

RAILROAD & Co.[®]
TrainController[™] + 4DSound[™]

**Model Railroad
Multi Train/Multi Channel Surround Sound System**

Manual

for all Windows Systems

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Overview

RAILROAD & CO. is the leading product line of computer programs for digitally or conventionally controlled model railroads. It contains the following members:

- **TrainController™** is the world's leading software for computer controlled model railroads.
- **TrainProgrammer™** is the program, which makes programming of DCC decoders as simple as a few clicks with your mouse.
- **+Net™** is a module, that allows to control your layout with a network of several computers running **TrainController™**.
- **+4DSound™** is a module, that recreates realistic spatial sound effects for each model railroad layout controlled by **TrainController™** without the need to install on-board sound into each decoder.
- **TrainMonitor™** is the world's first program, which is especially made for indication of train positions on the computer screen based on train detection and train tracking.

By reading this manual one can obtain information about how to add realistic and spacial sound effects to a model railroad layout controlled by **TrainController™**.

An overview of the basic concepts of **TrainController™** is provided in the **TrainController Users Guide**. It is assumed, that you are familiar with the contents of that document.

1 Introduction

1.1 Overview

TrainController™ is a system to operate a model railroad layout from a Personal Computer running MS Windows 98 or 95, Windows ME, Windows XP, Windows 2000 or Windows NT.

TrainController™ provides you with the ease of point and click to operate your switches, signals, routes and other accessories displayed on track diagram panels. Track diagram panels are individually created for each yard or section, as desired. You can run your trains with on-screen throttles, external hand held throttles connected to your computer, or with your favourite throttles or hand held throttles supported by your digital system. You can operate digital engines equipped with their own decoders, as well as conventional models without decoders. Digital and conventional engines can run on the same track. Far-reaching automation features make railroad operations manageable by one person and match those found on the largest club layouts. You can see on the screen which engine/train is on which track.

1.2 Realistic spatial Sound Effects with +4DSound™

+4DSound™ is an additional software module, that can be added to **TrainController™**. **+4DSound™** adds realistic and spatial (4D) sound effects to the operation of your model railroad. Why 4D? Sound effects are not only played at the according locations in the regular three dimensional space of your train room but also affected by timing, speed, attenuation and other factors.

+4DSound™ uses a series of stationary speakers placed around the layout to re-create the sound of trains traveling along the track. It does not require installation of onboard sound decoders into each particular locomotive.

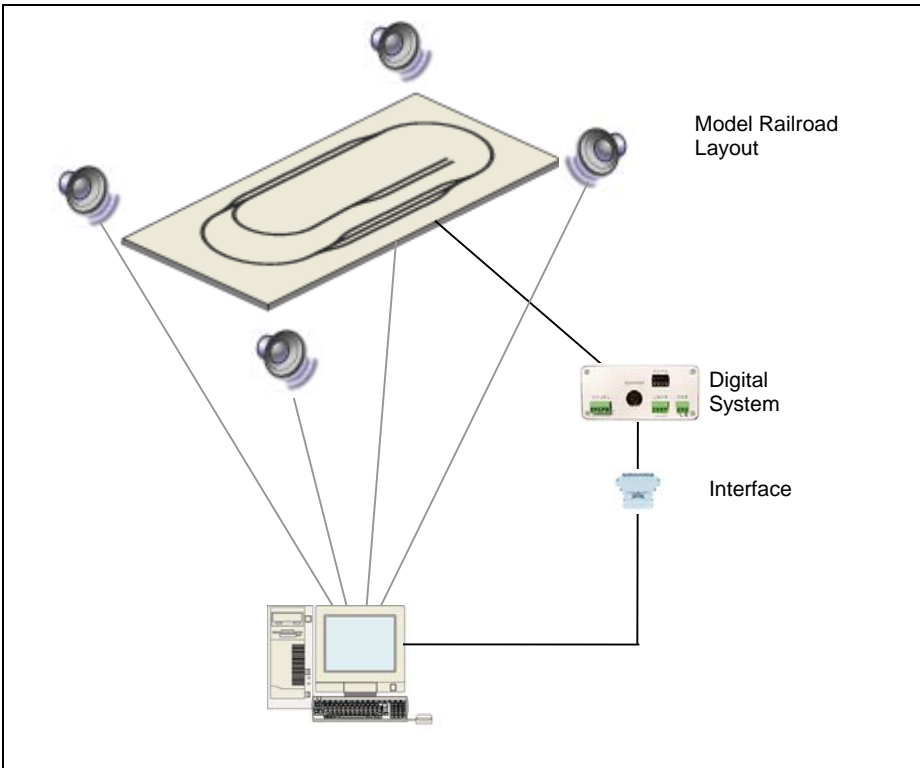


Diagram 1: Global architecture of +4DSound™

The diagram displayed above shows the structural principle and the hardware components of model railroad computer control with **TrainController™+4DSound™**. The image does not reflect the spatial conditions. In particular the speakers are usually located around the model railroad layout.

The system utilises the train tracking features of **TrainController™** to determine the location of each train, then blends the train sounds among the stationary speakers, allowing the sound to follow the train's movement.

The advantage of **+4DSound™** is the ability to use larger and better speakers under the layout, providing better bass response and much more realistic sound than onboard speakers alone can produce. **+4DSound™** can be combined with any digital system and it can be used by itself or in conjunction with an onboard sound system.

Stationary sounds can be programmed into the software, too, such as industrial sounds, waterfalls, animals and other nature sounds, and grade-crossing bells.

