



Owner's Manual

SCS

High Output RTL® Subwoofer

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DOCUMENT CONVENTIONS

This document contains general safety, installation, and operation instructions for the Wisdom Audio SCS High Output RTL® Subwoofer. It is important to read this document before attempting to use this product. Pay particular attention to:

WARNING: Calls attention to a procedure, practice, condition or the like that, if not correctly performed or adhered to, could result in injury or death.

CAUTION: Calls attention to a procedure, practice, condition or the like that, if not correctly performed or adhered to, could result in damage to or destruction of part of or the entire product.

Note: Calls attention to information that aids in the installation or operation of the product.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

DANGER:



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

IMPORTANT



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying this equipment.

Marking by the “CE” symbol (shown left) indicates compliance of this device with the EMC (Electromagnetic Compatibility) and LVD (Low Voltage Directive) standards of the European Community.



Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Important Safety Instructions

Please read all instructions and precautions carefully and completely before operating your Wisdom Audio equipment.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this equipment near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade of the third prong is provided for your safety. If the provided plug does not fit into your socket, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. ALWAYS disconnect your entire system from the AC mains before connecting or disconnecting any cables, or when cleaning any component.
15. NEVER operate this product with any covers removed.
16. NEVER wet the inside of this product with any liquid.
17. NEVER pour or spill liquids directly on to this unit.
18. NEVER bypass any fuse.
19. NEVER replace any fuse with a value or type other than those specified.
20. NEVER operate this product in an explosive atmosphere.
21. ALWAYS keep electrical equipment out of the reach of children.

Introduction

Congratulations on purchasing your Wisdom Audio subwoofer. The **SCS's Regenerative Transmission Line™** technology delivers tremendous bass performance in terms of depth, dynamics, and distortion resulting in articulate bass that integrates seamlessly with high-resolution main speakers such as Wisdom Audio's Sage Series.

We recognize that setting up a **Wisdom Audio High Output RTL®** subwoofer can be a bit more involved than connecting a common sealed or ported subwoofer, which is why we recommend that our systems be engineered and calibrated by Factory Personnel

Overview

Your Wisdom Audio **SCS subwoofer** uses a modern implementation of an old idea for high quality, low distortion bass reproduction. While the roots of the Regenerative Transmission Line™ go back to the 1950's, it is the combination of modern computer modeling and the vastly more powerful motors of contemporary driver design that make the RTL™ so special.

There is a class of bass enclosures that has been around since the 1950's, which can be described generically as "low frequency tapped waveguides" or "tapped pipes". It was an idea that was a bit ahead of its time then, since fully optimizing its use required both powerful drivers and computer modeling. But, if you are into such things, check out US Patent 2,765,864 (filed in 1955), and an AES paper published in 1959, *"Analysis of a Low Frequency Loudspeaker System."*

We have utilized sophisticated modeling software to fully optimize our enclosures and have developed drivers that are specifically optimized for this application. We call our unique implementation of this relatively old idea a "Regenerative Transmission Line™" subwoofer, or "RTL" sub for short.

All dynamic drivers develop energy on both sides of the diaphragm, with the rear energy being 180° out of phase with the front energy. If you allow the driver to operate in free space (no enclosure), the front and rear energies largely cancel each other out – especially at low frequencies.

In our **Regenerative Transmission Line™ subwoofer**, the energy from the back side of the driver is sent along a long, folded path in such a way that its lowest frequencies arrive back at the front side of the driver in phase, effectively summing to an increase of

6 dB in output. Thus, the energy from both sides of the woofer cone is used in a productive way, resulting in a substantial reduction in distortion and an effective surface area double compared to what you would otherwise expect. As an example, the effective radiating surface area of the one 10" woofer in the SCS is equivalent to *one* 15" woofer in more conventional enclosures yet fits in a 3.5" deep stud bay.

The results are quite stunning. Low frequencies are strikingly dynamic and responsive and integrate quite seamlessly with the fast and detailed Sage Series planar magnetic hybrids. As an example, the SCS can output more than 128 dB at 30 Hz.

Unpacking the SCS

The Wisdom Audio SCS subwoofer is a substantial piece of equipment. Please exercise caution when unpacking your SCS to ensure that you do not strain yourself from its (perhaps unexpected) weight.

