

SAPPHIRE

ELECTRONICS

Sapphire

DRIVE SERIES

By Phoenix Gold

OWNER'S MANUAL

PHOENIX GOLD "SAPPHIRE" ELECTRONICS LIMITED

Phoenix Gold warrants to the first consumer/purchaser of a new Phoenix Gold Sapphire electronic product that it be free from defects in material and workmanship. The sole obligation of Phoenix Gold under this limited warranty shall be to provide, without charge, parts and labor necessary to remedy defects, if any, which appear within 30 days, if installed by a consumer or 18 months if installed by an authorized "Sapphire" retailer/installer from the date of purchase.

This warranty is the sole and exclusive express warranty given with respect to the Phoenix Gold electronic product and all other express warranties are hereby excluded. Neither Phoenix Gold nor the authorized Phoenix Gold Retailer/Installer is responsible for indirect, incidental or consequential damages, so the above limitation may not apply to you.

The Phoenix Gold warranty does not extend to any defect, malfunction or failure caused by misuse, abuse, accident, faulty hookup, defective associated equipment or the use of the product with equipment for which it was not intended. Please read your owners manual carefully.

There are two ways that you may utilize the warranty on a Sapphire electronic product purchased in the USA.

- 1) You may return the product to the authorized Phoenix Gold Retailer/Installer from whom it was originally purchased along with proof of purchase. Without proof of purchase warranty repair may not be covered!*
- 2) Or contact Phoenix Gold and acquire an RA# for the product and ship it with proof of purchase prepaid (and insured) via UPS to the address below. Without proof of purchase warranty repair may not be covered!*

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Outside of the USA, please contact your Phoenix Gold distributor. If you have any questions, call or fax us as noted.

Phoenix Gold • One Phoenix Gold Way • 9300 North Decatur
Portland, OR 97203 • Tel: (503) 288-2008 • Fax: (503) 978-3380



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BEFORE YOU BEGIN YOUR INSTALLATION

Congratulations on your new purchase! Your Sapphire amplifier is Made With Pride In The U.S.A. and manufactured at Phoenix Gold with meticulous quality control and exacting standards.

Sapphire Series amplifiers take advantage of the best electronic components in the industry and utilize construction techniques typically found only in exotic car audio products. Your amp can drive a tough 2 ohm stereo load and offers thermal protection and tri-mode output to name only a few features. Sapphire Amplifiers offer true power and performance • That's 100% Phoenix Gold!

Properly installed, your Sapphire amplifier will provide years of listening enjoyment. Before installing your Sapphire amplifier, please take a moment to carefully read the entire manual. It is required reading for the protection of your vehicle and for the maximum performance of your car audio system.

Thanks for buying Phoenix Gold!



TEAM PHOENIX GOLD

SUPPORT FROM PHOENIX GOLD

Team Phoenix Gold is a factory program designed to support consumers and dealers competing in IASCA, USAC & WAC associations using a combination of Phoenix Gold products. This team is for people who share a common goal • Winning!

We promote winning team cars and knowledgeable team members. Team Phoenix Gold members share ideas about many “not so obvious” aspects of system installation and competition. We publish teammate suggestions and technical support to put together a winning system. The Bottom Line, Team Phoenix Gold gives it's members the resources and attitude they need to Finish In The Winners Circle.

Team Phoenix Gold is also about having fun. Ask any of the team members and they'll tell you the same. When you join Team Phoenix Gold you're part of a team of elite car audio enthusiasts. A team that strives for perfection! If you'd like more information or a team application, call Team

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Phoenix Gold at (503) 288-2008.

FEATURES

COMMON TO ALL MODELS

- Tri-Linear output capability, simultaneous stereo & bridged mono set up is possible
- MOS-FET switching power supply
- Variable input sensitivity
- Thermal overload protection
- Output overload protection
- Optically isolated power supply
- Extensive burn-in and QC testing for the ultimate in reliability
- Stable into 2 ohm stereo loads
- 2 layer Gold plated 2 ounce copper G10 glass epoxy printed circuit board
- Muting circuitry assures no turn on/off noise
- 12dB per octave electronic crossover (x models)
- MADE IN THE GOOD OL' USA

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SPECIFICATIONS

COMMON TO ALL MODELS

- THD at rated power 4 ohms.....0.02%
- Frequency response 20-20kHz +/- 1dB
- Signal to noise ratio.....>100dB
- Input sensitivity 200mV to 2V
- Idle current.....1A
- Dampening factor @ 1kHz.....250
- Min to Max voltage requirements.....10.5-15V
- Dimensions: SA1.0 & 1.0x: 8.00 x 8.25 x 2.00
SA3.0x: 8.00 x 9.50 x 2.00
SA1.4x: 8.00 x 13.10 x 2.00
SA1.5x: 8.00 x 15.50 x 2.00

