

2XSTM

Crossover/Subsonic Filter

Owner's Manual

Congratulations on purchasing the state of the art autosound crossover - the 2XSTM. The 2XS is adjustable, programmable, bridgeable and very quiet. Please take a moment to familiarize yourself with the many features of the 2XS by reading this manual.

Features of the 2XS:

- 2 way 18dB/octave active, electronic crossover programmable with a plug in module
- Sharp 18dB/octave subsonic filter
- Noise rejecting triple isolated transformer balanced DC to DC power converter
- Very low noise (-119dB signal to noise ratio) and total harmonic distortion (0.005%)
- Output level controls
- Mono bass output and bridging adapter
- The finest quality - designed and built in America

GETTING TO KNOW YOUR 2XS

The Audio Control 2XS is a compact, audiophile grade programmable crossover, subsonic filter, level matcher and bridging adapter. In short, loaded with real world features.

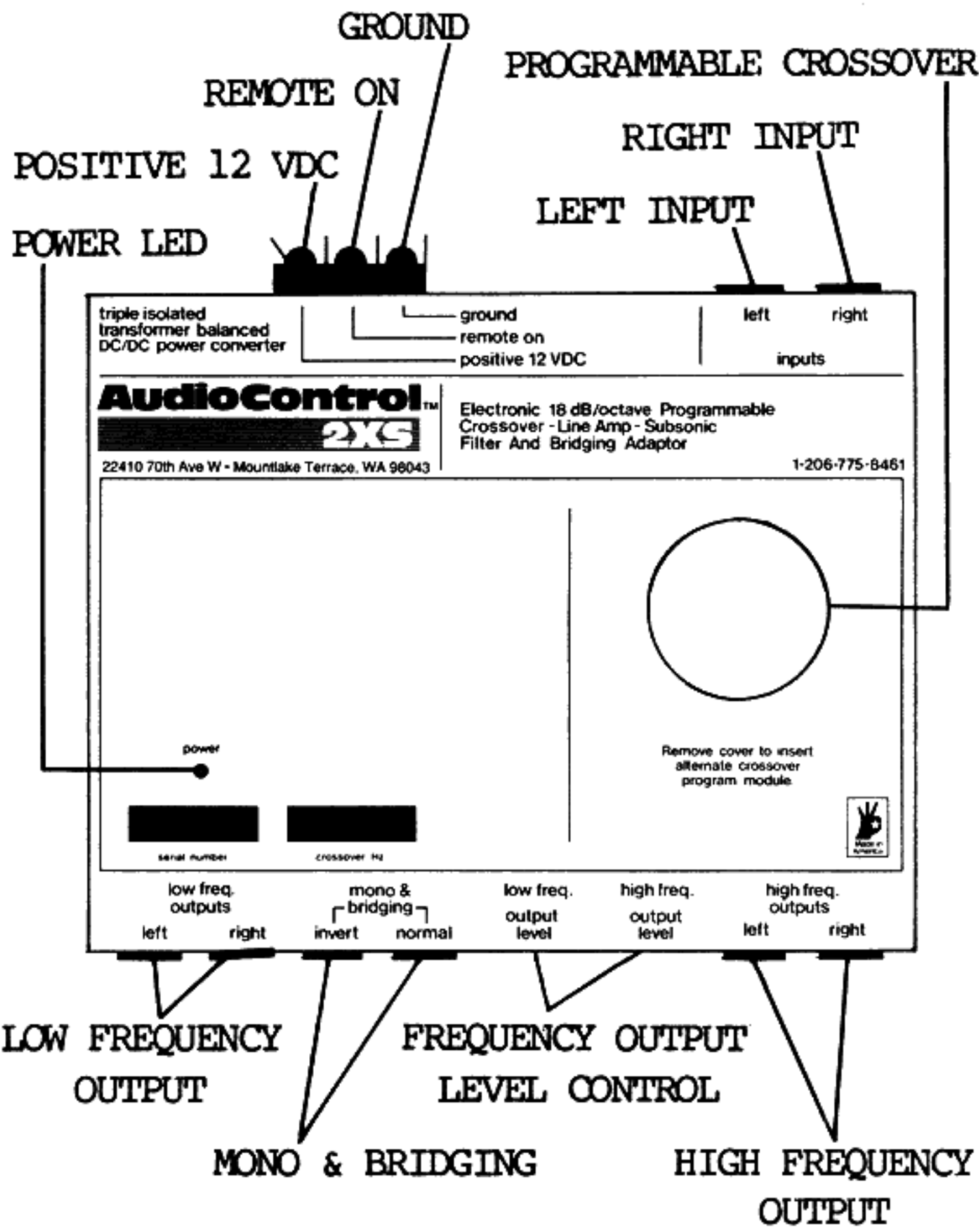
INPUTS AND POWER. Lurking on the top edge of the 2XS, you'll see two RCA-type audio inputs. These are the inputs which run between your source or equalizer and the 2XS.