CAUTION

Do not attempt to lift your SCS by yourself. Unpacking this subwoofer is clearly a two-person job. It is unwise for a single person to attempt doing so.

Do not attempt to lift your SCS while bending or twisting from the waist. Use your legs for lifting, not your back.

Always stand as straight as possible and keep the SCS close to your body to reduce strain on your back.

The SCS is fully assembled on delivery and preset for 230V operation. If your AC mains service is 115/120V (as is the case in North America), slide the voltage selection switch to "115" prior to plugging in the power cord. See page 12:

"AC Mains Voltage Selector."

Subwoofer Placement

Subwoofers offer somewhat greater flexibility in placement since the frequencies they reproduce are not readily localizable by the human ear. This is because the wavelengths they reproduce are more than ten feet (3 meters) long, but our ears are located only about 6-7 inches (17 cm) apart. Thus, these extremely long waves do not contribute meaningfully to the imaging that the main speakers create.

However, this fact does not mean that the placement of the subwoofers has no effect on the sound quality in the room. Far from it. The subwoofers are the *most* likely to suffer from the response irregularities introduced by the room itself, operating as they do below approximately 80 Hz in most systems.

Recent research into the behavior of rooms as a function of speaker placement has concluded that – if you have the freedom to do so – there are significant advantages to placing several smaller subwoofers around the room, rather than relying on a single large woofer. Moreover, the optimum placement is usually centered on each of the four walls, or deep in the corners of the room. If you have the luxury of doing so, this simple placement strategy can reduce the size of the room’s response irregularities from 20 decibels down to perhaps as little as 6-8 decibels – a tremendous improvement.

Reducing the room’s inherent problems to this degree provides a huge advantage.

Room Treatment

Rectangular rooms have six reflecting surfaces (four walls, ceiling, and floor) that reflect sound to the listener, after various delays introduced by the indirect routes the sound take on their way to the listener. These first reflections are particularly damaging to sound quality. Looking at the simplest case of stereo reproduction, you have a minimum of *twelve* first reflection points in your room that deserve some attention.

Unfortunately, it is often difficult to do much about the ceiling and floor reflections, even though they are arguably the most destructive. (The minimization of these reflections is one of the strongest arguments for the tall, line source loudspeakers that Wisdom Audio builds.) This leaves you with eight “first reflections” that you should consider minimizing somehow. These points are easily found by having an assistant slide a small mirror along the four walls of the room, while you sit at the listening position.

Any place on the wall where you can see a reflection of *any* speaker is a first reflection point. Concentrate on the first reflections for the Left and Right speakers first.

If you can, arrange to apply either absorption or diffusion at these eight points (don't forget the wall behind you). Absorption can be as simple as heavy, insulated drapes; diffusion can be provided by a well-stocked bookcase with books of varied sizes. Alternatively, you can buy purpose-designed room treatments (some sources listed under References, below).

The important things to remember are these: a good room should have a balance of absorption and diffusion; and if you are going to treat only a few areas of the room, the first reflection points are the most important ones to treat.

Professional Acoustic Design

Does this all sound too complicated? For good reason: it *is* complicated.

The difference between the average listening room and one that is professionally designed and implemented is huge. A great listening room will disappear to an astonishing degree, letting the experiences captured in your recordings speak to you directly. A well-designed room is also quieter and more comfortable. It can easily become a favorite retreat for peace and rejuvenation.

If you decide to investigate the possibility of improving your room with the help of a professional, it is important to find someone who focuses on residential spaces. Most acousticians are trained to deal with large spaces – airports, auditoriums, lobbies in commercial buildings, etc. The problems seen in “small” rooms (residential spaces) are quite different, and outside the experience of most acousticians. Find someone who specializes in and has a great deal of experience designing home studios, home theaters, and the like. Your Wisdom Audio dealer may be such a person; failing that, he/she can help you find such a professional.

