

Phase Coupled Activator™

Series Three

Digital Subharmonic Restoration System
and Electronic Crossover

AudioControl™

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Series Three

Digital Subharmonic Restoration System
and Electronic Crossover

Owner's Enjoyment Manual

U.S. Patent #4,698,842

AudioControl®

making good stereo sound better®

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Congratulations, you have just purchased a unique, patented (U.S. Patent #4,698,842) product that's going to significantly improve the sound of your system and everything you play through it (with the possible exception of certain bass recordings that are beyond help). The Phase Coupled Activator Series Three is the only audio product which can digitally restore musical notes lost or reduced in the recording and reproduction process. In addition, the Phase Coupled Activator Series Three contains an audiophile quality, 24dB per octave, Linkwitz-Riley electronic crossover to make connecting a subwoofer for all that new bass even easier.

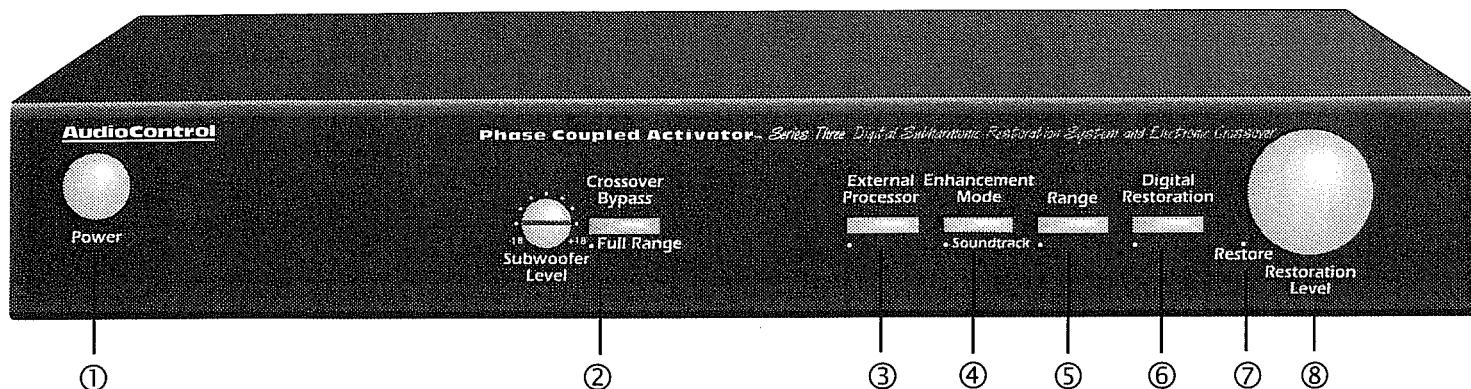
We know you're dying to fire this new box up and start fracturing foundations, but chill out a few minutes and read the first portion of this manual. The Phase Coupled Activator Series Three is so different it deserves a bit of explaining.

What you can expect from your Phase Coupled Activator Series Three:

- ☞ Depth and impact restored to CD's, Cassettes, FM and Home Theater soundtracks via patented circuitry.
- ☞ Reality for home theater soundtracks with special voice filtering for improved sound quality.
- ☞ Custom speaker protection and bass tuning with our exclusive Programmable Frequency Match (PFM) infrasonic filter.
- ☞ A user-programmable, two-way, 24dB per octave, Linkwitz-Riley electronic crossover.
- ☞ Line and speaker level inputs for simple subwoofer installation on any system.
- ☞ Highest Quality, Five Year Warranty, and Built In the USA by an award winning American manufacturer.

A Guided Tour Of The Phase Coupled Activator Series Three

The Front Panel



① **Power Switch** — Pretty self-explanatory. The Phase Coupled Activator Series Three draws a mere 8 watts so if you prefer to leave this unit on and plug it into a switched outlet on the back of your receiver/preamp, by all means, please feel free to do so.

② **Crossover Low-Pass Output Level and Bypass Switch** — These are the heart of the Phase Coupled Activator Series Three electronic crossover section. The output level

control adjusts the volume of the signal going to your subwoofer. This allows you to properly match the volume of your subwoofer to the main speakers. The Bypass switch disables the subwoofer (low pass) output and runs the main speakers full range. **WARNING:** If you are using very small bookshelf speakers, make certain the volume control is turned down before pressing this switch. The crossover comes factory preset at 90Hz. If you need to change it, please refer to the crossover section of this manual.

③ **Tape/External Processor** — This is just like the tape monitor switch on your receiver. Since the Phase Coupled Activator Series Three uses the receiver's tape monitor, we thought it was only fair to replace it with another one. This is also a good place to hook up other signal processors such as an AudioControl equalizer.

④ **Soundtrack Mode** — This button will minimize or eliminate the extra grumbling on lower voices you may occasionally notice on some FM or video sources. You should also press this button if you are listening to older monophonic recordings.

⑤ **Range** — Go ahead and push this button in if you have big woofers and want an extra kick in your bass. This extends the low frequency restoration all the way down to 16Hz, so make sure your speakers and amp can handle it. This is serious bass and it takes a lot of woofer cone area and amplifier power to reproduce. NOTE: Make certain the PFM filter module is set appropriately for your woofer. The factory setting for the PFM is 25Hz, this should work well with an 8" to 12" subwoofer. You can use a lower frequency if your subs can play lower.