+4DSound™ provides the following features:

- Prototypical engine sound for all kinds of locomotives, such as 2-, 3- or 4-cylinder steam engines, diesel engines, electric engines.
- Multi Train support
- Multi channel sound allows for complex sound effects – e.g.:
channel 1: primary steam engine sound;
channel 2: secondary steam engine sound;
channel 3 to channel 5: multiple ambient sound
channel 6+: sound events (water pump, whistle, valves, bell, coal shoveling etc.)
- Chuffs are synchronized to the motion of the locomotive and vary in pitch, volume and revolution
- Event sounds are played on motion changes, on demand, triggered by function keys, scattered or looped.
- Well suited for all manually and automatically controlled model railroad layouts.
- Smooth integration into the operation and train tracking features of **TrainController™**.
- Stationary sounds reproduce local sounds of industries, farms, traffic, nature, weather, etc.



A surround sound system (e.g. 5.1) is required to make spatial sound effects audible. The use of mono and stereo speakers is possible, too. But this will result in replay of regular mono and stereo sound without any spatial or surround sound effect.

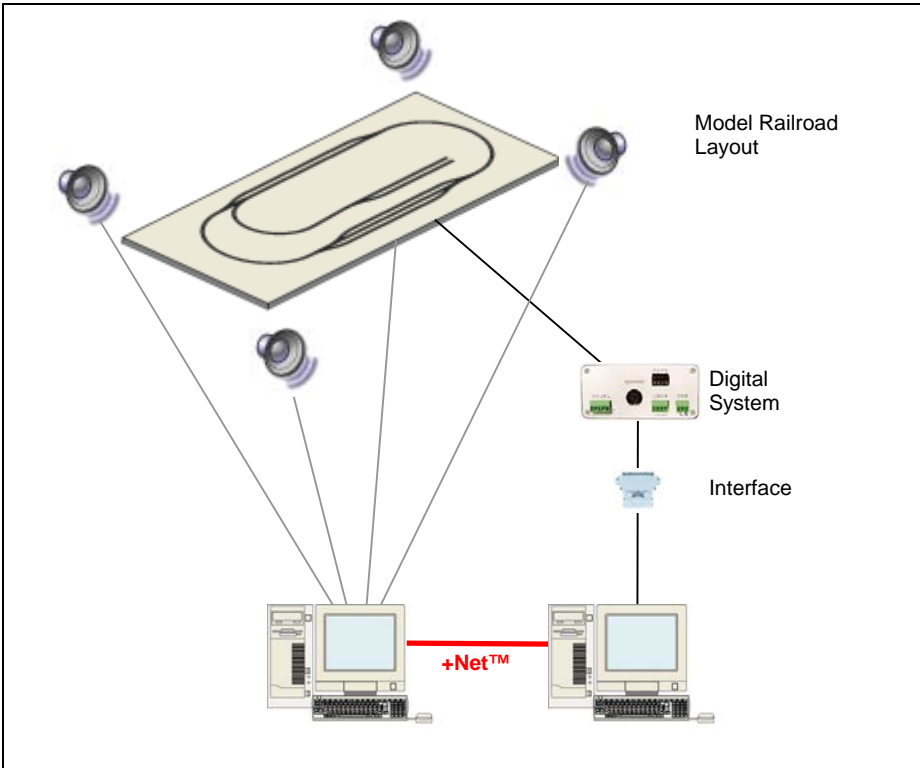


Diagram 2: Separating Layout Control and Sound Replay by +Net™

+4DSound™ can also be combined with **+Net™**, the network extension of **TrainController™**, for example to run model railroad control and sound replay on separate computers, if desired. This is especially useful, if you are looking for a useful application for a spare computer. For further information about **+Net™** refer to the **+Net™ Manual**, please.

1.3 The Foundations of +4DSound™

+4DSound™ sound effects are stored in so called **TrainAnimator™** files. These files are created and edited by **TrainAnimator™** and loaded and processed by **TrainController™**. All sound effects of a certain locomotive are stored in one single **TrainAnimator™** file. This package is called *sound profile* of the locomotive. Additionally it is

possible to create **TrainAnimator™** files for stationary sound effects to represent the sound effects of industries, farms, traffic, nature, weather, etc. on your layout. It is possible to store as many of such effects as desired in one **TrainAnimator™** file.

Sound Files and Sound Fragments

The sound effects of locomotives are composed by using sound fragments, that are stored in separate sound files. In general all files that are saved in the Windows WAW format are suitable for use with **+4DSound™**. The Windows .WAV format is the standard format for storing sound of any kind within the Windows system. These sound files are usually created by recording the sounds generated by real locomotives.

Many sound decoders, that can be loaded with individual sounds, use similar fragments and sound files. If you are in possession of such sound decoders and you have already stored sound fragments, that are suited to be loaded into these decoders, on the hard disk of your computer, then you can use these sound files for **+4DSound™**, too. The Internet also provides a rich selection of suitable sound files.



To achieve best results for surround sound replay the sounds should be recorded in or converted to mono format prior to using them in **+4DSound™**.

In this document we cannot provide comprehensive instructions on how to digitalize sound data with the aid of your computer and how to store them on the hard disk. Please also refer to the manuals of your PC, which will provide further information to this topic.

Motion Phases

The sound effects of locomotives are based on different motion phases of running locomotives.

The following motion phases are provided:

Off:

Motion sound of the associated locomotive is turned off.

Turn On:

Start of machine

Idle:

Locomotive is standing still with running machine

Start:

Locomotive begins to move

Accelerate:

Locomotive is increasing its speed

Run:

Locomotive is running at constant speed

Decelerate:

Locomotive is decreasing its speed

Stop:

Locomotive stops

Turn Off:

Machine is turned off

Some of the phases listed above are permanent phases (**Off, Idle, Accelerate, Run, Decelerate**). This means, that these phases do not end until the locomotive explicitly changes its motion status. The **Run** phase, for example, does not end until a locomotive, that is running at constant speed, begins to change its speed for some reason. The sound effects assigned to this phase are being played permanently as long as the locomotive remains in this motion phase.

