ST-B SERIES

Owner's Manual

Before operating the unit, please read this manual throughly and retain it for future reference.

MISSION STATEMENT

Committed to Excellence

ZAPCO is dedicated to the pursuit of audio fidelity. Our prime objectives are to design and manufacture audio products of unsurpassed quality, to provide unparalleled support and service for these products and to conduct business in a manner that will enhance the quality of life for all involved.

Experience
(Knowledge from doing)

There is absolutely no substitute for experience; that is a simple fact of life. Another simple fact is that ZAPCO has, for over forty years, been the leader in defining quality standards for the car audio industry.
These years of experience have led to a thorough understanding of the challenges that are unique to the world of car audio. ZAPCO's relentless quest for sonic purity consistently yields imaginative designs that utilize the most innovative technologies. The resulting products set the criteria by which all others in the industry are judged.

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The ST-B Series. Great sound for every day use.

ZAPCO has a reputation for sound reproduction and quality that is unsurpassed. It is our dedication to sonic purity and our passion for performance that built Zapco's reputation. With all the new amps coming into the market, not one has been any threat to Zapco's standing as the premium amp and processor line. Just check the audio competition scene and the audio forums.

But not everyone wants to compete. The question was this: could Zapco put it's 40-years of audio experience to work to develop an amp for every-day use? An amp that all can afford but that will stay true to the Zapco heritage for sound and reliability? Absolutely! We can and we have! The new ST-B amps are a testament to the fact that you can build a quality product with great sound in an amplifier for every day use.

With the Studio-B amplifiers Zapco brings the sound quality and reliability that built the Zapco legend to an amplifier that everyone can afford.

Before you start your installation

ZAPCO highly recommends that a fuse or circuit breaker be placed within 18" of the battery. Although you will add a fuse or fuse block near the amplifier it is still a possibility that a pinched power wire between the component fuse and the battery could result in a short, or even a fire. The protection device should be placed where it can be accessed easily and all wiring should be routed safely and correctly according to the following guidelines:

Do not run wiring close to hot or spinning objects.

Always use wire grommets when routing wire through the firewall or any other metal panels.

Make sure that the potential for pinched wiring is avoided by routing all wires away from moving hinges and seats. This also includes brake, gas and clutch pedals, hood and trunk hinges, etc.

Continuous exposure to excessive sound pressure levels may cause permanent hearing loss. ZAPCO strongly advises that you use common sense when setting volume levels. If you experience ringing in the ears, it could cause permanent hearing damage!

When connecting our amplifiers to pre-wired stock speakers, care must be taken that there are no common connections between left and right speaker wires, i.e. two or more speakers using the same ground connection (very common in pre-85 cars), as this will cause the amplifier to go into immediate protection or may cause damage to the amplifier. Output connections are not common chassis ground. Please follow the hookup instructions in this owner's manual. Any questions should be directed to your local ZAPCO dealer.

