



Master Volume Control

Owner's Enjoyment Manual

AudioControl

making good stereo sound better®

22410 70th Avenue West • Mountlake Terrace, WA 98043 • Phone 425-775-8461 • Fax 425-778-3166
• www.audiocontrol.com •

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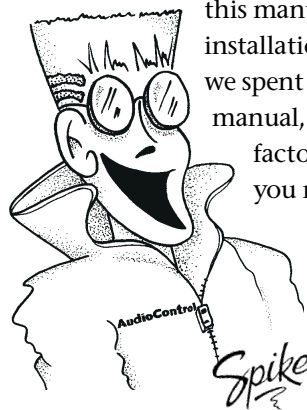
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INTRODUCTION

Congratulations on your purchase of a truly one-of-a-kind product, the AudioControl Master Volume Control, or MVC as his friends call him. The MVC was meticulously designed to help eliminate annoying system hiss and get the maximum potential out of your amplifiers! The MVC Master Volume Control maximizes your car audio system's signal-to-noise level which will in turn increase your system's dynamic range.

You may even think about skipping this section. To that we say, **BIG MISTAKE!** You need to read the first few sections of

this manual first before diving in to your installation. Above and beyond the fact that we spent lots of time writing this cool manual, it will save you many calls to our factory where you will be asked, "Did you read the manual?"



Now sit back and grab a beverage of your choice, kick up your feet and enjoy your time with the manual as we have spent many rainy nights writing it.

KEY FEATURES OF YOUR MVC

- Master volume control for your system (*one knob does it all*)
- Trunk Mounted Chassis (*easy to install*)
- Six channels of input and output (*lots of control*)
- Connectable inputs (*2 channels in can give you 6 out*)
- Linkable control for multiple MVCs (*more outputs ouh ouh ouh*)
- High signal voltage capabilities (*drive a lot in, control it with one knob*)
- Output level controls (*balance the voltage to your amps*)
- Signal voltage indicator LEDs (*level-matching made easy*)
- Adjustable delay amplifier trigger output (*no more pop*)
- High headroom PWM switching power supply (*compensates for vehicle voltage fluctuations*)

QUICK INSTALLATION INFO

For those of you who have many sophisticated installations under your belt, please refer to the diagrams on pages 13 through 16 for guidance in installing your MVC. If you are curious, your MVC is shipped with the following configurations:

Feature	Factory Setting
Inputs	Independent
PFM Module	33 Hz
Remote Out turn-on delay	1.5 seconds
Power Ground Isolation	Isolated

Note: These configurations can be changed via the internal jumpers.

A word of advice and warning must come from us at this time. It is highly recommended that you retain the services of your authorized AudioControl dealer to install your MVC. Not only do they have training, tools, and know-how to do the job right the first time, we extend your warranty from one year to FIVE FULL YEARS.

Should you still decide to install your MVC yourself, we encourage you to read this manual thoroughly and reference it during the actual installation. Good luck!



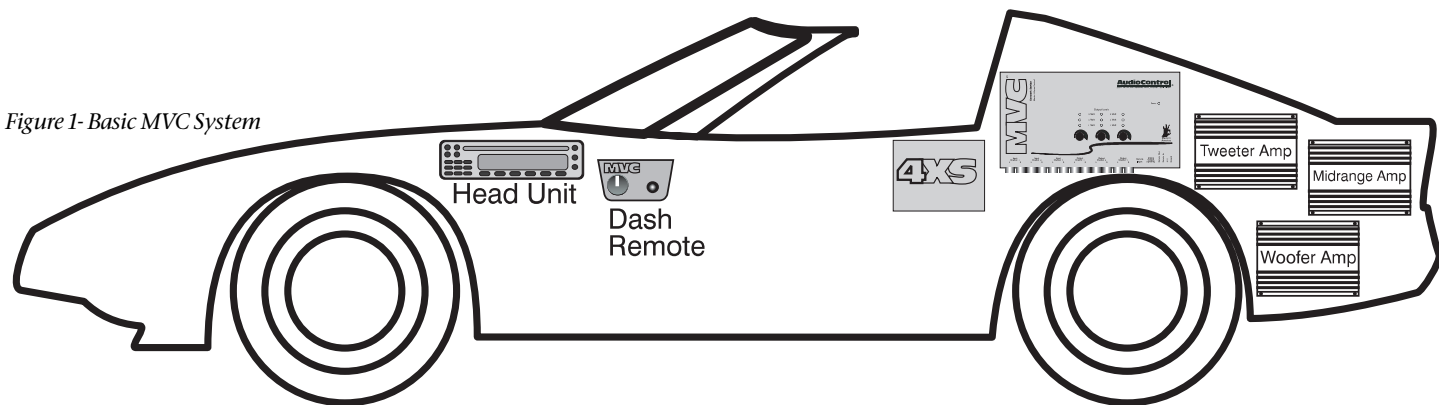
THE AWESOME BENEFITS OF YOUR MVC

How Does The MVC Do Its Thing?

The MVC is designed to go in the rear of the vehicle, by your amplifiers and processors. However it can be controlled anywhere inside (or outside) the vehicle by a remote mounted volume control. By lowering the volume/signal

level at the rear of the car, rather than the front, you can squeak all the signal possible from your source unit and run it to the rear of your car. You are now delivering more signal to your amplifiers and it is noise free.

Figure 1- Basic MVC System



The MVC controls the signal running into the amplifiers. If you have a “high output voltage” source unit, remember that if the volume on the source unit is only $\frac{1}{2}$ way up, you are only sending $\frac{1}{2}$ the “high output voltage” to your amplifiers.

How Do I Tell My Friends About My MVC And Sound Cool?

