

S500 Series

Two-Way Passive Loudspeakers and Subwoofer

OWNER'S MANUAL



Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus 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. Only use attachments/accessories specified by the manufacturer.
10. Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
11. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as 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.



12. Exposure to extremely high noise levels may cause permanent hearing loss. Individuals vary considerably in susceptibility to noise-induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a period of time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the permissible noise level exposures shown in the following chart. According to OSHA, any exposure in excess of these permissible limits could result in some hearing loss. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels use hearing protectors while the equipment is in operation. Ear plugs or protectors in the ear canals or over the ears must be worn when operating the equipment in order to prevent permanent hearing loss if exposure is in excess of the limits set forth here:

Duration, per day in hours	Sound Level dBA, Slow Response	Typical Example
8	90	Duo in small club
6	92	
4	95	Subway Train
3	97	
2	100	Very loud classical music
1.5	102	
1	105	Fooyoung screaming at desTROyer about deadlines
0.5	110	
0.25 or less	115	Loudest parts at a rock concert

WARNING — To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.



Correct Disposal of this product: This symbol indicates that this product should not be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to an authorized collection site for recycling waste electrical and electronic equipment (EEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, waste authority, or your household waste disposal service.

Please write the serial number for your loudspeaker(s) here for future reference:

Loudspeaker 1

Loudspeaker 2

Loudspeaker 3

Loudspeaker 4

Purchased at: _____ **Date of Purchase:** _____

Don't forget to visit our website at www.mackie.com for more information about this and other Mackie products.

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Introduction

S500 Series Passive Loudspeakers are the perfect voice for your passive system, with proven performance that is professional as it is affordable. They feature high-output transducers that sound great and the full-range boxes deliver ultra-wide 90° x 50° dispersion.

Road ready, the rugged, PVC vinyl-covered wood enclosure also include protective edge bumpers, keeping your investments safe during transport. S500 speakers are the perfect complement to Mackie's PPM Series Powered Mixers. Or, integrate them with Mackie FRS Series Power Amplifiers and a SP260 Speaker Processor for a completely optimized passive system with the flexibility and performance you need.

Features

S500 Full-Range Models:

- Class-leading power handling for professional shows
 - S512 – 500W program / 1000W peak
 - S515 – 600W program / 1200W peak
 - S525 – 1200W program / 2400W peak
- Precision, high-output transducers
 - S512 – 12" woofer / 1" HF driver
 - S515 – 15" woofer / 1" HF driver
 - S525 – Dual 15" woofers / 1" HF driver
- Rugged, professional PVC vinyl covered wood enclosures with protective edge bumpers
- Wide-dispersion 90° x 50° high-frequency horn
- HF protection circuitry reduces high-frequency output to protect against driver damage
- NL4 and 1/4" input and thru connections for connecting multiple units on a single amp channel

S518S Subwoofer:

- Class-leading power handling
 - 900W program / 1800W peak
- 18" high-output woofer
- Integrated low-pass filter focuses power to low frequencies for maximum punch
- NL4 and 1/4" input and thru connections for connecting multiple units on a single amp channel
- Rugged, professional wood enclosure with high-durability, textured paint

How to Use This Manual

After this introduction, a getting started guide will help you get things set up fast. The hook-up diagrams show some typical setups.



This icon marks information that is critically important or unique to the loudspeaker. For your own good, read and remember them.



This icon leads you to in-depth explanations of features and practical tips. They usually have some valuable nuggets of information.

Appendix A is a section on troubleshooting and repair.

Appendix B is a section on connectors.

Appendix C shows the technical specifications.

Getting Started

The following steps will help you set up your loudspeakers quickly.