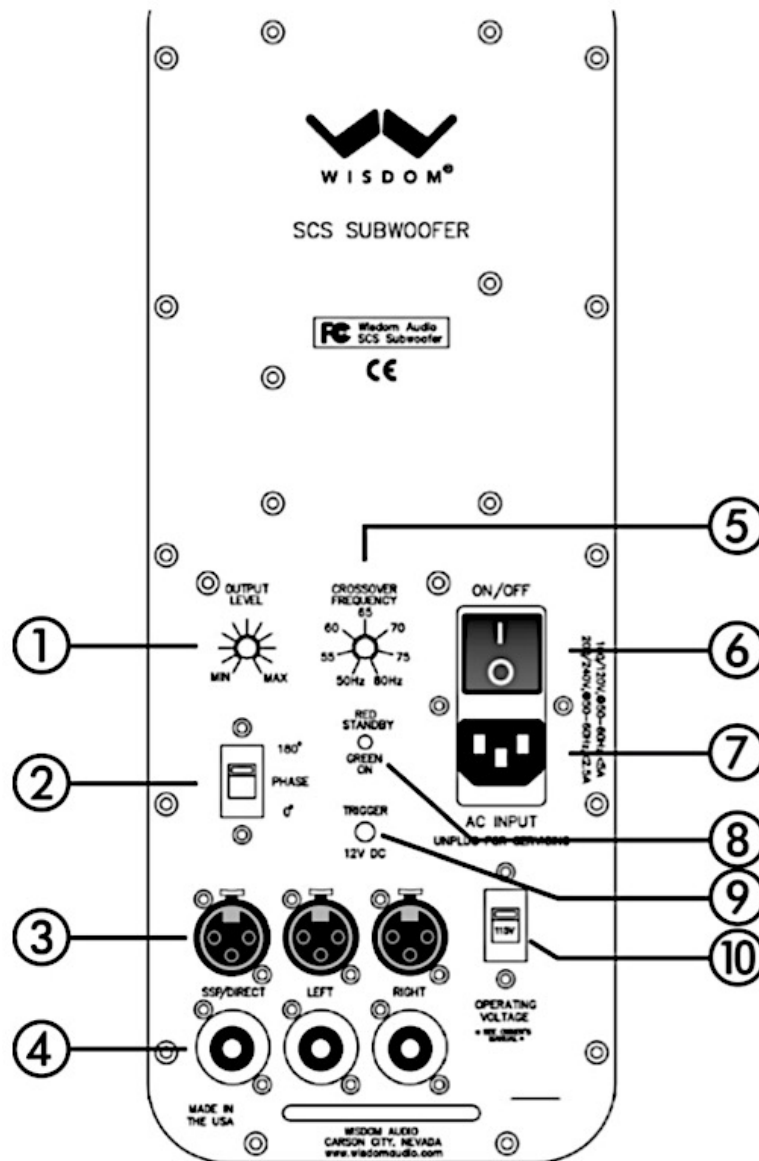
References

Books on Acoustics

The Master Handbook of Acoustics, F. Alton Everest, TAB Books

Sound Reproduction: The Acoustics and Psychoacoustics of Loudspeakers and Rooms by Dr. Floyd Toole, Focal Press

Rear Panel



DANGER! Potentially dangerous voltages and current capabilities exist within your SCS subwoofer. Do not attempt to open any portion of the SCS's cabinet. There are no user-serviceable parts inside your SCS. All service of this product must be referred to a qualified Wisdom Audio dealer or distributor.

1. **Output Level Control:** When using the Left and Right inputs, this flush-mounted control adjusts the volume of the SCS over a wide range. Use it to establish a volume for the SCS that matches the volume of the main speakers. This control is bypassed when using the SSP/Direct input, since the volume control function is handled by the surround sound processor.
2. **Polarity Switch:** Use this sliding switch to invert the polarity of the SCS as needed to integrate properly with your main speakers.

CAUTION! Always turn off the main power and wait a few seconds for the power supply to discharge before changing the position of the polarity switch.

If you are in doubt as to which position (0° or 180°) is the correct one for your system, play some material with significant energy at and around your chosen crossover frequency. Pink noise will also work. Then listen to the system with both the SCS and the main speakers playing. The position with more energy at the chosen crossover region (e.g., the position that sounds louder or “fuller”) is the correct position.

3. **Balanced (XLR) Inputs:** Three XLR input connectors are provided, as follows:

SSP/Direct: for use with a surround sound processor/preamplifier. This input bypasses both the internal crossover and level control of the SCS, since both functions are handled by the SSP.