A wonderful analogy of this whole process is that of a faucet, a garden hose, and a nozzle. Your source unit is a faucet on a sink that is opened up and lets the maximum amount of pressure flow through the hose, which is your interconnect cables. The MVC is the nozzle at the end of the

hose that maintains the high pressure, or in this case high signal level, and serves as an audio signal valve.

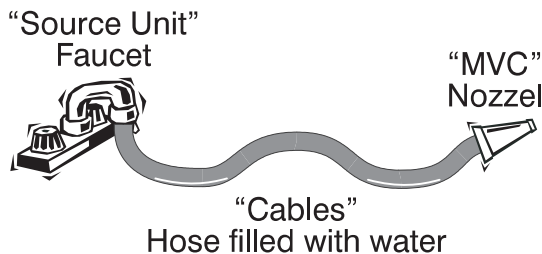


Figure 2- How the MVC works

What Is Dynamic Range (and should I care?)

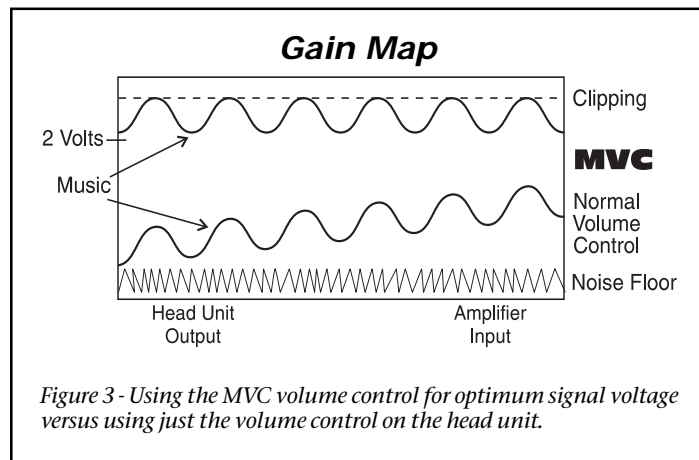
The dynamic range of an audio system is the measurement from when the system is playing its loudest to the part where it is playing the quietest. If you are into rock'n roll, then you want those guitar licks to be clean, loud and in your face. On the other hand if you like jazz or orchestral music, you will appreciate the clarity and crispness of your system at lower levels.

Sometimes dynamic range and signal-to-noise are confused with each other. Quite simply, your audio system's dynamic range will never be better than your systems S/N ratio. Therefore, if you have a noisy system, you are missing out!

Signal-To-Noise: The Up and Coming Rock Group?

Your system's signal-to-noise ratio is the measurement between your audio signal level, which contains music, and your system's noise floor, which contains hiss, pops, buzzes, and whines. If you are listening to your buddies car audio system and it has all of the above obnoxious sounds...even when the music is playing, we call that LOW signal-to-noise.

On the other hand if you have your volume control cranked up and on quiet songs, you hear almost ZERO background noise, that is considered a HIGH signal-to-noise level. Most serious sound-off competitors have high signal-to-noise ratios (at least the ones that win do).



With this particular system, the only problem you have to deal with is the source unit's volume control. When the volume control is raised and lowered, the signal voltage is going to rise and fall also, still minimizing the system's potential.

What About High Voltage Head Units?

Many car audio head unit manufacturers are starting to pull their heads out (a little pun) and realizing that they should provide head units with higher signal voltage on the outputs. Not only will this increase a system's S/N, but it will also allow you to drive your amplifiers better. Unfortunately, like any source unit, it has a level or volume control that raises the signal level up and down. We are back to square one!

FEATURES AND HIGHLIGHTS

This section is designed to provide for more specific information on all of the nifty features that are built in to your MVC. Not only will the knowledge of these features make you wiser and smarter in the autosound world, you will be the topic of conversation at soundoff cocktail parties.

Master Volume Control: The MVC will allow you to run the audio signal at the highest possible level from your source unit, through the processors, and to the amplifiers. The MVC will then attenuate the signal level of your car audio system right before the inputs to your amplifier.

Connectable Inputs and Outputs: If you have a “serious” car audio system but have more inputs than outputs, your MVC will be a godsend. Rather than use a bunch of kludged together cables, the MVC will serve as your system controller. The incredibly wise engineers at AudioControl came up with a way in which you can take two channels of input signal and provide 2, 4, or even 6 channels of output.

Remote Control: The MVC “brains” are designed to be installed in the rear of the vehicle, while the volume control knob can be mounted anywhere in the vehicle. (Or outside the vehicle.) This is ideal if you have a high SPL vehicle.

Output Level Controls: If your system is composed of more than one amplifier, it is common for one amplifier or set of speakers to out perform another, causing an unbalanced system. You know the ones, all highs, no lows, must be...unbalanced. The MVC has output level controls for each pair of channels. This will allow you to adjust the amount of signal going to specific amplifiers for a much more balanced system.

Signal Voltage LED Indicators: The MVC signal voltage LED indicator tells you precisely how much signal voltage is present at the outputs of your MVC. This will help you with matching the output of your MVC with the inputs of your amplifier.

Linking MVCs: Your MVC can control up to 6 channels of signal but you also have the ability to add more MVCs if you have more amplifiers. What is totally cool is that you can link all of the MVCs together so they operate off the same dash mounted control.

Turn-On Delay For Amplifiers: Your MVC comes with an amplifier turn-on delay feature that will allow you to delay your amplifier turn-on by either 1.5 or 4 seconds. When running multiple components in your car audio system, sometimes the amplifiers will turn on faster than your source units causing an annoying THUMP in your system.

