AudioSystem

EWS®64 S

Installation Guide V1.0

English

CE declaration

We:

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

hereby declare that the product:

TerraTec AudioSystem EWS®64 S

to which this declaration refers is in compliance with the following standards or standardizing documents:
1. EN 55022

2. EN 50082-1

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

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

This declaration is based on:

Test report(s) of the EMC testing laboratory

Declaration of Conformity according to 47 CFR Part 2 & Part 15

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.

CONTENTS

Introduction.

The AudioSystem EWS®64 S.

Congratulations.

Thank you for selecting TerraTec for the acoustic part of your multimedia system. We would like to make the installation and operation of your new component as simple as possible for you with this guide.

We realize, of course, that nobody (including us ☺) enjoys reading handbooks, but we recommend it highly for this card, as you might otherwise never get to know some of the many features of the AudioSystem.

In addition to this guide, our online help also contains detailed information, especially regarding various applications.

OVERVIEW.

In purchasing the AudioSystem EWS®64 S, you have selected a product from a sound card generation for which the term “sound card” is a bit understated.

The following will give you a quick overview of the many features of your new card:

- Complete game compatibility under DOS and Windows 95, including support for Microsoft DirectSound® and DirectSound®3D.
- Up to 64-voice synthesizer with 2 MB RAM (expandable to 64 MB).
- FX processor for all audio signals with a variety of reverb, chorus and 3D algorithms.
- Hard disk recording system with hardware support of up to 32 audio tracks.
- Playback of 64-channel MOD files without CPU usage.
- in conjunction with ’DigitalXtension R’ - digital recording system with one stereo input (optical or coaxial) and one stereo output (optical and coaxial) in S/PDIF format.
- in conjunction with the ’ActiveRadio Upgrade’ FM RDS cable tuner.

And best of all, these functions are all available at the same time.

Enjoy a world of multimedia creativity with your new TerraTec AudioSystem EWS®64 S.

GETTING STARTED.

- Shut the computer down, touch the metal case to ground yourself and disconnect the power cable. Open the PC case and take the sound card out of its packaging.
- Connect the audio cable of your CD-ROM drive to CN4 or CN5. CN4 can be used for most IDE drives.
- Carefully install the sound card in a free 16-bit ISA slot in your PC: choose a slot as far as possible from the VGA or video adapter card.
- Tighten the screws to hold the card in place and reinstall the housing cover of your PC.
- Connect the mini-plug jack of your active speakers, headphones or adapter cable to your stereo system into the socket. You can also connect a second pair of active speakers to the second stereo output with a mini-plug jack.
- Make sure that the stereo system or active loudspeakers are off before you switch on the PC. If you have headphones connected to the sound card, do not put them on yet.
- Switch on the PC and wait until it boots.
- Insert the installation CD when prompted by 95 and follow the instructions on the screen. The drivers are located in **\DRIVER\WIN95**.
- Follow the additional instructions which will then be displayed.
- The software installation for the EWS® applications starts automatically after the drivers have been installed. Please follow the onscreen instructions closely.
- The detailed installation instructions in the body of this User Guide contain information you will find useful if you have any questions not covered by the “Getting started” guide, or if you encounter problems during installation.

TECHNICAL DATA.

Here once again the technical data of your AudioSystem EWS®64 S

COMPATIBLE WITH THE FOLLOWING STANDARDS:

- Intel™ Plug and Play
- Microsoft™ DirectSound™
- Microsoft™ DirectSound™3D
- General MIDI
- General Synthesizer
- MPU-401™ compatible
- SoundBlaster™
- SoundBlaster™ Pro
- Adlib™
- MPC Level III

WAVETABLE SYNTHESIZER:

- 2 MB sample RAM onboard
- Expandable to 64 MB sample RAM
- 64-voice wavetable synthesizer (downloadable GM/GS soundsets)
- General MIDI
- General Synthesizer

FX PROCESSOR:

- Various reverb and chorus effects
- Multi-band equalizer
- Virtual 3D Sound (V-Space)
- Space simulation for 2 and 4 audio channels
- Effects available for all audio sources

- Audio features:
- 8/16-bit converter modules, 5 KHz-52 KHz sample rate
- Mono microphone input with switchable preamplifier
- 2 analog stereo outputs
- Analog mono input for PC speaker
- (only with 'DigitalXtension R') 1 44.1 kHz S/PDIF digital input, optical or coaxial
- (only with 'DigitalXtension R') 1 44.1 kHz S/PDIF digital output, optical and coaxial
- Simultaneous extended full duplex recording during playback of up to 8 channels
- 4-bit hardware real-time compression and decompression ADPCM
- 8-bit hardware real-time compression and decompression as per µ-Law, A-Law CCITT standard
- Record and playback all audio sources

FM SYNTHESIZER:

- 4OP+ technology
- 20 parts, stereo

STEREO DIGITAL / ANALOG MIXER:

- Mixing of a variety of audio sources: microphone, CD, synthesizer, digital audio, line-in and radio (with ActiveRadio Upgrade).

MIDI INTERFACES:

- 2 MPU-401™ MIDI interfaces (UART mode)
- Duplex MIDI interface for simultaneous record & playback with up to 32 MIDI channels

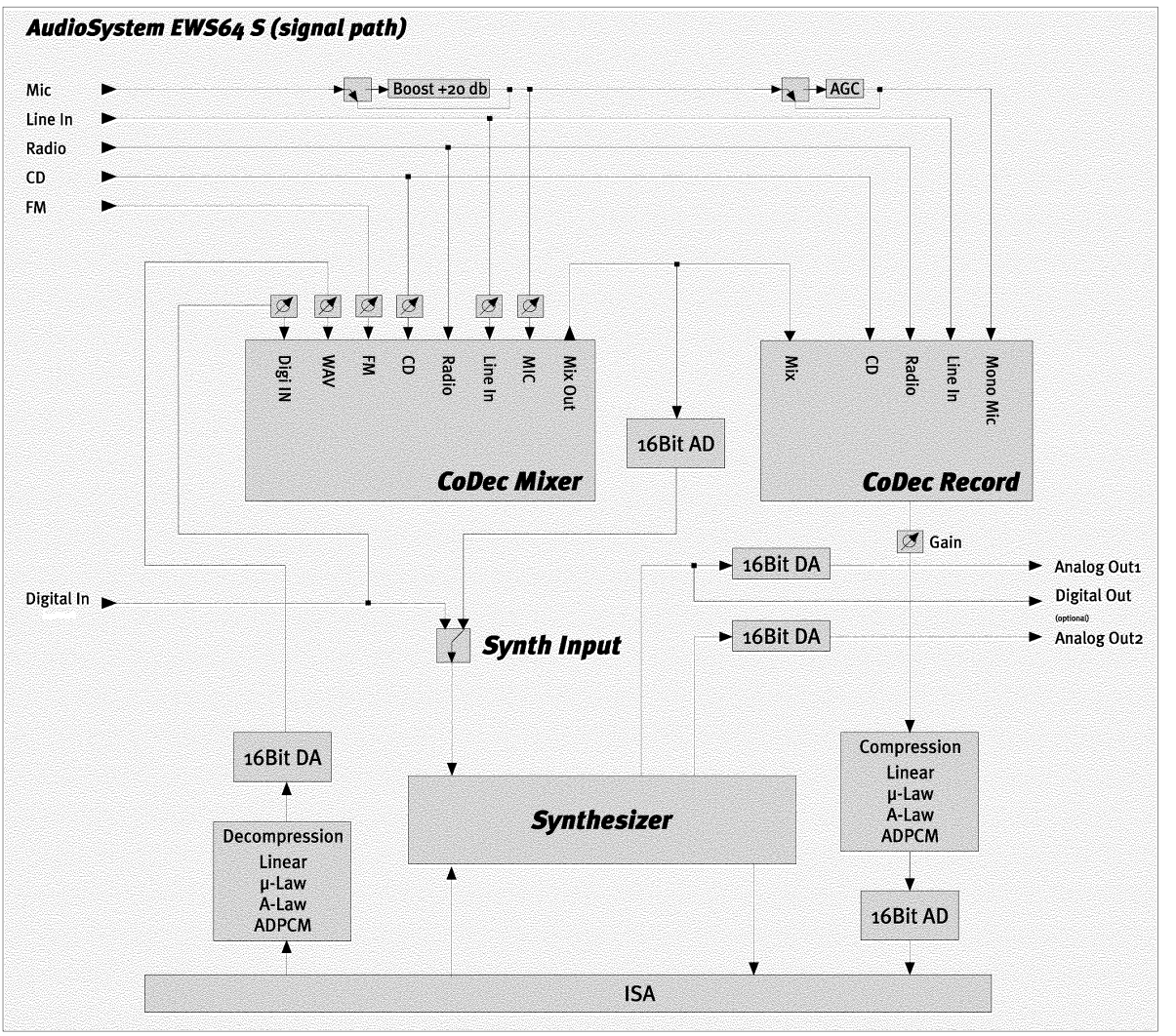
DIGITAL GAME PORT FOR JOYSTICKS AND MIDI:

- Connection for analog or digital joysticks

Minimum system requirements:

- Pentium™ or compatible processor, 100 MHz minimum
- 16 MB RAM
- VGA or SVGA card with 800 x 600 pixels at 256 colors
- CD-ROM drive
- 20 MB free hard disk space
- Windows 95

SIGNAL FLOW IN THE CARD.