You'll also notice a terminal strip with screws set in it. These are where you hook the +12 volt and ground connections which power the 2XS. The third terminal is for remote turn on of the 2XS. It connects to your radio or tape player power antenna lead to allow you to activate the 2XS simply by firing up your tape deck.

OUTPUT JACKS. On the lower edge of the 2XS are more RCA-type jacks (looking from left to right) for low frequency outputs, a mono bass or low frequency output, an inverted mono bass for bridging an amplifier and high frequency outputs. Use of the mono bass and inverted mono bass is optional but included with the 2XS to save you the expense of a separate bridging adapter.

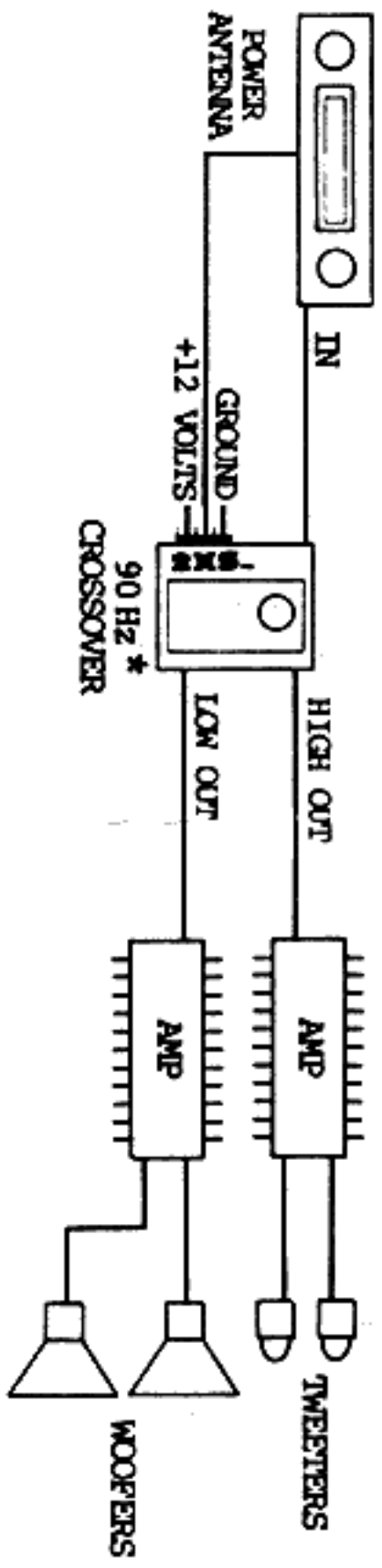
OUTPUT ADJUSTMENTS. Use these adjustments to control the 2XS's output to your power amplifier. The circuitry provides output level control to drive virtually any power amplifier made while allowing maximum signal to noise ratio.

CROSSOVER FREQUENCY PROGRAM MODULE. Underneath that round cover on the 2XS rests the 14 pin module which allows you to adjust the crossover frequency point to match any system. The module is accurate, stable over time and adjustable to virtually any frequency you want.

