AudioSystem

EWS 88 MT

The ultimate MultiTracking solution

AudioSystem

EWS 88 D

Advanced Digital Audio Tool

English Manual

Version 1.0, dated 25.05.00

CE Declaration

We:

TerraTec Electronic GmbH · Herrenpfad 38 · D-41334 Nettetal

Declare that the following products:

Audiosystem EWS88 MT

Audiosystem EWS88 D

which are referred to in this declaration, are in compliance with the following regulations:
1. EN 55022

2. EN 50082-1

The following user conditions and application requirements apply:

Private use, business and commercial use.

This declaration is based on:

Test results of the EMV-Prüflaboratorium

Contents

Hello!

You are now the proud owner of TerraTec's EWS AudioSystem for music and audio-production and we congratulate you on this decision. You have chosen a state-of-the-art audioproduct and we are confident that the AudioSystem will serve you to your expectations and will provide you with lots of fun in the years to come.

This manual will cover both EWS 88 MT and EWS 88 D. The installation and use of the two is generally identical and, as such, we will only go into some specific details wherever necessary. Following is a summary of what you now have in front of you.

AudioSystem EWS88 MT

High-quality audio performance.

The AudioSystem EWS88 MT gives you analogue recording and playback of audio to a very high standard. The break-out box 88AX is equipped with the latest 24-bit converters with up to 96 kHz sample playback rate. This results in a remarkable s/n ratio of 108dB(A) using the analogue outputs!
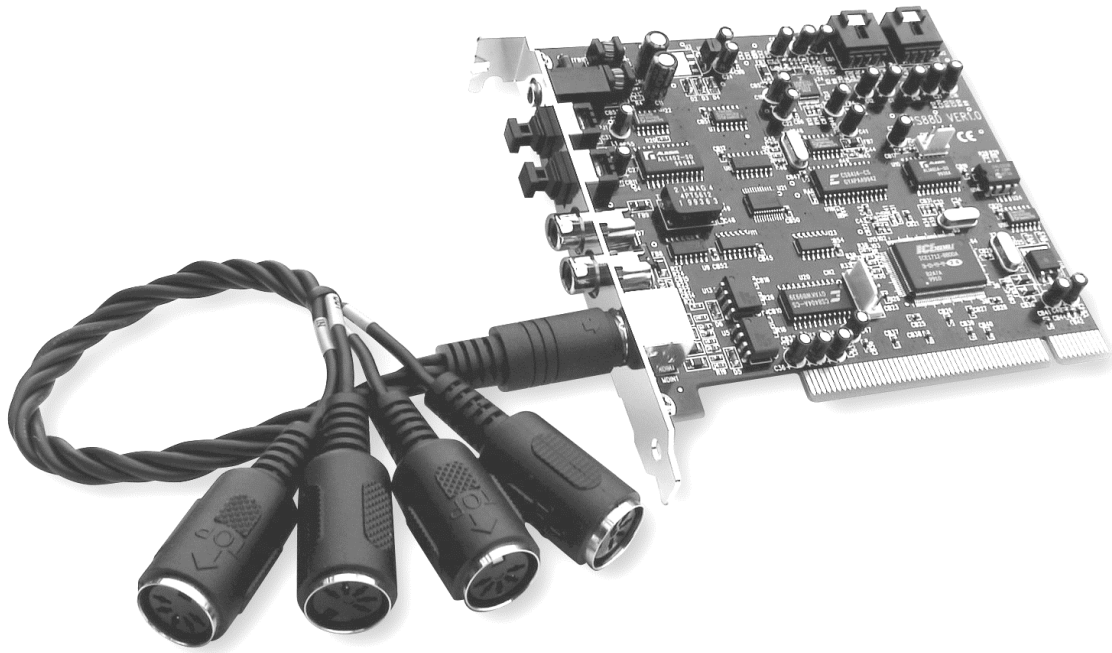
AudioSystem EWS88 D

Flexible ADAT connectors.

The AudioSystem EWS88 D gives you digital recording and playback with its ADAT-Lightpipe-Interface. This offers up to 8 audio channels with 24-bit resolution. The optical interface can also transmit S/PDIF-standard signals and Raw-Data, like Dolby AC-3. Last but not least, ADAT signals can be converted to S/PDIF signals and vice versa.

Recording and playback of audio in the digital domain.

The AudioSystem EWS88 is equipped with one stereo 24-bit S/PDIF-format connector for transferring recordings from DAT or Minidisk to your PC entirely in the digital domain. In addition, you have full access to all common sampling frequencies and their settings like copy-protection and generation-bit. The optical S/PDIF-Interface on the EWS88 D gives the same features (i.e. AC3 and DTS).

Software à la carte.

The ControlPanel – the brain of your EWS88 – will become indispensable before you know it. It features a well laid-out user interface, and intuitive control of the card's settings make the day-to-day use as easy as possible. You will also find Emagic's® MicroLogic AV (EWS-Edition) as part of the software package to get you started. The current version 4.1 of the MIDI/Audio-Software offers you real 24-bit hard disk recording.

The drivers' quality leaves no-one second-guessing. Special ASIO 2.0- and GSIF support allows for incredibly low latency.

We hope you will enjoy using the EWS 88 and suggest, to flip through the manual every now and then. Apart from the necessary technical information, we have prepared diagrams and examples in the relevant sections of this manual. We believe that even experienced users will be able to learn something. **At least you should read the small summaries,** which are framed and highlighted with an exclamation mark. The frames summarize the following paragraph and contain important tips concerning the setup, which will make your everyday work with the EWS so much easier.

Enjoy

... Your TerraTec Team!

Tips for owners of AudioSystems EWS64.

If you own an AudioSystem EWS64 with the digital-board (one of the expansion modules or DigitalXtension 'R'), you can connect this to the EWS. Run the EWS64 S/PDIF-output to the co-axial input of the EWS88. We suggest you read the paragraph on digital synchronization via S/PDIFon page 37 *"The ADAT connectors on EWS88 D."*.

One more thing, though: The "Control Panel" in this manual refers to the supplied software package for the AudioSystem EWS88. The good old EWS(64)-Panel will be referred to explicitly when necessary.

Multiple EWS 88 in one system.

Up to four EWS88 can be installed and run in sync in one PC. This configuration produces 40 in and outputs, which can all be accessed from your favorite sequencer. Both cards – EWS88 D and MT – may be combined freely.

Currently (driver version 4.02.16.98) you have access to only 1 SystemSound output when running multiple EWS 88 – the most recent driver will be activated automatically.

To ensure faultless operation of multiple PCI cards, all PCI cards must be connected to each other using a special connector cable (supplied), or the optional EWS® ClockWork. This connection will guarantee perfect sync of all cards. Please read the chapter entitled "Card connectors and their applications." starting on page 33.

The EWS88's ControlPanel recognizes individual cards automatically and allows you to control the settings on every individual EWS 88 . This way, you will never be shown any "useless" parameters.

INSTALLATION.

> *Tip!* Even as a professional you should at least read "Software" from page 47 onwards. The information with regards to the drivers and the ControlPanel is essential in the understanding of the system.
> Thank you.

A quick summary for all quick-starters:

- Both EWS88 D and MT are PCI cards (as you have probably noticed). They should be installed as far away as possible from graphics cards or SCSI controllers.

- The 88AX module (only supplied with the MT version and *only* to be used with this) can also be mounted externally. Both connection cables cannot be plugged in the wrong way around.

- Before installing multiple EWS88 (whether MT or D, or mixed), each of the cards must be defined as MASTER or SLAVE through the cards' software. Read Page 44 to find out more.

- You will require 1 IRQ. If you wish to install multiple EWS88, you can do this – the cards operate on a IRQ-Sharing-system.

- You will need a few free addresses (usually not a problem).

- Driver installation follows the usual standard, all drivers are supplied on the CD ROM.

- After installing the drivers, check the Device Manager and look out for any exclamation marks. If you see them, you have a problem. Possible solutions are listed in the FAQ to be found on CD.

- Having installed the drivers, the software installation will start automatically. It is essential to install the ControlPanel.

This concludes the quick-start manual. A detailed description with diagrams and pictures of the installation process follows next.

Construction of the EWS88 MT.
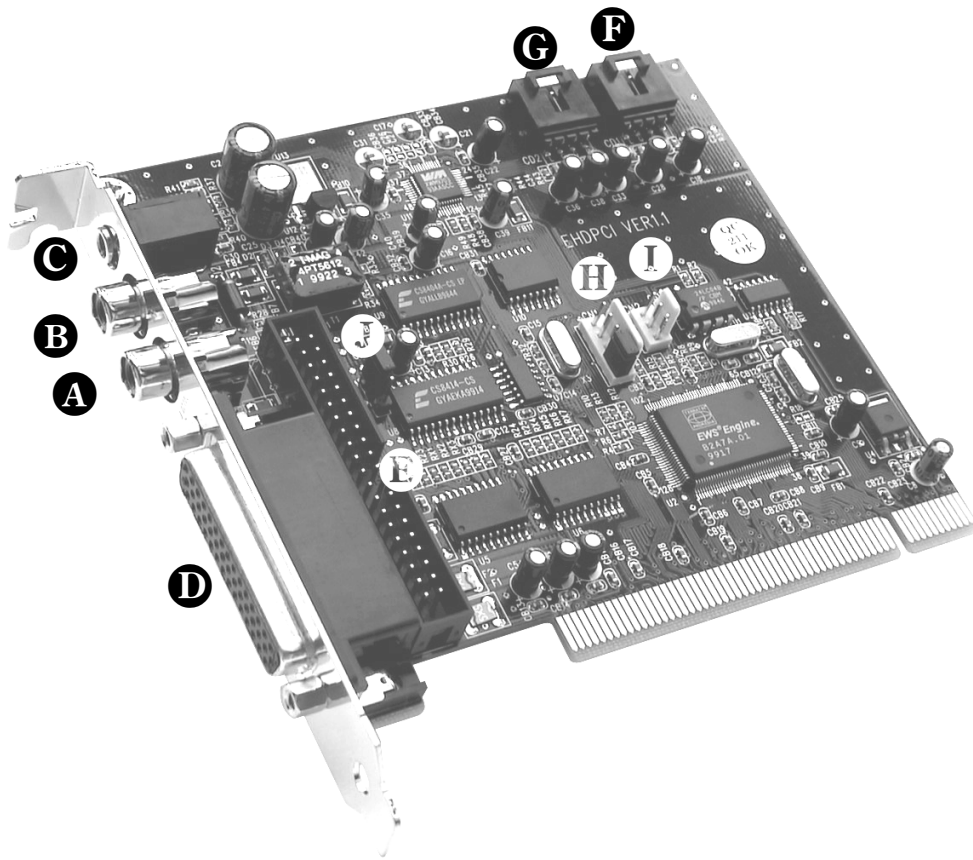
A Digital input (S/PDIF and RAW-Data)

B Digital output (S/PDIF and RAW-Data)

C Separate analogue output (SystemSound output, i.e. for system sounds)

D Connector for break-out box (external)

E Connector for break-out box (internal)

F 1st CD audio connector

G 2nd CD audio connector

H EWS®-Connect: Sync-IN-connector for cascading (5-pole, the plug must remain inserted on the master card!)

I EWS®-Connect: Sync-OUT connector for cascading (3-pole)

J Jumper only(!) for internal testing purposes (the jumper **must not** be removed)

Construction of EWS88 D.
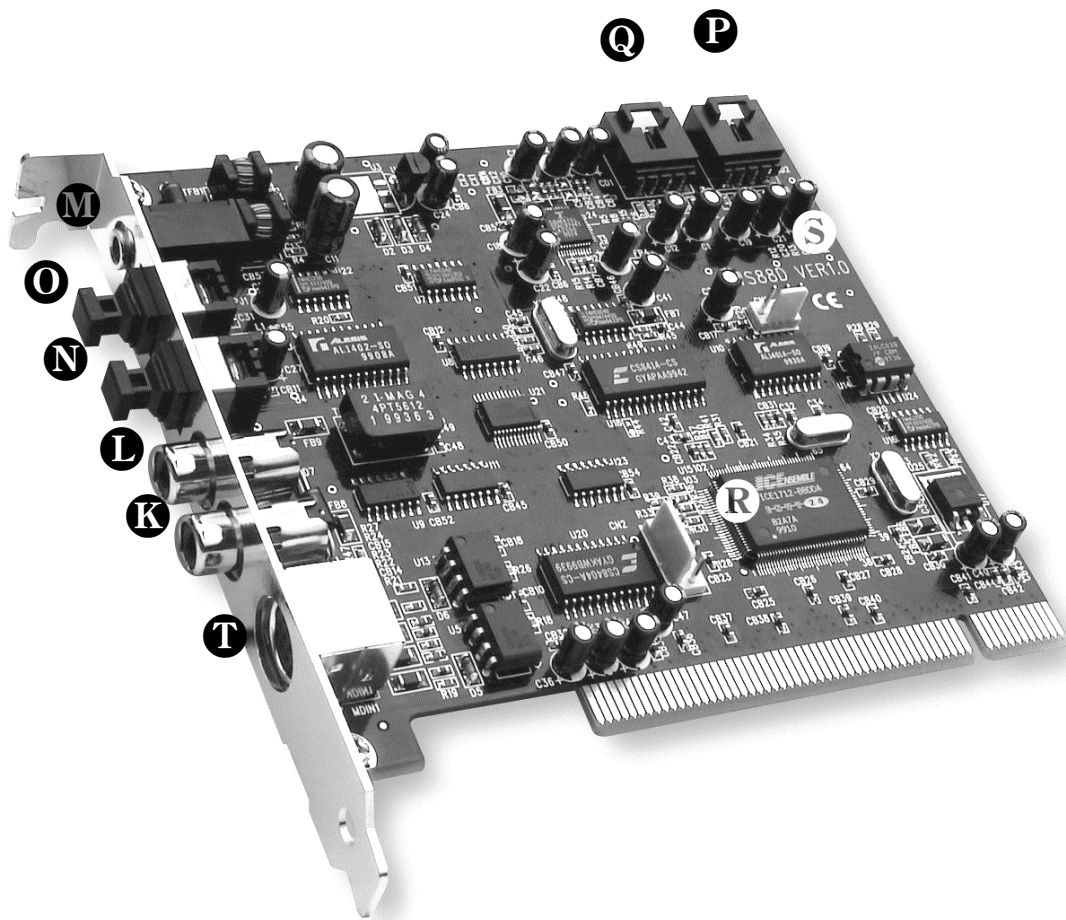
Ⓚ Digital co-axial input (S/PDIF and RAW-Data)

Ⓛ Digital co-axial output (S/PDIF and RAW-Data)

Ⓜ Separate analogue output (SystemSound output, i.e. for system sounds)

Ⓝ Digital optical input (ADAT, S/PDIF and RAW-Data)

Ⓞ Digital optical output (ADAT, S/PDIF and RAW-Data)

Ⓟ 1st CD audio connector

Ⓠ 2nd CD audio connector

Ⓡ EWS®-Connect: Sync-IN-connector for cascading (5-poe, the plug must remain inserted on the master-card!)

Ⓢ EWS®-Connect: Sync-OUT-connector for cascading (3-pole)

Ⓣ Multipin-connector for 2 MIDI I/O

Connecting the 88AX break-out box.

Supplied with the AudioSystem EWS88 MT is a break-out box equipped with 8 analogue in and outputs and two MIDI sockets. It contains high quality 24-bit AD/DA converters and can be placed inside a vacant 5.25-inch bay in your PC or externally. As the case is well shielded, you don not have to worry about noise-„pollution" when installing the break-out box. However, we recommend to keep it from close proximity of a mixing desk or synthesizer, or purely for esthetical reasons if you own multiple EWS 88s and your PC does not offer enough vacant drive bays.

Important: The break-out box must not be disconnected from the card while in operation! This may destroy it..

You will find more information in chapter "Card connectors and their applications." from page 33.

Installing the PCI card.

Before you install the card, please be aware of any particularities of your PC. It is best to refer to your PC's manuals and the manuals of any other cards you may have installed.

As long as you follow the tips, you should not run into any trouble.

If you still encounter difficulties, simply read the corresponding chapter in this manual thoroughly.