Left & Right: for use in systems that lack any bass management (as would be provided by a surround processor). For example, you can run the Left and Right outputs of a traditional stereo preamplifier into these inputs, and then set the crossover frequency and subwoofer level on the SCS itself. If your preamplifier does not have multiple outputs, use a Y-adapter to send the same full-range signal to both the SCS and the power amplifier for the main speakers.

Balanced interconnects are less susceptible to picking up noise than are single-ended interconnects. As such, if your system gives you the choice of using either balanced or single-ended connections, the balanced (XLR) connections are preferred.

4. **Single-Ended (RCA) Inputs:** Three RCA input connectors are provided, as follows:

SSP/Direct: For use with a surround sound processor/preamplifier. This input bypasses both the internal crossover and level control of the SCS, since both functions are handled by the SSP.

Left & Right: For use in systems that lack any bass management (as would be provided by a surround processor). For example, you can run the Left and Right outputs of a traditional stereo preamplifier into these inputs, and then set the crossover frequency and subwoofer level on the SCS itself. If your preamplifier does not have multiple outputs, use a Y-adapter to send the same full-range signal to both the SCS and the power amplifier for the main speakers.

5. **Crossover Frequency Control:** When using the Left and Right inputs, this flush-mounted control adjusts the crossover frequency of the low pass filter in the SCS between 50-80 Hz. Use it to establish a smooth transition from the SCS to your main speakers. This control is bypassed when using the SSP/Direct input, since the crossover function is handled by the surround sound processor.
6. **Power Switch:** An AC mains switch is located above the power cord on the rear panel of the SCS. This switch may be used to disconnect the unit from the AC mains without having to unplug the SCS from the wall outlet. If you plan to be away for an extended period or have any other reason to turn the SCS completely off, you may either unplug the SCS or you may use the AC mains switch.

IMPORTANT! As with all your electronics, we suggest you completely disconnect the SCS from the AC mains during severe electrical storms.

7. **AC Mains Input:** A 15-ampere IEC standard power cord is used with the SCS. A high quality 15-ampere AC mains cord is included with the product, although the use of the standardized IEC receptacle means that you may easily substitute another high-quality AC mains cord if you wish.

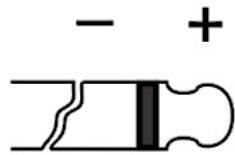
WARNING: Your new Wisdom Audio SCS has been safety-tested and is designed for operation with a three-conductor power cord. Do not defeat the “third pin” or earth ground of the AC power cord.

We recommend that care be taken to ensure that all AC plugs for the equipment in the system be wired to ensure proper AC polarity. Doing so will minimize noise in the system.

In the U.S., a simple AC mains tester (found at any hardware store) can test to ensure that your electrical outlets are wired properly. Elsewhere in the world (for example, in European Union countries), the AC mains plugs themselves are not always polarized. Your dealer can test for the proper orientation of the plug in the outlet. In such a case, it is good practice to mark both plug and outlet to ensure that all products remain in the proper orientation should it become necessary to temporarily disconnect the system (as for example, during an electrical storm).

- 8. Standby/Operate Indicator:** This LED indicator glows green when the SCS has power and is in Operate mode. If the SCS is placed into Standby by means of the DC Trigger, the output will be muted, and this LED will glow red. If this LED is not lit at all, no power is reaching the SCS. Check the power switch, the power cord, and the circuit into which the SCS is plugged.
- 9. DC Trigger Input:** This 12v trigger input provides compatibility with a wide range of products to facilitate remote turn-on and turn-off in systems. These 1/8" (3.5mm) "mini-jacks" allow other components to bring the SCS in and out of standby. The remote trigger input will be operated by any positive-polarity DC signal between 3–20 volts (only a few milliamps are required), with tip polarity as shown below:

Remote turn-on tip polarity:



Input Signal: 3-20 volts @ less than 10 mA

Output Signal: 12 volts @ 100 mA

If no plug is inserted in the DC Trigger input, the SCS will remain in the Operate mode unless turned off by the power switch. Inserting either a "dummy" plug or a trigger that has 0V on it will place the SCS into Stand- by; it will return to Operate when the voltage on the plug reaches the 3-20V range, or when the plug is removed.

