

ARCHITECT™

Model 560

Model 735

Model 760

12 Channel
Power Amplifier
Speaker Optimizer

Professional Installer's Consciousness Guide

AudioControl®

For Those Who Consider Perfection Possible®

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Important Information

Dealer Name _____

Date Installed _____

Serial Number _____

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Installer's Guide

CONGRATULATIONS!

You are now installing a component which can dramatically improve the performance of any multi-zone audio system, especially those utilizing in-wall speakers. The Architect Models 560, 735 and 760 are American-designed, American-built “set and forget” components which will provide a lifetime of trouble-free audio enjoyment.

The Architect Models 560, 735 and 760 are made by AudioControl, the only electronics company in the world that specializes in equalizers, signal processors and audio analyzers. And the company whose professional sound division sells the most popular one-third octave real time analyzer in the world, the SA-3050.

AudioControl’s passion for high quality, meticulous attention to detail and pro sound heritage shows itself in the dozens of awards we have won for our designs, products and service. Now, as when we began, our greatest satisfaction is our reputation for sonic excellence and reliability among people just like you throughout the world.

This manual is designed to help you get everything you can out of your new amplifier/equalizer. So, even though you’re dying to see it in action, please take a few minutes to slog through our not-so-weighty prose and learn how to get the most from your new Architect. Anything with this many knobs deserves all the explanation it can get.

The Architect Product Highlights

720 Watts Strong — With twelve powerful channels of audiophile amplification, The Architect 560 and 760 will drive 60 watts, per channel 8 ohms with all channels driven. (35 watts per channel, Model 735.) This is a true heavy duty amp design, so go ahead and put a small quarry of rock speakers by the patio. Then sit back and enjoy the pristine sound.

Built For The Long Haul — The Architect has been designed with durability in mind. The Lightdrive protection circuitry defends The Architect and your speakers against clipping, distortion, damage, parties and even teenagers. Even if the party lasts all weekend.

Light Drive Protection — Few things are more irritating than a problem in one zone of an audio system effecting the entire system. This will not happen with The Architect. Every stereo output zone features independent protection against short circuits, over-heating, DC offset and clipping. Even if the protection needs to kick in, that doesn’t necessarily mean that the

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Product Highlights

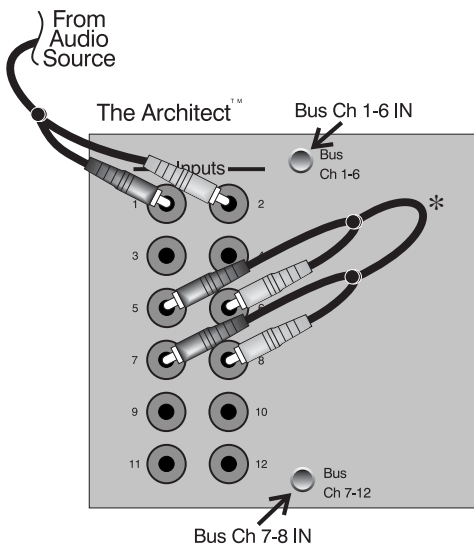
affected zone will shutdown. If a zone overheats, the smart protection reduces the power to that zone, allowing it to cool down with only a minimal reduction in speaker volume. Of course the protection circuits are smart enough to reset themselves when the problem is solved.

Specially Designed Equalization Controls — (Models 735 and 760) The Architect Model 735 and 760 is intended to provide a dramatic sound improvement for “small” speakers, such as those with 6-inch and 8-inch woofers. The Architect’s 45Hz, 150Hz, 300Hz, 700Hz, 2500Hz and 12kHz band centers were chosen to optimize in-wall and 2-way bookshelf speakers at critical frequencies where adjustment is most advantageous. The bandwidths (or ‘Q’ as our engineering types call it) have also been optimized for the difficulties that in-wall speakers present. This allows The Architect Models 735 & 760 to improve the sound of these smaller speakers better than any other equalizer.

PFM Programmable Subsonic Filter — The Architect’s Programmable Frequency Match (PFM) circuitry is an installer adjustable bass-blocking filter which protects small speakers and improves their overall sound. The smaller woofers found in most in-wall or bookshelf speakers cannot reproduce the bass of a larger speaker (the laws of physics intervene). If called upon to reproduce a bass note that would cause the speaker to move PAST its maximum cone travel, damage can result - and even if it doesn’t, severe audible distortion DOES. The solution is AudioControl’s exclusive PFM circuit. It gives small woofers only those frequencies they can use by “chopping off” bass below an installer programmed frequency (40Hz is the factory setting). The woofer is protected and can do a better job of reproducing mid-bass and higher frequencies.

Input Bussing – Sometimes you just want to feed the same music to every room in the house. You could use a single, stereo amp and series/parallel the speakers. The problem is that if you get a short in the system or the amp dies, **all** of the zones go dead. The Architect solves that dilemma by letting you send a single stereo signal to all 12 channels of the Architect with the press of a button. Every room enjoys independent protection and equalization.

Made in the Northwest Rainforest — The Architect began its existence at our factory in Mountlake Terrace, Washington, a few miles north of Seattle. Here, we also build precision test instruments, equalizers and analyzers and a totally awesome line of car stereo components. AudioControl began in 1977 and has won so many audio industry awards for design and engineering excellence that our reception room wall is starting to sag. But enough about us. Let’s start getting the most from your audio system!