INSTALLING THE SOUND CARD.

If your setup CD contains a README file, you should read this file before installing the sound card in your PC. The README file should contain the latest information, including details not available when this Installation Guide went to press. Bear in mind the custom features of your PC configuration. Check the user documentation for your PC and other expansion cards installed for information on card-specific settings.

Follow these instructions for straightforward installation. Consult the applicable parts of this User Guide for more detailed information in case you run into difficulties. Our hotline is at your disposal if problems persists. Check the Appendix of this User Guide for the hotline phone numbers and times when hotline support is available.

Start by making sure that nothing is missing.

You should have received:

- The EWS®64 S sound card
- 1 setup CD
- 1 User Guide (hi there)
- 1 customer service card
- 1 audio cable (mini-jack to cinch)
- 1 registration card with the serial number

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

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

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

1. Switch off your PC and all connected periphery, in other words printer, monitor and so on. Leave the AC cord connected for the time being, so that your computer is still grounded.

2. Touch the metal chassis at the rear of the PC to ground yourself and discharge static. Now unplug the cord from the AC mains socket.

3. Remove the housing cover from your PC.

4. Find a free 16-bit expansion slot as far as possible from other cards such as the VGA card or video adapter, remove the screw securing the metal cover over the slot and remove the cover itself.

5. Carefully remove the sound card from its antistatic bag and pick it up by the edges. Do not touch the components or the reverse side of the card.

6. Align the holder at the rear of the sound card in the expansion slot in such a way that the card's connectors are directly in line with the slot's socket.

7. Carefully seat the card in the slot. You might have to exert some pressure to make a good contact. Take care to ensure that the contacts are precisely in line, in order to avoid damaging the motherboard in your PC.

8. Insert and tighten the screw from the slot cover to secure the sound card in its slot.

9. Reinstall the housing cover of your PC.

10. Connect the loudspeakers or your stereo system to the sound card. See the section entitled *Connecting external periphery* on page 27).

11. Make sure that your stereo system or active speakers are off. Boot your PC and install the drivers. (Please also read the chapter *Installation of the drivers under Windows 95* on page 14).

Setup under Windows 95.

Installation of the drivers under Windows 95

The installation of the sound card is completely software-based. The buzzword here is 'Plug and Play'. Still, there are a number of factors that are important for the success of such an installation. Let's cover these one at a time:

The Plug and Play (PnP) BIOS

While your system boots, the BIOS examines the PnP card in the expansion slot to ascertain what type of card it is, and which I/O addresses, interrupts and DMA channels it can use (see also the chapter *IRQ, DMA and I/O addresses - what are they?* on page 26). If you have more than one PnP expansion card in your system, the computer's resources are distributed across the various cards in such a way that no conflicts arise. It's really not necessary to pay much attention to the settings.

It's possible that the interrupts or DMA channels cannot be assigned without conflicts if there are no free channels left. In this case, the BIOS disables the device for which no resources could be assigned. This can be seen as a yellow exclamation mark in the *Device Manager* of the *Control Panel*.

If your motherboard has a sound chip on board, we definitely recommend disabling it in the BIOS. In some cases it may not be possible to disable it completely, which will result in a conflict with the AudioSystem. In this case, it may help to set the I/O addresses, interrupts and DMA channels of the internal chip as far away as possible from the ideal values. Please refer to the handbook of your motherboard or PC for further details on this. Otherwise, try to use other values for the EWS® or disable individual devices (see also the *Manual configuration* chapter on page 25).

But let's get back on track:

From the viewpoint of the Plug and Play BIOS, the EWS®64 S consists of 5 devices:

The CoDec. This component is responsible for the Soundblaster and AdLib compatibility, as well as for the complete analog mixer section for the inputs (CD, line-in, radio etc.).

The digital control port. This device is used for switching, e.g. for MIDI routing.

The game port. This is the port which Windows uses to communicate with your joystick. Windows 95 is now capable of directly recognizing different manufacturer's types and setting itself up accordingly.

The MIDI-2 port. This is the device for the card's second MPU-401 interface. With suitable MIDI routing (GAMEPORT ⇢ MIDI-2), this device can be used to communicate with external MIDI devices such as synthesizers or drum computers, as well as storing and processing their data in a suitable sequencer program such as Cubasis AV Lite.

The synthesizer port (MIDI-1). This is the somewhat unassuming name for the actual heart of the EWS®. In addition to wavetable synthesis, this synthesizer is responsible for all effects, the 4-band equalizer, stereo expansion, the MOD interface and much more.

Resources

New PCs are being built with higher and higher clock speeds and ever more main memory, but the resources - I/O addresses (ports), interrupts (IRQs) and DMA channels - are getting tighter all the time (see also the chapter *IRQ, DMA and I/O addresses - what are they?* on page 26).

The resources required by the EWS® are stored on the card in a chip (the EEPROM). Individual devices which are not needed can be deactivated or restricted on the chip to save resources.

For example, the factory setting has not assigned an interrupt to the MIDI 2 port. In practical terms, this means that you can only use this device for MIDI playback, not for MIDI recording, with the default settings. Recording is not possible until an additional interrupt (IRQ) has been assigned to the device.

The following rule of thumb can be used to simplify your personal resource assignment: The amount of resources which you have to place at your equipment's disposal increases with your performance requirements. For example, it wouldn't be advisable to operate the synthesizer without an interrupt (IRQ) if you would like to use the "EWS®64S Synth Record" for hard disk recording.

More information on these settings can be found in the chapter "Manual Configuration of the Card" (page 25).

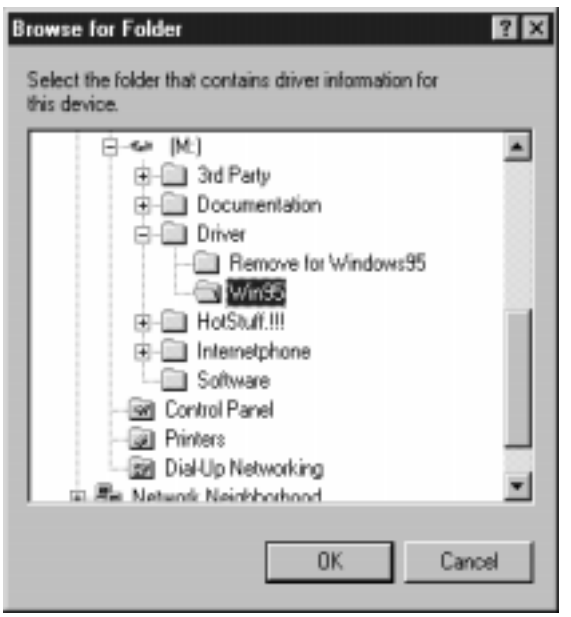
But now, on to Windows 95:

Just as your PnP BIOS detected a new component in your system, the PnP operating system Windows 95 will do the same.

Windows will ask for the equipment manufacturer's driver immediately after detecting the new component.

This driver can be found on the setup CD under **\DRIVER\WIN95**.

Hold it! Windows Service Release 2. When installing under Windows 95 Service Release 2, you may be prompted to specify a path for a certain file repeatedly. In this case, please always specify the folder on the CD containing the drivers.



You may also find that some of the required Windows multimedia components aren't set up on your system. Don't be surprised if you are prompted to insert your Windows CD. Also, be sure to answer "no" to the question of whether your system should be restarted until Windows has found and configured all 5 devices.

Before restarting Windows, turn down the volume of your active speakers or your stereo. You can then adjust the level with the *ControlPanel* application and your system after restarting.