The Most Important Feature Of All: Reliability. That's right, your AudioControl MVC comes with a full 5 year parts and labor warranty when it is installed by an authorized United States AudioControl dealer. These seasoned pros have the training and the equipment to take care of the job quickly and not leave your dashboard looking like Swiss cheese. Keep in mind that if you or your friends are "good with electronics" and you choose to install it yourself, the MVC still has a one year parts and labor warranty.

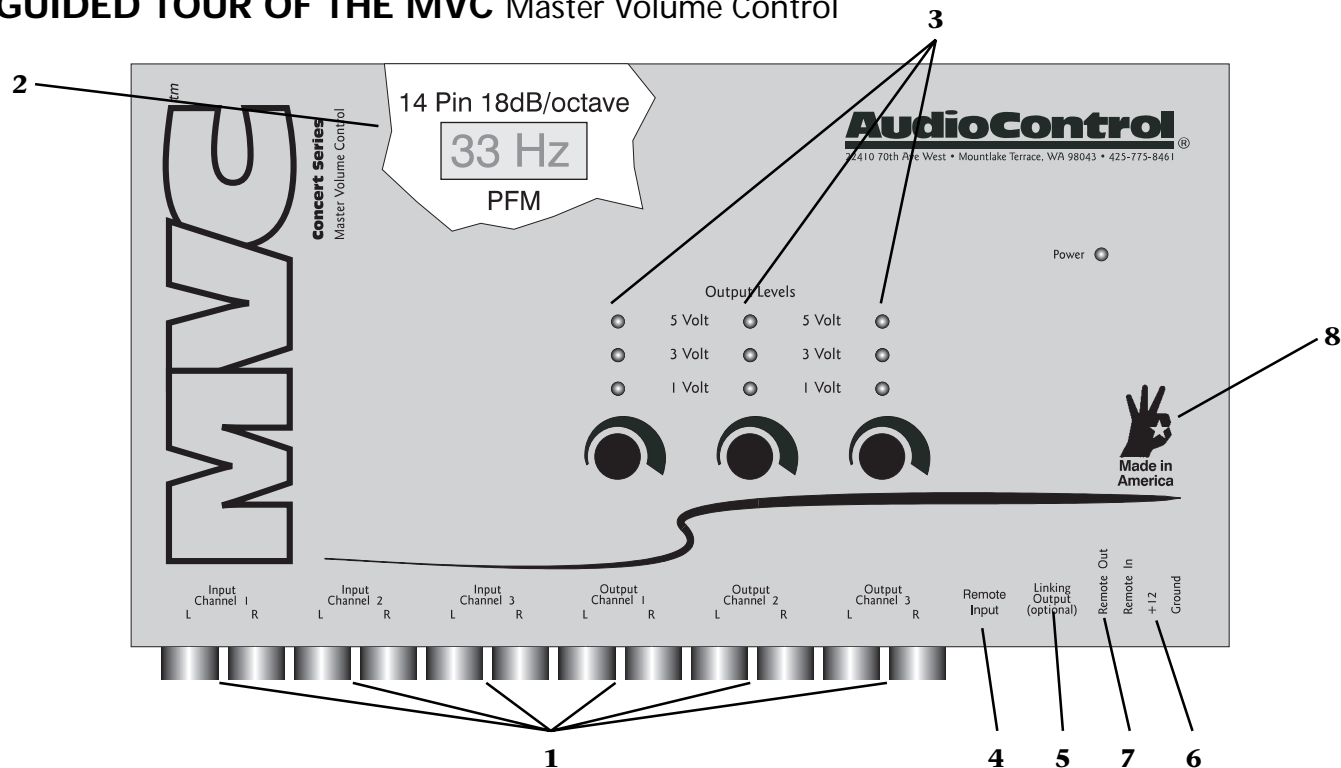
WARNING:

Perform The Following Task Immediately Before Going On

To activate your warranty, you need to FILL OUT AND SEND IN YOUR WARRANTY CARD! Also, save your invoice or sales slip as proof of purchase. Not only are these necessary for warranty purposes, they are also important if the unforeseen disappearance of your MVC should happen while you are socializing at the local espresso and salmon bar. Insurance companies have very little imagination.



A GUIDED TOUR OF THE MVC Master Volume Control



A GUIDED TOUR OF THE MVC Master Volume Control

1- Signal Inputs and Outputs: The MVC can take up to six channels of input signal and provide up to six channels of output signal. When a signal is fed into the “Channel 3” inputs of the MVC it has the ability to send a signal to the “Channel 3” and “Channel 2” and/or “Channel 1” outputs.

2- PFM Filter: The “Channel 3” inputs utilize a PFM subsonic filter which will help with speaker control and amplifier power management. To change the PFM frequency, you need to remove the top of the chassis and change the modules. Your local AudioControl dealer generally carries an assortment of these replacement modules. This is discussed in detail on page 18.

3- Output Level Adjustments and Indicators: The MVC has output level adjustments for each pair of channels to allow for the balancing of your system without having to adjust your amplifiers gains. The LED indicators display the amount of signal present at the outputs of your MVC.

4- Remote Input: This input connects via a telephone cord cable to the level control of your MVC. Should you connect it to an actual phone, you will definitely get a wrong number.

5 - Linking Output: If your system requires more than one MVC (more than 3 amplifiers), the linking control will allow your MVC to pass control signal to another MVC input. More about this on page 18.

6- Power Connection: This nifty little connector will allow you to wire up your MVC in the daylight as opposed to doing it with your head crammed in the trunk. Very cool!

7- Remote Out: The remote output allows your MVC to delay the turn-on of your amplifiers. You can change the delay time from 1.5 seconds to 4 seconds by adjusting jumpers under the chassis top. This will help eliminate any turn-on thump you get when the source unit turns on slower than the amplifiers.

