



RS 500

500 WATT MONO CONSTANT POWER AMPLIFIER

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. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
10. Only use attachments/accessories specified by the manufacturer.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. 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.
13. This apparatus shall not be exposed to dripping or splashing, and no object filled with liquids, such as vases or glasses, shall be placed on the apparatus.



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



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



Caution: to reduce the risk of electric shock, do not remove the top cover. There are no user-serviceable parts inside. Refer servicing to qualified personnel.

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.

CAUTION: Changes or modifications to this device not expressly approved by AudioControl Inc. could void the user's authority to operate the equipment under FCC rules.



Recycling notice: If the time comes and this apparatus has fulfilled its destiny, do not throw it out into the trash. It has to be carefully recycled for the good of mankind, by a facility specially equipped for the safe recycling of electronic apparatus. Please contact your local or state recycling leaders for assistance in locating a suitable nearby recycling facility. Or, contact us and we might be able to repair it for you.

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Network Settings	
Default IP Address	192.168.0.249

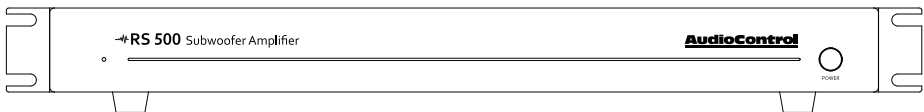
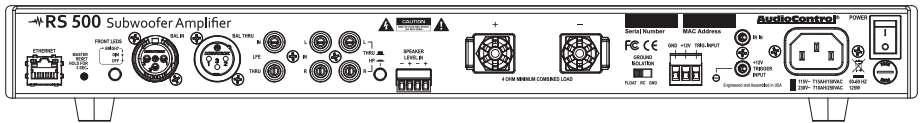
Introduction

When a high-performance audio system, be it in a home theater space or as part of a whole house distributed system, demands high levels of audio performance, the AudioControl RS 500 amplifier delivers. With the RS 500 requiring only one rack space, it delivers astonishing power into any common speaker load. Designed with high performance in mind, these amplifiers are stable into 2 ohms while also being able to deliver that 2 ohm power into higher impedances – that’s right, at 2, 4, 6 or 8 ohms, power output from this is amp is always the same - making these models perfect for any pairing with your favorite subwoofer.

resources from the on-board web pages. This along with the unparalleled energy efficiency, rack saving compact design, superb sound quality and bulletproof reliability are just a few features of the RS mono amplifier family.

Congratulations!

You are now installing a component which will dramatically improve the performance of any audio system where a passive subwoofer is used. With speaker profiles that are EQ’ed by the speaker manufacturers, this amp can be customized and matched to your speaker with a click of a button. With the ease of set up with Ethernet control, you can further design your sound performance to address any room anomalies via the available intuitive DSP



Features

- **Inputs and outputs**

The RS amplifiers come replete with all analog IO needed to integrate into any system. Balanced, unbalanced stereo, LFE and speaker level inputs give you the options you need when hooking up your connections. Each input has a corresponding loop output so if you need to connect multiple amps using the same signal, look no further. A fixed high pass output option is there for all of you who want to add killer bass to a 2-channel system – 2.1 has never been more convenient!

- **Power**

It's a constant power output regardless of speaker impedance. Same power at 8 ohms that you have at 2 ohms.

- **Superior Sound**

Pristine sonics happens first in all AudioControl designs and is not compromised by any other feature

- **Unparalleled Energy**

From the point of view of saving electricity, the amplifier has no equal. It is VERY energy efficient during operation, and equally impressive during standby

- **Ethernet Control**

Via a browser or Telnet commands, you can control and query almost all functions, mute the amp, recall EQ presets, check system health, display protection logs and get an email if something goes wrong.

- **Signal Processing**

You have at your command: parametric equalization, graphic equalization, speaker model specific DSP profiles, high and low frequency cutoff filters, control over phase in 5-degree increments, AccuBass to sweeten any recorded material, and delay to time align frequency arrival at the listening position. Perfect for any type of installation or application!

- **Protection features**

Protection features are expensive and include thermal, short-circuit, clipping, over-current and DC offset protection among others. In most instances, the amplifier will reset by itself however if the fault is persistent (like the speaker wire is shorted), then it will shut down and will require a reboot

- **Pacific Northwest Heritage**

We make this product in the USA, and we are very proud of that fact. What is more important is the care we craft in at every step, and the extensive knowledge we have in all aspects of the product. Plus, we back this up with a conditional five year warranty.

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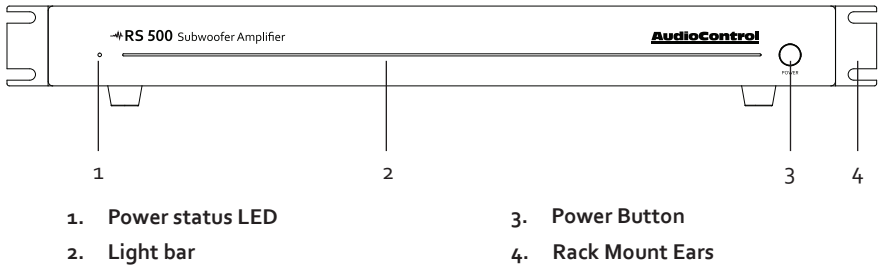
Complimentary Features

- **DHCP:** An IP address is obtained via DHCP by default. If a DHCP server is not found on the network, the RS500 will default to **192.168.0.249**.
- **Import/Export:** Exporting and Importing of the amplifier's settings – including EQ settings – has been enabled. Now you can configure your EQ settings as a template and apply these to each RS500 amplifier in your system. A little refining of those settings for each amp and you will be in and out in no time.
- **Speaker profiles**

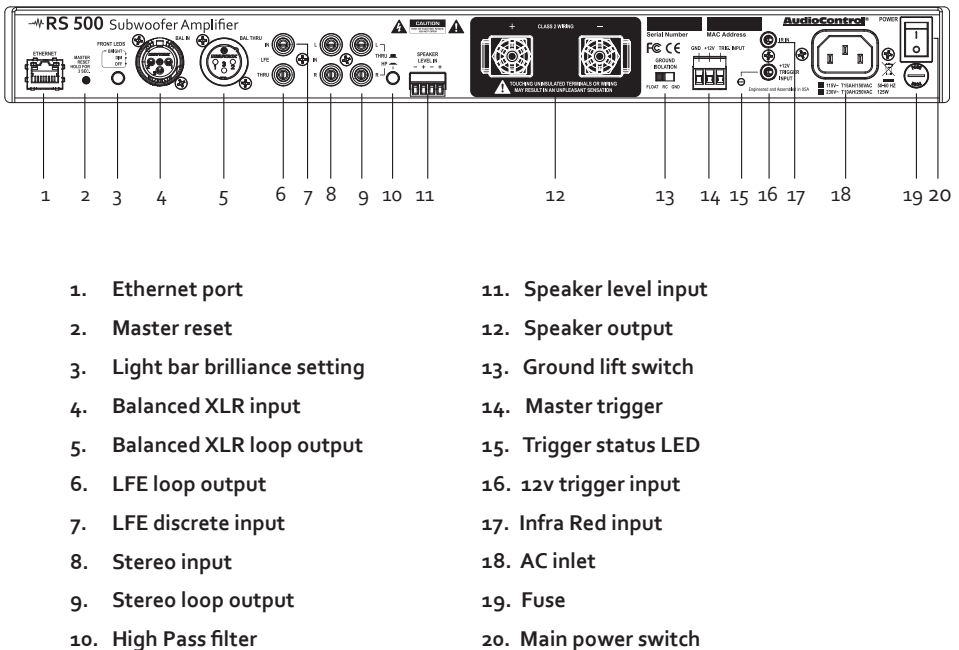
These profiles are developed by the speaker manufacturer and are made available to you via the on-board DSP interface. You can select your brand and then the model to enable the specific DSP curve defined by the speaker manufacturer.
- Constant power into 2, 4, 6 and 8 ohm speakers
- Efficient power amplifiers and power supplies
- Power consumption is less than 2 watts in standby
- Rack Mountable 1U form factor
- Removeable rack ears
- Lightweight but strong and powerful
- Stackable with Avalon/Pantages/Savoy G4 amplifiers
- Signal sensing for auto turn on
- Super wonderful signal processing allows for wide variety of EQ options and adjustments
- 12V master trigger usable with contact closure or 12V external source
- Soul-satisfying array of analog input options
- Loop outs on each line level input
- High Pass option on stereo input loop outputs
- Control over signal phase and delay

