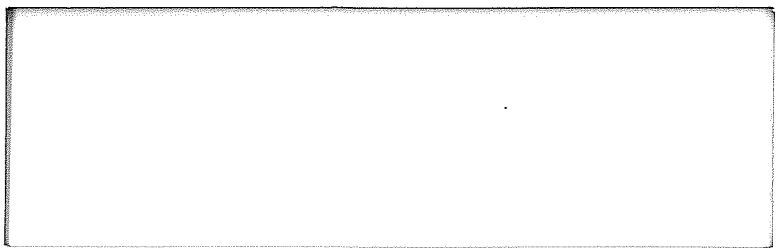
# EQQ tm

## 4-CHANNEL EQUALIZER/PRE-AMPLIFIER

OWNER'S INSTALLATION MANUAL AND
CONSCIOUSNESS COURSE

AudioControl™



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22313-70th Avenue West • Mountlake Terrace, WA 98043 USA
Phone (206) 775-8461

**Congratulations** on buying a truly unique car stereo enhancement. It will give you countless hours of improved autosound performance. For those of you who don't want to hike through a whole manual, we've begun with "Express -- Can't Wait" instructions. But if you're not entirely familiar with car stereo installation, or just want to learn exactly how the EQQ fits into your system, please take a few minutes to read this whole manual. First, here's what you can expect from your EQQ.

• **Car acoustic problems solved.** Car interiors vary widely in size and acoustic make-up. So do doors and trunks which create speaker enclosure volumes that contribute significantly to the sound of speakers. Not to mention the literally thousands of different types of speakers available. Or all the different placements which are possible. It's mind- (and ear-) boggling. The EQQ gives you a way to compensate for these and other problems to optimize the sound of your overall system.

• **Component line level incompatibilities eliminated.** Unlike home stereo systems, there are no exact standards for car stereo input/output levels. Few car stereo amplifiers are equipped with more than 2-way "hi/low" input controls. And cassette/receiver output levels vary all over the map. The result is often improper level matching which can result in excessive noise or distortion. Now you have the control to provide a perfect balance and signal-to-noise ratio.

• **Better use of powered and even "high-powered" decks.** Because of the tremendous range of input levels which each section of the EQQ can handle, you can now tame speaker outputs into refined line level sources. Decks with no preamp outputs, or just one preamp output can be easily used as line level sources for two external power amps.

• **Tremendous sound control.** Twelve bands of equalization including five HALF-octave bands for precise bass control and seven octave bands. For each of FOUR channels! All engineered into a compact, rugged chassis.

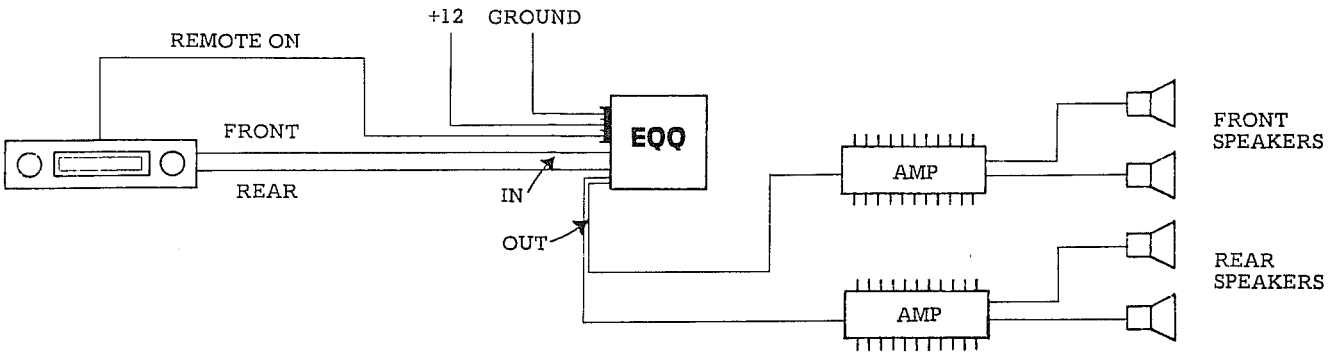
• **Better use of your fader.** Front speaker systems are often far different than rear systems. Ever used a fader and had the sound QUALITY change radically along with the song balance? Not any more. Because the EQQ is connected to both "sides" of the fader control, you can achieve smoother transitions than ever before -- even with powered decks or ones with just one preamp output.

• **Highest quality.** Your EQQ is built in Mountlake Terrace, Washington near Seattle. Our Performance Match series has regularly won many coveted industry awards for design and engineering excellence.

• **Envious friends.** Even if they have an IDENTICAL system (not to mention one they paid more than you did for), you can count on your system sounding better. Because even the finest custom system can sound much better with the addition of the EQQ.

## ULTRA-FAST, CAN'T WAIT HOOK-UP DIAGRAMS.

For professional installers or brave, anti-manual types, here are two "express" diagrams. The EQQ goes between the deck and power amplifiers. More hook-up diagrams appear on PAGE 9, 11, 13.



## GETTING TO KNOW YOUR EQQ.

The Audio Control EQQ is a compact, audiophile-grade, line level sound processor. It contains 2 separate sets of LEFT/RIGHT stereo channels, each of which has: A 5-band half-octave bass equalizer, 7-band upper frequency octave equalizer, input/output level matching circuits. In short, a solution for many previously unsolved problems often encountered in car stereo systems. While it may seem designed only for head-ends (that's an installer's term for your cassette/receiver or cassette/tuner) with TWO pre-amp outputs, it can also be used with head-ends that have just one pre-amp output or even powered decks with NO pre-amp outputs.

**INPUTS.** On one end of the EQQ, you'll see two sets of RCA-type audio inputs like the ones on the back of home stereo components. These will be connected to the inputs from your head end.

**INPUT LEVEL CONTROLS.** On the face of the EQQ are two sets of knobs and two small, red LED's. These control the volume of the signal coming from your head end pre-amp outputs. They are one of the major features of the EQQ. You use them in conjunction with the LED's to adjust the output level of your head-end to match the EQQ's internal equalization circuitry. A special variable gain amplifier allows astonishing variation in drive signal without ANY overload distortion. -- Even from high powered decks!