***Optional -**

Connect channels 5-6 to
Channels 7-8 to bus input signal
to all channels

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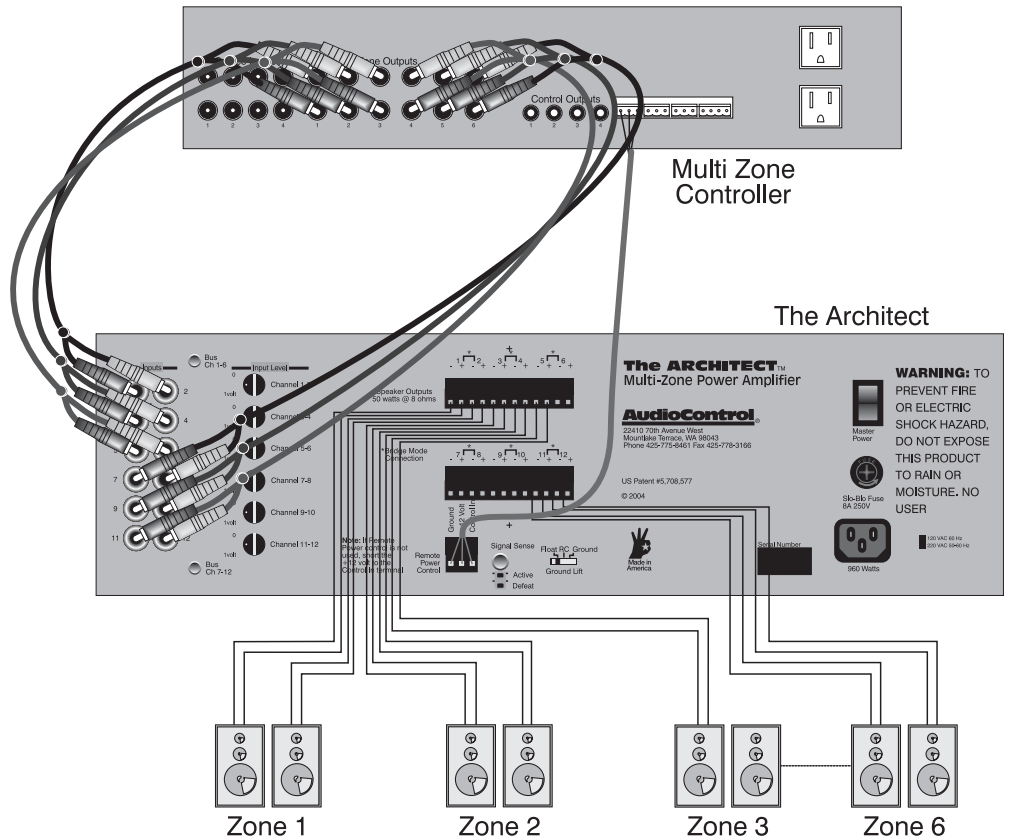
Experienced Installer's Quick Hook-Up Guide

What follows are "Express" hook-up diagrams for professionals and experienced audio buffs.

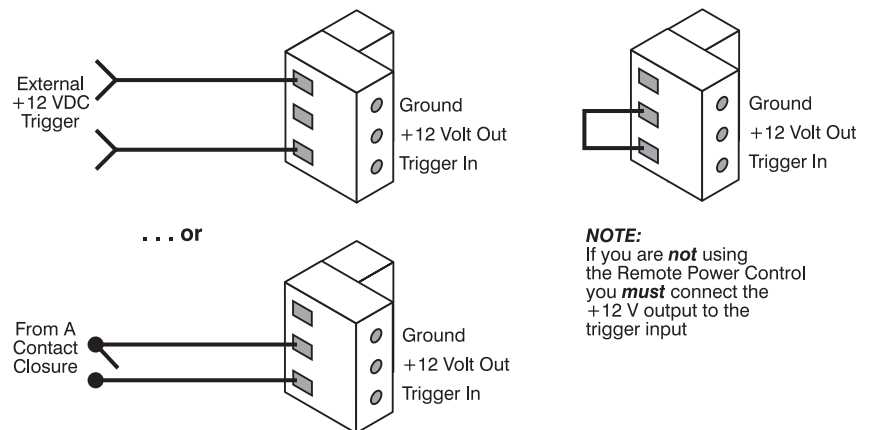
Make sure to fill out and mail the warranty card.

The PFM filter module comes factory set at 40Hz. See page 17 for details on changing the PFM modules. A complete range of frequencies is available from the factory and information is also available on building your own modules in Appendix B. Modules are also available from any AudioControl car stereo dealer in a pinch.

Final adjustment of The Architect Model 735 & 760's boost/cut controls in each zone is best done with a one-third octave real time analyzer and pink noise test signal, but it can be done by ear, especially if you desire to emphasize certain frequencies.