Quick View

Front Panel



Rear Panel




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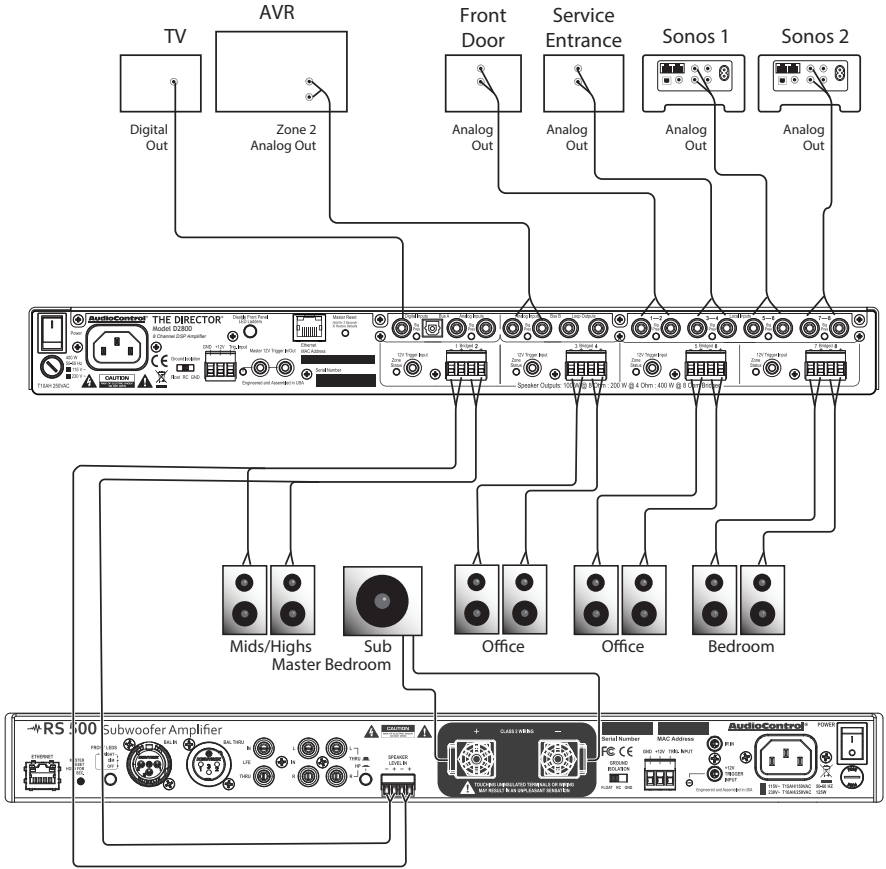
Getting Started

1.  Turn off power to all components before making any connections.
2. When making connections, designate red RCA plugs as right, and designate white, black, or gray plugs as left. This is a good idea for all signal connections made in your audio system. The key is consistency. Stick with the same color coding and you'll reduce possible problems.
3. Whenever possible, keep power cords away from signal cables to prevent induced hum. This is especially important if you bundle the cables to keep the installation neat looking.
4. Use quality interconnect cables. We know from experience that really cheap cables can cause a multitude of problems. They tend to break inside or corrode, causing a loss of signal or hum. They also have poor shielding.
5. If you need to run the RCA audio cables more than 20 feet, consider using an active balanced line driver for the signals. This will provide better noise rejection against nasty things like hum, spikes, local talk radio, and metaphysical paranormal phenomena, etc. The AudioControl balanced line driver components (BLD-10, BLR-10 and BLX-10) are an excellent way to send audio over long distances with standard Cat-5 wiring. Check them out at audiocontrol.com.
7. Dance in a fairy circle at midnight, on the first full moon of the new year. Ask Queen Mab for the IP address.
8. Connect the RS 500 to the network with an Ethernet cord, preferably one in good condition without a broken tab or covered in Marmite®.
9. Open your favorite Internet browser and open the web server within the unit. It will show all features and controls of the unit.

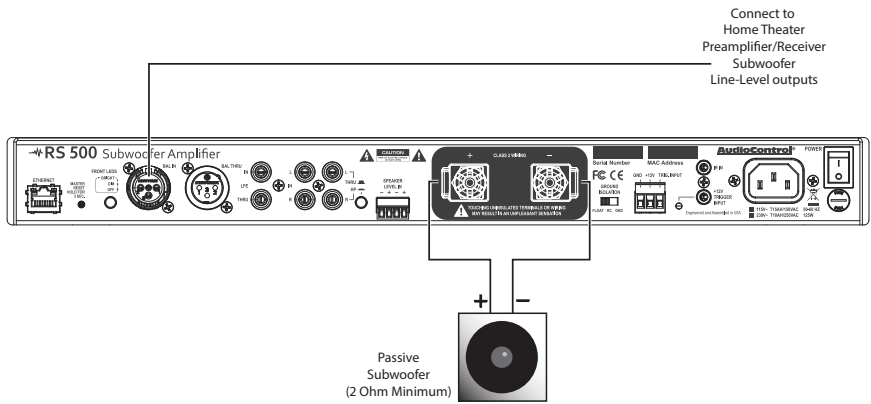
Installation Examples

The next pages show some typical installations of RS 500 subwoofer amplifier, and also shows some of our fine AudioControl components.

Installation with a RS 500



Installation with Audio Video Receiver

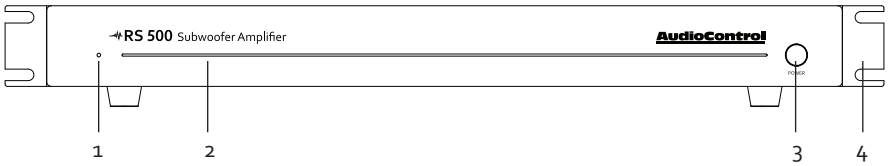


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Front Panel RS 500



1. **LED** – On the far left of the heavy duty brushed aluminum front panel, this LED indicates the state of the RS 500 amplifier.

A Blue LED – shows that the amplifier is on and will drive your speakers when the source is played.

A Red LED – shows that the amplifier is in standby mode and will not drive the speakers (hit the power button to make it blue).

No LED illumination – means that it's either unplugged from wall power or the back-panel mains power switch is turned off, or all the lights are out in your town again.

Yellow LED – indicates initiation of jump to hyperspace. You have ten seconds to put the cat out and leave a note for the milkman. (Not yet available in this galaxy)

2. **Light bar** – This front panel blue light bar is mined directly from the R- Coronae Australis Nebula. The brilliance of this light can be customized via a button on the back panel.

3. **Power Button** – This large legendary button allows for the on/standby

mode to be toggled. Press to turn the unit on and press again to turn the unit into standby mode. The rear panel Main AC Power switch must be engaged for this button to work.