**SUBSONIC FILTER.** If you think cone flutter caused by subsonic (ultra-low) frequencies is only caused by turntables and warped records, you haven't watched high-powered car subwoofers closely. For a variety of reasons, distortion-causing, power-robbing subsonics can find their way into a car system, too. (Especially if you made a tape from a record). The sharp 18dB/octave subsonic filter in the EQQ cops off these inaudible frequencies without affecting low bass. However, there IS a switch to remove this feature from the signal path.

**EQUALIZER SECTIONS.** Ever seen so many knobs packed into such a tight space? Most of this bewildering array are precision half-octave and octave equalization controls. They correspond to the "sliders" on a home equalizer. Each knob is essentially a tone

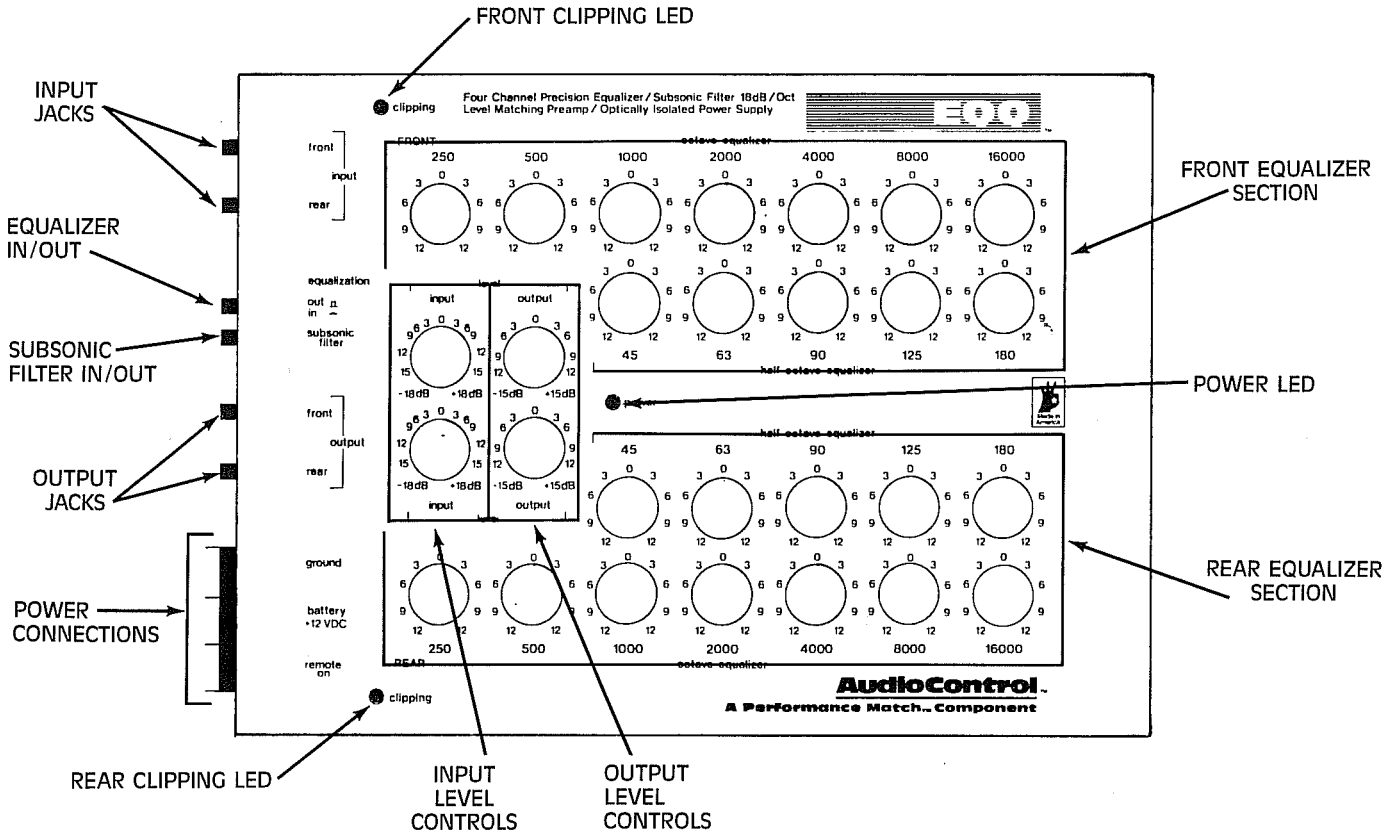
control, devoted to an individual part of the frequency spectrum. Each can then be adjusted more accurately for better control of acoustics and sound source. Don't panic just because of the sheer numbers of possible adjustments. It does not take a "golden ear" or tons of test equipment to use these equalizer controls. Just common sense, patience and your own musical tastes.

**EQUALIZER IN/OUT SWITCH.** This is used during installation to let you compare the effects of the EQQ versus no equalization. The switch is left IN once you have made the best settings.

**LEFT AND RIGHT OUTPUT JACKS.** Next to the input sockets are four output jacks. These will be connected to your power amplifiers and/or electronic crossover.

**OUTPUT LEVEL CONTROLS.** Power amplifiers are very choosey about their input level. Unlike home stereo amps which receive input signals at standard line level, autosound amps have to put up with the varying outputs found on head end units. If this input is too low, you'll hear excess noise through your speakers and the amp won't work up to its potential. If the input is too high, the amp can be overdriven and produce internal distortion. There's another annoying problem, too. With the wrong input level, a power amp can reduce your ability to use the head end volume control. Just a slight rotation of the volume takes you from no sound to too loud. While some amps have simple two or three-way level adjustments, the only precise solution is the EQQ. With the output level controls, gain can be set so that a mid setting on your volume control is truly mid volume in relation to the power amplifier's abilities.