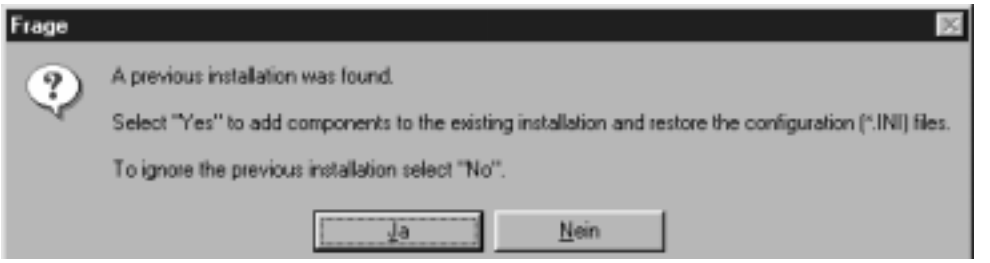
The installation program to set up the applications will start next. The whole exciting story is covered in detail in the next chapter, *Installation of Applications Under Windows 95* (page 18).

Installation of Applications Under Windows 95.

Once the drivers have been set up correctly, the installation program for the applications will start automatically. A special tool which is set up on your computer with the following procedure lets you take full advantage of the options provided by the sound card.

The setup program automatically selects the language of your Windows95 installation. If you would like to install a different language, please choose it in the menu.

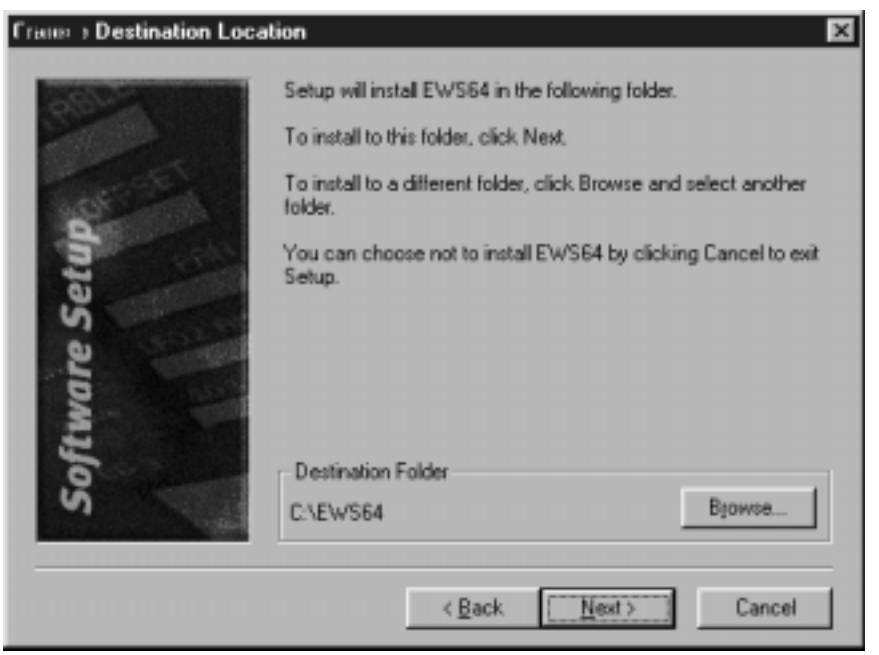
If the setup program will abort with an error message if it determines that the EWS® isn't set up correctly on your system.



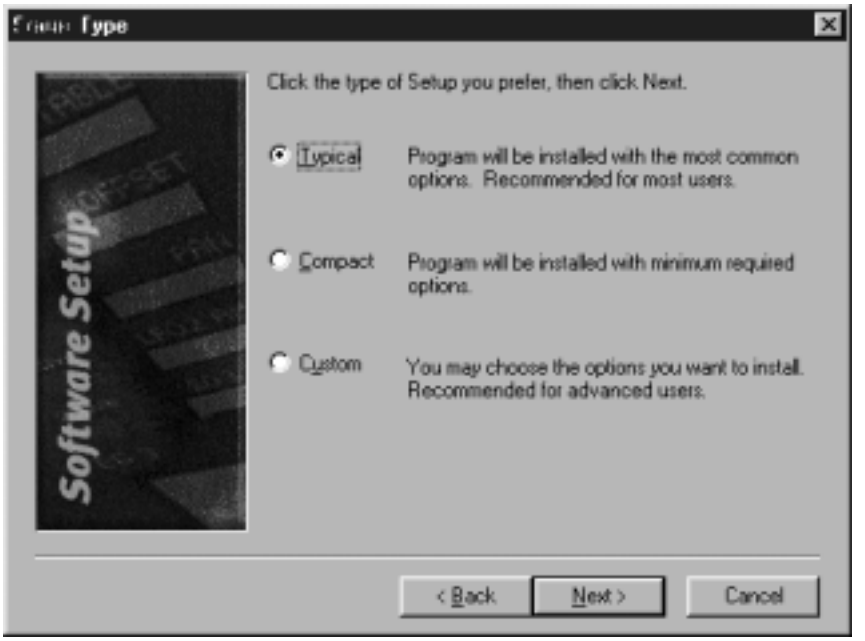
This is the dialog box that appears if the applications are already installed. Selecting *Yes* starts the update mode which you can use to add components to your current installation or to restore a number of standard components. If you select *No*, the previous installation will be ignored.

If you intend to reinstall your applications because of problems you are experiencing, it would certainly be advisable to remove your current installation first.

(Please also read the chapter *Uninstalling under Windows 95* on page 22).

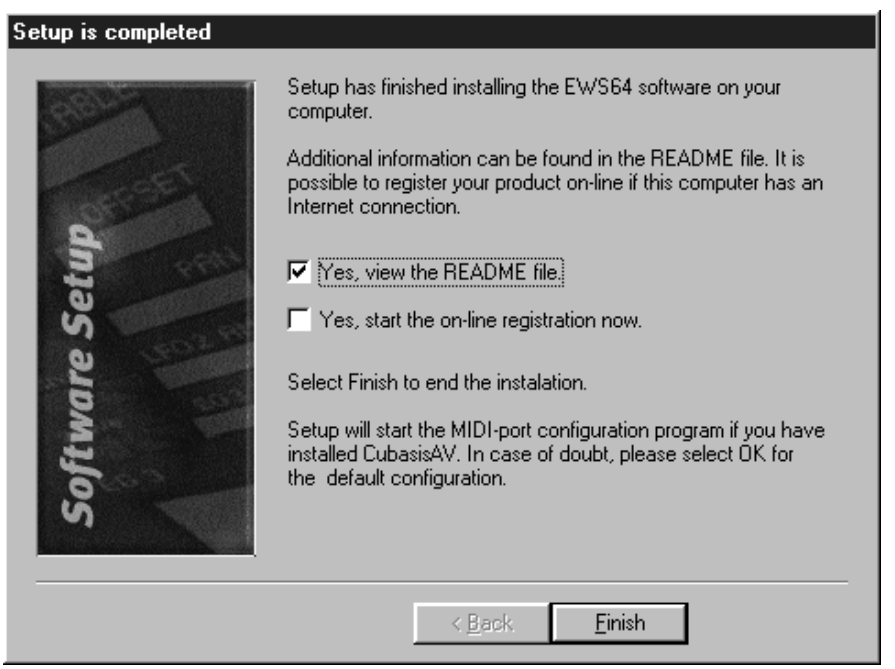


Please select the location for the programs on your hard disk. It's advisable to use the default path, as the documentation repeatedly refers to it. It's also the assumed location when installing updates downloaded from the Internet.

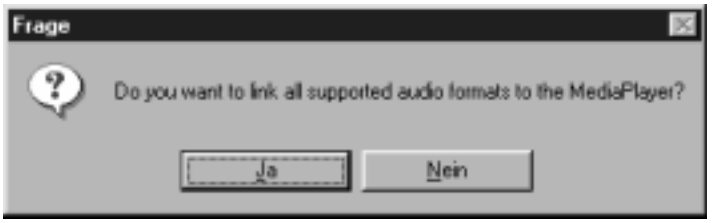


Next, select the type of installation. The *Typical* installation is recommended for inexperienced users. If you only have a limited amount of hard disk space, select „*Compact*“. Experienced users with a clear idea of what they need should select „*Custom*“.

Continue by following the instructions on the screen until you arrive at the dialog box below after the files have been copied:



If you would like to perform the *on-line registration*, please ensure that your Internet access is correctly configured. It will not be possible to connect to our server otherwise.



If you answer *Yes* to this question, a variety of audio formats (*.WAV, *.MOD, *.MID etc.) will be associated with the EWS® Media Player. Double-clicking on WAV files in the Explorer will automatically bring up the Media Player for the playback.