The other phases (**Turn On, Start, Stop, Turn Off**) are intermediate phases. The sound effects assigned to such phase are only played once during the transition of certain permanent phases to another permanent phase. The duration of these phases is determined by the duration of the sound effects assigned to them. If a locomotive, that is standing still (**Idle**) begins to move, then the sound effect of the **Idle** phase stops to play, then the sound effects of the **Start** phase are played once and finally the sound effects of the **Accelerate** phase begin to play. This allows for replay of short sound effects, that are specific to a starting train.

There are also the following two pseudo phases:

All:

Sound effects, that are to be played during all motion phases. This pseudo phase is just provided for convenience reasons. If a certain sound effect is to be played during all phases of movement, then it can be assigned to the **All** phase, instead of multiple assignment of the same effect to each particular motion phase. A typical example of a

sound effect assigned here is the permanently hissing sound, that is generated by the water heated in the boiler of a steam engine.

On Demand:

Sound effects, that are to be played on explicit demand, e.g. triggered by an engine function in **TrainController™** or played as a stationary sound.

Sound Effects

Sound effects are composed by sounds stored in sound files (WAV file format). **+4DSound™** is able to process arbitrary WAV file formats. The sound data should be provided in mono format, however, because stereo format is not well suited for replay as surround sound.

For each motion phase of a locomotive different sets of sound effects can be specified:

Engine Sound:

Primary sound generated by the locomotive's engine. This is the sound, that is usually audible, when the machine of the locomotive is running. Engine sound is composed by sound fragments, that are stored in separate sound files. Depending on the type of engine more than one sound fragment may be assigned as engine sound. These files are then played one after the other during one revolution cycle. For a diesel or electric engine it is usually sufficient to assign one single sound fragment as engine sound. This fragment is then played in an endless loop while the engine is turned on. Steam engines usually require more than one sound fragment – one for each chuff in a revolution cycle. The engine sound of a 4 cylinder steam engine, for instance, is usually based on a sequence of four different sound fragments. These fragments are played one after the other, the complete sequence is repeated in an endless loop while the engine is running. Sound fragments should be kept short. The chuff of a steam engine normally lasts only a fraction of a second. Fragments used for diesel or electric engines may be such short, too, because the permanent sound is recreated anyway by repeating this sound in an endless loop.

Secondary Engine Sound:

Optional secondary sound. Mixed with the primary engine sound to allow for more complex and realistic engine sound. Secondary engine sound can be used in cases, where the sound of the locomotive or train changes significantly depending on the speed, i.e. not only in terms of volume, velocity or revolutions. The sound of a complete train, for example, will be dominated at slow speed by the sound of the machine while at higher speed the noise of the wheels of the cars may be more dominating. In order to reproduce this the sound of the machine can be assigned as primary engine sound while the sound of rolling wheels is assigned as secondary engine sound. If the volume of

these sound effects is adjusted in a way, that the primary engine sound is played loudly at low speed and silently at high speed and vice versa the secondary engine sound is played silently at low speed and loudly at high speed, then the desired effect will be achieved.

Ambient Sound:

Optional engine sound played continuously the background. The silent sound of boiling water in a steam locomotive is a good example. If more than one sound file is assigned here, than all files are played simultaneously.

It is not necessary to assign engine or ambient sound to all motion phases. If no such sound effect is assigned to the intermediate phases (**Turn On, Start, Stop, Turn Off**), then these phases are simply skipped and the sound of the following (permanent) motion phase is directly played after the sound of the previous phase. If, for example, no sound effect is assigned to the **Start** phase, and the train begins to move, then the sound of the **Accelerate** phase is played directly after the sound of the just terminated **Idle** phase. It is also not necessary to assign sound effects to the **Accelerate** or **Decelerate** phase. Even though a steam locomotive, for example, will sound more realistic, if their chuffs sound more heavy or louder during acceleration, its **Accelerate** or **Decelerate** phase may be left blank. In this case the sound effects assigned to the **Run** phase will be played, too, during acceleration or deceleration of this locomotive.

Event Sound:

These are sound effects, that are played on certain occasions. Event sound can be played at the beginning of a phase (such as the noise of brakes at the beginning of the **Stop** phase), scattered during a phase (such as the noise of the pump of a steam engine) or on demand (i.e. triggered explicitly such as the whistle). Each event sound can be based on a sequence of one or more sound files, that are being played one after the other. It is also possible to repeat each event sound or specific parts of it a certain number of times or in an endless loop.

Stationary sound effects for track side sound only use event sounds, that are assigned to the **On Demand** phase.

Sound Modifiers

The sound effects can be influenced by the following attributes:

Volume:

Determines the volume of the sound effect. For locomotive sound and some phases it is

possible to specify different volume levels for the minimum and maximum speed of the locomotive. The volume for all intermediate speed levels is interpolated accordingly.

Velocity:

Determines the pitch, at which the sound effect is played. For locomotive sound and some phases it is possible to specify different velocity levels for the minimum and maximum speed of the locomotive. The pitch for all intermediate speed levels is interpolated accordingly.

Revolutions:

Determines the duration of one revolution cycle. This parameter applies only to the primary and secondary engine sound and only, if more than one sound file is assigned to the sound effect. It determines, how fast the particular sound files are played one after the other. For steam engines this is the most important factor to generate realistic steam sound. For some phases it is possible to specify different revolution levels for the minimum and maximum speed of the locomotive. The revolution for all intermediate speed levels is interpolated accordingly.