**POWER.** On the same side of the EQQ is a terminal strip with screws set in it. This is where you connect the +12 volt and ground connections which power the EQQ. The third terminal is for remote turn-on of the EQQ. It connects to a special output from the head-end or the power antenna lead and allows you to activate the EQQ simply by firing up your tape deck or tuner.


FRONT CLIPPING LED
INPUT JACKS
EQUALIZER IN/OUT
SUBSONIC FILTER IN/OUT
OUTPUT JACKS
POWER CONNECTIONS
REAR CLIPPING LED
INPUT LEVEL CONTROLS
OUTPUT LEVEL CONTROLS
FRONT EQUALIZER SECTION
POWER LED
REAR EQUALIZER SECTION
clipping
Four Channel Precision Equalizer / Subsonic Filter 18dB / Oct
Level Matching Preamp / Optically Isolated Power Supply
front
input
rear
equalization
out
in
subsonic filter
front
output
rear
ground
battery +12 VDC
remote on
clipping
FRONT
REAR
250
500
1000
2000
4000
8000
16000
45
63
90
125
180
input
output
-18dB
+18dB
-15dB
+15dB
octave equalizer
half octave equalizer
AudioControl
A Performance Match... Component

## STEP-BY-STEP INSTALLATION INSTRUCTIONS.

**IMPORTANT DECISION TIME.** Do you install the EQQ yourself or have an installer do it? Actual installation of the EQQ is relatively simply for moderately handy people. However, ADJUSTMENT of the EQQ can be quite complex due to its 4-channel nature. For the best possible performance, we recommend that you have the final EQQ adjustments done by an Audio Control Performance Match dealer equipped with a third-octave analyzer. If you opt for installing it yourself, but having an expert adjust it, skip to the MOUNTING AND WIRING section. If you're willing to trust your ear, the following are step-by-step instructions for the adjust-it-yourselfer.

**AN OVERVIEW.** In the immortal words of the Hitchhiker's Guide to the Galaxy, "DON'T PANIC." The next few pages of this manual may seem to contain an awful lot of instructions, but that's mostly because we've broken the installation procedure down into more basic, understandable steps instead of glossing over things. After nagging you to fill out the warranty card and file your receipt, the instructions are divided into several sections.

**1. Temporary installation & level adjustments.** The only way to properly adjust your EQQ is to be sitting inside the vehicle with the doors shut. Thus, we first have you do a temporary installation with all connections in place, but with the EQQ where you can get at it, hopefully in your lap. We make the assumption that you are installing the EQQ using a head end with two pre-amp outputs and are using two power amps. Refer to the hook-up diagrams farther on if you are using electronic crossovers and then follow the instructions anyway.

**2. Equalizer adjustment.** You do this after the temporary installation.

**3. Final permanent installation.** After you've made all adjustments, it's time to actually nail the EQQ down in its final resting place. (Don't use nails, though unless you're driving a rare 1951 Firehauser plywood car).

## A. The Most Important Instruction Of All!

Fill out the WARRANTY CARD and mail it in! It's also critical that you keep your invoice or sales slip to establish the date when you purchased your EQQ, and hence your Limited Warranty. It's also good insurance proof should a bass-loving car thief take a fancy to your system. Insurance companies are notably reluctant to believe something as esoteric as the EQQ was part of a system, since it doesn't fall into any of their little pre-defined niches the way decks, amps and speakers do.)

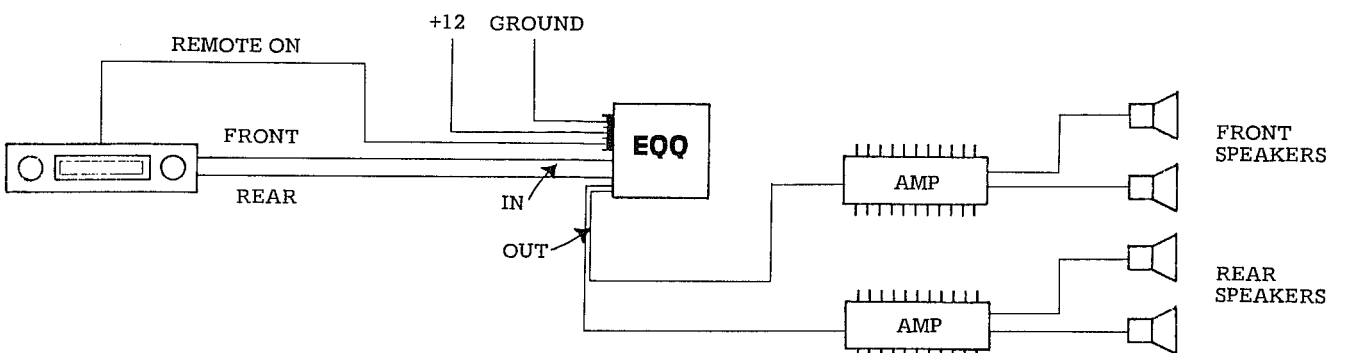
## B. Temporary Installation.

You'll need the following: 4 sets of EXTRA-LONG RCA-type patch cords. 2 sets should be long enough to reach from the passenger compartment to the head end unit. The other 2 must reach from the passenger compartment to the power amplifier. Power wires for connecting the EQQ to +12 volts and common ground. These should also be long enough to reach into the passenger compartment. We recommend 16-gauge or thicker. Screwdriver for connecting power wires to the EQQ. Crimper and spade lugs for the ends of the power wires. Cassette tape of well-recorded music containing a good mix of low bass, midrange and treble. Even if you're a classical music fan, we suggest using a pop or rock tape for adjustment purposes. Okay, here goes. Make sure to check off each instruction after you have done it. And remember, you can always chicken out and have your Audio Control dealer install and/or adjust it.

☐ 1. Install the deck, power amplifiers and speakers according to their instructions. Don't you wish the people who wrote THOSE manuals had our twisted sense of humor? Don't answer that. AT THIS POINT, DETERMINE WHICH OF THE FOLLOWING TYPES OUTPUTS YOUR HEAD-END UNIT HAS: A. 2 pre-amp outputs. B. 1 preamp output and 1 or more sets of speaker outputs. C. Speaker outputs only. If this is the case, check the owner's manual to determine the power output of the unit.