- 10. AC Mains Voltage Selector:** This switch reconfigures the SCS for either 115V or 230V operation.

WARNING! NEVER change the position of this switch while the SCS is connected to AC mains power.

If you need to change the operating voltage for the SCS, disconnect it completely from the AC mains, and wait for a few seconds for its power supply to discharge. Then slide the switch all the way to the other position. Only then should you reconnect the AC mains.

Setting Up the SCS

The unusual form factor of the SCS allows it to be used effectively in many situations where a more conventional “bass cube” would be either cumbersome or impossible. Examples include locating it behind a couch, in the small space between the couch and the wall or lying flat under a set of risers in a home theater with multiple rows of seating.

The SCS also includes three locations for the exit of the Regenerative Transmission Line™. As shipped from the factory, the vent is located on the end of the SCS enclosure. However, if your location would be better served by the vent being on one side or the other, your dealer can easily swap the grille for the solid aluminum plate that covers the desired exit location. There is no difference in performance, but often a great difference in application flexibility.

VERY IMPORTANT! You **MUST** use a Wisdom Approved DSP as the SCS requires special bandpass filter and PEQ settings for the RTL to work properly.

For the purposes of this manual, we will assume that you have already connected an approved signal processor with the necessary signal processing for the SCS. The SCS (like all RTL subwoofers) requires a very specific non-standard EQ slope to ensure good performance. Use of a non-approved EQ or amplifier without the correct signal processing will cause poor performance from the SCS. For an approved list of amplifiers and surround processors to use please email us at info@wisdomaudio.com

North American Warranty

Standard Warranty

When purchased from and installed by an authorized Wisdom Audio dealer, Wisdom Audio loudspeakers are warranted to be free from defects in material and workmanship under normal use for a period of 10 years from the original date of purchase on the cabinet and passive drivers.

IMPORTANT: Wisdom Audio loudspeakers are designed for installation and operation in environmentally controlled conditions, such as are found in normal residential environments. When used in harsh conditions such as outdoors or in marine applications, the warranty is three years from the original date of purchase.

During the warranty period, any Wisdom Audio products exhibiting defects in materials and/or workmanship will be repaired or replaced, at our option, without charge for either parts or labor, at our factory. The warranty will not apply to any Wisdom Audio products that has been misused, abused, altered, or installed and calibrated by anyone other than an authorized Wisdom Audio dealer.

Any Wisdom Audio product not performing satisfactorily may be returned to the factory for evaluation. Return authorization must first be obtained by either calling or writing the factory prior to shipping the component. The factory will pay for return shipping charges only if the component is found to be defective as mentioned above. There are other stipulations that may apply to shipping charges.

There is no other express warranty on Wisdom Audio products. Neither this warranty nor any other warranty, express or implied, including any implied warranties of merchantability or fitness, shall extend beyond the warranty period. No responsibility is assumed for any incidental or consequential damages. Some states do not allow limitations on how long an implied warranty lasts and other states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. This warranty is applicable in the United States and Canada only. Outside of the U.S. and Canada, please contact your local, authorized Wisdom Audio distributor for warranty and service information.

Obtaining Service

We take great pride in our dealers. Experience, dedication, and integrity make these professionals ideally suited to assist with our customers' service needs.

If your Wisdom Audio loudspeaker must be serviced, please contact your dealer. Your dealer will then decide whether the problem can be remedied locally, or whether to contact Wisdom Audio for further service information or parts, or to obtain a Return Authorization. The Wisdom Audio Service Department works closely with your dealer to solve your service needs expediently.

IMPORTANT: Return authorization must be obtained from Wisdom Audio's Service Department BEFORE a unit is shipped for service.

It is extremely important that information about a problem be explicit and complete. A specific, comprehensive description of the problem helps your dealer and the Wisdom Audio Service Department locate and repair the difficulty as quickly as possible.

A copy of the original bill of sale will serve to verify warranty status. Please include it with the unit when it is brought in for warranty service.

WARNING: All returned units must be packaged in their original packaging, and the proper return authorization numbers must be marked on the outer carton for identification. Shipping the unit in improper packaging may void the warranty, as Wisdom Audio cannot be responsible for the resulting shipping damage.

