
GameWave 32Plus

User's Manual



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Introduction

Orchid's GameWave 32Plus™ brings the exciting world of multimedia sound and entertainment to your computer. GameWave 32Plus supports both FM (frequency modulated) and wavetable synthesis. Although FM produces acceptable sound, the GameWave 32Plus's wavetable synthesis uses actual digital recordings of musical instruments and effects in place of computer generated sounds. GameWave 32Plus uses the Algorithmic/Wavetable Synthesis (A/WS) method for creating sounds. A/WS uses FM emulation and wavetable synthesis both alone and in combination with one another.

The sound of Game 32Plus is controlled by a 20 MIPS (million instructions per second) digital signal processor (DSP). This DSP chip can perform several types of synthesis and support multiple sound standards simultaneously. The flexible architecture of GameWave 32Plus provides the ability to switch between sound standards and to update to new sound standards without additional hardware.

Hardware support is provided for software written for the major sound standards, including Sound Blaster, Windows Sound System and General MIDI. In addition, GameWave 32Plus comes with Mitsumi and Sony CD-ROM interfaces.

Thank you for purchasing the GameWave 32Plus. Care has been taken to ensure that it will provide you with years of trouble-free operation. We believe that you will be pleased with your purchase.

About This Manual

This manual presumes that you are already familiar with your IBM PC-compatible computer. While the GameWave 32Plus has been designed to be easy-to-install, we recommend that you refer to your computer's reference manual when terminology or installation steps are unfamiliar to you. Each section is divided into short, easy-to-follow steps, to help you understand the installation and function of the GameWave 32Plus.

Section 1: Hardware and Software

Whether you are a beginner or an experienced user, this section will give you important information on proper installation, and instructions on how to connect external devices to GameWave 32Plus.

Section 2: Orchid Utilities

This section provides you with several Orchid utilities. These utilities will enhance the capabilities of your GameWave 32Plus and your CD-ROM drive.

Appendix A: Technical Information

If you are experiencing installation difficulties or require troubleshooting information, this appendix gives you checkpoints to ensure that your GameWave 32Plus is operating properly. Appendix A also includes the technical specifications.

Appendix B: MIDI

Here you are given an overview of the MIDI specification and a list of the General MIDI and percussion sounds used on GameWave 32Plus.

Before You Begin

This manual will familiarize you with the features, installation and use of the GameWave 32Plus. There are several symbols and conventions used throughout this manual which will help to draw your attention to a feature or to focus on important information:



When you see the Magnifying Glass it means the text is referring to something you should take a closer look at before proceeding further.



When you see the Exclamation Mark, it gives important information on avoiding damage to property.

Common Names

BBS	Bulletin Board System
DAC	Digital/Analog Converter
DSP	Digital Signal Processor
MIDI	Musical Instrument Digital Interface
MPC	Multimedia PC
PC	Refers to the family of IBM PC, PC/XT or PC/AT compatible computers

INSTALLING GAMEWAVE 32PLUS

Designed to be easy to use and easy to install, GameWave 32Plus can be used with the preset jumper settings. If you need to change the default address settings, refer to "Preparing Your GameWave 32Plus" in this section. For details on connecting external devices, refer to "External Devices" in this section.

Quick Installation

Hardware Installation

If you are connecting a CD-ROM drive, go to "Installing a CD-ROM Drive," otherwise continue. Please refer to Figures 1.2 and 1.5 for connection locations.



STATIC!

Before handling the GameWave 32Plus, be sure to guard against electrostatic discharge. Be properly grounded by touching the power supply housing, or you may want to buy a Ground strap from your local computer store.


1. If you previously installed another sound card, remove it and all associated files and drivers from your hard drive.
2. Turn off the power to your computer, unplug all power cords and remove the computer cover.
3. Install the GameWave 32Plus into a 16-bit expansion slot.
4. If you are connecting external speakers to the GameWave 32Plus, connect the speaker cable to the SPEAKER jack on the metal bracket.
5. If you are connecting amplified external speakers to the GameWave 32Plus, connect the speaker cable to the LINE OUT jack on the metal bracket.
6. If you are connecting a microphone to the GameWave 32Plus, connect the microphone cable to the MIC jack on the metal bracket.
7. If you are connecting a MIDI device or a joystick to the GameWave 32Plus, connect the cable to the joystick port on the metal bracket (refer to Figure 1.5).

8. Reconnect previously removed cables and power cords and replace the cover of the computer.

Software Installation

The following instructions assume you are using a floppy drive designated as Drive A:, and a hard drive designated as drive C:. Please substitute the correct drive letter if your computer is configured differently.

GINSTALL.EXE is an easy-to-use, menu driven installation program that allows you to automatically install the GameWave 32Plus software drivers and utilities to your hard drive. Insert the GameWave 32Plus disk into your floppy drive and invoke the GINSTALL.EXE installation program by typing:

```
A : \GINSTALL  
```

From the Display Driver Installation Program menu, press any key, and the following menu appears:

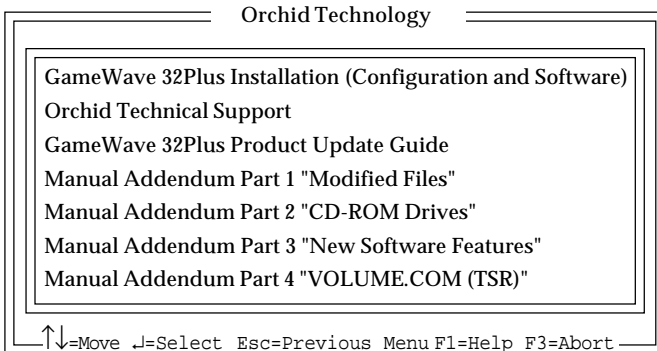


Figure 1.1: GINSTALL Main Menu Screen

The installation program automatically copies the GameWave 32Plus drivers and application programs to your hard drive. Once the software is



For assistance during the installation process, GINSTALL.EXE provides on-line help by selecting the F1 key at any time.

installed, the installation program can automatically update your CONFIG.SYS and AUTOEXEC.BAT files.

At this point, you must restart your system. The CD-ROM drive is initialized on bootup. If it does not initialize on bootup, check for an I/O, DMA or IRQ address conflict. Verify the address settings of other peripherals in your system to correct the address conflict(s).