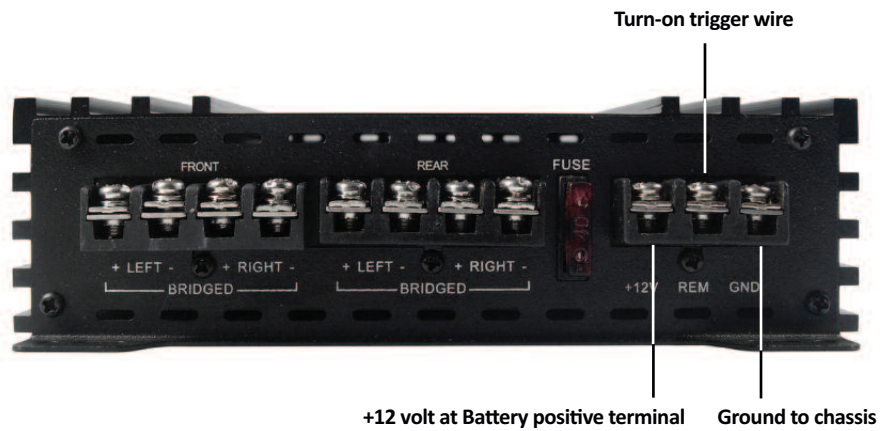
Planning your power connections

The power end plates of the Zapco ST-B amplifiers carry the power connections and the speaker connections and vary somewhat by the number of channels. For example, the power end of the ST-4B below has (of course) speaker connections for four channels. The ST-B amps all have on-board fuses and the fuse rating as printed above the fuses. The main 12-volt power input, the 12-volt turn-on wire, and the main Ground connection are common to both models.

- The main power input must be connected the vehicle battery's positive (+) terminal, and a main system fuse should be placed close to the battery
- The main ground or negative connection must be securely attached to bare metal at the vehicle frame, or other heavy chassis component with a direct connection to the frame

Note: Seat bolts and seat belt bolts are NOT good ground points

- The terminal between the main power and ground is the +12 turn-on input and can be connected to the head unit turn-on output wire.
  If none is available it can be connected to an accessory (ACC) terminal.
  You should avoid using any ignition-on (IGN) wire, as they can be noisy



Some words about Power and Ground

Note: The second most common cause of underperforming amplifiers is insufficient power current or a pour power connection. The most common cause of underperforming amplifiers is insufficient ground current or a bad ground connection.

12-volt current: Battery Power works only if it travels in a complete circuit from the battery positive terminal to the battery negative terminal. Main power input, of course, is attached to the battery positive terminal. Ground current is returned to the battery through the chassis to the to the point where the battery is grounded.

The current available for your amplifier to use to produce power will be restricted by the smallest gauge of wire in the circuit and by the weakest physical connection in the circuit.

Wire Size

It's often surprising how many people will obsess about signal wire but routinely provide the amplifier with only a fraction of the current it needs to do its job. The most common wire gauge used in car audio is 10-gauge, and the most common location for amplifiers is in the trunk.

Wire Sizing Chart

	◄---------- Length of Run ----------►							
	4 ft	7 ft	10 ft	13 ft	16 ft	19 ft	22 ft	28 ft
0-20 amps	14	12	12	10	10	8	8	8
20-35 amps	12	10	8	8	6	6	6	4
35-50 amps	10	8	8	6	6	4	4	4
50-60 amps	8	8	6	4	4	4	4	2
65-85 amps	6	6	4	4	2	2	2	0
85 -105amps	6	6	4	2	2	2	2	0
105-125 amps	4	4	4	2	2	0	0	0
125-150 amps	2	2	2	2	0	0	0	0

Let's look at a fairly small system. If you use a 50 watt/ch amp (25 amps) for the highs and a 100 watt/ch amp (40 amps) for the woofers, you need at least a 4-gauge and maybe a 2-Guage wire to provide 65 amps at the trunk. Anything less and your car won't go boom. It'll just go Blap!

Note: It takes lots of current to make lots of power!

Remember! An electrical circuit is just that... a complete circuit. For current to travel, you must complete the circuit from the positive terminal to the negative terminal (which is connected to the vehicle frame). So what ever Gauge wire you use for power (B+) you must also use for ground (B-).

Note: A 4-gauge power wire needs 4-gauge ground wire!

Use the Wire Sizing Chart! Add up the fuse values on the amplifier(s) then choose the proper size wire based on the distance from the car battery to the amplifier location. Again, always use the same gauge wire for the main ground as you do for the main power. Always make your ground as short as possible and secure it to a clean solid surface, preferably the vehicle frame.