⑥ **Digital Restoration** — This allows instant comparison of the bass poor sound coming from your source with the

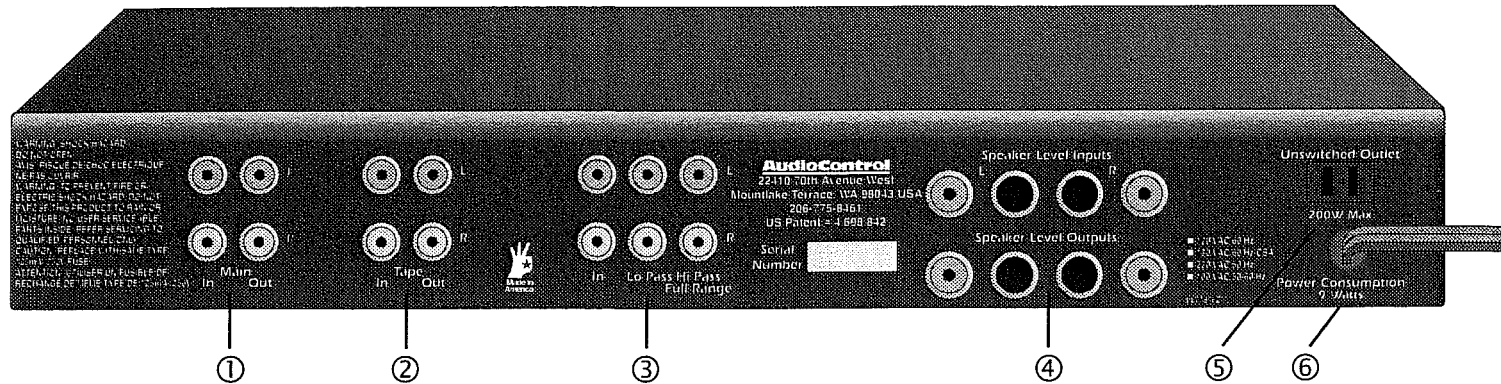
rich, deep sound restored by the Phase Coupled Activator Series Three. Seriously, we designed this processor to provide a realistic floor of bass fundamentals that you can enjoy for years to come, not just to bowl people over with lots of rattle and boom. CAUTION: When using the Phase Coupled Activator Series Three, do not use the loudness button on your receiver or turn up the bass on your tone controls or equalizer. You don't need it.

⑦ **Restore LED** — This light indicates when the digital bass restoration is busy rebuilding those lost bass notes you are looking for.

⑧ **Restoration Level Control** — This knob determines just how much restored bass you get. When first using your Phase Coupled Activator Series Three, begin with the knob in the middle. For the majority of sources, this is "How it should have been in the first place". Turn the knob to the left if you have mondo subwoofers or a very well recorded CD. Turn it to the right to really rattle the windows.

CAUTION: The Phase Coupled Activator can overdrive some surround sound preamps. If you hear any popping or fuzziness (distortion) in the speakers, turn the restoration level control down. Something is clipping in your system.

The Rear Panel



① **Main In/Out** — This pair of RCA jacks connects the digital bass restoration into your stereo. Remember to hook this up even if you are using the internal crossover of the Phase Coupled Activator. The bass restoration is separate from the crossover. You can use the Speaker Level Input instead of the Main Input if you don't have a Tape Monitor or External Processor loop on your receiver/preamp.

② **Tape / External Processor Loop** — This is to replace the tape loop we used up on your receiver. You can connect any tape deck, equalizer or other signal processor here.

③ **Independent Electronic Crossover** — The Phase Coupled Activator Series Three contains a high-quality 24dB per octave crossover. This is completely independent of the bass enhancement, so remember to hook up both sections when you need them. The crossover Main Input comes from

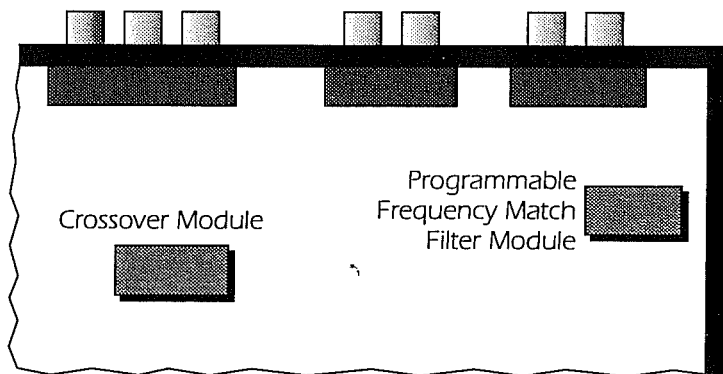
your preamplifier's main output. The High Pass and Low Pass crossover outputs run to your power amplifiers.

④ **Speaker Level Connectors** - The Phase Coupled Activator Series Three can be connected directly in-line with the speaker outputs of your receiver. This allows you to use the digital bass restoration and electronic crossover with a separate subwoofer. **IMPORTANT NOTE:** The speaker connections are NOT processed by the Phase Coupled Activator Series Three. The speaker signal passes thru the unit without any change. You still need to use the Main Output to feed either a separate amplifier or the Independent Electronic Crossover.

⑤ **Unswitched Outlet** - You never seem to have enough power outlets around the stereo, so here's an extra. Use it for any equalizers, tape decks, CD players, and so on. Do NOT use this outlet for anything that draws a lot of power such as an amplifier, hair dryer or lava lamp.

⑥ **Power Cord** - Herein flows all the power from your local electric company's generators.

The Insides



The crossover module - This *user replaceable* 16 pin resistor module controls the frequency of the 24dB/octave Linkwitz-Riley crossover. This module is set from the factory at 90 Hz to work with most subwoofers. New modules can be purchased from your authorized AudioControl dealer or built yourself with the information at the back of this manual.

The Programmable Frequency Match (PFM) filter module - The PFM module is very similar to the crossover module except that it has 14 pins. This 18 dB/octave filter limits the lowest frequency that is played through your stereo. The factory setting is 25Hz.

Before You Dig In

The Paperwork

THE MOST IMPORTANT INSTRUCTION OF ALL:

Fill out the warranty card and mail it in to us. Also, record the serial number and put your sales receipt in a safe place. This is very important in the unlikely event that your new unit gets a sudden virus, or for proof of ownership if somebody takes a liking to your stereo in the middle of the night. Insurance companies have no sense of imagination when it comes to things like the Phase Coupled Activator Series Three ever being in your stereo system.

Also, make certain you save the box. It's handy if you ever move or (perish the thought) need to send the unit back to the factory. This ends the nagging section of this manual.

Notes on using your Phase Coupled Activator Series Three

Big No-No Department

Do not turn up the bass equalizer, tone controls or under any circumstance use your system's LOUDNESS button. The Phase Coupled Activator provides a much deeper bass response than the average recording (even your CD's).