Repetition:

Determines, how often a specific sound effect is to be played. This attribute only applies to the engine or ambient sound assigned to intermediate motion phases or to event sound. A value of 0 results in an endlessly looped sound effect.

Trigger (Event Sound only):

Determines, when to play a specific event sound. Possible choices are the beginning of a motion phase, on explicit demand or scattered by random during a phase.

Interval (Event Sound only):

Determines, after which delay a scattered sound effect is being repeated. It is possible to specify different minimum and maximum delays. The actual delay between two replays of this effect is selected as a random value, that is located between these minimum and maximum values.

Name (Event Sound only):

Specifies a logical name for an event sound. This name can be used to refer to this event sound when associating it with an engine function in **TrainController™**.

Typical Sound Profiles

The following tables show typical sound profiles for steam and diesel or electric locomotives. They describe, which kind of sound fragments are typically assigned to which motion phase to recreate the sound, that is typical for the related type of locomotive.

If you are in possession of a sound decoder and you have already stored sound fragments, that are suited to be loaded into these decoders, on the hard disk of your computer, then you can use these sound files here, too. The Internet also provides a rich selection of suitable sound files.

Simple Steam Engine:

Motion Phase	Engine Sound	Sec. Engine Sound	Ambient Sound	Event Sound
Turn On				
Idle				pumps (scattered)
Start				
Accelerate				
Run	3 or 4 sound fragments for the chuffs of a 3- or 4 cylinder steam engine			
Decelerate				
Stop				brakes (begin of phase)
Turn Off				
All			light hissing of hot water or steam	shovels
On Demand				whistle bells etc.

Table 1: Sound Profile of a simple Steam Engine

Table 1 shows the configuration of a simple steam engine. No engine sound effects are assigned to the **Start**, **Accelerate**, **Decelerate** and **Stop** phase. In this case the effects assigned to the **Run** phase will be used here, too.

Complex Steam Engine:

Motion Phase	Engine Sound	Sec. Engine Sound	Ambient Sound	Event Sound
Turn On				
Idle				pumps (scattered)
Start	3 or 4 heavy or loud chuffs; played at slow revolution			
Accelerate	3 or 4 heavy or loud chuffs recorded at slow speed	3 or 4 heavy or loud chuffs recorded at high speed		
Run	3 or 4 normal chuffs recorded at slow speed	3 or 4 normal chuffs recorded at high speed		
Decelerate	3 or 4 very light chuffs recorded at slow speed	3 or 4 very light chuffs recorded at high speed		
Stop				brakes (begin of phase)
Turn Off				
All			light hissing of hot water or steam	shovels
On Demand				whistle bells etc.

Table 2: Sound Profile of a complex Steam Engine

Table 2 shows the configuration of a complex steam engine. This configuration will sound more realistic than the previous configuration. The sound fragments assigned to the **Start** and **Accelerate** phase should reflect the sound of heavy steam chuffs, that are usually created by steam locomotives, that are accelerating or running under heavy

load. The sound fragments assigned to the **Decelerate** phase should reflect a lighter sound.

Usage of secondary engine sound is optional. For more realistic results you can assign other sound effects as secondary engine sound. In this case the primary sound is mainly played for low speed, while the secondary engine sound is played for high speed. The volume of the primary engine sound should decrease with raising speed while the volume of the secondary engine sound should increase with raising speed. The following table reflects typical settings:

	Volume at min Speed	Volume at max Speed
Engine Sound	high	low
Sec. Engine Sound	low	high

Table 3: Mixing primary and secondary Engine Sound

Diesel/Electric Engine:

Motion Phase	Engine Sound	Sec. Engine Sound	Ambient Sound	Event Sound
Turn On	sound of starting motor			
Idle	sound of idling motor			
Start				
Accelerate				
Run	sound of running motor			
Decelerate				
Stop				brakes (begin of phase)
Turn Off	sound of stopping motor			
All				
On Demand				horn, bells etc.

Table 4: Sound Profile of a Diesel/Electric Engine

Table 4 shows the configuration of a diesel or electric engine. One single sound fragment is assigned to each motion phase as engine sound. This sound is played in a permanent loop. To achieve more realistic results you can also assign individual sounds to the **Start**, **Accelerate** or **Decelerate** phase, if you are in possession of appropriate sound fragments. As additional extension it is possible to assign sound generated by rolling wheels as secondary engine sound. The volume is adjusted in a way, that the sound of the rolling wheels becomes audible, when the train reaches a certain speed level. At high speed the secondary engine sound may even drown out the primary engine sound.

Stationary Sound (e.g. Farm):

Motion Phase	Engine Sound	Sec. Engine Sound	Ambient Sound	Event Sound
Turn On				
Idle				
Start				
Accelerate				
Run				
Decelerate				
Stop				
Turn Off				
All				
On Demand				cow, chicken, pig, etc.

Table 5: Sound Profile of Stationary Farm Sound

Table 5 shows the typical configuration of a stationary sound. It is possible to store all sound fragments, that belong to a certain sound source, in one single configuration (e.g. all sounds generated by the same farm, by the same factory, by a certain station, etc.).

