
SoundDrive 16

User's Manual



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Orchid Technology
45365 Northport Loop West
Fremont, CA 94538-9973



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Orchid Technology has been a leading manufacturer of hardware and peripherals for personal computers since its incorporation in 1982, and is noted for introducing new standards to the personal computer industry:

- 1982 **PCnet:** the first personal computer Local Area Network.
- 1984 **PCturbo:** the first Accelerator card for PC compatible computers.
- 1985 **ECCELL:** the first PC Multifunction card with error correction.
- 1987 **RamQuest 50/60:** the first EMS (Expanded Memory Specification) product for the IBM PS/2 computers.
- 1990 **ProDesigner II:** the first Super VGA graphics adapter to support 1024 x 768 graphics in 256 colors on interlaced *and* non-interlaced monitors.
- 1991 **Fahrenheit 1280°:** first to ship a Windows accelerator, based on S3's 86C911 chip.
- 1992 **Fahrenheit VA:** first to ship a Windows accelerator with video audio built-in.
- 1993 **Celsius/VLB** first to ship a Windows accelerator based on IIT's award-winning AGX015 chip.



Introduction

The SoundDrive 16™ is an advanced 16-bit sound card. With SoundDrive 16 you can play and record digital audio, play and record MIDI, and experience multimedia and entertainment software with full, rich sound.

Two versions of the SoundDrive 16 are available: *SoundDrive 16EZ +SCSI* features both SCSI and Mitsumi CD-ROM interfaces. *SoundDrive 16EZ* features the Mitsumi CD-ROM interface only, and is upgradeable to the SCSI interface with a single chip! In addition, joystick and MIDI ports are provided for entertainment and music software.

SoundDrive 16 uses FM synthesis for creating musical instrument sounds. A unique feature of the SoundDrive 16 is the optional Orchid Wave Booster wavetable synthesis daughtercard. This daughtercard plugs into the SoundDrive 16 and enhances the sound in Windows, and multimedia applications with real music instruments.

Because it is multimedia ready, the SoundDrive 16's hardware and software interfaces turn your 386 or 486 PC into an MPC Level 2 compliant system. It is compatible with software that supports the major sound standards, including AdLib, Sound Blaster and Microsoft Sound System. With the software applications and utilities included, you can create and control your multimedia environment.

Thank you for purchasing the SoundDrive 16. Care has been taken to ensure that it will provide you with years of trouble-free operation. We believe 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 SoundDrive 16 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 chapter is divided into short, easy-to-follow steps, to help you understand the installation and function of the SoundDrive 16.

Chapter 1: Hardware and Software Installation

Whether you are a beginner or an experienced user, this chapter will give you important information on proper installation, and instructions on how to connect external devices to SoundDrive 16.

Chapter 2: Orchid Utilities

This chapter provides you with several Orchid utilities. Utilities are included to enhance the capabilities of your SoundDrive 16 and your CD-ROM drive.

Chapter 3: Audio Applications

Here you are given information on the use of the Orchid Audio Applications to create and control your multimedia environment.

Appendix A: Technical Help and Information

If you are experiencing installation difficulties or require troubleshooting information, this appendix gives you checkpoints to ensure that your SoundDrive 16 is operating properly. Appendix A also includes the SoundDrive 16 technical specifications.

Appendix B: MIDI

Here you are given an overview of the MIDI specification and a list of the optional General MIDI, MT-32 and percussion sounds available.

Important! - Before You Begin

This manual contains information for the products listed below. All references to "SoundDrive 16" will refer to all products listed unless otherwise noted.

SoundDrive 16EZ

The SoundDrive 16EZ is an FM Synthesis, OPL-3, 16-bit sound card. It can record and play back 16-bit resolution, 44KHz sample frequency stereo audio. In addition it provides a Mitsumi CD-ROM interface. The SoundDrive 16EZ is also designed for the optional Orchid WaveBooster wavetable synthesis daughtercard.

SoundDrive 16EZ +SCSI

The SoundDrive 16EZ has all the features of the SoundDrive 16EZ, and adds the SCSI-2 CD-ROM interface.

Before You Begin

This manual will familiarize you with the features, installation and use of the SoundDrive 16. There are several symbols and conventions used throughout this manual to help 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 to avoid 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 SOUNDDRIVE 16

Designed to be easy to use and easy to install, SoundDrive 16 can be used with the preset jumper settings. If you need to change the default address settings, see the section "Jumper Settings."

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 1.1 and 1.7 for SoundDrive 16 connection locations.



STATIC!

Before handling the SoundDrive 16, 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 from your SYSTEM.INI and CONFIG.SYS files.
2. Turn off the power to your computer, unplug all power cords and remove the computer cover.
3. Install the SoundDrive 16 into a 16-bit expansion slot.
4. If you are connecting external speakers to the SoundDrive 16, connect the speaker cable to the SPEAKER jack on the metal bracket.
5. If you are connecting amplified external speakers to the SoundDrive 16, connect the speaker cable to the LINE OUT jack on the metal bracket.
6. If you are connecting a microphone to the SoundDrive 16, 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 SoundDrive 16, connect the cable to the joystick port on the metal bracket (refer to Figure 1.7).

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

Software Installation

1. Start Microsoft Windows.
2. Insert the SoundDrive 16 software disk into your floppy drive.
3. From the Program Manager File menu, choose Run.
4. Type the drive letter, then SETUP.EXE, e.g., A:\SETUP.EXE.
5. The SETUP.EXE program automatically copies the SoundDrive 16 software and application programs to your hard drive.
6. Once the software is installed, the SETUP.EXE program automatically updates your CONFIG.SYS and AUTOEXEC.BAT files.
7. At this point, you must exit Windows and reboot 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).
8. If you are installing a Mitsumi compatible CD-ROM drive, refer to the installation procedures provided by the CD-ROM manufacturer.

The SoundDrive 16 hardware and software installations are complete! The application programs installed will be located in the Orchid Audio Applications group on the Windows desktop.



If you are installing a SCSI peripheral, you must run the Future Domain setup utilities from the DOS prompt. See the section "SCSI CD-ROM Device Drivers Installation."

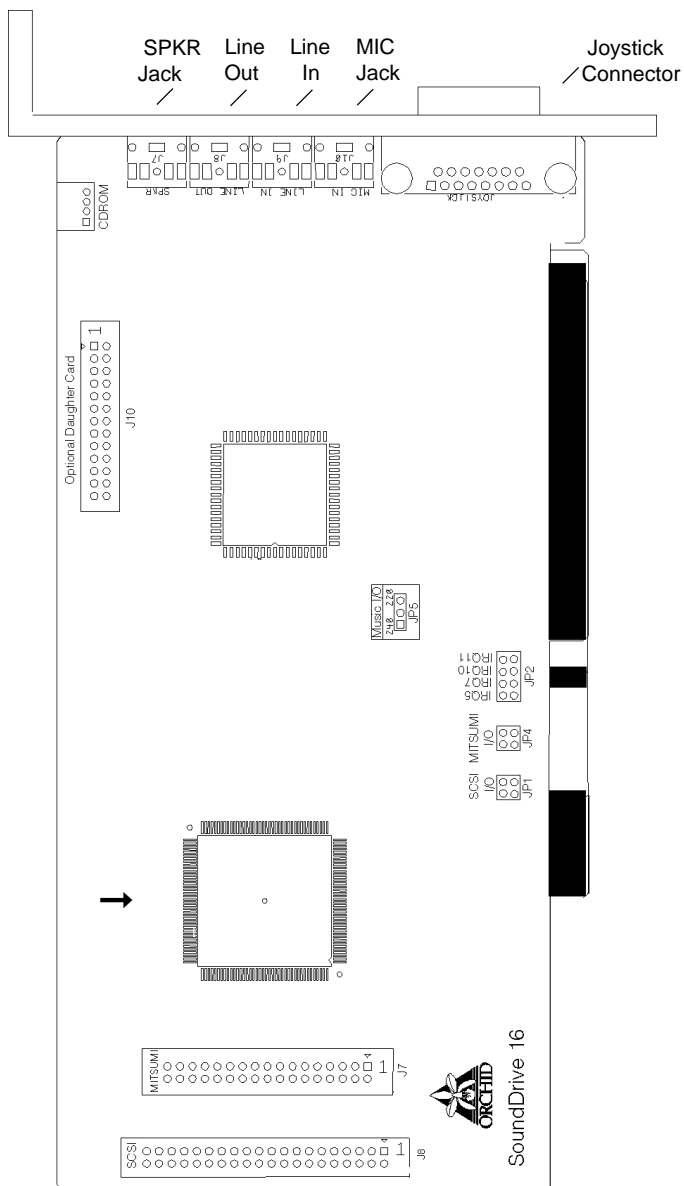


Figure 1.1: SoundDrive 16 Diagram

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

→ *The SCSI chip. This chip is optional on the SoundDrive 16EZ.*

Jumper Settings

The following table lists the jumpers used in the configuration of SoundDrive 16. The information following the table explains the jumpers in more detail.