Big Oh-Wow Department

Try it for yourself. Put on some background music. Mantovani, Nirvana, Sousa - whatever your musical taste is. Now press the digital bass restoration button on the patented Phase Coupled Activator Series Three. Listen to the music for a while and then turn off the restoration. You will find a staggering change in the sound quality. Not volume, just quality. No equalization or loudness button can achieve this.

Doing the Deed - Hooking up your Phase Coupled Activator Series Three

Connection Tips

If you're a hi-fi veteran, this may seem repetitive, but some things can never be repeated too many times (just ask our Customer Support Department).

- ☑ Turn off all components before making any connections and don't stand in a bucket of water.
- ☑ When making connections, make sure that "left goes to left" and "right goes to right." The obvious and time-honored way to assure this is to assign RED plugs to Right and WHITE/GREY/BLACK plugs to left.
- ☑ Whenever possible, keep power cords away from signal cables (i.e., inputs from CD players, cassette decks, etc.) to prevent induced hum. This is especially important for turntable cables that carry very weak signals. Notice that we have placed the Phase Coupled Activator's power cord on the extreme right side. This helps you bundle all power cords down the right side of your stereo cabinet and all the signal cable down the left.

☑ Use quality interconnect cables. We're not going to get into the debate about whether \$100 interconnects improve the sound of your system. But we know from experience that really, REALLY cheap connections can cause problems. They tend to disconnect inside, causing a hum or loss of signal. In general, use cables of a quality at least equal to those included with the Phase Coupled Activator Series Three.

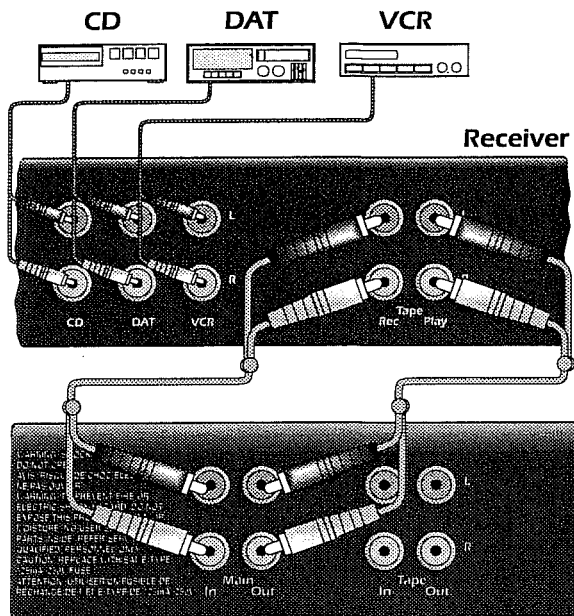
The Phase Coupled Activator Series Three is really two units in one enclosure: A patented digital bass restoration processor and an active two-way electronic 24dB/octave programmable crossover. These two sections are completely independent of each other. You can use just one or the other or both sections together.

☑ Make certain you have enough woofer cone area and amp power to run the extra bass the Phase Coupled Activator puts out.

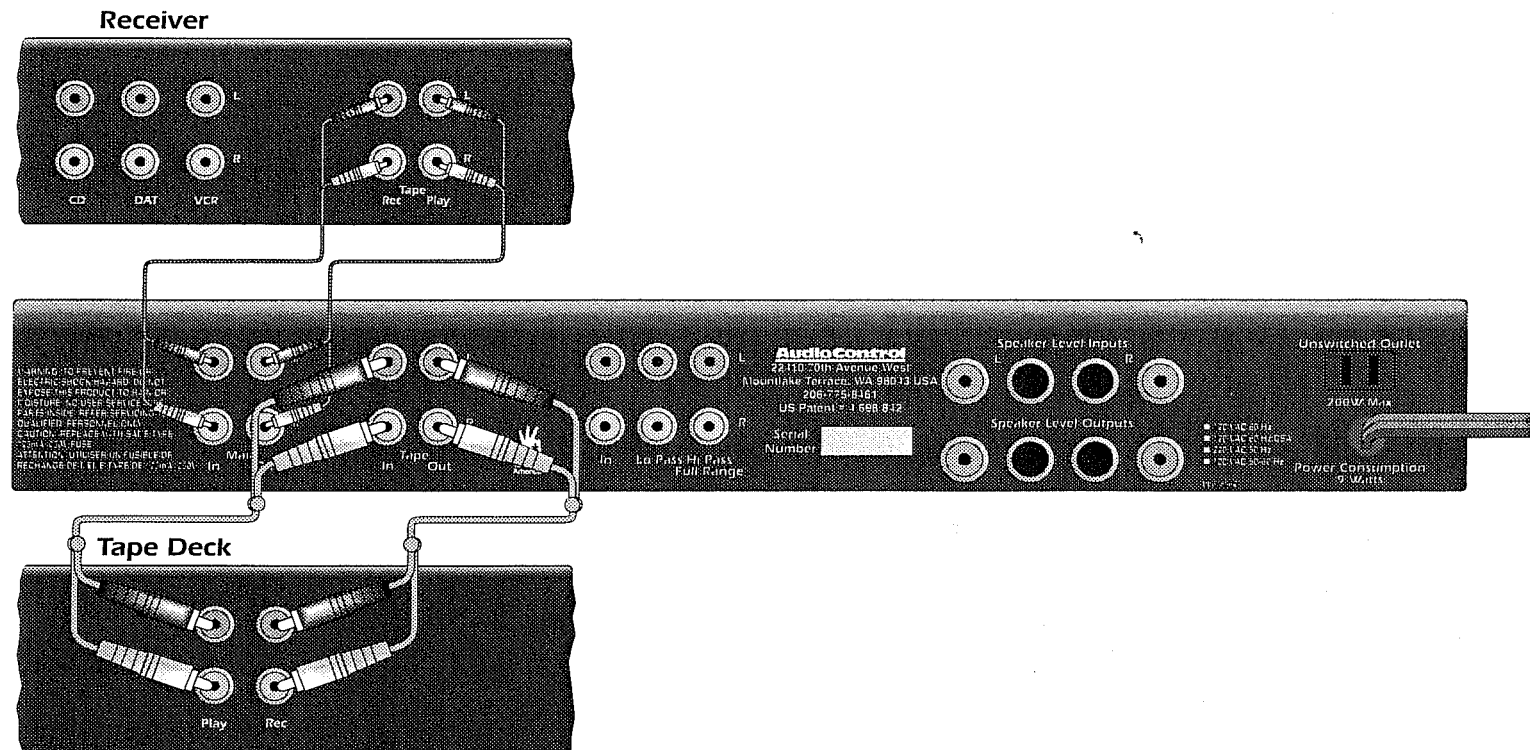
Connecting the Digital Bass Restoration - The Tape Loop Method.