Well, that's that - the complete range of EWS® features is now available to you.

If you have any questions regarding the use of the individual applications, check the online help, which can generally be opened using *F1*.

Have fun ... !

Uninstalling under Windows 95.

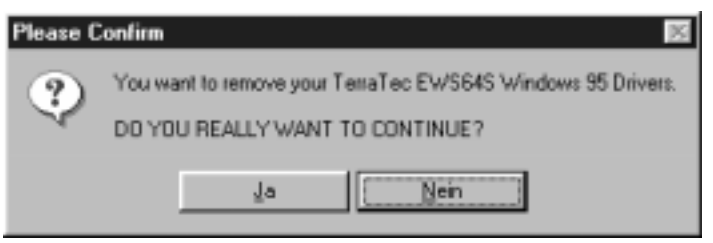
Unfortunately, conflicts between various devices and programs are fairly common under Windows 95. A new installation will suddenly cause something completely unrelated to stop working. It may therefore occasionally be necessary to remove and reinstall various components.

The following section thus explains how to remove the individual components of the AudioSystem EWS®64 S from your system. Please bear in mind, however, that reinstalling cannot serve as a cure-all. Please consider this step carefully, especially since quite a bit (the settings of the drivers, the configuration of the individual applications) can be lost in the process.

Removing the applications. The applications are removed using a program designed for this purpose. Look under *Diverses* in the EWS® program group for *Uninstall EWS® Software*.

After you have started the program and answered the first question with *Yes*, all applications and their associated files will be removed. You can now reinstall the software by starting the setup program manually. It can be found in the **\APPLICATIONS** directory of the setup CD.

Removing the drivers. The drivers can be uninstalled using a special program which does not have a shortcut of its own in the EWS® program group. The program (**64SREM.EXE**) can be found in the **\REMOVE** subdirectory of the EWS directory. Start the program using the Windows Explorer or the *Run* command of the *Start* menu.



If you answer *Yes* to this question, the program will remove all EWS® drivers from your Windows 95 system. Windows will detect the card when the system is restarted. Please see Chapter 3.1, "Installation of the Drivers Under Windows 95" (page 14) for further information on installing the drivers.

WHICH DRIVER DOES WHAT?

Several recording and playback drivers are available under Windows 95. The following is a brief description of their individual functions.

In order to take advantage of the possibilities of various combinations of these drivers, please read the chapter "*Signal Flow in the Card*" (page 11).

EWS®64S Synth Play #? This is the WAV playback driver of the synthesizer. The number of available WAV drivers is user-definable. For more information, please see the software help under "*The driver*".

EWS®64S Synth Record. This is the WAV recording driver of the synthesizer, which records that which has been set under *Synth Input* and *Synth Record* in the *ControlPanel*. For more information on the configuration options of the *ControlPanel*, please see the software help under "*The ControlPanel*".

EWS®64S CoDec Play. This is the WAV playback driver for the CoDec.

EWS®64S CoDec Record. This is the WAV recording driver of the CoDec, which records that which has been set under *CoDec Record* in the *ControlPanel*. For more information on the configuration options of the *ControlPanel*, please see the software help under "*The ControlPanel*".

EWS®64S MIDI Record. This is the recording driver for MIDI files sent to the MIDI-1, the MIDI interface of the synthesizer. To record data from an external device using this driver, the MIDI routing must be set accordingly. Start the *ControlPanel* and right-click the appropriate icon in the taskbar tray (right next to the clock). This opens the *EWS® Desktop* menu. In the submenu *MIDI Settings*, please select *GAME Port <-> MIDI-1*.

EWS®64S MIDI Play. This driver outputs the MIDI data to the internal wavetable synthesizer and other devices connected in parallel (please also read the chapter *Connecting a MIDI Keyboard* on page 31).

EWS®64S MIDI2 Record. This is the recording driver for MIDI files sent to the MIDI-2, the MIDI interface of the CoDec. To record data from an external device using this driver, the MIDI routing must be set accordingly. Start the *ControlPanel* and right-click the appropriate icon in the taskbar tray (right next to the clock). This opens the *EWS® Desktop*. In the submenu *MIDI Settings* please select *GAME Port* **<->** *MIDI-2*.

EWS®64S MIDI2 Play. This driver forwards the MIDI data to the MIDI interface of the CoDec, MIDI-2. It's not possible to hear anything in this case, as the CoDec does not have wavetable synthesis. The main purpose of this MIDI interface is the exchange of MIDI data with external devices.

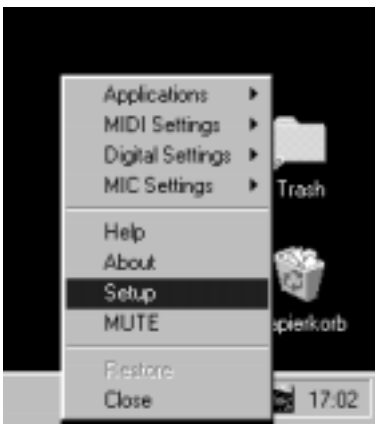
MANUAL CONFIGURATION.

Please bear in mind that manual configuration can cause conflicts with other devices which can restrict the functionality of your system. Proceed as follows to determine which resources are available in your system:

- Go to *Settings* in the *Start* Menu and select the *Control Panel*.
- Double-click *System*.
- Open the *Device Manager*.
- Double-click *Computer*.

The following rule of thumb can be used to simplify your personal resource assignment: The amount of resources which you have to place at your equipment's disposal increases with your performance requirements. For example, it wouldn't be advisable to operate the synthesizer without an interrupt (IRQ) if you would like to use the synthesizer for hard disk recording.

But let's get started: Start the *ControlPanel* in the EWS® program group and right-click on the small icon in the taskbar tray (right next to the clock).



This opens the *EWS® Desktop* menu. Please select *Setup* and assign the required resources in the following dialog box. Your system will be fully functional again after restarting the system and installing any devices that might now be required.

IRQ, DMA and I/O addresses - what are they?

Here's a brief explanation of these terms in case you would like to make changes to your hardware (such as installing a new card), problems occur with your installation, or simply to satisfy your curiosity.

The communications of system components with the main processor or the memory on the motherboard is handled by signal lines or channels. A conflict arises when two components try to access the same communications line at the same time. Three types of signal lines are available for the exchange of data.

1. IRQs or interrupts are needed for a component to inform the CPU that data is to be output or received.

2. DMA (direct memory access) channels are responsible for the transfer of data to the main memory (as opposed to the CPU).

3. I/O or input/output addresses are special address ranges available for data exchange between the system components and the CPU.

These resources are assigned without conflicts by a PnP BIOS. It is still possible to manually change the configuration, however (please also read the chapter *Manual Configuration* on page 25).

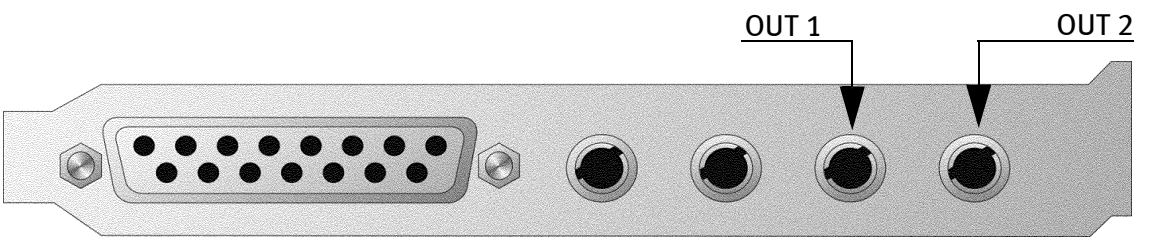
Connecting external periphery.

Speakers or headphones, a CD-ROM drive, a MIDI keyboard, a mono microphone, a joystick and external audio devices (stereo microphone, cassette recorder, CD player, tuner, mixer, etc.) can be connected to the card. The following chapters describe the options available to you.

Connecting the speakers / hifi system.

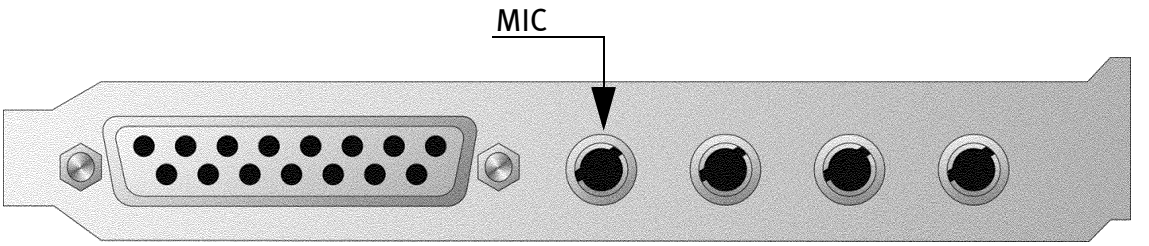
The output of the sound card is suitable for the connection of active speakers or a stereo system.

