

USER MANUAL
for

SoundRacer X



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BASIC USER MANUAL

Congratulations on purchasing your SoundRacer X! Welcome and get ready to enjoy exciting Super Sports Car engine sounds!

What you need:

- A car with an AC alternator that produces small pulses on the 12V system. Most cars on the market are compatible but not electric and hybrid cars.
- A cigarette lighter/12V socket in the car.
- A car stereo system with FM receiver/AUX input.

1. Startup SoundRacer

1. Apply the parking brake and set the gear selector in neutral.
2. Place SoundRacer in the cigarette lighter/12V socket.
The display indicating FM frequency should light up automatically. If not, the ignition key has to be turned to the position where power is applied to the socket. You will see the display light up when power is on.
3. A. For cars with AUX input: Set the AUX switch on SoundRacer X to AUX OUT (up). Connect the enclosed stereo cable to the car AUX input and the SoundRacer AUX connector. Select AUX input on the radio.

B. For cars without AUX input: Activate the FM receiver and set it to a frequency where no radio station is heard.
Set the AUX switch on SoundRacer X to AUX IN (down)
Press the + or – button on SoundRacer to set the same frequency as on the FM receiver.

Now you should hear an idling engine sound. Adjust the volume on the radio so that the sound is clearly heard.
4. Start the engine and rev it up to 2500-3000rpm (revolutions per minute) by quickly pressing down the throttle and then release it. You should hear a short beep in the speakers when the engine is slowing down. The beep indicates that SoundRacer has found the alternator signal. After a few seconds, when the engine is down to the idling rpm, you should hear two beeps indicating that SoundRacer has detected the idling rpm.
5. That's it! Now you can press down on the throttle and hear a Super Sports Car engine rev up.
6. To load the next sound on SoundRacer X just press the SOUND button. The blue LED starts flashing for about 12 second and the new engine sound is heard.

Drive off and enjoy, but always drive safely!

2. If it does not works as expected

SoundRacer cannot detect the engine rpm?

If there is no first beep or second beeps or the sound does not follow the engine rpm, then SoundRacer has a problem detecting the alternator signal and rpm. This can happen if the alternator signal is too weak. In that case it can help to increase the electrical load on the alternator by turning on the headlights, seat heating, rear window heating or other electrical equipment.

It is also possible to change the rpm sensibility by generating sound files with other settings on parameter 7, see SOUND PARAMETER SETTINGS.

The radio will not remain on the selected frequency, changes to another station.

Try deactivating AF function on the radio. AF is used to automatically search for the best station in an area. Usually there is an AF button on the radio and an AF symbol in the display. Press the AF button until the AF symbol disappears. See the user manual for your car radio for a detailed and correct description.

The radio reception is weak, the sound is low with a lot of noise.

Check the car antenna and radio. The transmitting power of SoundRacer and other FM transmitters is limited by government regulations. This means that the antenna cannot be too far from the transmitter.

Check that no radio station transmits very close to the selected frequency.

The sound quality is low.

The quality of the engine sound is naturally highly dependent on the sound system in the car. With high class radio receiver, amplifier and speakers you will have an astonishing sound experience, with a standard car stereo you will still have great engine sound but maybe less impressive. Especially the low frequency sounds are important so adjust the audio controls on the radio to suit your taste.

3. Tips & Tricks

Engine sound: Adjust volume, treble and bass on the radio to get the best sound experience in your car. More bass brings a more powerful sound effect. Just be careful not to blow your speakers.

Engine speed: If you want the SoundRacer “engine” to run on lower rpm you can adjust it by setting parameter 9 to a lower value, like 120. This is useful if you drive a “high rev” car or for highway driving.