IF YOUR DECK HAS 2 PRE-AMP OUTPUTS, CONTINUE. IF NOT, READ PAGES 18-19 ON POWERED DECKS BEFORE PROCEEDING WITH STEPS 2-4.

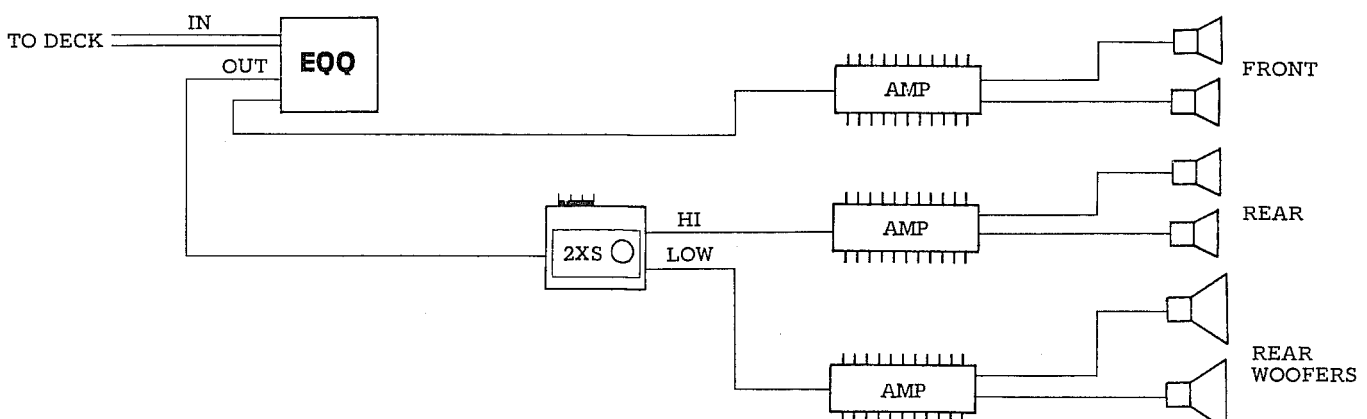
☐ 2. Locate the two sets of pre-amp outputs on the cassette/receiver or cassette/tuner.
☐ 3. Connect a set of patch cords to each set of head end outputs.
☐ 4. Connect the other ends of both sets of patch cords to the EQQ's inputs. Make sure to keep track of which set of patch cords came from which head end pre-amp output. Many decks are marked FRONT and REAR. If they're not, just keep track of each by marking them with a piece of tape close to where they plug into the EQQ.
☐ 5. Using a crimper, attach spade lugs to two lengths of 16-gauge wire.
☐ 6. Disconnect the negative terminal of the car's battery. Unless you want a little extra tingle in your day.



☐ 7. Attach one length of wire to a +12 volt source and the other to a common ground (we cover this more in depth later on).
☐ 8. Connect the other ends of the +12 and ground wires to the proper terminals on the EQQ. Since the power wires are probably going to be a different length in the final installation, you don't have to terminate the temporary ends with spade lugs if you don't want to. Just twist all the conductors on each wire into a tight spiral and make sure no stray strands are sticking out.
☐ 9. Also run a short length of wire from the EQQ's +12 VOLT terminal to the adjacent REMOTE ON terminal. This will trick the EQQ into turning on during the temporary installation.
☐ 10. Reconnect the car's negative battery terminal.
☐ 11. Set all EQQ equalizer knobs to 0dB (flat). Also make sure that any tone controls on the head end unit such as bass, treble or loudness controls are set flat or turned off.
☐ 12. Set the head end unit's LEFT/RIGHT and FRONT/REAR balance controls to their center settings. IF YOU ARE USING A POWERED HEAD END, CONSULT PAGE 18.
☐ 13. Set the EQQ's level controls to 0.
☐ 14. Play a music tape and turn the tape deck's volume control 3/4 of the way up. (We refer to this setting as "3 o'clock," assuming that zero volume is at 6 o'clock and "all the way up" is at 5:59). Naturally, you won't hear anything because no connections have been made from the EQQ to your amplifiers or speakers.
☐ 15. Locate the two LED's on the top of the EQQ.
☐ 16. Now rotate one set of EQQ input level controls until the corresponding LED is blinking on regularly. By that we mean, it's staying on almost all the time.
☐ 17. Now turn down both of these input controls JUST SLIGHTLY until the LED is flickering irregularly, say once a second.
☐ 18. Repeat steps 16 & 17 for the other input level control and corresponding LED. You have now adjusted the EQQ for correct input levels.
☐ 19. Eject the tape.
☐ 20. Connect the EQQ's outputs to your power amplifiers. If you're keeping track of the two sets of pre-amp outputs, make sure that the correct EQQ output is connected to the correct power amplifier. Consult the amplifiers' owner's manuals to determine if they have input level adjustments. If they do, set each for between .8 volts (800mV) and 1 volt (1000mV) sensitivity.

☐ 21. Shut the car's doors and windows and turn the tape deck volume control ALL THE WAY OFF. Now insert the music test tape again.
☐ 22. Rotate the cassette deck's FRONT/REAR balance control all the way to the FRONT.
☐ 23. Turn the volume control up 3/4 of the way (3 o'clock). Hopefully, you'll hear music coming from your front speakers.
☐ 24. Adjust the corresponding EQQ OUTPUT level control until the sound is LOUD but just below clipping (audible distortion).
☐ 25. Now rotate the cassette deck's FRONT/REAR balance control all the way to the REAR and repeat step 23.

☐ 26. Next set the FRONT/REAR balance control in the center detente position and listen to the overall sound balance. If you're hearing too much front or rear speaker system, re-adjust the EQQ until the sound is pleasantly balanced between front and rear.
☐ 27. Now turn the head end's volume control ALL THE WAY OFF. Listen for hiss from the speakers. If large amounts are present, reduce BOTH sets of EQQ OUTPUT adjustments slightly until none is present. You are now done with the input and output level adjustments. Take a walk. Raid the 'fridge. Catch your breath.



