
# ST-Series X

## Owners Manual

Before operating the unit,
please read this manual thoroughly
and retain for future reference

# The Zapco Studio X Series Amplifiers

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 that 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. The pros know what to use to win.

But not everyone wants to compete. The question was this. Can Zapco put it's 40-yrear 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 Studio X series is a test-ament to the fact that you can build a quality product with great sound in an amplifier for every-day use.

The high quality 1% metal film resistors that we used in C2K and Reference amps? They are right here in the Studio X. The high current 5532 Op-Amps from the C2K Competition amps are in the Studio X also, and the Studio X uses high-end KEC outputs just like the Z and ZX series amps.

How about power? The Studio X amps may not have the power of our big competition amps, but these little powerhouses are certainly not shy. The A/B full range-amps have over 50 watts RMS/ch at 4Ω and about 100 watts RMS/ch at 2Ω. The Studio X bass amps are 1Ω stable at 500w, 1000w, and 1500watts RMS.

Along with all that performance, you need an amp that will actually fit in you car, few if any modifications. The Studio X is just what you ordered. Only 2" tall and 6.4" wide and 11" long (ST-4X). Even the longest amp (ST-5X)is only 15"."

Power, price, size, and performance. No it's not designed for competition.

Of course, if you do want to jump into the competition lanes with your new ST-X series amp, you probably won't be alone.

So go ahead...Pop in your favorite disk, grab the volume, and see if you don't agree. Dedication to sonic purity is definitely a good thing

# Install Sense

As a manufacturer, Zapco has taken great pains to produce a product that will give you many years of superior performance and reliability. However , certain basic rules need to be followed if you want to achieve the products potential in your vehicle.

**It takes power to make power.** The power and ground wire is critical to your system. If the wire gauge is too small your amp will never produce its rated power. Even worse...Straining to produce power from insufficient current can over-tax the power supply of your amp and cause amp failure.

**See the chart below**

**Recommended Wire Gauge**

| Up to | 4 Ft | 7 Ft | 10 Ft | 13 Ft | 16 Ft | 19 Ft | 22 Ft | 28 Ft |
|---|---|---|---|---|---|---|---|---|
| **20 A** | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 8 |
| **35 A** | 12 | 10 | 8 | 8 | 4 | 4 | 4 | 4 |
| **50 A** | 10 | 8 | 8 | 4 | 4 | 4 | 4 | 4 |
| **60 A** | 8 | 8 | 4 | 4 | 4 | 4 | 4 | 2 |
| **85 A** | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 0 |
| **105 A** | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 0 |
| **125 A** | 4 | 4 | 4 | 2 | 2 | 0 | 0 | 0 |
| **150 A** | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |

Be Safe: Add up the fuse recommendations of all the amps in your system. Then see how long a run you will have from the battery to the amplifiers . Now locate the wire gauge on the chart above.

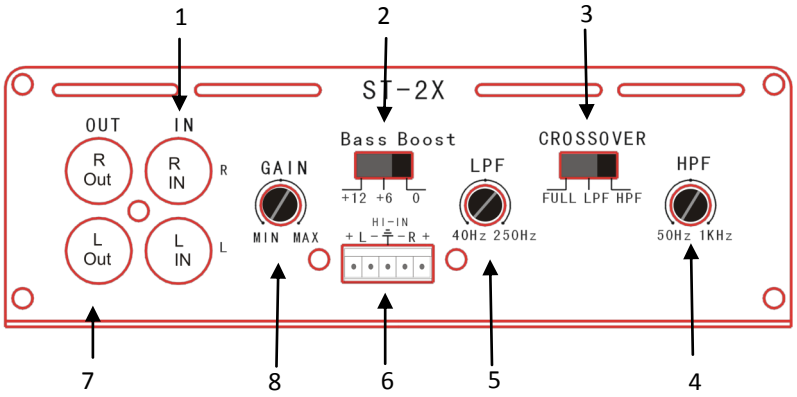
i.e. If your amp needs an 80A fuse and you're your wire run will be 16ft long you will need to use 2 gauge wire or you will lose performance and possibly damage your new amplifier.

**Ground Matters just as much as power.** Electricity travels in a circuit. The ground wire needs to be the same size as the power wire or your current (and power) will be reduced. A weak ground connection will also limit current flow. You need a good solid ground connection to the vehicle frame. Remember: A body panel is not a frame. Many metal body panels never even make contact with the frame. Make sure you have a solid ground to the frame, to guaranty you get full performance from your system.