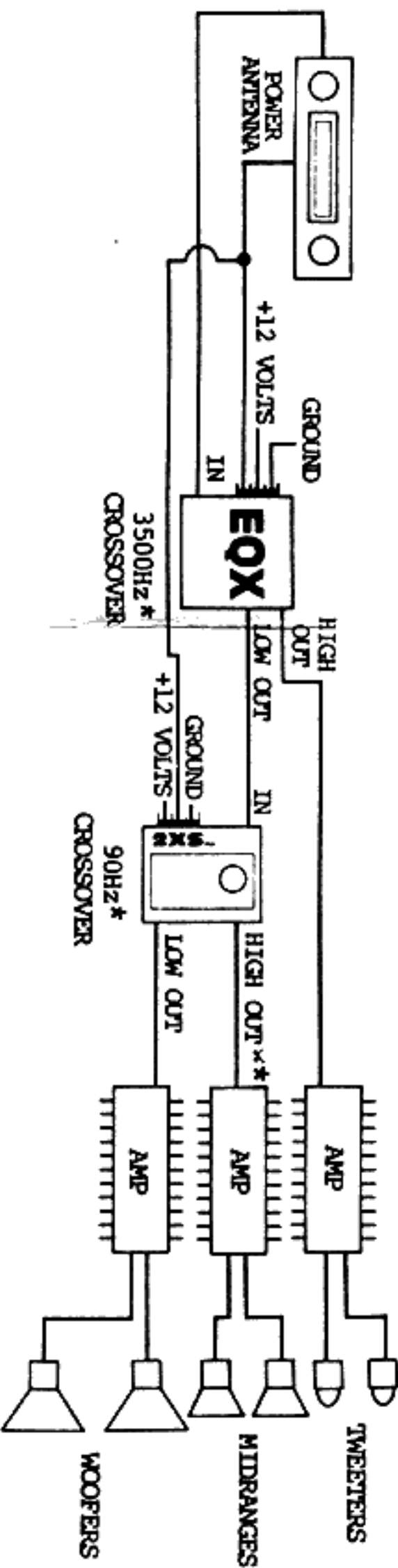


INSTALLATION EXAMPLES. Hook up Diagrams:

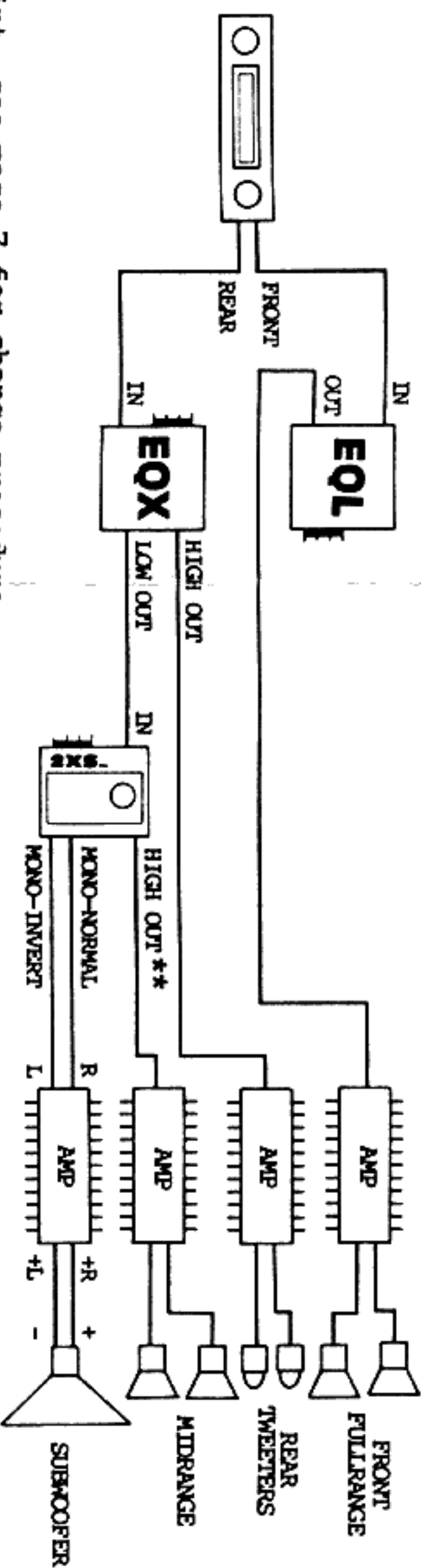
A. SIMPLE BI-AMP



B. TRI-AMP WITH BOX EQUALIZER/CROSSOVER



C. THE ULTIMATE



*Example crossover point, see page 7 for change procedure.

**System midrange crossover point.

QUICK REFERENCE GUIDE TO INSTALLING THE 2XS.

If you can install a power amplifier or speakers, you won't have any trouble with the 2XS. Two cables in, four cables out, and the power connections. After that, we've gone ahead and talked each individual facet of the 2XS to death. You don't have to read it, but it will help you understand some of the more sophisticated features of the 2XS.

THE MOST IMPORTANT INSTRUCTION OF ALL. Fill out the Warranty Card! It is critical that you keep your invoice or sales slip, since it is your proof of purchase should anything happen to your 2XS.

MOUNTING. The 2XS can be mounted in many parts of the car, depending on the vehicle's configuration. Inside the dash, under a seat and in the trunk are possibilities in descending order of distance from the head end. Use 100% shielded cables for the best results. Wherever you mount the 2XS take the following into consideration.