If you are still none the wiser, our Service-Hotline will be able to assist you.

First, take some time to check the contents of the overall package.

Included with the AudioSystem EWS88 MT you find:

1 PCI-Sound card TerraTec AudioSystem EWS88 MT

1 Break-out box (88AX)

1 Cable for external connection card -> break-out box

1 Ribbon cable for internal connection card -> break-out box

1 Adapter for internal connection card -> break-out box

1 Internal Sync-cable for cascading multiple EWS88 MT

4 Rubber feet to protect surfaces

4 Screws with bolts to install the break-out box

1 Audio lead minijack -> RCA

1 Installation and driver CD

1 Manual

1 Service form

1 Registration card with serial number

Included with the AudioSystem EWS88 D you find:

1 PCI-Sound card TerraTec AudioSystem EWS88 D

1 MIDI adapter

1 Internal Sync-cable for cascading multiple EWS88

1 Installation and driver CD

1 Manual

1 Service form

1 Registration card with serial-number

You can return your registration card to us, or you may use our website to register on `http://www.terratec.net/register.htm`. This is important for support and the hotline.

> **Warning.**
> Unplug your PC from the socket and remove the cable from the back plate before opening it!

And now step-by-step:

- Switch off your computer, as well as all peripherals such as your printer and monitor. Do not unplug it, yet. This provides additional grounding.

- Touch your computer's back plate to discharge any static you might carry. Now you can remove the power chord.

- Open your PC.

- (ONLY EWS88 MT) If you want to install the 88AX box internally, you must find a vacant 5.25-inch drive bay. Depending on your PC, you might have to remove its front cover with suitable tools. Please take extra care when doing this, as sharp edges may cause injury.
  Tip: choose a bay located directly under an existing CD drive. Otherwise suspended cables will literally drive you `round the bend every time you change a CD.
  Connect the ribbon cable to the back of the break-out box using the supplied adapter and slide the box into position. Affix the box with the screws (make sure you use the bolts to ensure that the box is installed electrically safe).

- Now locate an empty PCI-slot, take out the screw, which holds the cover plate in its place, and remove it. To ensure maximum system performance, choose a slot, which is not immediately next to an existing card, as some components such as graphics-cards and SCSI devices may transmit signals which interfere with the EWS88 card.

- Carefully remove the packaging and hold it with one hand on its edges, the other hand on the metal PC case.

- This will ensure that your electrostatic charge discharges into the PC case and won't damage the sound card. Under no circumstances you must touch the card's electrical components.

- (ONLY EWS 88 MT) After placing the break-out box inside your PC, connect it to the card.

- If applicable, connect CD drives, additional EWS88 or the optional EWS®ClockWork and card. Please note the corresponding installation directions (to CD-drives page 42; for cascading from page 44).

- Align the golden connector with the length of the PCI slot.
  Gently press the card into the slot. The pressure must be evenly applied to the whole length of the card in order to slot in. It is important that you do not press the card too hard, as you may damage the card.

- Secure the card to the expansion slot with a screw.

- Replace the cover onto your system.

- (ONLY EWS88 MT) If you have not installed the 88 AX box inside your PC, connect it to the back plate of the card using the supplied cable. It can be screwed to the connector at both ends. It is not possible the wire the card and the box incorrectly due to the lay-out of the plugs.

- (ONLY EWS88 D) Connect the MIDI-lead to its connector on the back of the PCI card.

- Connect your peripherals (Mixer, Synthesizer, Monitors) to the EWS88. (Read the chapter "Card connectors and their applications." starting on page 33).

- Plug in your PC. Set the monitors or your Hi-fi to a low volume level. Switch on your PC.

INSTALLING DRIVERS.

The AudioSystem EWS88 is currently supplied with drivers for Windows 95 (including the various Service-packs), Windows 98 and Windows NT4. Before installing the drivers, find out which operation system you are using. For Windows 95 in particular there are a number of versions which are to be differentiated.

You will find the information about your operating system and its various versions in the SystemProperties page in your Windows ControlPanel.
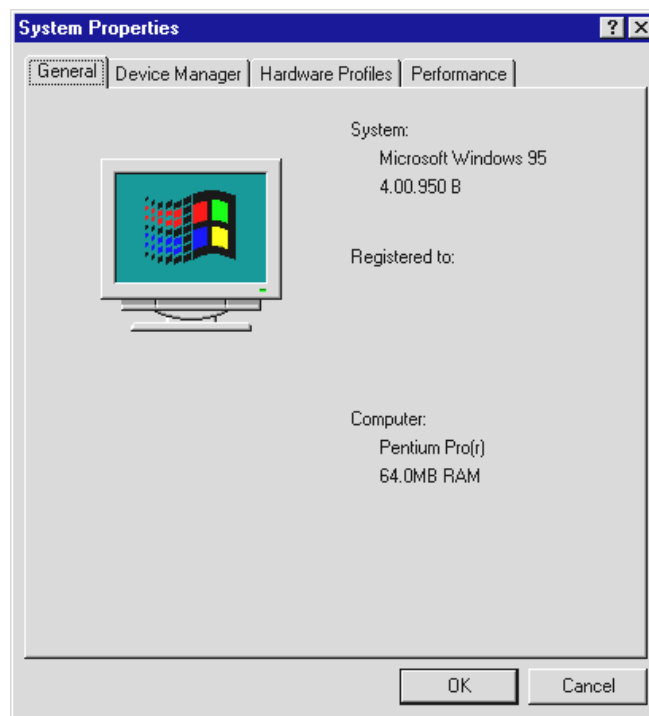
For example, this displays the operating system as Windows 95 Release OSR2.

We recommend running the card under Windows 98. The current version of this operating system offers better MIDI- and audio-compatibility. Better timing and improved system performance are the result – Qualities, which are of high priority to the professional musician. Therefore: It's worth it.

In the following guide to the driver installation `<CD>` stands for drive, which is associated with your CD ROM drive, which holds the EWS88 AudioSystem driver CD.

Installation in Windows 95A (OSR1).

As soon as you have installed the AudioSystem EWS88, Windows 95A recognizes the card as a new hardware component and shows you the following screen.

*Choose "Driver from disk provided by hardware manufacturer" and click **OK**.*

There will be a message from bygone days, when drivers used to fit onto a single floppy disc ;-) .

Enter the path `<CD>:\Driver\Win9x\` *and click **OK**.*

Alternatively, you can choose the correct path using your mouse. Simply click on Browse.

Windows now installs the drivers automatically, and confirms this with different windows, which you can take note of. Nothing else should happen at this stage. If you encounter any other messages, pressing return is usually a good idea.

If Windows asks you for further drivers, refer to the previous path with the EWS88-CD. It is also possible that some Windows extensions need to be installed alongside. (i.e. if this is the first installation of a sound card in your system). Keep your Windows CD handy.

Having installed the drivers, the software installation should start automatically. If this does not happen, you need to start the setup program manually from the EWS88-CD .

```
<CD>:\Applications\Setup.exe
```

Follow the setup process on your screen, where basically nothing can go wrong. It is essential for using this manual, that you install the EWS ControlPanel. The other software is not essential, but useful nevertheless.
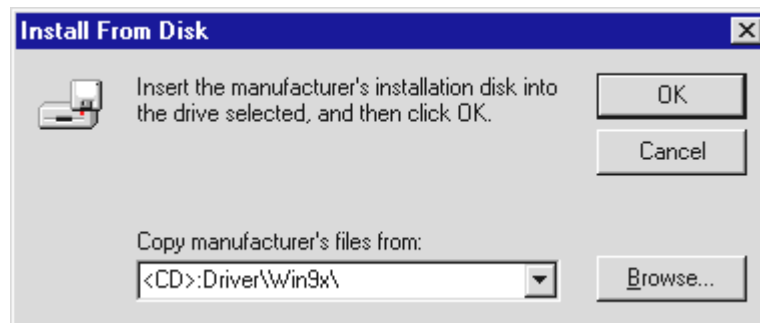
Installation in Windows 95B (OSR2).

As soon as you have installed AudioSystem EWS88, Windows 95B recognizes the card as a new hardware component and shows you the following screen.
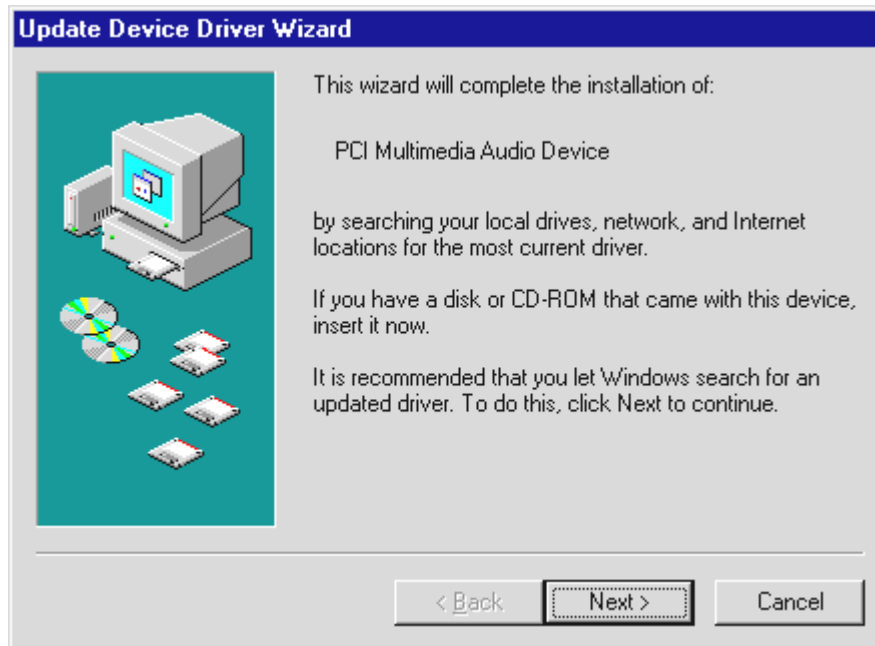
click "next".

Click "Other Locations".
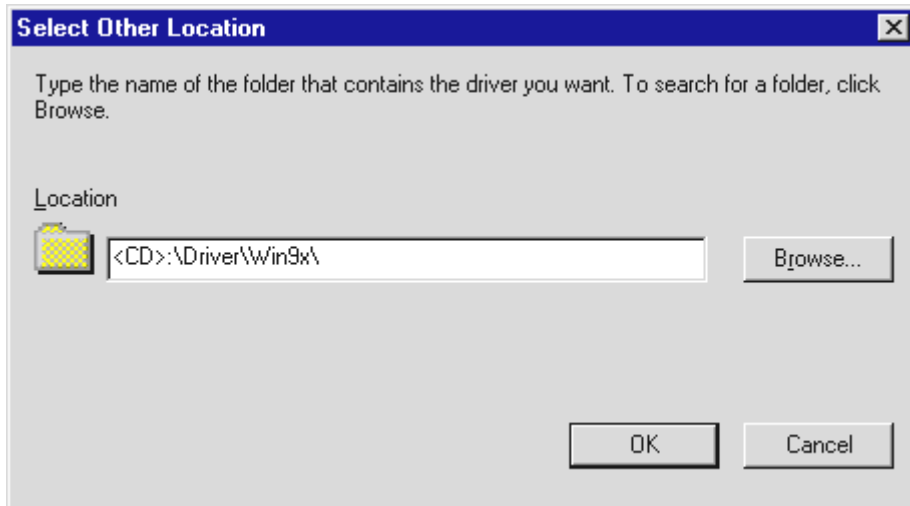
*Enter the path `<CD>:\Driver\Win9x\` and click **OK**.*

Alternatively, you can choose the correct path using your mouse. Simply click on Browse.

If you have entered the path correctly, Windows has found the corresponding driver. Click "Finish".
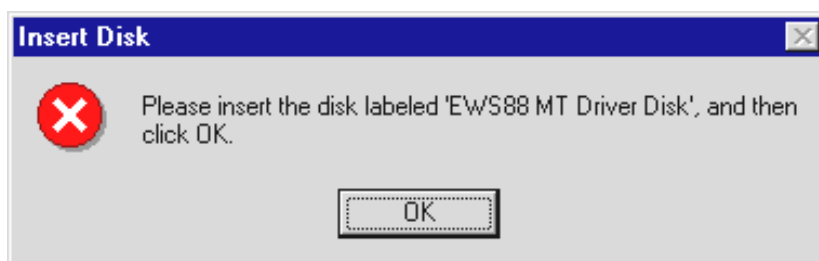
*If this screen appears, click **OK**.*
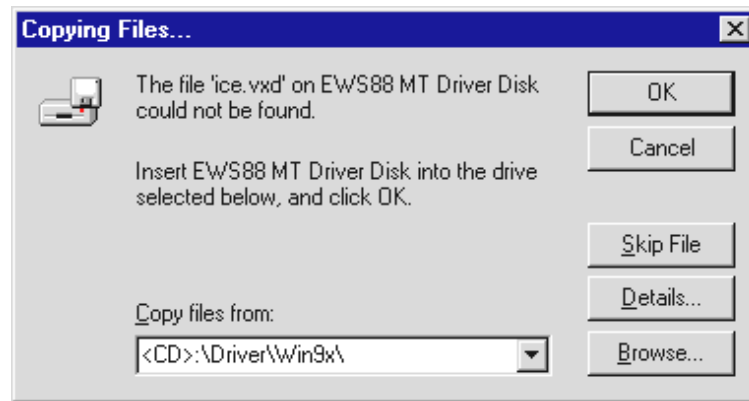
*Enter the path `<CD>:\Driver\Win9x\` again and click **OK**. Alternatively, you can choose the correct path using your mouse. Simply click on "Browse".*

Windows now installs the drivers automatically, and confirms this with different windows, which you can take note of. Nothing else should happen at this stage. If you encounter any other messages, pressing return is usually a good idea.

If Windows asks you for further drivers, refer to the previous path with the EWS88-CD. It is also possible that some Windows extensions need to be installed alongside. (i.e. if this is the first installation of a sound card in your system). Keep your Windows CD handy.

Having installed the drivers, the software installation should start automatically. If this does not happen, you need to start the setup program manually from the EWS88-CD .

`<CD>:\Applications\Setup.exe`

Follow the setup process on your screen, where basically nothing can go wrong. It is essential for using this manual, that you install the EWS ControlPanel. The other software is not essential, but useful nevertheless.

Installation in Windows 98.

As soon as you have installed AudioSystem EWS88, Windows 98 recognizes the card as a new hardware component and shows you the following screen.
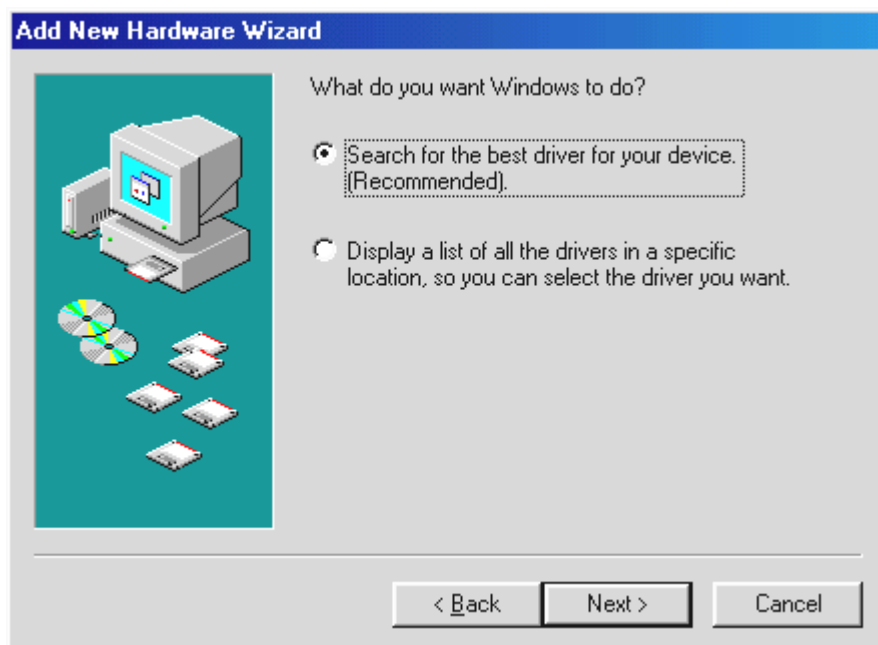
Click "Next".