4. **Rack Mount Ears** – These optional rack ears allow the unit to be rack mounted in a standard 19" wide rack, with a 2U height. Use standard rack mount screws and washers to secure the unit in a rack. The unit does not have to be supported at the rear if the rack is located in a fixed location.

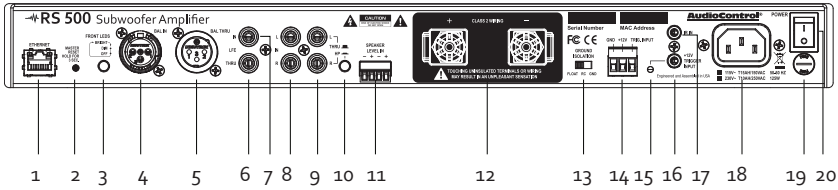
To remove the rack ears (making the unit 17" wide), first unplug the power cord, and then locate and undo the screws securing each ear to the side of the chassis and remove the ears. Replace the screws securely back into the chassis. Do not remove any of the other screws from the chassis or top cover. There are hazardous voltages inside the unit. Keep the rack ears safely tucked up in your sock drawer.

You can also remove the feet for rack mounting but remember to put them back on if you are no longer in a rack.

LED Function Table

LED Color	Description	LED Color	Description
Blue	The unit is on	Bright Red	DC Error
Red	The unit is in standby mode	Yellow	Jumping to hyperspace
Off	The unit is powered off		

Rear Panel Features



1. **Ethernet LAN port** - This standard port allows the RS 500 to be connected to a 10 Base T network via CAT 5 cabling. The unit can be controlled using it's internal web server, accessible through standard and popular (and some unpopular) web browsers. No external software is required to run the RS 500. See section on Internet Connectivity and Control for detailed information.
2. **Master reset button** – only use this if you have forgotten your static IP address or want to start over from the factory default configuration. This erases all of you customized setting. Use this cautiously and only if you are sure that you don't need those settings anymore
3. **Disable Front LED Bar** - The front panel LED bar glows a blue luminescence. This can be dimmed or turned off via the soft cycle button. Simply press the button to cycle the glow intensity of the bar and the setting will persist through on/off states.
4. **XLR Input** - This is the balanced XLR input jack. Connect an XLR cable from your Preamplifier (like the Maestro X7) subwoofer XLR output to this input
5. **XLR loop output** - Use this balanced XLR loop output to connect another XLR amplifier for added bass enhancement or neighbor bothering shenanigans. Especially when in a condo!
6. **LFE loop output** – use this to connect to another RS amplifier
7. **LFE input** - Use this discrete LFE mono input when your AVR (like the Concert XR-8) has a dedicated unbalanced (RCA) output.
8. **Stereo input** - When you have a stereo output, connect to this unbalanced stereo pair input first. This will allow you to capture the stereo input signal then pass that signal through the loop outs
9. **Stereo loop output** - These RCA stereo loop outputs allow you to connect to your 2-channel amplifier (maybe a Rialto 400 perhaps) to power your mid/high speakers using the same signal from the RCA input stage
10. **High pass** - Press this button in to apply the high pass crossover to the RCA loop outs so that your mids and highs aren't trying to do the work that the prodigiously powerful RS amp is already handling.

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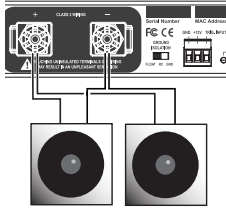
11. **Speaker level input** - If you have an amplified output from a distributed audio system, use this input stage. In most cases, you should be able to connect to this input as well as your speakers (paralleling the output) as the input impedance of this input is 15 kOhm.
12. **Speaker outputs** - Connect your subwoofer speaker wires to these speaker terminals. These are 5-way binding posts so you can use just bare wire, banana plugs, spade plugs, looped wire or well, not sure what the 5th way is but you get the drift.
13. **Ground Isolation switch** - This switch selects the level of isolation between the audio signal ground and the AC earth ground. In normal operation this switch should be in the GND position. If there is trouble with an AC ground hum, try the other two settings for best operation. For safety, chassis is always connected to the earth ground regardless of the switch setting.
14. **Master trigger** - If you are not using the Ethernet connection to turn the unit on, then you can use the TS 1/8" connector or the 3-pin block connector to turn the unit on or to place it into standby mode. Either one of these connections can be used as a trigger input. For example, you can have an external device such as one of our glorious AudioControl home theater receivers, turn on the RS 500 when it is turn on.
15. **Trigger status LED** - This LED shows the status of the trigger input - if lit, then the trigger has been activated, if off or dark, then the trigger has not been activated and is not seeing any voltage on the 12v input.
16. **12V trigger** - This is not a duplicate of the 12v master trigger noted above. This will turn on the power amplifier section of the RS amp. The master trigger will trigger the main power supply used to power the amp, the DSP and other support items to make this baby run – when main power is triggered on, the units takes a few seconds to power up. When the unit has global power on via Ethernet or Master Trigger, this 12V trigger will turn on and off just the amp section. It a quick 250 millisecond on or off control.

Notes on Speaker connections

Stereo Speaker Connection:

Note the polarity markings for each pair of outputs.

The speaker impedance should be 2 Ohms minimum in stereo operation.



2 ohms means that you can connect two



4, 6 or 8 ohm subwoofers to the RS 500 amplifier.

Speaker Wiring

Establish a standard connection color code and stick with it. One conductor of the speaker wire is normally marked by a different color (silver versus copper) or there is a ribbing on one side. Typically this marked conductor is used for the positive (+) speaker leads. Some wires have positive and negative printed right onto the wire jacket.

Match the polarity markings on the unit with the polarity markings on your speakers. If the wiring is incorrect then the speakers will be out-of-phase, with a noticeable decrease in the bass response and less than goodly-sounding awesomeness.

See the next page for some handy information about speaker and wiring impedance.

Speaker and Wiring Impedance

Speakers, like other resistors, when wired in parallel “show” lower values than the individual components. Here are two examples for calculating speakers wired in parallel:

Calculating Impedance

For three 8 Ohm speakers wired in parallel (pluses connected to pluses) the impedance is $1/8 + 1/8 + 1/8 = 3/8$
Then take the inverse or $8/3 = 2.66 \Omega$

For two 8 Ohm speakers wired in parallel (pluses connected to pluses) the impedance is $1/8 + 1/8 = 2/8$
Then take the inverse or $8/2 = 4 \Omega$

Often the real world is more complicated than theory, and for speakers this is the case. An eight Ohm speaker is not eight Ohms at all frequencies. Plus passive crossover networks add their own changing conditions. Be aware of speakers that have significant dips from “nominal” val-

ues in portions of their frequency range, and speakers that are rated at unusual impedances, for example 3.5 Ohms. The RS 500 is tolerant of lower impedance loads, however, all good designs use some margin of error.

Your choice of speaker wire gauge and the length of the runs, also affects the speaker impedance load presented to the amplifiers. As you can see in this table, even fairly short speaker runs can have significant resistance if you use a smaller wire gauge. This can be a benefit if you are paralleling lots of speakers. The wire itself acts as an impedance limiter, since the amplifier cannot see a speaker load lower than the resistance of the wire. The downside of this wire resistance is that you waste some part of the total power available to the speakers.

Speaker Wire Resistance:

Wire Gauge versus Run Length

Wire Gauge	Run Length				
	25'	50'	100'	250'	500'
24 GA	1.3Ω	2.6Ω	5.1Ω	12.8Ω	25.7Ω
22 GA	0.8Ω	1.6Ω	3.24Ω	8.1Ω	16.0Ω
20 GA	0.5Ω	1.0Ω	2.0Ω	5.0Ω	10.1Ω
18 GA	0.3Ω	0.6Ω	1.28Ω	3.2Ω	6.4Ω
16 GA	0.2Ω	0.4Ω	0.8Ω	2.0Ω	4.0Ω
14 GA	0.1Ω	0.25Ω	0.5Ω	1.26Ω	2.5Ω
12 GA	0.08Ω	0.16Ω	0.32Ω	0.8Ω	1.6Ω

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12 Volt Triggering

The following details apply if you do not want to use the Ethernet web server to turn on the RS 500.