2 Preparing Sound Effects with TrainAnimator™

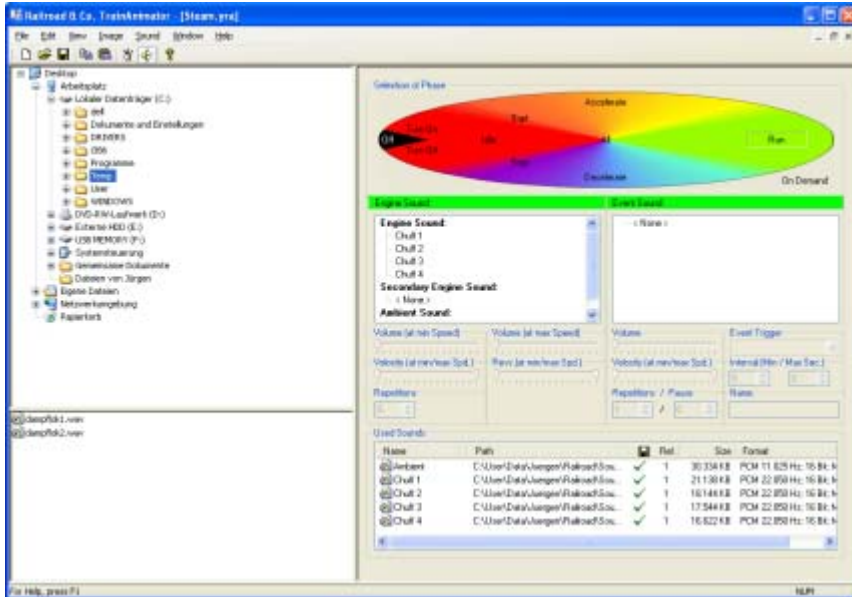


Diagram 3: TrainAnimator™

After start **TrainAnimator™** open the sound editor with **Sound Editor** command of the **View** menu. The sound editor is displayed in the above diagram.



Before doing anything else, select the type of object, which you want to create sound effects for, with the Type command of the Sound menu. There are different type settings provided for steam locomotives, diesel or electric locomotives or stationary sounds. After selecting the type those options and sound modifiers are disabled, that are not appropriate for that specific type. Engine sounds, for example, cannot be assigned to stationary sounds; the specification of revolutions does usually only make sense for steam locomotives, while the engine sound of diesel and electric locomotives is played in a continuous loop. Experienced users, who want to use freely the full range of available options and who want to be able to combine each option with each other, may consider to select **Custom Loco** as type. Novice users, who are not very familiar with the use of the sound editor, however, should select one of the other, more easy to use types.

Next browse to the locations of your hard disk, where the sound files are stored, that you want to use as sound effects. This is done with the two file browser windows in the left part of the **TrainAnimator™** window.

Before importing a sound file into your project, select the motion phase, to which the sounds shall be assigned. The available motion phases are displayed in the coloured ellipse at the top of the sound editor and can be selected by clicking to the associated label with the left mouse button. Alternatively select the desired phase from the **Phase** menu of the **Sound** menu. A visual feedback of the selected phase is also given in the bar below the coloured ellipse, which always shows the colour, that belongs to the currently selected phase.

The most convenient way to assign sound files as effects to motion phases is to drag and drop the names of sound files from the list in the left part to the appropriate place in the right part of the **TrainAnimator™** window. If you want to assign a sound file, that contains a steam chuff, as engine sound to the **Run** phase, for example, drag the according file name from the left part of the **TrainAnimator™** window to the **Engine Sound** section in the right part of the window. Alternatively select the file in the left part of the window and use the appropriate **Insert As** command of the **Sound** menu.

If the file, that you want to insert, is already used in another phase of your project, then you can directly select this file from the list of **Used Sounds** in the lower right area of the **TrainAnimator™** window instead of searching it on your hard disk.

After assigning files as sound events to your project you can change the according sound modifiers with the controls provided in the right part of the window. Changes of these modifiers apply always to those sound fragments or events, that are currently selected in one of the lists.

If you want to listen to a sound file, e.g. to check it prior to insertion into your project, click to it with the right mouse button and use the **Play** command. Alternatively call the **Play** command of the **Sound** menu. Sounds can be picked for playing from any list, that is visible in the **TrainAnimator™** window.

If you want to test your composition, use the **Sound Simulation** command of the **View** menu. This opens a small throttle window, that lets you turn on the engine and change the speed of a simulated locomotive. Now move the speed slider and listen to the sound effects, that correspond to the particular motion phases. Each change made in the right part of the window should now result in appropriate changes of the generated sound.

When the edited sound profile fit your needs, store the profile in an .YRA file by using the **Save** or **Save as** command of the File menu. The profile can be loaded later into **TrainAnimator™** again by using the **Open** command of the **File** menu.

3 Using Sound Effects with TrainController™

3.1 Associating Sound with Engines

Assign the .YRA file, that contains the sound effects for a particular locomotive, to the engine object in **TrainController™** in the usual way (engine properties).

The sound effects assigned to the particular motion phases will then be played automatically as the engine moves.

It is possible to turn on or off this engine sound individually for each engine and at any time during operation with the **Engine Sound** command of the **Train** menu.

It is also possible to turn on or off the engine sound of each engine automatically. For this purpose a new engine operation called **Engine Sound** is provided, that can be executed by schedules, macros, indicators, etc. This is useful for example to turn off the engine sound automatically at the end of each schedule, that stores a train in a hidden yard.

3.2 Using Sound as Engine Function

It is possible, to use sound effects of type **Event Sound**, that are stored in the .YRA files within the pseudo phase **On Demand**, as engine functions. These sounds are played once when or scattered as long as the associated engine function is turned on.

To associate an event sound with an engine function select **Event Sound** in the **Type** option of the **Functions** tab in the **Engine Properties** dialog. If this is done, then all event sounds stored in the **On Demand** phase of the .YRA file will be listed in the **Event Sound** box. Here select the desired event sound.

The selected event sound is played, whenever the associated engine function is turned on. Scattered or permanent (e.g. looped) replay stops, when the engine function is turned off.

Please note, that the **Engine Sound** command of the **Train** menu does not affect replay of sound events assigned to engine functions. They are audible even if the engine sound is turned off.

As other engine functions, too, these event sounds can also be played automatically (e.g. at the beginning of a schedule). For further details refer to the description of engine functions in the **TrainController™ Users Guide**.