✓ Locate the Tape Monitor jacks on the rear of your receiver or preamp. They will be either marked TAPE IN and TAPE OUT or REC (record) and PLAY. If you have multiple tape connections on your receiver, make certain you use a set that can monitor. Many A/V receivers will only monitor on tape two and not on tape one.

✓ Connect the jacks on the Phase Coupled Activator Series Three marked MAIN IN and MAIN OUT to the tape monitor jacks you just located on your receiver. Always make certain you connect In to Out and Out to In. See the diagrams for examples.

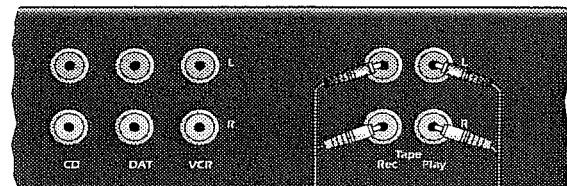


Adding a Cassette Deck to your System

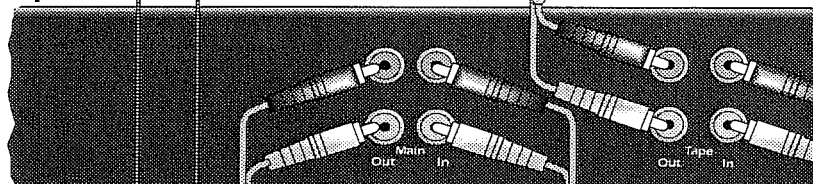


Connecting to an Equalizer and Tape Deck

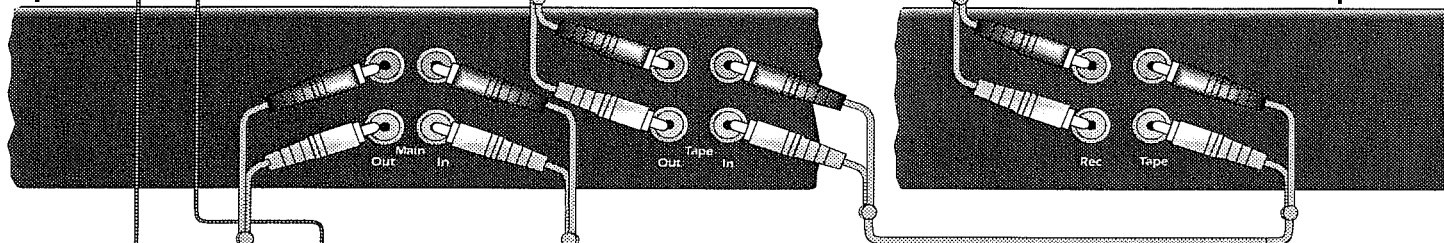
Receiver



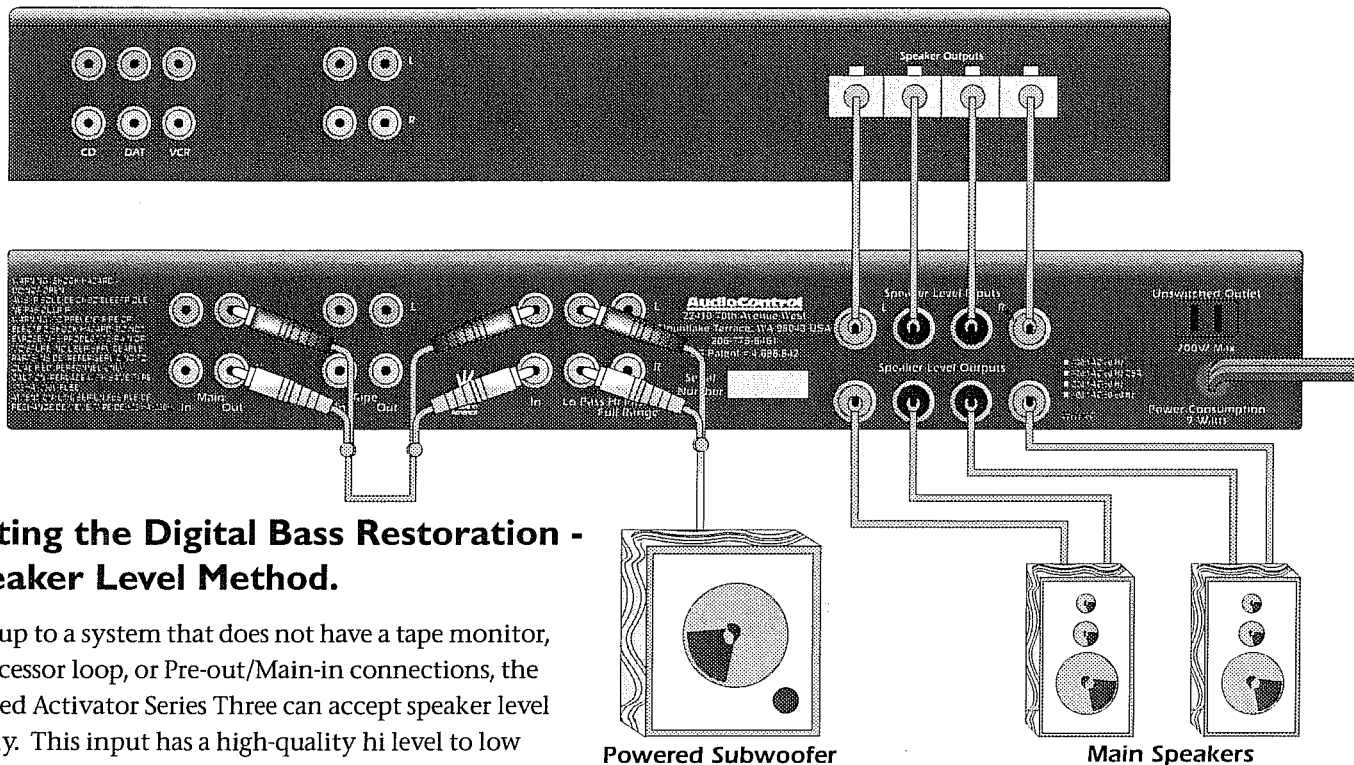
Equalizer



Tape Deck

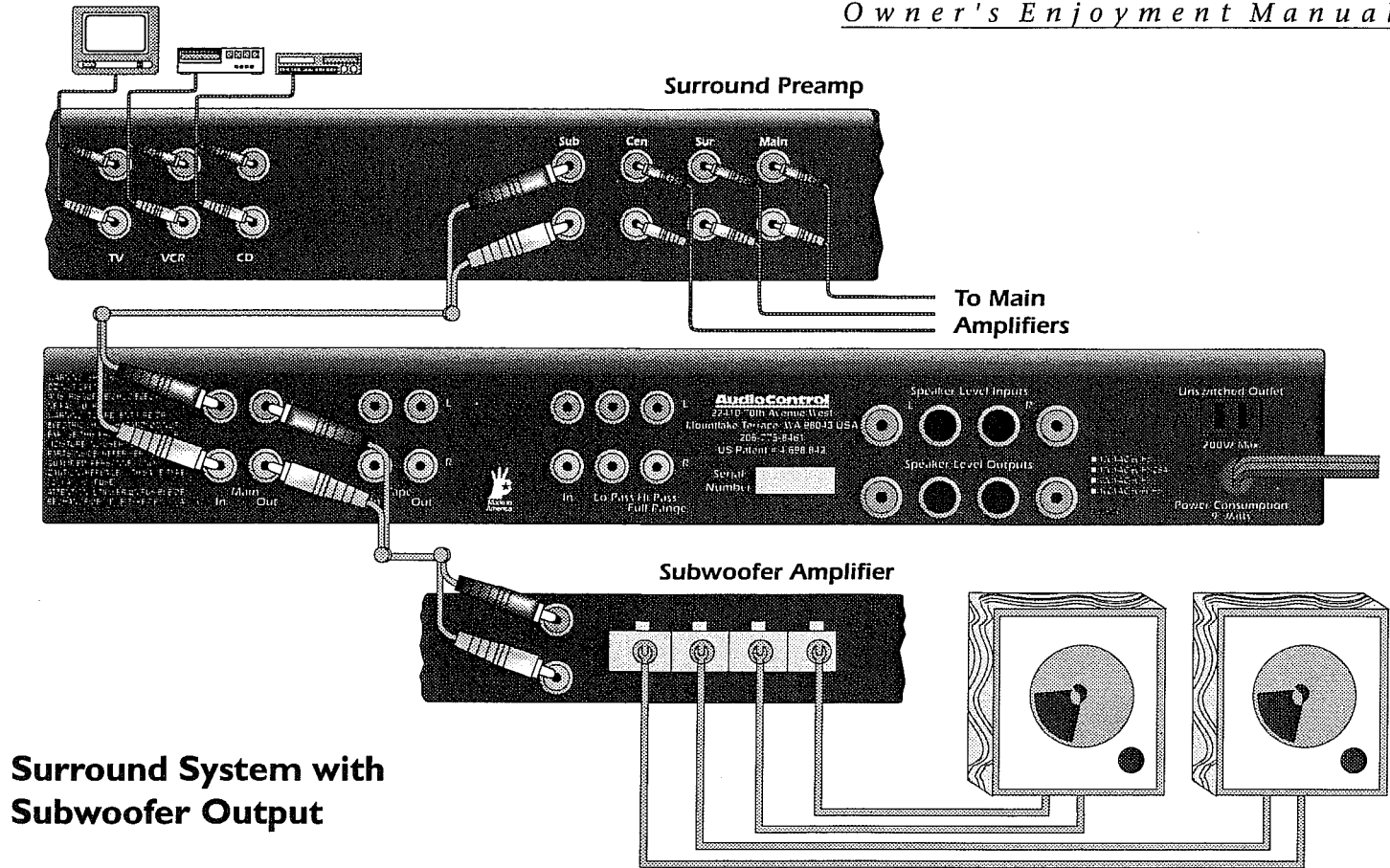


Receiver



Connecting the Digital Bass Restoration - The Speaker Level Method.

To hook up to a system that does not have a tape monitor, external processor loop, or Pre-out/Main-in connections, the Phase Coupled Activator Series Three can accept speaker level input directly. This input has a high-quality hi level to low level adapter that converts the speaker outputs of your receiver into something that a separate subwoofer amplifier can use. Great deal, huh?



**Surround System with
Subwoofer Output**

Lift and Separate - The Electronic Crossover

Normally, an electronic crossover of the quality that we have designed into the Phase Coupled Activator Series Three would cost you \$500. But since we always try and give you more for your money, we've added a totally separate and very handy hi-fi component — a programmable 24dB/octave electronic crossover. It can let you take maximum advantage of the rich, added sound which the Phase Coupled Activator Series Three can restore. It divides the sound frequency spectrum into two parts — those sounds above the crossover frequency and those below.

This allows you to either...

1. Augment the performance of your existing speakers with a subwoofer. This approach lets your speakers operate over the full frequency range and use the crossover to add an extra low bass kick that is sent to a separate amplifier and subwoofer.

or...