Six Zone System with The Architect and Preamp/Controller



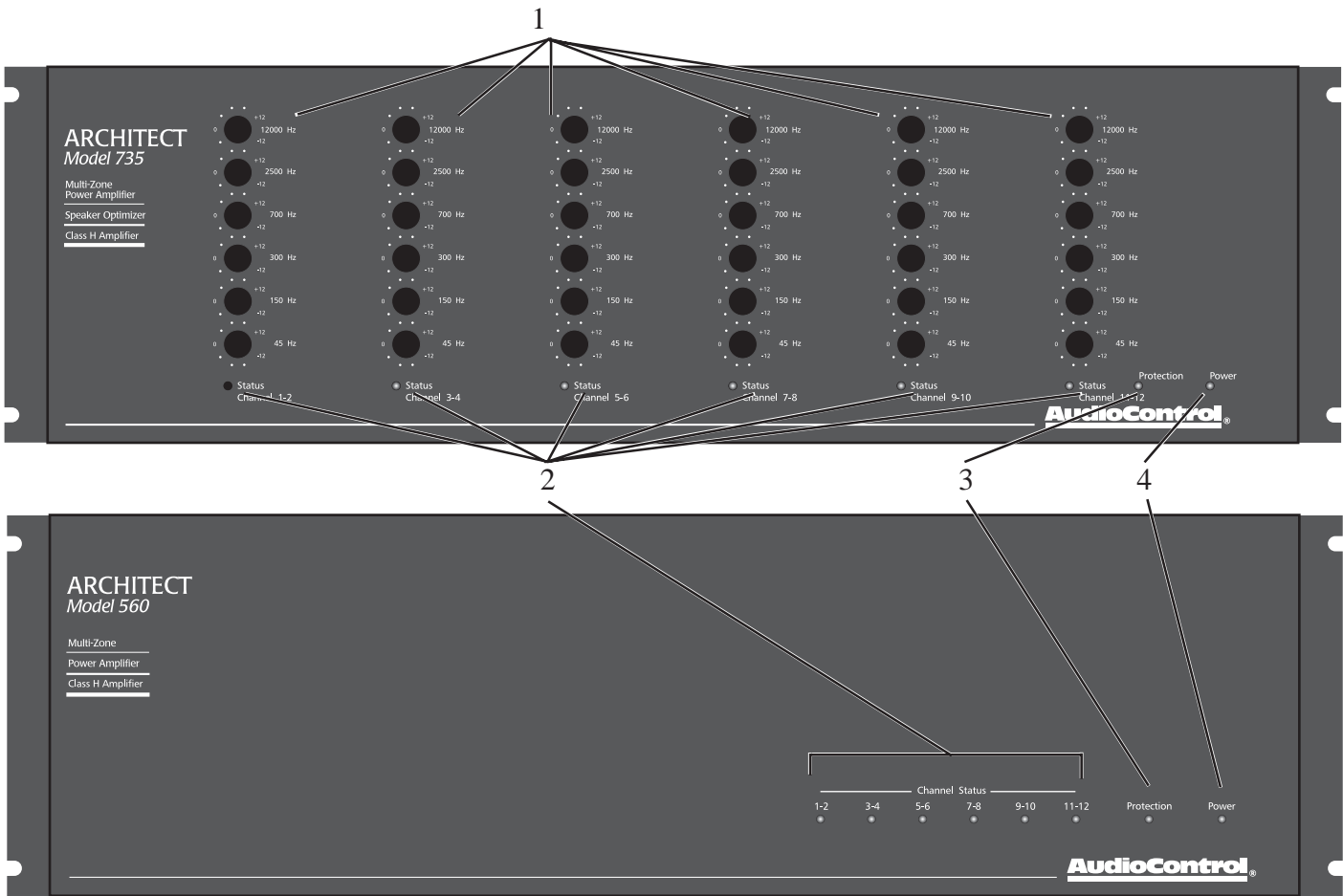
Remote Power Control Hookup

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A Guided Tour Of The Architect™ Model 560 & Models 735 & 760



Front panel:

1. Stereo Speaker Optimizer Controls — (Models 735 & 760) This sea of knobs provide up to 12dB boost or cut at 45Hz, 150Hz, 300Hz, 700Hz, 2500Hz and 12KHz. After initial adjustment the only time you would change the control settings are 1) if you connect different speakers into the system, 2) if (assuming the speakers aren't built-in) you move them significantly, such as from a bookshelf to floor stands, or 3) if your room acoustics change through addition or rearrangement of furniture, wall or floor coverings, large hairy dogs, etc.

Note: If you have the Signal-Sense turned on, then the status LED will not turn on until there is an audio signal present on that zone's inputs.

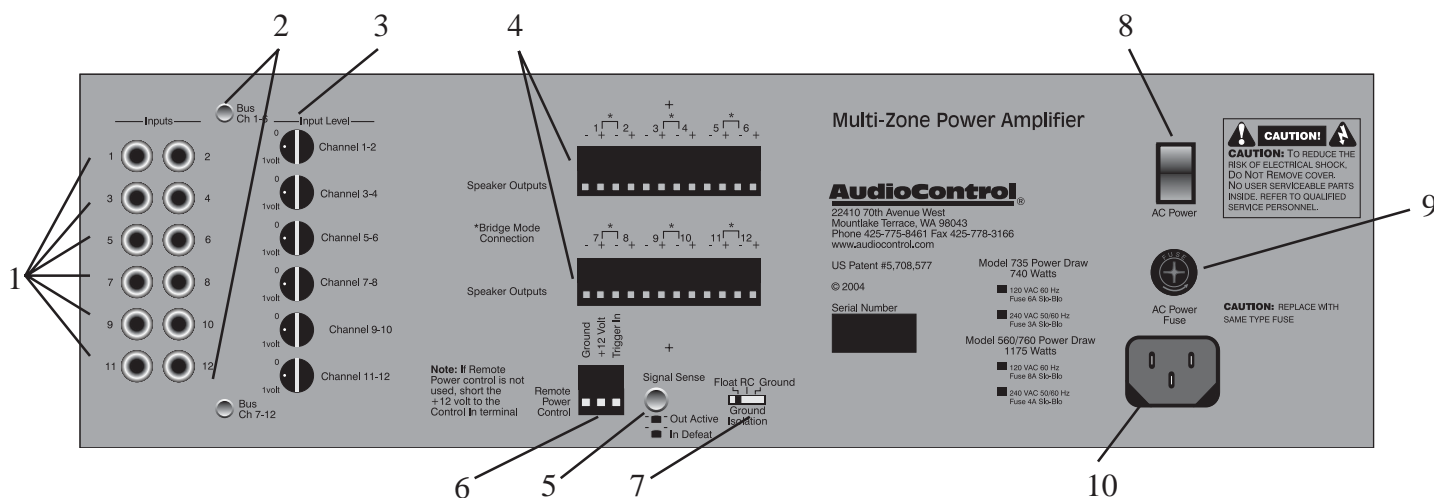
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2. Channel Status LEDs — These dual-color LEDs serve two purposes. First, they illuminate Blue when the corresponding zone is active. The second function of the status LED is to turn Red if something has caused that zone to go into protection.

3. Protection LED — This LED also has two faces. In normal operation it glows Blue when the remote power trigger is active and The Architect is in stand-by. If the Protection LED turns Red, then one of the internal protection circuits have come into use. All the protection circuits automatically reset themselves when the problem causing the fault has been fixed.

4. Power LED — Nothing too tricky here...if you have the Master Power switch (on the back panel) turned on and The Architect is plugged into an active AC outlet, this little Blue light will shine forth.

A Guided Tour Of The Architect™ Model 560 & Models 735 & 760



Back panel:

1. Inputs — These unbalanced RCA inputs connect to your control preamplifier's outputs. The signal sense and equalizer circuitry work in channel pairs (1&2, 3&4, etc.) but you can still use each input as a separate mono channel.

2. Input Bus Switches — Sometimes you need to feed the same audio signal to multiple channels of the Architect. The Input Bus switch lets you gang three zones together with the press of a button.

3. Input Level Controls — These stereo-ganged controls vary the input sensitivity of the Architect.

4. Speaker Outputs — These terminal blocks are designed to make an installer smile. You can unplug the blocks and connect all of the speaker wires to them without balancing The Architect on your lap. This also makes it very simple to pre-wire a system without ever taking The Architect out to the installation site. The speaker connector blocks will accept up to 12 awg wire.

5. Signal Sense Defeat — The signal sensing circuitry activates a zone approximately one second after an audio signal is present on the Input RCA jacks. To defeat this function and leave The Architect ready to play at all times, press this switch in to the recessed (Defeat) position.