The driver and utility software installation is complete! The Orchid software programs will be located in the Orchid Audio Software group.

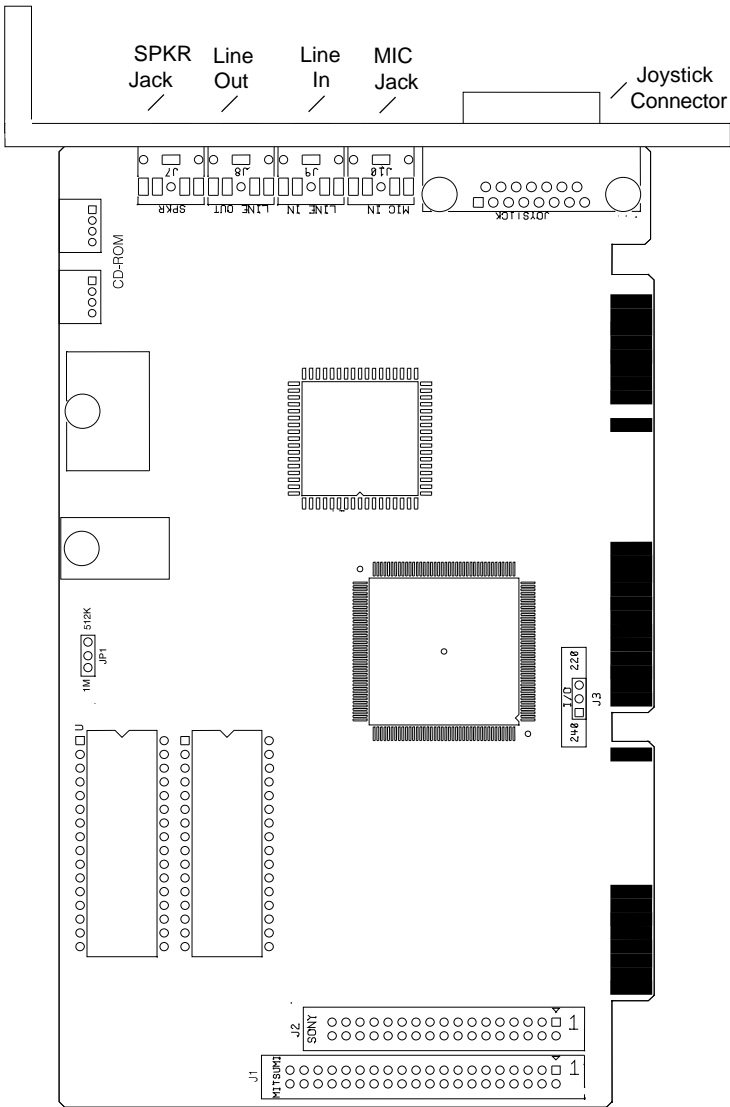


Figure 1.2: GameWave 32Plus Diagram

NOTE: Pin 1 on the card is indicated by a square.

Preparing Your GameWave 32Plus

Jumper Settings

The following table lists the jumpers used in the configuration of GameWave 32Plus. The information following the table explains the jumpers in more detail.

Jumper	Setting	Default	Function
Jumper J3	Connect 1 & 2	✓	Enable I/O address 240 Enable I/O address 220
	Connect 2 & 3		
Jumper JP1	Connect 1 & 2	✓	Enable 2MB Wavetable (for optional 1MB ROMS) Enable 1MB Wavetable (512K ROMS)
	Connect 2 & 3		

Table 1.1: Jumper Settings

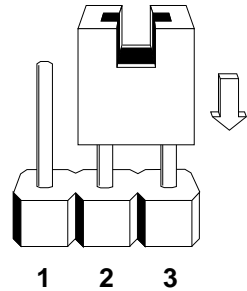


For help on avoiding address conflicts, see Appendix A.

Jumper J3: I/O Address

Jumper J3 sets the base port address for Sound Blaster mode. The default setting is 220 Hex.

Figure 1.3: Jumper J3 (pins 2 and 3 connected). Default address

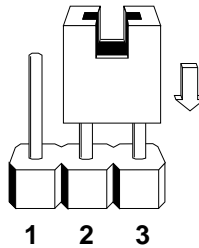


If you need to change the default address, connect pins 1 and 2 to select the optional address—240 Hex.

Jumper JP1: Wavetable

The GameWave 32Plus uses two 512K Wavetable ROM chips for 2MB of compressed sample sounds. The 512K default setting gives you 2MB of authentic instrument recordings. The 1MB setting is for the optional 1MB ROM chip size for 4MB of compressed sample sounds. Refer to Table 1.2 for details on the Wavetable configuration.

Figure 1.4: Jumper JP1 (pins 2 and 3 connected).
Default address



To configure for the optional 4MB of sample sounds, connect pins 1 and 2 to select the 1MB address setting.

Wavetable Configuration

The DSP on the card decompresses the sample sounds as it plays them. The following table details the wavetable configuration of GameWave 32Plus.

Sample Sound Size	Compressed Size	ROM Size
2MB (1MB x 16)	1MB	2 x 512KB
4MB (2MB x 16)	2MB	2 x 1MB

Table 1.2: Wavetable Configuration

where:

Sample Sound Size = actual uncompressed sample size

Compressed Size = size of samples after compression

ROM Size = chips used to store the sample set



See Figure 1.5 for the connection locations of the external devices.

External Devices

External Speakers

You can connect 4 or 8 ohm external speakers or headphones to GameWave 32Plus. The speakers and headphones plug into the SPEAKER jack on the GameWave 32Plus metal bracket.

Joystick

Plug the joystick into the 15-pin connector on the metal bracket.

MIDI

If you purchased the optional MIDI interface kit, you can connect a MIDI IN device, or joystick at this time. First plug the MIDI interface cable to the DB-15 joystick/MIDI port on the GameWave 32Plus. Then connect your joystick or MIDI devices to the appropriate MIDI interface cable connectors.

Line In

You can connect an external mono or stereo audio source to the GameWave 32Plus, such as a tape player or radio. Use the appropriate converter cable to interface to your external equipment.

Line Out

Allows you to connect the audio output of your GameWave 32Plus to your home stereo or VCR.