8- Made In America: This symbol indicates that your MVC was lovingly designed and assembled in the USA. Baseball, hot dogs...you know the rest. Just a reminder that AudioControl provides a full 1 year parts and labor warranty on any product we manufacture. However, if your authorized AudioControl autosound dealer installs your MVC, your warranty is extended a FULL FIVE YEARS!

INSTALLING YOUR MVC Master Volume Control

Up to this point everything you have read has served to educate you on the operation of the MVC. We are sure that you are chomping at the bit to install your MVC so we recommend you read the following sections very carefully.

Placement & Mounting of the MVC

Placement: The MVC needs to be installed in the signal path just prior to your amplifiers inputs. Hence, the closer the MVC is to your amplifiers (physically not emotionally), the better. Needless to say, in your efforts to mount the MVC as close to the amplifiers as possible, be careful drilling holes. You may put a hole in a gas tank or electrical wiring if you're not careful.

Mounting: Once you have selected a permanent mounting location, position the unit and mark the appropriate mounting holes with a felt-tip pin or scratch awl. After drilling small pilot hole, secure your MVC with self tapping screws.

WARNING: Failure to disconnect the negative terminal of your battery prior to the installation of your MVC can result in a warm tingly feeling.

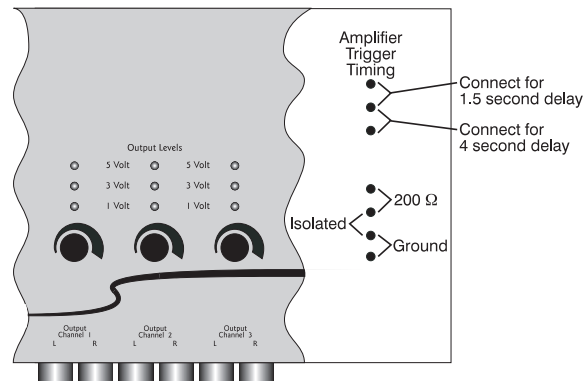


Figure 5 - Internal Jumper Connections On MVC

Electrical Connections

Remote In: Connect a 22 to 18 gauge wire from the head-unit's remote turn-on to the "Remote In" connector on the MVC.

Positive (+12V) Connection: Insert an 18 gauge or larger wire into the connector labeled "Power" on the nifty connector of your MVC. Connect it to a good constant source of 12 volts (we suggest the battery), fused at 1 amp.

Ground Connection: Use the same gauge wire as you did for the positive connector and run it from the "Ground"

connector on the MVC to the negative terminal of the battery, a ground bus, or a verified ground location. The factory head unit ground is not a good ground!

Remote Out: Connect an 18 to 22 gauge wire from the "Remote Out" on your MVC to the turn-on trigger of your amplifier. If you wish to change this delay from 1.5 seconds to 4 seconds, remove the chassis top and move the labeled jumper.

When the electrical connections are complete, you may reconnect the negative terminal to your battery.