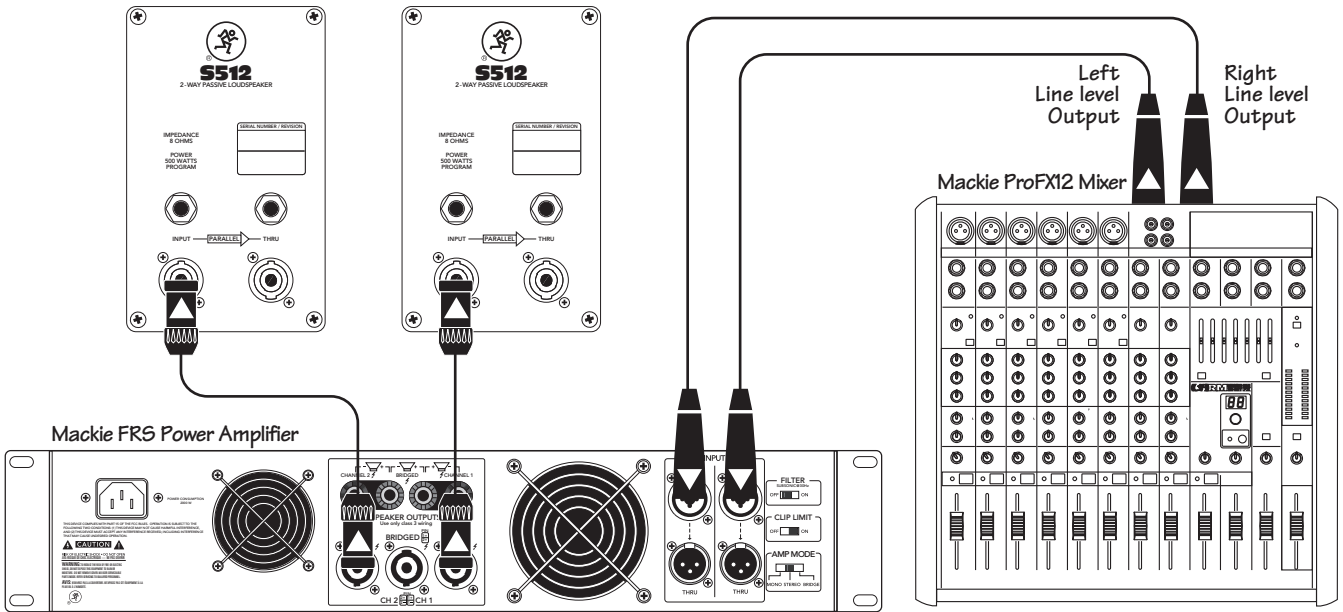
1. Make all initial connections with the power switches OFF on all equipment. Make sure the master volume, level, or gain controls are all the way down.
2. Connect the line-level outputs from your mixing console (or other signal source) to the inputs of your power amplifier.
3. Connect the “Speaker Output” from your power amplifier (or powered mixer) to the INPUT connector on the S500 Series speaker (1/4" or NL4 jack).
4. If you are using the S518S subwoofer with one of the full-range loudspeakers, connect the 1/4" or NL4 THRU to the subwoofer’s input.
5. Turn on your mixing console (or other signal source).
6. Turn on the amplifier. Turn up its volume or gain control(s) as recommended by the manufacturer.
7. Start the signal source, whether it be speaking into a microphone or starting a CD player. Adjust the volume controls on the mixer (or other signal source) for normal operation.

Things to Remember:

- Never listen to loud music for prolonged periods. Please see the Safety Instructions on page 2 for information on hearing protection.
- When you shut down your equipment, turn off the amplifiers first to prevent thumps and other noises generated by any upstream equipment from coming out of the speakers. When powering up, turn on the amplifiers last.
- Save the shipping boxes and packing materials! You may need them someday. Besides, your cat will love playing in them and jumping out at you unexpectedly. Remember to pretend like you are surprised!
- Save your sales receipt in a safe place.
- Record the serial numbers in the spaces provided on page 2, along with where and when you bought them.