If you drive a “low rev” car, like a diesel, you can set the parameter 9 to a higher value, like 220

4. How it works

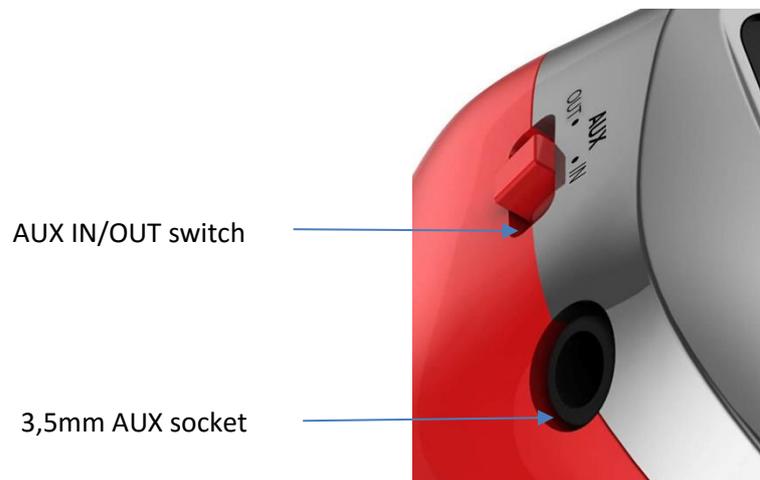
The technology in SoundRacer is based on signals (electrical noise) on the electrical cables from the AC alternator that is used in most cars today. The signal frequency follows the engine speed, SoundRacer detects this signal and transforms it to a simulated rpm. The increase in simulated rpm is then multiplied with a factor in order to produce a more exciting acceleration impression without running the car’s engine at high rpm. Based on the changes in rpm SoundRacer also produces different sounds: idling, acceleration at lower rpm, acceleration at higher rpm and deceleration. The engine sounds are transferred to the car radio by the built-in FM transmitter.

5. Use the AUX in/out connector

Use the 3.5 mm stereo cable to connect a music player to SoundRacer to enjoy your favorite music on the car radio. The 3.5 mm plugs fits in the headset output of the music player and the AUX socket under the SoundRacer front. Set the AUX switch on SoundRacer X to IN.

If the car has a AUX in socket, the 3,5 mm cable can connect the SoundRacer directly to the car radio amplifier. This is useful in areas with many FM radio stations and can also provide better sound quality. Set the AUX switch on SoundRacer X to OUT.

CONTROLS AND CONNECTIONS



TECHNICAL DESKRIPTION

SoundRacer X Car FM Transmitter

Engine sound output Built in FM transmitter sends the sound to the car FM radio on one of 199 frequencies: 88,1 MHz – 107,9 MHz
Max FM transmitting power is restricted by authorities.
AUX out with included 3,5mm stereo cable.

Engine sounds Engine sounds included with SoundRacer X:
car sounds
Shelby Mustang V8
Lamborghini V10
Lexus LFA V10
Ferrari V12

motorcycle sounds
Classic American V-Twin
Suzuki GSX

For information on how to create sounds see [SOUND FILE SPECIFICATIONS](#)

MicroSD memory card Sound files are stored on a MicroSD memory card. Several engine sounds can be stored on the card and next sound is loaded by pressing the SOUND button. Input signal settings and other parameters are stored together with the sound files. User can select settings and sounds in the [FILE GENERATOR WINDOWS PROGRAM](#) and store on the MicroSD card. A SD adapter is included.



Power supply 12V DC.
Current consumption at 12,4V: 50 mA without charging, up to 700mA during charge of tablet or phone.

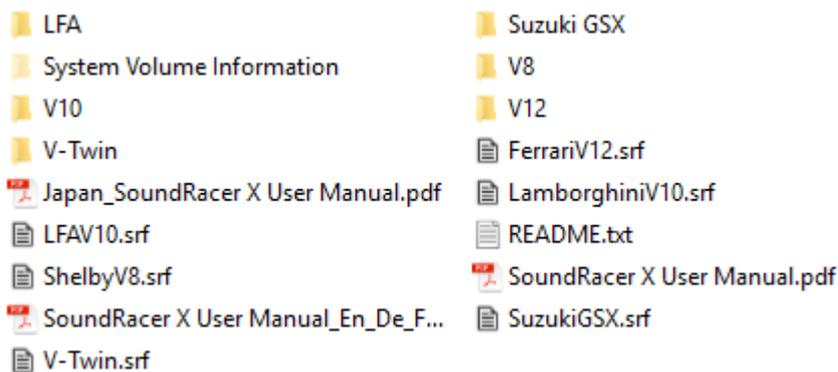
Car USB charger USB socket for charging mobile phones and tablets with up to 1 Ampere.