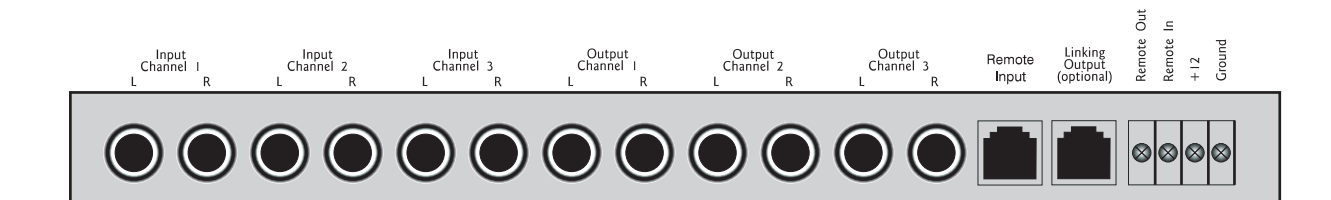


Figure 6 - Front View of MVC

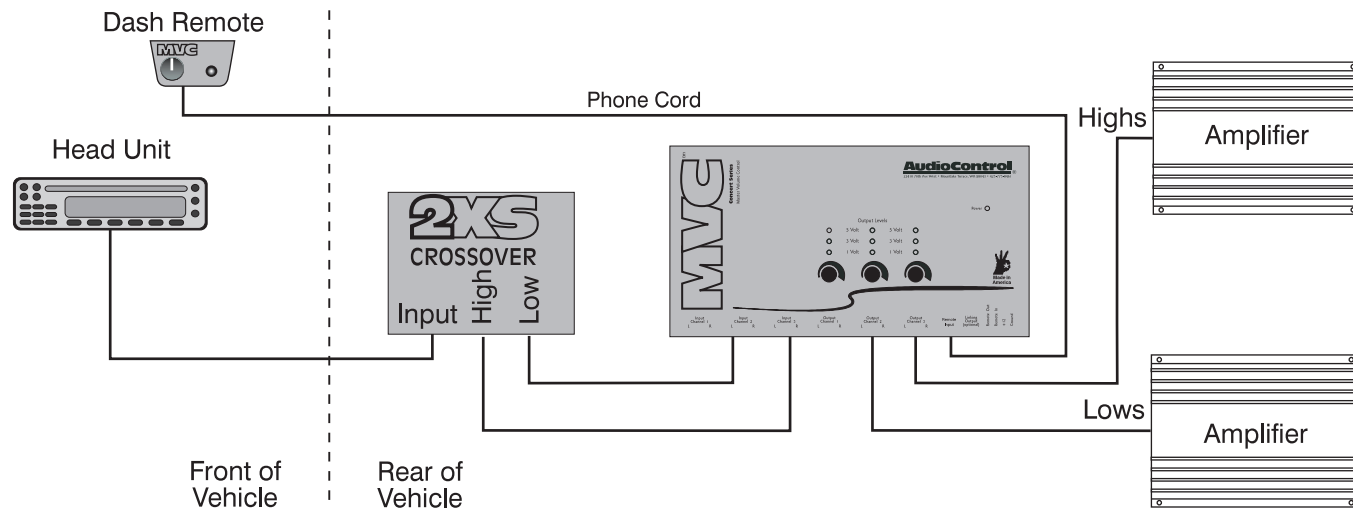
AUDIO CONNECTION AND LEVEL MATCHING

By now you have realized that there are as many ways to configure the MVC master volume control as there are speaker companies. Prior to your installation, spend some quality time sketching out your system configuration. We have included several diagrams in the next section to give you some ideas. When installing the MVC, follow the next steps meticulously:

1. Connect the inputs of your MVC to the outputs of the last component (source unit, crossover or processor) before your amplifier. At this time do not connect the MVC outputs to your amplifiers.
2. Set the input and output level control on all processors, crossovers, etc. to 0dB. This should equate to the highest level they can reach without clipping.

3. Turn the control knob on the MVC all the way up.
4. Turn on your system and increase the volume control on your source unit up approximately 70-80% (or just below clipping if you know where that is).
5. Play your favorite tape or compact disc that contains constant, dynamic music. No rap or orchestral music. Remember you still have NOT connected the inputs to your amplifiers!
6. With the music playing, (yet you don't hear anything) adjust the output level controls until the voltage LEDs on the "Output Status Indicators" start to flash along with the music. Take a moment to dance to the beat if you wish.

System Diagram - MVC with a 2XS and 2 amplifiers



AUDIO CONNECTION & LEVEL MATCHING *continued*

7. Check your amplifiers owner's manual or on the unit itself to determine the highest voltage of signal you can send in to your amplifier. (If you are still dancing from the previous step, you may now stop!)

8. Adjust the output level controls on your MVC until the voltage indicator LEDs are flashing at the maximum signal voltage level your amplifier can handle.

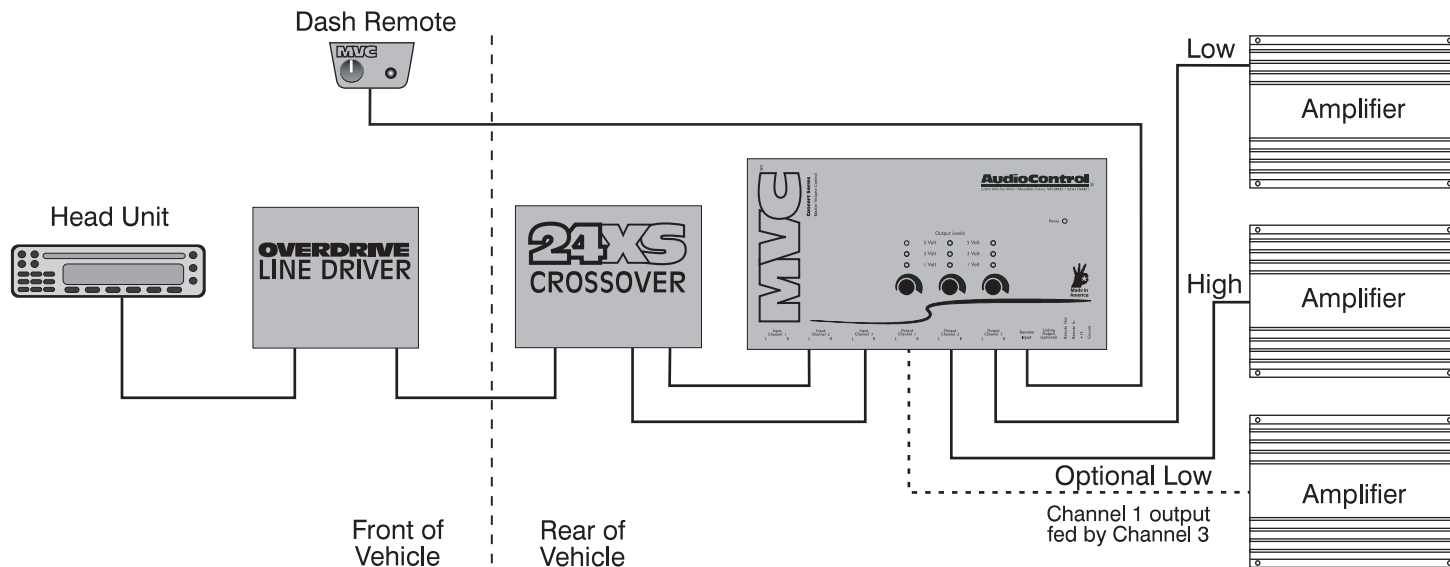
9. Reduce the volume on your MVC dash control, but don't touch your source unit. Set the gains on your amplifiers at the highest input voltage setting. In some this means turning the gain controls counter-clockwise also known as "turning them down".

10. Connect the RCAs between the MVC and your amplifier(s) and raise the signal level, using your MVC, to a medium level.