Mounting your ST-B amplifier

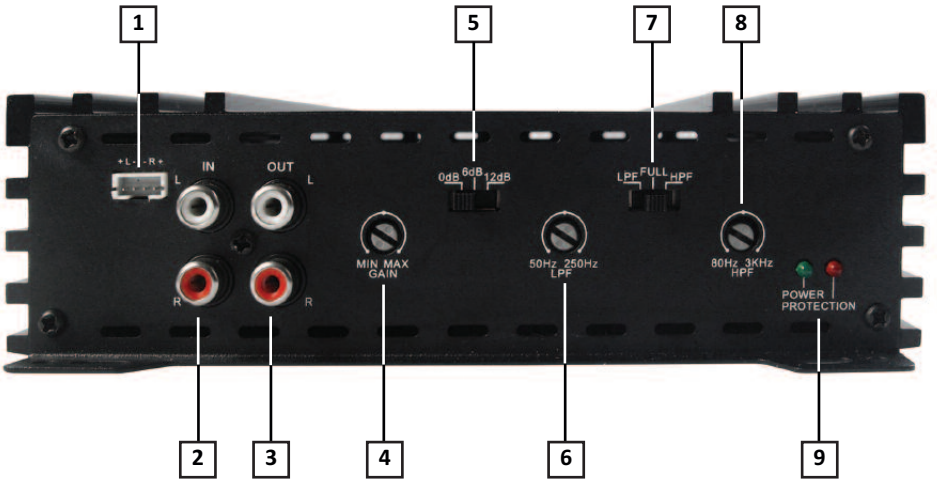
Mounting your Zapco amplifier is easy. Just keep in mind a few guidelines:

- The amplifier can be mounted in any direction, on wood, metal, or carpet
- The metal chassis of the amp can be grounded or left isolated
- The amplifier requires adequate ventilation. Creating power creates heat, and cooling requires air. Position the amplifier with sufficient surrounding area for air supply and keep the end plates clear for future access
- Keep the amplifier out of the engine compartment or other locations that may cause excessive heat or moisture
- Do not mount the amplifier to a subwoofer box or other place that may have excessive vibration

Setting Gains: Gain pots are not volume controls. Before you first turn on your system, you should make sure all gain controls are set to minimum. Gain controls should be used only if absolutely necessary. Turning up gain controls causes increased noise, makes distortion more likely and reduces the dynamic range of your system. If you head unit does not have sufficient output, you will get much better results by investing in a line driver to provide more signal to the amplifier.

ST-2B Input/Controls Ends

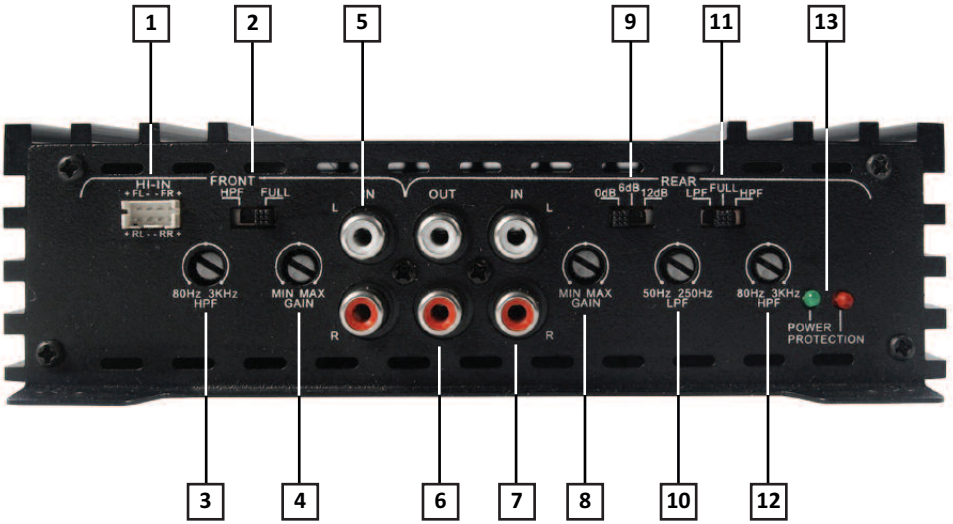
The Input ends of the ST-2B amplifier is where you find the signal input connectors,the pass through outputs, the crossover controls. For High Level (speaker level) you also find the port for the input plug.