- Don't mount it near heaters or other places where it will get really hot.
- The mounting location must be safe from water seepage.
- The 2XS must be firmly mounted to the car. This protects connections from breakage and stress as well as the possibility of it becoming un-attached when you blast over a speedbump sometime.
- Analyze the potential location carefully to make sure that mounting holes won't pierce a gas tank, gas/brake/or electrical lines.

The 2XS has been designed with very high quality parts and in a manner which reduces mass-related circuit board stress (a typical failing of a lot of car gear).

Still, all electronics have a limit to environmental stress. So no fair mounting it to the front bumper or under the oil pan.

AUDIO WIRING. The idea is to minimize potential interference and noise. That means good quality 100% shielded audio-type cables. Since the 2XS has a very low output impedance (150 ohms), cable noise pick-up OUT of the 2XS should not be a problem.

However, the deck that feeds the 2XS most likely has a medium output impedance (2K to 10K ohms) and long cable lengths can be a problem. That's why we suggest mounting the 2XS as close as possible to the head unit. The cables going from the deck to the 2XS must be the best you can get. Not cheapo stranded shield with 80% shielding. Try to hold out for the trusty 100% shielding to cut noise in this critical run.

POWER WIRING. The 2XS's +12 volt and ground (-) connections should be made with 18 gauge wire or better. Use spade lugs and a crimper.

NOTE: As always, you should disconnect the negative terminal of the car's battery before working on electrical connections. Unless you want an extra tingle in your day.

USE A SINGLE GROUND POINT THAT YOU KNOW IS COMMON WITH OTHER GROUNDED PARTS OF THE STEREO SYSTEM. MAKE THE CONNECTION WITH NO LESS THAN 18 GAUGE MULTI-STRANDED WIRE.

Keep in mind that the entire car is NOT one perfect ground. Even slight resistance can cause problems.

OUTPUT LEVEL CONTROLS. These controls provide two useful functions. First they allow the overall balance between hi output and low output level - which is especially useful when the power amps do not have input

level controls or when only a hi and low sensitivity switch is provided. Second they can provide extra gain or loss if needed. Some head units have very weak output levels - in this case both controls can be operated on the hi side of "0". If the output is extremely high as in the output of a head unit with speaker output level only you can operate the controls on the low side of "0" to match hi/low balance as well as to match overall levels to the power amps.

CROSSOVER FREQUENCY SELECTION

We recommend that a crossover frequency be based on the design criteria of the midrange and tweeter. A 2-way system with 8" for low to mid and 2" dome tweeters would be determined by the tweeter's nominal frequency specs and power handling. The higher you cross over a tweeter, the higher the reliability when you decide to crank the volume full.

In short, design for the system, not the woofers alone. We designed the 2XS with a fixed but PROGRAMMABLE crossover. This is the most reliable and accurate design. It will not change frequency over time and that is important.

We have provided the 2XS with a 90Hz module ALREADY PLUGGED IN. This is a common subwoofer/dedicated woofer crossover point.

MAKING YOUR OWN CROSSOVER FREQUENCY. We have also provided you with a chart of resistor values needed for whatever crossover point your particular system will need. Access to the crossover module is through the round access cover on the top of the 2XS. NOTE: The resistors used must be AT LEAST FIVE PERCENT TOLERANCE CARBON OR METAL FILM.

If you don't want to make your own crossover module, see your dealer as he probably has an Audio Control Module Kit and will sell you other modules at a modest charge. If you need a crossover frequency not listed here, use the following formula to calculate the resistor.

$$\text{RESISTOR (ohms)} = \frac{7234315.59}{\text{Frequency}}$$

CROSSOVER FREQUENCY	RESISTOR VALUE
72Hz	100k ohms
80Hz	91k ohms
88Hz	82k ohms
96Hz	75k ohms
117Hz	62k ohms
129Hz	56k ohms
142Hz	51k ohms
153Hz	47k ohms
168Hz	43k ohms
185Hz	39k ohms
212Hz	34k ohms
220Hz	33k ohms
241Hz	30k ohms
268Hz	27k ohms
300Hz	24k ohms
328Hz	22k ohms
361Hz	20k ohms
401Hz	18k ohms
750Hz	9.6k ohms
1000Hz	7.2k ohms
1500Hz	4.8k ohms
2000Hz	3.6k ohms
2500Hz	2.9k ohms
3000Hz	2.4k ohms
3500Hz	2.1k ohms
4000Hz	1.8k ohms

SUBSONIC FILTER: WHAT AND WHY.