Jumper	Setting	Default	Function
JP1 (SCSI Memory Segment)	No Connection Connect option 1 Connect option 2 Connect 1 & 2	✓	Set SCSI address - CA000 Set SCSI address - C8000 Set SCSI address - CE000 Set SCSI address - DE000
JP2 (CD-ROM/SCSI IRQ)	No Connection Connect option 1 Connect option 2 Connect option 3 Connect option 4	✓	No Interrupt Used Set Interrupt 5 Set Interrupt 7 Set Interrupt 10 Set Interrupt 11
JP4	No Connection Connect option 1 Connect option 2 Connect 1 & 2	✓	Set Mitsumi I/O Address - 360H Set Mitsumi I/O Address - 320H Set Mitsumi I/O Address - 340H Set Mitsumi I/O Address - 310H
JP5 (SoundDrive 16 I/O Address)	Connect 1 & 2 Connect 2 & 3	✓	Enable I/O address 240 Enable I/O address 220

Table 1.1: Summary of Jumper Settings

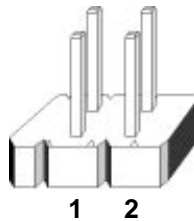
Jumper JP1: SCSI Memory Address Segment

If you do not have the optional SCSI chip installed on your SoundDrive 16, you can ignore this jumper setting. This jumper sets the memory address for the SCSI interface. The default address is OFF, which configures for memory address CA000. The address ranges used are CA000-CBFFF, C8000-C9FFF, CE000-CFFF, or DE000-DFFFF.



For help on avoiding address conflicts, see Appendix A.

Figure 1.2: Jumper JP1 (no connection). Default address



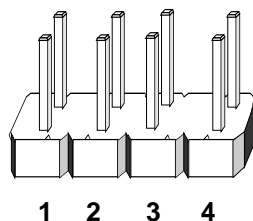


SCSI CD-ROM drives do not require an interrupt. If a SCSI CD-ROM drive is installed, disable Jumper JP2 by removing the connector.

Jumper JP2: CD-ROM/SCSI IRQ Address

Jumper JP2 sets the interrupt for a Mitsumi CD-ROM drive, or a SCSI device such as a scanner that requires an interrupt. The default setting is no connection (no interrupt used).

Figure 1.3: Jumper JP2 (no connection). Default address



If you encounter a conflict with another device in your system, you can select IRQ 5, 7, 10 or 11.

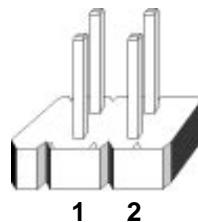


When installing a Mitsumi CD-ROM drive, be sure to configure the Device Driver for Programmed I/O, not DMA Transfer.

Jumper JP4: Mitsumi I/O Address

If you are not using a Mitsumi CD-ROM drive, this jumper can be ignored. This jumper sets the interrupt address for the Mitsumi interface. The default address is OFF, which configures for I/O address 360H.

Figure 1.5: Jumpers JP4 (no connection) Default address



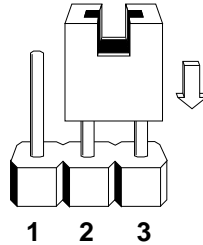
For details on the device driver parameters, see "CD-ROM Device Drivers."

If you need encounter a conflict with another device in your system, you can select I/O address 320H, 340H or 310H.

Jumper JP5: SoundDrive 16 I/O Address

Jumper JP5 sets the base I/O port address for Sound Blaster mode. The default setting is 220Hex.

Figure 1.6: Jumper JP5 (pins 2 and 3 connected). *Default address*



Position the jumper connector across Pins 1 and 2 of Jumper JP5 to enable address 240Hex.

External Devices

External Speakers

You can connect 4 or 8 ohm external speakers or headphones to SoundDrive 16. The speakers and headphones plug into the SPEAKER jack on the SoundDrive 16 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 will have an additional cable. This cable plugs into the 15-pin connector and provides MIDI IN and MIDI OUT connections, in addition to a joystick connection. Connect this cable to the joystick port and connect any MIDI devices to the appropriate cables.



See Figure 1.7 for the connection locations of the external devices.



WARNING!

The SoundDrive 16 can produce high sound levels when played through headphones. To avoid permanent or temporary hearing loss or impairment, always hold the headphones away from your ears when adjusting the volume.

Microphone

You can connect a 300-600 ohm microphone to SoundDrive 16. Plug it into the MIC jack on the metal bracket.

CD-ROM

The SoundDrive 16 supports both internal and external CD-ROM drives. It has interface connectors for the Mitsumi and SCSI-2 internal CD-ROM drives, and an MPC Level 2 audio connector for CD audio.

Line In

You can connect an external mono or stereo audio source to the SoundDrive 16, 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 SoundDrive 16 to your home stereo, VCR or amplified speakers.

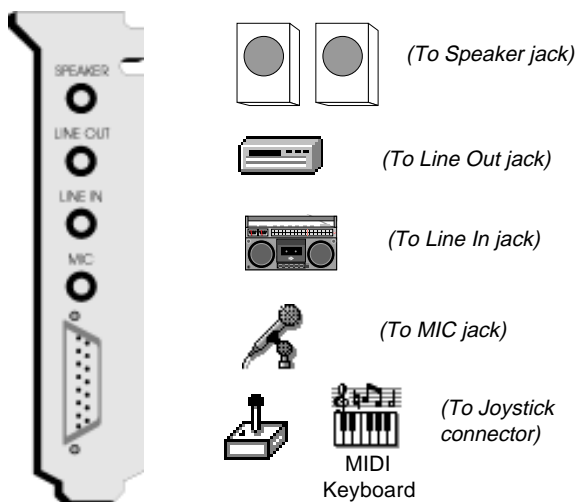


Figure 1.7: SoundDrive 16 Bracket

The MIDI Interface

An optional MIDI Kit is available for SoundDrive 16. The kit includes a Sound Blaster-type MIDI cable and MIDI software. To purchase the kit call your local dealer or the Orchid Sales department. See the Technical Help and Warranty Information card for Orchid telephone numbers.

Optional WaveBooster Daughtercard Interface

An optional WaveBooster daughtercard is available for SoundDrive 16. Installation is easy! It plugs right into the SoundDrive 16 (see Figure 1.1). Refer to Appendix B for a listing of the General MIDI and MT-32 sounds available. To purchase the WaveBooster call the Orchid Sales department.

Installing a CD-ROM Drive

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 for a successful installation:

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



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



SoundDrive 16 uses an MPC-2 compatible audio cable for the CD-ROM drive. Please contact your drive manufacturer or local dealer if you need this cable.