If you would like to connect one or two stereo systems, connect the outputs of the sound card (*Out1* or *Out2*) with the AUX input of your stereo system(s).



Connecting a microphone.

Use the input labeled “MIC” if you want to connect a mono microphone. The input sensitivity is adequate for most mainstream commercially available capacitor-type and dynamic microphones.

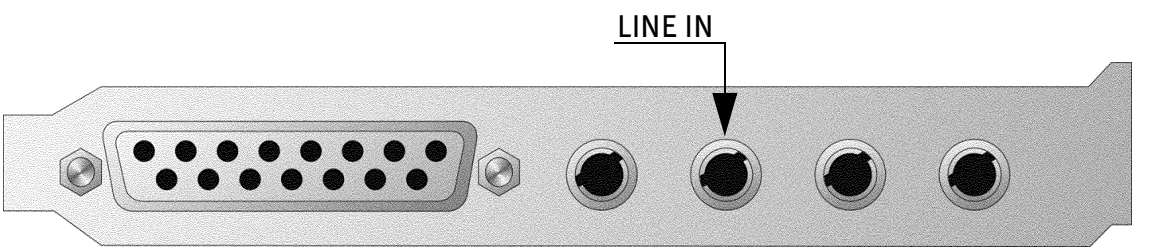


Recordings can be made over this channel with the *MIC* setting of the *CoDec Record* in the *ControlPanel*. Adjust the volume with the *REC* level in the *CoDec* section of the *ControlPanel* to avoid distortion.

If the signal appears to be too weak, switch on the microphone preamplifier. Start the *ControlPanel* and right-click the appropriate icon in the taskbar tray (right next to the clock). This opens the *EWS® Desktop* menu. In the submenu *MIC Settings*, please select *Boost +20db*. A check mark is displayed next to the entry to indicate that the amplifier is active.

Connecting External Audio Sources.

Use the input labeled *LineIN* for connecting external periphery such as a mixer, CD player, cassette recorder or similar. These external audio sources can be mixed with the internal audio sources or recorded digitally using the *ControlPanel*. The input sensitivity is suitable for the use of conventional audio components (2 Vrms).



CONNECTING A JOYSTICK.

You can use the 15-pin socket shown below to connect analog or digital joysticks. Bear in mind that you can have only one active joystick port in your PC configuration. If you want to use the port on your sound card you will have to deactivate any other joystick port in the system.

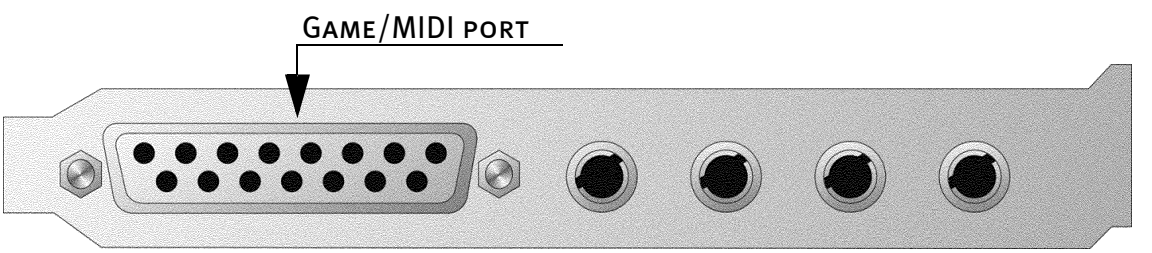
You can use a Y-adapter cable to connect several analog or digital joysticks to a common port. This adapter assigns each of the two joystick channels to a separate connector.

If you would like to use a *ForceFeedBack* joystick on this port, you may need to use an MPU-401 interface to transmit the *ForceFeedBack* data to the joystick.

It's advisable to use the second interface (*MIDI-2*) for the data to avoid affecting the MIDI playback for games. The *Gameport MIDI Routing* must be correctly set up for this purpose.

Start the *ControlPanel* and right-click on the small icon in the taskbar tray (right next to the clock). This will open the *EWS® Desktop* menu.

In the submenu *MIDI Settings*, please select *GAME Port <-> MIDI-2*.

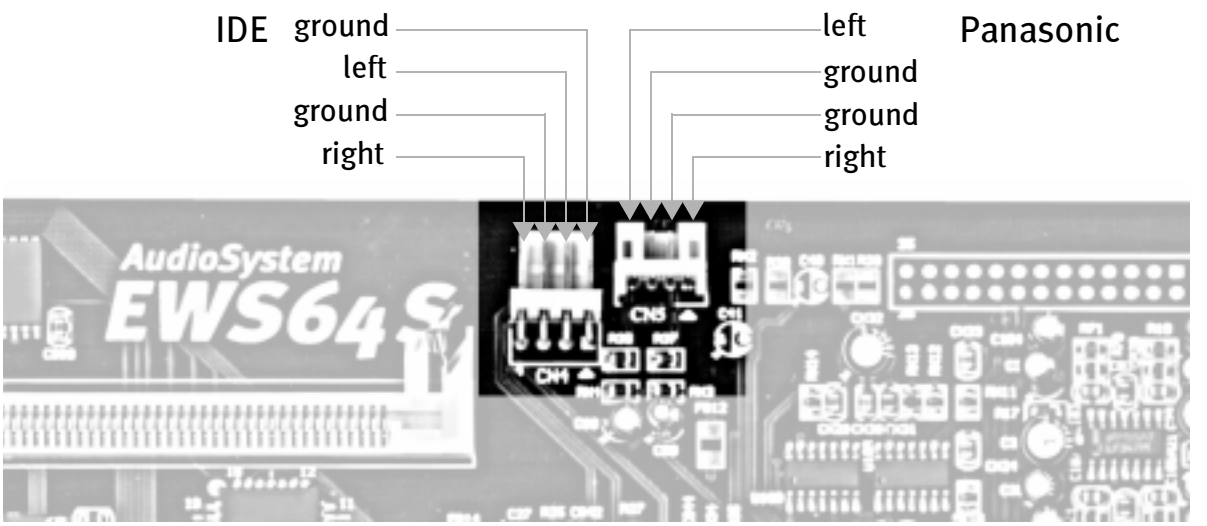


Connecting the CD-ROM Audio Cable.

Before you can listen to an audio CD under Windows or to record its signal, the audio output of the drive must be connected to the sound card.

CD audio connections are provided for IDE and Panasonic. Many older IDE drives (including Mitsumi) use the *Panasonic* connection. Newer IDE drives can be connected to the wide connector CN_4 marked *IDE Standard*.

However, as this hasn't been standardized and the pin assignments sometimes even vary between types from a single manufacturer, we urgently recommend reading the handbook to check the pinout of the supplied audio cable.



Recordings can be made over this channel with the *CD* setting of the *CoDec Record* in the *ControlPanel*. Adjust the volume with the *REC* level in the *CoDec* section of the *ControlPanel* to avoid distortion.

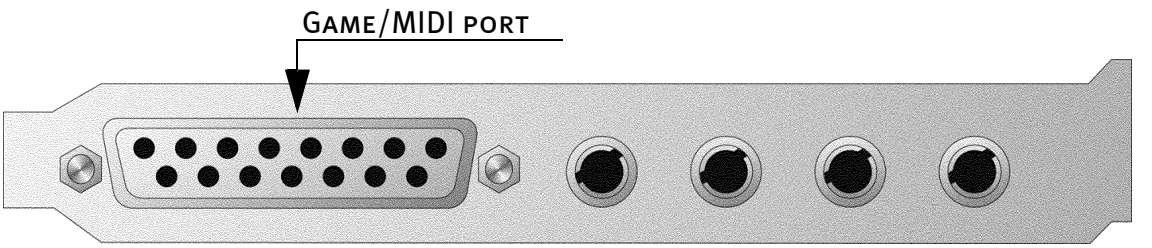
If you have two CD-ROM drives installed, use the slower one for audio CDs, since these only run at single speed. It is only possible to alternate the audio connections, as they cannot be decoupled from one another.

CONNECTING A MIDI KEYBOARD.