FILE GENERATOR WINDOWS PROGRAM

The Windows program **SRFileGen.exe** is used to select settings and sounds and create a file named **output.srf**. The file should be transferred to a MicroSD memory card. SoundRacer X can read sounds and settings from the MicroSD card.

Content of MicroSD card

The MicroSD card delivered with SoundRacer X contains Windows program, sound files and documentation.



The .srf files are generated files with standard settings. Copy all files and folders to a computer to read the manuals and as backup.

Generating an output.srf file from wav sound files

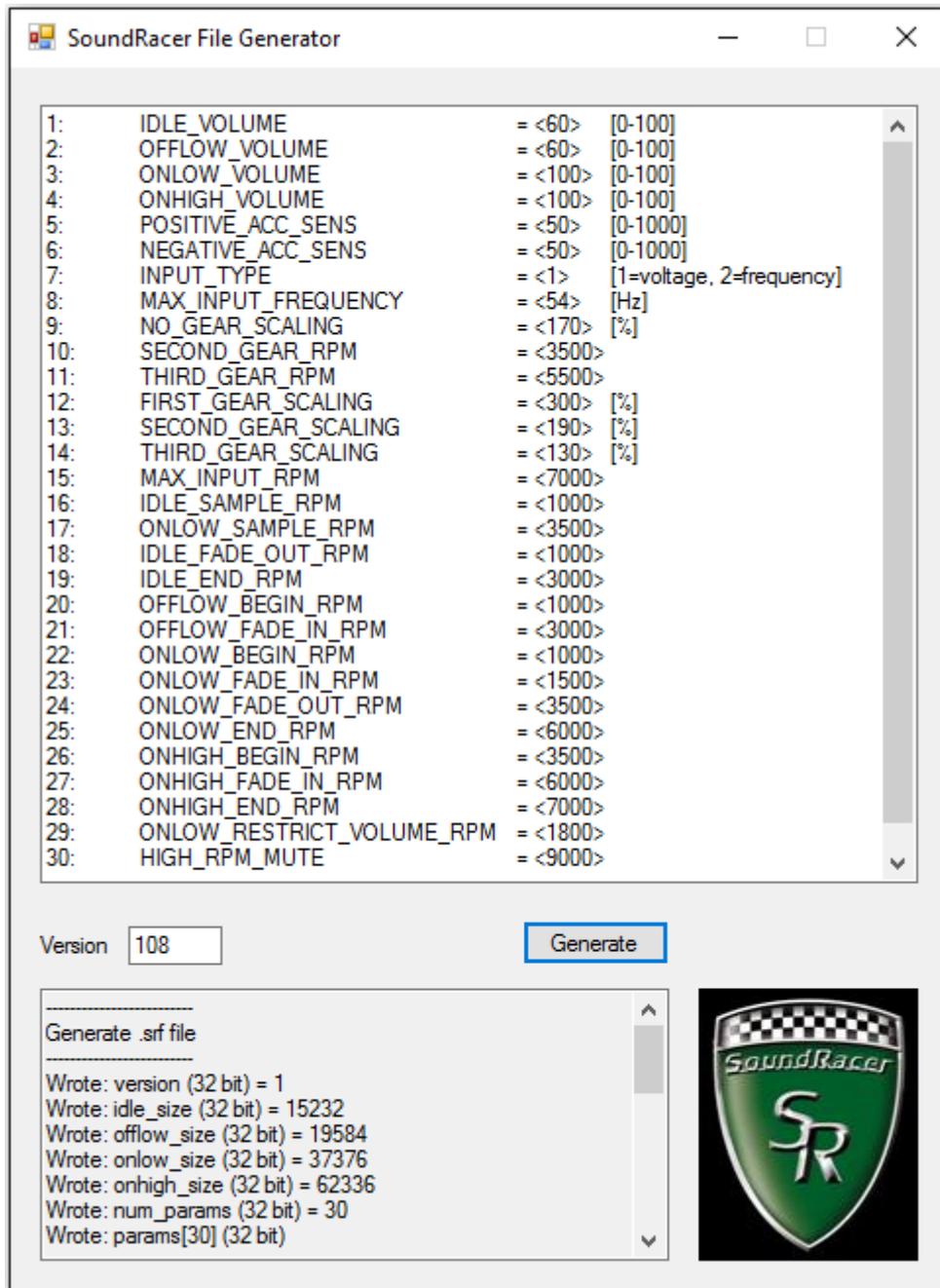
Place four files idle.wav, onlow.wav, onhigh.wav and offlow.wav in a folder. It is convenient to name the folder with the name of the sound. Place the program **SRFileGen.exe** in the same folder.