Your dealer can order a new set of shipping materials for you if you need to ship your loudspeaker and no longer have the original materials. There will be a charge for this service. We strongly recommend saving all packing materials in case you need to ship your unit someday.

If the packaging to protect the unit is, in our opinion or that of our dealer, inadequate to protect the unit, we reserve the right to repackage it for return shipment at the owner's expense. Neither Wisdom Audio nor your dealer can be responsible for shipping damage due to improper (that is, non-original) packaging.

Specifications

All specifications are subject to change at any time to improve the product.

- **Frequency response:** 20Hz – 80 Hz \pm 3dB relative to the target curve
- **Maximum output:** 120dB / 25 Hz /1m
- **Rated power:** 450W
- **Mains voltage:** 100/120V, or 230/240V
- **Power consumption:** 575W (+/- 5%) at full power
- **Dimensions:** See appropriate dimensions drawings on next page
- **Shipping weight, each:** 72 lbs. (33 kg)

For more information, see your Wisdom Audio dealer or contact:

Wisdom Audio

1572 College Parkway, Suite 164

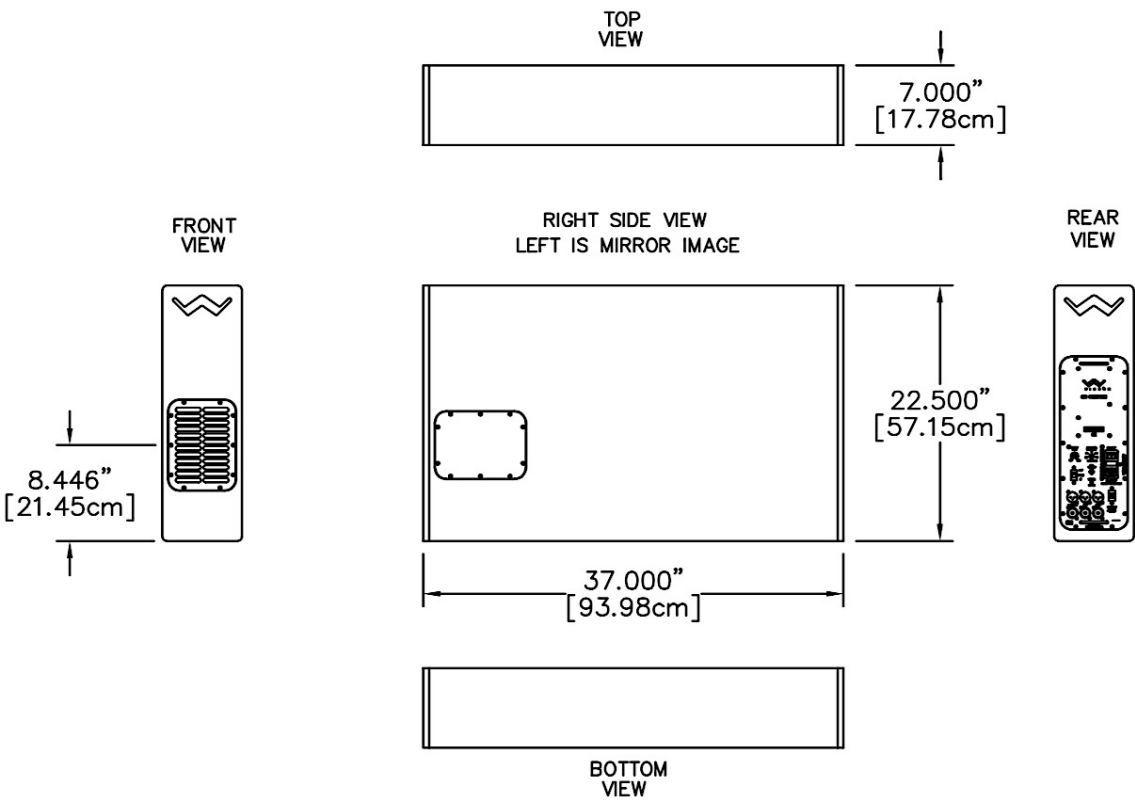
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SCS Dimensions





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