6. Remote Power Control — This three pin connector allows you to remotely turn on The Architect. You can either use a contact closure

between the Control In and the +12VDC output or an external 12 volt trigger between the Control In and Ground terminals. The +12 volt output is not designed to power other pieces of equipment. It is a current limited output for switching The Architect only.

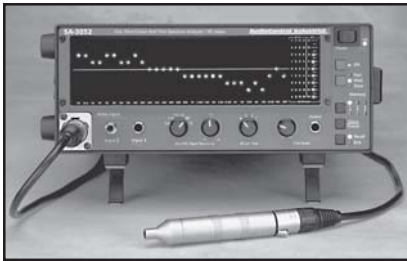
7. Ground Lift Switch — This switch selects the level of isolation between the audio signal ground and your AC earth ground. In normal operation this switch should be in the Ground position, but if you run into trouble with an AC ground hum, try the other two settings for the best operation. For your safety, the chassis is always connected to ground regardless of the switch setting.

8. Master Power Switch — This switch shuts off the main AC power. Normally the only time you need to turn off the master power is if the homeowner is going to be gone on vacation for the summer.

9. AC Power Fuse — The Architect is designed with several layers of protection circuitry. This power fuse is here just in case something really awful goes wrong.

10. Power Cord — The Architect draws a hefty 1000 watts maximum. Make certain that it is plugged directly into the wall outlet or a power strip with sufficient power rating. Since The Architect has remote power switching, you can plug the unit into an outlet that is always active.

Hooking Up Your System



SA-3052

Hooking Up Your System

What you'll need:

1. The Architect Multi-Zone Power Amp.
2. RCA audio hook-up cables.
3. Small blade screwdriver for terminal blocks.
4. (Optional) A balanced line driver if you are going to mount The Architect more than 20 feet from the control preamp.
5. Enough speaker wire to reach all of your speakers.
6. Multi-zone controller, receiver, or preamplifier.
7. Although you can set the speaker optimization controls by ear, a real-time audio analyzer such as the AudioControl SA-3052 is very helpful.



BLR-10 and BLD-10 Balanced Audio Drivers send audio over CAT-5. Extends high quality audio up to 1000'.

**Installation:
The Long Version**

What follows is a step-by-step guide to integrating The Architect into your multi-zone system. If it seems overly detailed, please forgive us. We would rather tell you too much than too little.

First, check your new Architect for any shipping damage. We pack 'em pretty securely, but it's a vicious world out there and anything can happen between us building them here in Mountlake Terrace, Washington, and your installation.

Paperwork

Yes, filling out the warranty registration card is about as exciting as cleaning out your sock drawer, but we'd definitely like the card back after you've hooked up The Architect and played with it a while. We DO read each and every incoming card and react to your suggestions. That's how great products like this are created.

Next, record the serial number on the sales receipt and make certain the home owner puts it away in a safe place. Stashing the receipt away is very important in the unlikely event that your Architect ever needs servicing, or...well things do happen...you sometimes need to prove to an insurance adjuster that something as great as The Architect was installed in the system.

Placement

The Architect is a very efficient amplifier, but it does need some breathing room to operate properly. Make certain that the vents on the top and bottom are not blocked and have at least 1/2" of air space. Also make certain that heat sensitive components such as CD or tape players are not directly on top of The Architect.

A benefit of having a remote power control on The Architect is that you can install it in another area of the house (such as a basement or utility room) away from the main component stack. Make certain that you use a good quality audio line driver (the AudioControl BLD-10 and BLR-10 come to mind) to extend the RCA cables if you choose this remote type of installation.

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Installation: The Long Version

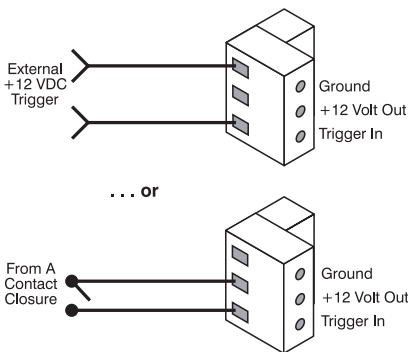


Warning - Always connect the safety earth ground. If you have an AC hum problem, use the ground lift switch

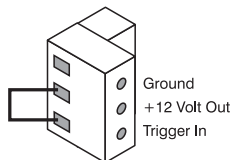


Installation Hint: If your installation doesn't require this remote power turn-on, you must put a short piece of wire between the +12 V output and the Trigger In pins.

Note: The channels are paired into stereo zones (channels 1&2, 3&4, etc.). The signal-sense control effects both channels in a zone at the same time even if only one input is used.



Note: If you are **not** using the Remote Power Control you **must** connect the +12 V output to the trigger input.



AC Power

Under normal operating conditions, The Architect can draw up to 1000 watts of AC power. Don't plug it into a switched outlet on your system unless you are certain that it can handle the power rating. Also, please don't cut off the ground pin on the power connector. It is an important safety feature. If you need to plug it into a two prong outlet, use a ground adapter (and connect the ground on it). If you have a ground noise problem, try the ground lift switch on the rear panel.

Remote Power Control

The Architect has three levels of power control.

1. Main AC Power Switch — This is the master control and must be turned ON for The Architect to function. When the main power switch is on, the Blue Power LED on the front panel lights up. Normally the only time that you would need to turn the AC power switch off is when the system is going to be unused for an extended period.

2. Remote Power Control — This removable 3-pin remote connector on the rear panel allows simple interfacing with external control systems. It accepts either a contact closure or external +12 volts DC (see diagram). The two-color Protection LED on the front panel illuminates Blue to show that the remote power control is active and The Architect is in Stand-by.

3. Signal-Sense Circuit — This provides individual zone power control. When active, it senses that an audio signal is present on the RCA inputs, enables the power and unmutes that zone. The zone status LEDs on the front panel light up Blue when a signal is present.

In some installations it may be desirable to defeat the signal-sense control and leave all zones active regardless of the audio input. To defeat the signal-sense, press in the Signal-Sense Defeat button on the rear panel.