*choose "Search for the best driver for your device. (Recommended)." and click "Next".*

Enter the path `<CD>:\Driver\Win9x\` *and click "Next".*

Alternatively, you can choose the correct path using your mouse. Simply click on Browse.

Click "Next".

To finish installation, click…"Finish"!

Windows now installs the drivers automatically, and confirms this with different windows, which you can take note of. Nothing else should happen at this stage. If you encounter any other messages, pressing return is usually a good idea.

If Windows asks you for further drivers, refer to the previous path with the EWS88-CD. It is also possible that some Windows extensions need to be installed alongside. (i.e. if this is the first installation of a sound card in your system). Keep your Windows CD handy.

Having installed the drivers, the software installation should start automatically. If this does not happen, you need to start the setup program manually from the EWS88-CD .

`<CD>:\Applications\Setup.exe`

Follow the setup process on your screen, where basically nothing can go wrong. It is essential for using this manual, that you install the EWS ControlPanel. The other software is not essential, but useful nevertheless.

Uninstalling drivers in Windows 95 and 98.

If you wish to remove the drivers from your system, it is best to do this using the DeviceManager before physically removing the card. Highlight the *AudioSystem EWS88* entry and remove it, that's all.
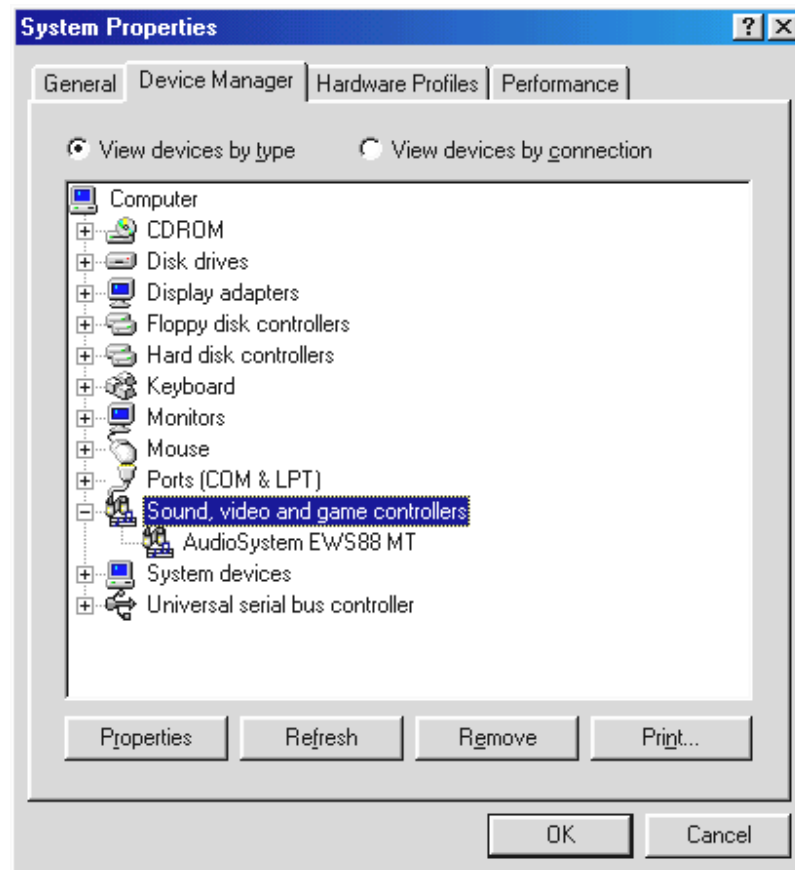
Removing the software is just as easy. Search for the programs in Add/Remove Programs in your Windows ControlPanel. Highlight the programs you wish to remove and click "Add/Remove"....

Installation in Windows NT 4.0.

When installing AudioSystems EWS88 in Windows NT you need to consider, that you need to be a registered administrator.
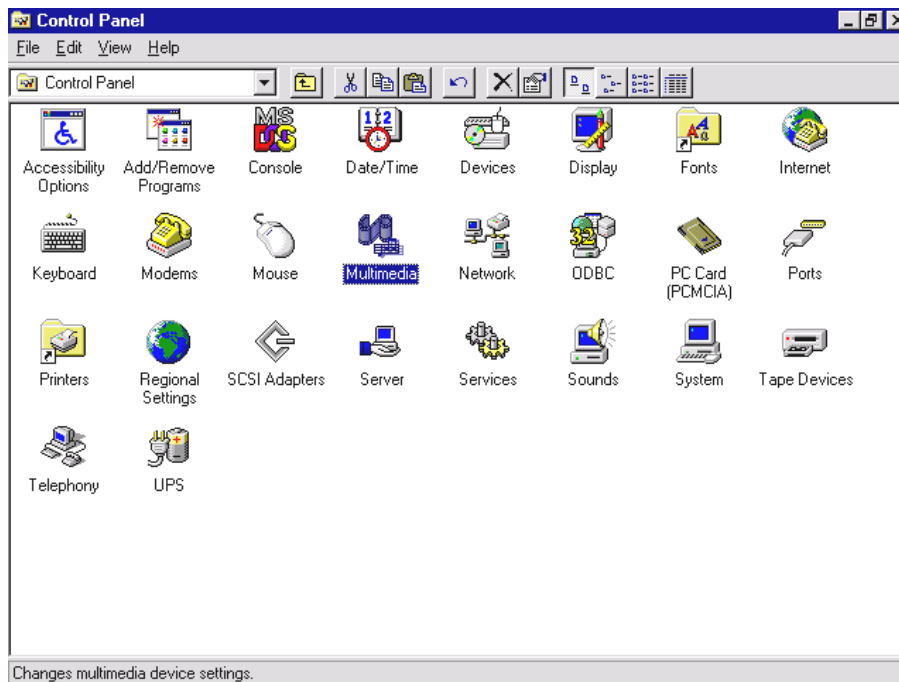
Open the Multimedia section in your Windows ControlPanel and ...
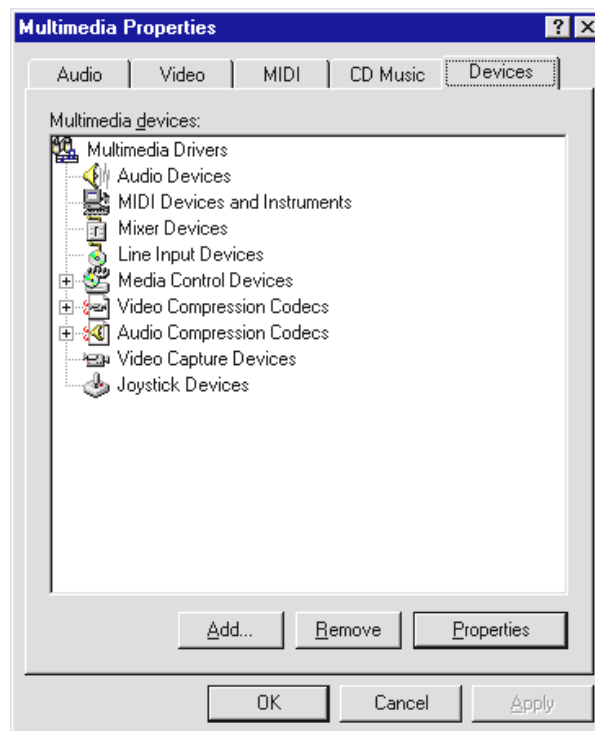
... choose "Device".
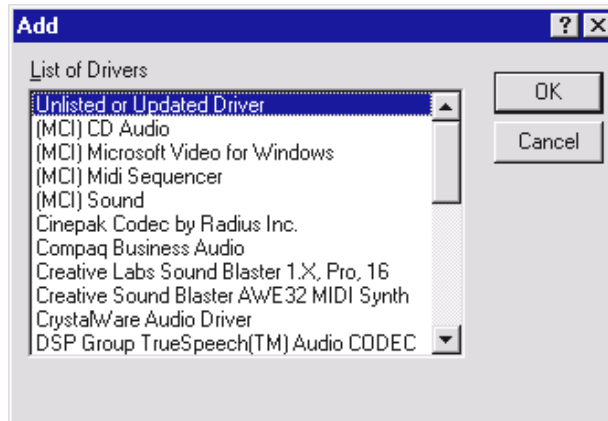
*Chose "Unlisted or updated Driver" and click **OK**.*
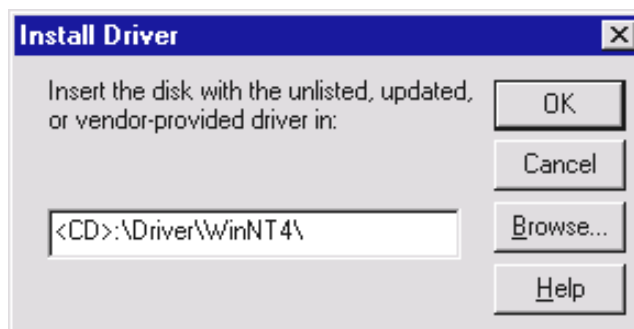
*Enter the path `<CD>:\Driver\WinNT4\` and click **OK**.*

Alternatively, you can choose the correct path using your mouse. Simply click on "Browse".
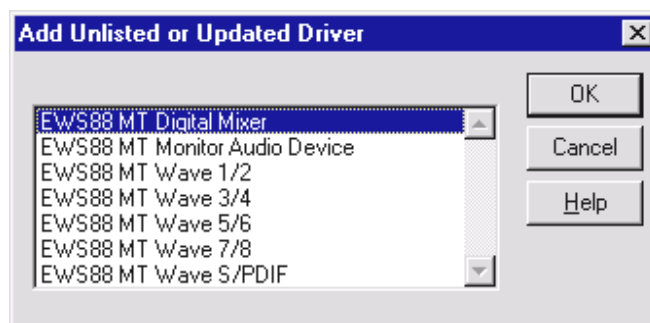
*All 7 drivers for **AudioSystems EWS88** must be added one after another. Highlight one of the drivers and click **OK**.*

If your system has previous drivers for EWS88, the following window will appear:
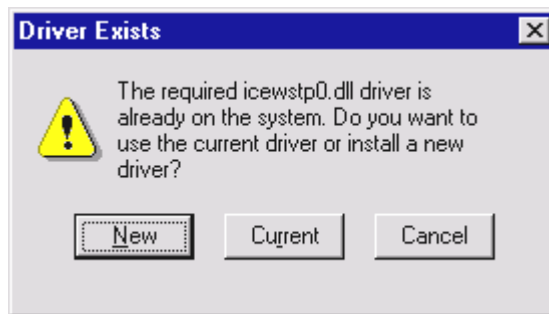
Click "New", so older drivers can be EWS88 overwritten.

After the new drivers have been installed, you will be asked to restart your system.
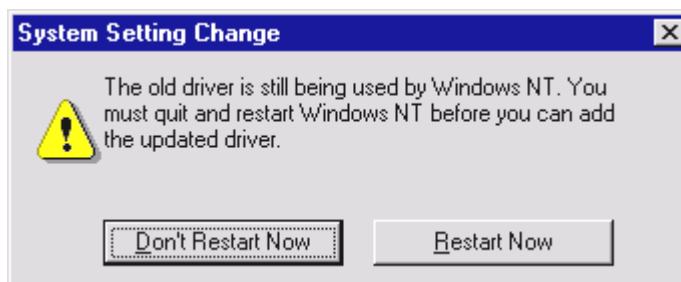
If you have not finished installing all 7 drivers for EWS88 do not restart your machine.

Repeat all previous steps until all 7 drivers have been added to your system. Once you have installed all drivers, you need to restart your computer.

Having installed the drivers, the software installation should start automatically. If this does not happen, you need to start the setup program manually from the EWS88-CD .

`<CD>:\Applications\WindowsNT\Setup.exe`

Drivers installed – this is what it looks like.

Having successfully installed your drivers, you should check that everything in your Windows 9x- system is in working order. The Device Manager lists all the installed recognized hardware components in your PC. You can find the Device Manager in the system icon in your Windows ControlPanel.
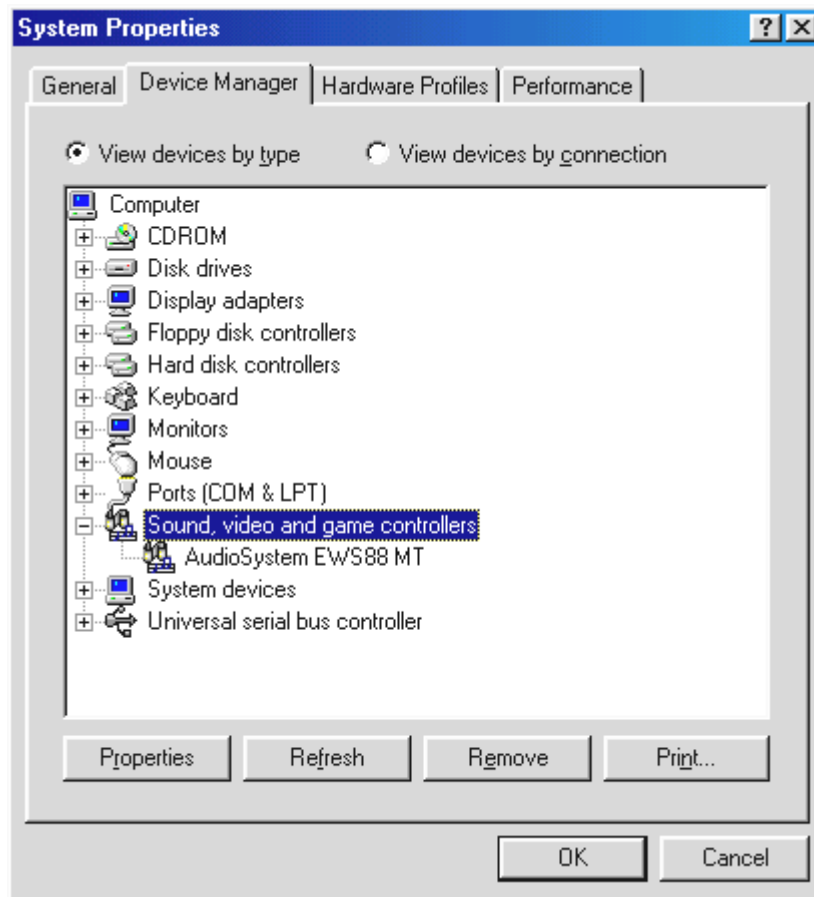
If everything is installed correctly, it should look something like this. The window shows the root for **Sound, video and game controllers**. *You can open it by clicking on the "+"-symbol to the left of the icon.*

Multimedia settings

Finally, you should check the "Multimedia"-settings on your system and adjust the playback of audio data (i.e. system sounds) using the Windows Wave-Mapper.