Install the CD-ROM hardware as recommended by the CD-ROM manufacturer. Follow the steps below for help on installing the CD-ROM 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 SCSI or Mitsumi connector on the SoundDrive 16 card. Pin 1 is located on the bottom right corner of the connectors. Make sure that Pin 1 on your cable (colored stripe) is connected to this pin.
3. Connect the audio cable to the CD-ROM drive's audio connector.
4. Connect the other end of the audio cable to the MPC-2 compatible CD-ROM audio connector on the SoundDrive 16.
5. You are now ready to install the SoundDrive 16. Go to "Quick Installation" at the beginning of this chapter. See "Software Installation" to install the SoundDrive 16 software and application programs.

CD-ROM Device Drivers

CD-ROM drives require device drivers to access the drive. These device drivers are generally provided by the manufacturer of the CD-ROM drive. Usually one device driver is added to the CONFIG.SYS file and one to the AUTOEXEC.BAT file.

The device driver added to the CONFIG.SYS file is the CD-ROM device driver. This file configures the CD-ROM drive and initializes the drive on boot up. It is dependent on the type of CD-ROM drive installed.

The device driver added to the AUTOEXEC.BAT file is an executable file, which tells the operating system that a CD-ROM drive is installed in the system and what configuration the CD-ROM drive is using. MSCDEX.EXE is a commonly used device driver. There are other versions of this device driver that perform the same function, such as the CORELCDX.COM device driver.

SCSI CD-ROM Device Drivers Installation

If you have installed a SCSI CD-ROM drive in your system or other SCSI device, perform the following installation procedure:

1. Install the SoundDrive 16 software and driver installation as documented in the Software Installation section. After the installation is complete exit Windows.
2. Insert the Future Domain software diskette into the appropriate floppy drive.
3. From the floppy drive, type SETUP.EXE. For example, A:\SETUP.EXE.
4. The Future Domain installation menu appears.

5. The installation program automatically detects the presence of a SCSI CD-ROM drive or other SCSI device. The device drivers are automatically copied to your hard drive and the program modifies the CONFIG.SYS and AUTOEXEC.BAT files.
6. When the installation is complete reboot your system to access your CD-ROM drive.

Configuring the SCSI CD-ROM Device Drivers

The SoundDrive 16 setup program automatically installs two device drivers for a SCSI CD-ROM drive: FDCD.SYS and CORELCDX.COM.

FDCD.SYS is added to the CONFIG.SYS file. This device driver initializes the SCSI CD-ROM drive on boot up and configures the settings for the drive.

CORELCDX.COM is added to the AUTOEXEC.BAT file. This device driver tells the operating system that a CD-ROM drive is installed. CORELCDX.COM is similar to the MSCDEX.EXE device driver.

If you need to configure the **FDCD.SYS** device driver, the following syntax is used:

```
device=FDCD.SYS /D:name [/F /I /N:# /R /T  
/V /Z]
```

The parameters are defined as follows:

- /D 1 to 8 character device name.
- /F scans CD-ROM drives in ascending SCSI ID numbers.
- /I inhibits invalid disk change status.
- /N:# sets a maximum number of units to support with # as the number.

- /R** forces a SCSI Bus Reset to occur before driver initialization.
- /T** forces drive to use the OEM Tool Kit even if Future/CAM{SYMBOL 212 \f “Symbol”} is available.
- /Z** displays the driver size.

If you need to configure the **CORELCDX.COM** device driver, the following syntax is used:

```
CORELCDX /D:driver_name /M:mem_bufs  
L:drive_letter/E /FILES: num  
/CACHE:pt;dir;data/DATABLK:blk_val /E:emm_val  
/STACK [:stack_size]
```

The parameters are defined as follows:

- /D:driver_name** identifies the name of the CD-ROM device driver to be used. You can enter more than one **/D:driver_name** option to identify multiple CD-ROM device drivers. The names you enter must match names used in the **/D:device_name** parameters for each device driver entry in the **CONFIG.SYS** file.
- /M:mem_bufs** specifies the approximate number of sector buffers allocated. Using a predetermined formula, the total number of sector buffers is divided among the path table directory and data cache. Minimum, maximum and alignment requirements may require that the actual number of buffers differ slightly from those you specify.

- `/L:drive_letter` forces the CD-ROM drive letter assignment to begin at a particular drive letter if you have software that requires your CD-ROM drive to be assigned a specific drive letter. If that drive letter is not available, CD-ROM drives are assigned from the next available drive letter.
- `/E` uses expanded memory for the cache buffers if it is available. Expanded memory is allocated in blocks. To make the most efficient use of allocated memory, this option may slightly increase the number of specified cache buffers.
- `/FILES: num` specifies the number of CD-ROM files that you can open at the same time. Each file requires approximately 16 bytes. By default, the limit is the number specified by the `FILES=` line in the `CONFIG.SYS` file.
- `/CACHE:pt;dir;data` specifies the number of cache blocks to allocate for the path table cache, directory cache, and data cache. Each block requires 2K.
- The path table cache stores information about the name and location of each sub-directory on the CD. Each (2K) path table cache buffer accommodates approximately 100 sub-directories.
- The directory cache stores information such as the name and location of the files in each sub-directory on the CD.

The data cache stores the most recently accessed contents of files on the CD. When you specify the number of sector buffers using the `/M:mem_bufs` option, the `mem_buf` value is divided among the path table, directory, and data cache using a predetermined formula. You can use the `/CACHE:pt;dir;data` option to fine-tune the allocation of cache blocks.

When adjusting the allocation of cache blocks, you cannot exceed the following minimum and maximum sizes for each area:

path table cache:

block size	1 sector
minimum	2 sectors
maximum	64 sectors

directory cache:

block size	1 sector
minimum	2 sectors
maximum	64 sectors

data cache:

block size	2 sectors
minimum	1 block (If you use <code>/DATABLK</code> to alter the block size, the minimum sectors change).
maximum	64 sectors

When using the expanded memory for cache buffers, certain internal alignment requirements are enforced. You cannot change these requirements.

NOTE: The /CACHE: and /M: options are mutually exclusive. If you use both switches, the /M: option is ignored.

/DATABLK:blk_val adjusts the number of 2K sectors assigned to each data cache block. Valid values are 1, 2, 4, or 8. The default is 2. This option is useful for applications that read data from a CD in contiguous segments. CORELCDX uses a read ahead plus least recently used (LRU) algorithm for its data cache. Data read into the cache is read in blocks.

Setting the data block size to 1 disables read-ahead caching, but an additional 4K of conventional memory is required. Also, note that the read-ahead caching logic internal of some CD-ROM drives is adversely affected by changing the default data cache block size.

/E:emm_val extends the basic MSCDEX compatible/E option by allowing you to force CORELCDX to use expanded memory, if it is available, for code, data, or cache buffer storage.

The valid emm_val options are:
code/data only in expanded memory.

cache blocks only in expanded memory, the same as the /E option.

code/data and cache blocks in expanded memory.

When expanded memory is used for code and data, only a small 'footprint' (less than 2K) remains resident in conventional memory. This option may be incompatible with some CD-ROM applications. For example, those that perform absolute disk reads into expanded memory buffers.

If cache buffers are located in expanded memory, a small amount of conventional memory may also be allocated for storage of required tables. Also, to make efficient use of expanded memory, and due to internal cache alignment requirements, the number of cache blocks in use may be adjusted slightly when this option is used.

`/STACK[:stack_size]` causes CORELCDX to switch to its own internal stack while processing software interrupts, rather than using the programs stack.

Use the `stack_size` variable to change the stack from its default size of 512. For example, `/STACK:1024` causes a 1K stack to be used, while `/STACK:256` causes a 256 byte stack to be used.

Mitsumi Compatible CD-ROM Device Drivers

If you are installing a Mitsumi compatible CD-ROM drive, you will need to install the device drivers provided by the CD-ROM manufacturer. Follow the installation procedure provided by the CD-ROM manufacturer. Remember, you will need a CD-ROM device driver added to the CONFIG.SYS file and an operating system device driver like MSCDEX.EXE added to your AUTOEXEC.BAT file.