1• Speaker level input plug for OEM hookup
2• RCA inputs from an after-market head unit
3• Pass through RCA output allows "daisy chaining" amplifiers
4• Variable gain control (set to minimum before initial turn-on)
5• Bass boost switch for 0, 6dB, or 12dB
6• Low Pass frequency selector for the bass crossover
7• Crossover selector for low pass, full range, or high pass
8• High pass filter for the mids/highs
9• Green power-on LED and red protect LED

ST-4B Input/Controls Ends

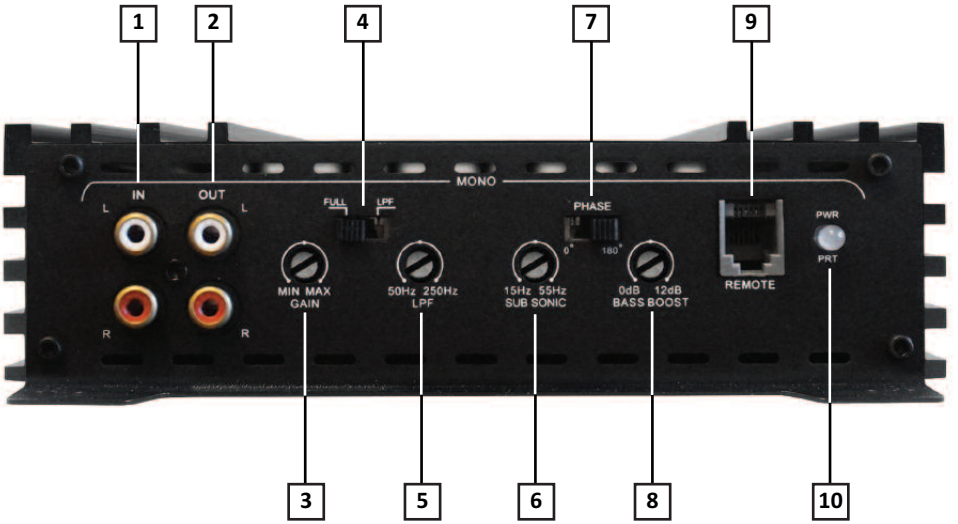
The ST-4B has similar functions as the ST-2B but the 4 channel layout puts the controls in different positions.



1• Speaker level input plug for OEM hookup
2• Front crossover function selector for full range of high pass
3• Front High Pass frequency control
4• Front Channels Variable gain control (set to minimum before initial turn-on)
5• Front channels RCA inputs
6• Pass through RCA output (rear channels can feed another amp)
7• Rear channels RCA inputs
8• Rear Channels Variable gain control (set to minimum before initial turn-on)
9• Rear channels Bass Boost switch for 0, 6dB, or 12dB
10• Rear Low Pass frequency control
11• Rear crossover function switch for high pass, full range, or low pass
12• Rear High Pass frequency control
13• Green power-on LED and red protect LED

ST-1B Input/Controls Ends

The ST-1B has similar functions as the other ST-B amps but the 1 channel layout puts the controls in different positions. Plus the ST-1B has a remote control port.



1• RCA inputs
2• RCA outputs
3• Variable gain control (set to minimum before initial turn-on)
4• Crossover function selector for full range of low pass
5• Low Pass frequency control
6• Sub Sonic filter
7• 0-180° Phase control
8• 0-12 dB Bass boost control
9• Remote control port
10• Power/protect LED