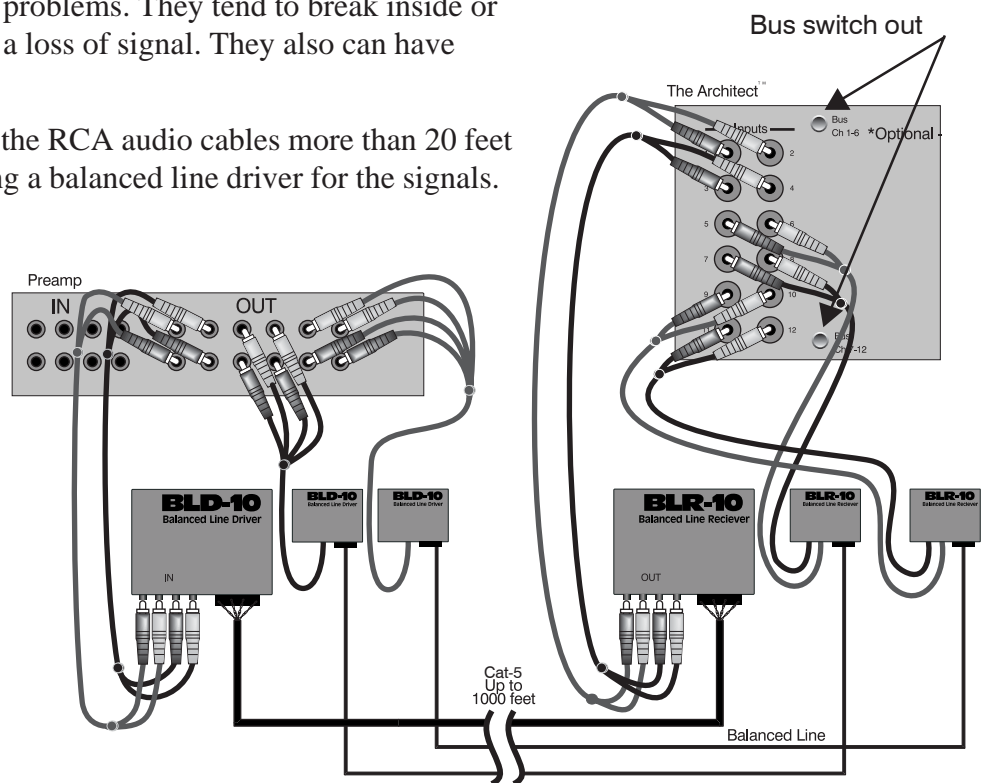
Installation: The Long Version

Audio hook-up

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

1. Turn off ALL components before making any connections.
2. When making connections, designate RED RCA plugs as RIGHT and WHITE, BLACK, or GREY plugs as LEFT. In fact, this is a good idea for ALL signal connections made in your audio system. The key is consistency. Stick with the same color-coding and you'll reduce possible problems.
3. If the same audio signal needs to feed multiple channels the Input Bus switch on the Architect must be pressed 'in'.
4. Whenever possible, keep power cords away from signal cables to prevent induced hum. This is especially important if you bundle the cables to keep the installation neat looking.
5. Use quality interconnect cables. We're not going to get into the debate about whether \$100/meter cables improve the sound, but we know from experience that really, REALLY cheap cables can cause a multitude of problems. They tend to break inside or corrode, causing hum or a loss of signal. They also can have poor shielding.

6. If you need to run the RCA audio cables more than 20 feet you should consider using a balanced line driver for the signals. This will provide better noise rejection against nasty things like hum, spikes, local talk radio, etc. Ask your AudioControl representative for more information about line drivers.



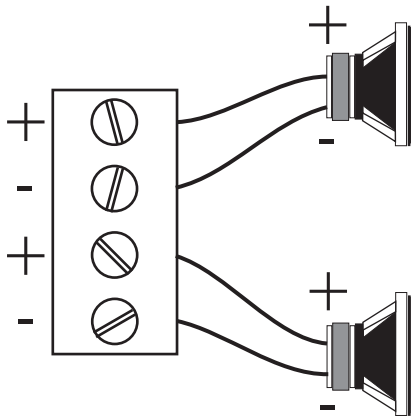
*Twelve Channel Multi-Room System
using the BLD-10/BLR-10 line driver*

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Speaker Hook-up



Speaker connection wiring

Speaker Hook-up

The same rule applies to the speaker wires as the RCA connections. Establish a standard connection color code and stick with it. One conductor of the speaker wire is normally marked by a different color (silver versus copper) or there is a ribbing on one side. Typically this marked conductor is used for the positive (+) speaker leads. Of course the really good wire has Positive and Negative printed right onto the wire jacket.

Your choice of speaker wire gauge and the length of the runs also affects the speaker impedance load presented to the amplifiers. As you can see in this table, even fairly short speaker runs can have a very significant resistance if you use a smaller wire gauge. This can be a benefit if you are paralleling lots of speakers. The wire itself acts as an impedance limiter, since the amplifier cannot see a speaker load lower than the resistance of the wire. The downside of this resistance in the wire is that you waste some part of the total power available to the speakers.

See the appendix for information about bridging the Architect into mono operation.

Congratulations! You're done with the audio hook up. Now for the details of operation...

Speaker Wire Resistance Wire Gauge versus Run Length

	25'	50'	100'	250'	500'
24 GA	1.3 Ω	2.6 Ω	5.1 Ω	12.8 Ω	25.7 Ω
22 GA	0.8 Ω	1.6 Ω	3.24 Ω	8.1 Ω	16.0 Ω
20 GA	0.5 Ω	1.0 Ω	2.0 Ω	5.0 Ω	10.1 Ω
18 GA	0.3 Ω	0.6 Ω	1.28 Ω	3.2 Ω	6.4 Ω
16 GA	0.2 Ω	.4 Ω	0.8 Ω	2.0 Ω	4.0 Ω
14 GA	0.1 Ω	.25 Ω	0.5 Ω	1.26 Ω	2.5 Ω
12 GA	0.08 Ω	.16 Ω	0.32 Ω	0.8 Ω	1.6 Ω

Equalizing the System

Before proceeding on to setting up the Speaker Optimization controls on the Architect, it's a good idea to make sure that you have everything connected and working properly.

