sound Canvas by default.

For the Roland Sound Canvas emulation, look for 'Sound Canvas', 'SCC1' or 'General MIDI'.

If you have the option of MT-32 or Sound Canvas, select Sound Canvas because in most cases, selecting it will give better performance.

For Sound Blaster emulation look for Sound Blaster. Remember, Mega–Em will not play Sound Blaster Music, only digital effects.

Now the program is asking for my sound card settings. What should they be?

If prompted for:

- a MIDI interface, select Roland MPU-401.
- a Roland base address, you must select 330 (hex.).

- a Roland IRQ setting, select IRQ 2/9. If your software fails to initialize the Roland, try using the -RIRQx switch with MEGAEM.EXE.

- a Sound Blaster base address, select your UltraSound Base Port Address unless you have used the -SBBxxx switch with MEGAEM.EXE.

- a Sound Blaster IRQ, select your UltraSound MIDI IRQ unless you have used the -SBIx switch with MEGAEM.EXE.

- a Sound Blaster DMA channel, you must select 1.

By now you should be ready to run your software. Always remember to load Mega-Em and turn emulation on before running the software. Many programs will crash if they're set up for a certain music device but can't locate it.

USING MEGA–EM — A STEP BY STEP EXAMPLE

This example assumes that your program's manual tells you to configure your sound options with a program called INSTALL, and that the program is run by typing START <enter>.

Step 1. Load MEGAEM.EXE by **typing :** `MEGAEM` **<enter>.** If you need to use any options, **type :** `MEGAEM` [options] **<enter>.**

Step 2. Turn on emulation by **typing** `EMUSET` **<enter>.** Many programs will only allow you to select sound devices they can detect.

Step 3. Load the installation program by **typing:** `INSTALL` **<enter>.**

Step 4. Answer any prompts until you are prompted to select a sound device.

Assume you are given the following options:

AdLib
Sound Blaster
Roland MT-32/LAPC1
Roland Sound Canvas
Roland MT-32/LAPC1 with Sound Blaster
Roland Sound Canvas with Sound Blaster

Step 5. In this case you should select "Roland Sound Canvas with Sound Blaster" because it will probably give the best music performance and digital sound effects. Note that any of the above examples will work with Mega–Em, although the 'AdLib' option will not give any sound, and the "Sound Blaster" option will not play any music or "FM" effects.

Step 6. Complete the rest of the prompts from the installation program. If prompted whether or not to save the configuration, select YES.

Step 7. Load your program by **typing:** `START` **<enter>**. That's it.

Note: You shouldn't have to configure the program again. Just make sure you have loaded Mega–Em and turned on the emulation by running EMUSET.

APPENDIX D - ULTRINIT.EXE

ULTRINIT.EXE is a utility used to initialize your UltraSound for use. It is highly recommended that you put the following line in your AUTOEXEC.BAT file *after* the SET ULTRASND=... line. For example:

```
set ULTRASND=220, 1, 1, 11, 5.
C:\ULTRASND\ULTRINIT.EXE
```

The installation program will do this for you automatically.

Note: Most UltraSound software will work even if ULTRINIT has not been run. However, ULTRINIT is required for some software to be able to use the MIDI port, and it also resets the UltraSound to stop any continuously playing sounds. Continuously playing sounds can occur if you reboot your computer while the UltraSound is playing a sound or sound file.

ULTRINIT.EXE has five options :

1)	-O	Leave output enabled after it resets the card
2)	-M	Leave microphone input enabled
3)	-L	Leave line level input enabled.
4)	-D	Disable UltraSound joystick port
5)	-E	Enable UltraSound joystick port

To leave output , microphone, and line level input enabled after ULTRINIT resets the UltraSound

card, for example, **type:** `ULTRINIT -O -M -L`.

There is also a version of the initialization program that you can run from your CONFIG.SYS file. ULTRINIT.SYS just initializes the card and then remove itself from RAM.

ULTRINIT.SYS is needed to set up UltraSound so that other drivers will detect the UltraSound as Sound Blaster. This detection is necessary because some drivers (e.g., CD ROM) will not run with sound unless they detect the presence of Sound Blaster. Note that ULTRINIT.SYS does *not* load the Sound Blaster driver; it only sets up what is necessary for those drivers to detect UltraSound as Sound Blaster. For information on how to get full Sound Blaster capability, see Chapter 6, "Game Support."

APPENDIX E - MANUALLY ADDING ULTRASOUND WINDOWS DR

If you are new to Windows, the following procedures may look daunting, but manually adding UltraSound Windows 3.1 drivers is actually quite easy. Follow these instructions step by step.

*Note: If you have not previously installed any other sound cards or other MCI MIDI devices in your system, you can skip the following step:

The Windows driver installation will overwrite your current MIDIMAP.CFG file with a new one created specially for UltraSound. If you wish to retain your current MIDIMAP.CFG file (it's in the \WINDOWS\SYSTEM subdirectory), you can copy it with a different name or extension to the same directory. For example, from your C:\WINDOWS\SYSTEM\ directory:

- **Type:** `COPY MIDIMAP.CFG MIDIMAP.SAV`

INSTALLING THE DRIVERS

At the DOS prompt, start Windows.