# The ST-2X

**Two channel, compact chassis car amplifier with RCA pre-amp input and speaker level input**

## ST-2X Input



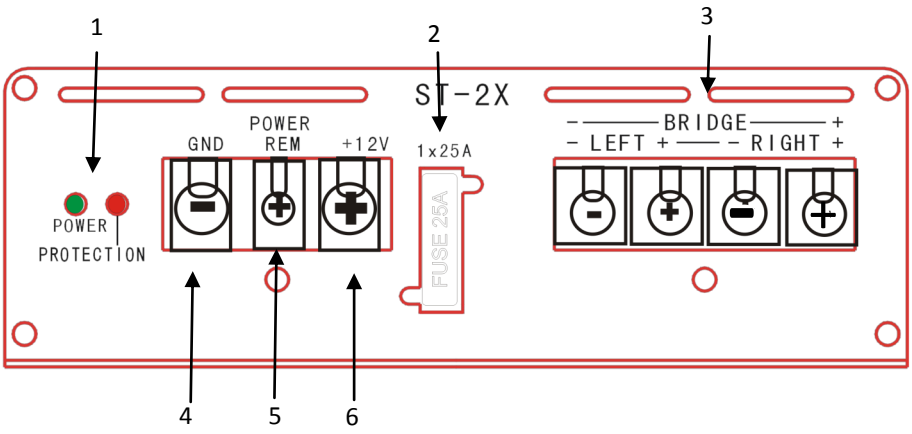

1. **RCA IN** connectors are to connect the ST2X to an aftermarket head unit
2. **Bass Boost** allows 6dB or 12dB boost of bass frequencies
3. **Crossover** selector determines high pass, low pass, or full range
4. **HPF** If you use high pass, this control determines frequency 50Hz to 1KHz
5. **LPF** If you use low pass, this control determines frequency 40Hz to 250Hz
6. **HI In** is the speaker level input plug.
7. **RCA OUT** connects to another amp to "daisy chain" two amplifiers from a single RCA head unit output.
8. **Gain:** This control balances output of the head unit to the input of the amp

**Install Notes:**

a**. HI IN:** The Hi In plug has + and - for right and left speaker inputs. The fifth wire is "Signal Ground". For best performance and lowest noise this wire should be grounded at the chassis of the factory head unit. Invest a little time now and you will get better performance for years..

b. **Gain:** Gain is not a volume control. It is only to match the head unit output to the amp input. You should always put this control to minimum (counter clockwise) during installation.

## ST-2X Output

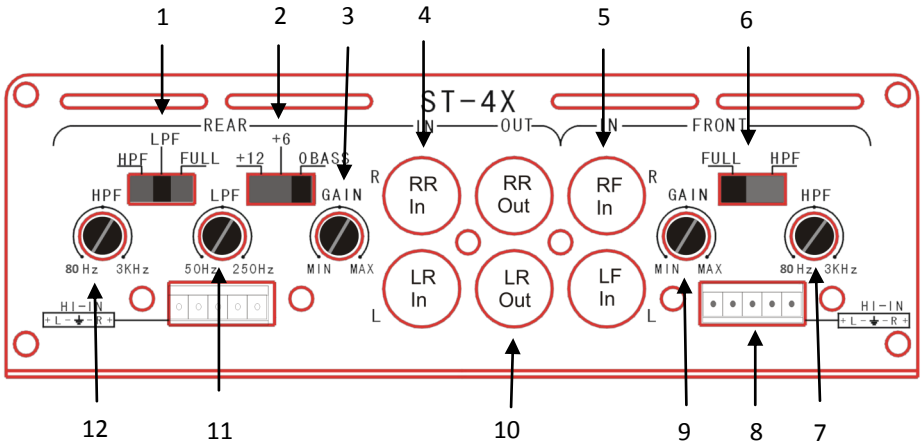



1. **LED Indicators** let you know the status of the amplifier. The green LED tells you the amp is on. The Red LED lets you know the amp is in "protection" because of some problem with the system.
2. **Fuse** The fuse protects the car should a catastrophic problem occur in the amp. Always replace with the same size fuse
3. **Speaker connections** The heavy duty terminal block provides positive speaker connections. Simple insert the wire and cinch down the set screw. Note that the Mono bridge positions here are L **-** to R +
4. **GND** The amp should have a firm connection the car frame. *** See section "Install Sense"**
5. **REM** The remote terminal connects to the head unit remote out, or to some other switched 12 volt source to turn on the amplifier.
6. **+12V** The main 12 volt must be connected directly to the vehicle's battery using wire of the proper gauge. *** See section "Install Sense"**