 idle.wav	2016-08-28 15:57	WAV-fil	30 kB
 offlow.wav	2016-08-28 15:57	WAV-fil	41 kB
 onhigh.wav	2016-08-28 15:57	WAV-fil	122 kB
 onlow.wav	2016-08-28 15:57	WAV-fil	74 kB
 output.srf	2016-08-28 17:03	Server Respon...	263 kB
 ShelbyV8.srf	2016-08-28 17:01	Server Respon...	263 kB
 SRFileGen.exe	2016-08-28 15:57	Program	56 kB

This is a sample of the folder. Here the output.srf file have been created. There are also a srf file that is renamed to ShelbyV8 for storing on the MicroSD card.

Double click on the program file SRFileGen.exe to start the program.

This window will open. Note: Here the parameters are changed to the standard values for the SoundRacer X.



NOTE: This is the same program used for SoundRacer Electric Vehicle Sound Module, and many parameters have no function in SoundRacer X. A new version of the File Generator program will be available later for download from the SoundRacer website. It will have a more developed user interface.

Basically, the settings 5, 6, 9 and Version are used.

- 5 POSITIVE_ACC_SENS = <50>
Set to <50> or more for fast sound response at acceleration.
- 6 NEGATIVE_ACC_SENS = <50>
Set to <50> or more for fast sound response at deceleration.
- 9 NO_GEAR_SCALING = <170>
Speed to RPM factor, set to 170 or more for higher sound revving

The other settings are used for changing the sound character and functions, more info see [SOUND PARAMETER SETTINGS](#).

Enter a 3 digit Version number. Use a unique version number for each file on the MicroSD card. When the Engine sound select button is pressed, the module search for the next higher version number and starts reading the file from the MicroSD card and store it in the processor memory. It takes about 15 seconds, then the sound output starts. **NOTE: If two or more files have the same version number, only one file will be able to load.**

When a file is created it has the name *output.srf*. Change the name before the file is transferred to the MicroSD card.

Here are the sound files on the MicroSD card and their version numbers:

File name	Version
ShelbyV8.srf	108
LamborghiniV10.srf	110
LFAV10.srf	111
FerrariV12.srf	112
SuzukiGSX.srf	122
V-Twin.srf	123

If there is no MicroSD card in the sound module it will just use the sounds and settings stored in the processor and nothing happens when you press the SOUND button.

NOTE: There may be limitations for file names and version numbers that we have not found during the tests. If you find any such limitations we appreciate if you send the information to info@soundracer.se