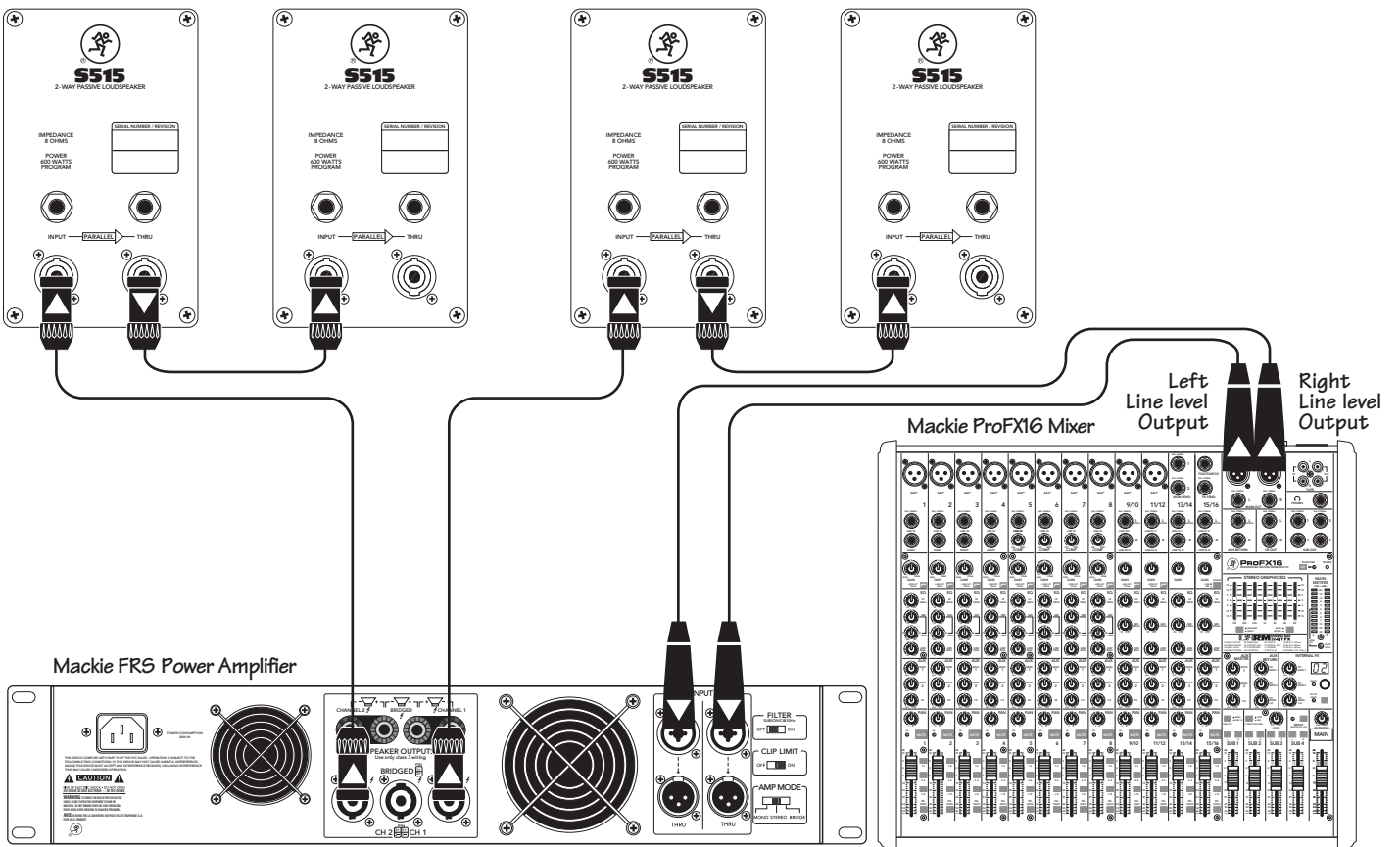
Hookup Diagrams

Two S512's with a Mixer and Power Amplifier



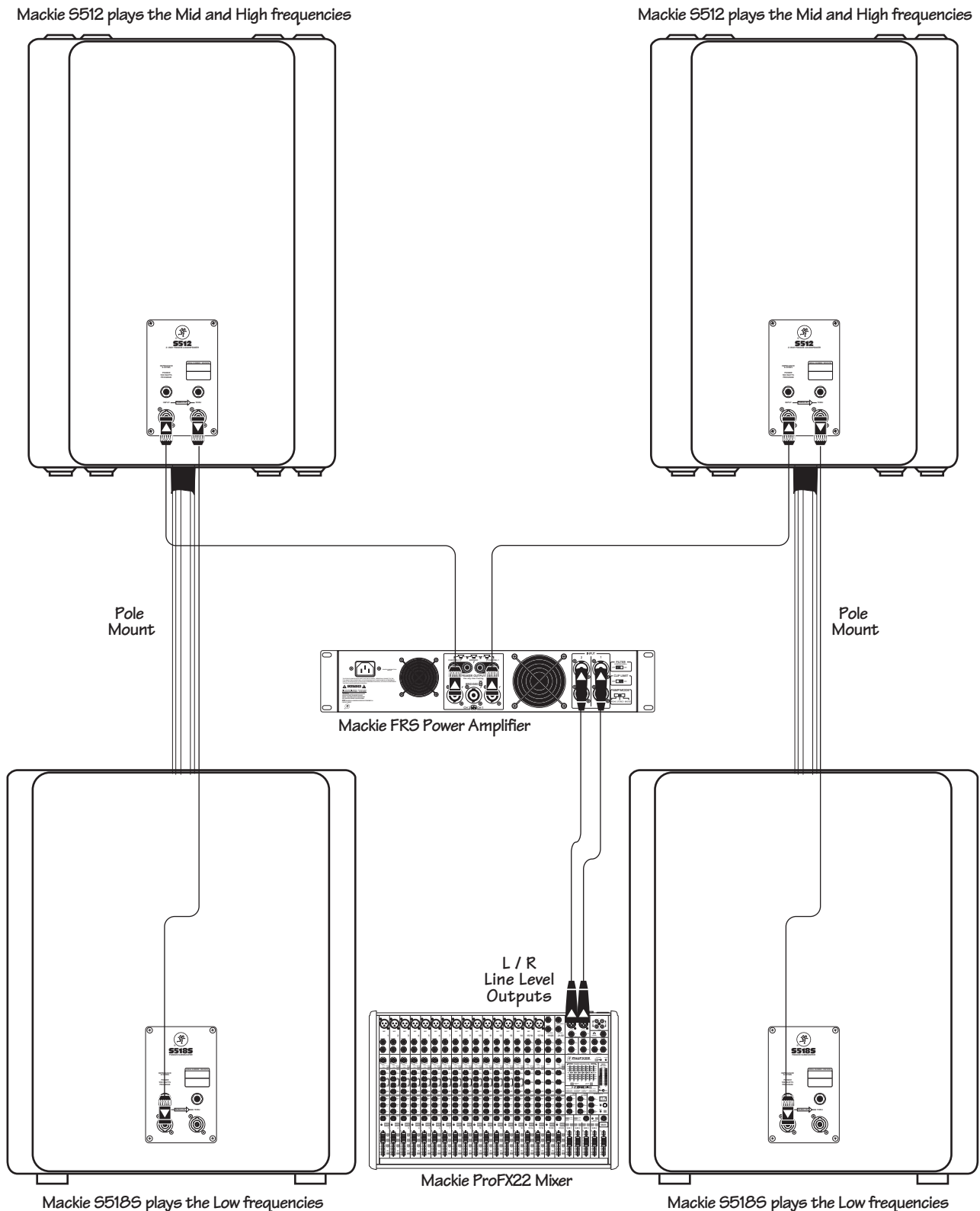
The left and right line-level outputs from a mixer feed the inputs of a power amplifier. The speaker outputs of the power amplifier feed the inputs of two Mackie S512 loudspeakers.