# The ST-4X

**Four channel, compact chassis car amplifier with RCA pre-amp input and speaker level input**

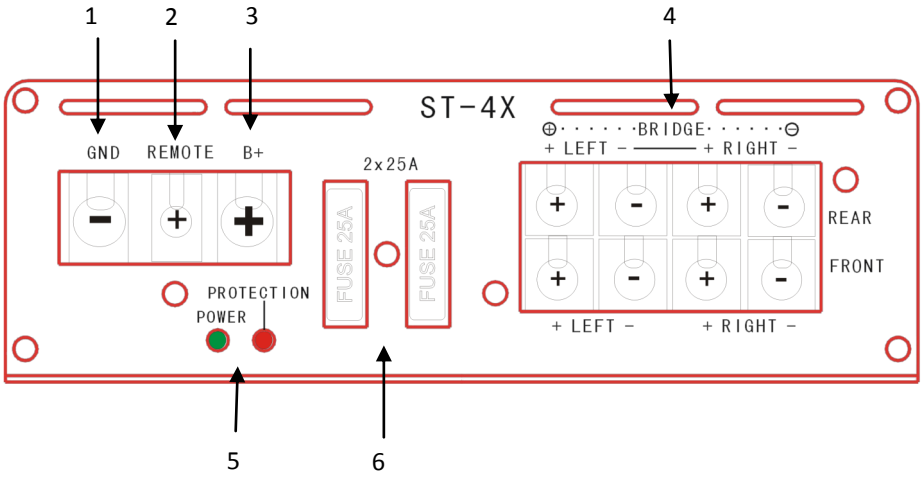
## ST-4X Input




1. **Rear Crossover** selector determines high pass, low pass, or full range for the rear channels
2. **Bass Boost** allows 6dB or 12dB boost of bass frequencies in the rear channels
3. **Rear Gain:** This control balances output of the head unit to the input of the amp and with the front amp channels
4. **Rear RCA IN** connectors are to connect the ST-4X to an aftermarket head unit rear outputs
5. **Front RCA IN** connectors are to connect the ST-4X to an aftermarket head unit front outputs
6. **Front Crossover** selector determines high pass or full range for the front outputs
7. **HPF** If you use High Pass crossover, this control determines frequency 80Hz to 3Khz
8. **Speaker Level** input. The ST-4X has Hi-level input plugs for front and rear speaker level inputs. *See Install notes of ST-2X

9. **Front Gain:** This control balances output of the head unit to the input of the amp and with the rear amp channels
10. **Rear Outputs:** These provide an RCA output to drive the front channels if the head unit has only one RCA out. Connect a short RCA between the Rear out and the Front In.
11. **LPF:** If you use the rear low pass crossover, this control determines frequency 20Hz to 1KHz
12. **HPF:** If you use the rear high pass crossover, this control determines frequency 80Hz to 3KHz

## ST-4X Output




1. **GND** The amp should have a firm connection the car frame. *** See section "Install Sense"**
2. **REM** The remote terminal connects to the head unit remote out, or to some other switched 12 volt source to turn on the amplifier.
3. **+12V** The main 12 volt must be connected directly to the vehicle's battery using wire of the proper gauge. *** See section "Install Sense"**
4. **Speaker connections** The heavy duty terminal block provides positive speaker connections. Simple insert the wire and cinch down the set screw. Note that the Mono bridge positions are L+ to R **-**, for both front and rear speaker sets
5. **LED Indicators** let you know the status of the amplifier. The green LED

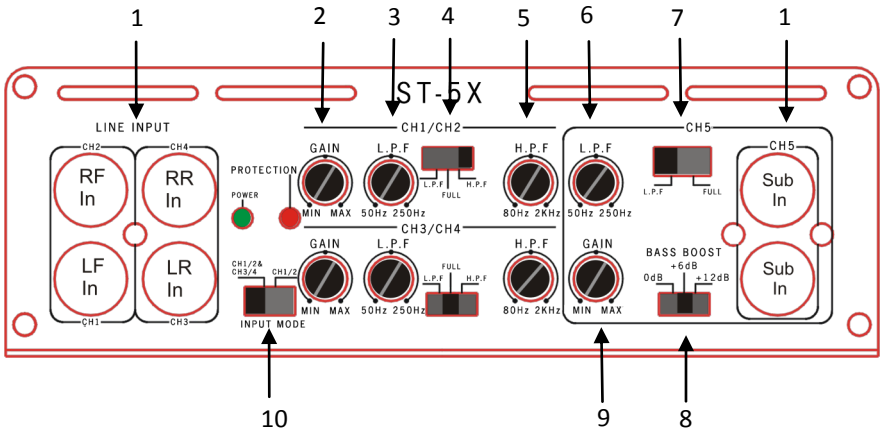
tells you the amp is on. The Red LED lets you know the amp is in “protection” because of some problem with the system.