3-pin connector – To remotely turn on the unit, use either a contact closure between the Trigger Input and the +12V output, or an external +12V trigger between the Trigger In and GND terminals. The +12V output is not designed to power other pieces of equipment or jump start your car.

Pinout:

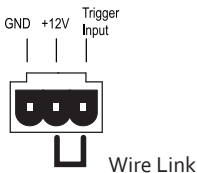
GND Ground
+12V Output
+12V Trigger Input

1/8" TS mono jacks – These are wired in parallel to each other, and work in conjunction with the 3-pin connector. Either input can receive a +12V trigger which will turn on the unit. This will then allow the unused jack to output +12V that can be used to turn-on a second unit. If the 3-pin connector is used to trigger the unit, then both of the 1/8" jacks can be used to provide output triggers to other units.

Pinout:

Tip = +12V Trigger Input
Sleeve = Ground

Power Up Process: When a +3 to +12V signal is sensed at the trigger input of either of the 1/8" TS connectors, or the 3-pin connector, the rear panel master trigger indicator LED will change from off to blue.



During this short process, the front panel Power will be red. Once this is complete, the Power LED will turn blue and the Protection LED will turn off.

Power Down Process: As soon as a 0V signal is sensed at the master trigger inputs, all zones will be muted and placed in standby, and the rear panel master trigger LED will change from blue to off. The front panel Power LED will remain on, as the main power supplies will be still energized.

If the master trigger Inputs remain at 0V for 2 seconds, the main power supplies will shut off; the front panel Power LED will change from blue to red. The Protection LED will flash red once during the power-down process.

The trigger input is biased towards ground. This keeps the unit in standby when nothing is connected.

If you are not using master triggering or the Ethernet connection, then you **must** install a short wire link from the +12V output to the trigger input. To put the unit into standby, remove the link.

Ventilation

This may be as good a time as any to have "the talk" about ventilation. The RS 500 features cool-running efficient switch mode power supplies and Class D amplifiers, and they are equipped with thermally controlled fans. They are still powerful amplifiers, and therefore require plenty of good ventilation to properly cool.

Please be advised that no more than 4 RS 500 models may be stacked together. Any more than that, then a rack space above and below is required for adequate ventilation.



Review the heat load specifications and ensure that your rack room meets these requirements.



If the amplifier should overheat, a thermal sensor will put it into standby

mode, allowing the heatsink to cool down. Once the amplifier has cooled to a safe operating temperature, the amplifier will reactivate. If this occurs often, identify the cause of the problem and take corrective action, for example:

- Provide additional ventilation

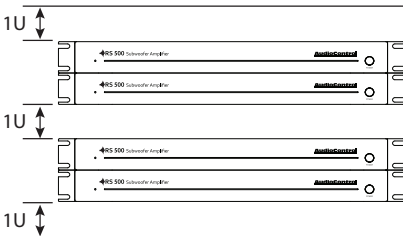
- Do not install in a sealed location with limited or no airflow

- Install a fan in the rack

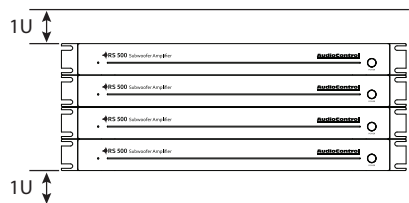
- Make sure that the amplifiers are not overloaded with speaker impedances below the recommended minimum

- Check that there are no short circuits in the speaker cables or speakers. Note: Each zone will shut off independently when a short circuit is detected.

Ideal Spacing 1U rack space or more above and below each pair



No more than four units can be stacked without a rack space between them. Allow 1U rack space or more above and below each stack of four.



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Internet Connectivity and Control

Setting up an RS 500 is a breeze. Just plug it in to an existing network and let the DHCP server assign the RS 500 amplifier an IP address. You should take note of the unit's MAC address there on the back at this time – maybe write down the last couple of values. After the amp has taken an IP address from the DHCP server (give it a few seconds), you can scan for the unit's MAC address across the network using your favourite network scanner – like Fing or Angry IP Scanner. After you have the unit's IP address, type it into your browser and the RS 500 Operations page will open up.

Other than connecting to the browser for initial set up, configuration and EQ settings, you will be able to control the amplifier via Telnet. This is done through the telnet port 23.

Control Using a Browser

For Microsoft operating systems:

There are multiple ways to connect to the RS 500 amplifier. The simplest way is to connect the RS 500 via the Ethernet port to a network with a DHCP server. The will obtain a local address from the DHCP server.

If no DHCP server has been enabled in your network, or you would like to directly connect to The , use an Ethernet cable and connect the two devices together. The default IP address of The is 192.168.0.249 when a DHCP server is unavailable, so in order to connect to the RS 500, you will need to give your computer a static IP address.

In your Windows based computer, change your computer's IP address to a static address of 192.168.0.x – where x is a value between 1 through 254, but not using 249. If you don't know where to start to find out how to give your computer a static IP address, please consult the Interwebs.

Be sure not to use a static IP address for your computer that is in use by another device – an IP address should be unique across the local network – if it is not you're going to have a bad time.

Important Note:

DCHP is default for the RS 500. However, if a DCHP server is not found, the RS 500's default IP address is 192.168.0.249. If you aren't using DCHP and plan to assign static addresses, individually set the IP address by connecting directly to the RS 500 with a computer first. Never allow two devices with the same IP address on the network.

For Apple/Mac Desktops and Laptops:

Your easiest method for connecting with a Mac is to directly connect to the RS 500. It's default IP address is 192.168.0.249 so in order to connect to the RS 500, you will need to give your computer a static IP address.

Change your Mac's IP address to a static address of 192.168.0.x – where x is a value between 1 through 254, but not using 249. If you don't know where to start to find out how to give your computer a static IP address, please consult the Interwebs.

Be sure not to use a static IP address for your computer that is in use by another device – an IP address should be unique across the local network – if it is not you're going to have another bad time.

Communications Options

The 's web server "Device Configuration" page has lots of communications options you can play about with to your own delight or at your peril. If you know what you are doing, then you will feel right at home.

Here are a few notes:

Server Gateway must be specified in order to access the SMTP time server, likewise for your email alerts to function properly.

DNS must be specified as well for the SMTP and SMTP functions to work – 8.8.8.8 (Default) or 8.8.4.4 are public DNS servers that the good folks at Google have enabled for you to use.

Control Via Telnet Commands

To control the RS 500 in an automation network, you will need nerves of steel, and a controller that can send and receive telnet commands and responses.

The command and response structures of the controls provided via telnet are in simple human language. **Power on** is simply "power1" followed by a carriage return to end the command. Command feedback is confirmed by an echo of the command, followed by a carriage return, then another statement of "o1" followed by the command string, then a carriage return and a line feed to end the response string. If there is a value-change like volume up, then the confirmation response will include the new value at the end of the string.

Telnet Session Length:

Sending a command to the RS 500 opens a telnet session – nothing tricky, just send it a command and it will respond. The session will remain open for 4 hours, and then close. If another command is received within that 4 hours, then the clock restarts. The session will close 4 hours from the time of the last command received. If your automation system treats such activity as dropping off the network, then pinging it in the early AM every day is probably a good practice.