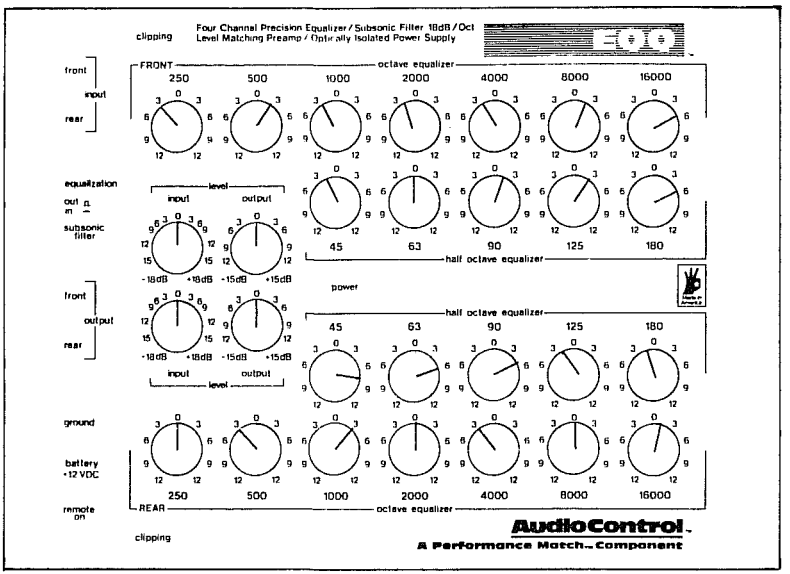
## C. Equalizer Adjustment.

Here's where your ears and tastes in sound come in. There is no Correct Way to set the EQQ's equalizer section. Some people want thudding bass. Others want "flat" response (whatever that means). Make sure that you use a tape which is familiar to you and represents the type of music that you will be playing regularly.

☐ 1. Insert the test tape and turn up the head end volume control to 3 o'clock. This should be loud, but not unpleasantly so. If it hurts your ears, re-adjust the EQQ's output level adjustments.
☐ 2. Listen to the music. Does it sound boomy? Is the bass weak? Do vocals and instrumentals sound harsh or overbearing in relation to bass and treble? Each of these factors is controlled by different knobs on the EQQ.
☐ 3. Press the EQUALIZER IN/OUT switch to IN.
☐ 4. Make sure that the head end's FRONT/REAR balance control is set in the middle.
☐ 5. Listen for frequency ranges which sound exaggerated, usually those in midrange and 90-250 Hz regions. Adjust both sets of EQQ frequency controls in these areas and frequently flip the EQ IN/OUT switch back and forth to compare the equalized sound with the un-equalized input.
☐ 6. Next listen for and boost frequency ranges which sound weak in relation to the overall sound. Almost always, 45 and 63 Hz need lots of increase simply due to the design limitations of cassettes and woofers.
☐ 7. Chances are, your rear speaker system puts out more bass than your front system. It is important to fine tune both front and back individually as well as together (now you're starting to see why we gently hinted that an electronic third-octave analyzer is handy). Temporarily turn the head end's FRONT/REAR balance control all the way to the FRONT and make any obvious adjustments using regular IN/OUT comparisons. Repeat this for the all-REAR fader position.
☐ 8. Return the fader to its center detente position and check the overall balance again. After many IN/OUT comparisons, when the sound is as good as you think you can get it, draft a Fearless Assistant and go for a drive. With the Fearless Assistant at the wheel, listen to the overall sound, now combined with road and engine noise. Make additional adjustments if necessary. Hints: In equalizer adjustment, it is not uncommon for the 90, 120 and/or 180 Hz bands to be cut quite a

bit. Nor is it odd for the 45 and 63 Hz controls to be boosted a lot. Generally, most of the other controls should not be boost or cut much more than 3-5dB. In all cases, the overall "curve" should be centered around 0dB. That is, at least SOME controls should be set near 0dB. Otherwise, the overall curve will affect the overall level of the system and create ripples in the response pattern. The following is a suggested starting point for your adjustments.

If you want to fine tune your system even further, we suggest returning to your Audio Control Performance Match dealer who has test equipment which can optimize the system's sound.



## D. Mounting And Wiring.

**Placement.** Theoretically, you can place the EQQ anywhere that it can receive power. The two most convenient places are under the seat and in the trunk. If possible, we suggest you mount it close to the power amplifier(s), for ease of connecting power and remote power-on wires. If this means trunk mounting, be sure to read the stiff lecture on cable quality, since interference can be induced over the long cable run between deck and EQQ. Needless to say, make sure you can get at the power, equalizer knobs and inputs and outputs. While the EQQ has been designed with very rugged parts, and engineered in a manner which reduced physical circuit board stress, be sure to consider the following guidelines:

- Avoid mounting the EQQ near a heater, in front of the firewall or anywhere else where it can get really hot.
- The mounting location must be safe from water seepage. Lot of trunks have seal problems. Check for old stains or moisture before settling on a permanent site for your EQQ.
- Make sure the EQQ can be firmly mounted without excessive vibration. This protects connections from breakage and stress as well as the possibility of it coming UN-attached when you blast over a speed bump.
- Avoid any location where mounting screws may potentially pierce a gas tank (lots of which are in the vicinity of the trunk), gas, brake or electrical lines.

Type of wire for power connections. Both +12 and ground (-) connections to the EQQ should be made with multi-stranded wire no smaller than 16 gauge. The remote turn-on connection between power amp and the EQQ can be made with thinner wire.

**Type of interconnects for audio connections.** It is extremely important to use high quality co-axial stereo hook-up cables for the wiring between the head unit, the EQQ and your power amplifiers. Intense electromagnetic fields are generated in an automobile which can be picked up by car stereo wiring. The increased low level wiring present when using electronic signal processing and powerful amplifiers increases the chances of creating an "antenna" which feeds this interference directly into your speakers. There it can compete with your music as audible clicking, whining, ticking or buzzing. Theoretically, all RCA-type co-ax cables (like the ones you use to hook up your home stereo) are shielded to prevent interference.