2. Relieve your speakers completely of the task of reproducing ultra-low bass. This approach uses the indepen-

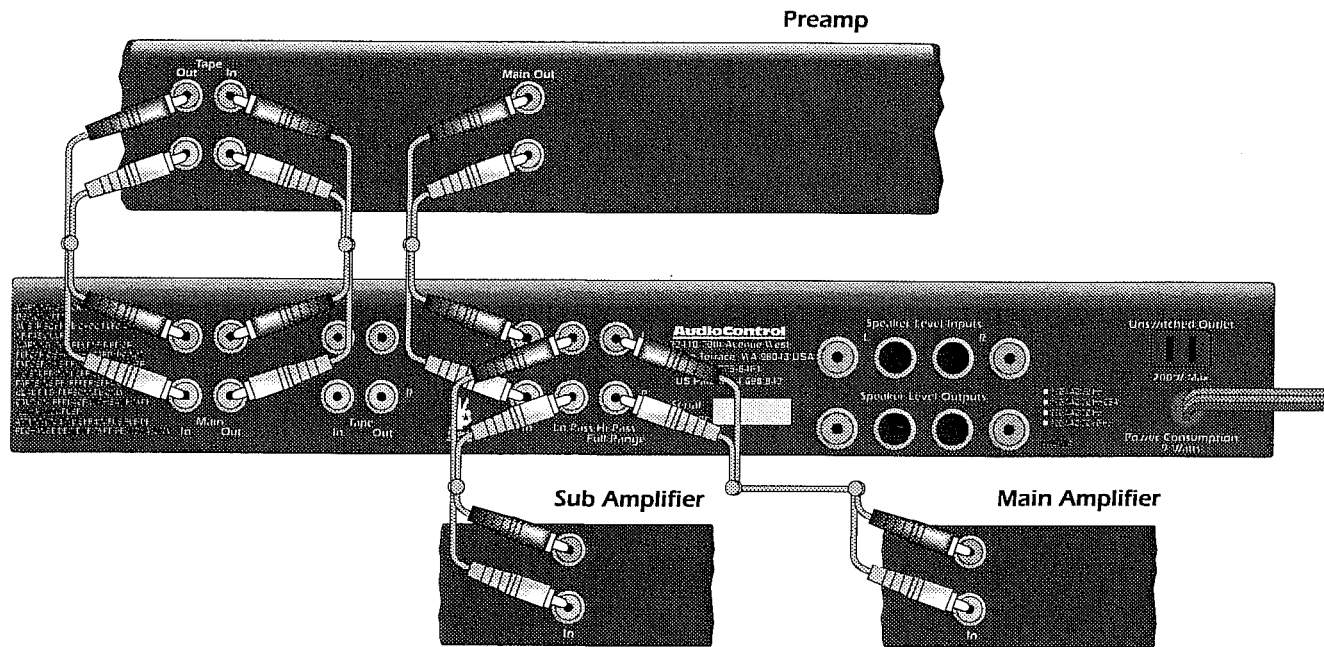
dent electronic crossover of the Phase Coupled Activator Series Three to actually divide the music signal into two parts. The subwoofer gets the low bass while the main speakers breath a sigh of relief since they only reproduce the higher frequencies. This method is highly recommended since it cuts the bass power demands on your main speaker amplifier and reduces overall system noise and distortion.

The crossover in the Phase Coupled Activator Series Three comes factory preset at 90Hz, but you can easily change the internal plug-in resistor module to whatever frequency best suits your speakers. Consult your dealer or speaker manufacturer for the proper crossover point for your system.

Since the crossover is independent of the digital bass restoration in the Phase Coupled Activator Series Three, you must hook up both sections if you want both the wonderful low bass impact of its patented circuitry and the benefits of an electronic crossover.

See drawing on the next page ➤

Using the Independent Electronic Crossover



Remember - The digital bass restoration is independent of the electronic crossover. Both sections must be connected for the full effect.

Building Your Own Crossover/PFM Module

An electronic crossover divides your music into two or more frequency bands. Since speakers can only be designed to accurately reproduce a limited range of frequencies, a crossover must be used to send the appropriate information to each speaker.

The correct selection of crossover frequencies greatly depends on your choice of speakers. Please check with the speaker manufacturer for their recommendation regarding a good crossover point.

The Phase Coupled Activator Series Three comes with a programmable 24dB/octave Linkwitz-Riley crossover. It is preset at the factory at 90Hz. This frequency can easily be changed by removing the top of your unit and replacing the existing resistor module in the socket. New modules are available either from your authorized AudioControl dealer or directly from our factory. If you are feeling adventurous and are handy with a soldering iron, you can easily make your own resistor modules. Here's how ...

To calculate the proper resistor value for the custom module, use the following formula:

$$\frac{7200}{\text{Frequency (Hz)}} = \text{Resistor Value (kilohms)}$$

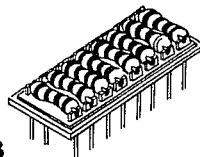
For example, if you need a crossover point of 150Hz.

$$\frac{7200}{150\text{Hz}} = 48 \text{ Kohms}$$

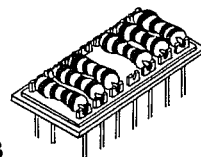
For a 24dB/octave crossover module, you need eight resistors and a 16 pin DIP component header. For the 18dB/octave PFM module, you need six resistors and a 14 pin header. The resistors should be 1/4 watt, 5% tolerance, carbon film.

Note: *If you need more information about crossover modules, write us and ask for Technical note #1005 - Crossover Modules.*

Program modules



24dB



18dB

Useful Info From The Old Stereophile On The Mount

Stereo Systems and the Phase Coupled Activator Series Three

Since the Phase Coupled Activator Series Three digitally restores bass fundamentals, you must have a speaker system that can reproduce the results. If your speakers have woofers smaller than 8" (20cm) you might consider adding a subwoofer to the system or be very careful turning up the volume when the bass restoration is turned on. If you hear a fluttering or clacking sound during bass notes, BACK OFF the restoration level control (or get bigger speakers.)

To boldly go where no video has gone before...

Remember how your favorite movie sounded in the theater? If you haven't gone Audio/Video and tied your TV and VCR into the stereo system, you're missing out on a whole lot of sound. Enhancing movie soundtracks is one of the most exciting uses for the Phase Coupled Activator Series Three. Music takes on a new depth. Special effects will knock

you out of your seat. Even those old Sci-Fi reruns sound great. Be careful though, you might find yourself buying a new stereo system for the bedroom TV.

Room Acoustics and Bass Restoration

If a room is boomy all by itself, low fundamental reproduction will sound muddy and boomy also. To help fix the room, start by moving your speakers out away from the walls or corners. Try raising them up on speaker stands. This takes some experimentation, but can yield dramatic results.