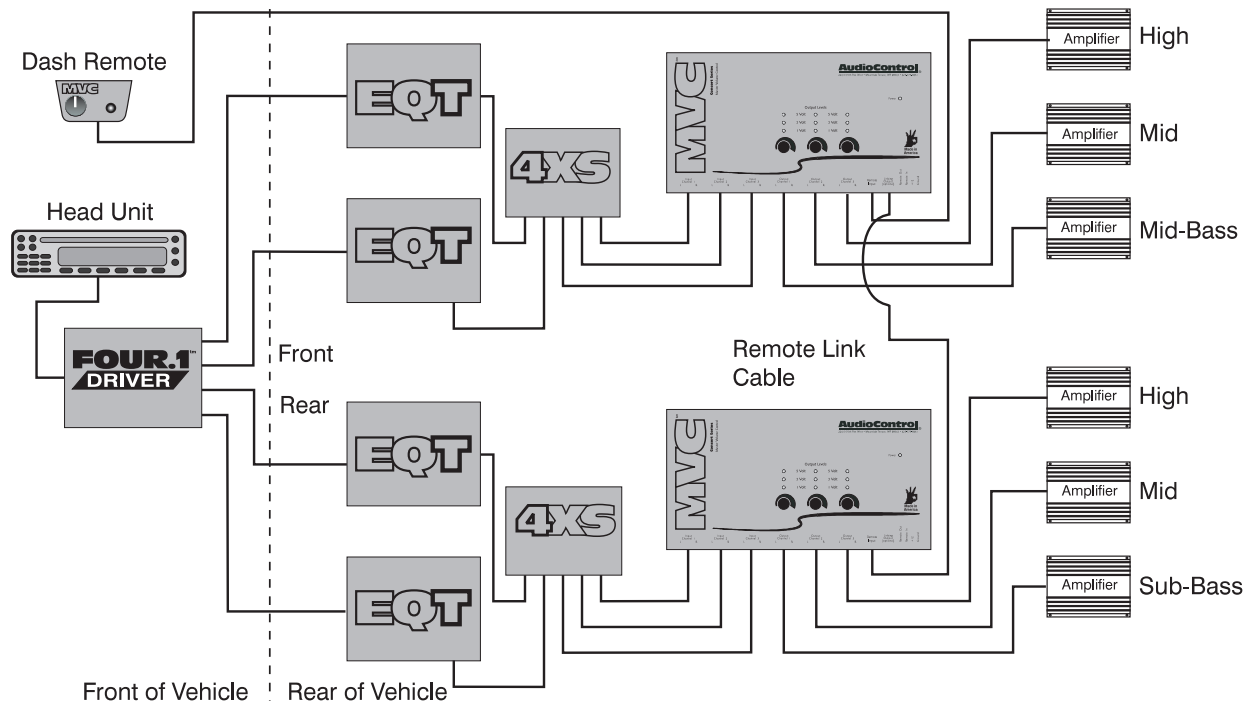
11. Using either a Real Time Analyzer (blatant plug for AudioControl products) or just your ears, if there are no other options, adjust the output levels on your MVC to balance the sound of your system. You will want an equal amount of bass, midbass, midrange, and high frequencies. Try not to increase or "boost" the output controls of the quieter amplifiers but decrease or "cut" the louder amplifiers.

12. You will have achieved optimum level settings (aka audio nirvana) for your system when the volume control for the MVC is maximized and the amplifiers are just starting to clip. If you have a different experience, see the section on troubleshooting.

System Diagram - MVC with a 24XS, 2 amplifiers plus additional subwoofer amplifier



System Diagram - MVC Competition System



CONNECTING INPUTS

If you are running a two channel system but wish to connect to more than one amplifier, you can link the inputs from “Channel 3”, to the outputs of “Channel 3”, to “Channel 2” and “Channel 1”. Very cool! To change the signal configuration, remove the chassis top and move the jumpers to the appropriate labeled configuration. See figure 10.