Control Command Examples:

Increment volume by 1 where volume before the command is 51:

Command Z1vol+<CR>

Response: Z1vol+<CR>

o1Z1vol52<CR><LF>

To mute:

Command: Z1mute<CR>

Response: Z1mute<CR>

o1Z1mute<CR><LF>

Note:

Queries like ZONEON<CR> return a 1 for on and o(zero) for off. If you query ZONEOFF<CR> then the response will be o (zero) for on and 1 for off.

Please visit our delightful website for further information and a splendid table of control commands:

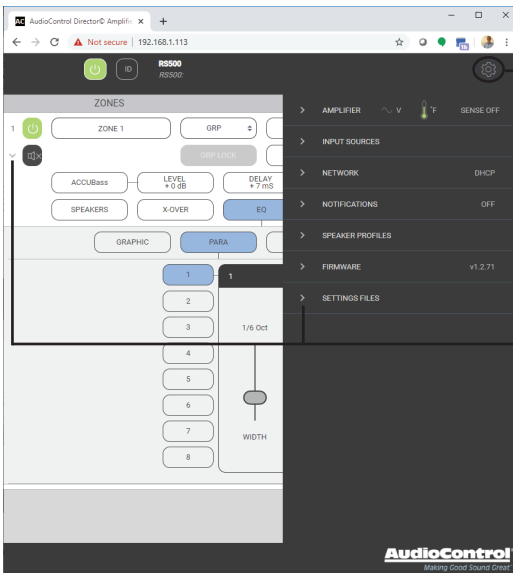
<http://www.audiocontrol.com>

(As things in the fast-paced world of technical documentation are constantly changing, visiting our website is one way to make sure you have the latest information.)

Set up via the Web Page

Using a browser, type in the IP address of the unit to navigate to the web page on any device. The web page is responsive - meaning it will auto size to your screen. If you have a small phone, the layout adjusts to that size and is touch sensitive. If on a computer, the web page is sized according to your browser size. And through this interface, you will configure all the parameters of your new spectacular RS 500 amp.

The initial view of the web page shown below illustrates the current state of the amplifier. To change your settings - DSP, renaming, IP address, phase, delay etc.. click on the caret (the ">" icon) to expand the selections.



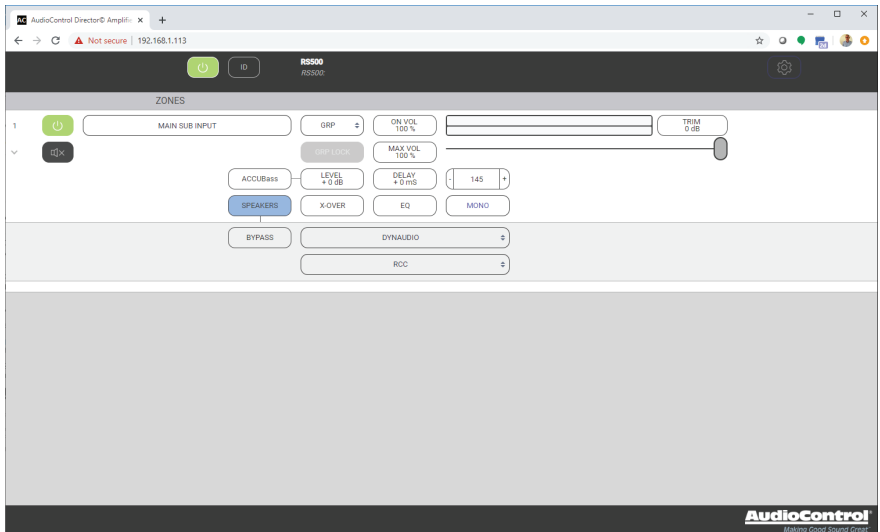
This gear icon opens and closes the global settings menu.

Clicking the caret expands the menu options

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Simply clicking on an option will expand the adjustable parameters. These configuration options allow you to customize the amplifier's performance to match your system design.

Global Standby: This basically is a main power off where the amp, power supply and DSP are shut down. Power up from this state is about 10 seconds.

ID: Pressing this button will cause the Ethernet lights to flash in tandem on the back on the unit

Temperature: Provides the status of the channel temperature.

Voltage: Shows the amplifier's voltage status

Trim: Trim the levels of the zone output. The range of adjustment is suitable for balancing SPL between multiple RS 500s or in combination with other amp and speaker configuration.

Zone Standby: This turns only the amp card on and off which allows for a quick time to power output - meaning

set this to on and in less than 500ms or so, you'll have bass. No boot-up time to worry about. It's important to note that if you are relying on signal sense, you should have both global on and zone channel on to respond to the signal input.

Zone Source: Renaming the input source can be done here.

On Volume: Sets the volume to a specific value at startup if the volume was at a higher level than what is defined here. If lower, then the lower value is used at startup.

Max Volume: Sets max volume of the amplifier.

ACCUBass: Sets the value of the ACCU-Bass compensation filter.

Delay: Sets the value of the delay - up to 200 ms in 5ms increments.

Phase: An all-pass filter is incorporated here to allow changes in the phase of the output signal. Use this to control nulls and other room issues. Changes phase in 5 degree increments from 0 to 180 degrees.

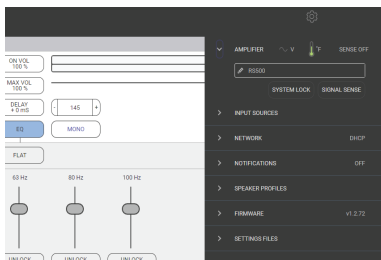
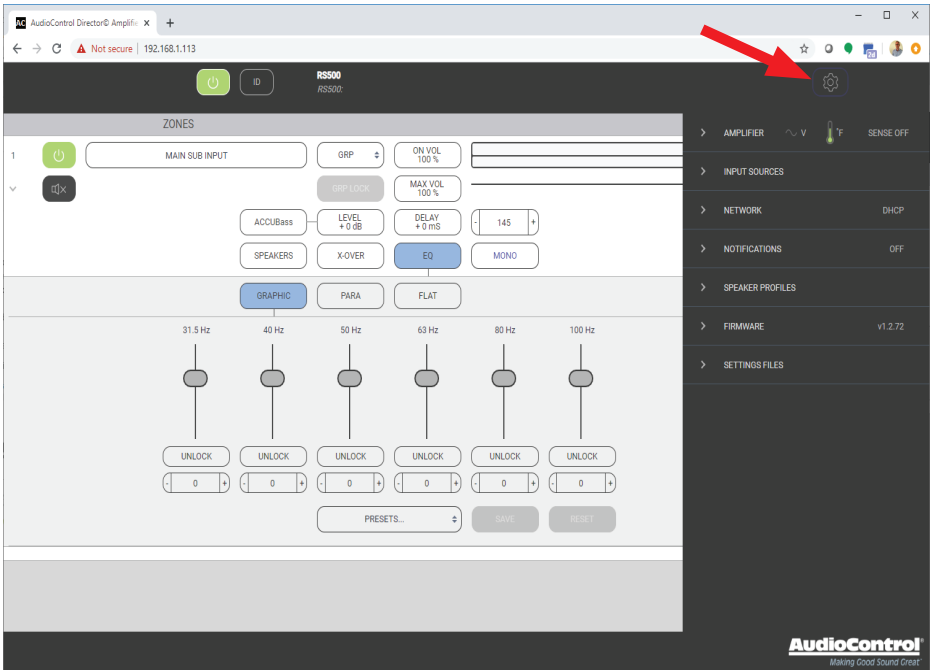
Speakers: Here you can set your speaker profile. The speaker profile is an optimized settings file that the speaker manufacturer has designed to maximize the speakers performance with the RS 500.