Microphone

You can connect a 300-600 ohm microphone to GameWave 32Plus. Plug it into the MIC jack on the metal bracket.

CD-ROM

The GameWave 32Plus has interface connectors for the Mitsumi and Sony internal CD-ROM drives.

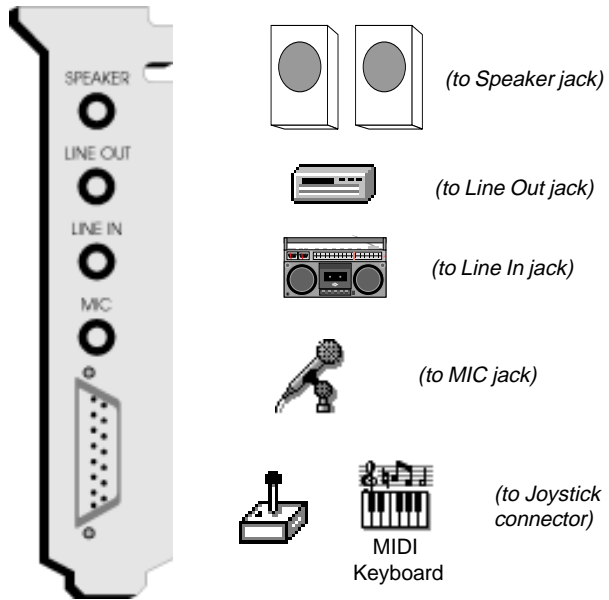


Figure 1.5: GameWave 32Plus Bracket

The MIDI Interface

An optional MIDI Kit is available for GameWave 32Plus. The kit includes a Sound Blaster-type MIDI cable and MIDI software. To purchase the kit, call the Orchid Sales department.

Installing a CD-ROM Drive

There are several different brands and models of CD-ROM drives that can be attached to GameWave 32Plus. These instructions apply to all models, except where indicated. *If you are installing a CD-ROM drive these instructions will help you, but you should also refer to the documentation that came with your CD-ROM drive.*

Before starting the setup and installation, make sure that your computer is turned OFF and the power cord has been disconnected from the wall outlet. Your CD-ROM drive kit should contain the following items:



Try to avoid excessive twists or bends in the cable that might damage it or interfere with other boards in your computer.

- CD ROM Drive with optional slide rails
- Interface Cable
- Audio Cable

Install the CD-ROM hardware as recommended by the CD-ROM manufacturer. Follow the steps below for help on installing the CD-ROM interface and audio cable.

Installing the cable:

1. Connect one end of the interface cable (ribbon-type) to the CD-ROM drive interface connector. Be sure to match the colored stripe to Pin 1 of the CD-ROM drive connector.
2. Connect the other end of the cable to the Sony or Mitsumi connector on the GameWave 32Plus card. Be sure to match the colored stripe to Pin 1 of the CD-ROM drive connector.



Please contact your CD-ROM drive manufacturer or local dealer if you need a CD audio cable.

NOTE: The Sony CD-ROM connector has only 34 pins. If you received a 40-pin cable with your Orchid or Sony CD-ROM drive, several pins will hang over the connector. Those pins are not used. Just be sure to line up Pin 1, and let the excess pins hang off the other end of the connector.

3. Connect the audio cable to the CD-ROM drive's audio connector.
4. Connect the other end of the audio cable to the CD-ROM audio connector on the GameWave 32Plus.
5. You are now ready to install the GameWave 32Plus. Go to "Quick Installation" at the beginning of this section. See "Software Installation" to install the GameWave 32Plus software and application programs.


CD-ROM Device Drivers

CD-ROM drives require device drivers to access the drive. Two device drivers are added to the CONFIG.SYS file. These modifications are made automatically when a CD-ROM is selected.

Configuring GameWave 32Plus for a CD-ROM

To configure a CD-ROM drive, follow the steps below:

1. Change directory to the GW32PLUS subdirectory and type the following:

```
C:\GW32 /C 
```

2. Select the Type of CD-ROM installed.
3. Accept the configuration and exit the program.

GameWave 32Plus CD-ROM Device Drivers

The following is a description of the device drivers that are installed automatically in the CONFIG.SYS and AUTOEXEC.BAT files, when a CD-ROM drive

option is selected from the Orchid Audio Hardware Setup program. The CD-ROM selections available are: Other, Sony and Mitsumi.

Other CD-ROM selection:

CONFIG.SYS

```
Device=C:\SWAVE32\SWCD.SYS /I:12 /A:360
```

where:

- /I: specifies the IRQ to the GameWave 32Plus used by the CD-ROM drive.
- /A: specifies the I/O Address to the GameWave 32Plus used by the CD-ROM drive.

The SWCD.SYS device driver initializes the GameWave 32Plus for the presence of a CD-ROM drive. It is required by any CD-ROM option selected.

NOTE: SWCD.SYS is the only device driver loaded when the Other option is selected as the CD-ROM choice. It must be loaded in the CONFIG.SYS file before any other CD-ROM device driver. If you have selected Other as your CD-ROM choice, you will also have to install the device drivers provided by your CD-ROM manufacturer. Refer to your CD-ROM manufacturer's documentation for installation procedures.

Sony CD-ROM selection:

CONFIG.SYS

```
Device=C:\SWAVE32\SWCD.SYS /I:12 /A:360
```

```
Device=C:\SWAVE32\SLCD.SYS /D:SWCD0001 /B:360  
/M:P/V/C
```

Refer to the Other CD-ROM selection for a description of the SWCD.SYS device driver. The SLCD.SYS device driver initializes a Sony CD-ROM drive.

where:

- /D:** specifies the device name of the CD-ROM drive. The device name must be identical to the device name specified in the CORELCDX.COM device driver.
- /B:** specifies the I/O Address for the CD-ROM drive.
- /V:** specifies verbose mode.

AUTOEXEC.BAT

```
C:\SWAVE32\CORELCDX.COM /D:SWCD0001
```

The CORELCDX.COM device driver initializes the operating system, or DOS, for the presence of a CD-ROM drive.

where:

- /D:** specifies the device name of the CD-ROM drive. The device name must be identical to the device name specified in the SLCD.SYS device driver.