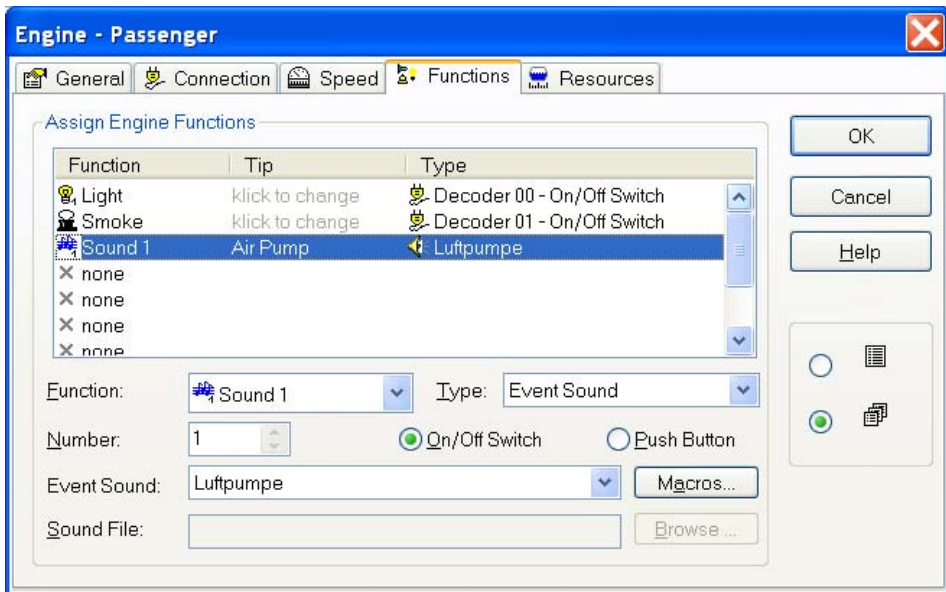


Diagram 4: Assigning Event Sound as Engine Function

3.3 Specifying the spatial Location of Blocks

In order to generate true spatial surround sound according to the current location of each engine, it is possible to specify the spatial location of each block in **TrainController™**. If a surround sound system is connected to your computer, then the sound assigned to a particular engine will be played at that location in the virtual sound space, that belongs to the block, where the engine is currently located.

The spatial location of each block is specified in the **Sound** tab of the **Block Properties** dialog.

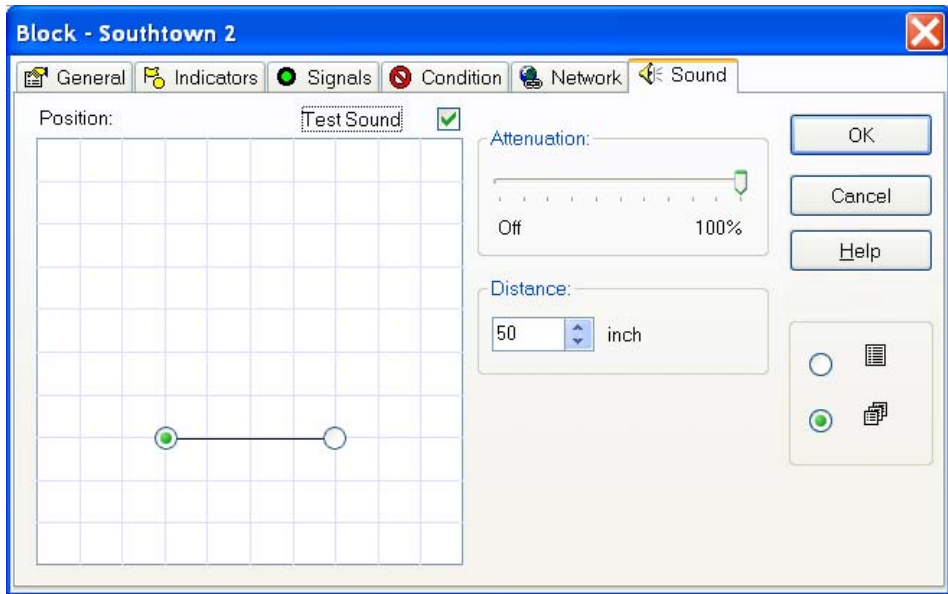


Diagram 5: Specifying the spatial location of a Block

This tab provides the following options:

Position:

Drag the markers to the spatial location of the left/upper and right/lower exit of the block. To identify these locations, turn on the **Test Sound** option. While this option is turned on, a permanently repeated clicking sound is audible. Now drag the according marker, until the clicking sound seems to origin from that location, where the associated exit of the block is located.

If there is a gap between this block and adjacent blocks, then drag the according marker to the centre of this gap. This avoids, that the sound “skips”, when a train passes the gap between this block and adjacent blocks. If there are more than one adjacent blocks and if there is no common centre of the according gaps, then try to find an audible “average centre” of these gaps.

Distance:

Specify the actual distance between the two markers on your real layout. This option is used to fade the sound smoothly and according to the actual speed of the train between the stationary speakers of your sound system while the train travels through the block.

Attenuation:

Specify the attenuation, that shall be applied to sounds originating from this block. This value is a percentage value, i.e. 100% means no attenuation. This option is useful to generate additional realistic sound effects for valleys, gorges, tunnel entries or other parts of your layout, that are covered somehow.

3.4 Stationary Sounds

Stationary sounds are not bound to the movement of trains. Instead they are bound to a specific location of your layout and played there. Stationary sounds can be used to reproduce the sound of industries, farms, traffic, weather, animals or specific track side sounds on your layout.