Speaker Wiring of the ST-B Amplifiers

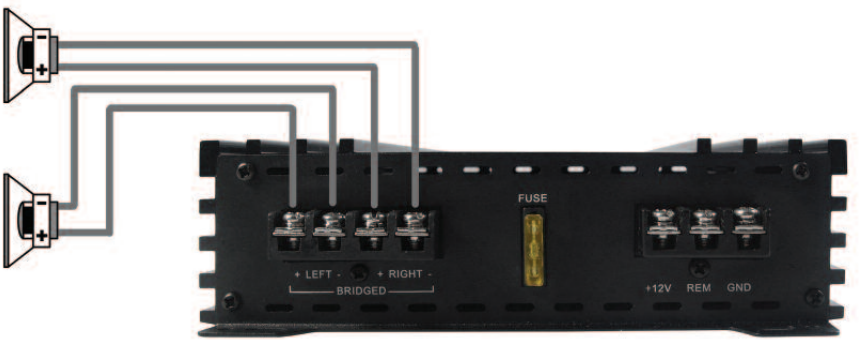
The Very Basics

- No speaker wires can be shorted to, or touching either ground or each other. This will put the amp into protect and may damage the amplifier
- When bridging the left and right channels of any ST-B amplifier, you use the left channel (Ch1) positive and the right channel (Ch2) negative, as indicated on the chassis by the speaker terminals

ST-2B Speaker Wiring

2Ch Stereo Mode

A simple 2 speaker hookup for a right and left stereo pair. Speakers can be 2Ω or 4Ω.



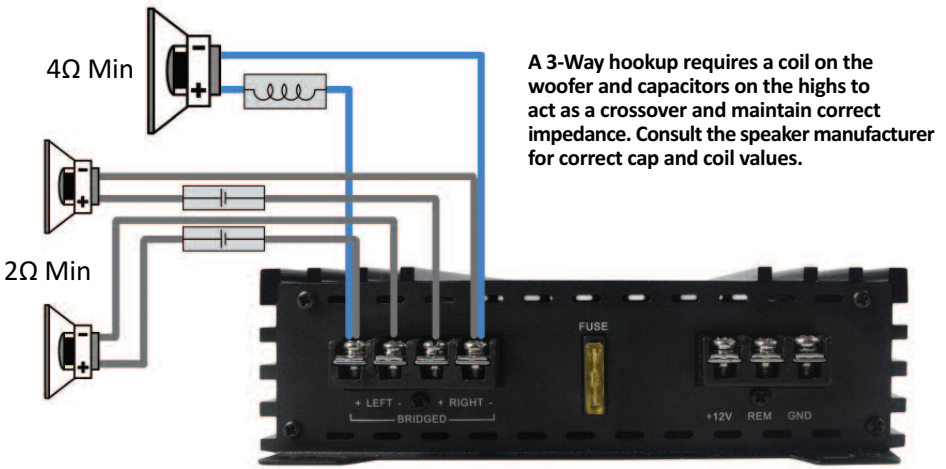
Single Channel Mode

The ST-2B can be used in bridged mono mode to drive a single speaker or a woofer. NOTE that in bridged mono mode the speaker load must be 4Ω minimum.

3Ch Mode

It is possible to run the 2Ch amps in “3-Channel” mode by running a pair of speakers for the mids and highs on left and right channels, and at the same time run a woofer bridged between the L+ and R- terminals as shown. However, since each channel will see 1/2 the impedance of the woofer you must use a woofer of no less than 4Ω. The amplifier sees impedance by frequency, so you can have two 2Ω loads but you must use a passive crossover on each speaker in the three channel mode. With the crossovers in the line, the amplifier will always see a minimum load of 2Ω on each channel at all frequencies.