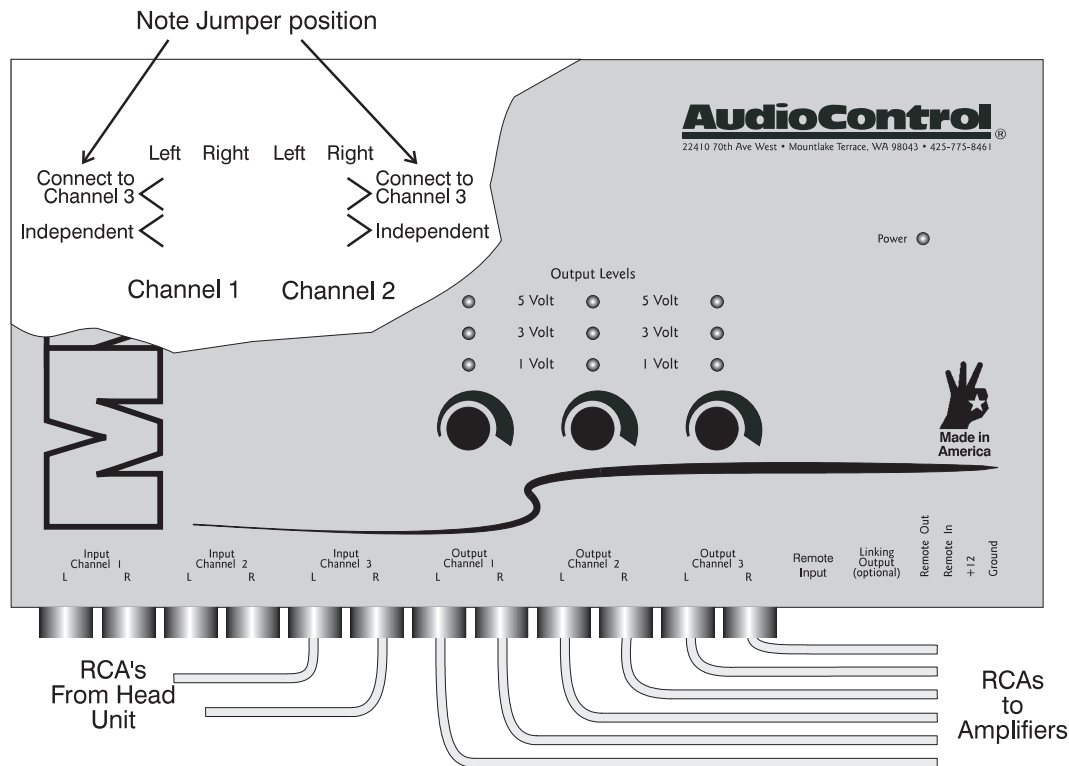


Figure 10 - Connecting 2 channels of input to 6 channels of output

Linking More Than One MVC

If you find yourself with more amplifier inputs than you have MVC outputs... fear not as we have predicted this situation. You can connect multiple MVCs together yet have them all operate using the same control. This is ideal for competition systems or when you are building a high SPL system. Connect the Linking Output of MVC #1 with the Remote Input of MVC #2. Use the dash control connected to MVC #1 to control the **entire** system!

PFM Module

Many car audio systems truly push the limits of their subwoofer...without really knowing it. Tuned enclosures effect the roll-off of many speakers, yet lots of source materials force the speakers to play lower than expected. The net result is wasted amplifier power and damaged speakers. The AudioControl PFM (Programmable Frequency Match) filter is a programmable subsonic filter. It allows you to only let the speaker play as low as it should

be playing. Because every system is different, we allow you to change the PFM roll-off frequency to whatever you choose. Just remove the cover on your MVC and replace the factory installed PFM module with one of your choosing.

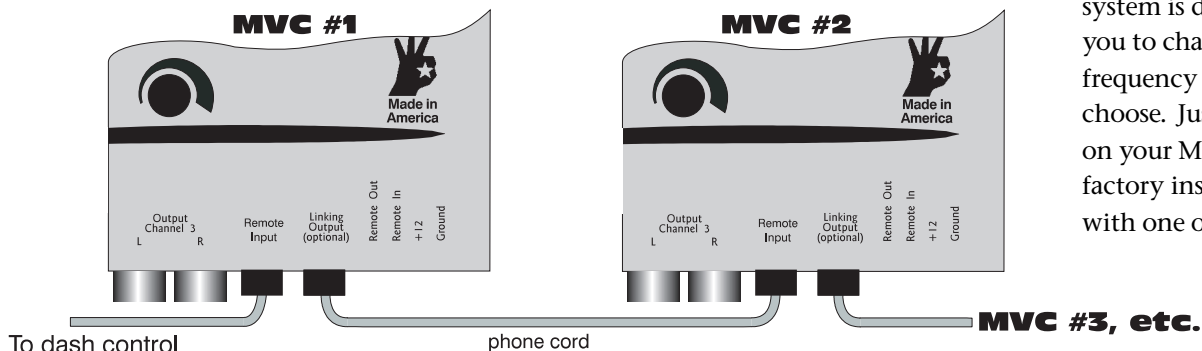


Figure 11 - Linking more than 1 MVC

TROUBLE SHOOTING

Clipping: If your system “clips” or distorts at medium volumes, check to make sure your the gain controls on your amplifiers are at the proper setting or the output level controls on your MVC may need to be decreased.

Voltage Indicators Don’t Come On: Make sure the “Power” LED is on. If so then check with your source unit manufacturer to determine if it produces enough signal voltage to trigger the LEDs. In many cases, adding the Overdrive line driver or FOUR.1 in-dash EQ will solve this problem.

Low Volume: If you find that you are getting low volume when your MVC is control is maximized, re-adjust your output levels.

Doodle here...

IF YOU LIKE THE MVC, YOU'LL LOVE...

The **Overdrive**. If more signal voltage is necessary in your system, don't feel alone. Many customers have added The Overdrive line driver and felt like they had new amplifiers.

Do you like great sound, but you're kind of addicted to



The Overdrive

the features of your factory source unit? You know, steering wheel controls, clean cosmetics, or maybe the backlighting is just the way you like it? Whatever the case, you are a candidate for The **EQL**™. The EQL is our award winning dual-bandwidth, trunk mount equalizer, with a bonus! It has speaker level inputs! Run your factory head unit right into the EQL and BOOM, instant adapter/equalizer/line driver.



The EQX

Thirteen full octave and 1/2-octave spaced bands help tame even the most wicked acoustical environment, your car. Need a crossover **and** an equalizer? **The EQX**™ is just the ticket and will also connect directly to your factory head unit.

The Epicenter™. Our patented (US Patent #4,698,842) bass restoration component, that puts the “woof” back into woofer just got better! More Bass Louder! That's the new Epicenter. You have to hear it to believe it.

The **3XS**™. A 4 channel, 2 way crossover with breathtakingly steep 24dB per octave slopes. If performance is important to you, then you will appreciate the 3XS.

And now a word from the legal department...

THE 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 AudioControl MVC. So go ahead and read 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 that 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 MVC for five years from the date you bought it, if installed by an authorized AudioControl dealer, 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 purchase your MVC.
2. You must keep your sales slip or receipt so you have proof when and from whom you bought your MVC. We're not the only company to require this, so it's a good habit to be in with any stereo purchase.
3. Your MVC has to have been originally purchased from an authorized AudioControl dealer. You do not have to be the original owner to take advantage of the 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 AudioControl Factory; (b) an authorized service center; or (c) someone authorized in writing by AudioControl service your MVC. If anyone other than (a), (b) or (c) messes with your MVC, that voids the warranty.