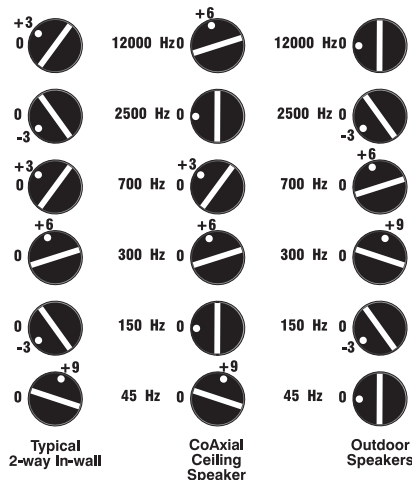
1. Double-check all connections. Make certain that all of the audio and speaker connections are firmly seated and tightened down.
2. Turn on your audio system. The Power LED on the Architect should be Blue, the Protection LED should be Blue (after a few seconds of Red on startup) and (unless you have defeated the Signal-Sense) the Channel Status LEDs should be off.
3. Start one of the audio sources playing and send that signal to the Architect (how you do this depends on your particular multi-room system). The zone status LED should illuminate Blue within one second after the music begins.
4. Check each speaker output zone to ensure that each one plays properly.
5. With all the speaker loads turned on, turn up the volume and make certain that the channel status LEDs on the Architect stay Blue. If they slowly toggle between Blue and Red, then there is either a short in the speaker wiring, or the combined speaker load is too low.



Installation Hint: For the absolutely best results, The Architect™ Model 560, 735 and 760 should be adjusted with a real time analyzer such as the AudioControl Industrial SA-3052.

Congratulations! You're ready to go on to setting the Speaker Optimization controls.

The following are examples of typical settings of the Architect™ 700 Series Speaker Optimizer controls. Naturally, the results of adjustments will vary depending on the individual acoustic environment, the type of speakers, and the personal preferences of the listener. These recommendations are not concrete, they are simply good starting points.



Example Settings

You're almost done! Now for the details of operation...

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Equalization Controls

Here is a brief introduction to each of the Speaker Optimization control frequencies and what their effect is on your music.

45Hz — Low bass. This is about the lowest frequency which in-wall, extension and small bookshelf speakers can achieve. Boosting it too far might cause problems, even though The Architect's PFM filter cuts frequencies under 40Hz. But if your speakers can take it, a mild boost will enhance bass instruments such as Fender bass, kick drum, floor toms, timpani and double bass violas.

150Hz — High bass. There's a lot of bass information at this frequency. In fact, most modern music is mixed to enhance this area of the frequency spectrum. 150Hz also determines the depth of male vocals and contains reverberant information which contributes to the spaciousness of sound. Boosting 150Hz can add "POW!" and impact to bass or it can make the sound "bonky" and "boomy". This is a critical adjustment with small or in-wall speakers. Experiment with it.

300Hz and 700Hz — High and low midrange. These controls directly effect the sound of instruments and vocals. These bands also determine the speaker's presence (whether the music sounds far away or close in). Small speakers often produce too much midrange, so these controls are candidates for being turned down slightly during your initial experimentation. Definitely consider reducing 700Hz if you are only using your extension speakers for background music.

2500Hz — Treble. Female vocals and the "edge" of instruments such as guitars, snare drums, saxes, violins, etc. are found in this range. If accentuated too much (by boosting this control) sounds in the 2500Hz range can seem harsh and fatiguing to the ear due to excessive output by the speaker or because of live, reflective room acoustics.

12kHz — High treble. The fine detail, texture and sheen of music is found here. The breathiness of vocals, the sheen of cymbals, the high overtones of piano and strings. Actually, there's audible music information up to 20,000Hz on some CD's and most adult's hearing is still pretty good at 15,000Hz. But we've chosen 12,000Hz because it provides more useful control to compensate for room acoustics and common small-speaker deficiencies.

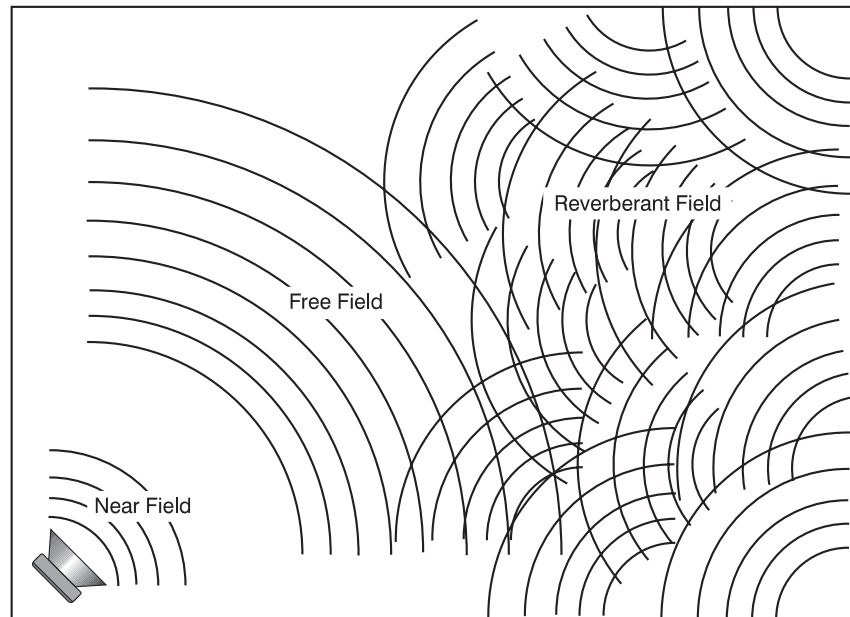
**A Short Introduction To Equalizers and
Acoustics**

Magazine reviewers and audio system owners spend much time critically appraising speaker and other stereo components. Unfortunately, a phenomenon that has a very large effect upon sound is not easily judged or changed. That effect is the ACOUSTICS of the environment in which you are listening.

Room acoustics is a complicated subject about which entire textbooks have been written. We simply want you to be aware of a few basics that have a direct effect on real time audio analysis.

Sound travels in waves, as you probably learned in junior high school. In a stereo system, these waves are created by the speak-

ers. Like waves in a pond created by a splash, sound waves emanate from the transducers (drivers) in your speakers and spread out into the room. If your room were infinitely big, that's all there would be to it. But just like waves in a pond reach the bank and reflect back, sound waves bounce off walls, ceilings, and floors, reflecting, reinforcing and canceling each other as shown in the figure above. Since sound is energy, the way it reflects depends upon the angle of the



Room interaction

surface, the type of material and the frequency of the sound wave. Because your listening position is likely to be towards the back of the Free Field waves shown in the diagram, you also get part of the reflected Reverberant Field as well.