Four S515's with a Mixer and Power Amplifier, Daisy-Chaining



The left and right line-level outputs from a mixer feed the inputs of a power amplifier. The speaker outputs of the power amplifier feed the inputs of two Mackie S515 loudspeakers. Their respective THRU jacks feed the inputs of another pair of Mackie S515 loudspeakers.

Two S512 Loudspeakers Daisy-Chained with Two S518S Subwoofers



The S512's may be used with the S518S subwoofers to create an incredibly powerful system. Here, the left and right line-level outputs from a mixer feed the inputs of a power amplifier. The speaker outputs of the power amplifier feed the inputs of two Mackie S512 loudspeakers. Their respective THRU jacks feed the inputs of a pair of Mackie S518S subwoofers, whose internal low-pass filter allows the subwoofers to reproduce only the lowest frequencies. The S512's may be pole-mounted on top of the S518S subwoofers, as displayed.

Placement

The S500 Series loudspeakers are designed to sit on the floor or stage. The S512 and S515 may also be pole-mounted via the built-in socket on the bottom of the cabinet. Be sure the pole is capable of supporting the weight of the loudspeaker. The S525 and S518S are NOT designed to be pole-mounted.



WARNING: These cabinets have no rigging points and are not suitable for rigging.



NEVER attempt to suspend any S500 Series loudspeaker by its handles.

As with any loudspeakers, protect them from moisture. If you are setting them up outdoors, make sure they are under cover if you expect rain.

Room Acoustics

The S500 Series loudspeakers are designed to sound as neutral as possible. However, room acoustics play a crucial role in the overall performance of a sound system. Here are some placement tips to get the best performance from the S500 Series loudspeakers:

- Avoid placing loudspeakers in the corners of a room. This increases the low-frequency output and can cause the sound to be muddy and indistinct.
- Avoid placing loudspeakers against a wall. This, too, increases the low-frequency output, though not as much as corner placement. However, if you do need to reinforce the low frequencies, this is a good way to do it.
- Avoid placing the loudspeakers directly on a hollow stage floor. A hollow stage can resonate at certain frequencies, causing peaks and dips in the frequency response of the room. It is better to place the loudspeakers on a sturdy table or tripod stands.
- Position the loudspeakers so the high-frequency drivers are a foot or more above ear level for the audience. (Make allowances for a standing / dancing-in-the-aisles audience). High frequencies are highly directional and tend to be absorbed much easier than lower frequencies. By providing direct line-of-sight from the loudspeakers to the audience, you increase the overall brightness and intelligibility of the sound system.

- Highly reverberant rooms, like many gymnasiums and auditoriums, are a nightmare for sound system intelligibility. Multiple reflections off the hard walls, ceiling and floor play havoc with the sound. Depending on the situation, you may be able to take some steps to minimize the reflections, such as putting carpet on the floors, closing draperies to cover large glass windows, or hanging tapestries or other materials on the walls to absorb some of the sound.

However, in most cases, these remedies are not possible or practical. So what do you do? Making the sound system louder generally doesn't work because the reflections become louder, too. The best approach is to provide as much direct sound coverage to the audience as possible.. The farther away you are from the loudspeaker, the more prominent will be the reflected sound.

Use more speakers strategically placed so they are closer to the back of the audience. If the distance between the front and back speakers is more than 100 feet, you should be able to use a delay processor to time-align the sound. Since sound travels about one foot per millisecond, it takes 1/10 of a second to travel 100 feet.