OUTPUT POWER - MODELS AVAILABLE IN SELECTED REGIONS

1.0x - 2 Channel Amplifier

Into 4 ohms @ 12/13.8vDC30/40 WRMS
Into 2 ohms @ 12/13.8vDC45/60 WRMS
Bridged into 4 ohms @ 12vDC 90/120 WRMS
Total Dynamic Power 240 Watts

SA3.0x - 2 Channel Amplifier

Into 4 ohms @ 12/13.8vDC75/100 WRMS
Into 2 ohms @ 12/13.8vDC 110/150 WRMS
Bridged into 4 ohms @ 12vDC 220/300 WRMS
Total Dynamic Power480 Watts

RATED OUTPUT POWER

CONTINUOUS OUTPUT POWER PER CHANNEL

SA1.0 - 2 Channel Amplifier

Into 4 ohms @ 12/13.8V DC30/40 WRMS
Into 2 ohms @ 12/13.8V DC45/60 WRMS
Bridged into 4 ohms @ 12/13.8V DC90/120 WRMS
Total Dynamic Power240 Watts

SA1.4x - 4 Channel Amplifier

Into 4 ohms @ 12/13.8V DC30/40 WRMS
Into 2 ohms @ 12/13.8V DC45/60 WRMS
Bridged into 4 ohms @ 12/13.8V DC90/120 WRMS
Total Dynamic Power480 Watts

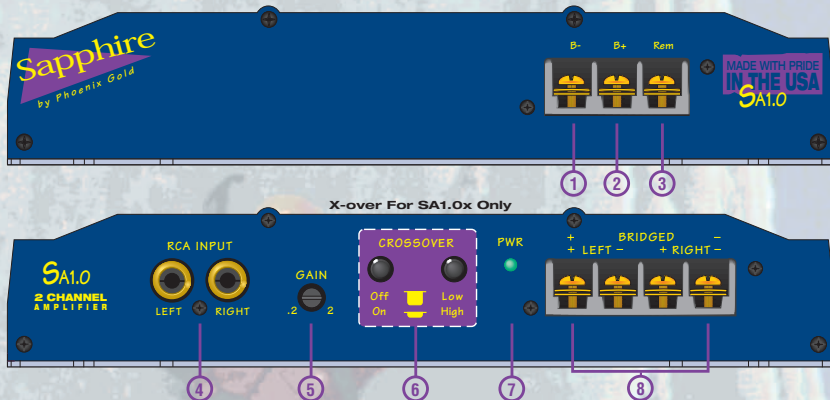
SA1.5x - 5 Channel Amplifier

Into 4 ohms @ 12/13.8 V DC30/40 WRMS
Into 2 ohms @ 12/13.8 V DC45/60 WRMS
Bridged into 4 ohms @ 12V DC.....90/120 WRMS
Subwoofer Out into 4 ohms @ 12V DC 90/120 WRMS
Subwoofer Out into 2 ohms @ 12V DC.110/140 WRMS
Total Dynamic Power600 Watts

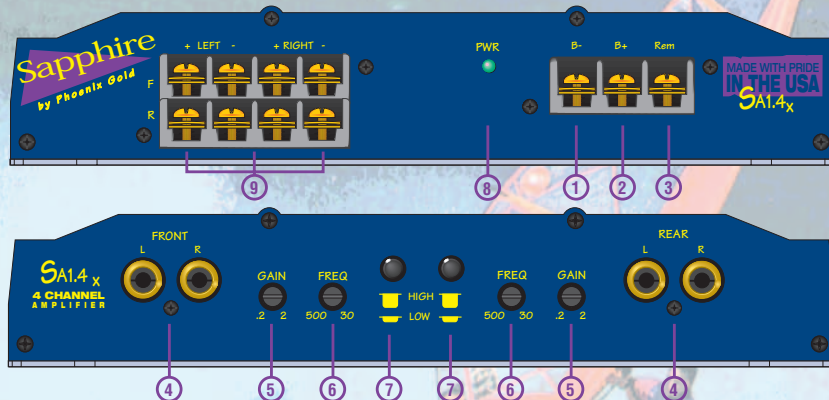
A WORD ABOUT OUTPUT POWER

At Phoenix Gold, we rate power output of an amplifier at two different voltages. Without your engine running, the amplifier is operating at 12 volts I.E. (worst) case. At 13.8 volts (engine running) the amplifier will produce more power!