In addition, you will need to configure the parameters of the drive to use programmed I/O. Refer to your CD-ROM manufacturer's documentation.

Configuring the MSCDEX.EXE Device Driver

If you are using the MSCDEX.EXE device driver and need to configure the driver, the following syntax is used:

```
[drive:\  
][path\  
]mscdex.exe /d:device_name  
[/l:m]
```

The parameters are defined as follows:

/d: Specifies the device name of the CD-ROM drive. The driver1 parameter must match the parameter specified by the /D switch on the CONFIG.SYS command that starts the corresponding CD-ROM device driver.

The MSCDEX command must include at least one /D switch. To install additional CD-ROM device drivers, specify an additional /D switch for each device driver.

/l: Specifies the drive letter of the first CD-ROM drive. If you have more than one CD-ROM drive, MS-DOS assigns additional CD-ROM drives subsequent available drive letters.

- /m*: Specifies the number of sector buffers.
- /e*: Specifies that the CD-ROM driver use expanded memory, if available, to store sector buffers.
- /k*: Specifies that MS-DOS should recognize CD-ROM volumes encoded in Kanji. By default, MS-DOS does not recognize Kanji CD-ROM volumes.
- /s*: Enables sharing of CD-ROM drives on MS-NET or Windows for Workgroups servers.
- /v*: Directs MSCDEX to display memory statistics when it starts.

Chapter

2

ORCHID UTILITIES

SoundDrive 16 comes with DOS and Windows utilities that allow you to send commands to your CD-ROM drive, software volume control, and a mixer. In addition, you have the ability to play instrumental music through your computer keyboard.

Also included are audio applications to take advantage of the multimedia capabilities of SoundDrive 16. The utilities and audio applications are automatically installed using the SETUP.EXE program. Refer to Chapter 1 if you have not installed the SoundDrive 16 software.



This manual presumes that you are already familiar with the basics of Microsoft Windows. Please refer to the Microsoft manual when terminology or installation steps are unfamiliar to you.



You cannot run the CD-ROM utilities from the Windows MS-DOS prompt. You must first exit Windows.

SCSI CD-ROM Utilities

The following SCSI CD-ROM utilities are DOS programs and must be run from the DOS (C:\) prompt:

FDLTEST

This test utility will test the integrity of the CD-ROM device driver(s) and drive.

FDEJECT

Ejects the CD-ROM disc from the CD-ROM drive. If the drive door is locked, this utility first unlocks the door and then ejects the disc. This function is valid only for CD-ROM drives that support a software controlled eject command.

FDLOCK

Locks the door on the CD-ROM drive. On most drives, this disables the eject button on the front of the drive.

FDUNLOCK

Unlocks the CD-ROM door that has previously been locked by FDLOCK or another utility.

FDAUDIO

A Terminate-and-Stay Resident (TSR) utility that can be used as an audio CD player. Once it is loaded into memory, FDAUDIO can be accessed from within a program by pressing the SHIFT-ALT-CTRL keys simultaneously. Press the ALT-F4 key to terminate the TSR.

The following options are available for FDAUDIO:

- << **Skip Back**: skips back one track.
- >> **Skip Forward**: skips forward one track.
- < **Fast Reverse**: skips back 10 seconds into current track.
- > **Play**: plays the current track if the CD is not currently playing.
- >> **Fast Forward**: skips forward 10 seconds into the current track if the CD is currently playing.
- " **Pause/Resume**: Pauses the current track if the CD is playing, or resumes if the CD is paused.
- **Stop**: stops the CD.
- ▲ **Next CD**: goes to the next CD player if there is more than one CD in the system (for example, if the current CD is at drive letter D:, then the next CD will be at E:).
- ▼ **Previous CD**: goes to the previous CD player if there is more than one CD in the system (for example, if the current CD is at drive letter E:, then the previous CD would be D:).

Key-Z Player

Key-Z player allows you to play instrumental music from your computer, using a standard computer keyboard. The unique note mapping feature prevents you from playing an incorrect note in your chosen Key or Scale. Your computer is transformed into an intelligent polyphony (multiple notes at a time) musical instrument that is exhilarating to play.

Key-Z Player incorporates the following features: a standard MIDI file song player, graphic piano keyboard display, graphic mixer with volume, channel, patch, pan and mute control, and over 40 song styles.

To run Key-Z Player:

1. From the Orchid Audio Applications program group, double-click on the Key-Z Player icon. The following screen appears:



Figure 2.1: Key-Z Player Screen

The buttons at the top of the screen are from left to right: File, Key, Scale, Layout, Settings, Player, Piano, Mixer, and Help. To access a feature, click once on the feature.

Key - allows you to choose from 12 different keys. Click on the key of your choice. You can change the key any time by clicking on the Key button and selecting another key. **NOTE:** After you have made your selection, a check mark appears next to your selection.

Scale - Key-Z Player offers four types of scales: Major, Minor, Blues and Harmonic Minor. Choose a Scale the same way you choose a Key Signature. Click once on the preferred scale to start playing music from your computer keyboard.

Layout - maps the notes on your keyboard to your choice of Jagged or Horizontal.

Jagged - maps the keys so that they progress up the scale alternating rows. This mapping also works well for organ solos and arpeggios.

Horizontal - maps the keys so that they progress up the scale from left to right, from the bottom to the top, while increasing the pitch for each row. This mapping works great for quick string-scale runs and playing blues' piano.

Setting - offers the following four features:

MIDI Mapper - allows you to view your current MIDI Mapper settings from inside Key-Z Player. **NOTE:** All notes from Key-Z Player are routed through the Mapper. Refer to the Windows User's Guide for instructions on setting up the MIDI Mapper.

Multimedia Drivers - allows you to view your currently installed multimedia drivers. **NOTE:** Your multimedia drivers must be installed for Key-Z Player to function.

Patch Names - this feature gives you a list of eight types of sound hardware:

0-127	1-128
General MIDI	Proteus
MT-32	Roland GS
U-110	U-110 Tones

Keyboard - brings up a dialog box that allows you to type in Channel, Patch and Volume changes.

NOTE: You may add to the Patch List by editing the PATCHES-INI file located in your Key-Z Player directory.

Player - opens or hides the Song Player window that includes the controls for playing standard MIDI Song Files. You can also measure the length of a song by using the Bar Control option.

Bar Control - the bar control detects the length of the song, (how many measures the song consists of). For example, if you have a 128 bar song, the bar control will start at Bar Zero, which is the beginning of the song. It will play through the entire song, ending at Bar 128. *NOTE:* The song must be stopped before using the bar control slider.

Piano - graphically displays all notes that are playing. The graphic keyboard has seven full octaves.

Mixer - features 16 channels, and allows you to control the Patch, Volume, Pan and Mute of each track in the Song File. Make sure the patch for each track is set to an appropriate patch for your output device.

Key-Z Player - Solo

Key-Z Player can be used to perform solo compositions, test melodies, play rhythm and bass tracks, and learn scales and arpeggios in various keys.

To play Key-Z Player - Solo:

1. Select the Key and Scale you desire.
2. Select the Patch for the sound you desire.
3. Select the keyboard mapping from the Layout menu.
4. Set your Volume and begin playing by tapping out notes on your computer keyboard.

Keyboard Notes

The playable key is shown in white. You can play multiple notes and chords by pressing several keys at once (this is called polyphony).



Figure 2.2: Playable Keyboard Note

Note Progression

Notes begin with the lowest left row (the Z row) in Horizontal Mapping, and the “A” key in Jagged Mapping. This ends with the highest note on the upper right.

Sustain

There are several ways to get sustained notes: (1) for continuous sustain, press the Caps Lock key. The notes played are sustained until the Caps Lock key is pressed again. (2) Hold down the Shift key while playing various notes.