6. **Fuses** The fuses protect the car should a catastrophic problem occur in the amp. Always replace with the same size fuse

## The ST-5X

**Five channel, compact chassis car amplifier with mono bass section**

### ST-5X Input

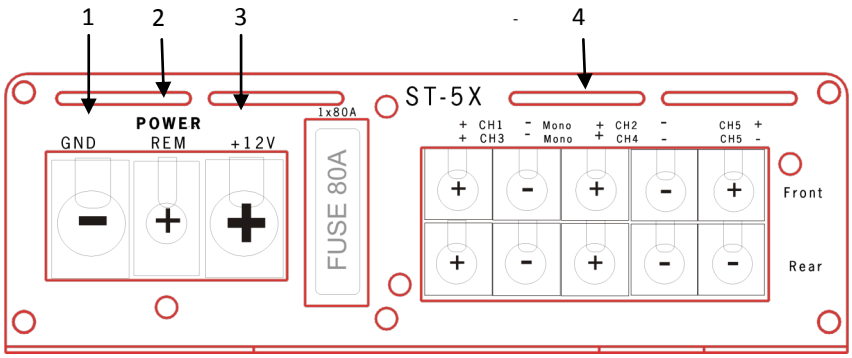



1. **RCA IN** connectors for Front, Rear, and Sub are to connect the ST-5X to an aftermarket head unit ‘s outputs (See also item 9)
2. Front and Rear **Gain:** These controls balance the output of the head unit to the input of the amp and balance the front-to-rear-to-sub levels. (See "Install Sense" section)
3. Front and Rear **LPF** controls set the crossover point when using the low pass crossover filters.
4. Front and Rear **Crossover** selectors determine high pass, low pass, or full range for the front and rear channels.
5. Front and rear **HPF** controls set the HP frequency when the high pass crossover filters
6. **LPF** control sets the sub crossover frequency when using the sub low

pass crossover.

7. **Crossover** switch chooses low pass or full range for the sub output
8. **Bass Boost** allows 6dB or 12dB boost of bass frequencies in the sub channel
9. **Gain** set the input level for the sub section
10. **Input Mode** selector allows you to choose to use separate input RCAs for the front and rear inputs, or to have channels 1 and 2 serve as the input for both front and rear sections .

## ST5X Output side

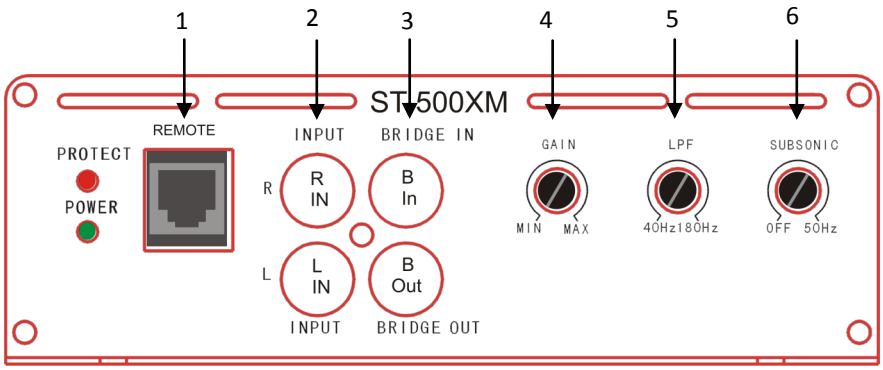



1. **GND** The amp should have a firm connection the car frame. *** See section "Install Sense"**
2. **REM** The remote terminal connects to the head unit remote out, or to some other switched 12 volt source to turn on the amplifier.
3. **+12V** The main 12 volt must be connected directly to the vehicle's battery using wire of the proper gauge. *** See section "Install Sense"**
4. **Speaker connections** The heavy duty terminal block provides positive speaker connections. Simple insert the wire and cinch down the set screw. Note that the Mono bridge positions are L+ to R **-**, for both front and rear speaker sets.
5. **Fuses** The fuses protect the car should a catastrophic problem occur in the amp. Always replace with the same size fuse if required

# The Studio X Mono Class D Amps

There are three Class D mono amps in the Studio X line,. The ST-500X at 500 watts RMS, the ST-1000XM at 1,000 watts and the ST1500XM at 1,500 watts RMS.

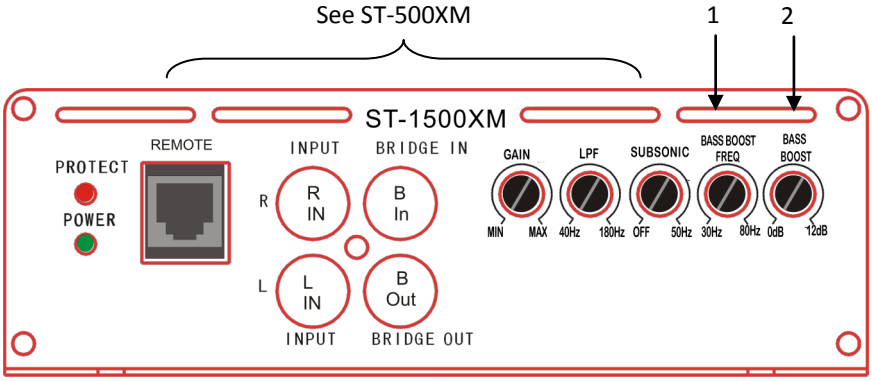
## The ST-500XM  Input Side




1. **Remote** each ST– X bass amp includes a wired dash remote for the bass output
2. **RCA inputs** accept  the input signal from the head unit
3. **Bridge** in and Bridge out are used to “strap” to ST-X mono amps so they can work together to drive a single speaker (see following section on strapping mono amps)
4. **Gain** control is used to balance the output of the head unit to the input of the amplifier
5. **LPF**  Being a bass amp, the STx has full time low pass  bass crossover that can vary from 40Hz to 180Hz
6. **Subsonic** To protect your woofers from sub sonic frequencies and to conserve amplifier power, a variable subsonic filter can be set from  50Hz down to Off