Protection

A protection circuit is built into the S512, S515 and S525 to protect their high-frequency drivers from excessive power. When tripped, the protection circuit substantially reduces the power to the HF driver. After the driver cools to a safe operating temperature, the protection circuit resets and normal operation resumes. **However**, if the protection circuit senses excessive power, it will trip again. In this case, it is necessary to reduce the power to the loudspeaker by either turning down the gain controls on the power amplifier or turning down the master volume control on the mixer or other sound source.



CAUTION: The protection circuit is designed to protect the HF driver under reasonable and sensible conditions. Should you choose to ignore the warning signs (i.e., frequent clip LED indications on the mixer or power amplifier, excessive distortion), you can still damage the drivers in the S500 Series loudspeakers by overdriving them past their recommended amplifier power-handling ratings, or past the point of amplifier clipping. Such damage is beyond the scope of the warranty.

Amplifier Power

The S500 Series loudspeakers have three power-handling numbers: continuous, program and peak. So how much power do you really need to drive these loudspeakers? The answer to that question depends on what type of program material you are running through the system and how loud it needs to be.

Some audio signals have lots of momentary peaks whose amplitudes extend far above the average overall level of the program. Percussion instruments are a good example of this. Other types of signals, like highly compressed rock music, have a higher average signal level with fewer peaks. Speech reinforcement requires less power overall, but involves large moment-to-moment variations in level.

Assuming you want to use the full capability of the loudspeaker, and the program contains at least some momentary peaks, we recommend that you use an amplifier that is rated at twice the continuous power rating of the loudspeaker (into 8 ohms). For the S512 loudspeakers, this would be $250 \text{ watts} \times 2 = 500 \text{ watts}$ per channel into 8 ohms. This ensures that the amplifier can reproduce peaks that are 6 dB higher than the continuous (rms) power-handling rating before clipping occurs.

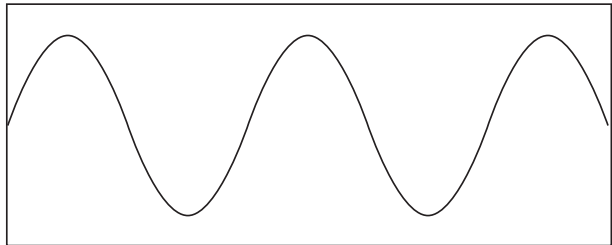
Recommended Power Ratings

- S512: 500 watts into 8 ohms (250 watts rms x 2)
- S515: 600 watts into 8 ohms (300 watts rms x 2)
- S525: 1200 watts into 8 ohms (600 watts rms x 2)
- S518S: 900 watts into 8 ohms (450 watts rms x 2)

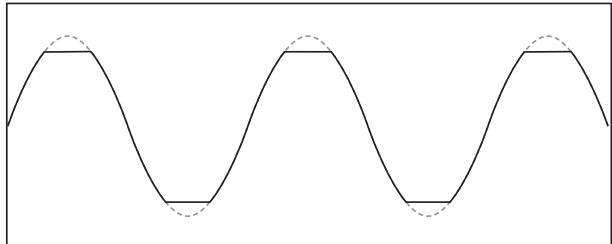
Preventing Loudspeaker Damage

Speaking of clipping, this is likely the number one cause of damage to loudspeakers. Clipping occurs when the signal at the output of any device in the system (not just the amplifier) reaches its maximum level. The input signal to the device may continue to increase, but the output simply stops, and is characterized by a “flat-top” appearance to the waveform.

Normal Sine Wave Signal ☺



Clipped Sine Wave Signal ☹



Clipping interrupts the motion of the transducer, creating distortion and excessive heat in the driver, which can damage it over time.

Some folks think that if they use a power amplifier whose power rating is below the maximum power-handling rating of the loudspeaker, then they can't possibly damage the loudspeaker. But if the amplifier is driven into clipping, even a lower power amplifier can damage the loudspeaker.

The bottom line is that to prevent damage to the loudspeakers, you must have a properly operating sound system. Proper operation of a sound system includes being aware of types of audio signals being reproduced, controlling the output levels accordingly, and operating all the devices in the system so that no clipping occurs within the signal chain.

Appendix A: Service Information

If you think your Mackie product has a problem, please check out the following troubleshooting tips and do your best to confirm the problem. Visit the Support section of our website (www.mackie.com) to get some ideas or contact our technical support heroes. You may find the answer to the problem without having to send your Mackie product away.

Troubleshooting

No Sound

- Are the level controls on the mixer or amplifier turned all the way down? Follow the procedures in “Getting Started” section on page 4 to verify that all of the volume controls in the system are properly adjusted.
- Is the signal source working (and making union scale)?
- Are all the connections good and sound? Make sure all of the connecting cables are in good repair and securely connected at both ends.