A special cable, the TerraTec MIDI-KIT, is necessary to connect your sound card to a MIDI keyboard, an external synthesizer or expander. This cable is included with TerraTec keyboards.

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

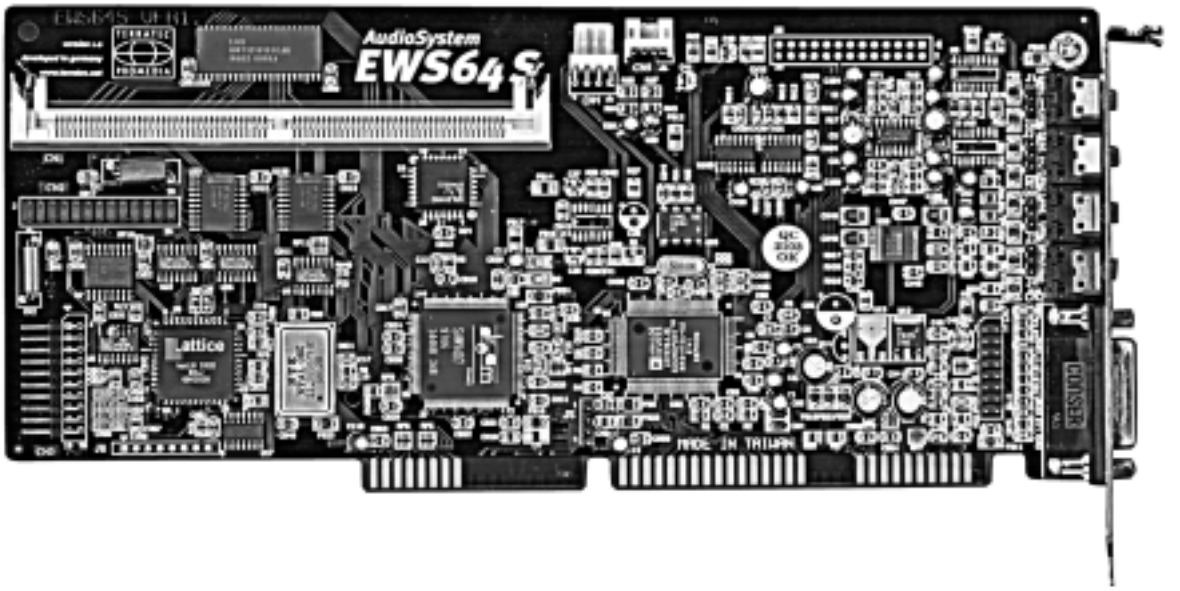
When connected to the game/MIDI port, it provides joystick, MIDI In and MIDI Out connections.



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

You can route one of the MIDI interfaces to the Game/MIDI port or separate the interface from the port using the software. Further detailed information on MIDI can be found in the "*Music on your PC*" handbook on the setup CD.

About the Card.



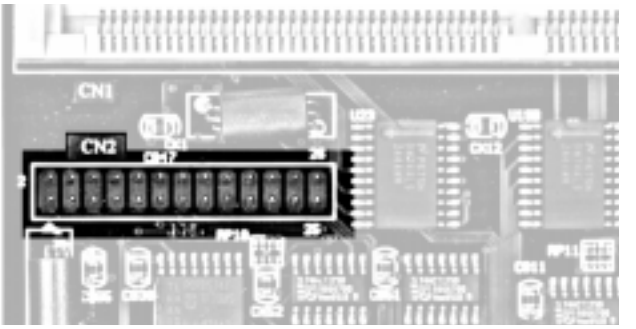
Internal taps.

The AudioSystem S has several internal taps to implement the connection of signal lines between various components within the computer.

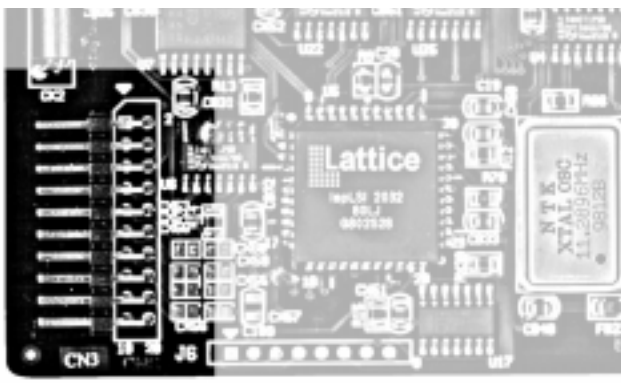
For a start, there's the

- CN1 – SIMM socket for an additional SIMM module to expand the memory from 2 MB to a maximum of 64 MB. Please read chapter *Memory Upgrades – Installing Additional RAM* (page 34).

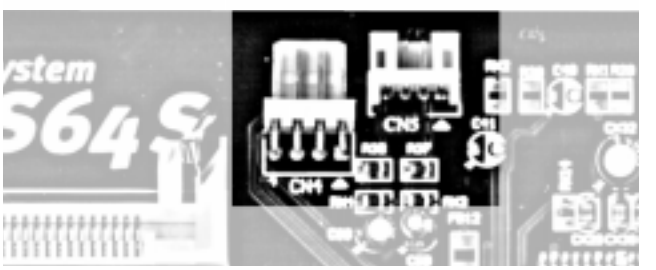
- CN2 – DigitalXtension for the installation of a digital option in your AudioSystem.



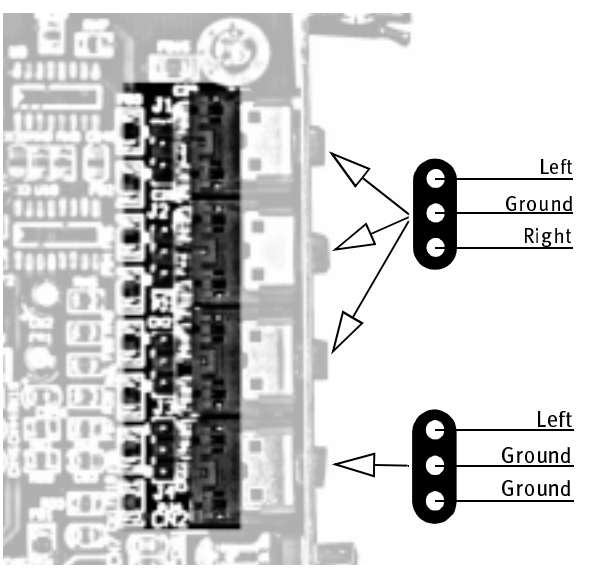
- CN3 – RadioXtension
  to equip your AudioSystem with an RDS FM tuner module.



- CN4 and CN5 – CD Audio to connect a CD-ROM drive to your AudioSystem (see also the chapter *Connecting the CD-ROM Audio Cable* on page 30).



The sound card has four more internal taps which are connected in parallel with the sokkets on the end panel. These internal taps correspond to their respective input/output sockets. Bear in mind that you cannot use the internal and external input/output simultaneously. These internal taps are switched as follows (see illustration on the right):



Memory Upgrades – Installing Additional RAM.

The AudioSystem EWS®64 S is supplied with 2 MB RAM permanently installed on the card. This RAM is used for a variety of purposes. For example, the operating system of the synthesizer is loaded into this memory. It is also used as temporary storage for digital audio channel data blocks. Parts thereof are also used for the storage information used for the generation of echo and delay signals. Currently, the operating system does not use more than 162 kB with the card fully functional. This leaves nearly 2 MB for your own samples, MOD files or DirectSound Static Buffers. Should you need more memory, you can always add a memory module.

Fastpage-mode compatible 4 MB, 8 MB, 16 MB, 32 MB and 64 MB PS/2 SIMM modules may be used. Use only 60 ns or faster modules. If you would like to use a 64 MB module, be sure to use one with only 8 chips rather than 32 chips. What's more, not all EDO-DRAM SIMMs work correctly with the EWS®64.

The following table lists the various usable SIMM types:

Size	Structure	Number of chips	Chip structure
4 MB	1M x 32	8	1M x 4
4 MB	1M x 32	2	1M x 16
8 MB	2M x 32	16	1M x 4
8 MB	2M x 32	4	1M x 16
8 MB	2M x 32	4	2M x 8
16 MB	4M x 32	32	4M x 1
16 MB	4M x 32	8	4M x 4
32 MB	8M x 32	16	4M x 4
64 MB	16M x 32	8	16M x 4

Be sure to arrange the right to exchange the RAM module in advance with your dealer should it become necessary.