Unfortunately, cheapoid cables skimp on external shielding, since interference is not a problem in most home hi-fi hook-ups. Avoid the temptation to simply use "that old set of patch cords that came with my receiver" or super-cheap cables sold as accessories in TV or hardware stores. Consult with your Audio Control dealer to obtain high quality, well-shielded cables with securely fitting male connectors on each end. For installations such as the "gonzoid system" example, you might even consider use of special audiophile hook-up cables specially designed for high-end autosound use. Remember, it's better to invest in good cables before installation, rather than try to trace interference once inferior cables are buried deep in your car's interior.

**Audio wiring placement.** Unlike speaker cables, which can be routed directly next to existing car wiring, we also recommend that you route line level (coaxial) wiring between the head end unit and the EQQ away from car wiring, amplifier power supply cables or speaker wires if possible. This will help avoid induction problems, especially when you're running cables from the head unit all the way back to the car's trunk. Also keep connections between the EQQ and power amplifiers as short as possible to further minimize noise problems.

**Mounting.** The EQQ installs just like a power amplifier, secured by four screws and lock washers through the four slots in the unit's base. You will need:

- Screwdriver
- Pencil or other marking device
- Power drill and bits, one of which should be just under the diameter of the mounting screws.
- Crimper and spade lugs

Clear the area of impressionable children and maiden aunts who may react to colorful language.

☐ 1. First place the EQQ in its mounting position and mark the four screw holes. Try to keep them to the outsides of the slots if possible.

☐ 2. Now remove the EQQ and drill four small pilot holes. This will insure accuracy and guard against stripping out the larger holes to come.

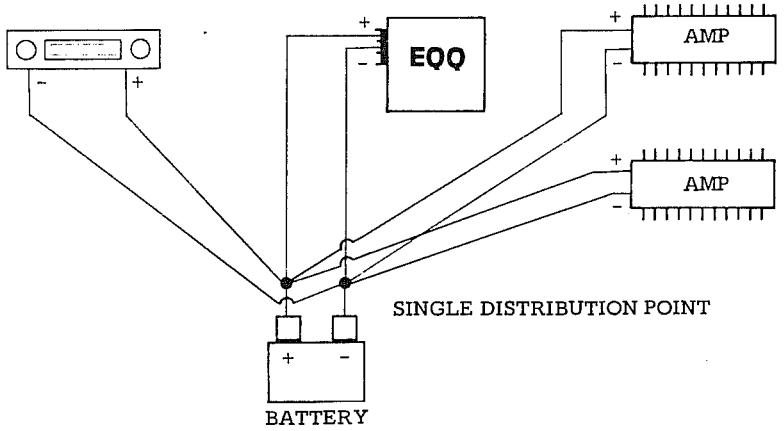
☐ 3. Next drill larger holes on size smaller than the sheet metal mounting screws.

☐ 4. Replace the EQQ and secure tightly with four sheet metal screws and lock washers.

☐ 5. Again, disconnect the car's negative ground connection from the battery. The hook-ups most open to interpretation and possible problems are the power and ground connections. Remember the lecture on using cables with good metal shielding so that they can protect your system from electro-magnetic interference? The metal enclosures on the wires connected to the EQQ's inputs and outputs can act as a shield only when they are properly connected and grounded.

**The Incredibly, Mind-Boggling, Earth-Shaking, Noise-Reducing Importance of Star Ground & Power Connections.**

Sounds like a science fiction movie, doesn't it? Actually, it's the only recommended method of +12 & negative ground connection. We'd chisel the following in stone, except that it would make the manual weigh too much: For best protection from noise, there should be ONE AND ONLY ONE path each from ALL your car stereo components to the positive and negative side of your vehicle's electrical system.



For power connections, it means running individual +12 volt wires for EACH component to the + side of the battery. If you don't the result is like flushing a toilet while you're in the shower. With ground connections, it means hooking the ground (negative) terminals of the head unit, EQQ, and power amplifiers together as shown above and routing that common heavy gauge ground wire to some place you're SURE is actually part of the negative side of the car's electrical system. The nearest piece of bare metal isn't necessarily a true ground. If you're in doubt, connect the car stereo system's star ground system directly to the battery's negative terminal or where the battery's negative grounding strap contacts the vehicle frame.

☐ 6. After tattooing the previous lecture into your brain, terminating power wires with spade lugs and connect the +12 VOLT and GROUND connections to the EQQ in the correct manner.

☐ 7. Locate the remote turn-on terminals on both the EQQ and one of your power amplifiers. Using short wires, connect the EQQ REMOTE TURN ON terminal to the power amplifier. If the EQQ is located closer to the head unit, you can run a wire from the deck's remote turn-on/power antenna wire to the EQQ.

☐ 8. Check over all 16 audio connections, making sure that left and right polarities have been maintained and that both preamp outputs have been routed to the correct power amplifiers. Also check out the power wiring one more time.

☐ 9. Re-connect the car's negative-to-ground connection.

☐ 10. Power up the entire system, pop in a cassette and check out the results.

You're now done with the installation and adjustment process!

## SECURITY COVER.

A steel "security" cover is available for the EQQ which completely covers all of the top controls. This was originally requested by professional installers as a means to keep folks from fiddling with their careful adjustments. But it's also useful when you've made your own adjustments. Although we have designed the EQQ to be very grunge-resistant, the cover affords further protection from dust and moisture. It also keeps other prying fingers from the unit and looks nifty. Consult your dealer.

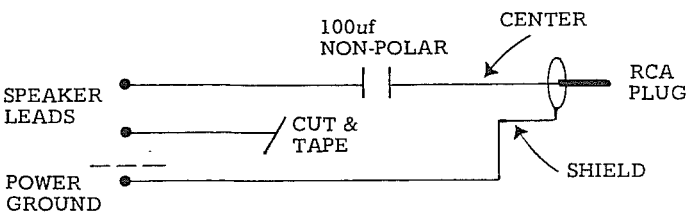
## SPECIAL INSTRUCTIONS FOR POWERED DECKS.