One side is way louder than the other!

- Are the level controls set the same for both channels on the mixer and amplifier?
- Check the pan control on the signal source. It may be turned too far to one side. If you're using a stereo signal source, it may be delivering an out-of-balance stereo signal.
- Try switching sides: Turn off the amp, swap the speaker cables at the amp and turn the amp back on. If the same side is still louder, the problem is with your speaker cabling or the loudspeakers. If the other side is louder now, the problem is with the mixer, the loudspeaker processor, the amp, or the line-level cabling.

Poor bass performance

- Check the polarity of the connections between the amplifier and the loudspeakers. You may have your positive and negative connections reversed at one end of one cable.

Bad Sound

- Is the input connector plugged completely into the jack? Make sure it is plugged all the way in.
- Is it loud and distorted? Reduce the signal level at the mixer.
- If possible, listen to the signal source with headphones plugged into the preamp stage. If it sounds bad there, it's not the loudspeaker.
- Too much bass or not enough bass? Move around the room and see if the bass response changes. It's possible your listening position coincides with a room mode where the low frequencies either become exaggerated or nulled. If so, try moving the loudspeakers to a different position, or moving your listening position.

Care and Maintenance

Your Mackie loudspeakers will provide many years of reliable service if you follow these simple guidelines:

- Avoid exposing the loudspeakers to moisture. If they are set up outdoors, be sure they are under cover if you expect rain.
- Avoid exposure to extreme cold (below freezing temperatures). If you must operate the loudspeakers in a cold environment, warm up the voice coils slowly by sending a low-level signal through them for about 15 minutes prior to high-power operation.
- Use a damp cloth with a mild soap solution to clean the cabinets. Avoid getting moisture into any of the openings of the cabinet, particularly where the drivers are located.

Repair

For warranty service, refer to the warranty information on page 13.

Non-warranty service for Mackie products is available at a factory-authorized service center. To locate your nearest service center, visit www.mackie.com, click "Support" and select "Locate a Service Center." Service for Mackie products living outside the United States can be obtained through local dealers or distributors.

If you do not have access to our website, you can call our Tech Support department at 1-800-898-3211, Monday-Friday during normal business hours, Pacific Time, to explain the problem. Tech Support will tell you where the nearest factory-authorized service center is located in your area.

Appendix B: Connections

The S500 Series loudspeakers have 1/4" and NL4 input and thru connectors. The connectors are wired in parallel, so use only one of the input connectors.

Normally, one would use only one thru connector, but it is possible to use both thru connectors. Keep in mind that all of the speakers are connected in parallel through these connectors, so you want to be sure not to go below the minimum impedance requirement of the amplifier.

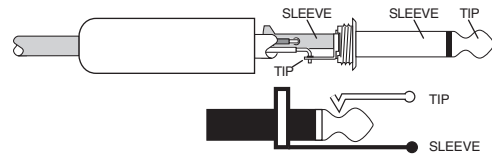


Use heavy gauge, stranded wire for connecting a speaker to the output of a power amplifier.

Do not use coaxial cable like a guitar cord to make speaker connections. They are not designed to handle the high currents produced by a power amplifier and can overheat. As the distance between the amplifier and speaker increases, so should the thickness of the wire. Speaker wire has resistance, and when electricity passes through a resistor, power is lost. The thicker the wire, the less the resistance it offers, and the more power actually gets to the speaker.

TS Phone Plugs and Jacks

"TS" stands for Tip-Sleeve, the two connections available on a mono 1/4" phone jack or plug. They are used for unbalanced signals and speaker connections.



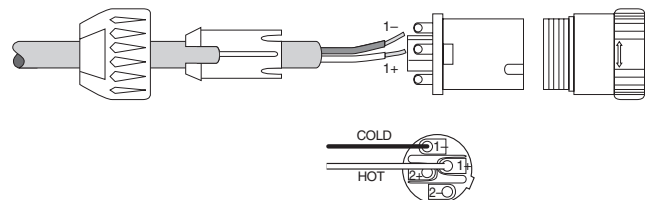
1/4" TS Connector

Sleeve = Cold (-)

Tip = Hot (+)

NL4

These connectors are designed to handle the higher currents produced by amplifiers and have a locking feature to prevent accidental disconnections. Simply line up the tabs on the plug with the jack on the S500 Series loudspeaker, push it in and rotate it clockwise 1/4 turn to lock it in place.