X-Over: Here you can set the Low Pass and High Pass crossover filters to control the frequencies being sent to your subwoofer.

EQ: In this section, you control both the graphic and parametric EQ filters to dial in your subwoofer's performance.

Global Configuration

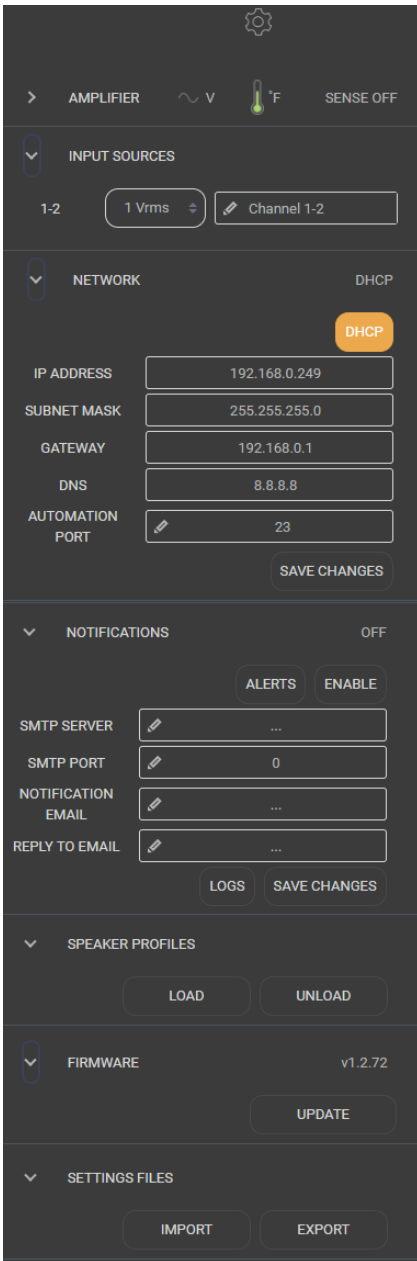
By clicking on the Gear icon, you access your global configuration options.



Amplifier: Here you can rename the RS 500, set Signal Sense to on or off and lock the system. Setting signal sense is done by simply toggling the button. System Locking is also a toggle but requires you to enter in a system password. Once system is locked, control over parameters can only be done with the password you entered here so make sure to write it down!

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Input Source: This option allows you to name the input source for your RS 500 - like Rear Sub or Main Sub Out. You have the option to change the input voltage sensitivity here as well. Common AVR outputs are in the 1V to 2V range - best bet is to simply use 1.5Vrms.

Network: This is where you enter in all your network configuration settings if you are setting up manually. If automatic, there's not much to do here other than ensure the DHCP button is selected. If you are having trouble connecting, the default IP address of the unit 192.168.0.249. You can connect manually peer to peer to troubleshoot.

Notifications: Set up this amplifier to alert you to any parameter you want to flag. Entering in the SMTP info here will allow the amp to send you updates about it's health.

***extra space here to remind you to wash your hands and use your mask*

Speaker Profiles: We often add new models to the Speaker Partners Program database. These can be downloaded from audiocontrol.com and uploaded to the amp here.

Firmware: Update your firmware here. But make sure you make a back up of your settings below just in case.

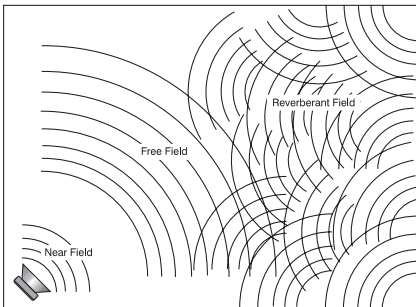
Settings: Here you can back up the setting of your RS 500, all parameters are stored to an external file.

Acoustics

Magazine reviewers and audio system owners spend much time critically appraising speakers and other audio components. Unfortunately, a phenomenon that has a very large effect upon sound is not easily judged or changed. That effect is the ACOUSTICS of the environment in which you are listening.

Room acoustics is a complicated subject about which hefty textbooks have been written, and entire galaxies have gone to war over. We simply want you to be aware of a few basics that have a direct effect on real time audio analysis.

As you probably learned in high school, sound travels in waves. In an audio system, these waves are created by the speakers. Like waves in a pond created by a splash, sound waves emanate from the transducers (speakers) and spread out into the room. If your room were infinitely big, that's all there would be to it. But just as waves in a pond reach the bank and reflect back, sound waves bounce off walls, ceilings, and floors, reflecting, reinforcing and canceling each other as shown here:



Since sound is energy, the way it reflects depends upon the angle of the surface, the type of material and the frequency of the sound wave. Because your listening position is likely to be towards the back

of the Free Field (waves shown in the diagram), you also get part of the reflected Reverberant Field as well.

Now we add the next set of complications: Different frequencies of sound have different wave lengths (a function of frequency and the speed of sound). Each frequency's wavelength contributes differently to the Free and Reverberant Fields because they are different sizes. For example, a 32 Hz bass note has a wavelength of 35 feet, while a 16,000 Hz note has a wavelength just under a tenth of an inch. Tiny treble waves can be caught and neutralized by draperies, carpeting, upholstered furniture and gangs of indolent Persian cats...while gigantic bass waves simply slosh back and forth in the room.

Another set of variables is the shape and volume of your listening room. Large rooms require more bass energy to excite waves within them. Small rooms need less energy, but reflect it differently. And then there's the fact that most rooms don't have four walls anymore, but open into dining rooms, lofts, cathedral ceilings, etc. All of this means that predicting sound interaction patterns is very difficult due to the irregularities of the room shape.

As you can see, room acoustics is an important but complicated subject. To learn more about room acoustics, get a copy of AudioControl's Technical Paper 107, "Small Room Acoustics De-Mythologized". You can download this paper from www.audiocontrol.com (search "De-mythologized") or if you're still into the printed page, call us and we'll mail you a copy. The overall point that we're trying to make is that the various rooms in a home function as gigantic mechanical equalizers, boosting or cutting certain frequencies depending on size, shape, volume, acoustic treatment and the position of the speakers.

Benefits of Equalization

Rarely is the room and room decor designed to get the most out of the audio system. In fact, almost always the opposite is the case where the speaker positions and sizes are dictated by some factors which are actually contrary to good sound. This real world situation is where equalization can provide great benefits.

Speaker positions, furniture, and general room layouts may cause peaks in the frequency response. Fortunately these peaks can be tamed by judicious equalization. Also, it may be that the client has specific tastes, such as being the most interested in hearing voices such as cricket broadcasts, and you can tailor the sound to these tastes. Remember there are memories in The RS 500, and you could use different settings via the memories for different sources.

At all times, though, the laws of physics are hard to violate, although we do try our best. Equalization cannot make terrible acoustics sound terrific, only better. If the room has a tile floor and glass walls for example, the best case results will still be pretty bad by most measures. Further, while equalization can do wonders to help a less than perfect speaker, nothing will make a mediocre speaker sound fabulous. In other words, for best results, start with good speakers and reasonable room acoustics, if possible.

Note: *For the absolutely best results, the equalizer controls on the RS 500 should be adjusted with a real time analyzer such as the AudioControl Industrial SA-4200i. Visit www.audiocontrolindustrial.com for more analysis products.*

Equalizing the System

Before proceeding with equalizing the system, it is a good idea to make sure everything is connected and working properly. You know how to check connections, and here are some reminders specific to The RS 500, as well as the steps to equalize.