Subsonic frequencies are below the level you hear, below 20 Hertz. You don't need them. They rob amplifier power, can cause speaker damage and may cause inter-modulation distortion. All of these are very bad for a high fidelity sound system. If you can see very slow woofer cone flutter, subsonics are present. The 2XS includes a sharp 18dB/octave subsonic filter to cut off these inaudible and problem causing frequencies. With a subsonic filter, the bass response will sound more solid and the mid-range may even open up as the amplifier is not working so hard.

POWER SUPPLY SPECIAL FEATURES

The 2XS has a special power supply to operate in the difficult, real world electronic environment called a car. The 2XS is completely isolated so it can reject electronic trash thrown its way by either the car system or other elements in the stereo system, particularly amplifiers. The result is very quiet operation and another common car stereo system headache gone.

A HONDA IS NOT A BUICK; OR WHY TO PERFORMANCE MATCH_{TM} YOUR SYSTEM.

The 2XS is one component in the Audio Control_{TM} Performance Match_{TM} line designed to extract "killer" performance from your car stereo system. Basically, there are real world barriers to good auto sound such as the fact that doors and trunks rarely make good speaker boxes. Audio Control Performance Match products, like the 2XS, EQX and EQL allow you to adjust or "voice" components to the specific acoustics and components of your stereo system whether it is a small Honda or a larger Buick. The result is, as one warranty card stated, "A dream come true."

For more information on automobile acoustics, mail us a stamped, self-addressed envelope and we will mail you a copy of a technical paper titled, "The Effect of Car Acoustics on Automobile Sound Systems - The Problem and a Solution" by Rick Chinn. This is a very informative paper and we highly recommend reading it.

THE AUDIO CONTROL 2XS LIMITED WARRANTY

People are scared of warranties. Lots of fine print. Lots of noncooperation. Months of waiting around.

Well, don't be scared of this warranty. It's designed to make you rave about us to your friends. It's a warranty that looks out for you and helps you resist the temptation to have your friend "who's good with electronics" try to repair your Audio Control 2XS. So go ahead and read through this warranty, then enjoy your new component for a few days before sending in the warranty card and comments.

"Conditional" doesn't mean anything ominous. The Federal Trade Commission tells all manufacturers to use the term to indicate certain conditions have to be met before they'll honor the warranty. IF you honor these conditions, we will warrant all material and workmanship on your 2XS for ONE YEAR from the date you bought it, and will fix or replace it, at our option, during that time.

Here are the conditions that make this warranty conditional:

1. You have to fill out the warranty card and send it to us within 15 days after you purchased your 2XS.
2. You must keep your sales slip or receipt so you have proof when and where you bought your 2XS. We're not the only company to require this, so it's a good habit to get into with any stereo purchase.
3. Your 2XS has to have been originally purchased from an authorized Audio Control dealer. You do not have to be the original owner to take advantage of the one year warranty, but the date of purchase is still important so be sure to get a copy of the sales slip from the original owner.
4. You cannot let anybody who isn't; (a) The Audio Control Factory; (b) An authorized service center; or (c) someone authorized in writing by Audio Control service your 2XS. If anyone other than (a), (b), or (c) messes with your 2XS, that voids the warranty.
5. The warranty is also void if the serial number has been altered or removed, or if the Audio Control 2XS is used improperly. Now, that sounds like a big loophole, but here is all we mean by it. Unwarranted abuse is: (a) Physical damage (our mobile products are not meant to be used as jack stands for your car); (b) Improper connection. We have done the best we can to protect the inputs; however, 120 volts into jacks can fry the innards of the poor beastly. (c) Sadistic things. This is the best mobile product we know how to manufacture, but if you use it for the front bumper of your Baja bug and get it full of water and dirt, things will go wrong.

Assuming you conform to numbers 1-5, and it isn't all that hard to do, we get the option of deciding whether to fix your old unit or replace it with a new one.

LEGALESE SECTION.

This is the only warranty given by Audio Control. This warranty gives you specific legal rights which vary from state to state. Promises of how well your 2XS will work are not implied by this warranty. Other than what we've covered in this warranty, we have no obligation, express or implied. Also, we will not be obligated for direct or indirect consequential damage to your system caused by hooking up the Audio Control 2XS.