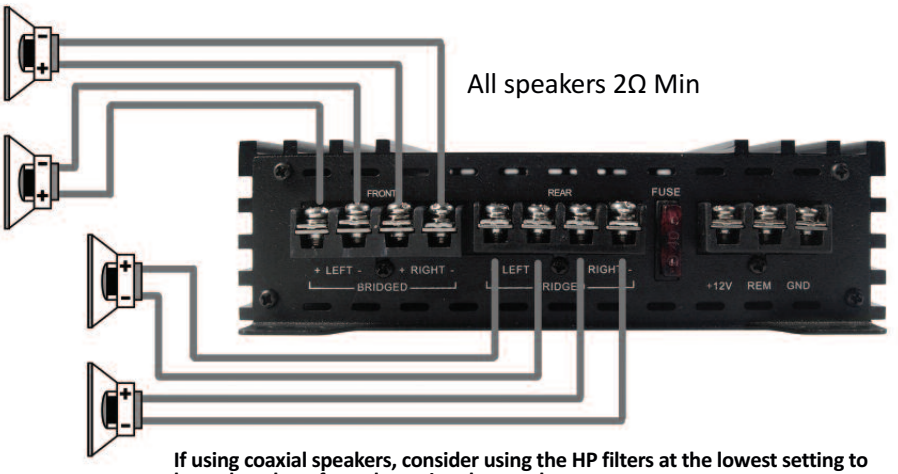
- Main speakers can be 2Ω~4Ω. Woofer can be 4Ω~8Ω but cannot be less than 4Ω (as in any bridged situation)
- The active amp crossovers are not used in this system



A 3-Way hookup requires a coil on the woofer and capacitors on the highs to act as a crossover and maintain correct impedance. Consult the speaker manufacturer for correct cap and coil values.

ST-4B Speaker Wiring

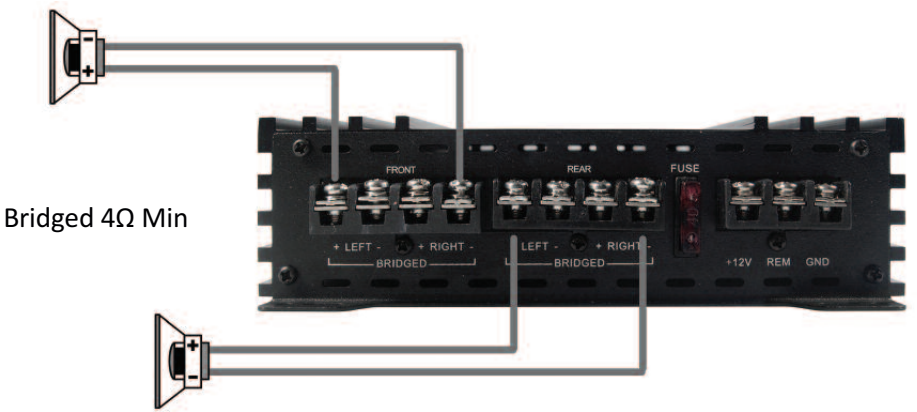
4Ch Mode



If using coaxial speakers, consider using the HP filters at the lowest setting to keep deep bass from damaging the speakers.

High Power 2Ch Mode

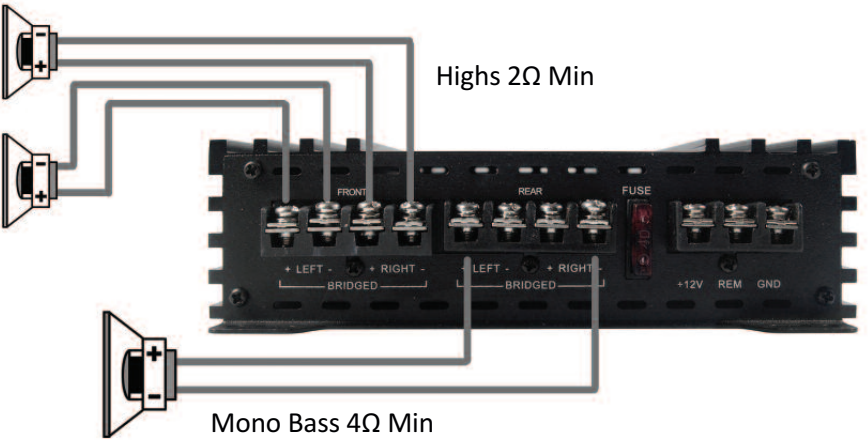
Similar to bridging a stereo amp to a mono woofer, you can use the 4-Ch amp in a dual mono mode to create (in this case) a stereo amp with 190 watts RMS/ch. As with any bridged setup the speakers must be a minimum of 4Ω impedance. If you are using the active crossovers you should be sure that they are set to the same frequency



High power stereo using dual mono bridge hookups requires that the speakers be a minimun of 4 Ohms impedance each.