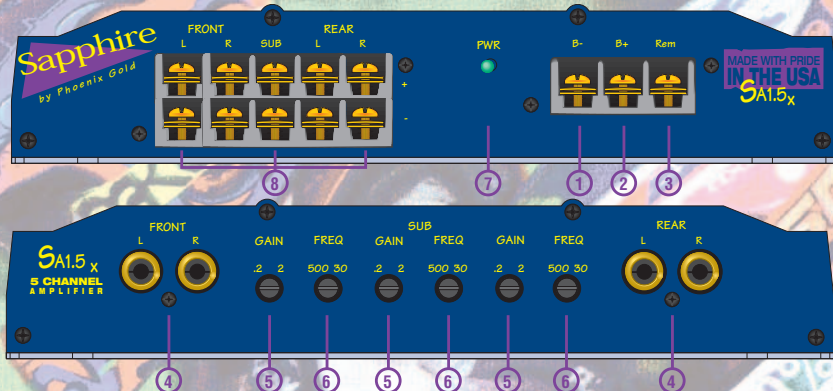


- 1. Power Ground (B- Chassis Ground):** We recommend using Phoenix Gold PRO10B or PS9R ground cable for a clean connection.
- 2. Power Input (B+ Positive 12 Volts DC):** This 24kt Gold (3) position barrier type connector is designed to accommodate up to 7 gauge power cable with our PRO81/82's. We recommend our PRO10/7R or PS9/7R power cable and always use the same gauge ground cable.
- 3. Remote Turn-On:** Connect the automatic antenna lead or "remote" 12V DC lead from source unit to this terminal. This connection allows the amplifier to be turned ON and OFF at the source unit.
- 4. RCA Inputs:** This two channel amplifier has left and right pre amp inputs. Typically all CD players and AM/FM cassette decks with RCA connections are compatible.
- 5. Gain Adjustment:** Allows amplifier to produce full power output when input voltage is between 0.2 - 2.0 volts.
- 6. High / Low Pass Switch (SA1.0x only):** Selects either High Pass (125Hz) or Low Pass mode (90Hz). Feature only available in selected markets.
- 7. Power On LED:** Indicates the amplifier is receiving 12V DC at the B+ and Remote input terminals. The amplifier is "On".
- 8. Speaker Outputs:** This specially designed (4) position 24kt Gold barrier connector, accepts up to 10 gauge speaker wire. We suggest termination with a Phoenix Gold PR0404 spade terminal.