Mitsumi CD-ROM selection:

CONFIG.SYS

```
Device=C:\SWAVE32\SWCD.SYS /I:12 /A:360
```

```
Device=C:\SWAVE32\MTMCDAS.SYS /D:SWCD0001  
/P:360 /A:0
```

Refer to the Other CD-ROM selection for a description of the SWCD.SYS device driver. The MTMCDAS.SYS device driver initializes a Mitsumi CD-ROM drive.

where:

- /D:** specifies the device name of the CD-ROM drive. The drive name must be identical to the

device name specified in the CORELCDX.COM device driver.

/P: specifies the I/O Address for the CD-ROM drive.

/A: sets audio play mode to stereo.

AUTOEXEC.BAT

C:\SWAVE32\CORELCDX.COM /D:SWCD0001

The CORELCDX.COM device driver initializes the operating system, or DOS, for the presence of a CD-ROM drive.

where:

/D: specifies the device name of the CD-ROM drive. The device name must be identical to the device name specified in the MTMCDAS.SYS device driver.

Section

2

ORCHID UTILITIES

GameWave 32Plus comes with DOS and Windows utilities to enhance the capabilities of GameWave 32Plus and your CD-ROM drive. The utilities are automatically installed using the GINSTALL program. Refer to "Section 1: Hardware and Software" if you have not installed the GameWave 32Plus software.

GW32.EXE

The GW32.EXE utility program configures the address settings and emulation modes of your GameWave 32Plus from the DOS command line. From the DOS prompt, type the following:

```
CD\GW32PLUS
```

then

```
GW32 /C 
```

The following screen appears:

Orchid Audio Configuration, Version 3.10 (c) 1993-1994, Orchid Technology	
Emulation Mode	: Sound Blaster + General MIDI
Volume Level	: 12
Startup Music	: On
Joystick Port	: Disable
Sound Blaster Interface	: Disable
Windows Sound System	: Port=530
MIDI (MPU-401) Interface:	Port=330 IRQ=5
CD-ROM Option	: None
CD-ROM Interface	: Disabled
Accept the above configuration	
F2 = Set all Ports, IRQ's and DMA's to default values	
↑↓ Move Cursor ← = Select Esc = Abort Configuration	

Figure 2.1: Orchid Audio Configuration Screen



For help on eliminating address conflicts, see Appendix A.

Section 2: Orchid Utilities

The command line options are as follows:

- C:\GW32 /? - A listing of options and syntax
- C:\GW32 /C - Change the hardware setup values
- C:\GW32 /S - Status of the current configuration
- C:\GW32 /V:x - Sets the volume, where x is 0 to 31
- C:\GW32 - Reinitializes the hardware with the last saved settings

Volume Control

The VOLUME.COM utility program allows you to change the volume of the GameWave 32Plus within a program, by using Hot Keys. This utility can be executed from the GW32PLUS subdirectory or added to your AUTOEXEC.BAT file.

The default Hot Keys values are:

- ALT + :
- ALT + "

You can define Hot Keys and make other changes from the DOS command line. The DOS command line options are:

- /I - Installs the TSR
- /S or /? - Display Status
- /D - Disables the Hot Keys
- /E - Enables the Hot Keys
- /K<Key><Down><Up> - Defines the Hot Keys

<Key> is either C (CTRL) or A (ALT) key. Down and Up can be any printable character. For example:

C:\VOLUME /I /KAXC



This installs the TSR and redefines the Hot Keys as:

- ALT + X - to turn Down the volume
- ALT + C - to turn Up the volume



Some software applications have a built-in volume control. Check your application before using the volume control utility.



Some games will disable TSR programs before they begin. These games will disable the VOLUME program.

DOS Control Panel

The Orchid Audio DOS Control Panel utility allows you to easily fine tune your instrument settings for DOS games and sequencing applications. Run the DOS Control Panel from the DOS prompt by typing:

```
CD\GW32PLUS
```

then

```
MXRDOS
```

The following menu appears:



Figure 2.2: Orchid Audio DOS Control Panel

The changes you make while the GameWave 32Plus DOS Control Panel is open do not take effect until the OK button is pressed.

DOS Control Panel Features

Allows you to select the recording input volume level for the selected device. It is useful for playing external audio sources through the GameWave 32 Plus's amplifier.

Input

This selection allows you to choose the type of audio input source to be used during audio recording. The

devices available to record from are MIC, LINE, and CD.

Volume

Here you can adjust the volume individually for CD Audio and FM Synthesis files, or use the Master selection for overall volume control.

MIDI Channel Enable

The channel where MIDI messages are received.

Mode

OMNI ON mode allows an external keyboard or the GameWave 32Plus to receive MIDI data on all 16 MIDI channels at once.

OMNI OFF mode allows an external keyboard or the GameWave 32Plus to receive MIDI data on only the MIDI channels selected.

GameWave 32Plus Windows Utilities

The Orchid Audio utilities allow you to control the compatibility options and MIDI performance parameters of the GameWave 32Plus. The control panels provide an intuitive user interface as they send MIDI System Exclusive (SYSEX) messages to the GameWave 32Plus synthesizer.

GameWave 32Plus Mixer Console

This utility allows you to control the output levels of all sound devices supported by GameWave 32Plus. You can also control the input level of the selected input port.

1. Start the Microsoft Windows Application.
2. From the Orchid group, double-click on Orchid Mixer. The following menu appears:



Figure 2.3: Mixer Configuration Screen

Volume Controls

To adjust the volume for the Wave, MIDI or CD options, move the scroll bar to the desired level.

Mute Control

Click on this button to Mute all sound output. Click on it again to UnMute all sound output.

Input

This selection adjusts the input level for the selected recording device.

Select Input

Use this selection to select a port to use for recording. Your port options are: Microphone, CD-ROM or Line In.

Windows Control Panel

The Orchid MIDI Windows Control Panel allows you to easily configure your MIDI Input and Output device(s) and fine tune your instrument settings.