1. Turn on the system. The Power light on the left front panel should be blue .
2. Connect to this specific unit over the network by entering its unique IP address into a browser (Firefox, Safari, Chrome are preferred).
3. Make sure the unit is turned on and turn off signal sense in the Operation page on the browser. On the front panel all zone status lights should start red and then turn to blue.
4. If any are not blue, check the Operation page to see if you need to unmute all zones.
5. Play pink noise through the system into the zones you are going to adjust. If needed, there is a pink noise audio file at www.audiocontrol.com. Search for "pink noise". The signal is playing through The unit when the LED's level meter on front panel responds to the volume.
6. Assuming you have wireless network access, now grab your trusty real time analyzer (RTA) and go into the zone you wish to adjust.
7. Place the microphone in the middle of the area of listening at the height of the typical listeners head.
8. In general, use the equalizer controls to lower peaks in the frequency response first. Peaks obscure the surrounding sounds and lowering the peaks will unleash overshadowed sounds.

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Parametric and Graphic Equalization

The graphic equalization controls in The RS 500 are selected to correspond with the characteristics of wall and ceiling speakers, and as such are very effective. Graphic controls are the easiest to tune and provide a “graphic” representation of what the adjustments are. Parametric equalization requires selecting the frequency, the bandwidth of the control, as well as the level of adjustment, not an easy task to get correct. In general, parametric equalization is valuable for very large areas of change or very narrow areas.

Parametric equalization in The RS 500 is most likely best used for taming very narrow peaks. Do not use for very narrow dips as these dips are likely caused by cancellations and will not respond to equalization boost.

Advanced Discussions

In Wall Volume Controls

What happens to the in-wall volume control if the amplifier power is greater than it can handle?

It will not be pretty but then again no one will die. Typically, the magnetics of the volume control will be over taxed, saturate and thereby become a lower impedance than rated. This will encourage the amplifier to put out even more power possibly putting the amp into protection. If not this extreme, there is an excellent chance the volume control saturation will damage the sound quality. The upshot is use a volume control with a margin of safety.

Installation of multiple units

Can you stack units of the RS 500 on top of each other without an air space in between?

You can stack a maximum of 4 units on top of one another, and allow a free rack space above and below.

Ideally, 2 units can be stacked with a free space above and below, as this will improve the ventilation to the units.

May you daisy chain or y-cord audio and power trigger connections?

Daisy chaining audio is easy as there are Loop output jacks, which can be used to drive the next amplifier.

For power control, it is easiest to have an Ethernet connection to each unit. The 12 volt mini jacks are powered to turn on another unit when the main unit is on (not standby). If you need more than 15 milliamps current on the 12 volt output, use a relay to prevent over loading The . (The itself only takes 1 milliamp to turn on.)

What are the power requirements and BTU outputs of The ?

More detailed information is shown in the specifications section. In general, we feel a conservative, real life design criteria is 1/8th power. This will be a quite loud listening level for most rooms and assumes all zones driven at the same time. You will be amazed at how cool The is at this level. One rule does not fit all situations, so apply your knowledge of the particular circumstances involved. Also, see the section below on unique rooms and SPL.

How many units may I put on one 15 amp breaker?

It depends. Since you are limited to 1500 watts per device by most codes, there should be a separate 15 amp circuit for each unit.

The circumstances where the RS 500 draws maximum power are very rare outside of an engineering lab. Maximum power is using a sine wave input which has at least a third higher energy density than music. This would mean that all channels are operating at maximum, an unlikely situation even during a really fun party. Even more unlikely is all channels on multiple units operating at full output.

You know the system better than we do, so it is your decision. If the only use is background music, then the one-eighth power in the specifications is a reasonable (actually conservative) power draw. Of course, you will want to include a margin of safety for unusual circumstances. And in the final analysis, you have to do what the electrical inspector tells you to do.

What should I use the "Trim" controls in the browser for?

The Trim controls are an easy-to-access level setting control which you can use while in the zone. The Trim controls allow minor not major adjustments.

Troubleshooting

Many problems can be eliminated by re-checking the wiring and settings of the unit. If a problem cannot be solved using the guide below, please call the AudioControl team for further assistance, or e-mail us at sound.great@audiocontrol.com

1. **No Sound**
 - a. Verify the Power LED is Blue.
 - b. Verify Protection LED is Off.
 - c. Verify Zone Status LED is Blue.
 - d. Verify that the correct input has been selected in the web server menus
 - e. Verify the source unit is operating.
 - f. Check the speaker connector plugs on the rear panel are secure.
 - g. Unplug the power cord and check the AC Power Fuse on the rear panel.
2. **Protection LED is off, but none of the Zone Status LEDs are on:**
 - a. Defeat the signal-sense circuits using the signal sense switch on the web server Operation tab. All of the zone status LEDs should turn on. If they do not, call AudioControl's customer service.
 - b. Verify the source unit is operating.
 - c. Increase the preamp volume if signal sense is engaged, or just going steady.
3. **Channel Status LED is Red:**
 - a. Check speaker leads for a short. Swap speaker connectors on rear to see if the problem moves with the wires.
 - b. If the unit is excessively hot, turn down the volume and allow it to cool off. The protection LED should turn off after a short while. Verify that any ventilation holes have not become blocked.
 - c. The speaker impedance may be too low. Use an ohmmeter to measure the impedance on the speaker wires.
4. **Speaker channels are cutting in and out:**
 - a. If using external volume controls, check that they can handle the power output.
 - b. Make sure the speaker impedance is not less than 2 Ohms.
 - c. There may be a short in the wires. Suspect a short if the problem happens only at the highest volumes.
5. **Protection LED is Red:**
 - a. Disconnect power from the unit for 3 to 4 minutes and reconnect to power.
 - b. Disconnect all speaker wires. If it still turns red, and the unit has cooled, something rather serious has happened inside the unit. Call AudioControl's lonely folks in customer service.

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6. Speaker Buzzing or Crackling at high volume:

- a. Reduce any preamplifier/equalizer low-frequency boost.
- b. Turn off your “Sounds of the Pacific Northwest” chainsaw and bacon-frying CD.

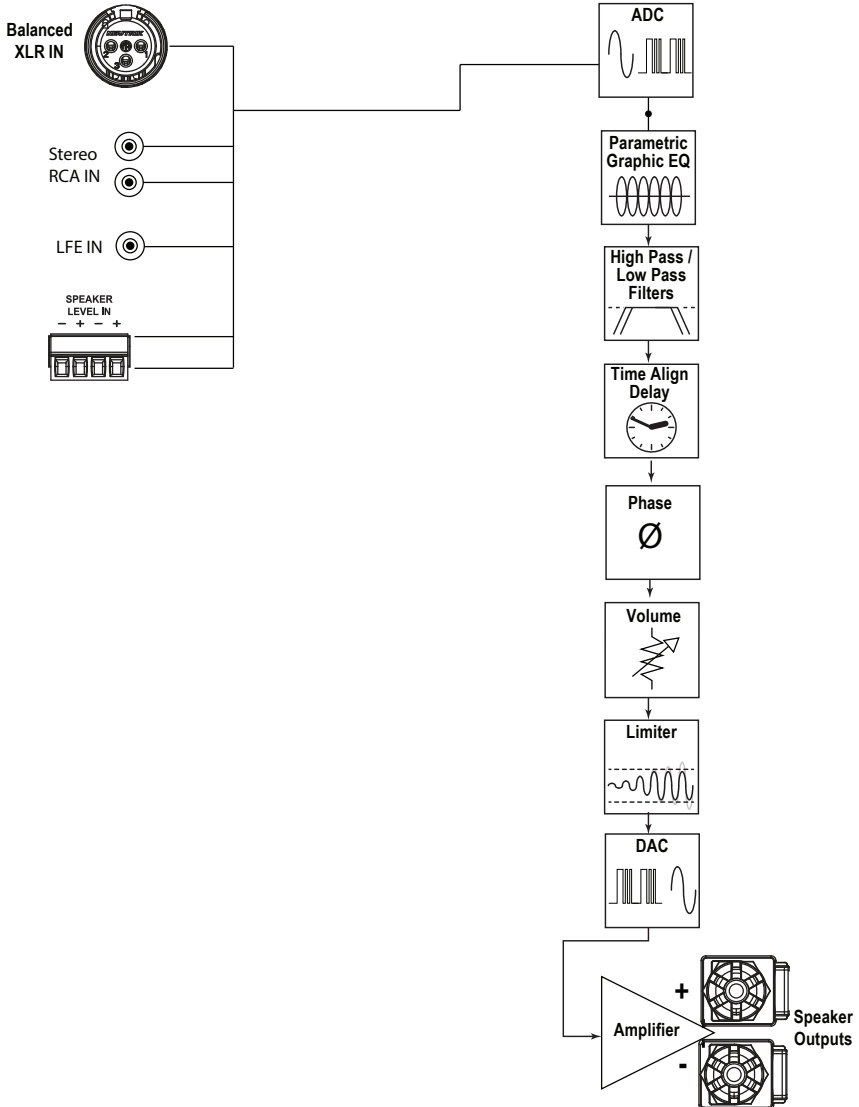
7. There is no audio input signal, but the Zone Status LEDs are still blue:

- a. Check the signal-sense switches in the unit’s web server tabs. If they are not engaged, the zone status LEDs will stay on as long as the master trigger is enabled.
- b. The zone status LEDs stays on for 2 minutes (depending on music volume) after the audio signal has stopped. This delay helps prevent prematurely muting during quiet passages or song changes.

8. The unit is on but you cannot trigger it off

The unit will stay on if either the 12v master trigger is on, or jumpered on.

Block Diagram



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RS 500 Specifications

Output Power	500 watts @ 8, 4 and 2 ohms
Frequency Response (20 Hz to 350 Hz).....	±1 dB
Total Harmonic Distortion/Ch.....	0.1% (500 watts @ 8 ohms 20 Hz -350 Hz)
Maximum Input Voltage	4 Vrms (Balanced/Unbalanced) 30 Vrms (Speaker Level)
Input Impedance.....	15 kohms
Signal to Noise Ratio.....	> 95 (A wtd, ref full output)
16.5" Damping Factor.....	> 350
Gain	36 dB
Analog Input Sensitivity.....	1Vrms for full output
Minimum Speaker Load.....	2 ohms
Protection.....	Clipping, Thermal, Short Circuit, DC offset

AC Power Requirements

Standby.....	<2 watts
Idle.....	38 watts
1/8th power (loud listening level).....	62.5 watts
Full Power.....	500 watts

BTU/hr Output

Standby.....	5.6 BTU/hr
Idle.....	129 BTU/hr
1/8 power (loud listening level)	153 BTU/hr
Full Power.....	255 BTU/hr

Dimensions

Height.....	1.75" (1U)
Width (ears on).....	19.0"
Width (ears off).....	17.0"
Depth.....	16.5"
Weight	14.9 lbs.

What to do if you need service

First, if you need service, it is probably best to go and see a trained health care professional.

If the RS 500 needs service, then please contact AudioControl, either by e-mail or phone. We will verify if there is anything wrong in the system that you can correct yourself, or if it needs to be sent back to our factory for repair.

Please include the following items when returning the unit:

1. A copy of your proof of purchase. No originals please. We cannot guarantee returning them to you.
2. A brief explanation of the trouble you are having with the unit. (You'd be surprised how many people forget this.) If you can supply a really detailed description of the problem, this would be so much better, and our service technicians may add you to their Christmas Card list. Please include any notes about the system and other components you are using. Is it an intermittent problem that only occurs on the first full moon of Spring?
3. A return street address. (No PO Boxes, please).
4. A daytime phone number in case our technicians have a question about the problem you are having, or if they are just feeling lonely.

5. Package the unit in the original packaging if you still have it, and if the cat hasn't had three litters of kittens in the box. Use great care and plenty of good packing materials to protect the unit and prevent it from moving about inside the box. Do not use loose materials like packing peanuts or real peanuts.

You are responsible for the freight charges to us, but we'll pay the return freight back as long as the unit is under warranty. We match whatever shipping method you use to send it to us, so if you return the unit overnight freight, we send it back overnight. We recommend United Parcel Service (UPS) for most shipments.

Repair service is available at:

Attention: Service Department

22410 70th Avenue West,

Mountlake Terrace,

WA 98043 USA

Phone 425-775-8461

FAX 425-778-3166

e-mail:

sound.great@audiocontrol.com

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The Warranty

In just the same way as being covered in honey and thrown into a dark pit full of hungry woodchucks, people are scared of warranties. Lots of fine print. Months of waiting around. Well, fear no more. This warranty is designed to make you rave about AudioControl. It's a warranty that looks out for you and your client, plus helps you resist the temptation to have your friend Sparky, who's "good with electronics," try to repair your AudioControl product. So go ahead, read this warranty, then register the information at www.audiocontrol.com/product-registration and include your comments.

Our warranty has conditional conditions! "Conditional" doesn't mean anything ominous. The Federal Trade Commission tells all manufacturers to use the term to indicate that certain conditions have to be met before they'll honor the warranty. If you meet all of these conditions, AudioControl will, at its discretion, repair or replace any AudioControl products that exhibit defects in materials and/or workmanship during the warranty on your product for five (5) years from the date you bought it, and we will fix or replace it, at our option, during that time.

Here are the conditional conditions:

1. You must fully register your purchase within 15 days of the purchase date by going to the AudioControl product registration page at www.audiocontrol.com/product-registration. Failure to register your product will negate the warranty.
2. You need to hold on to your sales receipt! All warranty service requires original sales receipt documentation. The warranty only applies to the original purchaser from an authorized AudioControl dealer. Note: Products purchased from unauthorized dealers are not covered under warranty.
3. If an authorized AudioControl dealer installs your AudioControl product, the warranty is five years, otherwise the warranty is limited to one year.
4. Our warranty covers AudioControl products that have been installed according to the instructions in the installation manual.
5. You cannot let anybody who isn't: (A) the AudioControl factory; or (B) somebody authorized in writing by AudioControl service your AudioControl product. If anyone other than (A), or (B) messes with your AudioControl product, the warranty is void.
6. The warranty is void if the serial number is altered, defaced or removed, or if your product has been used improperly. Now that may sound like a big loophole, but here is what we mean by this: Unwarranted abuse is: (A) physical damage (don't use your product to level your dining room table); (B) improper connections (120 volts into the RCA jacks can fry the poor thing); (C) sadistic things! This is the best product we know how to build, but for example if you mount it to the front bumper of your car, drop it over the Niagara Falls or use it for Clay Pigeon shooting practice, something will go wrong.

Assuming you conform to 1 through 6, and it really isn't all that hard to do, we get the option of fixing your product or replacing it with a new one at our discretion.

In the event that your product is out of warranty or not covered under our warranty you may request to have any damage repaired at our normal "Out of Warranty" repair cost.

Legalese Section

This is the only warranty issued by AudioControl. This warranty gives you specific legal rights, and you may also have rights that vary from state to state. Promises of how well your AudioControl product will work are not implied by this warranty. Other than what we've said we'll do in this warranty, we have no obligation, express or implied. We make no warranty of merchantability or fitness for any particular purpose. Also neither we nor anyone else who has been involved in the development or manufacture of the unit will have any liability of any incidental, consequential, special or punitive damages, including but not limited to any lost profits or damage to other parts of your system by hooking up to the unit (whether the claim is one for breach of warranty, negligence of other tort, or any other kind of claim). Some states do not allow limitations of consequential damages.

Dance like nobody is watching