You can also try using a high-quality electronic equalizer (we just happen to know a good manufacturer) to smooth out the bass bumps in your room. Since the Phase Coupled Activator Series Three works on the music source itself and an equalizer matches the speakers to the room, these two are a match made in heaven for any system.

Well, that's all there is to it. By now, you should be enjoying music as much as when you heard it live. It is our pleasure to bring this experience to you.

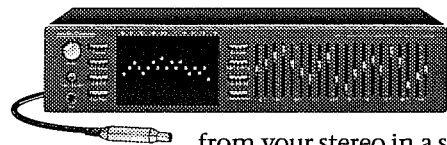
A Blatant Plug for Other AudioControl Products

AudioControl believes in "Making Good Stereo Sound Better", so we produce a complete line of high-quality, award-winning equalizers, analyzers and signal processors for home and car stereos. They're compatible with almost every receiver, integrated amp, pre-amplifier and home theater system and will help you create the best sound possible. Ask your AudioControl dealer for the juicy details.

The Ten -- A quality 10 band stereo equalizer that can improve the sound of any home audio system. Paired left/right equalizer controls makes it simple to adjust the controls without affecting your stereo imaging.

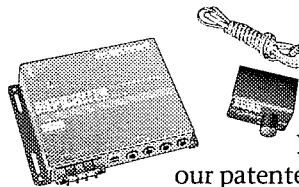
The C-101 Series III

This acoustical work horse provides all the tools to get great sound



from your stereo in a single chassis. The C-101 Series III features a 10-band, stereo, octave equalizer combined with a real-time audio analyzer, pink noise test signal generator and a laboratory-grade, calibrated measurement microphone.

The C-131 & R-130 -- These are the flagships of the AudioControl home product line. Both products are the best that we could design and compliment any audiophile system or quality home theater. The C-131 is a precision, 30 band, Constant-Q, one-third octave mono equalizer. The R-130 is a complementary real-time audio analyzer that allows you to "see" the acoustics of your listening environment and correct them.



The Epicenter -- If you like what the Phase Coupled Activator did for your home stereo, you'll love what the Epicenter will do for your car stereo. All the wonders of our patented bass restoration contained in a

compact, trunk-mounted car stereo unit. Ask your authorized AudioControl Performance Match autosound dealer about it.

And now a word from our legal department...

The WARRANTY

People are scared of warranties. Lots of fine print. Months of waiting around. Well, fear no more, this warranty is 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 AudioControl product. So go ahead, read this warranty, then take a few days to enjoy your new Phase Coupled Activator Series Three 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 that certain conditions have to be met before they'll honor the warranty. If you meet all of these conditions, we will warrant all materials and workmanship on the Phase Coupled Activator Series Three for **FIVE YEARS** from the date you bought it, and we will fix or replace it, at our option, during that time.

Here are the conditional conditions:

1. You have to fill out the warranty card and send it to us within 15 days after purchasing the Phase Coupled Activator Series Three.
2. You must keep your sales receipt for proof of purchase showing when and from whom the unit was bought. We're not the only ones who require this, so it's a good habit to get into with any major purchase.
3. Your Phase Coupled Activator Series Three must have originally been purchased from an authorized AudioControl dealer. You do not have to be the original owner, but you do need a copy of the original sales slip.
4. You cannot let anybody who isn't: (A) the AudioControl factory; (B) an authorized service center; or (C) somebody authorized in writing by AudioControl to service your Phase Coupled Activator Series Three. If anyone other than (A), (B) or (C) messes with your Phase Coupled Activator Series Three, that voids your warranty.
5. The warranty is also void if the serial number is altered or removed, or if the Phase Coupled Activator Series Three has been used improperly. Now that sounds like a big loophole, but here is all we mean by it.

Unwarranted abuse is: (A) physical damage (don't use the Phase Coupled Activator Series Three to level your book case); (B) improper connections (120 volts into the RCA jacks can fry the poor thing); (C) sadistic things. This is the best product we know how to build, but if you mount it to the front bumper of your humvee, something will go wrong.

Assuming you conform to 1 through 5, and it really isn't all that hard to do, we get the option of fixing your old unit or replacing it with a new one.

Legalese Section

This is the only warranty given by AudioControl. This warranty gives you specific legal rights that vary from state to state. Promises of how well your Phase Coupled Activator Series Three will perform are not implied by this warranty. Other than what we have 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 AudioControl Phase Coupled Activator Series Three.