Look up the multimedia properties (***ControlPanel ···⋮ Multimedia***) and highlight AUDIO. The EWS88 provides several drivers for audio-playback. We recommend the driver "System WavePlay". System sounds and other applications, which use the Wave-Mapper facility, will be played back through your EWS88. Programs which use the (more important) "WavePlay x/y" drivers or ASIO will not be affected.
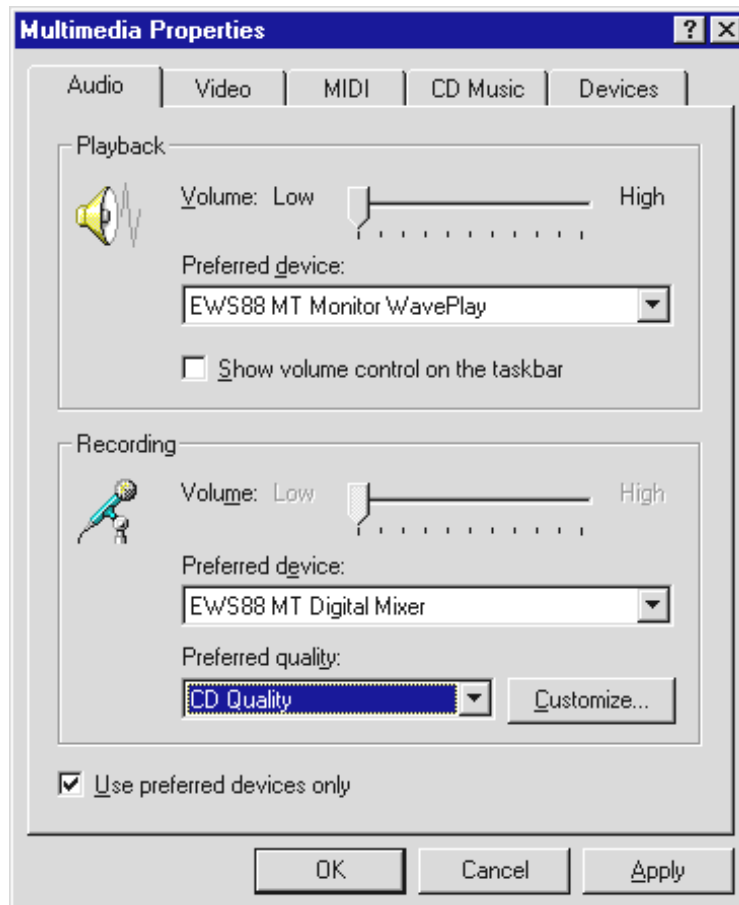
Playback of multimedia players or windows system sounds through Wave-Mapper is preferable.

For recording, it is best to use "EWS88 Digital Mixer". You probably won't use this too often, as you are more likely to select a driver from your recording software. However, it certainly cannot hurt and it is not possible to select "no driver" in any case. You can find more information on the individual drivers on page 48.

If you wish to run a card with wave-table synthesizer or software wave-table for MIDI playback (usually MIDI files) with your EWS 88, look up the MIDI settings *(MIDI).* If you have set MIDI playback to EWS 88 during installation of the drivers, select a preferred playback device (i.e. the sample playback in EWS64).
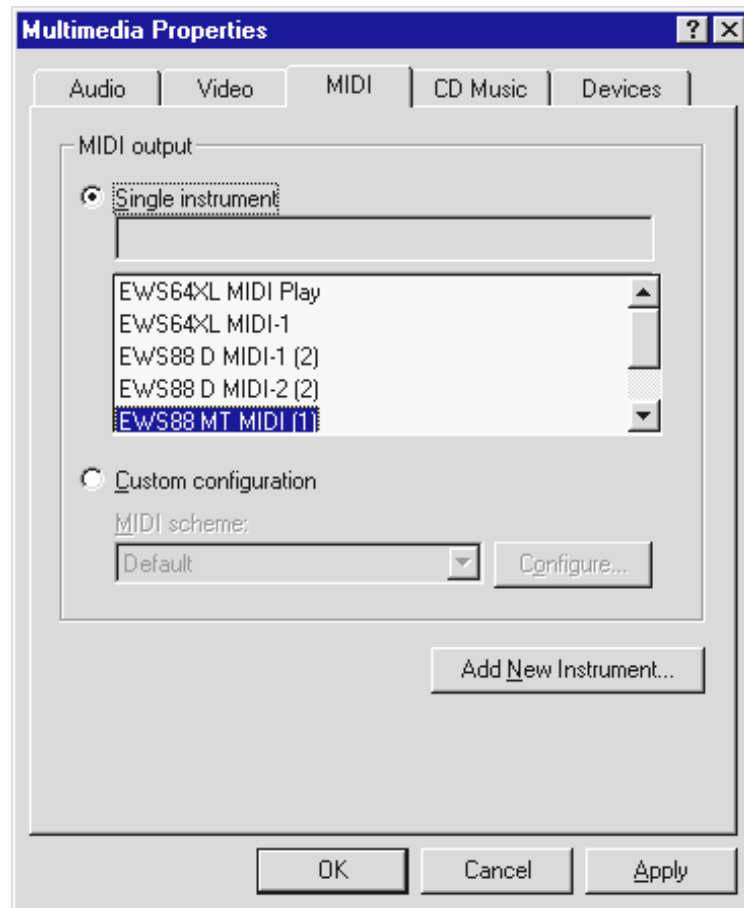
Playback of multimedia players or windows system sounds through MIDI-Mapper is preferable.

Should you select **EWS88 MT (D) MIDI,** then all MIDI data, which is using MIDI-Mapper, will be transmitted through the MIDI OUT on 88AX, or the MIDI interface on EWS88 D. This allows you to use external sound modules for playback.

Important: All settings mentioned above do not compromise MIDI playback in the most common sequencers.

CARD CONNECTORS AND THEIR APPLICATIONS.

There are numerous high-quality connecting options with the EWS88. Here we would like to explore these options and describe the corresponding setting in the EWS88-ControlPanels in detail. In addition, you will find tips for regularly used functions.

> **Tip:** In order to understand the internal routing, you should read the chapter "ControlPanel." from page 53.

ANALOGUE OUTPUTS ON EWS88 MT.

The analogue outputs on 88AX accommodate musician friendly levels of –10dBV or +4dBu. You can plug in your mixer and/or your instruments.

General.

The AudioSystem EWS88 MT is equipped with 8 high-quality outputs (labeled OUT on the break-out box), which can be accessed individually. The connectors are of the Cinch(RCA) type and are always displayed as pairs in the ControlPanel (1/2, 3/4, 5/6, 7/8). Naturally, you can also access the channels individually.

All output levels can be set between –10dBV and +4dBu in the ControlPanel's "Settings".

Safety-warning: Never plug analogue instruments into the jacks if the power is on! This will protect you from electric shocks, as well as your speakers and your hearing from sudden signal peaks. When plugging in digital instruments, you should at least turn down the volume.

ANALOGUE INPUTS ON EWS88 MT.

The line input-sensitivity on the 88AX may be controlled individually. You can switch between –10 dBV and +4 dBu and adjust the gain controls in order to make the most of the 24-bit converters.

General.

The AudioSystem EWS88 MT is equipped with 8 high-quality inputs (labeled IN on the break-out box), which can be accessed individually. The connectors are of the Cinch(RCA)-type and are always displayed as pairs in the ControlPanel (1/2, 3/4, 5/6, 7/8). Naturally, you can also access the channels individually.

The input sensitivity may be switched in the ControlPanel between –10dBV and +4dBu in "Routing / Analog Input Levels". –10 dBV is very common in home-studios (the signal-levels are comparatively low, which is compensated for with the higher input sensitivity). +4 dBu is generally a professional setting (Instruments are powerful enough, hence the input sensitivity is acceptable). If you find that one of your instruments does not deliver a high enough level, you can increase the sensitivity in 0.5dB increments in the ControlPanel.

Safety-warning: Never plug analogue instruments into the jacks if the power is on! This will protect you from electric shocks, as well as your speakers and your hearing from sudden signal peaks. When plugging in digital instruments, you should at least turn down the volume.

You can find more information on controlling inputs in the chapter "Software." from page 47.

Interesting notes.

Connecting and recording from turntable.

Very "hip" is currently the restoring and archiving of Vinyl or Schellack recordings. The AudioSystem EWS88 MT certainly does enable you to make high-quality recordings. However, there are certain considerations and we would like to point them out to you.

A direct connection to the EWS88 MT is not possible, because turntables – technically limited due to its pick-up mechanism – provide a rather weak and extremely unbalanced signal. As a result, it is vital to slot in an amplifier (hi-fi-amplifier or a dedicated phonostage with optimized distortion correction). A Hi-fi amplifier is usually equipped with a TAPE OUT socket, which you can connect to the EWS88 MT.

TerraTec does offer such a pre-amplifier for vinyl enthusiasts. The TerraTec **phono PreAmp** is equipped with a high-quality RIAA-EQ, as well as gain switches for the different cartridge formats. It also offers a mini-jack connector for use with standard sound cards. The power is supplied through the card's GAME Port. As such, it is vital to use a sound card which can operate in conjunction with the EWS88. We recommend our own TerraTec DMX Xfire 1024. Both components are probably cheaper than any comparable hi-fi amplifier equipped with a phono-stage.

Software for digital transfer and editing is included in the EWS88 package. Samplitude Project from SEK'D, for example, is optimized for handling large files and should pose no problem to beginners. However, conventional software alone is not really suited for dealing with the requirements of restoring audio files. In addition to the usual functions like editing, equalizing and volume, there are functions like removing background noise and clicks optimizing S/N ratios as well as other sound processing tools. And finally, a CD burning facility would be on everyone's wish list. All these functions are offered by specialized software, which can be purchased from the following manufacturers:

Algorithmix	`www.algorithmix.com`
Dartech	`www.dartech.com`
Diamond Cut Productions	`www.diamondcut.com`
Sonic Foundry	`www.sonicfoundry.com`
Steinberg	`www.steinberg.net`

Microphone.

The analogue inputs of the EWS88 MT do not accommodate microphones, especially not phantom powered ones (48V). The are usually equipped with a 6,3mm jack or XLR jack – so you might as well save yourself the time and not use your home-made adapters. If you are planning to record microphones with professional quality (i.e. speech, vocals or acoustic instruments), then there is no way around using additional peripherals. Dedicated channel-strips or mixing desks with suitable XLR-sockets AUX-Sends (or subgroups) can be purchased in the right shops.

The ADAT connectors on EWS88 D.

> The optical connectors on the EWS88 D accept other instruments, which respond to sending and receiving ADAT and S/PDIF signals. Included here are ADAT recorders, digital mixing desks or DAT and MiniDisk recorders. An optical connection allows for up to 8 channels to be transmitted with a sampling rate of 48kHz.

General.

Connecting ADAT compatible equipment to the EWS88 D is incredibly simple. Generally you will find a single input and a single output connector (IN and OUT). You can recognize the OUT connector by the red light shining inside it. Connect the ADAT out of the EWS88 D to a ADAT IN of your peripheral, and vice versa.

Using the ADAT connection for recording, you need to ensure that the sampling frequencies of both are identical. To guarantee perfect synchronization you must switch the masterclock setting in the ControlPanel to "External" .

Skipping this important step may result in audible dropouts in the recording. Of course the external instrument must be switched to the appropriate setting as well. If you intend to connect both instruments in both directions permanently, you must decide on a common synchronization frequency. Which format is most suitable for your studio, can only be decided by yourself. You need to consider, that – for safety reasons – when synchronized externally, the EWS88 only transmits audio data which are identical to the receiving machine. But here also special cases are to be taken into consideration: Digital mixing desks (i.e. Yamaha 02R), do not transmit any audio data when there is no external synchronization present (i.e. when your PC is switched off).

The suitable drivers for digital ADAT recording are "EWS88 WaveRec.". As up to 8 audio channels can be received, the drivers are grouped in pairs (1/2, 3/4, 5/6, 7/8). You can find more information on the drivers from page 48.

Useful information.

The digital interfaces on the EWS88 all transmit bit resolutions between 8 and 24 bit, as well as all sample rates between 8kHz and 96kHz. The same applies to the optical interface. However, as an ADAT Signal is transmitted via a TOS link-cable, its maximum sampling frequency is physically restricted to 48kHz, because 8 channels apear simultaneously.

The EWS88 D allows you to use optical interfaces independent from the ADAT standard and, for example, to the S/PDIF-standard. This will enable the card to transmit data with a 96kHz sampling rate. The relevant settings in the ControlPanel for this are described in detail from page 53.

Various manufacturers of software DVD-players (i.e. Power DVD, Version 5.55) support playback of DVD audio material through the EWS88. This allows you to split the signals (5.1 or 7.1) and playback AC3 or DTS material. You can find more information on the Power DVD on: http://www.cyberlink.com.tw.

The AudioSystem EWS88 D allows you to convert ADAT-signals to S/PDIF and vice versa. The relevant settings in the ControlPanel for this are described in detail from page 53.

Co-axial digital interface.

> The co-axial plug (Cinch-plug) connects to instruments, which send and/or receive S/PDIF-signals and RAW-data. This includes DAT-recorders, digital amplifiers or MiniDisk. In addition to 24-bit it will also transmit traditional 16-bit signals.

General.

Recording and playback of digital audio is taken care of by the connectors on the backplate of your PCI card. For this purpose, you have two RCA-type connectors. The AudioSystem EWS88 D also allows you to use the optical ADAT-connector for transmission and reception of S/PDIF-signals. (Please refer to page 37.)

Using the ADAT-connection for recording, you need to ensure that the sampling frequencies of both are identical. To guarantee perfect synchronization you must switch the masterclock setting in the ControlPanel to "External" .

Skipping this important step may result in audible dropouts in the recording. Of course the external instrument must be switched to the appropriate setting as well. If you intend to connect both instruments in both directions permanently, you must decide on a common synchronization format. Which format is most suitable for your studio, can only be decided by yourself. You need to consider, that – for safety reasons – when synchronized externally, the EWS88 only transmits audio data which are identical to the receiving machine. But here also special cases are to be taken into consideration: Digital mixing desks (i.e. Yamaha 02R), do not transmit any audio data when there is no external synchronization present (i.e. when your PC is switched off).

The suitable drivers for digital ADAT-recording are "EWS88 WaveRec S/PDIF". As up to 8 audio channels can be received, the drivers are grouped in pairs (1/2, 3/4, 5/6, 7/8). You can find more information on the drivers from page 48, detailed information on the ControlPanels settings from page 53.

The digital interfaces on the EWS88 all transmit bit resolutions between 8 and 24 bit, as well as all sample rates between 8kHz and 96kHz. Driver 4.02.16.98 and later allows you to use optical interfaces independent from the ADAT-standard and, for example, to the S/PDIF-standard. Some manufacturers of software-DVD-players (i.e. Power DVD, Version 5.55) support playback of DVD audio material through the EWS88. This allows you to split the signals (5.1 or 7.1) and playback AC3 or DTS material. You can find more information on the Power DVD on: http://www.cyberlink.com.tw.

Backup.

The digital interface and its software is not designed to back-up straight to DAT tape. Though technically possible, cheaper ways of backing up (to CD for example) are very common these days and less time consuming.

Digital cables.

Transmitting audio data through copper (co-axial) or lightpipes (optical) can result in tiny, though generally inaudible, errors. As a result, you should ensure, that you are using short high-quality cables:

Co-axial: 75 Ohm-cable up to 5m

Optical: plastic up to 1,5 m and glass fiber up to 5m

When using digital cables, differences in sound quality may seem exaggerated, but may occur nevertheless. This can be traced to the use of error correction algorithms in the DACs which are obviously more frequently used with lower quality cables. However, these differences are extremely minimal and one can get easily carried away in this matter. In case you are interested: The internet hosts a number of quite entertaining newsgroups on this subject ;-).

AES/EBU.

Instruments equipped with AES/EBU interfaces cannot be driven by S/PDIF interfaces – no ambitious DIY adapters are going to change this. However, the AES/EBU standard is nearly identical to S/PDIF and the main difference lies with the strength of the signal. A little soldering and you could build you own converter.

SYSTEMSOUND OUTPUT.

The SystemSound-output on the back of your PCI card has a signal output of 1Vrms and can be used in a number of ways.

General.

The AudioSystem EWS88 is equipped with an additional analogue output. It is located on the back plate of your PCI card. Despite room restrictions which forced us to accommodate only a mini-jack connection, audio test results and its performance, however, show that this is perfectly fine. A high quality 18-bit converter delivers powerful playback.

You can use this output for Windows SystemSound or as an independent output for audio editors or software synthesizers. The latter can profit from lightening fast DirectSound implementation in its driver. For further information on "System-WavePlay"-drivers refer to the chapter "Software." starting on page 47.

CD-Audio-connectors.

> The AudioSystem EWS88 offers two separate audio connections for your CD-drives. The ControlPanel, however, does not access them.

General.

One of the very useful features of the AudioSystem EWS88 is its ability to accommodate two CD drives (i.e. your DVD-ROM and your CD-R). The CD1 and CD2 connectors are electrically separated and can be controlled individually. However, you won't find the volume sliders in the EWS88 ControlPanel.

The connectors are MPC-compatible (Multimedia PC).