Key-Z Player - Accompanied

Key-Z Player can perform melodies while being accompanied by any standard MIDI Song File played in real-time.

To play Key-Z Player - Accompanied:

1. Open the Song Player window by clicking on the Player menu button.
2. Click on the Open Song button and select a song to play.
3. When the file is opened, it will use the default settings for Key, Scale and Tempo. In addition, the track structure of the Song File (including the instrument name and MIDI channel is set into the Mixer.



Please refer to Appendix B for the MIDI Drum Patch Settings.

NOTE: Key-Z Player can read and play Format 0 and Format 1 MIDI files. The standard MIDI files included with Key-Z Player are Format 1 files and contain the optional Key and Scale data.

Chapter

3

AUDIO APPLICATIONS

Using Audio Recorder

The Audio Recorder can record, playback, compress and store voice recordings and music. It allows you to add and edit voice annotations within Microsoft Windows applications such as Word for Windows, Microsoft Excel, Lotus 1-2-3 and all other application software that support Object Linking and Embedding (OLE).



This manual presumes that you are already familiar with the basics of Microsoft Windows. Please refer to the Microsoft user's manual when terminology or installation steps are unfamiliar to you.

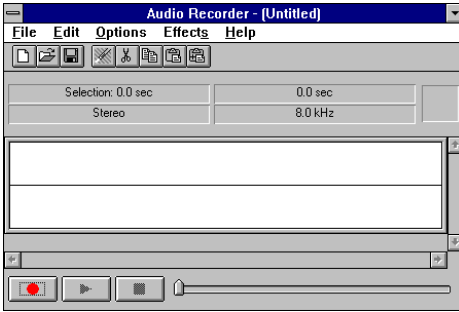
It provides different settings and compression levels for recording and output level controls. It is compatible with Microsoft Windows Sound Recorder for recording, editing and playback.

The Audio Recorder can record and playback in .WAV format and .AUD format. The .WAV format is Microsoft Windows 3.1 format for audio files. The .AUD format uses ESPCM/ADPCM compression to produce an audio file.

Different levels of compression are available in the Audio Recorder: ESPCM compression at low, medium and high levels, and linear PCM and ADPCM compressions.

To start Audio Recorder:

1. Start Microsoft Windows.
2. From the Orchid Audio Applications window, double-click on the Audio Recorder icon. The following screen appears:



To access Help, click on Contents from the Help menu in the Audio Recorder window.

Figure 3.1: Audio Recorder Screen

The buttons at the bottom of the Audio Recorder window are from left to right: Record, Play and Stop. The Audio Recorder can receive input from microphones, a cassette tape player, a compact disk player, or any other line-in source. The large area in the center of the window shows the waveform of the current audio file.

Recording an Audio File

To record a new file:

1. From the File menu, click on New. The following screen appears:

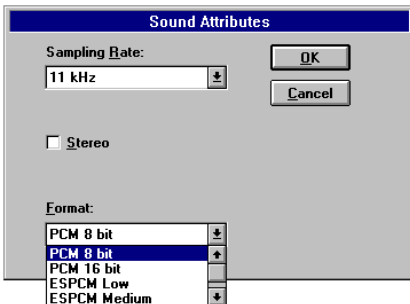


Figure 3.2: Sound Attributes Screen

2. Select your sampling rate, stereo ON or OFF and the compression format.

Choose one of the PCM (uncompressed) formats if you want the highest sound quality, or if you wish to edit or modify the recording with the Effects command before you save the file. Choose one of the ESPCM or ADPCM compression formats if you wish to save disk space and do not mind sacrificing some sound quality.

3. Click on the Record button.
4. Speak into the microphone.
5. When you are done, click on the Stop button.
6. From the File menu, click on Save As. If the file is uncompressed and you wish to save it uncompressed, do not click on the Options button. Choose a directory location, enter a name for the audio file, then click on OK button to save it. The uncompressed audio file is saved as a .WAV file.

If the file is uncompressed and you wish to compress it, click on the Options button and select the compression format you want. Click on the OK button. The compressed audio file is saved as a .AUD file.

You can use the Recording Control window to regulate the mix of audio from several sources. See the Recording Control section for more information.

Playing an Audio File

To play a file:

1. From the File menu, click on Open. The following screen appears:

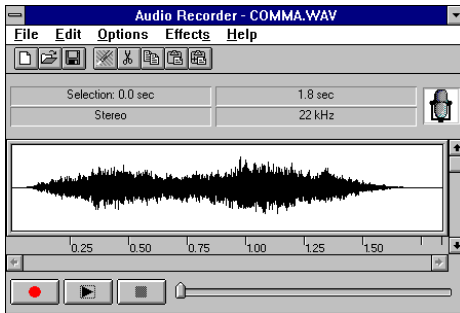


Figure 3.3: Playing a File Display

2. Load an audio file into the Audio Recorder.
3. Click on the Audio Recorder's Play button to hear the audio file. The file will play to the end unless you interrupt it by pressing the Stop button.

While a file is playing, the wave box graphically displays the waveform of the audio file as if it were being shown on an oscilloscope.

Changing the Waveform

The Audio Recorder's waveform display provides a graphic representation of the audio file currently in memory. You can control the display with the vertical and horizontal scroll bars.

- To zoom in on (or magnify) the waveform, move the vertical scroll button down. To zoom out, move the vertical scroll button up.
- To see more of the waveform ahead or behind the part currently displayed, click the right or left area of the horizontal scroll bar.
- To mark a portion of the audio file for playback, use the mouse to select that section in the waveform display. Then choose Play to hear the selected section.

- To deselect a selected portion of the waveform, click anywhere in the waveform display.
- To select the entire file, double-click anywhere in the waveform display.

Adding the Volume Control and Mixer

You can regulate the playback sound level or stereo balance with the Volume Control. See the Volume Control section for more information.

You can also use the Mixer option to play the current audio file together with other sound sources. See the Mixer section for more information.

Adding Sound

The Audio Recorder's drag and drop feature enables you to embed audio files in documents.

1. Load your Windows application and open a document.
2. Load an audio file.
3. Move the cursor to the icon at the top right of the Audio Recorder. The cursor changes into a hand. Press the mouse button down and drag the icon to the document window. Release the button at the place you want the audio icon to appear.
4. To play the audio in your document, double-click on the icon.



For more information on OLE, refer to your Microsoft Windows User's Guide.

You can also add audio to a document from the document's application. Place the cursor where you want the audio icon to appear, choose the application's command for inserting an object, then select Audio Recorder in the list box.

Edit Menu Commands

Insert File

Inserts another audio file into the current audio file at the current playing position. Inserting a file increases the length of the current audio file. The maximum length of a file is determined by the amount of memory available. You can also insert audio from the Clipboard.

Mix File

Mixes another audio file with the current audio file at the beginning or at the end. The audio files will blend together and play simultaneously. Mixing a file may increase the length of the current audio file. The maximum length of the new audio file is determined by the amount of memory available. You can also mix with audio from the Clipboard.

Delete File

Deletes the selected portion of the audio file. If you wish to save the deleted section, use the Cut command instead of Delete. To restore a deleted audio section, choose the Undo command before making any other changes to the file.

Changing the Properties

An audio file contains more than sound. You can attach a title, description and an icon to the audio file.

To change the properties of a file:

1. From the File menu, click on Properties. The following screen appears:



Figure 3.4: Changing the Properties

From this screen, you can place the cursor in the Label or Description area to add or change the label or description for the audio file.

2. Click the Play button to hear the audio file.
3. The Audio Recorder assigns a default picture of a microphone to each audio file. To select another picture more representative of the audio file's contents, click on the Set Picture button.
4. From the Set Picture screen, select the picture to appear with the audio file. It can be any graphic saved in a bitmap (.BMP or .DIB), wave (.WAV), icon (.ICO), executable (.EXE) or library (.DLL) file. The picture selected will appear in the Audio Recorder. It will also appear in any document in which you embed the audio file.
5. When you are finished, click on the OK button.