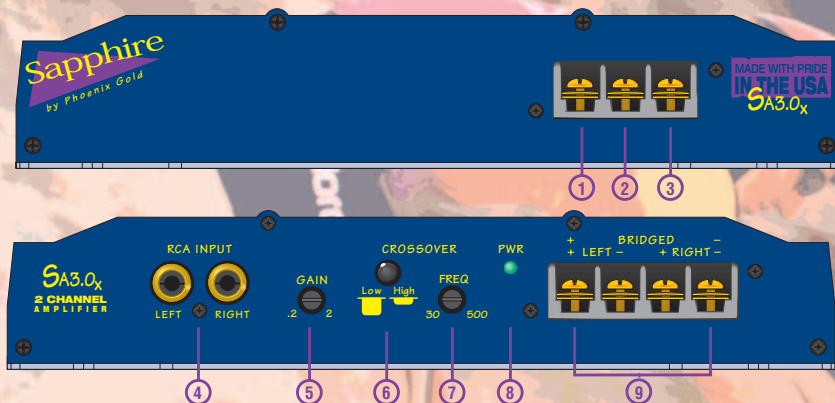


- 1. Power Ground (B- Chassis Ground):** We recommend using Phoenix Gold PRO10B or PS9R ground cable for a clean connection.
- 2. Power Input (B+ Positive 12 Volts DC):** This 24kt Gold (3) position barrier type connector is designed to accommodate up to 7 gauge power cable with our PRO81/82's. We recommend our PRO10/7R or PS9/7R power cable and always use the same gauge ground cable.
- 3. Remote Turn-On:** Connect the automatic antenna lead or "remote" 12V DC lead from source unit to this terminal. This connection allows the amplifier to be turned ON and OFF by the source unit.
- 4. RCA Inputs:** This four channel amplifier has front & rear pre-amp inputs. Typically all CD players and AM/FM cassette decks with RCA connections are compatible.
- 5. Gain Adjustment:** Allows amplifier to produce full power output when input voltage is between 0.2 - 2.0 volts.
- 6. Crossover Adjustment:** This amplifier has front & rear adjustable crossovers ranging from 30Hz to 500Hz.
- 7. High / Low Pass Switches:** These switches select either High Pass or Low Pass for the front and rear channels.
- 8. Power On LED:** Indicates the amplifier is receiving 12V DC at the B+ and Remote input terminals. The amplifier is "On".
- 9. Speaker Outputs:** This specially designed (8) position 24kt Gold barrier connector, accepts up to 10 gauge speaker wire. We suggest termination with a Phoenix Gold PRO404 spade terminal.





- 1. Power Ground (B- Chassis Ground):** We recommend using Phoenix Gold PRO10B or PS9R ground cable for a clean connection.
- 2. Power Input (B+ Positive 12 Volts DC):** This 24kt Gold (3) position barrier type connector is designed to accommodate up to 7 gauge power cable with our PRO81/82's. We recommend our PRO10/7R or PS9/7R power cable and always use the same gauge ground cable.
- 3. Remote Turn-On:** Connect the automatic antenna lead or "remote" 12V DC lead from source unit to this terminal. This connection allows the amplifier to be turned ON and OFF at the source unit.
- 4. RCA Inputs:** This (5) channel amplifier has front and rear pre-amp inputs. When all (4) inputs are used, front and rear channels fade and subwoofer is not affected by the preamp fader. All channels may also be driven by using front inputs only.
- 5. Gain Adjustment:** Adjustment of the amplifier to produce full power between 0.2 - 2.0 Volts.
- 6. Crossover Adjustment:** This amplifier has front, rear & subwoofer crossovers ranging from 30Hz to 500Hz. Front and rear outputs are stereo high pass and the Subwoofer output is a summed mono low pass.
- 7. Power On LED:** Indicates the amplifier is receiving 12V DC at the B+ and Remote input terminals. The amplifier is "On".
- 8. Speaker Outputs:** This specially designed (10) position 24kt Gold barrier connector, accepts up to 10 gauge speaker wire. We suggest termination with a Phoenix Gold PR0404 spade terminal.



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- 2. Power Input (B+ Positive 12 Volts DC):** This 24kt Gold (3) position barrier type connector is designed to accommodate up to 7 gauge power cable with our PRO81/82's. We recommend our PRO10/7R or PS9/7R power cable and always use the same gauge ground cable.
- 3. Remote Turn-On:** Connect the automatic antenna lead or "remote" 12V DC lead from source unit to this terminal. This connection allows the amplifier to be turned ON and OFF at the source unit.
- 4. RCA Inputs:** This two channel amplifier has left and right pre-amp inputs. Typically all CD players and AM/FM cassette decks with RCA connections are compatible.
- 5. Gain Adjustment:** Adjustment of the amplifier to produce full power between 0.2 - 2.0 Volts.
- 6. High / Low Pass Switch:** Selects either High Pass or Low Pass.
- 7. Crossover Adjustment:** This amplifier has adjustable crossover ranging from 30Hz to 500Hz.
- 8. Power On LED:** Indicates the amplifier is receiving 12V DC at the B+ and Remote input terminals. The amplifier is "On".
- 9. Speaker Outputs:** This specially designed (4) position 24kt Gold barrier connector, accepts up to 10 gauge speaker wire. We suggest termination with a Phoenix Gold PRO404 spade terminal for the best signal connections.



CHOOSING THE RIGHT LOCATION:

The Sapphire amplifiers have been designed to dissipate heat very efficiently. However, prolonged operation at high volumes or use in low impedance systems not utilizing a fan can cause the amplifier to overheat and shut down. Make sure that there is at least a 2 inch clearance above and around the amplifier.

The amplifier may be mounted upright (Figure 1), horizontal (Figure 2), vertical (Figure 3), but if possible NEVER upside down (Figure 4) a position which causes the heat to “feed-back” into the amplifier causing a premature system shut down.

The unit should be protected from exposure to moisture and it is best to mount the amplifier on:

1. The back wall or floor of the trunk.
2. Custom built amplifier rack.

Place the amplifier in the position that you wish to use and check for clearances around the unit!