The socket layout and signal path are as follows:

```
     CD In       CD In
   ┌─┬─┬─┬─┐   ┌─┬─┬─┬─┐
   │ ▪ ▪ ▪ ▪ │   │ ▪ ▪ ▪ ▪ │
   └─────────┘   └─────────┘
   R  G  G  L    R  G  G  L
      CD1           CD2
```
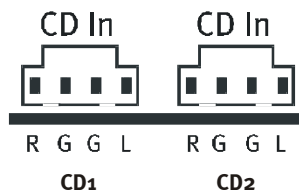
Cables are usually supplied with the CD drive. If not, they can be purchased at specialized computer shops and chains.

The CD-connections are routed to a module called (AC97-) Codec, which is widely used in sound cards. EWS64-users will have heard of Codec – it uses this chip primarily for gaming and multimedia applications. We have not implemented the (high-quality) AC97-Codec on the EWS88 ControlPanel for good reason. You can gain access to the volume sliders (this includes the separate 18-bit SystemSound output) through the standard windows mixer.
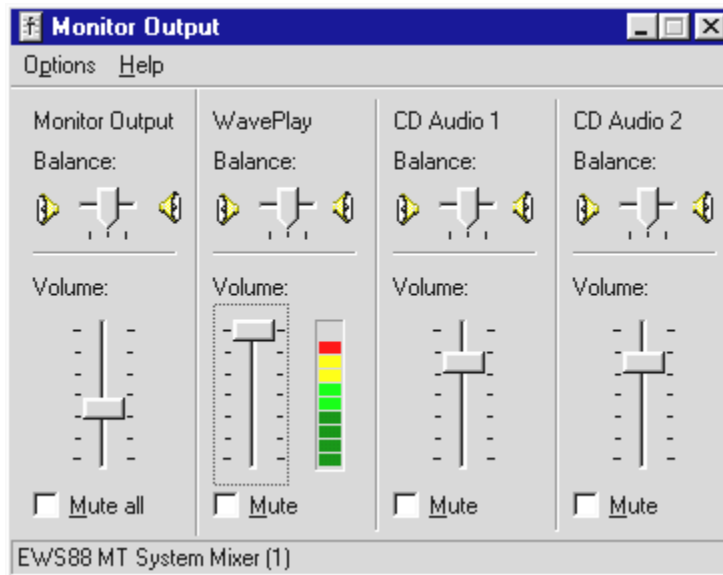
Unfortunately, access to the Windows mixer is not as easy as it might be and includes some manual setting of parameters, which could not be programmed by ourselves: The Windows Standard Mixer only appears, when you have copied the settings of the multimedia system on page 31 – as they appear on the diagram. The Windows taskbar displays a small yellow speaker (next to the clock). Double-click on it and click "Multimedia".

You can choose the volume sliders on display in the Multimedia Audio page by clicking the yellow speaker. Here you can find the sliders for the CD inputs. Depending on which channel is in use for recording, you could even record directly from CD (analogue).

SYNCHRONIZATION

Up to 4 EWS 88 can be installed in one PC and operated simultaneously. A custom made cable is supplied for connecting the cards to ensure seamless integration. Alternatively, you could use the optional EWS®ClockWork.

General.

The Audio Systems EWS88 MT and EWS88 D are equipped with our EWS®-Connect, which allows for perfect synchronization of multiple EWS88-systems in one PC. Only this type of interconnection guarantees perfect sync between the cards.

The EWS®-Connect will also be used to connect the optional TerraTec EWS® ClockWork. It even has the ability to synchronize external digital equipment.

Multiple-card configuration

When you are the proud owner of multiple EWS88 systems (remember: up to 4 cards can be installed in one PC simultaneously!) one of the cards needs to be assigned the master role. After installing the EWS software, you will be greeted with the message **"Multiple Card Configuration"** in the EWS start-up menu. Here's your chance to define the cards as "master" or "slave". We recommend to define the one card, which is to be used for external synchronization (ADAT or S/PDIF) as the "master", in which case the entire system will be synchronized to the external source (i.e. digital mixer or DAT). In principle, however, it is entirely up to you to choose the "master".

Only run **"Multiple Card Configuration"** when there is only one card installed.

If you own only one EWS88 , these setting have no effect at all. For ease of use, as well as later expansion, the card should be defined as "slave" (factory pre-set).
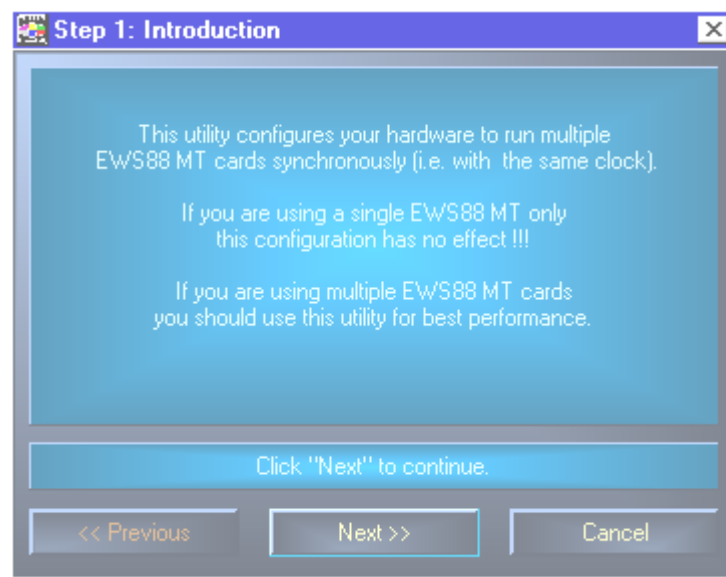
Follow the on-screen commands and re-boot Windows.

EWS®-Connect connector.

The EWS®-Connect connector consists of 2 pin headers, CN1 (5-pole) and CN2 (3-pole), whereas CN1 consists of a black and a white piece. If you have installed only one EWS88 in your system, just leave everything as it is: Jumper on CN1 (black bit). In this configuration, the card receives masterclock from its own clock-generator (internal), or from the digital input(S/PDIF or ADAT) of an external clock-generator (external). You can switch between the two in the ControlPanel.

When installing another EWS88, you need to connect the supplied thin cable on the "master" card to CN2 (Sync-Out). This connects to CN1 (Sync-In) on the first "slave" card. You need to keep and store the surplus jumper.

More cards? No problem: Simply run another cable from CN2 (Sync-Out) of the first "slave" card to CN1 (Sync-In) on the second "slave". And, surprise surprise, another one from CN2 of the second "slave" to CN1 on the third (and last) "slave".

The EWS®-Connect connector also provides the plug-in point for the optional EWS®ClockWork. This module will allow you to run all EWS-systems in your PC from an external WordClock- or SuperClock (256 FS)- signal in sync. For further information on this, please refer to the EWS-ClockWork manual.

Please Note: The EWS88 D hardware-revision 1.0 has a differing header inscription. Here CN2 is the 5 pin header (Sync-In) and CN1 is the 3 pin header (Sync-Out). Since the EWS88 D hardware revision 1.1 you will find the same EWS®-Connect inscription adapted to the EWS88 MT.

Settings in ControlPanel...

Even though all cards are interconnected via the EWS®-Connect, You can still run the cards with different sample rates. You can choose the settings for "independent" or a synchronized "Master/Slave" in the **Setting-Page** of the ControlPanel.

As all the cards are digitally synchronized, all slave cards are switched to external synchronization automatically when Master-/Slave-Mode is chosen. The clock in the first ("Master") clock is set to "internal" (You can chose the cards in the "Select" box on the right of the ControlPanel).

All cards are now running in parallel to the master-card. Should you want to run the master-card from an external clock (i.e. from a DAT-recorder), you need to set its clock to "External". The sync-code will be passed on to all other EWS88s.

SOFTWARE.

The TerraTec Team have not spared any efforts or costs in order to supply you with a software package that really delivers. You'll find programs, which allow you to...

- Set-up the AudioSystem EWS88 and control it,

- Listen to all important (and some unimportant) Audio data formats,

- Edit recorded and imported audio files

- And sequence it professionally.

One could call it a complete package. And the best of all is: The programs are sophisticated enough to offer you a truly professional service. There are no gimmicks. In addition you will find some extra programs in "HOTSTUFF.!!!" – it is a TerraTec tradition to collect the best available free and shareware, which should keep you busy for years to come.

Finally we would like to give you a summary of all the programs, provided you have chosen to install them all. You can find further information on the software in their respective help-files. Enjoy!

DRIVERS.

The AudioSystem EWS88 offers you a multitude of different drivers to record and playback audio files. All drivers start with "EWS88" and finish with a number in brackets. This number represents the card belonging to the driver, a useful feature when you are operating multiple cards. The drivers support all common bit-rates between 8 and 24 bit and sampling rates between 8 and 96kHz (Exception: "*System WavePlay/WaveRec*" – This one supports only 8 and 16 bit with 8 to 48kHz). The EWS automatically locks onto the current application's sample-rate , which will avoid signal-degradation due to sample-rate conversion.
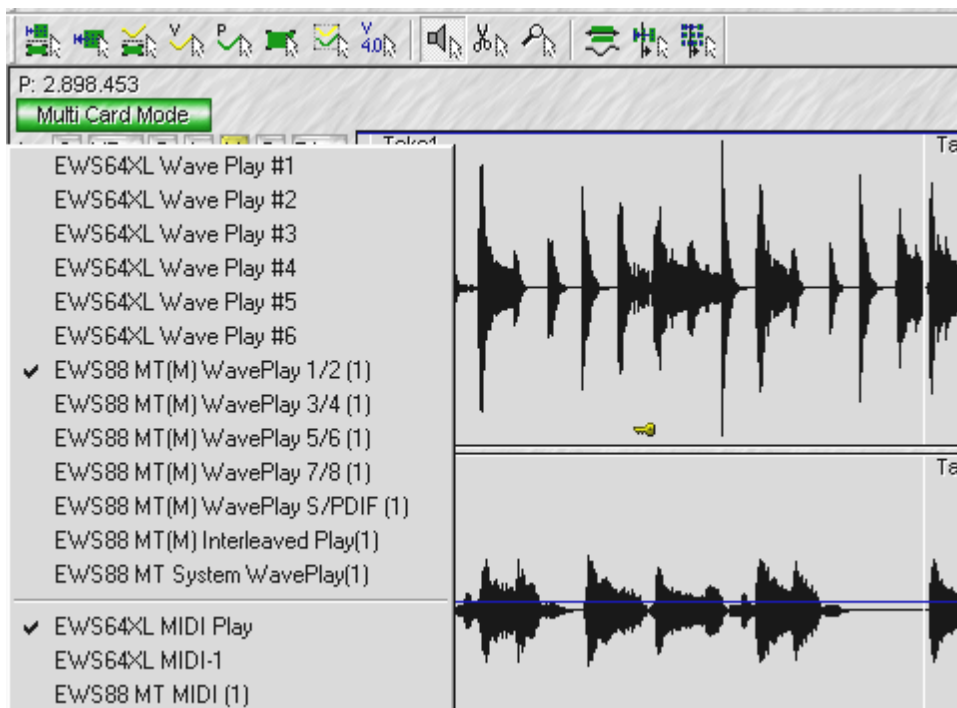

The playback drivers (in this case, Samplitude Project).

In addition, the drivers support a data-transport-format called "32 Bit unpacked". Audio data is being transported via the PCI-bus to the hard drive. The PCI-bus works with a 32-bit rate. Such a PC does usually achieve a balanced performance. 8-bit audio data will always consist of 4 (4 x 8 = 32), 16-bit data of 2 (2 x 16 = 32) separate data streams (top picture).

A 24-bit resolution, however, is slightly more complicated: Suddenly there are only 24 bits, which means that 8 are effectively "missing". The "24 Bit packed" standard resolves this problem: The PC-CPU divides 32 bits into multiples of 24 bits (center picture). This is heavy on any CPU and does not help the overall performance.

The "32 Bit unpacked" fills the remainder of the 24-bit signal with noughts and transmits these as a "proper" 32-bit signal. Most of today's applications make use of this resource-saving feature (bottom picture).
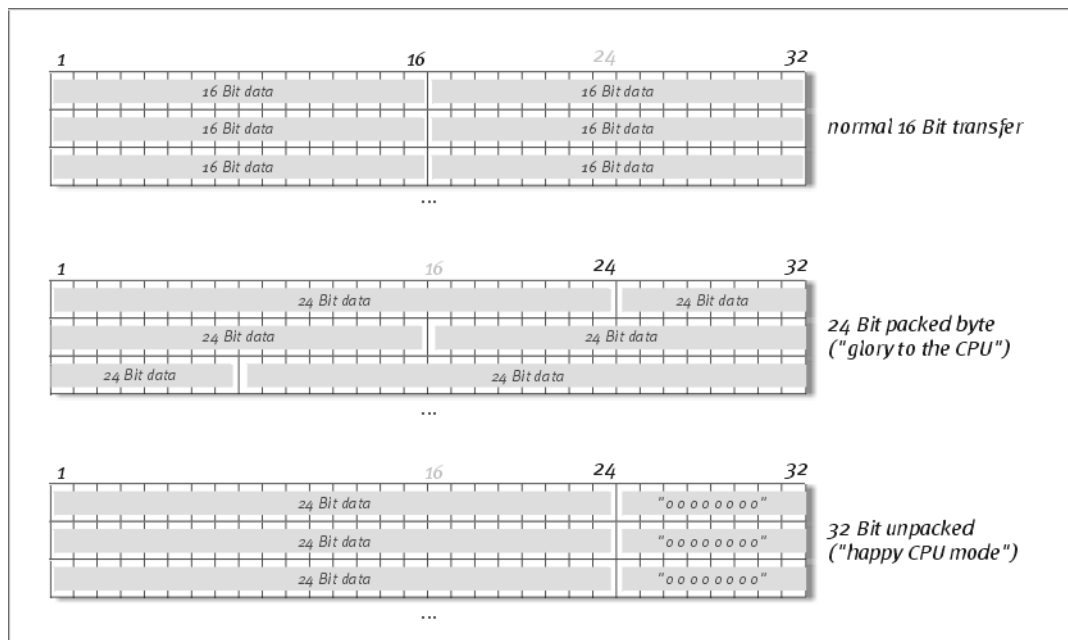
A closer look at the different drivers and "devices".

The most important ones: WavePlay and WaveRecord.

The most important drivers will be *"WavePlay"* for audio playback and *"WaveRec"* for recording. The driver names are identical to the ones which appear in different sections of the ControlPanel and refer to the 10 possible recording-and playback channels of the EWS88. The ControlPanel allows you to mix all WavePlay channels or to route them to the 10 outputs (8 x analogue or ADAT, 2 x co-axial) on your card. When recording, the driver names indicate the input pair, which receives the audio signal. *"WaveRec S/PDIF (1)"* is the digital input of the first EWS88. And of course there is the recording driver *"Digital Mixer"*. This will mix all digital signals at once (refer to page 54). As a result, it can be used for digitally resampling of all signals.

There are further hints and tips in the chapter "ControlPanel." from page 53.

Multiple channels with interleaved.

The driver *"Interleaved Play"* (or *Rec.*) is a driver particularly for applications which send/receive audio data according to the "Interleaved" standard. Windows-Wave-Format not only supports stereo data, but up to 8 audio channels, which can all be grouped together (in a file, for instance). This is particularly useful for multi-channel live performances: simply arrange 8 audio channels in a hard disk recording program (like CoolEdit PRO) in a single Interleaved WAV-File and play back on a system, which also supports "Interleaved".

SystemSound drivers.

A real treat turned out to be the integrated *"System WavePlay"* driver. This routed the sound directly to the backplate of the EWS88. Room restrictions meant that we could only accommodate a mini-jack connection. Audio test results and its performance, however, show that this is perfectly fine. A high quality 18-bit converter delivers powerful playback.

You can use this output for Windows SystemSound or as an independent output for audio editors or software synthesizers. The latter can profit from lightening fast DirectSound implementation in its driver. In *Generator* you can easily achieve a latency of less than 10ms!

The *"System WaveRec"* allows you to record directly from your 2 CD drives (see page 42).