The Recording Control

An audio file contains more than sound. You can attach a title, description and an icon to the audio file.

Starting the Recording Control:

1. From the Orchid Audio Applications program group, double-click on the Recording Control icon. The following screen appears:



To access Help, click on Contents from the Help menu in the Recording Control window.

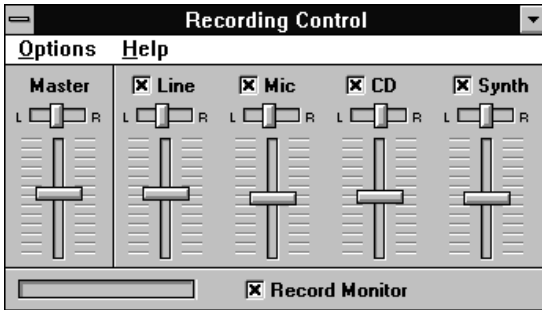


Figure 3.5: Recording Control Screen

The Recording Control can receive input from a microphone, compact disk player, synthesizer, or any other Line-In source. The Recording Control displays the recording level and stereo balance controls for each of your computer's hardware sources.

1. To include a recording source, click on the check box in front of its name.
2. To adjust the stereo balance of any source, drag its top horizontal sliding bar left or right.
3. To adjust the recording level of a source, drag its vertical sliding bar up or down.
4. To monitor a recording in progress, click on the Record Monitor check box.

The Volume Control

Starting the Volume Control:

1. From the Orchid Audio Applications program group, double-click on the Audio Recorder icon or the Mixer icon. From the Options menu, select Volume Control and the following screen appears:

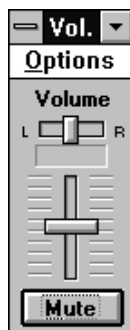


Figure 3.6: Volume Control Screen

The Volume Control enables you to regulate the volume and stereo balance at which sound is played. You can use the Volume Control with the Audio Recorder during playback. If you are playing multiple sources you can use the Mixer to combine them, and use the Volume Control as the master regulator. The Volume Control can receive input from a microphone, cassette tape player, compact disk player or any other Line-In source.

2. To adjust the stereo balance, drag the horizontal sliding bar left or right.
3. To adjust the volume, drag the vertical sliding bar up or down.
4. To turn the sound off, click on the Mute button. The word MUTE appears.
5. To turn the sound back on, click on the Mute button again.

The Mixer

Starting the Mixer:

1. From the Orchid Audio Applications program group, double-click on the Mixer icon. From the Audio Recorder or Volume Control Window, open the Options menu and select Mixer. The following screen appears:

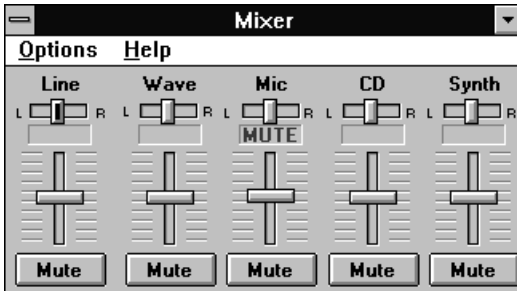


Figure 3.7: Mixer Screen

The Mixer allows you to combine signals from several audio sources during playback, with control over the volume and stereo balance of each source. When you use the Audio Recorder to play an audio file, you can open the Mixer to combine audio from the file with audio from other sources.

The Volume Control acts as a master regulator of the combined signal from the Mixer. The Mixer can receive input from a waveform audio file, a microphone, a compact disk player, a synthesizer or other Line-In source.

1. To adjust the stereo balance of a source, drag its top sliding bar left or right. To adjust the volume of a source, drag its vertical sliding bar up or down.
2. To turn off audio from any source, click on the Mute button. The word MUTE appears. Click the Mute button again to turn the audio back on.

3. To display the Volume Control window with the Mixer window, choose Volume Control from the Options menu.

The Extended Recorder

The Extended Recorder can be used to record meetings and for dictation. Like the Audio Recorder, the Extended Recorder records, compresses, stores and plays music and other sounds. Unlike the Audio Recorder, the Extended Recorder compresses and stores the audio file directly to your hard disk using ESPCM compression. The recording time is limited only by the amount of hard disk space you have available.

The Extended Recorder can record to and play back from both PCM and .AUD formats. PCM is the Microsoft Windows 3.1 audio file format. The .AUD format uses ESPCM compression to produce an audio file. The Extended Recorder provides a choice of linear PCM (8-bits or 16 bits) and ESPCM low (4-bits) compression.

System Requirements

Use the Extended Recorder with a hard disk compression utility only if you have a high-performance system and are using a low data rate for recording and playback. Otherwise, your computer's CPU may become overloaded.

For Best Results

If you wish to use 16-bit stereo at 44KHz for recording or playback, your system must follow the specifications below:

- 486 system running at 50MHz or faster
- 8 megabytes of RAM or more

- a hard disk access time of 15 milliseconds or faster

Operating a system without these specifications may cause data loss when you attempt 16-bit stereo, 44KHz recording.

Starting the Extended Recorder:

1. From the Orchid Audio Applications program group, double-click on the Extended Recorder icon. The following screen appears:



Figure 3.8: Extended Recorder Window

The buttons at the bottom of the Extended Recorder window are from left to right: Record, Play and Stop. This window shows the current file's name, the current location in seconds and the total length in seconds.

2. You can display more information on the selected file from the Extended Recorder. From the Options menu, select Expanded View. The following screen appears:



Figure 3.9: Extended Recorder Expanded View

The expanded view enlarges the Extender Recorder window to show the length of the recording, sample rate, mono or stereo, bits per sample and the free disk space and recording time available.

The Audio Clip Library

The Audio Clip Library includes music, phrases and sounds. You can play any audio file in the library by using the Audio Recorder (opened automatically by the Audio Clip Library), the Microsoft Sound Recorder, or other recorders compatible with the Windows .WAV format. You can also add folders and audio files of your own to the Audio Clip Library.

Starting the Audio Clip Library:

1. From the Orchid Audio Applications program group, double-click on the Audio Clip Library icon and the following screen appears:



Figure 3.10: Audio Clip Library Window

The Audio Clip Library includes three folders titled Music, Phrases and Sounds. The Music folder contains short musical interludes. The Phrases folder contains phrases used in business settings. The Sound folder contains a variety of mechanical and animal sound clips.

Talking Calculator

The Talking Calculator is an audio/visual calculator that allows you to perform calculations in Windows 3.1. You can reduce Talking Calculator to an icon so that it is readily available whenever you want to perform calculations.

To start Talking Calculator:

1. From the Orchid Audio Applications window, double-click on the Talking Calculator icon. The following screen appears:

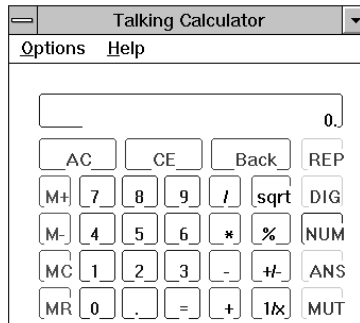


Figure 3.11: Talking Calculator Screen

To perform calculations with your mouse, just point and click. You will hear the number or operation clicked and the resulting answer. You can also use the keyboard by pressing the corresponding keys for each Calculator button. The following table describes each key on the calculator, its keyboard equivalent, and its function.