5. The warranty is also void if the serial number has been altered or removed, or if the AudioControl MVC 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 beast); (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 through 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 AudioControl. This warranty gives you specific legal rights, and you may also have rights that vary from state to state. Promises of how well the MVC will work are not implied by this warranty. Other than what we've said we'll do in this warranty, we have no obligation, express or implied. We make no warranty of merchantability or fitness for any particular purpose. Also neither we nor anyone else who has been involved in the development or manufacture of the unit will have any liability of any incidental, consequential, special or punitive damages, including but not limited to any lost profits or damage to other parts of your system by hooking up to the unit. Whether the claim is one for breach of warranty, negligence of other tort, or any other kind of claim. Some states do not allow limitations of consequential damages.

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

The warranty included with the unit shall supersede this plain-text version, if there is any inconsistency between the two.

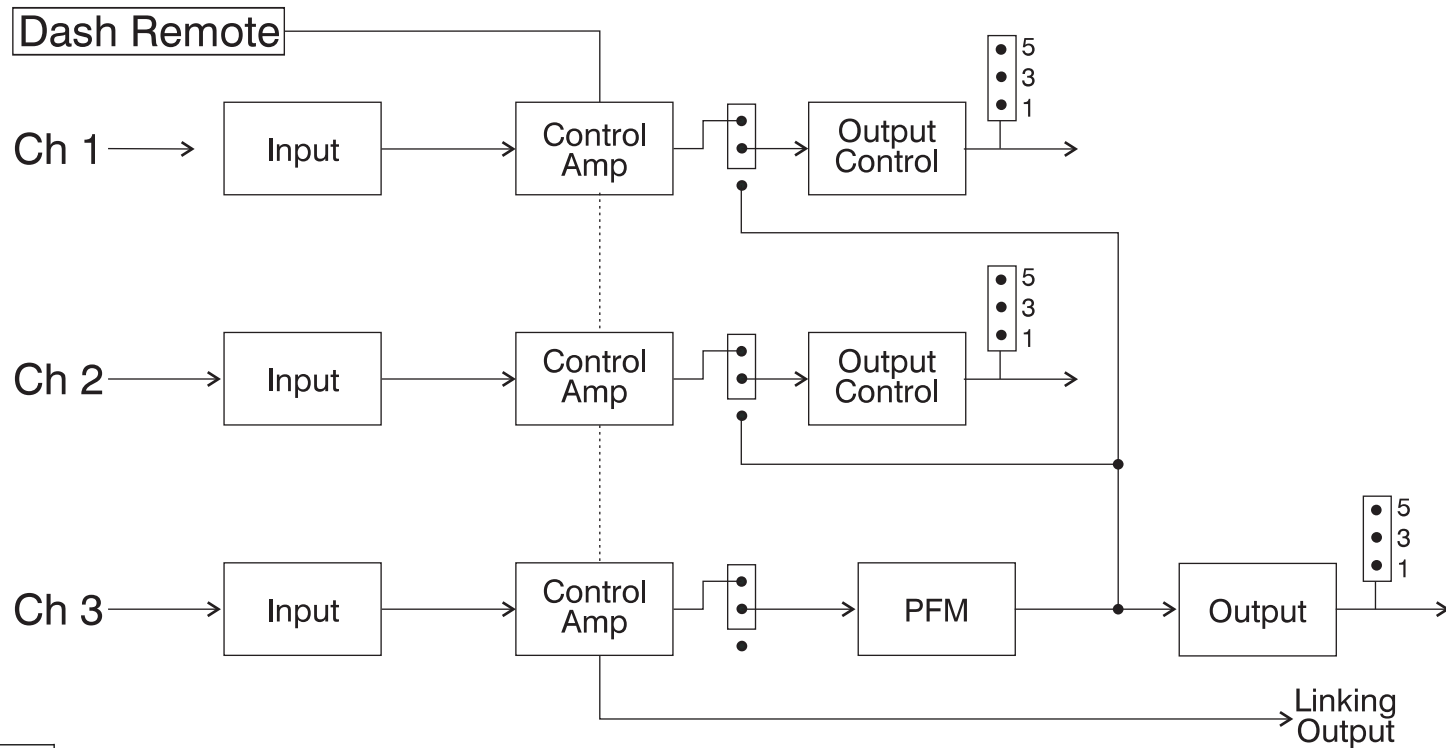
Failure to send in a properly completed warranty card negates any service claims.

MVC SPECIFICATIONS

All specifications are measured at 14.4 VDC (standard automotive voltage). As technology advances, AudioControl reserves the right to continuously change our specifications, like our weather.

Maximum input/output level	10 Vrms
Frequency response	10Hz-100kHz; ± 1 dB
Total harmonic distortion	0.03%
Signal to Noise ratio	-110dB
Input Impedance	20 Kohms
Output Impedance	150 Ohms
Inputs	6 channels
Outputs	6 channels
Programmable Frequency Match Filter	Factory set @ 33 Hz (Programmable)
Output attenuation	24 dB
Power supply	High headroom PWM
Power draw	250mA
Recommended fuse rating	1 Amp
Size.	9.75" W x 1.15" H x 5.25" D
Weight	2 lbs, 3 oz.
Ground Isolation jumpers	Yes
Remote out delay options	1.5 & 4 seconds
Country of originU.S.A.

MVC BLOCK DIAGRAM



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AudioControl®

making good stereo sound better
Electronic Engineering & Manufacturing, Inc.®

22410 70th Avenue West • Mountlake Terrace, WA 98043
Phone 425-775-8461 • Fax 425-778-3166
www.audiocontrol.com

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This manual was written while stomping puddles till our overshoes were filled and our moms made us a hot bowl of chicken soup on a typically rainy day in the Pacific Northwest.