1. Double-click on the Orchid Control Center icon and the following screen appears:

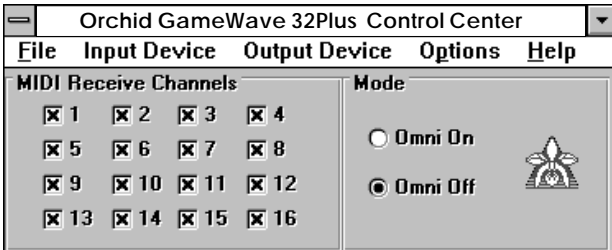


Figure 2.4: Orchid MIDI Windows Control Panel

2. Click on the button of your choice to make your selection.

Windows Control Panel Menus

The Orchid MIDI Control Panel has five menu selections: File, Input Device, Output Device, Options and Help. Use your mouse to click on the menu or hold down the ALT key and press the underlined letter.

File Menu

Allows you to exit the control panel program.

Input Device

This selection shows the available MIDI devices on your system. Select the device you would like to receive MIDI IN information from. If you are using an external MIDI device, like a keyboard synthesizer, make sure you have it connected to the MIDI IN port on the GameWave 32Plus.

Output Device

This selection shows the available MIDI devices on your system. Select the device you would like to send MIDI OUT information to. If it is an external device, make sure you have it connected to the MIDI OUT port on the GameWave 32Plus.

Options

MIDI Through - enables any data coming into the MIDI IN port on the GameWave 32Plus to be echoed back to the MIDI OUT port on the GameWave 32Plus.

Always on Top - enabling this selection allows the control panel to remain on top of any open Window or application.

Release Device If Inactive - releases the MIDI driver for use by another device. This is very important, since only one application at a time can access the MIDI driver under Windows. This option should usually be set ON, as it allows you to have the GameWave 32Plus and a sequencer open simultaneously. **IMPORTANT NOTE:** If the sequencer has a similar option, enable it! Otherwise, you will get the following error message from Windows:

"Device is currently in use by another application. Wait until device is free then try again."

Remember, only one application at a time can access the MIDI device driver.

Windows Control Panel Features

MIDI Receive Channels

The channel where MIDI messages are received. This is mainly used when using the GameWave 32Plus with external MIDI synthesizers. You can have the GameWave 32Plus respond only to MIDI data on specific channels, allowing you to create complex music arrangements utilizing multiple MIDI devices.

Mode

OMNI ON mode allows an external keyboard or the GameWave 32Plus to receive MIDI data on all 16 MIDI channels at once.

OMNI OFF mode allows an external keyboard or the GameWave 32Plus to receive MIDI data on only the MIDI channels selected.

Appendix

A

TECHNICAL INFORMATION

Orchid Technology is known for its responsiveness to its customers. This section gives you helpful hints for troubleshooting the GameWave 32Plus, and the technical specifications.

CompuServe

In addition to calling Orchid technology, technical support is now available through the CompuServe Information Service (CIS). You can also download drivers and get new product information. To find us on CompuServe, follow the instructions below:

1. Log onto CompuServe.
2. Type GO MULTIB to get into the Multimedia Vendor Forum B. Once you are in this forum, select Message Section #10. The message and library sections are labeled Orchid . . .

or

You may type GO ORCHID to get immediate access to the Orchid section.

3. If you would like to leave private mail for Orchid, type GO MAIL. Address your letters to our technical support account number 72662,2672.



All commands can be typed in lower or upper case letters.

Before You Begin

Because of the unique hardware design of the GameWave 32Plus, each sound standard is independent of the other. This is how GameWave 32Plus can emulate multiple sound standards simultaneously.

When troubleshooting the GameWave 32Plus for potential conflicts, it is important to remember that if a sound standard works correctly, the problem generally becomes a software issue. For example,

the startup music with the GW32.EXE program uses the SoundBlaster interface. If the startup music plays, the SoundBlaster interface is operating correctly. If an application that is emulating the SoundBlaster standard is not operating properly, contact the software manufacturer for possible configuration requirements or software updates.

Troubleshooting the GameWave 32Plus

The following information will help you diagnose problems you may have with the GameWave 32Plus. Following these simple steps serves a two-fold purpose:

You may be able to fix your problem and avoid having to contact the Orchid Technology Technical Support Department...

or

if these steps do not help you solve your problem, they will most certainly give you a better handle on what to tell Technical Support once you do contact them.

The information provided here is in symptom/response form. That is, a symptom is given, and a check point response is provided for you.

Symptom 1

System locks up on bootup with the GameWave 32Plus installed.

Check

1. If a CD-ROM drive has been installed in the system, verify that the SWCD.SYS device line in the CONFIG.SYS file is loading before any other CD-ROM device drivers.

2. If the lock up occurs when loading the GW32.EXE file, disable all sound settings by using GW32 /C. Enable each sound setting one at a time to identify which setting is causing the lock up. Port addresses and DMA conflicts will normally cause a lock up. IRQ conflicts will cause continuous noise from the speakers. When you have identified the conflict, change the address setting.
3. Check whether another peripheral in your system is using the same I/O address configured by Jumper J3 on the GameWave 32Plus.

Symptom 2

No startup sounds when running the GW32.EXE program.

Check

1. Verify that the external speaker is properly connected to the GameWave 32Plus stereo speaker jack.
2. Verify that the Startup Music is on and the volume is turned up in the GW32.EXE program.
3. Since the GameWave 32Plus uses the SoundBlaster interface to play the Startup Music, check for possible conflicts with the SoundBlaster interface settings.
4. Verify that the ORCHID.WAV file is in the GW32PLUS directory. This file is limited to 8-bit resolution and 22KHz sample frequency (mono). If you have replaced the ORCHID.WAV file with another wave file, verify that it does not exceed these limits.

Symptom 3

I cannot access the CD-ROM drive.

Check

1. If a CD-ROM drive is installed, verify that the SWCD.SYS device line in the CONFIG.SYS file is loading before any other CD-ROM device drivers.
2. Verify that the path and syntax for each of the device driver lines are correct (refer to Device Drivers in Section 2).
3. If there is an LASTDRIVE statement in the CONFIG.SYS file, verify that the drive letter used is set to a letter after the CD-ROM drive (refer to your DOS manual for more information).
4. Verify that the colored stripe on ribbon cable is correctly installed on Pin 1 on both the GameWave 32Plus and the CD-ROM drive.

Symptom 4

My CD-ROM drive does not play CD Audio.

Check

1. Verify that the audio cable used matches the pin-outs for the CD Audio connector. See this appendix for the CD-ROM Audio Cable Connector pin assignments. Contact the Orchid Sales department for cable options.