<u>Button</u>	<u>Key</u>	<u>Function</u>
+	+	Addition
-	-	Subtraction
*	*	Multiplication
/	/	Division
sqrt	@	Square root of the displayed value
%	%	Calculates percentages
=	=	or ENTER performs any operation on the previous numbers
+/-	F9	Changes the sign of the displayed number
1/x	r	Calculates the reciprocal of the displayed number
Back	Backspace	Deletes the rightmost digit of the displayed number
AC	ESC	Clears the current calculation
CE	DEL	Clears the displayed number
MC	CTRL+L	Clears any value stored in memory
MR	CTRL+R	Recalls the value stored in memory

M-	CTRL+M	Stores the displayed value in memory
M+	CTRL+P	Adds the displayed value to any value already in memory
NUM		Directs to announce results as whole number
DIG		Directs to announce results as digit
ANS		Directs to announce answer only
MUT		Directs to not make any announcements

To access Help, click on Contents from the Help menu in the Talking Calculator window.

The Chime

The Chime announces the time musically. Chime can announce the time or play audio files at different intervals when enabled.

To start Chime:

1. From the Orchid Audio Applications window, double-click on the Chime icon. The following screen appears:

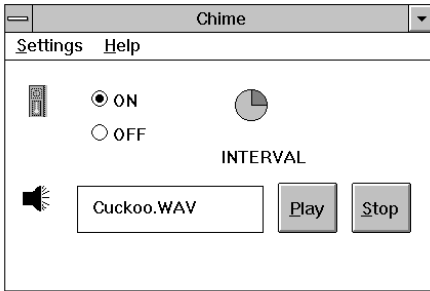


Figure 3.12: Chime Screen

Chime continues to make announcements when you reduce it to an icon. All Chime parameters can be set by selecting the Settings menu. To access Help, click on Contents from the Help menu in the Chime window.

The Timer

The Timer helps you to record time. Whenever you stop the Timer, it announces the amount of time remaining. It continues to display and announce count time remaining when you reduce it to an icon.

To start Timer:

1. From the Orchid Audio Applications window, double-click on the Timer icon. The following screen will appear:



Figure 3.13: Timer

The Timer window can appear in analog or digital display. Click on the Start button from the Timer window to begin the countdown. If there is zero time on the timer, click on the Reset button. This will reset the timer to the previous countdown. To stop the Timer at any time, click on Stop (the start button switches to stop when the timer is in operation). To access Help, click on Contents from the Help menu in the Timer window.

The Audio Reminder

The Audio Reminder features two alarms with different time, sound and snooze setups. These reminders are set up as alarms that will play the selected audio files at selected times.

To start Auto Reminder:

1. From the Orchid Audio Applications window, double-click on the Audio Reminder icon. The following screen appears:



Figure 3.14: Audio Reminder Screen

When the Audio Reminder is reduced to an icon, it will continue to operate, display and set off the alarms as required. To access Help, click on Contents from the Help menu in the Audio Reminder window.

The Talking Clock

The Talking Clock helps you keep track of time. It announces the time when you select the Say command. You can display the Talking Clock as an analog or digital clock.

To start Talking Clock:

1. From the Orchid Audio Applications window, double-click on the Talking Clock icon. The following screen appears:

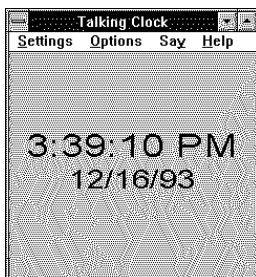


Figure 3.15: Talking Clock Screen

When you start the Talking Clock for the first time, a window with a standard analog clock appears and displays the system time. The next time you start the Talking Clock, the last display mode used will appear.

You can change the size of the Clock window and move it wherever you wish so that the current time, including seconds and date, appear on the screen. When the Talking Clock is set to "Always Minimize," it will continue to display and announce the time when you reduce it to an icon. To access Help, click on Contents from the Help menu in the Talking Clock window.

Stopwatch

The Stopwatch allows you to measure duration of time. You can set the Stopwatch to sound a tick each second and announce the amount of time elapsed from the time it was activated. When you start the Stopwatch for the first time, it displays in analog display mode.

To start Stopwatch:

1. From the Orchid Audio Applications window, double-click on the Stopwatch icon. The following screen appears:

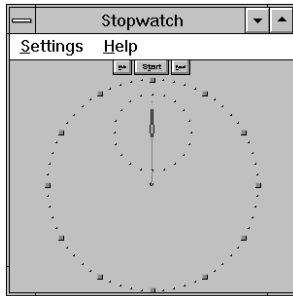


Figure 3.16: Stopwatch Screen

Digital display mode allows you to change the font. From the Settings menu, click on Set Font and select a font. You can change the size of the Stopwatch window and move it wherever you wish so that the time lapsed, including minutes and seconds, appear on the screen. Stopwatch continues to display and keep time when you reduce it to an icon. To access Help, click on Contents from the Help menu in the Stopwatch window.

Appendix

A

TECHNICAL HELP

Orchid Technology is known for its responsiveness to its customers. This section gives you helpful hints for troubleshooting the SoundDrive 16 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:



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

1. Log onto CompuServe.
2. Type GO MULTIBVEN 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.

Troubleshooting the SoundDrive 16

The following information will help you diagnose problems you may have with the SoundDrive 16. Following these simple steps serves a twofold 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 SoundDrive 16 installed.

Check

1. Check whether another peripheral in your system is using the same I/O address configured by Jumper JP5 on the SoundDrive 16.

Symptom 2

No sound output.

Check

1. Is the external speaker properly connected to the SoundDrive 16 SPEAKER jack?
2. Is there another adapter in your system that may be using the same address (I/O Address, DMA Channel or Interrupt)? If so, change its addressing or select another address for SoundDrive 16. (Refer to Chapter 1 for available addresses).

Symptom 3

Certain applications do not play sound.

Check

1. Verify that the SoundDrive 16 and the software application are configured for the same sound emulation modes (for example, Sound Blaster or Sound Blaster Pro for digitized sound).
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 SET BLASTER statement is in the AUTOEXEC.BAT file.
4. Make sure the application is configured for the same IRQ, I/O, or DMA as the SoundDrive 16.

Symptom 4

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

Check

1. Check for a conflict with the Sound Blaster 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 Sound Blaster environment. Verify that the settings of the statement match the configuration for the SoundDrive 16 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 Sound Blaster, the software application may omit digitized sound if there is not enough base memory available.

Symptom 5

I cannot access the CD-ROM drive.

Check

1. Verify that the FDCD.SYS device driver (or other CD-ROM device driver) is loaded in the CONFIG.SYS file. Verify that the MSCDEX or CORELCDX.COM device driver is loaded in the AUTOEXEC.BAT file.
2. Verify that the path and syntax for each of the device driver lines are correct (refer to Chapter 1: "Device Drivers").
3. If there is a 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 SoundDrive 16 and the CD-ROM drive.

Symptom 6

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 Appendix A for the CD-ROM Audio Cable Connector pin assignments. Contact your CD-ROM manufacturer for the appropriate audio cable. The SoundDrive 16 has an MPC-2 audio connector.

Symptom 7

My joystick does not work when connected to the SoundDrive 16.

Check

1. Verify that the Joystick Port in the SD16.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 SoundDrive 16 has its own joystick port. Disable the joystick/game port on the I/O adapter card.

Symptom 8

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 SoundDrive 16 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 9

Wave files do not play correctly in Windows.

Check

1. Verify that the settings for the SoundDrive 16

driver in Windows match the hardware settings. This can be done by opening the Driver icon from the Control Panel and double-clicking on the driver.

2. If the .WAV file keeps repeating, this indicates an IRQ conflict.

Symptom 10

I received the error message "Could not load audio driver" or "General Protection Fault."

Check

1. Is the SoundDrive 16 audio driver installed in Windows? If no, install the driver. If yes, reinstall the driver. From the Control Panel window, click on the Drivers icon, click on Add, and reload the "SoundDrive 16 WAVE & MIDI" driver. Restart Windows and check the sound again.
2. Did you change the default address settings? If so, you need to reset the address settings in Windows.