In principle, trying out various SIMMs is no problem. If you insert them gently, nothing will be damaged on the card. The only thing that can happen is that the synthesizer section cannot be addressed and responds with an error message, or that strange, distorted sounds are produced during the playback of MIDI files.

Please insert your additional SIMM module carefully in the socket marked CN1.

The card's internal RAM can no longer be used after upgrading with a 64 MB module. The card thus will not have 66 MB after the upgrade.

PLAYBACK OF SEVERAL AUDIO FILES.

In principle, it is possible to play back, mix, change the frequency and playback speed (sample rate) and apply effects to up to 32 audio files at once via the synthesizer chip. Restrictions arise, however, due to the data transfer rates of the ISA bus. The ISA bus can theoretically transfer around 5 MB/s in burst mode. The actual data transfer rate in practice amounts to around half that rate due to hardware and system-related restrictions.

A stereo WAV file digitized with 16-bit resolution at a sample rate of 44.1 kHz would have to make it through the bus at 172 kB/s to be reproduced without errors. On the basis of this figure, around 14 files in this format could be played back simultaneously.

Then there's another obstacle: The data from various audio files are read from the hard disk in blocks in the sequence in which they were requested by the EWS®. Even if the WAV files are optimally positioned, a lot of time is lost by the reading head having to continually jump to the correct place on the hard disk. What's more, the processor is busy controlling the reading and the bus transfer. In a normal system with a Pentium 133 and a fast hard drive, the playback of more than 8 stereo tracks at once is hardly possible. Mono files are half the size, but increase the required disk activity and demands on the processor. 14 mono tracks should be possible in this case, but please remember that the processor is also busy with other tasks such as the control of the hard disk recording software.

Special demands must also be made on the recording software. It must be in a position to assign each audio track to its own WAV driver. This is a precondition to performing the mixing on the EWS®. If in doubt, check with your dealer (or our hotline) as to which programs directly support the EWS®. You can also always find the latest information on this topic on our web site (**http://www.terratec.net**).

Sampling.

The RAM of the EWS® can be used for storing, processing and reproducing your own sounds using MIDI keyboards or sequencers. A large reservoir of sounds for MIDI files, games and other applications is available from the GM/GS-compatible soundsets supplied with the card.

The "*Ed!son Micro*" editor can be used to load WAV files to the card and add them as instruments or replace the existing sounds. Generally, these are mono sounds which require one processor unit or slot as an individual instrument. Stereo sounds can be realized by loading the left and right channels into memory as separate samples and storing them under the program number of the instrument. Further details can be found in the software help.

At the present, the size of mono samples is restricted to 512 kB (1 MB for stereo samples). This results in a duration of nearly 6 seconds for 16-bit samples with a sample frequency of 44.1 kHz. This is sufficient in most cases, as the sounds are generally looped.

Please also read the "*Music with your PC*" handbook for more information on sampling.

Update and Upgrade of the Operating System.

The operating system is loaded into the synthesizer while the computer starts. This ensures that the functionality can be expanded. New effects, audio processing routines and modifications of the functions and signal paths can be implemented. Updates are improvements of the overall functions and are available from our BBS or web site; upgrades are special functions which we may offer in the course of time.

As a rule, upgrades must be purchased. We regularly provide information on this topic on our web site (**http://www.terratec.net**).

APPENDIX.

FREQUENTLY ASKED QUESTIONS.

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

Please be sure you are using the current versions of the AudioSystem EWS®64 S drivers.

The latest versions are available from the following sources:

TerraTec ReActor BBS: **+49 (2157) 8179-24** (analog)
+49 (2157) 8179-42 (ISDN)

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

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

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

I've performed the complete installation, but I don't hear anything when playing MIDI files-.

This is generally because there's no sound set (*.TTS or *.94B) loaded.

To load a sound set, either start the "SetManager" in the EWS® program group, or use the following steps to define the sets you want loaded automatically when Windows starts. Proceed as follows:

- Close all EWS® applications.
- Go to *Settings* in the *Start* Menu and select the *Control Panel*.
- Double-click *System*.
- Open the *Device Manager*.
- Double-click *TerraTec Audio Devices*.
- Click on *TerraTec EWS®64S Synthesizer*, followed by *Properties*.
- Now change to the *MIDI* tab.
- Activate *Load startup banks*.
- Click on *Load* and select a sound set. Confirm with *Ok*.
- Close all windows with *Ok*.

My MIDI sequencer program crashes regularly (e.g. with a protection fault in MMSYSTEM.DLL).

This is probably due to the settings of the virtual MIDI drivers. Ensure that the virtual MIDI drivers in a sequencer program such as Cubasis Audio AV Lite are active either as MIDI inputs or outputs, but not both. Please consult the software help for details.

I have timing problems between audio and MIDI.

It is possible to set the synthesizer driver's latency time manually. The factory setting for this value is 15 mS. Please experiment a bit with this value, as its effects on the timing can vary from system to system.

Please refer to the software help for details on setting the latency time.

The program 64SINIT.EXE reports that the sound card does not have enough free resources when starting up ('The PnP-Device .... has too few resources').

It's very likely that this is due to one of your computer's BIOS settings.

Please search your BIOS for an entry similar to the following: **`PNP OS INSTALLED: (YES/NO).`** The value in the BIOS must be set to **`NO`**, as the card can otherwise only be initialized by a PnP operating system. This is not the case with a DOS initialization, however.

If this does not help, please edit the EWS®INIT line of your **`AUTOEXEC.BAT`** by adding the parameter O (as in Oscar):

```
@C:\EWS64\64SINIT.EXE F O V B GSSBK320.94B
```

The joystick doesn't work.

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

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

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

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

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

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

A typical line could look like this:

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

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

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

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

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

3. Check the *Game Port MIDI Routing* settings using the *ControlPanel*. No MIDI signals are sent to or received from the Game/MIDI port if the switch there is set to *GAME Port MIDI OFF* (the game port will remain available, of course). If you have set the *Game Port MIDI Routing* to MIDI-1, all MIDI data will also be sent to any devices that may be connected to the Game/MIDI port. If you are using external MIDI devices, it is best to set the *Game Port MIDI Routing* to MIDI-2.

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

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

Why doesn't Cubasis AV Lite run smoothly, or why do the audio and MIDI diverge?

The problem is that Cubasis AV uses an audio driver for synchronization.

It's very likely that you haven't adjusted the synchronization and that Cubasis AV-SE therefore isn't running accurately.

Perform the following adjustment:

- Open *Cubasis AV* in the EWS® program group.
- Open the *Audio* menu and select *Hardware Settings*.
- Click on *Additional Settings*.
- The choice of audio drivers for audio playback within Cubasis is important now.
- If you use a *EWS® Synth Play* driver, select "*Sample Position*" for the *Sync Reference*.

Graphics boards may also be a source of timing or synchronization problems. To localize possible errors, use the standard Windows VGA driver and switch off any 3D functions.

If this corrects the problem, check with the manufacturer of your graphics board for updated drivers.

When restarting Windows 95 after installing the drivers, I get the error message "Windows protection fault while initializing IOS device".

The Windows protection fault can be corrected by renaming the file **RMM.PDR** in the **\WINDOWS\SYSTEM\IOSUBSYS** folder to **RMM.BAK**.

The simplest method for renaming the file is to use the Windows Explorer.

The TerraTec hotline

If you should still have any problems or questions, first follow all the instructions in this manual once again. If you have any questions on MIDI or wavetable synthesis, look in the accompanying Wavetable & MIDI manual. For questions on settings of the enclosed software, you should find the EWS®64 S software manual helpful. Many difficulties can generally be quickly resolved using these manuals. If you are quite sure that you cannot get any further on your own, please call our hotline. So that your call can be dealt with promptly, please have the following information to hand:

- your registration number,
- the manuals,
- a printout of your configuration files,
- the manual for your motherboard,
- a screen dump of your BIOS configuration.

If possible, please call us from your current computer. Make a note of the name of our support team member when you call because you will need the persons name if there is a fault and you have to send the card in to us.

Our support team may also be able to help you via the Internet:
`http://www.terratec.net/support.htm`

Here, too, it is advisable to have at your fingertips all the information concerning your computer. The more precise the information that you can give our support staff, the better the chance that we can help you quickly.

Please do not write in to us for assistance - either by post, fax, e-mail or carrier pigeon! For administrative reasons we are not able to deal with requests in writing.