Symptom 5

My microphone recording level is too soft or unable to record properly.

Check

1. Verify that your microphone has the proper impedance or is too sensitive. The GameWave 32Plus expects a microphone with an impedance of approximately 600-10K ohms.
2. Verify that the software used to record, and the Windows temporary directory are not on a drive that is using a disk doubling utility.
3. Turn up the microphone input level.
4. Make sure that the microphone is selected as the recording source.

Symptom 6

Wave files do not play correctly in Windows.

Check

1. In the SYSTEM.INI file in the Windows directory, under the [drivers] portion of the file, verify that the WAVE=SW32.DRV and AUX=SW32.DRV lines are present.
2. Verify that the settings for the GameWave 32Plus driver in the GW32.EXE program are not in conflict with another hardware device.

Symptom 7

MIDI files do not play correctly in Windows.

Check

1. In the SYSTEM.INI file in the Windows directory, under the [drivers] portion of the file, verify that the MIDI=MPU401.DRV line is present.
2. Verify that the settings for the GameWave 32Plus driver in the GW32.EXE program are not in conflict with another hardware device.

Symptom 8

Certain applications do not play sound.

Check

1. Verify that the GameWave 32Plus and the software application are configured for the same sound emulation modes (for example, SoundBlaster for digitized sound and General MIDI for music).
2. Many software applications require a large amount of base memory, such as 640KB and are unable to operate if any drivers or TSR programs are installed. Try removing all unnecessary drivers and TSRs or load them in high memory (refer to your DOS user's manual for more information).
3. Verify that the software application is configured for the same I/O, IRQ, and DMA settings as the GameWave 32Plus.

Symptom 9

Certain applications do not play digitized sound, such as speech or sound effects.

Check

1. Check for a conflict with the SoundBlaster interface configuration settings. Digitized sounds are played back through this interface.
2. Verify that the SET BLASTER statement is in the AUTOEXEC.BAT file. Some applications look specifically for this statement to set the SoundBlaster environment. Verify that the settings of the statement match the configuration for the GameWave 32Plus and the software application.

3. Verify that there is sufficient base memory to run the software application. If you are configuring the software application for SoundBlaster for digitized sound, and MIDI for Music, the software application may omit digitized sound if there is not enough base memory available.

Symptom 10

My joystick does not work when connected to the GameWave 32Plus.

Check

1. Verify that the Joystick Port selection in the GW32.EXE program is enabled.
2. Many I/O adapter cards have a built-in joystick/game port (even if they do not contain a 15-pin DB connector). The GameWave 32Plus has its own joystick port. Disable the joystick/game port on the I/O adapter card.

Avoiding Address Conflicts

A conflict may occur if you have another card in your system using the same I/O, DMA or IRQ addresses as GameWave 32Plus. Resolve the conflict by selecting another available address. When selecting a different address, please *note* the following information:

☞ A BUS mouse commonly uses I/O address 240H

☞ Network cards commonly use the following addresses:

IRQ 10 or 11

I/O 300H, 320H, 340H or 360H

☞ Other devices such as SCSI cards, hard disks and CD-ROM drives commonly use the following addresses:

IRQ 10, 11, 14 or 15

I/O 330H or 340H

☞ When you encounter an IRQ conflict, you will normally hear a continuous noise from the speakers. I/O and DMA conflicts normally lock up your system.

☞ GameWave 32Plus must use DMA Channel 1. If any other device is using DMA Channel 1, move it to another location.

MIDI Usage

Roland Synthesizers

Some Roland synthesizers, most notably the D-50, send "all notes off" commands when all keys are released. This causes GameWave 32Plus sounds to play in a "staccato" fashion. Holding down one key while playing other notes will correct this.

Windows Sound System

The Windows Sound System applications that come with the Windows Sound System hardware will cause a "Windows Sound System board not installed" error. This error occurs because the applications require the actual Microsoft hardware to run. You can correct this by loading the Microsoft Sound Systems driver instead of the GameWave 32Plus driver, or you can use the retail version of Windows Sound System (the software only version).

External keyboard control of GameWave 32Plus

If you wish to plug a MIDI keyboard into GameWave 32Plus, you may want to purchase the joystick/MIDI cable adapter from Orchid. The Orchid GameWave 32Plus also supports "standard" joystick/MIDI cable sets, so if you have access to a Sound Blaster or Pro Audio Spectrum MIDI cable or compatible cable, it should work properly.

Due to the number mechanism used by various keyboard manufacturers, access to some of the GameWave 32Plus sounds may be restricted. The following are keyboards that may have sound access limitations:

- Korg M1 - The Korg M1 can access sounds 0 - 100. Switching to the ROM card addressing restarts the patch numbering from 0, not 101.

- Yamaha DX-7 - This synthesizer can access sounds 0 - 64 (internal and cartridge). If your DX-7 has the E! retrofit, then cycling through the upper banks will provide access to sounds 64 - 128.

Technical Specifications

The features and specifications of the GameWave 32Plus are covered in this section. Also included are the specifications for the Joystick/MIDI Port.

Features

Full compatibility with software written for the following sound and multimedia standards:

- Sound Blaster
- AdLib
- Microsoft Windows Sound System
- General MIDI
- Roland MPU-401

Chipsets

Analog Devices 20MHz ADSP-2115 DSP
Analog Devices 1848 CODEC and Gate Array

Video Standards Supported

MDA, CGA, EGA and VGA

Computers Supported:

ISA machines: 386, 486 and compatibles

Card Size:

6" x 4.5"

Connectors:

DB-15 port for joystick/MIDI input/output
3.5 mm mono jack for microphone input
3.5 mm stereo jack for amplified speaker output
3.5 mm stereo jack for line input
3.5 mm stereo jack for line out
On-board interface for Sony CD-ROM drive
On-board interface for Mitsumi CD-ROM drive

Temperature:

Operating: from 0 to 40 degrees C
Storage: from -25 to 90 degrees C

Humidity:

Operating: from 15% to 90%

Storage: from 0% to 90%

Additional Features:

20 MIPS of Digital Signal Processing Power (DSP)

FM Synthesizer

- OPL2 FM emulation

Stereo Digital/Analog Mixer (built-in)