Usually a stationary sound consists of several sound effects (event sound), that represent in total the “noise profile” of a certain item of your model railroad. Examples of such items are stations, farms or factories; examples of stationary sounds are all sound effects, that are generated by a certain station, farm or factory.

Stationary sounds can be assigned in **TrainController™** to the operations of push buttons or on-off switches, indicators, macros, routes, etc. In this way they can be played manually or in the context of semi-automatic or automatic operation. For further details about operations refer to the **TrainController™ Users Guide**, please.

Stationary sounds are created with **TrainAnimator™** and must be assigned to the **On Demand** phase.

Managing Stationary Sounds

Stationary sounds are managed through the **Stationary Sounds** command of the **Edit** menu of **TrainController™**. With this command it is possible to create new stationary sounds, to delete existing sounds or to edit the properties of stationary sounds.

With the **Sound Properties** dialog it is possible to edit the properties of a Stationary Sound. The **General** tab of this dialog provides the following options:

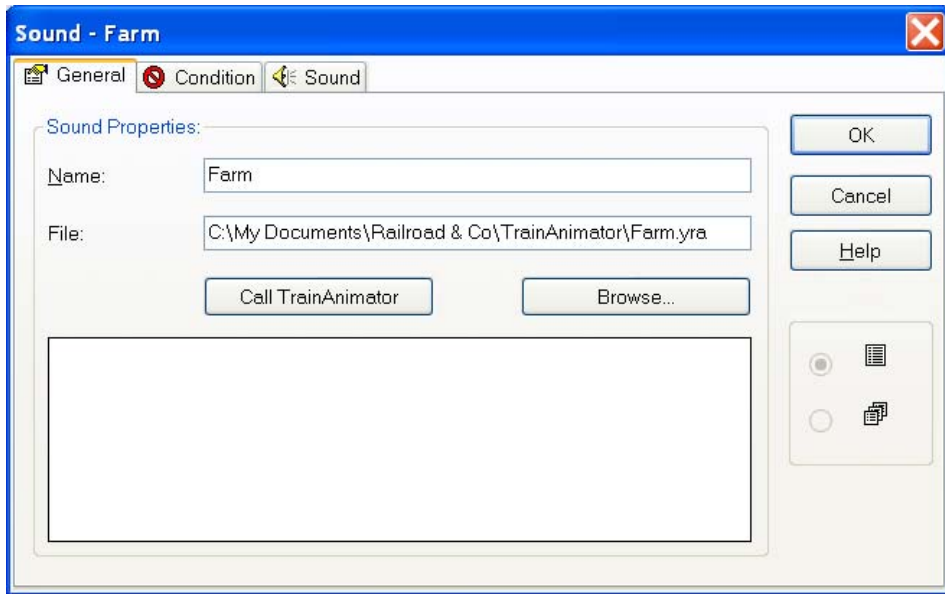


Diagram 6: Specifying general properties of a stationary sound

Name:

Enter an arbitrary name for this stationary sound. This name is for example useful when referring to this sound during assignment of this sound to the operations of other elements.

File:

Enter the name of the **TrainAnimator™** file (.YRA) here, that contains the desired event sound effects. If this is done, then all event sound effects, that are assigned to the **On Demand** phase of this file can be accessed with this stationary sound. In this way it is possible to store all sound effects, that belong to a specific item of your layout (e.g. all noises of a certain farm or factory) in one single **TrainAnimator™** file. Each sound effect stored in this single file can be played individually whenever and how often you like. This is shown in the next section.

It is also possible to specify the name of a single wave file here. If this is done, then the stationary sound contains one single sound effect, that is always played once.

Browse:

Use this option to browse for the desired file.

Call TrainAnimator:

Use this option to start **TrainAnimator™** to edit the selected **TrainAnimator™** file.

The **Sound** tab of the Sound Properties dialog allows to specify the spatial location of this stationary sound. This is the location of your layout, where the item (e.g. station, farm, factory etc.) is located, which this stationary sound belongs to. This tab provides similar options as displayed and described in section 3.3.

Playing Stationary Sounds

Stationary sounds are played by operations of push buttons, on-off switches, macros, indicators, routes, etc. For this reason the particular sound effects assigned to a stationary sound must be assigned to the operations of these elements. For further details about operations refer to the **TrainController™ Users Guide**, please.

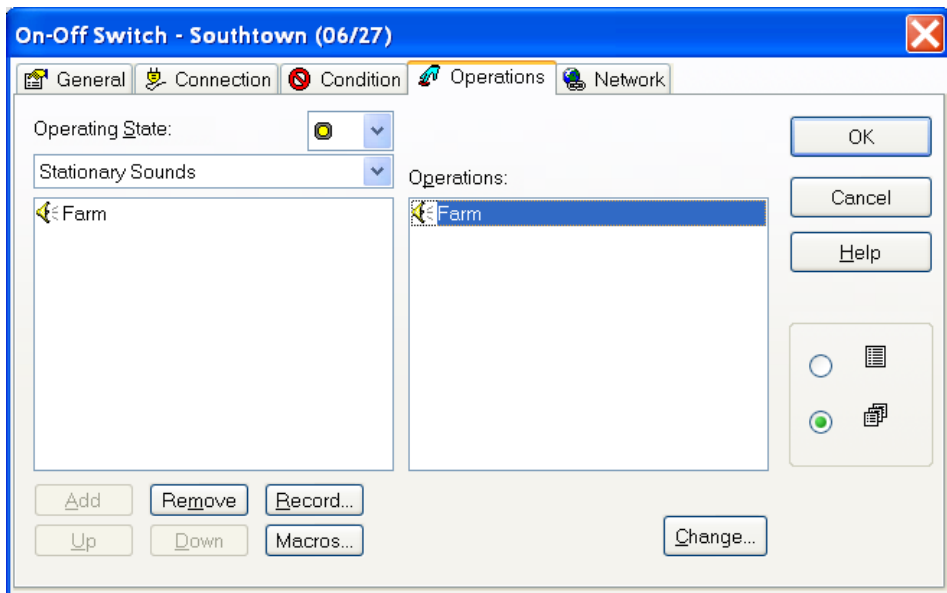


Diagram 7: Assigning a stationary sound to the operations of another element

By pressing the **Change** button in the dialog tab displayed above it is possible to select, which sound effects, that are assigned to this stationary sound, shall be operated. This is done with the **Sound Operation** dialog box displayed below:

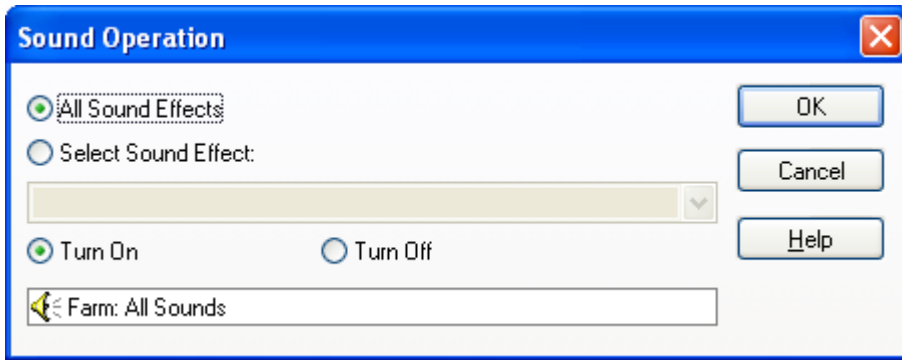


Diagram 5: Selecting the sound effect to be played

This dialog provides the following options:

All Sound Effects:

If this option is selected, then the operation will affect all sound effects assigned to the stationary sound.

Select Sound Effect:

If this option is selected, then the operation will affect only the selected sound effect. The selection contains all event sound effects, that are assigned to the **On Demand** phase of the stationary sound.

Turn On:

If this option is selected, then the operation will begin to play the selected sound effect(s). If **All Sound Effects** is being selected, then all sound effects contained in the stationary sound will begin to play simultaneously.

Turn Off:

If this option is selected, then the operation will stop the replay of the selected sound effect(s).

4 Installation, Licensing and Initialisation

Installation

At first install an appropriate set of stationary speakers at appropriate locations of your model railroad room. Note, that spatial effects are only audible, if a proper surround system is installed.

Installation of **+4DSound™** is very simple and self-explaining. Install **+4DSound™** on your computer to the same directory, where **TrainController™** is already installed. If this is not done correctly, the **Sound** tab displayed in section 3.3 will not become visible.

Licensing

If no **+4DSound™** license is installed on your computer, then you can test the features of **+4DSound™** in the demo mode. This demo mode is automatically turned on, when the **Offline** command of the **Railroad** menu is turned on. As a consequence you can test audible train movements only in the offline mode of **TrainController™**. It is not possible to use the features of **+4DSound™** simultaneously to the operation of your layout, when no license of **+4DSound™** is installed.



If you didn't install a license of **+4DSound™** on your computer and no sound is audible, then ensure, please, that the **Offline** command of the **Railroad** menu is turned on.

The **+4DSound™** license can be managed by using the **Sound Setup** command of the **Railroad** menu. This command opens the following dialog:

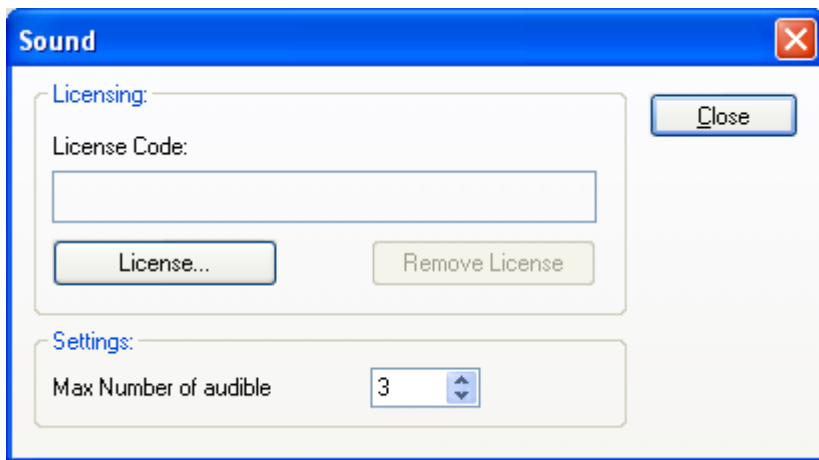


Diagram 8: License management and other Sound options

License Code:

The already installed code of your **+4DSound™** license valid for this computer is displayed here. The code cannot be changed here.

License...:

If no license for **+4DSound™** was installed yet on this computer, use this option to install a new license on your computer.

Remove License:

Use this option to remove the installed **+4DSound™** license, if any, from your computer. This option is useful, if you want to move a license from one computer to another.

Max Number of audible Engines:

In order to reduce the “noise” generated in your layout room you can reduce the number of engines, that are simultaneously audible, to a reasonable number. The default value is 3, which means that at most 3 engines are audible. If the sound of a fourth engine is turned on, by the **Engine Sound** command of the **Train** menu or automatically through the **Engine Sound** operation, then the sound of the first engine is automatically turned off.

Starting and Stopping

The replay of all sounds can be started and stopped globally by calling the **Sound Turn On** command of the **Railroad** menu. If sounds are turned off, then no engine sound, no event sound assigned to engine functions and no stationary sounds are audible.

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