

Why SoundGate Dealers have the edge...

The technologies used in today's vehicles are as sophisticated as any laptop computer. At SoundGate we believe these new technologies are full of opportunities for mobile electronic dealers across the nation. We make it a high priority to not only research these new systems, but to understand them and their impact on the aftermarket car audio industry. Armed with this knowledge, we are well equipped to help you integrate new components into these systems with our innovative, high-performance interfaces and unparalleled technical support.



www.soundgate.com

GENSWEEP

SoundGate



Description...

The SoundGate **GENSWEEP variable sweep tone generator (20 Hz - 2 KHz)** is a precision instrument encased in a compact, case approximately 3" in length by 2" in width. Red and black leads with alligator clips, and RCA output leads, allow easy connection to the system under test.

Purpose...

The GENSWEAP is used for identifying speaker wires in car audio systems, provides an output for setting component output levels, and is an effective tool for determining how noise is entering a car audio sound system.

Features...

The GENSWEAP uses precision-tolerance, high quality components, a durable plastic case, and RCA and alligator-clip output leads. Comprehensive instructions and 9-volt battery are included!

Be Sure To Ask Your Autosound Specialist About These Other Exciting SoundGate Products...

- Auxiliary Input Interfaces and Docking Stations which allow you to input the audio from MP3, DVD/Video, Satellite Radio, and more to OEM and aftermarket car audio systems
- High-performance Radio Replacement Interfaces for seamlessly integrating new receivers or CD players into OEM audio systems
- Competition-Grade Interfaces for adding amplifiers
- Remote Audio Control Interfaces that let you control aftermarket receivers and CD players from your factory rear seat, or steering-wheel-mounted audio controls.
- And many others!

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Preliminary:

1. Carefully slide the back cover plate off of the GENSWEAP.
2. Plug the battery into the connector, place the battery in the GENSWEAP, and re-install the cover plate.

TEST 1 **Testing speaker leads in a car**
When installing a new receiver or CD player in a car, it is sometimes difficult determining which wires go to each speaker. The GENSWEAP is a perfect tool for performing this test. If a wiring diagram is available for the car simply identify the speaker leads and go directly to step "E".

- A. Using a digital multimeter, first determine which wires at the radio harness are power wires. Test each wire in the harness with the car's ignition key in both on and off positions, and with the car's headlight switch in the on and off positions. Three power wires should be present and all three should measure at least 11.8 volts DC with the car's engine off. One of these three wires may show varying voltage as the instrument panel lights are dimmed.
- B. After these three wires have been identified and labeled, use the multimeter to test each remaining wire for resistance to chassis ground. The ground lead of the radio's harness should measure no resistance on the multimeter. Label this lead "chassis ground".
- C. After the above wires have been identified, up to ten wires may remain in the factory radio harness. With the multimeter set to measure

resistance, probe between the remaining wires. If any four of the remaining wires give consistent, like readings of at least a few hundred ohms, these are more than likely the negative speaker leads (if the readings are more than a few hundred ohms there is probably an amplifier in the system). Label these four wires "speaker negative". If resistance measurements of between 3.2 ohms and 8 ohms were measured, skip to step "D".

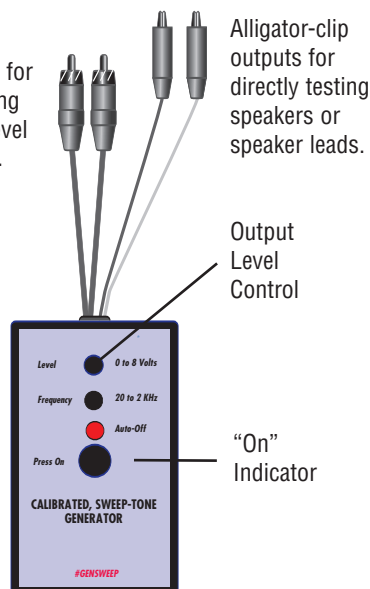
The positive speaker wires which match the wires just identified as "negative" are in most cases physically located next to each matching negative wire. Locate these four wires.

If an amplifier is present in the system (as indicated by measurements of higher than a few hundred ohms in the previous testing) it is recommended that a factory service manual be consulted to identify the amplifier activation lead. Activate this lead and continue to step "E".

D. If a reading of approximately 3.2 ohms, up to 8 ohms is measured between wires, you are more than likely measuring the resistance directly across the voice coil of a speaker. The two wires should be labeled "speaker". Six more wires in the harness should give like readings.

- E. At this point use the GENSWEAP and clip the black alligator clip to one wire of one of the identified speaker wire pairs. Push the "On" button of the GENSWEAP to turn the unit on. Touch the red alligator clip to the second wire in the harness. A tone should be heard from one speaker in the car. Label the two wires tested with the location of the speaker. Repeat the test for the remaining six wires.

RCA outputs for directly testing "pre-amp" level components.



Alligator-clip outputs for directly testing speakers or speaker leads.