- **Type:** `WIN` **<enter>**

Open the Drivers applet located in the Control Panel (in the Main group).

The normal installation of Windows 3.1 should have already installed: MIDI Mapper, TIMER, {MCI} MIDI Sequencer, and {MCI} Sound drivers. These drivers must be installed for UltraSound to work. If any of these drivers are missing, install them now by clicking on the ADD button. You will be prompted for certain disks from your Windows 3.1 disk set, so have them handy. Restart Windows to activate the changes.

One final note before installing the UltraSound driver. If you are upgrading from a Sound Blaster, Media Vision, or other sound card, you must first remove their associated drivers. Select each driver to remove and click on the Remove button. You can remove several drivers, if you like, before restarting Windows to activate the changes.

Now, install the UltraSound Windows driver.

® **Click on the ADD button, and select the Unlisted or Updated Driver in the Drivers list box, and click OK.**

A new dialog box will appear in which you must enter the path to your UltraSound Windows driver. For example:

♦ `C:>\ULTRASND\WINDOWS` **(assuming you installed UltraSound to drive C:)**

The Ultra Wave and MIDI Synth driver description should appear in another dialog box.

♦ **Click on it , then click OK.**

The UltraSound driver and associated files will install in the appropriate directories automatically.

The UltraSound Setup dialog box will appear.

- **Click on the appropriate boxes, and change the setup parameters if needed to match your UltraSound configuration. Refer to the Setup Record you filled out in the Quick Installation Guide. Click on Restart Now to activate the changes.**

If you have your UltraSound output hooked up to a stereo or headphones, you should hear a start-up .WAV sound played (the default sound sounds like 'Ta Da'...) when Windows starts.

To further test .WAV file playing, open the Windows Sound applets (in the Control Panel) or Sound Recorder (in the accessories group) and experiment. To test MIDI file playing, open the Media Player applet in the Accessories group, and look for the CANYON.MID MIDI file which is supplied in Windows 3.1. Press the 'triangle' play button and you should hear the song.

You are now ready to use any Windows based MIDI sequencer or MIDI player to create or hear songs with UltraSound's full 16-bit digitized instruments. Consult your software application's manual or the Microsoft Windows 3.1 manual for an explanation of the MIDI Mapper applet in the Control panel. If you are using UltraSound as your only output device, the current MIDI Mapper settings should be fine.

MANUALLY INSTALLING AND USING THE ULTRASOUND MIXER APPLET

We have included a simple Windows applet to allow volume control, output on/off, and selection of line and microphone input. Here's how to install it:

- Select the group you would like the Mixer applet to reside in, then pull down the Program Manager's File menu and select NEW.
- With the Program Item radio button on (the default), click OK. A dialog box called Program Item Properties will open. In the Name text box, call the item US_Mixer, or UltraMix or whatever you like.
- In the Command Line box enter the path `C:\ULTRASND\WINDOWS\MIXER.EXE` (assuming you installed the Ultrasound files in the default directory C:\ULTRASND).
- Then click OK. The Mixer applet's icon will appear in the group you selected.
- Open the applet by double-clicking on it and experiment with the level control and input and output check boxes. When recording using the line out of a CD or tape player, be sure to have the Microphone Input turned off to avoid recording noise from the unused input. For recording with the microphone input, turn Line Input off.

APPENDIX F - GENERAL INFORMATION

AGREEMENT

UltraSound, Gravis Utilities Software, MIDI patches, sound software, sample sounds (except as noted), and this *Gravis UltraSound User Guide* are protected by copyright, and all rights are reserved by Advanced Gravis Computer Technology Ltd. The UltraSound Utilities software is licensed from Forte Technologies, Inc. All software and this Gravis UltraSound Userare published exclusively by Advanced Gravis Computer Technology Ltd. and are licensed to the original purchaser for use only under the terms set out in this License Agreement and Limited Warranty.

Information in this document is subject to change without notice and does not represent any commitment on the part of Advanced Gravis Computer Technology Ltd. or its agents.

TRADEMARKS

Advanced Gravis, Gravis Utilities, GravTest, UltraSound Studio 16, FindCard, UltraSound, and Patch Manager are trademarks of Advanced Gravis Computer Technology Limited.
Microsoft, DOS and Windows are the registered trademarks of Microsoft Corporation.
Logitech is a trademark of Logitech Inc.
IBM is a registered trademark of International Business Machines, Inc.
PS/2 is a trademark of International Business Machines, Inc.
Sound Blaster is a trademark of Creative Labs Incorporated.
Ad Lib is a registered trademark of Ad Lib Incorporated.
All other trademarks and registered trademarks are the property of their respective owners.

Some sound effects courtesy of Mr. Sound FX, © Prosonus™ .