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

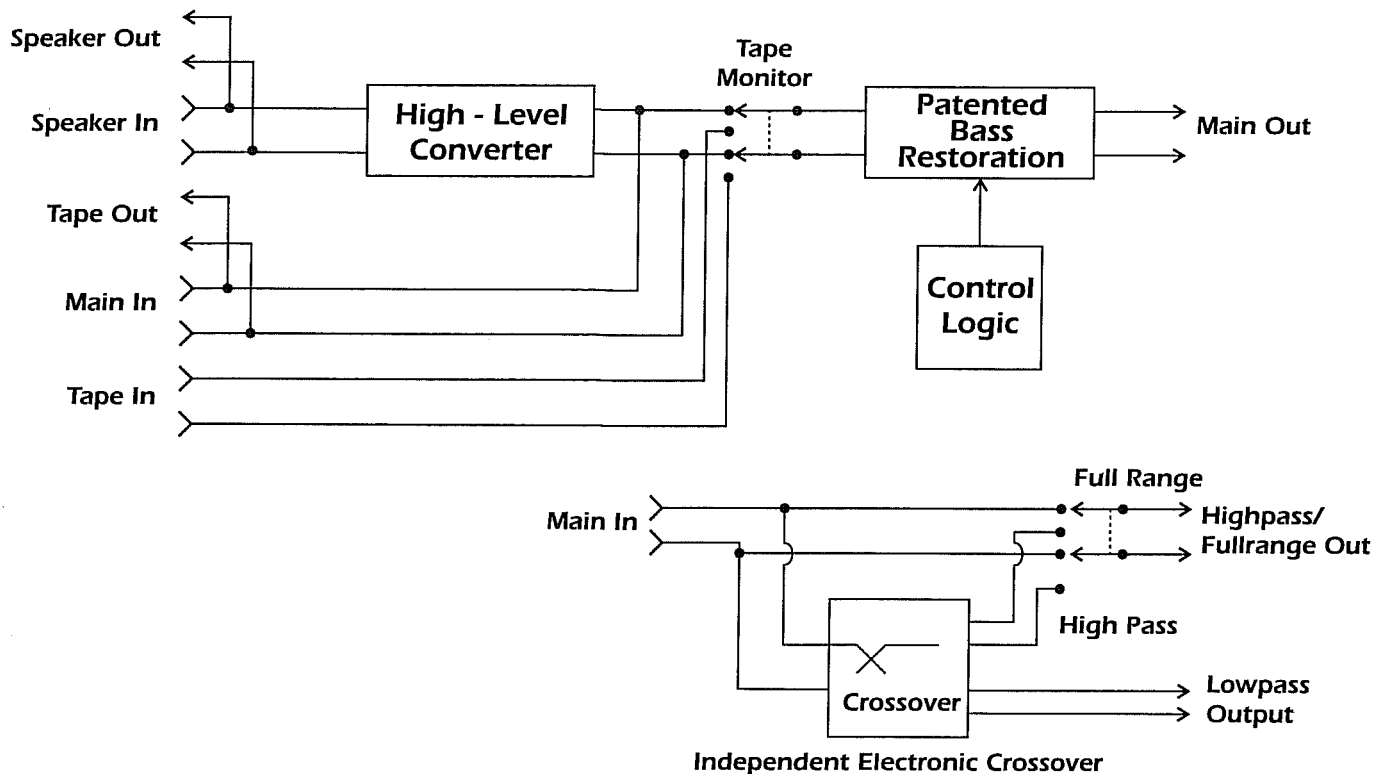
What to do if you need Service

First, contact AudioControl, either by phone 206/775-8461 or FAX 206/778-3166. We'll verify if there is anything wrong that you can fix yourself or arrange to have it sent back to our factory for repair.

Proof of Purchase (that sales receipt we've been harping about) **MUST** be included with the unit **AND** a brief note explaining what is wrong with the unit. You'd be surprised how many people forget to tell us what's wrong. Please include a daytime phone number in case our technician has any questions.

You're responsible for the freight charges to us, but we'll pay the return freight back. We match whatever method you send it to us, so if you return the unit overnight, we send it back overnight. We recommend UPS for any shipments.

Block Diagram



SPECIFICATIONS

Bass Restoration	U.S. Patent Number 4,698,842
Frequency response	20-20 KHz ± 1 dB
Total harmonic distortion	0.007%
Signal to Noise ratio (at full output)	110 dB
Maximum speaker level input power	150 watts
Crossover low-pass output gain control	± 20 dB
Electronic crossover	Two-way, 24 dB/Octave Linkwitz-Riley
Factory crossover setting	90 Hz (user programmable)
PFM filter slope	18 dB/Octave
Programmable Frequency Match (PFM) frequency	25 Hz (user programmable)
Power requirements	8 Watts
Size	2.5"high x 11"deep x 17"wide (19" wide with optional rackmounts)
Weight	10 lbs
Country of origin	USA



AudioControl®

making good stereo sound better®

Electronic Engineering & Manufacturing, Inc.

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really neat product while fighting a life and death struggle with man-eating slugs, listening to grunge rock and drinking a double-tall, vanilla latté espresso considering where we live.

P/N 9130320

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.

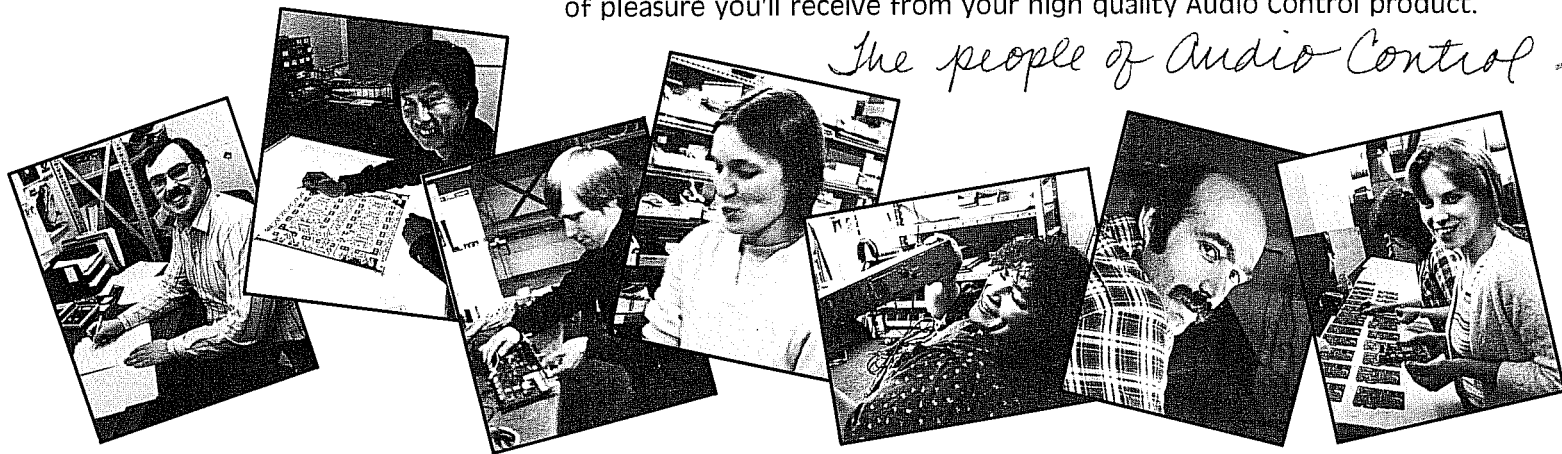
Maybe it's that we're located out here in the misty rain forest of the Northwest where moss grows on the windshields, the sun rarely makes it through the overcast, and Boston ferns grow so well they've formed a union. This fertile soil has grown Carver, Phase Linear, Speakerlab, and Tapco.

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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