Now we add the next set of complications: Different frequencies of sound have different wave lengths (a function of frequency and the speed of sound). Each frequency's wavelength contributes differently to the Free and Reverberant Fields because they are different sizes. For example, a 32Hz bass note has a wavelength of 35 FEET, while a 16,000Hz note has a wavelength just under a tenth of an inch. Tiny treble waves can be caught and neutralized by draperies, carpeting, upholstered furniture and gangs of indolent Persian cats...while gigantic bass waves simply slosh back and forth in the room.

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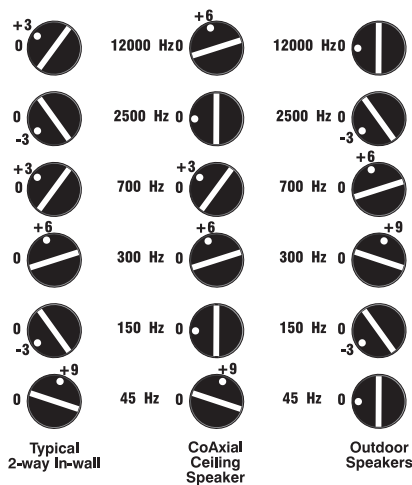
Pink Noise

Another set of variables is the shape and volume of your listening room. Large rooms require more bass energy to excite waves within them. Small rooms need less energy, but reflect it differently. And then there's the fact that most rooms don't have four walls anymore, but open into dining rooms, lofts, cathedral ceilings, etc. All of this means that predicting sound interaction patterns is very difficult due to the irregularities of the room shape.

As you can see, room acoustics is an important but complicated subject (To learn more about room acoustics, go to our website and download AudioControl's Technical Paper 107, "Small Room Acoustics De-Mythologized"). The overall point that we're trying to make is that the various rooms in your home function as gigantic mechanical equalizers, boosting or cutting certain frequencies depending on size, shape, volume, acoustic treatment and the position of the speakers.

Audio Analysis Using Pink Noise

It may take several series of adjustments since there is some interaction between each control. We have included some sample settings and general descriptions of each control's function on page 14.



Example Settings

After initial adjustment the only time you would change the control settings are 1) if you connect different speakers into the system, 2) if (assuming the speakers aren't built-in) you move them significantly, such as from a bookshelf to floor stands, or 3) if your room acoustics change through rearrangement of furniture, wall or floor coverings, large hairy dogs, etc.

Here are examples of typical settings for the Architect Models 735 & 760 Speaker Optimizer controls. These controls are discussed on page 12. Naturally, the results of adjustments will vary depending on the acoustic environment, type of speaker and sound sources you are using, but this is a good starting point.

For an extensive description on the use for the SA-3052 real time spectrum analyzer for these settings, please see that product's manual.

The Truth About Bass And The Programmable Frequency Match Filter

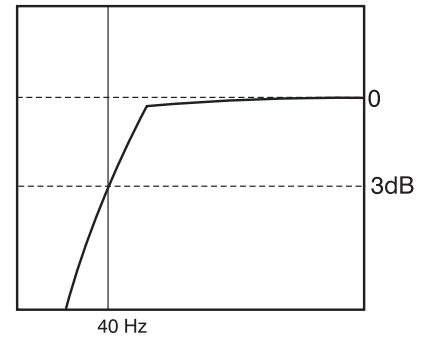
Now that digital audio is the favorite musical source, there's more low bass running around in a typical system. Low bass injects large amounts of power into ANY kind of speaker — up to 60% of your amplifier's output is being used to reproduce frequencies under 100Hz. That can really tax an audio system. The second problem is that bass produces heat in the speaker. If more heat is built-up than the speaker can dissipate, the voice coil can literally go into meltdown (or worse).

In addition, ultra-low bass and small speakers don't always get along, ESPECIALLY when you DO have ample power. The low bass music content can cause over-exursion: The speaker cone attempts to travel farther than its physical limits, potentially causing damage (in some cases you can actually hear a clacking sound!). Even before destruction sets in, there are other problems with feeding super-low bass to small speakers. Most bookshelf and in-wall loudspeakers are 2-way systems. That means that the woofer also handles a large part of the critical midrange area. When the woofer is bashing around trying to reproduce unrealistically low bass, its ability to produce midrange is compromised due to intermodulation distortion. So not only don't you get low bass, you get lousy vocal and instrumental reproduction.

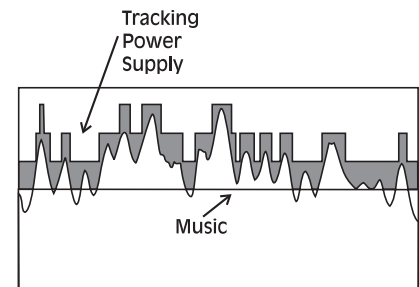
Pragmatically, it boils down to this: If you want ultra-low, foundation-shaking bass from an in-wall speaker, you should add a separate subwoofer. A more economic approach is to equalize the speaker for maximum low bass output **WITHIN IT'S PRACTICAL RANGE** and eliminate lower frequencies which either can't be reproduced or which incite excessive cone travel. While it may seem surprising, actually cutting off some of the lowest bass, will make the bass sound cleaner, punchier and even louder.

Intelligent Power Supply

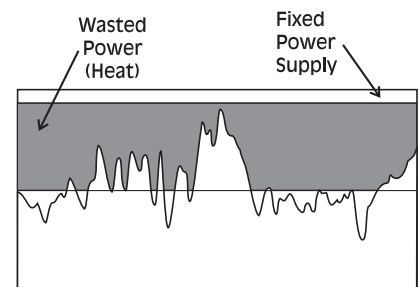
Typical amplifiers simply waste their excess headroom power as heat. This prematurely wears the electronic components and will substantially increase the ventilation requirements of a typical home audio equipment stack. Our Class H design monitors the audio power requirements and continuously adjusts the Architect for the optimum headroom. The result is much cooler operation and less power draw from the AC wall outlet.