Output Level Control

"On" Indicator

TEST 2 Determining Where Noise is Entering an Automotive Sound System

Under certain conditions noise (alternator whine, buzzes, pops, and clicks) can be heard over the speakers of a system after the installation is completed. This is typically encountered when the system consists of multiple components (i.e. - an equalizer, crossover network, and/or multiple amplifiers.)

- A.** Disconnect the speaker leads from the output of the amplifier. Connect the alligator clips of the GENSWEEP directly to the speaker wire pair and push the "On" knob. Start the car and listen for the noise previously heard. If it is still present it is likely being radiated directly into a passive crossover network into the speaker wiring, or directly into the speaker. If a passive crossover is present in the wiring move the crossover network to eliminate the noise. If a passive crossover network is not present, run a new set of speaker leads to the speaker, or move the existing pair. Reconnect the speaker wires to the amplifier.
- B.** Disconnect the RCA leads from the inputs of the amplifier(s). Plug the GENSWEEP into the amplifier's inputs. Start the car and turn the system on. Push the "On" knob on the GENSWEEP and listen for the tone. Listen for the noise that was previously heard in the system. If the noise is not heard, it is being injected into the system from a component upstream of the amplifier. If the noise is heard, it is most likely entering the system via the chassis of the amplifier. Make certain the amplifier is not touching any metal part of the car, except through its "ground" lead.
- C.** Repeat step "B" for every component of the system, working towards the source unit. If the noise disappears when the GENSWEEP is used in place of the source unit, the source unit (receiver, or CD player) is injecting the noise into the system.
- The noise can enter via the source unit's power leads, as a result of a ground loop between the component ground, antenna lead, or mounting of the chassis, or the noise can be radiated (Test 2, continued see next page)...directly into the chassis of the component. Each of these entry points will have to be tested.
- To test for noise entering via the power leads of the source unit, simply use a benchtop power supply, or battery from a second car, to supply the power and ground to the source unit. If the noise is gone upon supply of power from an outside source, the noise is entering via the power leads and noise filters will have to be used on each power lead.
- To test for noise caused by a ground loop, simply unplug the antenna and hold the radio away from the dash cavity so that the only contact it makes to chassis ground is via the negative ground lead of the component. If the noise disappears an antenna noise filter may have to be used, and/or the chassis of the component may have to be isolated from chassis ground.
- To test for noise being radiated directly into the chassis of the source component, simply pull the unit away from its mounting location. If the noise disappears as the receiver or CD player is pulled away from the dash, "mu-metal" (sometimes called co-netic shielding) will probably have to be used to shield the unit.

TEST 3 Finding The Quietest Grounding Point for Audio Components in The System

One of the most frustrating noise troubleshooting steps in a car is trying to find a quiet ground for the sound system components. The GENSWEEP turns this frustrating step into a simple one.

The balanced RCA outputs of the GENSWEEP become single-ended when the black alligator clip is grounded. This design feature lets you listen (through the installed system) to the noise that is present at the grounding location.

- A.** Unplug the RCA connectors from the input of the amp and connect the RCA outputs of the GENSWEEP to the amplifier. Turn the audio system on so that the amplifier is on. Push the "On" button of the GENSWEEP and listen for the tone (increase output level if necessary).
- B.** Connect a short length of wire to the black alligator clip of the GENSWEEP.
- C.** Touch the end of the length of wire to various, bare-metal grounding points. Any noise present at the grounding point will be heard through the sound system.
- D.** Probe various grounds until the quietest point is located. Ground the component the GENSWEEP is plugged into to this ground location.
- E.** Repeat this process for every component in the sound system.

TEST 4 Using the GENSWEEP to Set Output Levels of Components

Upon installation of a multi-component system it is impossible to tell, by ear, if the levels between the left and right channels are properly set. The GENSWEEP makes this a simple operation.

- A.** Simply unplug the RCA connectors from the input of the component to be tested - starting from the amplifiers. Plug the GENSWEEP's RCA outputs into the component.
- B.** Rotate the frequency knob clockwise to the (highest pitch) setting.
- C.** Using a multimeter set to measure "AC" voltage, clip the multimeter's leads across the speaker under test. Since the tone generated by the GENSWEEP provides an RMS reading at the speaker it is very simple to test both left and right speakers for AC voltage. Adjust the independent gain controls of the amplifier until the voltage measured at each speaker is identical.
- D.** Move the GENSWEEP to the inputs of the next component upstream of the amplifier. Perform the same test and measurement, and adjust the components' independent level controls until the voltages measured at both left and right channel speakers are identical.
- E.** Repeat this process until you have tested every component up to the source unit. At this point use the SoundGate CD101, 102, 103, or 104 to set the balance control of the source unit to provide exact voltage readings in both left and right channels. If the balance controls of the source unit do not have the resolution to make fine adjustments, adjust the level controls of the component that is first in-line, downstream of the source unit.

If you experience any problems, call SoundGate Technical Support at 800-256-0808, or e-mail us at sgtech@soundgate.com