**ASIO-drivers.**

Almost unnoticeable at first sight: The *ASIO-drivers* of the AudioSystem EWS88, which implement Steinberg's ASIO 2.0 are capable of achieving comparatively low latency. Cubase VST has an average latency of 7-20ms. Fast and clean systems are even capable of 3ms with a 96kHz sampling-rate! The in- and outputs at your disposal are *"WavePlay (x)"* and *"WaveRecord (x)"* and route the signal to the digital mixer, or the individual outputs. Again, this is described in detail on page 53.
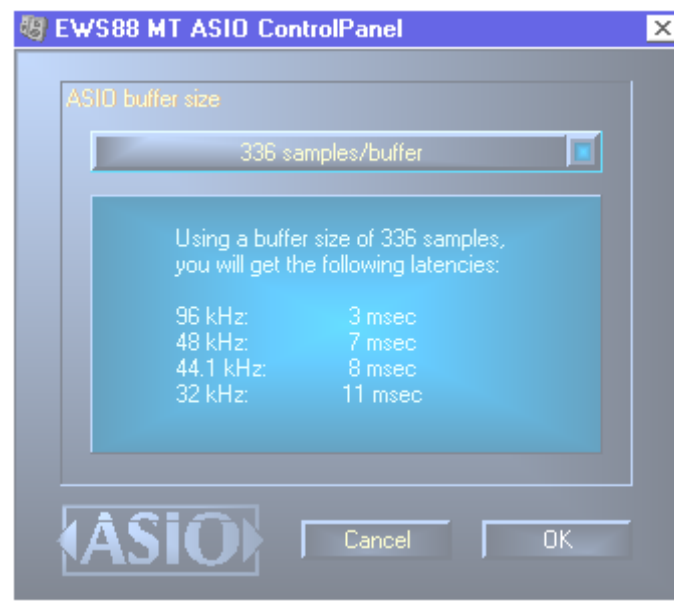
GSIF drivers.

Also hardly noticeable is the *GSIF driver* of the AudioSystem EWS88. The software sampler GigaSampler (as well as other products from Nemesys) has an equally fast and direct access to your hardware. The output-routing available to you in the various Nemesys programs, are determined by the driver *"EWS88 MT(D)GSIF (x)"* and route the signal to the digital mixer, or the individual outputs. This is described in detail in the chapter "ControlPanel." starting on page 53.
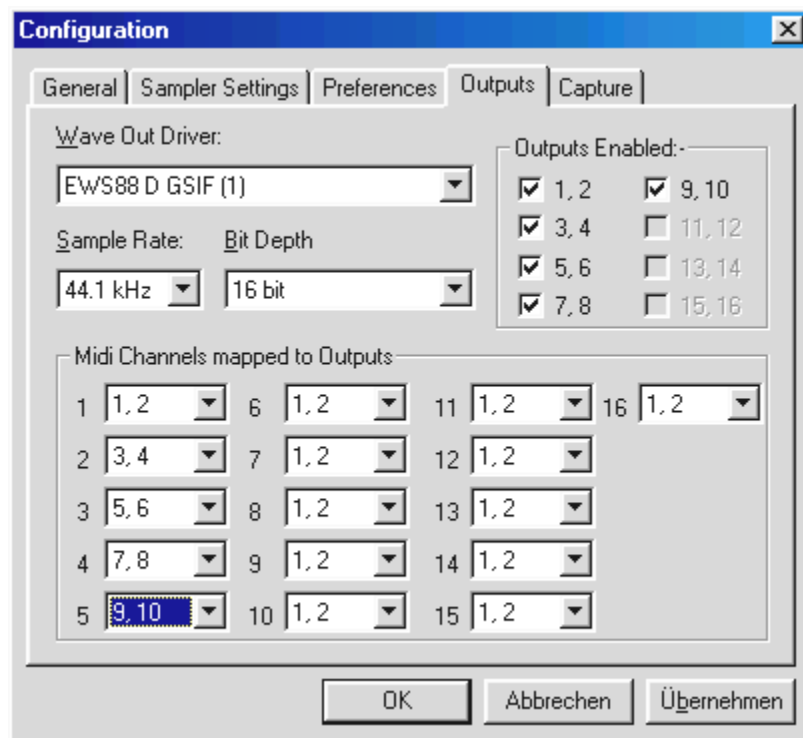
Driver configuration in Nemesys GigaSampler

MIDI drivers.

The playback of MIDI information through the MIDI IN and OUT connectors on the break-out box has its own set of drivers. The "EWS88 MIDI" driver can be activated wherever possible. The AudioSystem EWS88 D even offers you two separate MIDI IN and OUT drivers, which gives you 32 MIDI channels .

Should you wish to route Windows' MIDI playback through the EWS for external playback, simply change the settings in the Multimedia-MIDI page of Windows accordingly. You only need to select the EWS-MIDI driver (refer to chapter "Installation." on page 17).

ControlPanel.

The ControlPanel is – apart from the drivers – the most important software in this package. This gives you total control over your EWS88. You can change settings for sensitivity and volume as well as save and load your settings.

Unlike other mixer sections in PC-audio or sound cards, the ControlPanel is a tool, which needs to be setup once and then hardly ever changed. The chip-technologies applied in the EWS88 give you a multitude of options. If you know our EWS64-series cards (especially XL and XXL), you will notice a number of differences as well as their applications (don't worry, it won't get any worse… ;-)).

How does the ControlPanel work?

The ControlPanel, respectively the routing options in your EWS88 is principally very simple – this, however depends on your experience with PCs (or, adventures). If you have worked with a PC sound card until now, you will learn some particularities, which are clear to users of hardware mixers and recorders. Tip: take a few minutes and read at least the sections concerning the routing and the digital mixer – it will make things so much easier. Here we go!

The analogy input levels.

In the "Analogue Inputs" page, you can set the **Gain Levels** of the 8 analogue inputs.

Here you can adjust the levels at which the incoming signal will be recorded into the EWS88. –
10 dBV is very common in home-studios (the signal-levels are comparatively low, which is
compensated for with the higher input sensitivity). +4 dBu is generally a professional setting
(Instruments are powerful enough, hence the input sensitivity is acceptable). If you find that
one of your instruments does not deliver a high enough level, you can increase the sensitivity
in 0.5dB increments in the ControlPanel. Make sure that the Clip LED does not light up – when
this happens, the input is subject to an overload, which can lead to distortion in the signal. The
"Clipping" box to the right allows you to set the LED's sensitivity (-3 dB is usually a good
choice. If the LED starts to blink during the recording, it should indicate a well balanced input-
level). This is not all: The "Auto Gain" function lets you set the input levels automatically. You
can set this auto gain to different scanning times (scan 3/5/10 sec), during which the software
analyses the incoming signal and sets the appropriate gain-level (during this time, the signal
ought to be constant). You can activate this function simply by pressing the "Auto"-button
below the channel-strip (if you have two channels grouped to a single stereo channel , the
auto gain will be activated on both channels automatically).

Digital mixer.

You may already have found the "**Digital Mixer**". This function is especially helpful if you do
not own a hardware mixer, or prefer to mix internally. The digital mixer *always* accesses *all*(!)
20 channels (10 WavePlay-and 10 input signals) and routes these to output 1/2 or to the co-
axial digital output.

For example: You are using a Audio-/MIDI-Sequencer (Cakewalk®, Emagic®, Steinberg – whatever). In your arrangement are Audio- and MIDI-tracks present. All audio tracks are routed through various effects (plug-ins) and are being sent to the card's digital mixer (i.e. 1/2). The MIDI tracks control two external synthesizers, which you can connect to input 3/4 and 5/6 of the EWS88 MT. In addition, you are also running a software-synthesizer (Generator, Reality, etc). This audio-program uses WavePlay 7/8. And of course, you also own a EWS64, which also receives MIDI Data. You can connect the EWS64 to the EWS88 using its S/PDIF-output. All 10 audio signals are routed into the digital mixer. You can manually set all ten gain-levels and pan positions and the master volume can be adjusted using the Master Volume-fader. (The Digital Mixer has a 36-bit resolution and can mix up to 4096 24-bit audio-channels. Wow!).

On the "Routing"-page (refer page 56) you can set the output of the digital mixer to either 1/2 or S/PDIF, the master-signal can be transmitted digitally or analogue. That's all, ControlPanel understood!

> Summary: If you want to use the EWS88 MT purely as a I/O-card for your Audio-/MIDI-sequencer, you won't actually need the digital mixer. As mentioned earlier, your sequencer (software) controls the volume levels and pan positions. They are routed to the outputs directly.

Settings.

The settings window allows you to adjust a number of hardware settings, drivers and in response to our customer demands – the color scheme.

Routing.

Signal routing is the most interesting feature in the settings window. Here you determine which signal is routed to the output and whether it is muted, or not. (All signals are routed through the digital mixer , but need not necessarily be routed through the master output.)
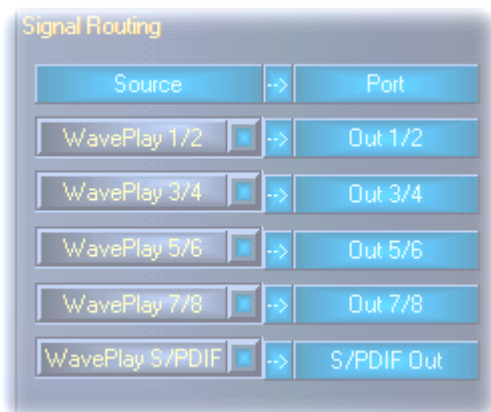
Usually, you will send an audio-signal (or multiple signals) from a certain audio program. This will be done by the windows drivers described as WavePlay-1/2, 3/4, 5/6, 7/8 and S/PDIF. Here you can determine, that a signal, which is routed through 3/4 is also audible through 3/4.

Alternatively, it is possible to rout an incoming signal (a signal not from a WavePlay-driver) directly to an output. This is especially useful when you record a signal from your sequencer and want to monitor it directly .In this mode, the WavePlay-becomes inaudible.

To summarize this section for the "musician experienced with mixing desks and recorders": The signal routings described in this section are akin to switching between tape and line input on a mixing desk. Choosing "WavePlay --> Out x/y" means, you'll hear the signal "off tape" (in the case off the sequencer). Choosing "In --> output x/y" you'll hear the incoming signal.

As a sound card-user, you will certainly ask yourself: "What about the volume control?!". With Windows you are used to adjusting the volume-levels within the Windows mixer. This is completely sufficient when you are mixing different signals, i.e. (Wavetable-)Synth, CD input, line and microphone input, etc. This, however, is a real recording-system, which is to process signals from different programs and route them without signal-degradation to the output section. Basically: The volume levels should be set in the respective programs themselves. Imagine your sequencer is directly connected to the outputs of your EWS88 – if you have ever used an external mixing desk, you would appreciate not having to adjust the volume-levels at three different points (in the audio-software, on the sound card mixer and the external mixing desk).

Master Clock.

This section is all about the sampling rate, which is being used to drive the EWS88. This is an important point, as the card can be synchronized to an external signal (i.e. a DAT-recorder) or internally (**Internal**) and pass the clock signal on to other devices. If there is a valid digital signal connected to the digital-in connectors (S/PDIF or ADAT) its sample rate will be displayed in the EWS ControlPanel and the EWS will be switch to external syncing. In addition, any card defined as a "Slave", and connected to other EWS cards with the EWS®-Connect connection will also be switched to external (see page 45). In Master/Slave mode , all "Slave" cards cannot be switched back to internal clocking, as the clock is provided by the "Master" card. The "Master" card can of course be clocked internally, and externally via a digital input.

Example: The EWS88 D is clocked by the EWS88 MT in Master/Slave mode, which, in turn, is switched to external synchronization via its digital S/PDIF input, connected to a Minidisk player. As the Minidisk player is running at a sampling frequency of 44.1kHz, the entire EWS system is switched to 44.1kHz and everything runs in perfect sync.

Now it becomes interesting: The DSP of the AudioSystem EWS88 is not equipped with a sample rate converter (only exception: the SystemSound driver, more of which on page 50). This building-block, which is very common in today's sound cards ensures, that you can playback and listen to signals with different sampling rates. It achieves this by "inter-locking" frequencies. For example: Your card is clocked to a DAT-recorder with 48kHz (externally). Then, you are working on a file, using your 44.1kHz Wave editor. While you are playing your file, Windows plays a SystemSound (22.05 kHz) while a text-message pops up. All sample rates are audible simultaneously, in 48 kHz – the externally synced sampling rate. Everything appears to be normal, even though audio files are not played using their respective sampling frequencies. If you listen carefully, though, you will notice a difference in sound quality. You see, the quality suffers when using this fundamentally useful converter – no matter how good it is. As the AudioSystem EWS88 is not a conventional sound card, and you would not be at all happy, if you found out that half of your songs had been recorded using the wrong sample frequency, we have chosen not to implement a sample rate converter. Instead, the sampling rate is adjusted dynamically to the required sampling frequency. Without any loss in sound-quality, of course. Just as it should be with a quality recording. But: If you try to play different audio-files with different sampling-frequencies, you will receive an error-message. Though it is possible to playback different audio files from different programs, they need to have the same sampling frequency. In addition, you need to ensure that the "Wave Playback/Record Mode" is set to "Multi-Application". More on this is to follow.

The button **"Rate Locked"**allows you to lock the sampling-frequency to a value (externally set). This way, you will avoid recording different sampling frequencies by accident. For example: A production is to be recorded exclusively in 96kHz. If you lock the sampling-frequency to 96kHz, no audio-file with a different frequency will be able to "sneak in". You will be notified.

The I/O Board.

An extremely simple feature of the ControlPanel. In case the 88AX becomes detached from the card, (this might be possible with tightened screws though), the converters must be newly calibrated. This will take almost exactly 250ms shouldn't hurt.

However, you should make sure, that the module never becomes de or attached during operation. It could be damaged.

Output.

Here you can adjust the levels (between +4 dBu and -10dBV) for all outputs of the EWS88 MT. –10 dBV is very common in home-studios (the signal-levels are comparatively low, which is compensated for with the higher input-sensitivity). +4 dBu is generally a professional setting (Instruments are powerful enough and make noise less prominent, hence the input-sensitivity is acceptable).

S/PDIF Out.

Here you determine, whether the signal you are sending via the digital interface contains security information. It is possible to include a copyright protection signal into your (original) recording. This is especially useful when you send out some demo tapes and do not want (digital) copies made of your composition.

Also included is the newly developed "Non-Audio" mode. Apart from S/PDIF and ADAT signals, AC3 and DTS signals (i.e. from a software DVD-player) can be transmitted directly to an external Dolby Digital Receiver.

Digital Out (only EWS88 D)

Especially the optical digital output allows you to choose the settings for the required format, even independently from the optical digital input. The optical output can send i.e. S/PDIF signals, while the optical input receives ADAT signals. For testing purposes, you have the "ADAT thru"-option , which will route the incoming signal directly to the optical output, by-passing the digital mixer and the drivers.
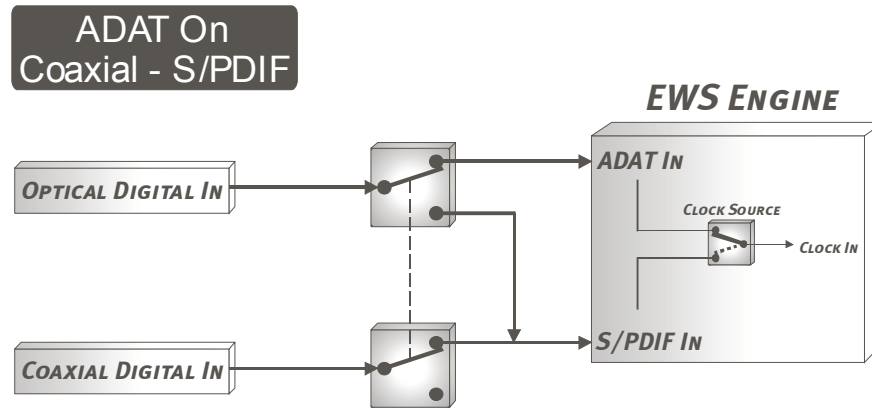
Digital In (only EWS88 D)

The optical input can also be switched between ADAT and S/PDIF signals.