For more information, contact:
Prosonus, 11126 Weddington St., North Hollywood, CA 91601
Phone (818) 766-5221, Fax: (818) 766-6098

FCC & DOC WARNING STATEMENTS

FCC Statement

This equipment has been tested and found to comply with the limits for 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 to radio or television reception, which can be determined by turning the equipment off and on, will not occur. The user is encouraged to try to correct the interference by one or more of the following measures:

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

CAUTION: changes or modifications not expressly approved by Advanced Gravis Computer Technology Ltd. could void the userTo meet FCC requirements, shielded cables are required to connect the device to a personal computer or other Class B certified device.

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.

DOC Statement

This apparatus complies with the Class 'B' limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations.

Cet appareil est conforme aus normes Class 'B' interference radio tel que specifier par Le Ministere Canadien Des Communications Dans Les Reglements D'Interference Radio.

APPENDIX G- SHAREWARE - WHAT IS IT?

Some of the programs bundled with the UltraSound product are *shareware.* These programs were written by users like you who were enthusiastic about the product and wished to write programs specifically for our card. Since the *shareware* and *public domain* concepts are quite often misunderstood, what follows is an explanation by The Association of Shareware Professionals (ASP) from their article, "What is Shareware?".

SOME DEFINITIONS

You've probably heard the terms *public domain, freeware, shareware,* and others like them. Your favorite BBS or disk vendor probably has many programs described by one or more of these words. There's a lot of confusion about and between these terms, but they actually have specific meanings and implications. Once you understand them, you'll have an easier time navigating the maze of programs available to you, and understanding what your obligations are, or aren't, with each type of program.

Let's start with some basic definitions:

Public domain has a very specific legal meaning. It means that the creator of a work (in this case, software), who had legal ownership of that work, has given up ownership and dedicated the work "to the public domain". Once something is in the public domain, anyone can use it in any way they choose. The author has no control over the use and cannot demand payment for it.

If you find a program that the author has explicitly put into the public domain, you are free to use it however you see fit without paying for the right to use it. But use care –due to the confusion over the meaning of the words, programs are often described by authors as being *public domain* when, in fact, they are shareware or free, copyrighted software. Look for an explicit statement from the author, to be sure a program is public domain.

Copyrighted is the opposite of public domain. A copyrighted program means the author has asserted his or her legal right to control the program's use and distribution, by placing the legally required copyright notices in the program and documentation. The law gives copyright owners broad rights to restrict how their work is distributed, and provides for penalties for those who violate these restrictions. When you find a copyrighted program, you must use it in accordance with the copyright owner's restrictions regarding distribution and payment. Usually, these are clearly stated in the program documentation.

Maintaining a copyright does not necessarily imply charging a fee, so it is possible and perfectly legal to have copyrighted programs which are distributed free of charge. The fact that a program is free, however, does not mean it is in the public domain –though this is a common confusion.

Shareware is copyrighted software which is distributed by authors through bulletin boards, on-line services, disk vendors, and copies passed among friends. It is commercial software which you are allowed to use and evaluate before paying for it. This makes shareware the ultimate in money back guarantees.

THE SHAREWARE CONCEPT

Most money back guarantees work like this: You pay for the product and then have some period of time to try it and see whether or not you like it. If you don't like it or find that it doesn't do what you need, you return it (undamaged) and at some point - which may take months - you get your money back. Some

software companies won't even let you try their product! In order to qualify for a refund, the diskette envelope must have an unbroken seal. With these "licensing" agreements, you only qualify for your money back if you haven't tried the product. How absurd!

Shareware is very different. With shareware you get to use it for a limited time, without spending a penny. You are able to use the software on your own system(s), in your own special work environment, with no sales people looking over your shoulder. If you decide not to continue using it, you throw it away and forget all about it. No paperwork, phone calls, or correspondence to waste your valuable time. If you do continue using it, then – and only then –do you pay for it. Shareware is a distribution method, NOT a type of software. Shareware is produced by accomplished programmers, just like retail software. There is good and bad shareware, just as there is good and bad retail software. The primary difference between shareware and retail software is that with shareware you know if it's good or bad BEFORE you pay for it.

As a software user, you benefit because you get to use the software to determine whether it meets your needs before you pay for it, and authors benefit because they are able to get their products into your hands without the hundreds of thousands of dollars in expenses it takes to launch a traditional retail software product. There are many programs on the market today which would never have become available without the shareware marketing method.

The shareware system and the continued availability of quality shareware products depend on your willingness to register and pay for the shareware you use. The registration fees you pay allow us to support and continue to develop our products.

Please show your support for shareware by registering those programs you actually use and by passing them on to others.

Shareware is kept alive by YOUR support!

CONTACTING ASP MEMBERS VIA COMPUSERVE

There is an easy and convenient way to speak directly to many ASP Members (both authors and vendors). Visit the shareware forum on CompuServe. Simply type "GO SHAREWARE", "GO SHARE", or "GO ASPFORUM" from any CompuServe ! prompt.

Here you will be able to talk to the authors of your favorite shareware programs, learn about other programs, ask questions, make suggestions, and much more. We'd love to meet you on-line, please come visit us today!

INDEX