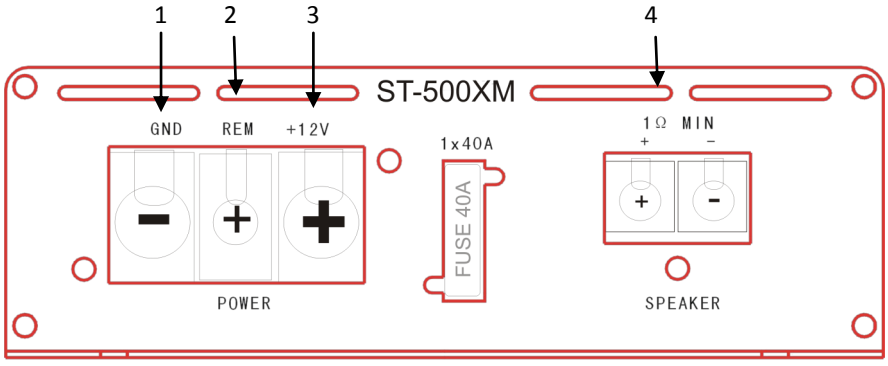
## The ST-1000XM and ST-1500XM Input side

The larger Studio X bass amps have all the features of the ST-500XM but they also add more bass control features



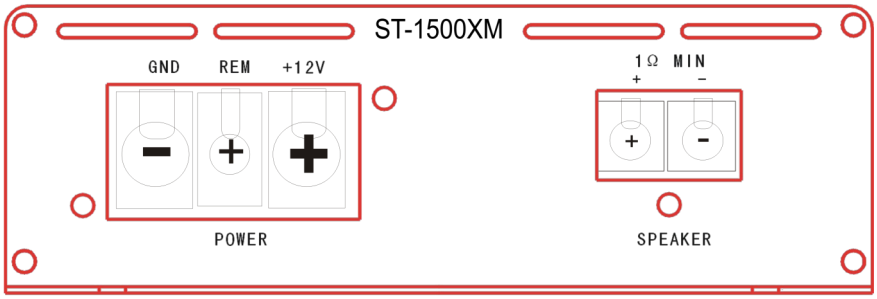

1. The ST-1000XM and 1500XM offer a variable bass boost. This frequency control varies the boost frequency from 30Hz to 80Hz
2. The Boost control allows a bass boost of 0dB to 12dB.

## ST-500XM output side



1. **GND** The amp should have a firm connection the car frame. *** See section "Install Sense"**
2. **REM** The remote terminal connects to the head unit remote out, or to some other switched 12 volt source to turn on the amplifier.
3. **+12V** The main 12 volt must be connected directly to the vehicle's battery using wire of the proper gauge. *** See section "Install Sense"**
4. **Speaker connections** The heavy duty terminal block provides positive speaker connections. Simple insert the wire and cinch down the set screw. Note that the Mono bridge positions are L+ to R **-**, for both front and rear speaker sets
5. **Fusing** Note the ST-500XM has an internal fuse but the ST-1000XM and 1500XM are not internally fused and require an additional fuse installed in the main power lead from the battery

## ST-1000XM and ST-1500XM output side



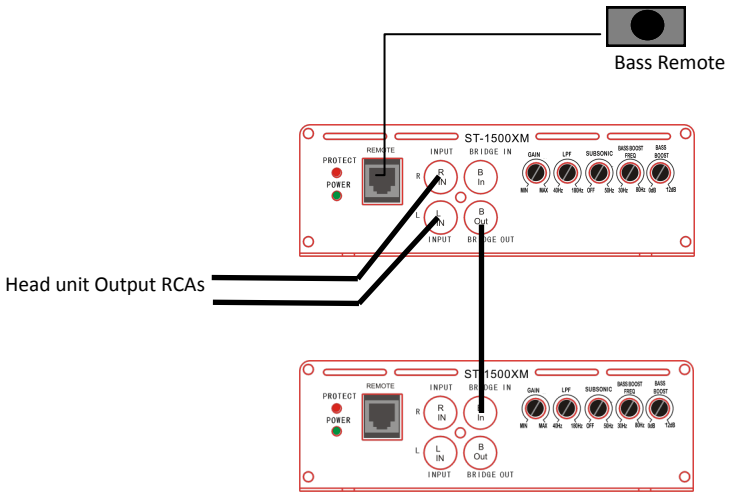

**Note that no internal fuse is provided with these amps and the installer must put an external fuse in the main power lead from the battery within 50cm of the amplifier. The ST1000XM Requires an 80Amp fuse and the ST-1500XM requires a 125Amp fuse.**
**If there is only one amp in the system, the fuse can go by the battery but you will need to compensate for current loss in the wire. See a qualified installation specialist for further fusing advise.**