When switching between input sources, you are presented with two options:

1. ADAT IN – S/PDIF co-axial

The optical TOS-link input can receive ADAT signals, while the co-axial S/PDIF input is also available.


Both signals can be auditioned and processed simultaneously (ADAT- and co-axial S/PDIF) , but only one can receive the clock signal. "Clock Source" allows you to chose, which input is to be used for this purpose.

Example: The co-axial input is connected to a DAT-recorder and the optical input is connected to a mixing desk with ADAT interface. The ClockSource is provided by "ADAT". The mixer is the master and set to 44.1kHz. As the DAT-recorder plays with a sampling-rate of 48kHz the signal will be distorted. Even when the DAT-recorder is set to 44.1kHz, the signal is still not synchronized with the clock provided by the mixing desk, and the signal is still distorted (even though this is hardly audible).

2. ADAT Off – S/PDIF Optical

As the TOS-Link interface can transmit S/PDIF signals and the EWS88 D can only process one S/PDIF input, the co-axial input will not be available here and the Clock-source is set to S/PDIF input.
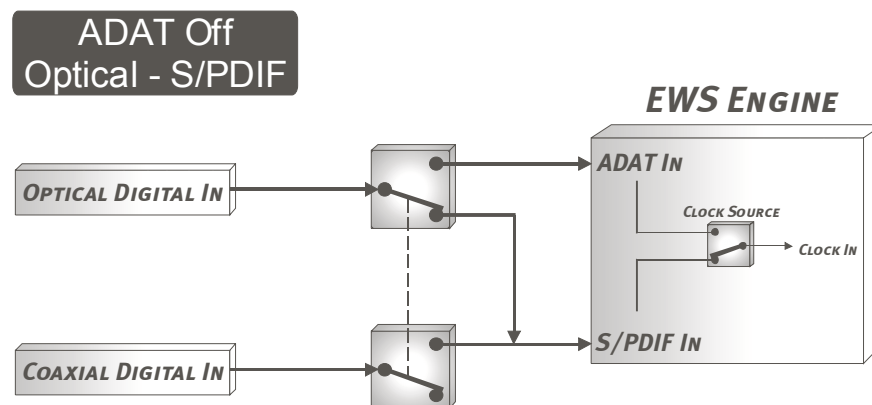
If the MasterClock was set to internal synchronization, or if the card is the "Slave" in a Master/Slave-mode, the ClockSource setting will have no impact at all.
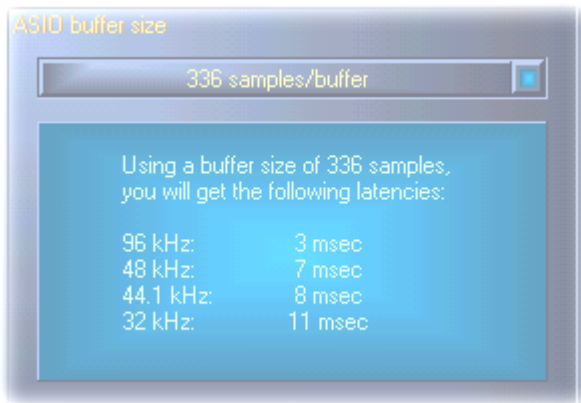
DMA Buffer Transfer Latency.
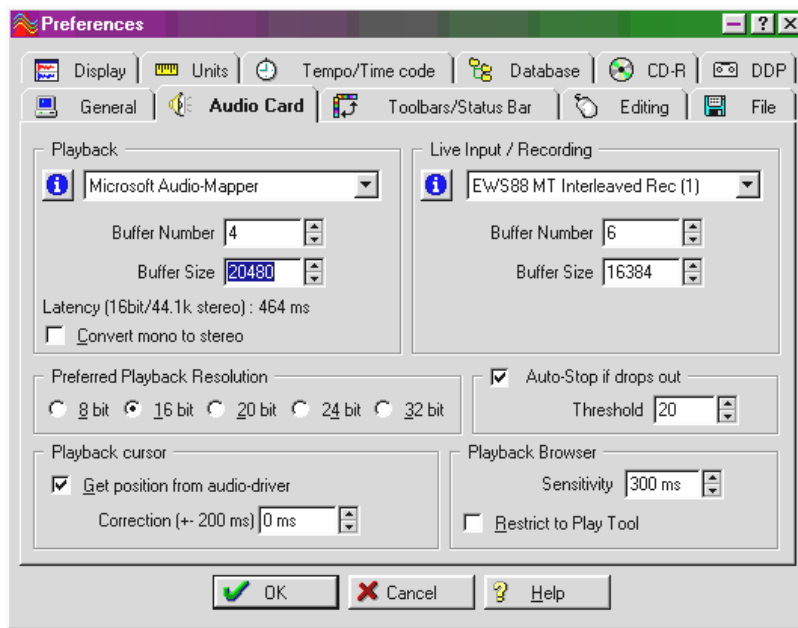
Here you can determine how quickly an application (i.e. software-synthesizer) can access the Widows drivers (except for the SystemSound-Out drivers). The faster, the better one would be inclined to think, if there wasn't a catch... The setting is system-dependent and can cause audible drop-outs during recording and playback, if your processor cannot cope with the load imposed by the setting. If you notice these drop-outs during playback, you will need to increase the DMA Buffer Transfer Latency. Equally important is the "tuning" of the offending application. Many programs offer manual setting of the audio-buffers (here: WaveLab).

Striking the balance: For higher levels of speed, try to keep the number and size of buffers as low as possible. Lower the DMA Buffer Transfer Latency in the ControlPanel step by step. The drivers themselves are very clean and fast . This means that you should achieve respectable results in respectable systems.

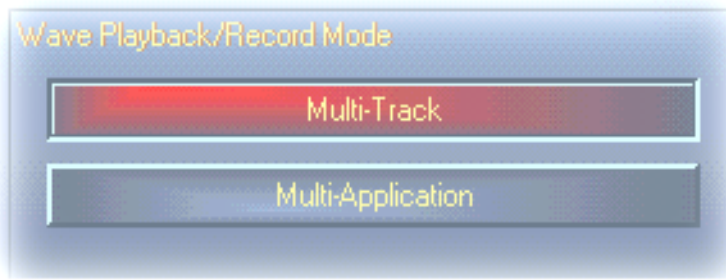**Note:** Setting the DMA Buffer Transfer Latency will not affect the performance of the ASIO or GSIF drivers.

ASIO Buffer Size.

Using a buffer size of 336 samples, you will get the following latencies:

96 kHz:	3 msec
48 kHz:	7 msec
44.1 kHz:	8 msec
32 kHz:	11 msec

The ASIO Buffer Size is responsible for the speed of the ASIO-drivers. The smaller the number of samples per buffer, the shorter the time it takes for your software to send signals. This setting is also – like the DMA Buffer Transfer Latency – system dependent. In the best case scenario, latency will be only 3ms. On common systems with a common processor load , you will work with a latency of about 7-30ms. Please note, that you will need to restart ASIO-applications once you have changed the ASIO-settings.

Wave Playback/Record Mode.

The Wave Playback/Record Mode determines, if you want to work with a single software application (i.e. your sequencer) or several simultaneously. As we have already shown ("The Master Clock" section), running programs with different sampling-rates is not possible. Identical recording and/or playback frequencies will not present a problem (simply switch to "Multi-Application" mode). The "Multi-Track" mode reserves all WavePlay drivers (respective WaveRecord-) for only *one* open application. This will usually be your favorite hard disk recording application. And it is in this case that this mode finds its application: In multi-track-mode, all drivers (WavePlay 1/2, 3/4, 5/6 etc.) need to be available simultaneously, and start in perfect synchronization. An extremely important feature, which is indispensable in professional sound recording.

Color- settings.

One of the most important decisions in the ControlPanel will be taken here. You just can't help noticing colors, wherever you look. Even the dullest desktop can be revitalized with a set of fresh new colors... . Enjoy! ;-)
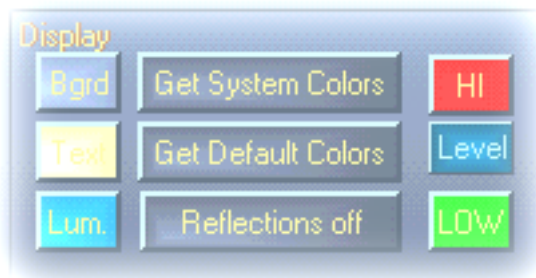
PS: No seriously, "reflections off" obviously switches off the reflections in the ControlPanel box. This can actually speed up slower systems. In Windows 95 you may not notice the shades at all, as the display relies on special Microsoft System files .

"Get System Colors" exclusively uses colors from the Windows System files..

"Get Default Colors" resets the color scheme.

If you don't like all these bright colors on your screen, rest assured: Even with reflections set to "off", the display will be no heavier on your processor than the usual gray of Windows.

Scene Memory-Function and choice of cards.

Digital mixers call this function "TotalRecall" – PC-users will be familiar with loading and saving. The "Scene"-button on the right of the ControlPanel allows you to save (Save), load (Load) or even delete older "scenes" (Delete). Press "cancel", and you will leave the box with no changes.

Also on the right of the card is the card-selection box (Select). Here you can switch the display to a multi-card setup. By the way, the Scene Memory Function always saves settings for all cards.

MediaPlayer.

To give you the right player for the right format at the right time, we have included a complete version of the popular WinJey. WinJey plays just about every audio-format, your computer can handle:

- MP3 - MPEG Audio Layer 3 – (requires only 16% system resources on Intel Pentium 200MMX),

- MP1 and MP2 Variants of the MPEG-format,

- WAV and VOC – the most common and most important, and the most uncommon and therefore least important, but one of the oldest digital audio format,

- MOD, S3M, XM, IT and other Tracker-formats,

- MID –Standard MIDI file format,

- CDA – Analogue playback of audio CDs.

The software also offers Skin-Support allows you to change the look of your player completely. You can find skins on the internet @ **www.winjey.com**.

Emagic® microLogic AV.

We are pleased to offer you Emagic's Logic, one of the most successful Audio-/MIDI-sequencers, currently in version 4.1, which is even more powerful. For the few of us, who don't yet know one of the world's most successful sequencers: Logic Allows you to record and edit MIDI and audio data. Logic offers you notation, various MIDI and Audio editors, as well as synchronization to video signals. Especially the audio-side of MicroLogic AV is well equipped with, full 24-bit/96 kHz support, real-time effects and control.

Newly added in version 4.1 is support for EWS88 ASIO drivers, as well as the possibility to use "Logic Audio Device Setup" Manager to chose your own driver combination (Which is especially helpful, if you are using multiple EWS88s in one system).
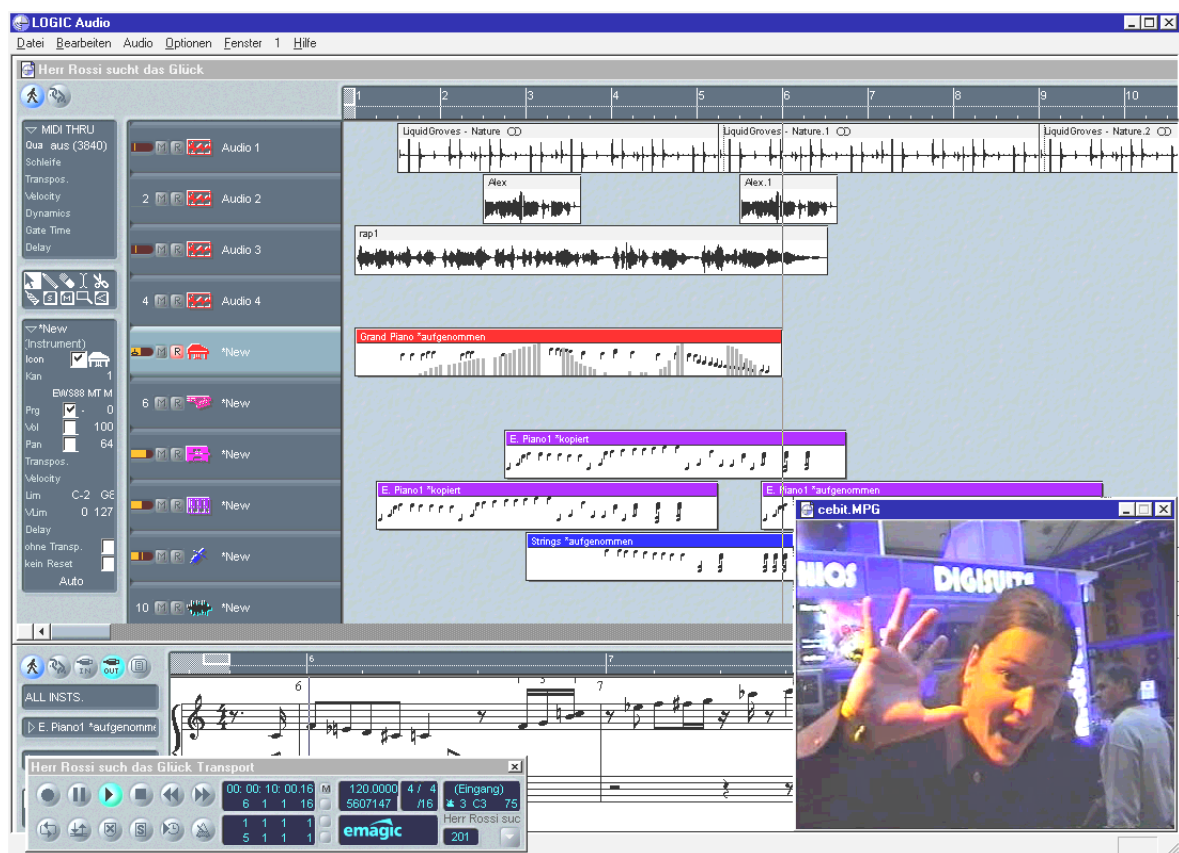
Further information on MicroLogic AV can be found online. You can even download the original manual. The documentation is supplies as a .PDF-file on the EWS88-CD.

SAMPLITUDE PROJECT – THE AUDIO EDITOR.

SEK'D®s award-winning Audio Editing Suite Samplitude allows you to record and edit your compositions in a professional manner, on multiple tracks with up to 24-bit resolution and 96 kHz sampling-rate. Unlike MicroLogic AV, Samplitude is foremost an audio editor. Cut and paste, volume changes, fades, cross fades, dynamics, Looping, EQ, Sample conversion, everything is included.
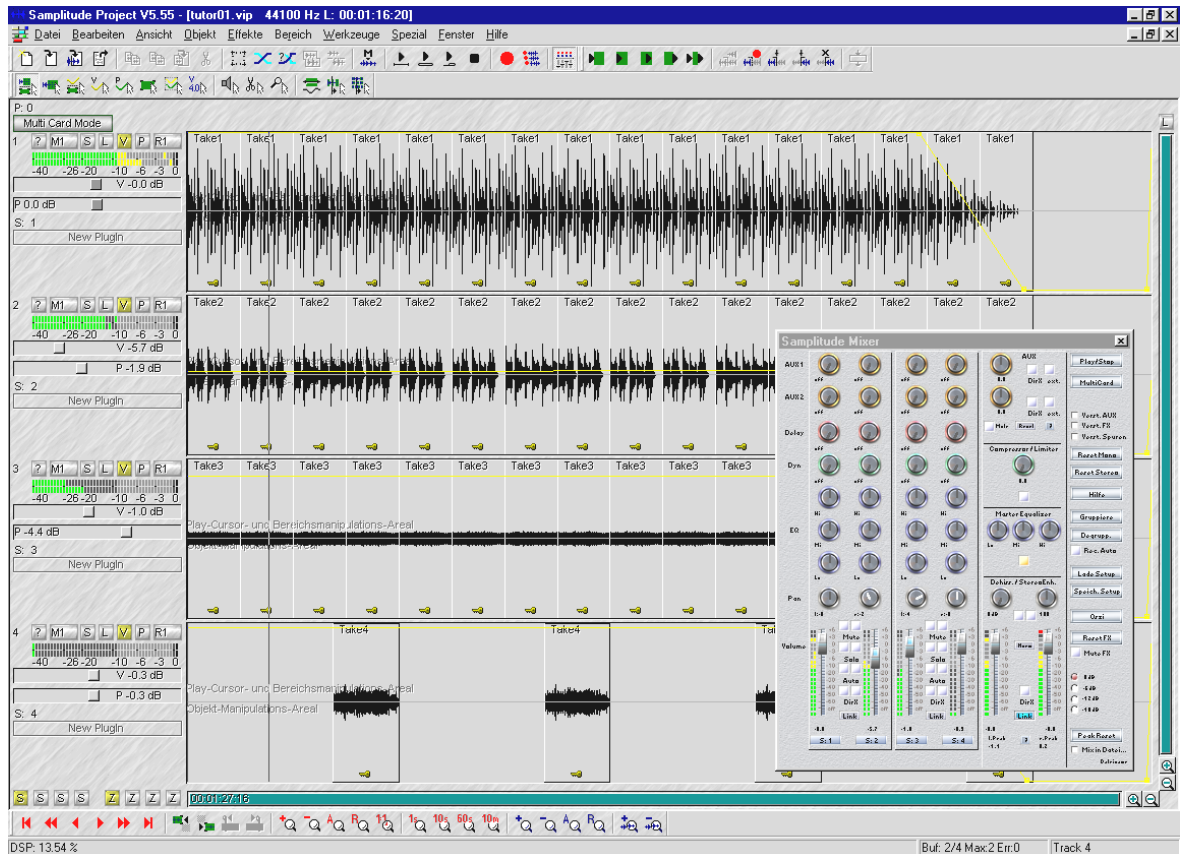

Further information on Samplitude can be found online. You can even download the original manual. The documentation is supplies as a .PDF-file on the EWS88-CD.