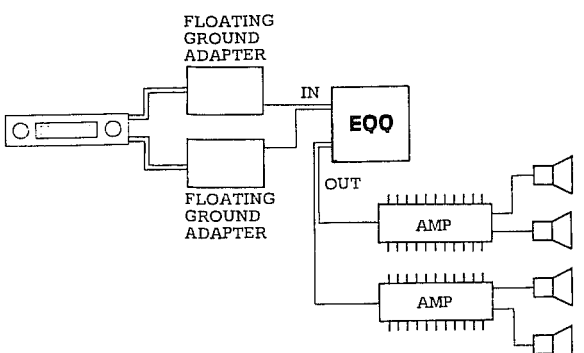
Using the EQQ with internally powered head ends isn't that difficult. Its outputs will be converted to "line level" by the EQQ and then routed to front and rear power amps. Some powered decks also have a pre-amp output. It is important to determine whether the deck's fader control has any effect on it. If the deck "fades" between the power and the pre-amp outputs, then use the instructions below only for the speaker outputs. The line level pre-amp output can be connected directly to the EQQ. If your deck has both front and rear speaker outputs, follow these instructions for each:

☐ 1. Determine whether the output is floating or grounded. This will require a simple ohm meter. If the negative speaker lead measures less than 50 ohms to the decks power ground wire, it is a grounded type.

☐ 2. FLOATING GROUND ADAPTOR -- If the output of your powered deck is floating, connect a floating ground adaptor (available from your Audio Control dealer) to each speaker lead. Or, you may make your own using a non-polar 100uf capacitor and RCA plug for each positive speaker lead.

☐ 3. Put electrical tape over the ends of negative speaker wires, since they will not be used.
☐ 4. GROUNDED SYSTEMS ONLY -- Connect your RCA cables directly to the speaker output wires of the deck. The positive (+) lead connected to the center of the RCA jack.
☐ 5. Now connect the RCA plugs to the EQQ input jacks as per the hook-up instructions on PAGE 9. Also connect the EQQ outputs to your power amps.



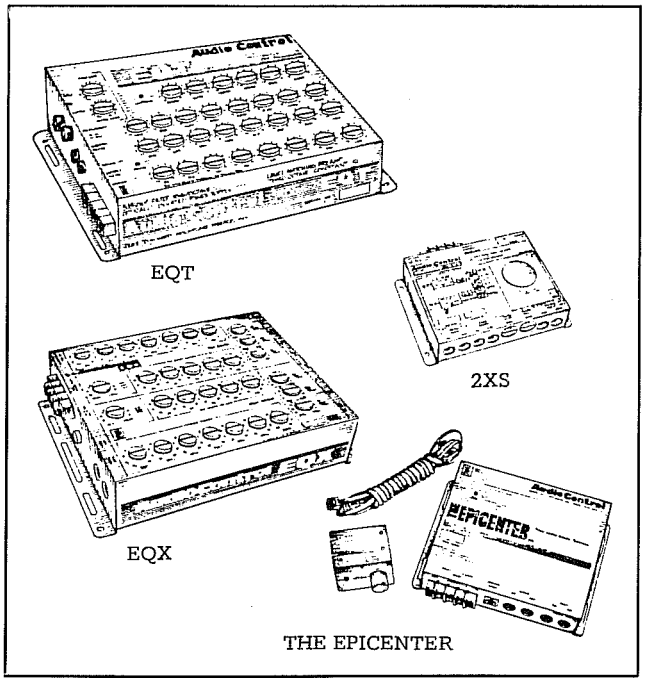

☐ 5A. If your deck has front AND rear speaker outputs and no pre-amp outputs, repeat the above instruction for the other speaker connections.
☐ 6. If the power amplifier has an input level switch, set it for .8V - 1V (800 to 1000 mV) sensitivity. If the amp isn't marked but has a rotary, variable input level control -- and has a rated sensitivity somewhere near 250mV to 1.5V -- set it at about 10 o'clock.
☐ 7. Set the OUTPUT LEVEL CONTROL(s) on the EQQ to the 0 setting.
☐ 8. Set the EQQ INPUT LEVEL control(s) to its minimum setting.
☐ 9. Using an FM station or loud cassette, adjust the volume control on the head unit to 3 o'clock
☐ 10. Advance the EQQ INPUT LEVEL setting until the 3dB HEADROOM LED flashes regularly, reduce the input level settings a bit.
☐ 11. If the system STILL isn't loud enough and you don't hear any clipping or speaker distortion (you animal!) you can adjust the EQQ OUTPUT level controls for even more volume. Be careful to avoid amp clipping or speaker distortion, however.
☐ 12. Now return to C. EQUALIZER ADJUSTMENT instructions on PAGE 12.

## A BRAZEN PLUG FOR OTHER AUDIO CONTROL PRODUCTS

The Audio Control EQQ is part of our Performance Match Series which includes:

- The **EQX,** a 2-channel compact audiophile-grade, digital-ready 12-band equalizer, line level preamplifier, bridging adaptor and programmable electronic crossover. Winner of the Audio/Video Magazine Auto Sound Grand Prix Award for best Equalizer of 1987 as well as many other industry honors.
- The **2XS**, 2-way 18dB/octave programmable electronic crossover with 18dB/octave subsonic filter, output gain adjustment and bridging adaptor.
- The **EQT**, world's only ONE-THIRD OCTAVE autosound equalizer. Now that you've seen what 1/2 and full octave equalization can do for a car system, you can appreciate what even finer adjustments can do.
- The legendary, car-shaking **EPICENTER.** Another Grand Prix award winner. This is an autosound version of our patented Phase Coupled Activator. It detects and digitally restores low bass that has been lost in the recording process. With good woofers, it's effect is astonishing. Ask for a demo at your Audio Control dealer.

Each of these components is compatible with every cassette/tuner, cassette/receiver and power amplifier made and will deliver significant improvements in the sound of any car system. Check with your Audio Control dealer for the juicy details.