SOUND PARAMETER SETTINGS

Most parameters are only used for SoundRacer Electric Vehicle sound system

1: IDLE_VOLUME	= <60>	[0-100]	Volume of idle sound
2: OFFLOW_VOLUME	= <60>	[0-100]	Volume of deceleration sound
3: ONLOW_VOLUME	= <100>	[0-100]	Volume of low acceleration sound
4: ONHIGH_VOLUME	= <100>	[0-100]	Volume of high acceleration sound
5: POSITIVE_ACC_SENS	= <50>	[0-1000]	Sensitivity for volume increase at acceleration
6: NEGATIVE_ACC_SENS	= <50>	[0-1000]	Sensitivity for volume decrease at deceleration
7: INPUT_TYPE	= <1>		1 is standard. In some cars 2,3 or 4 works better
8: MAX_INPUT_FREQUENCY	= <54>	[Hz]	Only for EVSound, not used for SoundRacer X
9: NO_GEAR_SCALING	= <170>	[%]	Speed to RPM factor,
10: SECOND_GEAR_RPM	= <3500>		Only for EVSound, not used for SoundRacer X
11: THIRD_GEAR_RPM	= <5500>		Only for EVSound, not used for SoundRacer X
12: FIRST_GEAR_SCALING	= <300>	[%]	Only for EVSound, not used for SoundRacer X
13: SECOND_GEAR_SCALING	= <190>	[%]	Only for EVSound, not used for SoundRacer X
14: THIRD_GEAR_SCALING	= <130>	[%]	Only for EVSound, not used for SoundRacer X
15: MAX_INPUT_RPM	= <7000>		RPM at max input voltage, 5V
16: IDLE_SAMPLE_RPM	= <1000>		RPM for idle sound sample
17: ONLOW_SAMPLE_RPM	= <3500>		RPM for onlow sound sample
18: IDLE_FADE_OUT_RPM	= <1000>		RPM for start of idle sound fade out
19: IDLE_END_RPM	= <3000>		RPM for complete idle sound fade out
20: OFFLOW_BEGIN_RPM	= <1000>		RPM for complete offlow sound fade out
21: OFFLOW_FADE_IN_RPM	= <3000>		RPM for start of offlow sound fade out
22: ONLOW_BEGIN_RPM	= <1000>		RPM for start of onlow sound fade in
23: ONLOW_FADE_IN_RPM	= <1500>		RPM for complete onlow sound fade in
24: ONLOW_FADE_OUT_RPM	= <3500>		RPM for start of onlow sound fade out
25: ONLOW_END_RPM	= <6000>		RPM for complete onlow sound fade out
26: ONHIGH_BEGIN_RPM	= <3500>		RPM for start of onhigh sound fade in
27: ONHIGH_FADE_IN_RPM	= <6000>		RPM for complete onhigh sound fade in
28: ONHIGH_END_RPM	= <7000>		Max onhigh RPM
29: ONLOW_RESTRICT_VOLUME_RPM	= <1800>		RPM for volume limit to reduce interference
30: HIGH_RPM_MUTE	= <9000>		Only for EVSound, not used for SoundRacer X

SOUND FILE SPECIFICATIONS

The SoundRacer sounds are recorded and prepared by a professional sound designer.

For customers who want to try developing their own sounds we provide this short description

A complete sound contains four different sound files:

idle.wav	1000 RPM idling	sampling frequency 11k (11025 Hz)
onlow.wav	3500 RPM acceleration	sampling frequency 22k (22050 Hz)
onhigh.wav	7000 RPM acceleration	sampling frequency 22k (22050 Hz)
offlow.wav	4000 RPM deceleration	sampling frequency 22k (22050 Hz)

Other rpm figures can be used but the proportions must be the same 1:3,5:7:4

Files should be Mono, not Stereo

Total size of the four files should be less than 400 kB, meaning that the four files can have a total length of about 9 seconds.

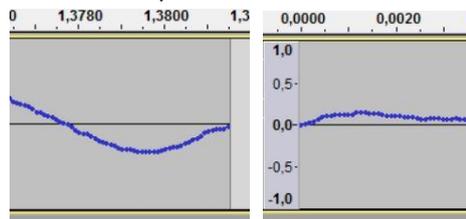
The free Windows program Audacity is very useful for handling the audio files

<http://audacity.sourceforge.net/download/>

Each file size must be a multiple of 128 bytes.

Each wav file should be able to loop without a hearable pitch shift or click.

Be sure that the beginning and the end of the file makes a good match, like this:



Notes:

It may not work with comments in the descriptor parts of the wav files

We have plans to set up an Internet forum where SoundRacer X users can exchange information and sounds and a web shop for sounds.

See www.soundracer.com

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