FIGURE 1
Upright Mount

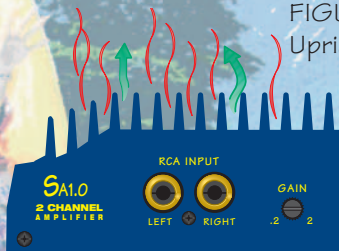
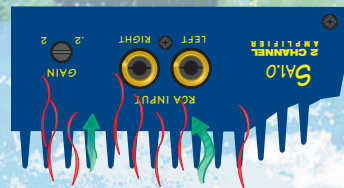


FIGURE 2
Horizontal Mount

FIGURE 3
Vertical Mount

FIGURE 4
Inverted Mount



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MOUNTING CONSIDERATIONS

Is there enough clearance for the RCA cables and connectors? Will the speaker cables be able to enter the terminal connectors correctly? Does your mounting position allow for easy access to the indicator LED's and amplifier controls?

1. Using the amplifier as a template. Mark the mounting surface with a felt pen or pencil. (Placing masking tape on the surface first will make these marks more visible).
2. Inspect location for fuel lines, wire harness and other important vehicle obstacles.
2. Drill 1/8 inch pilot holes.
3. Mount the amplifier with four (4) #10 by 3/4 inch panhead phillips screws.
4. Never Mount amplifier to metal surfaces.

Do not drill any holes while using the amplifier as a template. It is very easy to damage the amplifier's powder coated surface with a drill.

POWER/GROUND & SIGNAL CONNECTIONS

1. Use the largest gauge power and ground cable available. We recommend Phoenix Gold PRO7R/B or PS7R/B cable. The barrier strip power terminal can handle up to 7 gauge wire when utilizing PRO80 or PRO81 spade lug terminals.
2. Always place a fuse or circuit breaker no more than 12 inches from the battery. This protection is for the vehicle, not the stereo.
3. For audio connections, we recommend using high-quality audio interconnects like the Phoenix Gold TransBalanced or the Compact CSI cables. These cables are sonically superior and will unwanted "radiated noise" from your system. Always install the audio cables away from the power wires. Doing so will reduce noise caused by the power wires "radiating" noise into the audio cables. The use of superior audio cables make a big difference in the performance of your system.

GAIN ADJUSTMENT

Begin your adjustments at minimum sensitivity (Gain control at 2V). After selecting "dynamic" music, adjust the volume control on your source unit to approximately 3/4 max volume i.e. "maximum unclipped output." Next, slowly turn the "Gain" control on the amplifier clockwise until you hear the music starting to distort. High frequency clipping is the easiest to detect.

The SA1.4x has both front and rear gain controls, while the SA1.5x has front, rear and sub controls. You must adjust each gain control separately.