NL4 Connector

Pin 1 - = Cold (-)

Pin 1 + = Hot (+)

Pin 2 - = No Connection

Pin 2 + = No Connection

Appendix C: S500 Series Specifications

S512

System

Type:	Two-way, full-range loudspeaker
Frequency Range (-10 dB):	49 Hz – 18 kHz
Horizontal Coverage Angle:	90°
Vertical Coverage Angle:	50°
Sensitivity (1W @ 1m):	99.9 dB SPL
Nominal Impedance:	8 ohms
Power Handling:	250 watts continuous 500 watts program 1000 watts peak
Crossover Frequency:	3600 Hz

Transducers

Low Frequency:	12" / 305 mm woofer, vented
High Frequency:	1" / 25 mm tweeter

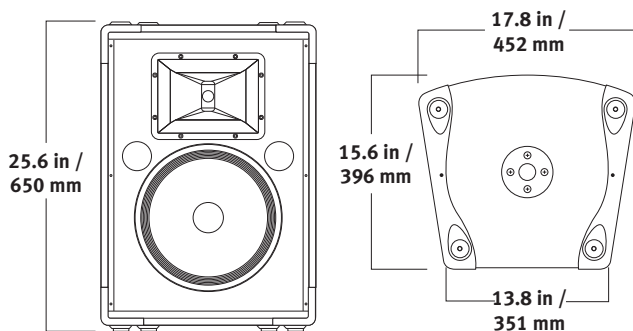
Physical

Input Connectors:	Two 1/4" TS jacks Two NL4 jacks, paralleled
Enclosure:	Wood with textured black PVC vinyl covering

Dimensions

Height:	25.6 in / 650 mm
Width:	17.8 in / 452 mm
Depth:	15.6 in / 396 mm
Weight:	49 lb / 22 kg
Mounting:	Pole-mountable

S512 Dimensions



S515

System

Type:	Two-way, full-range loudspeaker
Frequency Range (-10 dB):	47 Hz – 18 kHz
Horizontal Coverage Angle:	90°
Vertical Coverage Angle:	50°
Sensitivity (1W @ 1m):	101.1 dB SPL
Nominal Impedance:	8 ohms
Power Handling:	300 watts continuous 600 watts program 1200 watts peak
Crossover Frequency:	3400 Hz

Transducers

Low Frequency:	15" / 381 mm woofer, vented
High Frequency:	1" / 25 mm tweeter

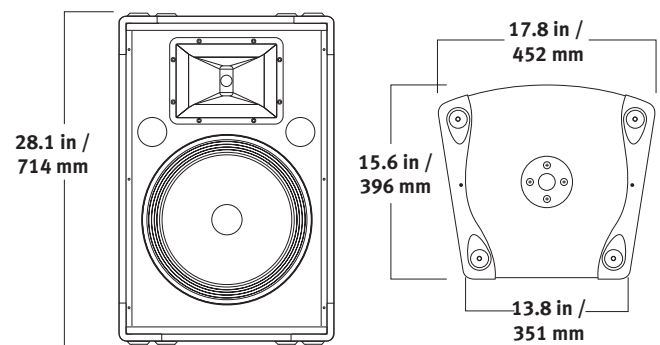
Physical

Input Connectors:	Two 1/4" TS jacks Two NL4 jacks, paralleled
Enclosure:	Wood with textured black PVC vinyl covering

Dimensions

Height:	28.1 in / 714 mm
Width:	17.8 in / 452 mm
Depth:	15.6 in / 396 mm
Weight:	51 lb / 23 kg
Mounting:	Pole-mountable

S515 Dimensions



S525

System

Type:	Two-way, full-range loudspeaker
Frequency Range (-10 dB):	51 Hz – 18 kHz
Horizontal Coverage Angle:	90°
Vertical Coverage Angle:	50°
Sensitivity (1W @ 1m):	102.9 dB SPL
Nominal Impedance:	8 ohms
Power Handling:	600 watts continuous 1200 watts program 2400 watts peak
Crossover Frequency:	2800 Hz

Transducers

Low Frequency:	Two 15" / 381 mm woofers, vented
High Frequency:	1" / 25 mm tweeter

Physical

Input Connectors:	Two 1/4" TS jacks Two NL4 jacks, paralleled
Enclosure:	Wood with textured black PVC vinyl covering

Dimensions

Height:	43.9 in / 1115 mm
Width:	16.8 in / 427 mm
Depth:	15.6 in / 396 mm
Weight:	75 lb / 34 kg

S518S

System

Type:	Subwoofer
Frequency Range (-10 dB):	37 Hz – 220 Hz
Sensitivity (1W @ 1m):	98.3 dB SPL
Nominal Impedance:	8 ohms
Power Handling:	450 watts continuous 900 watts program 1800 watts peak
Internal Low Pass Filter:	120 Hz, 12 dB/octave