## Strapping Studio X Mono Amps

Studio X mono amps are true mono units and you can double their power by "strapping" two units of the same model together to drive a single voice coil.

Always keep in mind that each amp must see a minimum load of 1Ω. A "strapped" pair of amps must see a minimum load of 2Ω (1 ohm per amp)

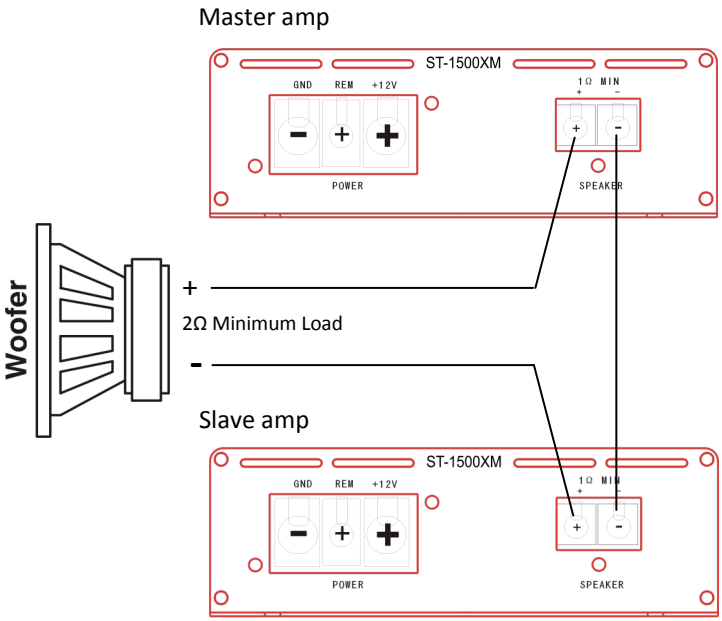
## Strapping the Inputs




1. Decide which amp will be the 'master" amp and which will be the "slave" amp
2. Connect the head units bass output or full range output RCA cables to the R and L RCA inputs of the first (Master) amplifier
3. Connect the "Bridge Out" of the master amp to the "Bridge In" of the salved amp with a single RCA Cable. Do not connect anything to the regular R and L inputs of the slave amp.
4. Connect the Bass Remote to the Remote in of the master amp.

**The master amp is now the control amp. All adjustments you make to the bass remote and to the master amp's other controls will be transferred to the slave amp and the Slave amp will be driving the negative side of the signal, and have no control functions of its own

## Strapping the Outputs of the Studio X Mono Amps




**As Above**

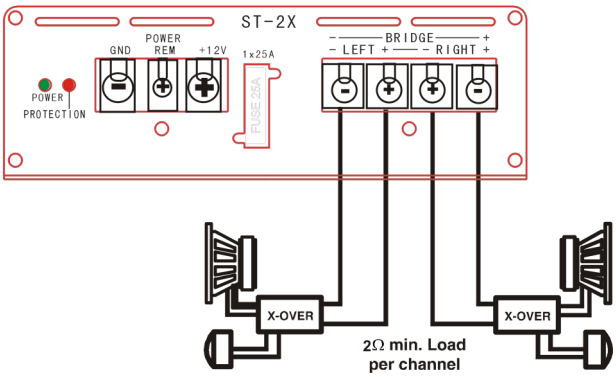
1. Connect the **master** amplifier's speaker output + terminal to the + (positive) terminal of the woofer.
2. Connect the **slave** amplifier's speaker output + Terminal to the - (negative) terminal of the woofer
3. Connect the Connect the two amplifier's speaker output - (negative) terminals together

**Note:** You are creating a much more powerful amplifier in this way and doubling the output. Make sure your speaker wire can transfer the power. We recommend a minimum of 12 gauge speaker lead, and for best performance you should use 10 gauge or 8 gauge.