- Selectable input and mixing of all audio sources for recording:

Line-In

Stereo CD-Audio

Mono Microphone

Stereo Digitized Audio Playback

- 8-bit and 16-bit sample modes
- Sampling Rate of :
2KHz to 48KHz (mono or stereo)

Synthesizer Emulations

- General MIDI Mode
Up to 32 simultaneous voices
- Yamaha OPL2 emulation
FM Stereo

Sample Sounds

- 2 megabytes (1MBx16) wavetable samples, compressed and stored in two 512K (1MB) ROMS

Audio Amplifier

- Frequency Response: 20Hz to 22KHz

Stereo Digitized Audio Recording

- 8-bit and 16-bit sample modes
- Sampling Rate of 2KHz to 48KHz

CD-ROM Kit

- One built-in Mitsumi CD-ROM interface and one built-in Sony CD-ROM interface

MIDI Kit

- Sound Blaster type Joystick/MIDI cable

Joystick Port/MIDI Interface

- Standard built-in (15-pin D-sub) connector
- Game I/O port for PC analog joystick
- Built-in interface for Sound Blaster MIDI cable with MIDI IN and MIDI OUT connectors
- MIDI time-stamp for Multimedia extension
- Sound Blaster MIDI compatible
- 64-byte FIFO buffer

Mono Microphone Input

- Automatic Gain Control for direct sound input

Address Settings and Pin Assignments

The GameWave 32Plus address settings are software configured using the GW32.EXE utility program (refer to Section 2). The following information lists the address settings and pin assignments in detail.

CD-ROM Addresses

I/O	IRQ
300	3
310	5
320	7
330	9
340	10
* 360	11
	* 12

Table A.1: CD-ROM Addresses

Sound Blaster Mode Addresses

I/O	IRQ	DMA
* 220	3	* 1
240	5	
	* 7	

Table A.2: Sound Blaster Mode Addresses

* *Default Setting*

Windows Sound System Mode Addresses

I/O	IRQ	DMA
* 530	7	0
640	9	1
E80	10	3
F40	11	

Table A.3: Sound System Addresses

MPU-401 Mode Addresses

I/O	IRQ
300	3
320	* 5
* 330	7
	9

Table A.4: MPU-401 Addresses

* *Default Setting*

CD-ROM Audio Cable Connector

Pin	Assignment
1	Ground
2	Left Channel
3	Ground
4	Right Channel

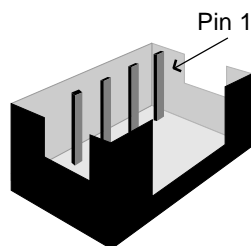


Table A.5: CD-ROM Audio Cable Pin-outs

Joystick/MIDI Port Pin Assignments

The joystick port on GameWave 32Plus is identical to the standard PC Game Control adapter. The 15-pin D-sub connector is also used as the built-in MIDI interface. The pin-out assignments are as follows:

Pin	Function	Pin	Function
1	+5V	9	+5V
2	A-1	10	B-1
3	A-X	11	B-X
4	GND	12	MIDI-OUT
5	GND	13	B-Y
6	A-Y	14	B-2
7	A-2	15	MIDI-IN
8	+5V		



If you want to use the joystick port on your PC, you can disable the joystick port on the GameWave 32Plus (refer to Section 2).

Table A.6: Joystick/MIDI Pin Assignments

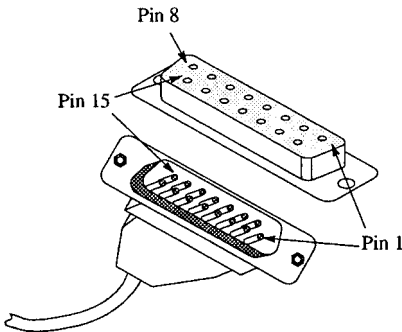


Figure A.1: Joystick/MIDI Pin-Outs

GameWave 32Plus MIDI Port Specifications

The chart below details the MIDI implementation for GameWave 32Plus.

Function	Setting	Parameters
Basic Channel	Default Channels	1-16 1-16
Mode	Default Messages Altered	No No No
Note Number	True Voice	21-108
Velocity	Note ON Note OFF	Yes Yes
After Touch	Key Channel	Yes Yes
Pitch Blender		Yes
Control Change		1 Mod Wheel 4 Foot Pedal 7 Volume 10 Pan 64 Sustain
Program Change	True Number	0-127
System Exclusive		Yes
System Common	Song Position Song Select Tune	No No No
System Read Time	Clocks Commands	No No
Auxiliary Messages	Local ON/OFF All Notes OFF Active Sense Reset	No Yes No Yes

B

MIDI

This section gives you an overview of the MIDI specification, and provides a list of the Patches and Percussion sounds stored on GameWave 32Plus.

MIDI Overview

MIDI (Musical Instrument Digital Interface) is a serial communications protocol designed specifically for electronic music devices. MIDI (pronounced "mid-ee") has revolutionized the composition, recording, and performance processes by allowing many instruments to be centrally-controlled like one electronic orchestra. The MIDI Manufacturers Association (MMA) is responsible for the development and evolution of MIDI.

MIDI contains instructions controlling how and when devices like digital synthesizers produce sound. You can think of MIDI as a sort of Postscript for music. Postscript describes objects, rather than casting them into bitmapped form. MIDI describes the elements of the musical performance, rather than casting them into the bitstreams of digital audio.

General MIDI

The GameWave 32Plus supports the General MIDI wave synthesis specification. General MIDI defines specific and predictable sounds for each of 128 program locations. This allows composers and producers to include program change commands in compositions that will configure the timbres appropriately for the tracks.

General MIDI Sounds

These are the General MIDI Patches (sounds) that are stored on the GameWave 32Plus. The GameWave 32Plus also contains over 40 percussion instruments on MIDI channel 10.