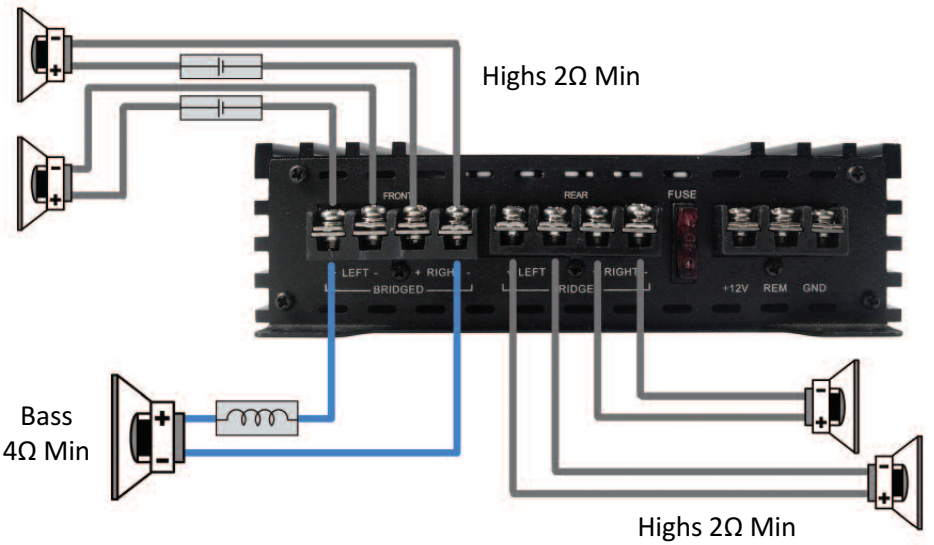
2-way Active System

Using the built-in active crossovers of the ST-4B, you can easily create an active 2-way system with mid/highs on the front channels and bass on the rear channels. Below is an active system with a bridged subwoofer on the rear channels.



5Ch System

The 5-speakers system requires a passive crossover between the front highs and the mono woofer, with capacitors on the front highs positives and a coil on the woofer positive. All amplifiers channels are full range.



ST-1B Speaker Wiring

The ST-1B has two + and two - terminals so you can hook up one woofer or two. One woofer can be 2Ω minimum. Two woofers must be 4Ω minimum each.

Technical Specifications

ST-2B

Power @ 4Ω: 2 x 65 watts
Power @ 2Ω: 2 x 90 watts
Power @ 4Ω Bridged: 180 watts
THD @ Rated Power < 0.1%
Signal to Noise Ratio > 97dB
Channel separation > 45dB
Freq. Response 20Hz-20KHz ±1dB
Input Sensitivity .25v to 5v
Dim. in mm: 182(W) x 52(H) x 200(L)
Overall: 182(W) x 52(H) x 230(L)

ST-4B

Power @ 4Ω: 4 x 65 watts
Power @ 2Ω: 4 x 90 watts
Power @ 4Ω Bridged: 2 x 180 watts
THD @ Rated Power < 0.2%
Signal to Noise Ratio > 97dB
Channel separation > 45dB
Freq. Response 20Hz-20KHz ±1dB
Input Sensitivity .25v to 5v
Dim. in mm: 182(W) x 52(H) x 280(L)
Overall: 182(W) x 52(H) x 310(L)

ST-1B

Power @ 4Ω: 200 watts
Power @ 2Ω: 300 watts
THD @ Rated Power < 0.2%
Signal to Noise Ratio > 97dB
Input Sensitivity .25v to 5v
Dim. in mm: 182(W) x 52(H) x 280(L)
Overall: 182(W) x 52(H) x 310(L)

Modesto, California USA
Since 1974

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