# Speaker Connections

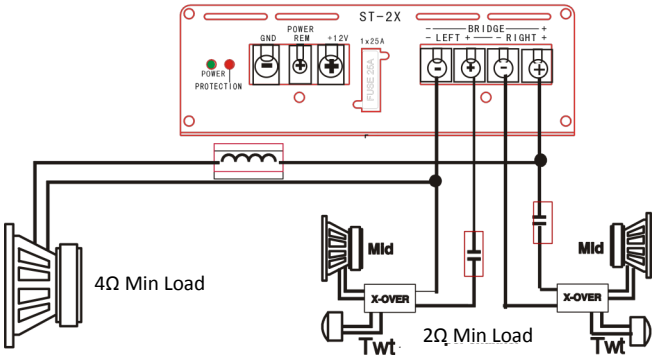
## ST-2X

Standard stereo hook-up connects + and-leads from the correct terminal to each speaker, taking care that no wire or speaker terminal makes contact with the metal vehicle body.




A bridged 3 channel “mixed mono” mode can be used to run Mids/Highs in stereo and a Sub in Mono from the same stereo outputs. To maintain proper impedance you must use passive crossovers (see below) when in mixed mono configuration. A simple Cap/Coil crossover will work for this set-up, placing a coil in the woofer positive (+) lead and caps in the mid/highs (+) leads.

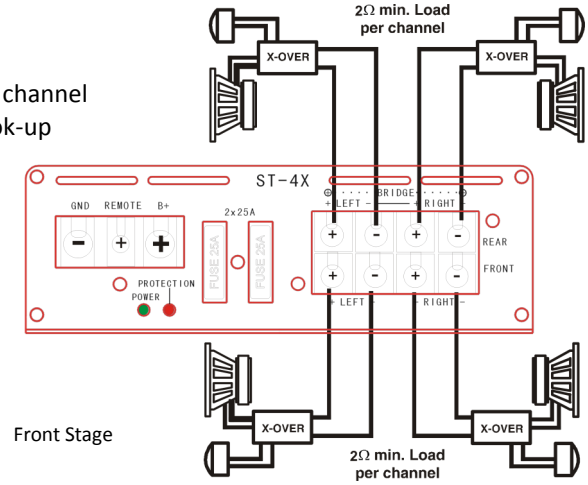
See your Zapco authorized dealer for more information on mixed mono set-ups



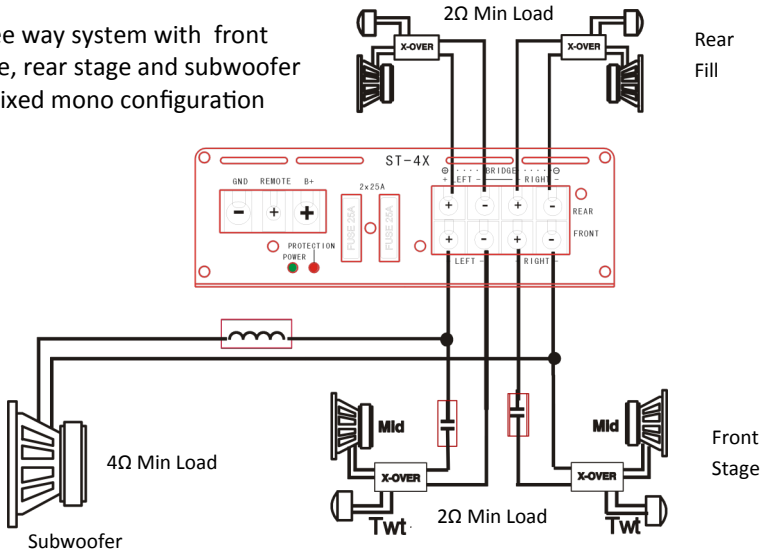
## ST-4X

Like the ST-2X, the ST-4X will drive 4Ω or 2Ω loads and can be hooked in 3 channel mixed mono mode. Although the + and- terminals are located slightly differently, the hook-ups are similar

Standard 4 channel system hook-up

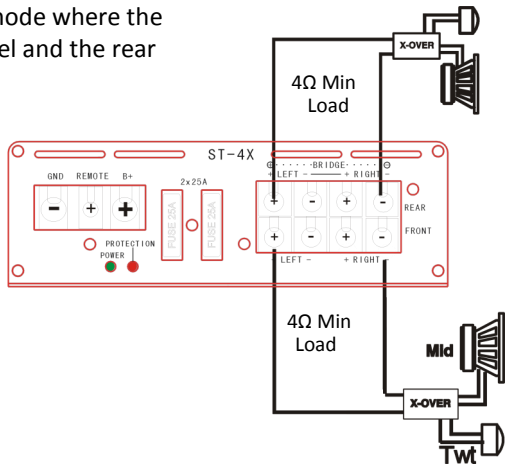



Three way system with front stage, rear stage and subwoofer in mixed mono configuration