"There was a time, when music was still hand-made ... :-)"

BuzZ – ThE tRaCker.

"A Freeware-toy with this card?! What the...?!" Well, one reason why we have chosen to include this program in our package is because it is Freeware – free of charge. Furthermore, we would like to introduce you to a sound tool, which leaves all the current sound card clichés behind. Our department for "fun at work" have chosen BUZZ to introduce musicians to a new way of sound production, which can be a valid alternative to conventional sequencers.

BUZZ takes you back to the dawn of sequenced pop music – It has, however, a thoroughly modern and optimized code for using Windows. BUZZ is a audio program akin to "trackers" which used to be around in the mid 80s on machines like the Commodore AMIGA and, later, on DOS-systems. In BUZZ you will be programming music, which sounds worse than it actually is: You can choose an instrument, called a "generator" and start programming patterns. A pattern is 1 or more bars of notes. These patterns can then be arranged to a complete song.
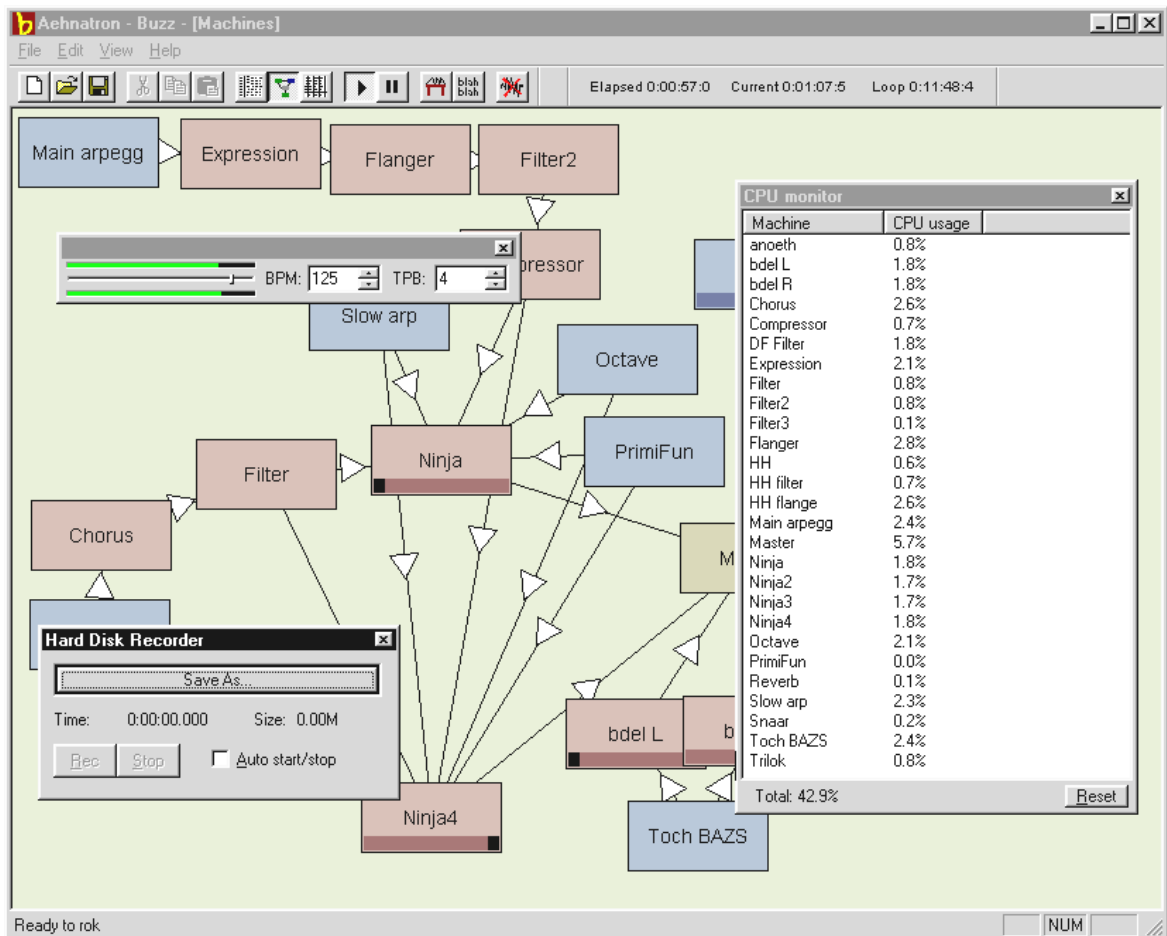
The great thing about BUZZ is that the patterns not only contain note information, but also information on the instruments. And these instruments don't have to be just players for WAV-data, but also physical modeling, Virtual Analogue Synthesizer, effects and much more. There are also options to import an external signal, as well as using VST plugins. Basically, this program is absolutely terrific ;-) .

BUZZ benefits from its open program code, which allows for third-party software to join in the fun. Obviously, the number 1 medium for information on generators, songs, etc. Is the internet. Here are only a few web-pages where you can start your research:

English	**www.buzz2.com**
English	**Welcome.to/buzzards/**
English	**buzz.lotek.org/**
German	**www.terratec.net/panorama**

If you like BUZZ, you are welcome to support the work on this project. You can find out how @

`http://www.fh-zwickau.de/~maz/products/german/index.html` (below).

Unfortunately, there is currently no manual. But then again, you probably wouldn't want to read it anyway ;-). The TerraTec Team has prepared a tutorial and included in the code. TUTORIAL ENGLISH.BMX can be opened in BUZZ. When running BUZZ, simply press F10.

Important:

*B*UZZ is quite a freaktool. It is freeware and continues to live on through its thousands of supporters worldwide. BUZZ is not, and will hopefully never be, a finished product. This means that the software is constantly being improved. It can crash, and it can generate frequencies, which don't sound nice at all, and can even be painful. The TerraTec Team cannot offer technical support for BUZZ and accepts no liabilities. Use of this code is at your own risk. But every "BUZZer" has gone through this, because it's worth it.

*HOTSTUFF.!!!-*CONTENTS.

On the CD ROM for the EWS88 we have compiled a number of other programs, tools and files. Have a look, there might be something just for you.
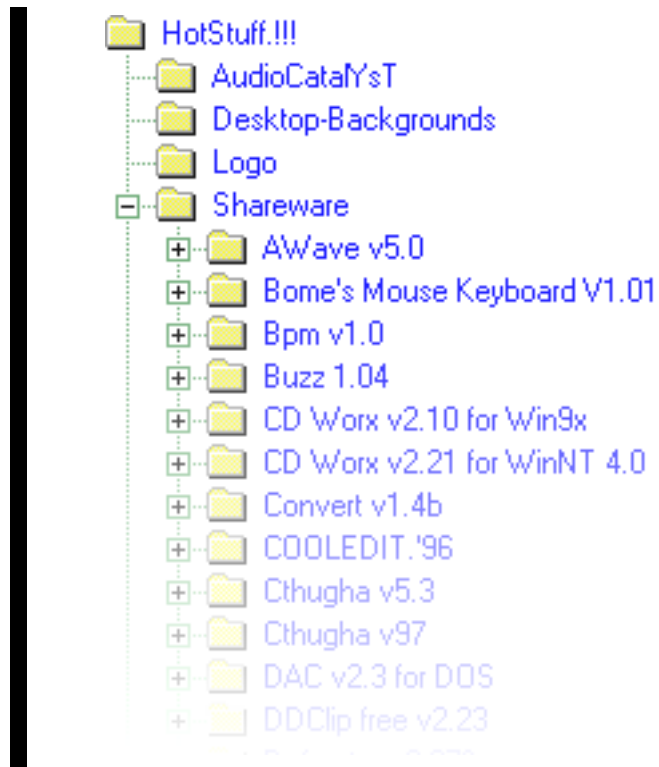
Most programs here are shareware. Please support the shareware-principle and pay your share, if you like the programs. Thank you.

Tips and useful information.

Connections.

The connection-options of the Audio Systems EWS88 are huge. Professionals will know how to connect the card with the external equipment: AUX sends, sub-groups, Tape channels and Inserts are things you are certainly familiar with. As the EWS 88 is principally no different to a tape-recorder, you can use most of the routings you already know from you console.

Here is a brief summary for beginners.

(Just) get started with the EWS88 MT.

On of the simplest applications is to run the EWS88 MT as a "normal" (Stereo) Sound card. Outputs 1+2 are to be connected to your monitoring system (hi-fi-System; AUX-, Video, Tape or CD-input). Inputs 1+2 are to be connected to the device, from which you wish to record. Digital devices like MiniDisk or DAT-recorder can also be connected to the card, as well as any MIDI Instruments you may have.

Always make sure: OUT goes to IN and vice versa. This also applies to MIDI

If you want to know more about the ControlPanel, refer to page 53 .

The EWS as a mixing desk.

The EWS88 MT gives you 8 analogue inputs (32, if you cascade 4 EWS88 MST!), And you could use this card in place of a mixing desk, though there are no complex routings (i.e. subgroups), equalization or effect-sends on offer. But simply merging all you channels using the EWS88, makes this a viable alternative. Fast PCs could even include the functions of your sequencer. For example, Cubase VST allows you to mix the card's input with (near) real-time effects.

EWS88 D and Mixdown

You might want to use the EWS88 D for transferring an external ADAT-signal to a different format. For starters, you could transfer all 8 audio-channels directly to your hard-drive and start editing them in your Wave-editor. The flexible routing and the digital mixer in the EWS88 allows you to mix all 8 channels and send them directly to the S/PDIF output and record these with a DAT-Recorder for instance!

Hard disks and storage capacity

Now you suddenly have a great recorder, which allows you record audio-signals to a previously impossible standard. Of course there is – as with most things in life – a catch: As the sound quality increases, so does the need for hard disk space. If you want to dip your toes into 24-bit recording, you should incorporate a large, and more importantly, fast enough hard-drive.

To give you an idea of the amount of data your hard disk has to deal with in these circumstances, here is a simple formula which allows you to calculate your requirements.

Number of channels x resolution in BIT x sampling frequency in Hz divided by 8 divided by 1024 and, again, divided by 1024 = MB/s

For one stereo signal (two tracks) with the highest possible resolution, you will achieve the following result in MB/s:

2 x 24 x 96000 / 8 / 1024 / 1024 = ~ 0,55

Slightly more than half an MB. This translates into 33 MB per minute.

Let's take a look at a typical multi-track scenario: 8 channels take up about 2.2 MB per second. An average arrangement of, let's say, 20 channels (of which we play back 16 at any one time), will require roughly 5 MB per second. And, of course, this is only for play-back.

Naturally, we are not trying to put you off such high resolutions, but we encourage you to take a good look at your requirements. Not every application justifies such a high resolution. Very often, the difference between 48 kHz and 96 kHz is negligible.
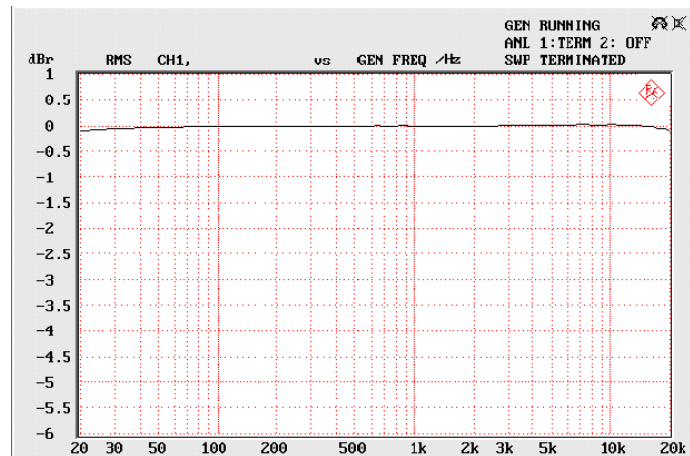
APPENDIX

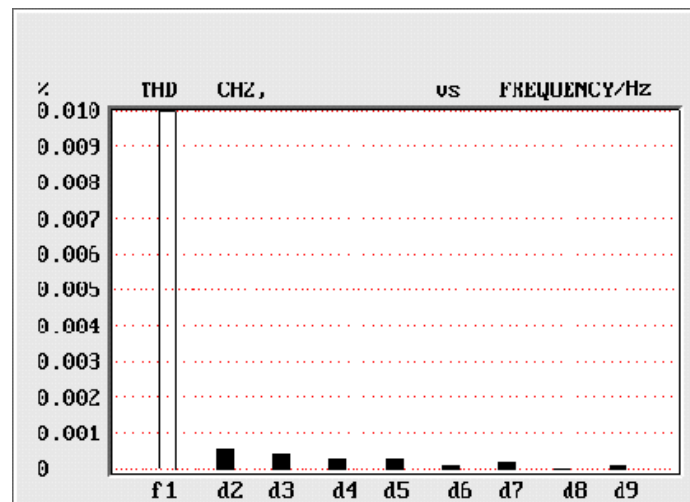### FAQ – FREQUENTLY ASKED QUESTIONS AND THEIR ANSWERS.

A FAQ (Frequently Asked Questions) to the first problem is included in the CD and online at `www.terratec.de/support.`
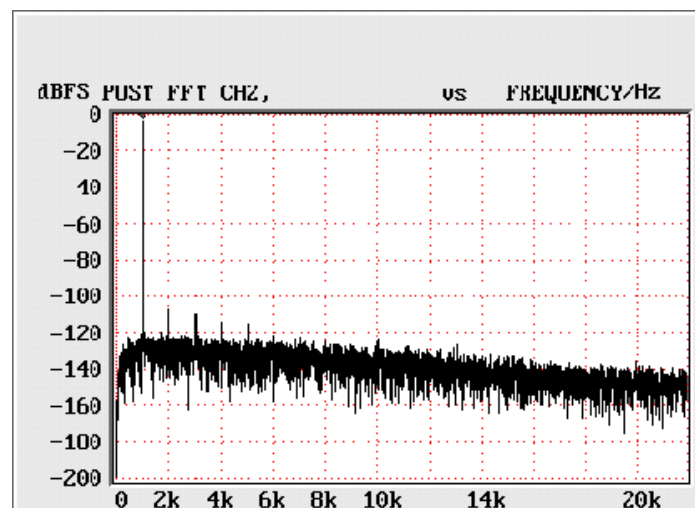
Technical data EWS88 MT.

*Frequency response

Total Harmonic Distortion

THD + Noise

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