TERRATEC SERVICE

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

Your advantages are:

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

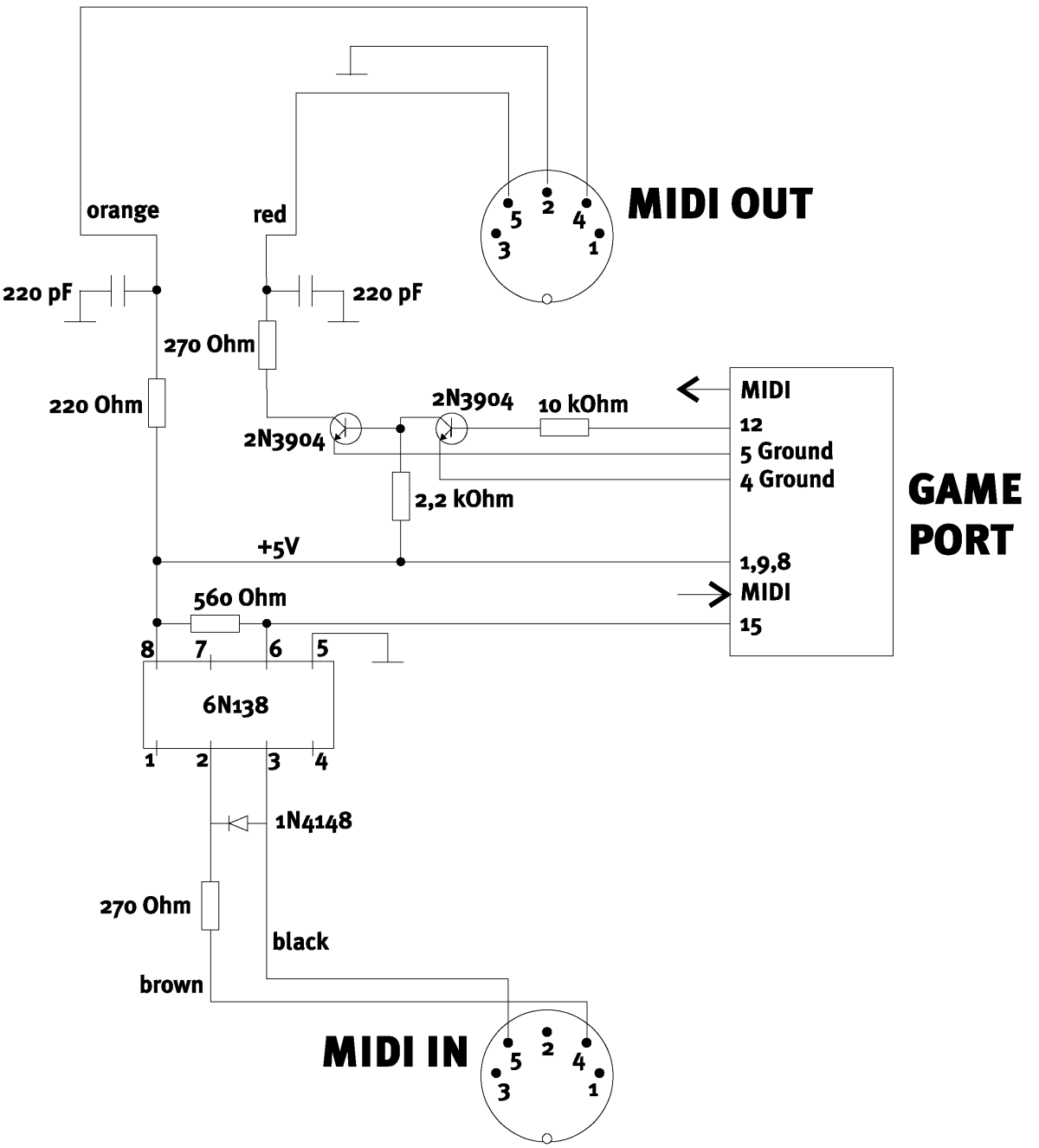
If you run into a problem you cannot solve please phone our hotline and note the name of the person who takes your call, because this will ensure that your card is not sent in vain.

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

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

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

SWITCHING OF THE MIDI INTERFACE



Glossary.

µ-law

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

16-bit expansion slot

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

4OP+

Special algorithm for generating FM sounds with 4 operators.

5.25“ module

Modular insert for the EWS®64 XL AudioSystem (optionally available for the EWS®64 L) in the format of a 5.25“ PC drive. This module contains 4 5-pin DIN connectors (2 MIDI In/Out) for the connection of devices to the two MIDI interfaces, as well as 1 switchable optical/coaxial digital input, 2 coaxial digital outputs and a headphone socket. It also contains the connector for an optional wavetable module.

8 Mbit

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

A-law

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

AdLib

One of the first manufacturers of sound cards. The AdLib standard defines the address for generating FM sounds.

ADPCM

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

analog

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

Applications

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

ATAPI-IDE

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

Audio streams

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

AudioRendering

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

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

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

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

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

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

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

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

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

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

Chip
Another name for integrated circuit (IC).

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

Configuration files
The CONFIG.SYS and AUTOEXEC.BAT boot files and the initialization files SYSTEM.INI and WIN.INI of Windows 3.1x are the files responsible for configuring the computer and the software by loading the appropriate drivers.

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

CPU
Central Processing Unit, the main processor in a computer.

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

DAC
Digital Analog Converter

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

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

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

DIN connectors
5-pin connectors for standard MIDI connections.

Direct Memory Access
Direct access to RAM bypassing the CPU.

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

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

DMA channels
Signal lines for direct memory access.

DMA
Direct Memory Access.

Double-speed
A measure of speed for CD-ROM drives, twice the speed of an audio CD player. The higher the speed, the faster the data-transfer rate of the CD-ROM drive. 16-speed drives are now common.

download
The process of transferring files from another compute, generally a mailbox, to the local computer.

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

Drumkit
A set of matched percussion instruments

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

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

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

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

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

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

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

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

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

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

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

General MIDI

Roland-developed standard for assigning instruments to the 127 program numbers of a MIDI channel. The standard also defines channel 10 as the percussion channel and assigns the percussion instruments to the MIDI note numbers.

General Synthesizer

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

GM

General MIDI

GS

General Synthesizer

Hard disk recording

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

Input/output address

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

Input/output address

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

Internet

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

Interrupt

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

IRQ

Interrupt request.

ISA bus

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

Joystick

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

Jumper

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

Keyboard

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

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

MailboX
Computer accessed by means of a modem and a telephone line. Mailboxes (BBS, Bulletin Board System) are a service provided by companies so that users have fast access to new drivers, utilities and useful information.

Main processor
CPU, central processing unit.

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

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

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

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

MIDI keyboard
A piano-like keyboard for driving MIDI sound generators

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

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

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

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

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

MPU-401

Roland-developed hardware interface for MIDI-compatible PCs. Today, this interface is an established standard for GM music playback in games under DOS, because the games require direct access.

MT32

Roland-developed MIDI instrument which was the standard instrument for MIDI playback in many games prior to the introduction of the GM standard. The popularity of this sound generator has since declined.

Multimedia PC

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

Operating system

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

PCI

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

Pentium

Intel processor family, the successor of the 486 processor.

Plug and Play

A standard developed by Microsoft and Intel which aims at optimized, conflict-free automatic assignment of system resources when the computer boots. Requires increased manufacturing complexity, because the system must be informed which resources are available.

PnP

Plug and Play

Polyphonic

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

PS/2 SIMM module

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

Resources

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

Roland Sound Canvas

A GM/GS module used by many musicians who produce MIDI music for games. Also popular among amateur musicians.

ROM

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

S/PDIF

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

Sample format

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

Sample RAM

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

Sample rate

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

Sampler

An expression used in the music sector for an electronic musical instrument which uses digitized audio data as its basic sound source. This can be produced in the sampler itself. In a sample player this audio material is hard-wired in ROM and cannot be overwritten with user sounds. These are often referred to among musicians as „romplers“ (ROM samplers).

Sampling

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

SB Pro

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

Screenshot

A printout of the screen contents obtained by hitting the Print key on the computers keyboard.

SCSI

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

Sequencer program

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

SFX-Kit

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

Signal-to-noise ratio

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

Slot

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

Soundblaster Pro

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

Soundblaster

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

Start files

Files automatically processed by the operating system when a computer boots and which configure and initialize the computer system. The start files for DOS are the CONFIG.SYS and AUTOEXEC.BAT, for Windows 3.1 and 3.11 they are the SYSTEM.INI and WIN.INI, whereas for WIN95 they are the registration database with the files SYSTEM.DAT and USER.DAT.

Synthesizer

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

TerraTec Electronic GmbH

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

Web page

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

Windows 95

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

WSS

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

Y-adapter

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