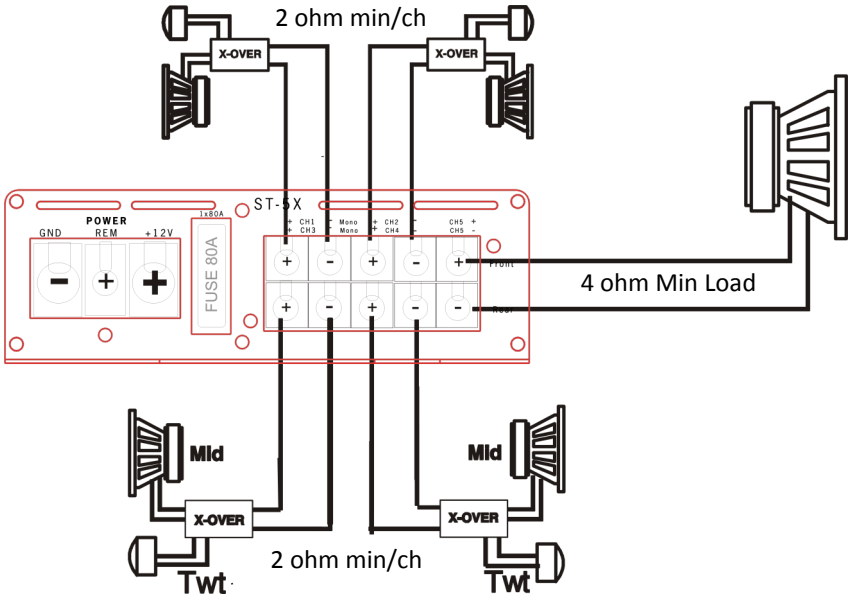
You can create a high power stereo amp by using the ST-4X in Dual Mono mode where the front amp powers one channel and the rear amp powers the other.

You will use Y-adapters to put the left input into both front channels and the right input into both rear channels




## ST-5X

The ST-5X puts everything together in one do-all amplifier.



# Specifications

**ST-2X 170 Watts RMS**

| | |
|---|---|
| Max RMS at 2Ohms @ <.5% THD at 1KHz | 2 x 85 watts / 1 x 170 watts |
| *Rated RMS Power | 50w x 2 @ 4Ω / 80w x 2 @ 2Ω / 160 w x 1 @ 4Ω Mono |
| STHD + Noise | < 0.05% |
| Signal to Noise Ratio | > 85dB |
| Channel Separation | > 60dB |
| Frequency Response | 15Hz to 30KHz ±1dB |
| Input Sensitivity | .25v to 5v |

**ST-4X 420 Watts RMS**

| | |
|---|---|
| Max RMS at 2 Ohms @ <.5% THD at 1KHz | 4 x 105 Watts / 2 x 210 watts |
| *Rated RMS Power | 60w x 4 @ 4Ω / 80w x 4@ 2Ω / 180 w x 2 @ 4Ω Mono |
| STHD + Noise | < 0.05% |
| Signal to Noise Ratio | > 85dB |
| Channel Separation | > 60dB |
| Frequency Response | 15Hz to 30KHz ±1dB |
| Input Sensitivity | .25v to 5v |

**ST-5X 720 Watts RMS**

| | |
|---|---|
| Maw RMS at 2 Ohms @ <.5% THD at 1KHz | 4 x 120Watts Plus 1 x 240 Watts |
| *Rated RMS Power | 60w x 4 @ 4Ω plus 240 w x 1<br>100w x 4 @ 2Ω plus 240 w x 1 |
| STHD + Noise | < 0.05% |
| Signal to Noise Ratio | > 85dB |
| Channel Separation | > 60dB |
| Frequency Response | 15Hz to 30KHz ±1dB |
| Input Sensitivity | .25v to 5v |

*** Rated RMS Power taken all channels driven and all frequencies**

**ST-500XM 500 Watts RMS**

| | |
|---|---|
| Rated RMS Power | 150w x 1 @ 4Ω / 250w x 1 2Ω / 500w @ 1Ω |
| THD + Noise | < 0.2% |
| Signal to Noise Ratio | > 70dB |
| Efficiency | > 85% |
| Frequency Response | 10Hz to 200Hz ±1dB |
| Input Sensitivity | .25v to 5v |

**ST-1000XM 1,000 Watts RMS**

| | |
|---|---|
| Rated RMS Power | 350w x 1 @ 4Ω / 680w x 2Ω / 1000w @ 1Ω |
| THD + Noise | < 0.2% |
| Signal to Noise Ratio | > 70dB |
| Efficiency | > 85% |
| Frequency Response | 10Hz to 200Hz ±1dB |
| Input Sensitivity | .25v to 5v |

**ST-1500XM 1,500 Watts RMS**

| | |
|---|---|
| Rated RMS Power | 550w x 1 @ 4Ω / 850w x 2Ω / 1500w @ 1Ω |
| THD + Noise | < 0.2% |
| Signal to Noise Ratio | > 70dB |
| Efficiency | > 85% |
| Frequency Response | 10Hz to 200Hz ±1dB |
| Input Sensitivity | .25v to 5v |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