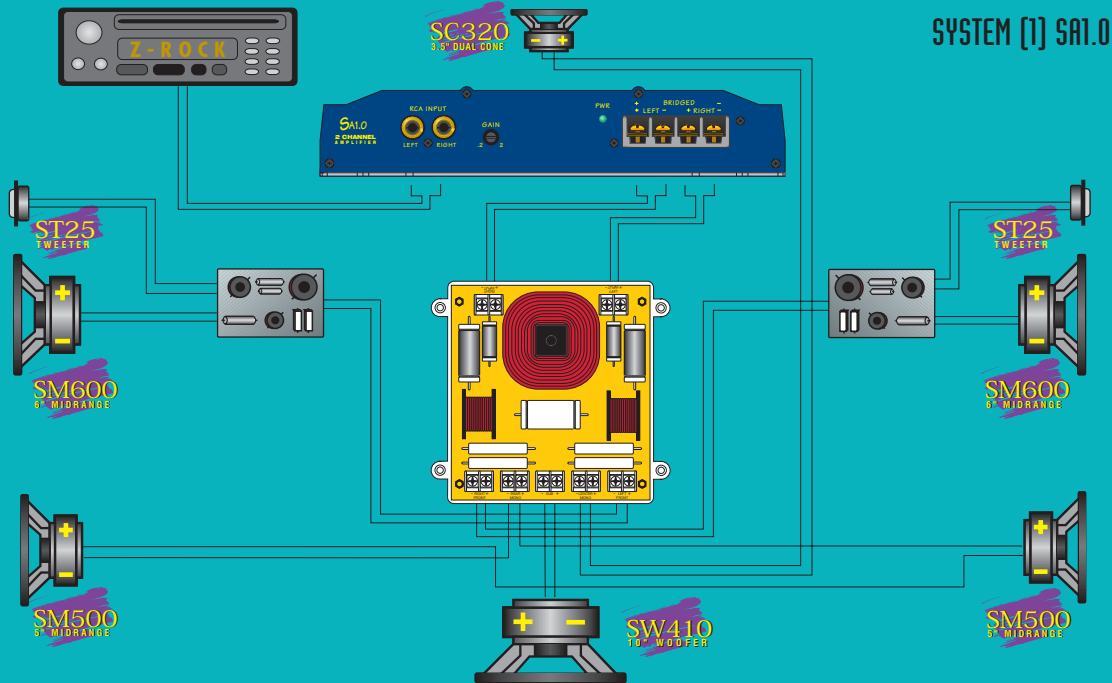
THE SA1.0x MODEL

This amplifier has a built-in 12dB/octave Hi Pass or Low Pass active crossover. The fixed crossover point for the Hi Pass is 125Hz and Low Pass is 90Hz. These points are not adjustable.

CROSSOVER ADJUSTMENT • SA1.3.0x , SA1.4x AND SA1.5x

Setting the crossover points in a car is dependent on the car's size and the woofers / mid bass drivers being used. If you are using a large enough mid bass driver (8" or 6") it is best to use a low crossover point (below 100Hz). This is true based on the fact that all cars have standing wave problems between 100 and 500Hz. The woofer, being a larger radiator than the mid bass driver, excites these standing waves with more energy. Using a large radiator in this frequency range causes the midbass to be muddy and colored. If you keep the woofer crossover out of this area, your integration between woofer and mid bass will be smoother and sonically better. If you are using a small mid bass driver (5.25" or 4"), you must use a higher crossover point as not to cause a large dip in the mid bass response. The fine tuning should be done with an RTA and your ears. This last procedure usually guarantees smooth sounding bass and mid bass in your car.

Note: If the crossover is set at lower frequency with the Low Pass switch engaged, you may not have any output!

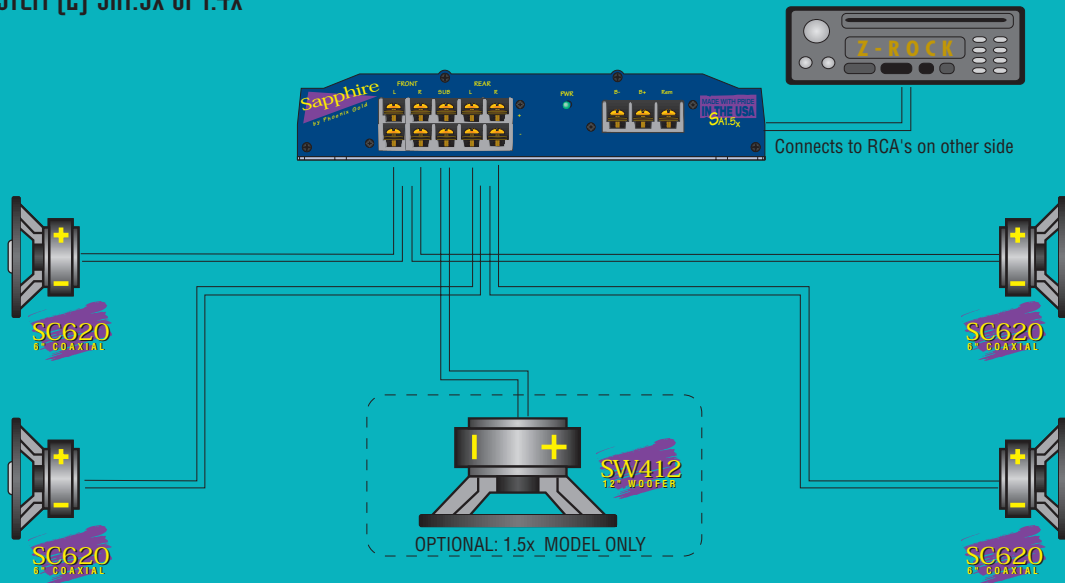


SYSTEM [1] SA1.0

SYSTEM DETAILS

This 4 ohm system utilizes one SA1.0 amplifier connected to an XVR14 passive crossover. Illustrated above, the XVR14 provides outputs for FRONT L/R, SUBWOOFER, REAR and CENTER mono.

SYSTEM [2] SA1.5x or 1.4x



S Y S T E M D E T A I L S

This system utilizes one SA1.5x or SA1.4x connected to four Sapphire speakers and utilizes the built-in adjustable 12dB per octave subwoofer crossover (SA1.5x only). This eliminates the need for an external crossover.

MAKE SURE YOUR SYSTEM'S

100%

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NO HYPE....JUST HILLER STUFF!



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