THE EPICENTER

## GENERAL NIFTY INFO FOR PEOPLE WHO HAVEN'T GIVEN UP ON OUR PURPLE PROSE YET -- OR A TRIVIA BUFF -- OR BOTH.

**Level matching.** If level adjustments between your head-end unit, CD player, outboard equalizer, etc. and power amplifiers aren't optimal, one or more of the following problems can occur: Noise, Distortion, Apparent lack of power, and Difficulty in adjusting volume, Noise is constantly generated by all electronics. The only solution is to minimize it and increase music levels so that they mask it. Distortion occurs when circuits cannot handle the amount of signal input. In effect, they "clip" much the same way an amp does when you turn it up too loud. The inverse of this is a seeming lack of power. You buy a gigundo external power amp, hook it in, crank up your deck and get disappointed. It happens because the power amp needs more signal input than your head-end can provide. An associated problem is when the head-end puts out so much signal that your volume control is rendered almost useless. Quiet to ultra-loud happens in about an 1/8 turn of the knob, making it hard to adjust.

The EQQ solves all the above problems by interposing itself between the line level source and your power amplifiers. It's adjusted for optimal input from your head-end and just the right amount of output for your particular power amp.

**Torpedoing subsonics.** Subsonics are a constant buggaboo with both car stereo and home systems. They're frequency oscillations that occur below audible frequency ranges (SUB sonics). They're caused by warps in records (and subsequent transcription to tape), variations in low bass output due to tape head effects, internal circuitry problems in some car electronics, and are even present on many CD's! If you can SEE the speakers' woofers flutter in and out, you're seeing subsonics. While they aren't audible in themselves, they cause some very audible (and potentially destructive) problems. Problems which are just as serious in car systems. The solution is a subsonic filter that cuts off inaudible frequencies before they get to your amps and speakers. The EQQ's subsonic filter is a sharp, 18dB/octave filter which eliminates virtually all of the extraneous cone flutter that plagues car stereo woofers.

**Noise rejection power supply design.** From an audio standpoint, car electrical systems

are about as quiet as a rock concert in a motorcycle factory during an earthquake. Along with alternator whine, ignition "ticking," turn signal clicks and dash lamp dimmer buzz, some power amplifiers themselves add noise. (For a thorough discussion of this, send for our Technical Paper 103). While the EQQ will not contribute to this electronic cacophony, it must be capable of REJECTING everything else thrown at it. It does this with a special optically-isolated power supply that's completely isolated so it can ignore electronic trash thrown its way. The result is very quiet operation and another car stereo headache gone.

## AUDIO CONTROL EQQ SPECIFICATIONS

All specifications are at 14.4VDC (standard automotive voltage)

**TOTAL HARMONIC DISTORTION** . . . . . 0.005%
**SIGNAL TO NOISE** (rated at full output) . . . . . -110dB
**INPUT IMPEDANCE** . . . . . 20K ohms
**OUTPUT IMPEDANCE** . . . . . 150 ohms
**MAXIMUM OUTPUT LEVEL** 7.5 volts
**INPUT GAIN** . . . . . ±18dB
**OUTPUT GAIN** . . . . . ±15dB
**FREQUENCY RESPONSE** . . . 20Hz-20KHz; ±0.5dB
**SUBSONIC FILTER** . . . . . 18dB/Octave at 25Hz
**POWER SUPPLY** . . . . . Triple Isolated transformer balanced DC/DC converter with optical-isolator
**SIZE** . . . . . 2.3"h x 9.5"l x 6.8"w
**COUNTRY OF ORIGIN** . . . . . USA

# AUDIO CONTROL EQQ 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 EQQ. 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 materials and workmanship on your EQQ 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 EQQ.

2- You must keep your sales slip or receipt so you have proof when and from whom you bought your EQQ. We're not the only company to require this, so it's a good habit to get into with any stereo purchase.

3- Your EQQ 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 the 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 to service your EQQ. If anyone other than (a), (b), or (c) messes with your EQQ, that voids the warranty.

5- The warranty is also void if the serial number has been altered or removed, or if the Audio Control EQQ 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 the jacks can fry the innards of the poor beasty. (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, 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 that vary from state to state. Promises of how well your EQQ will work are not implied by this warranty. Other than what we've covered in the warranty, we have no obligation, express or implied. Also, we will not be obligated for direct or indirect damages to your system caused by hooking up the Audio Control EQQ.

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

AudioControl™
22313-70th Avenue West
Mountlake Terrace, WA 98043 Phone (206) 775-8461

## THE AUDIO CONTROL STORY

We could be making electric toothbrushes, but we're not.

Audio Control's president made that observation while explaining why we design and handcraft stereo equalizers and other sound products. Of all the things a group of employees could legally produce in a Lynnwood, Washington factory, we think a device that lets you hear music better is just about the best thing we could be making.

We incubate and hatch our products in a modern plant complete with solder baths, non-stop FM over half dozen big speakers, a ping pong table in the breakroom, a Lab with a matched set of frisbees, more test equipment than a Japanese sci-fi flick, and employees so friendly that the UPS man regularly stops in to have lunch with us.

Maybe it's that we're located out here in the misty rain forest of the Northwest where moss grows on the windshields, the sun rarely makes it through the overcast, and Boston ferns grow so well they've formed a union. This fertile soil has grown Carver, Phase Linear, Speakerlab, and Tapco.

Whatever it is here in the Northwest, we're perfectly content to stay here and keep producing high quality, well-engineered, affordable hi-fi equipment without so much as a glimmer of the sort of greed and me-too-manship that so often pervades the stereo market. We like producing a high quality product that is useful and gives people pleasure without wasting energy or resources. Something nobody else thought of, though should have.

Thus, we're not only interested in what goes out of Audio Control, we're interested in the comments which come back. Our fearless leader and production staff still read every warranty card, suggestions from which have lead to customer-based product changes instead of marketing department speculation.

We're really glad you bought something from us. Our appreciation will come back to you in the thousands of hours of pleasure you'll receive from your high quality Audio Control product.

The people of Audio Control"


AudioControl™

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