Patch	General MIDI Sound
1	Acoustic Grand Piano
2	Acoustic Bright Piano
3	Electric Grand Piano
4	Honky Tonk Piano
5	Fender Rhodes
6	Chorused Piano
7	Harpsichord
8	Clavinet
9	Celesta
10	Glockenspiel
11	Music Box
12	Vibraphone
13	Marimba
14	Xylophone
15	Tubular Bells
16	Dulcimer
17	Hammond Organ
18	Percussive Organ
19	Rock Organ
20	Church Organ
21	Reed Organ
22	Accordion
23	Harmonica
24	Tango Accordion
25	Nylon Acoustic Guitar
26	Steel Acoustic Guitar
27	Jazz Electric Guitar
28	Clean Electric Guitar
29	Muted Electric Guitar
30	Overdriven Guitar
31	Distorted Guitar
32	Guitar Harmonics
33	Acoustic Bass
34	Fingered Electric Bass
35	Picked Electric Bass
36	Fretless Bass
37	Slap Bass 1

38	Slap Bass 2
39	Synth Bass 1
40	Synth Bass 2
41	Violin
42	Viola
43	Cello
44	Contrabass
45	Tremelo Strings
46	Pizzicato Strings
47	Orchestral Harp
48	Timpani
49	String Section 1
50	String Section 2
51	Synth Strings 1
52	Synth String 2
53	Choir "Aahs"
54	Voice "Oohs"
55	Synth Voice
56	Orchestra Hit
57	Trumpet
58	Trombone
59	Tuba
60	Muted Trumpet
61	French Horn
62	Brass Section
63	Synth Brass 1
64	Synth Brass 2
65	Soprano Sax
66	Alto Sax
67	Tenor Sax
68	Baritone Sax
69	Oboe
70	Basoon
71	English Horn
72	Clarinet
73	Piccolo
74	Flute 81
75	Recorder

Appendix B: MIDI

Patch	General MIDI Sound
76	Pan Flute
77	Bottle Blow
78	Shakuhachi
79	Whistle
80	Ocarina
81	Lead 1
82	Lead 2
83	Lead 3
84	Lead 4
85	Lead 5
86	Lead 6
87	Lead Fifths
88	Lead + Bass
89	New Age Pad
90	Warm Pad
91	Polysynth Pad
92	Choir Pad
93	Bowed Pad
94	Metallic Pad
95	Halo Pad
96	Sweep Pad
97	Rain
98	Soundtrack
99	Crystal
100	Atmosphere
101	Brightness
102	Goblins
103	Echoes
104	Sci-Fi
105	Sitar
106	Banjo
107	Samisen
108	Koto
109	Kalimba

110	Bagpipe
111	Fiddle
112	Shanai
113	Tinkle Bell
114	Agogo
115	Steel Drums
116	Woodblock
117	Taiko Drum
118	Melodic Tom
119	Synth Drum
120	Reverse Cymbal
121	Guitar Fret Noise
122	Breath Noise
123	Seashore
124	Bird Tweet
125	Telephone Ring
126	Helicopter
127	Applause
128	Gunshot

Percussion Sounds

These are the Percussion sounds on the GameWave 32Plus. These percussion instruments are accessed by sending data to MIDI channel 10.

Key #	Keyboard Note	Sound
35	B0	Acoustic Bass Drum
36	C1	Bass Drum 1
37	C1+	Side Stick
38	D1	Acoustic Snare
39	D1+	Hand Clap
40	E1	Electric Snare
41	F1	Low Floor Tom
42	F1+	Closed Hi-Hat
43	G1	High Floor Tom
44	G1+	Pedal Hi-Hat
45	A1	Low Tom
46	A1+	Open Hi-Hat
47	B1	Low-Mid Tom
48	C2	Hi-Mid Tom
49	C2+	Crash Cymbal 1
50	D2	High Tom
51	D2+	Ride Cymbal 1
52	E2	Chinese Cymbal
53	F2	Ride Bell
54	F2+	Tambourine
55	G2	Splash Cymbal
56	G2+	Cow Bell
57	A2	Crash Cymbal 2
58	A2+	Vibraslap
59	B2	Ride Cymbal 2
60	C3	Hi Bongo
61	C3+	Low Bongo
62	D3	Mute Hi Conga
63	D3+	Open Hi Conga
64	E3	Low Conga
65	F3	High Timbale
66	F3+	Low Timbale
67	G3	High Agogo
68	G3+	Low Agogo
69	A3	Cabasa
70	A3+	Maracas

71	B3	Short Whistle
72	C4	Long Whistle
73	C4+	Short Guiro
74	D4	Long Guiro
75	D4+	Claves
76	E4	High Wood Block
77	F4	Low Wood Block
78	F4+	Mute Cuica
79	G4	Open Cuica
80	G4+	Mute Triangle
81	A4	Open Triangle

NOTE: *C1* refers to the lowest C-key on a standard 5-octave keyboard. The + sign refers to a half-step (sharp).

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Neither Orchid Technology nor anyone else who has been involved in the creation, production, or delivery of this product shall be liable for any direct, indirect, special, punitive, consequential, or incidental damages (including, without limitation, damages for loss of business profits, business interruption, loss of business information, and the like) arising out of the use of or inability to use this product, even if Orchid Technology has been advised of the possibility of such damages.

Because some states do not allow the exclusion of liability for consequential or incidental damages, the above limitation may not apply to you. In any event, Orchid Technology's liability arising in any manner in connection with this product, whether based in contract, product liability, or tort, shall not exceed the purchase price of the product.

FCC NOTICE

FCC# DDS7EF0393-93-SWA

SoundWave 32
Certified compliant with FCC Class B limits, part 15

To meet FCC requirements, shielded cables are required
to connect the unit to a 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."

This equipment generates and uses radio frequency energy and, if not installed and used properly in strict accordance with the manufacturer's instructions, may cause interference to radio or television reception.

This device has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. Only equipment (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this product.

If this equipment causes interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

1. Reorient the receiving antenna.
2. Relocate the computer with respect to the receiver.
3. Move the computer away from the receiver.
4. Plug the computer into an outlet which resides on a different circuit breaker than the receiver.
5. If necessary, consult your dealer, or an experienced radio or television technician for additional suggestions.

You may find the booklet **How To Identify and Resolve Radio-TV Interference Problems** helpful. It was prepared by the Federal Communications Commission and is available from the U.S. Government Printing Office, Washington, DC 20402. Refer to stock number: 004-000-00345-4.

Orchid Technology is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

Operation with non-certified equipment is likely to result in interference to radio and TV reception. The user must use shielded interface cables in order to maintain the product within FCC compliance.

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