Symptom 11

I received the error message "Disk Could Not Keep Up with Digital Audio Rate."

Check

1. Were you recording when you received this error message? Decrease the sample rate or bit resolution. If you were recording in stereo, switch to mono.
2. Are you using a disk doubling utility? When you record, you are recording directly to the hard drive. Disk compression utilities can affect the performance of the hard drive.

3. Have you defragmented your hard drive lately?
Your software applicaton may have encountered a performance problem with your hard drive. Use one of the commercial disk optimizing utilities available. Excellent digital audio performance requires that you optimize your hard drive often.

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 SoundDrive 16. 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.
- ☞ SoundDrive 16 may use DMA Channel 0, 1 or 3.

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:**FM Synthesizer**

- 20-voice Stereo Synthesizer

Stereo Digital/Analog Mixer (built-in)

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

Line-in

Stereo CD-Audio

Mono Microphone

Synthesizer

Digital Audio

Stereo Digitized Audio Playback

- 8-bit and 16-bit sample modes
- Sampling Rate of :
2KHz to 44.1KHz (mono or stereo)
- Hardware audio decompression ESPCM (ratios of 2:1, 3:1, and 4:1)

Audio Amplifier

- Frequency Response: 20Hz to 22KHz

Stereo Digitized Audio Recording

- 8-bit and 16-bit sample modes
- Sampling Rate of 2KHz to 44.1KHz

CD-ROM

- One built-in Mitsumi AT-Bus CD-ROM interface and one built-in SCSI-2 CD-ROM interface (SCSI-2 CD-ROM interface optional on the SoundDrive EZ)

MIDI

- Sound Blaster type Joystick/MIDI cable

Wavetable

- Interface for optional Wave Booster daughtercard

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 SoundDrive 16 uses an I/O port address for the Sound Blaster emulation mode. This address is hardware configured (see Chapter 1). The following addresses are available for SoundDrive 16:

Sound Blaster Mode Addresses

I/O	IRQ	DMA
* 220	3	0
240	4	* 1
	5	3
	* 7	

Table A.1: Sound Blaster Mode Addresses

Windows Sound System Mode Addresses

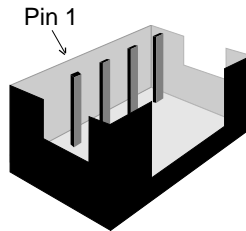
I/O	IRQ	DMA
* 220	3	0
240	4	1
	5	3
	* 7	

Table A.2: Sound System Addresses

CD-ROM Audio Cable Connector

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

Table A.3: CD-ROM Audio Cable Pin-Outs



* *Default Setting*

Joystick/MIDI Port Pin Assignments

The joystick port on SoundDrive 16 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		

Table A.4: Joystick/MIDI Pin Assignments

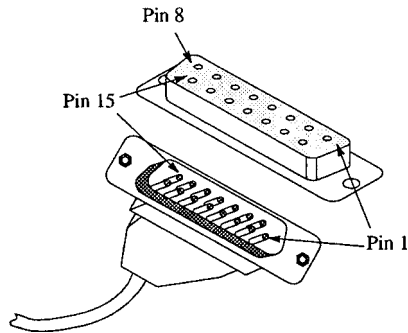


Figure A.1: Joystick/MIDI Pin-Outs

B

MIDI

This section gives you an overview of the MIDI specification, and provides a list of the Patches and Percussion sounds available with the optional Orchid Wave Booster daughtercard. This wavetable synthesis upgrade option enhances the sound in Windows and multimedia applications with real music instruments.

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

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.

WaveBooster Sounds

These are the General MIDI and MT-32 Patches (sounds) that are stored on the WaveBooster wavetable daughtercard. It also contains over 118 percussion instruments in 7 drum sets on MIDI channel 10.

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

34	Harmony Piano	Fingered Electric Bass
35	Chorale	Picked Electric Bass
36	Glasses	Fretless Bass
37	Soundtrack	Slap Bass 1
38	Atmosphere	Slap Bass 2
39	Warm Bell	Synth Bass 1
40	Funny Vox	Synth Bass 2
41	Echo Bell	Violin
42	Ice Rain	Viola
43	Oboe 2001	Cello
44	Echo Pan	Contrabass
45	Doctor Solo	Tremelo Strings
46	School Daze	Pizzicato Strings
47	Bellsinger	Orchestral Harp
48	Square Wave	Timpani
49	String Section 1	String Section 1
50	String Section 2	String Section 2
51	String Section 3	Synth Strings 1
52	Pizzicato	Synth String 2
53	Violin 1	Choir "Aahs"
54	Violin 2	Voice "Oohs"
55	Cello 1	Synth Voice
56	Cello 2	Orchestra Hit
57	Contrabass	Trumpet
58	Harp 1	Trombone
59	Harp 2	Tuba
60	Guitar 1	Muted Trumpet
61	Guitar 2	French Horn
62	Electric Guitar 1	Brass Section
63	Electric Guitar 2	Synth Brass 1
64	Sitar	Synth Brass 2
65	Acoustic Bass 1	Soprano Sax
66	Acoustic Bass 2	Alto Sax
67	Electric Bass 1	Tenor Sax
68	Electric Bass 2	Baritone Sax
69	Slap Bass 1	Oboe
70	Slap Bass 2	Basoon
71	Fretless 1	English Horn
72	Fretless 2	Clarinet
73	Flute 1	Piccolo
74	Flute 2	Flute 81
75	Piccolo 1	Recorder

Appendix B: MIDI

Patch	MT-32 Sound	General MIDI Sound
76	Piccolo 2	Pan Flute
77	Recorder	Bottle Blow
78	Pan Pipes	Shakuhachi
79	Sax 1	Whistle
80	Sax 2	Ocarina
81	Sax 3	Lead 1
82	Sax 4	Lead 2
83	Clarinet 1	Lead 3
84	Clarinet 2	Lead 4
85	Oboe	Lead 5
86	English Horn	Lead 6
87	Bassoon	Lead Fifths
88	Harmonica	Lead + Bass
89	Trumpet 1	New Age Pad
90	Trumpet 2	Warm Pad
91	Trombone 1	Polysynth Pad
92	Trombone 2	Choir Pad
93	French Horn 1	Bowed Pad
94	French Horn 2	Metallic Pad
95	Tuba	Halo Pad
96	Brass Section 1	Sweep Pad
97	Brass Section 2	Rain
98	Vibe 1	Soundtrack
99	Vibe 2	Crystal
100	Synth Mallet	Atmosphere
101	Windbell	Brightness
102	Glockensspiel	Goblins
103	Tube Bell	Echoes
104	Xylophone	Sci-Fi
105	Marimba	Sitar
106	Koto	Banjo
107	Sho	Samisen
108	Shakuhachi	Koto
109	Whistle 1	Kalimba

110	Whistle 2	Bagpipe
111	Bottleblow	Fiddle
112	Breathpipe	Shanai
113	Timpani	Tinkle Bell
114	Melodic Tom	Agogo
115	Deep Snare	Steel Drums
116	Electric Percussion 1	Woodblock
117	Electric Percussion 2	Taiko Drum
118	Taiko	Melodic Tom
119	Taiko Rim	Synth Drum
120	Cymbal	Reverse Cymbal
121	Castanets	Guitar Fret Noise
122	Triangle	Breath Noise
123	Orchestra Hit	Seashore
124	Telephone	Bird Tweet
125	Bird Tweet	Telephone Ring
126	One Note Jam	Helicopter
127	Water Bells	Applause
128	Jungle Tune	Gunshot

WaveBooster Percussion Sounds

These are the standard Percussion sounds on the WaveBooster wavetable daughtercard. These percussion instruments are accessed by sending data to MIDI channel 10. The WaveBooster features seven different drum sets.

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.

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FCC NOTICE

FCC# DDS7EF0494-16-SDR

SoundDrive 16
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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