Transducers

Low Frequency:	18" / 457 mm woofer, vented
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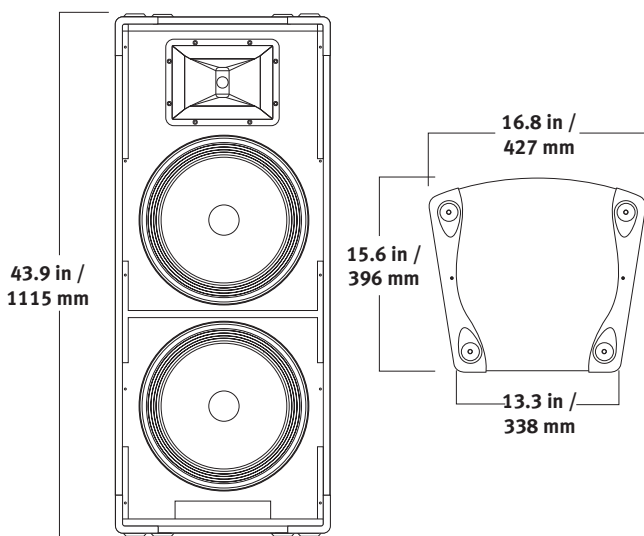
Physical

Input Connectors:	Two 1/4" TS jacks Two NL4 jacks, paralleled
Enclosure:	Wood with durable black paint

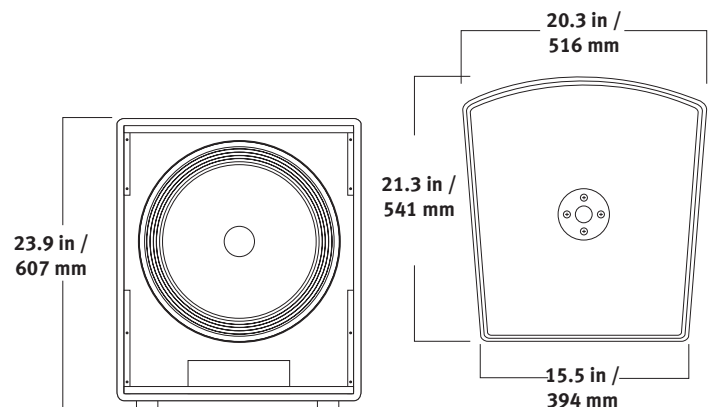
Dimensions

Height:	23.9 in / 607 mm
Width:	20.3 in / 516 mm
Depth:	21.3 in / 541 mm
Weight:	70 lb / 32 kg
Mounting:	Pole-mount on top

S525 Dimensions



S518S Dimensions



LOUD Technologies Inc. is always striving to improve our products by incorporating new and improved materials, components, and manufacturing methods. Therefore, we reserve the right to change these specifications at any time without notice. "Mackie," and the "Running Man" are registered trademarks of LOUD Technologies Inc. All other brand names mentioned are trademarks or registered trademarks of their respective holders, and are hereby acknowledged. ©2012 LOUD Technologies Inc. All Rights Reserved.

Mackie Limited Warranty

Please keep your sales receipt in a safe place.

This Limited Product Warranty ("Product Warranty") is provided by LOUD Technologies Inc. ("LOUD") and is applicable to products purchased in the United States or Canada through a LOUD-authorized reseller or dealer. The Product Warranty will not extend to anyone other than the original purchaser of the product (hereinafter, "Customer," "you" or "your").

For products purchased outside the U.S. or Canada, please visit www.mackie.com/warranty to find contact information for your local distributor, and information on any warranty coverage provided by the distributor in your local market.

LOUD warrants to Customer that the product will be free from defects in materials and workmanship under normal use during the Warranty Period. If the product fails to conform to the warranty then LOUD or its authorized service representative will at its option, either repair or replace any such nonconforming product, provided that Customer gives notice of the noncompliance within the Warranty Period to the Company at: www.mackie.com/support or by calling LOUD technical support at 1.800.898.3211 (toll-free in the U.S. and Canada) during normal business hours Pacific Time, excluding weekends or LOUD holidays. Please retain the original dated sales receipt as evidence of the date of purchase. You will need it to obtain any warranty service.

For full terms and conditions, as well as the specific duration of the Warranty for this product, please visit www.mackie.com/warranty.

The Product Warranty, together with your invoice or receipt, and the terms and conditions located at www.mackie.com/warranty constitutes the entire agreement, and supersedes any and all prior agreements between LOUD and Customer related to the subject matter hereof. No amendment, modification or waiver of any of the provisions of this Product Warranty will be valid unless set forth in a written instrument signed by the party to be bound thereby.

Need help with your new loudspeaker?

- Visit www.mackie.com and click Support to find: FAQs, manuals, addendums, and other documents.
- Email us at: techmail@mackie.com.
- Telephone 1-800-898-3211 to speak with one of our splendid technical support chaps (Monday through Friday, normal business hours, Pacific Time).



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