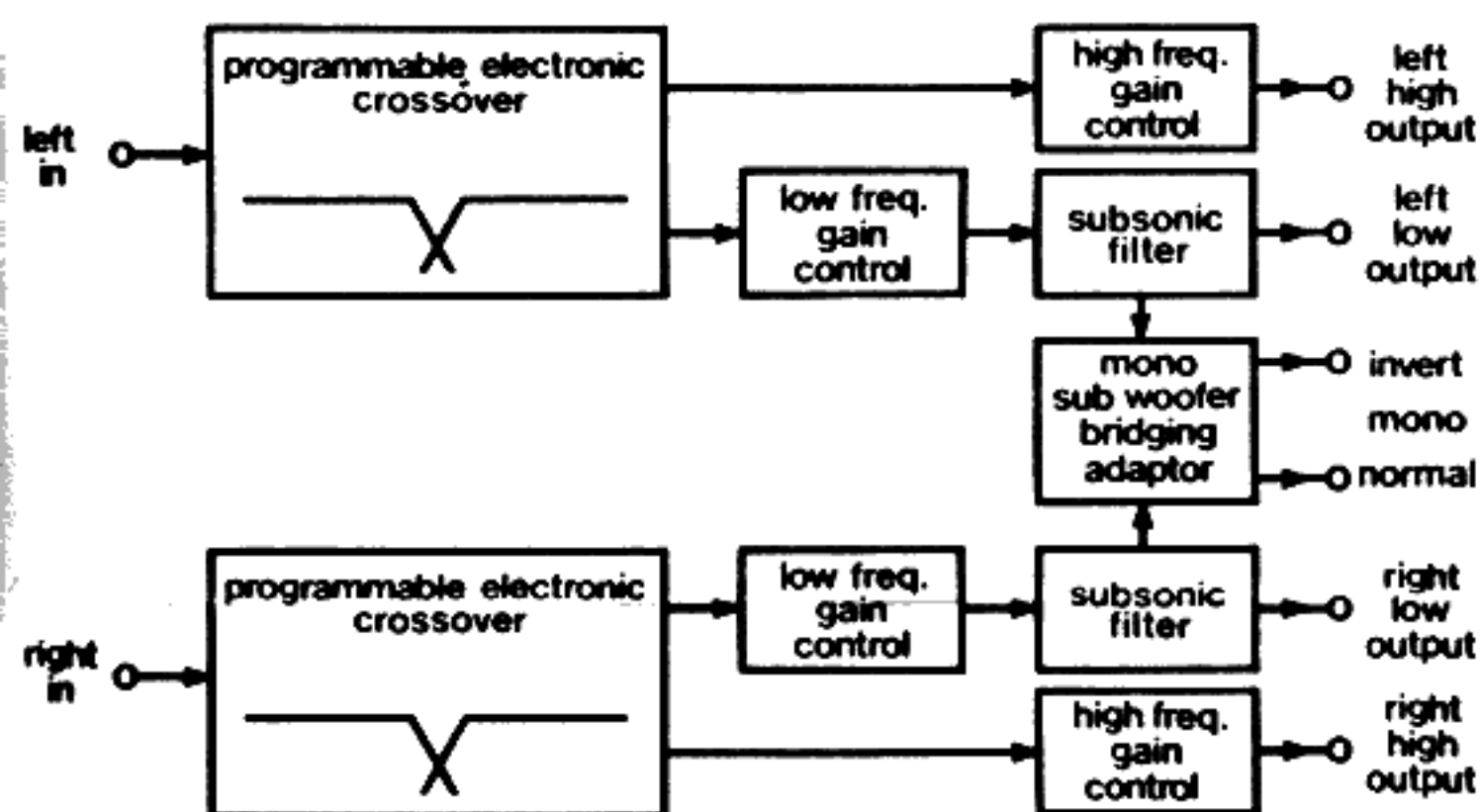
Failure to send in a properly completed warranty card negates any service claim.

2XS SPECIFICATIONS

Input Impedance	20k ohms
Output Impedance	150 ohms
Signal to Noise Ratio (rated full output)	-119dB
Total Harmonic Distortion (25Hz-20kHz)	0.005%
Maximum Output Level	7.0 Vrms
Output Gain	±12dB
Frequency Response	25Hz-20kHz; ±1dB
Power Supply	Triple Isolated transformer balanced DC to DC converter
Size	1.4"hx5.61"x4.5"w
Crossover Slope	18dB/Octave
Crossover Frequency	Programmable*
Subsonic Filter	18dB/Octave at 20Hz
Country of Origin	U.S.A.

*While the crossover comes pre-set at 90 Hz, it can be programmed for almost any frequency from 20 Hz to 20,000 Hz.

2XS BLOCK DIAGRAM



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Specification subject to change without notice.



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