PFM filter frequency response



Class H Amplifier



Typical Amplifier

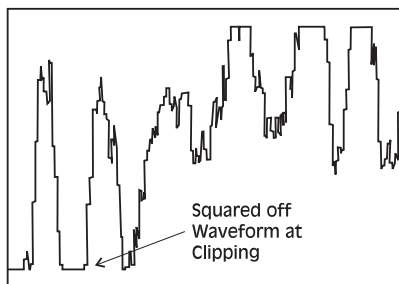
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Model 760

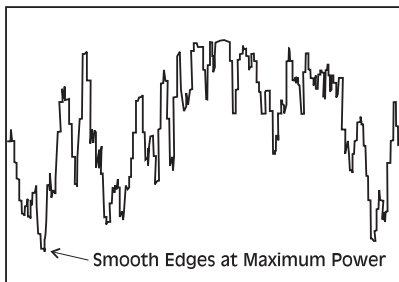
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What's Inside

A common problem with amplifiers is their *In-Rush* current. That is the extra power that the amplifier draws from the AC wall outlet when you turn on the amplifier. A single 15 amp household circuit may be fine for running a couple of Brand X amplifiers under normal operation, but when they are first turned on, the combined in-rush current draw is usually enough to pop the house circuit breaker. This is a major problem in areas where there are frequent brown-outs or power fluctuations. Our patented (U.S. Patent #5,708,577) power supply design smoothly ramps up the Architect from a cold start. This keeps the in-rush current under control and means you don't have to over rate the AC feed just to keep breakers from blowing during a brownout.



Normal Amplifier



Amplifier with Lightdrive

LightDrive Protection System

This amplifier is not only smart enough to protect itself, the Architect 700 series amplifiers also protects the speakers. When the volume is turned up too high and an amplifier is pushed into clipping; the resulting distortion will probably damage the tweeters in your speakers. AudioControl's exclusive *LightDrive* protection system eliminates the possibility of signal clipping in the Architect, even under the most demanding of conditions.

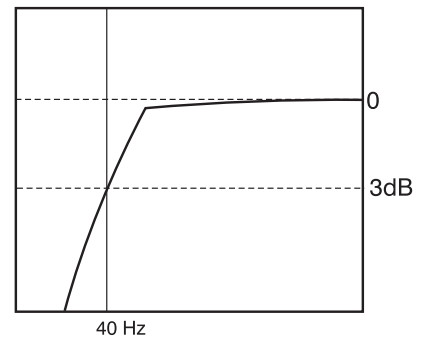
What is clipping? That's where the speaker output of an amplifier tries to exceed the available voltage of the amplifier's power supply. When that occurs, the amplifier can no longer properly create the audio signal waveform and the audio output becomes sharply squared off. This abrupt cutoff creates ultrasonics and high frequency distortion that is too much for a poor little speaker like a tweeter to handle. LightDrive solves this problem by continuously monitoring the output of the amplifier channels. If a channel begins to get near the limit of the power supply, it immediately begins compressing the audio to reduce the volume level. This happens so quickly that you'll never even hear the LightDrive system kick in...although your speaker will breathe a sigh of relief because it did.

Changing The PFM Modules

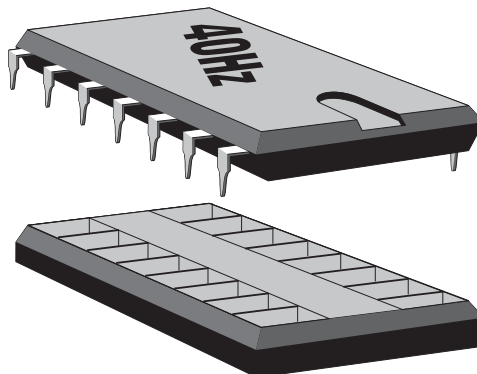
The equalization part is handled by The Architect Models 735 & 760's 45Hz control. The prevention part is handled by The Architect Programmable Frequency Match filter circuit. While it may seem surprising, actually cutting off some of the lowest bass will make the bass sound cleaner, punchier and even louder.

AudioControl's Programmable Frequency Match circuit is an adjustable subsonic filter which cuts off low frequencies. The PFM filter's cut-off point is adjustable via a small resistor module inside The Architect. When you receive your unit, it is programmed with a 40Hz bass cut-off. Depending on the application, you may want to change the filter frequency. Don't let ego get in the way and set the PFM too low because somebody thinks that a 6" woofer should be able to play down to 20Hz.

The following standard module frequencies are available from AudioControl: 20, 25, 35, 40, 45, 50, 60, 70, 80, 90, 100, 120, 130, 150, 200, and several higher frequencies going up to 6000Hz which probably aren't applicable except in very special circumstances. Each module's frequency is determined by 6 resistors inside a 14-pin DIP network. See Appendix B for details on building your own modules.



PFM rolloff curve



Close-up view of PFM Modules

Note: The modules are not directional so it does not matter which way they are inserted.

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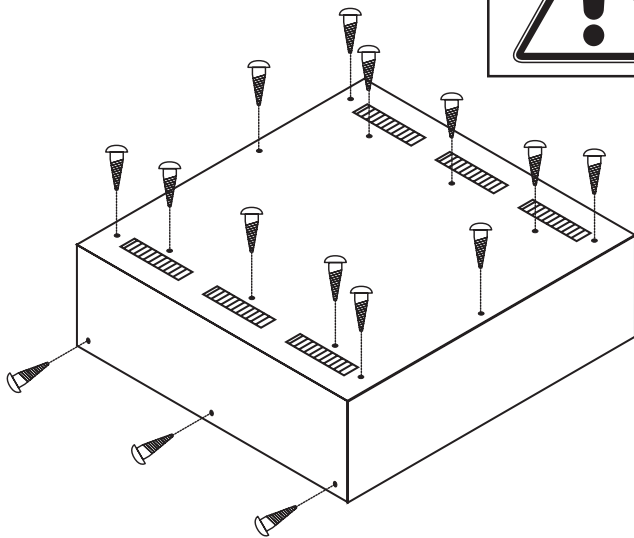
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Changing The PFM Modules

Changing The PFM Modules



WARNING: Unplug the Architect from AC power before beginning. There are dangerous voltages present inside.

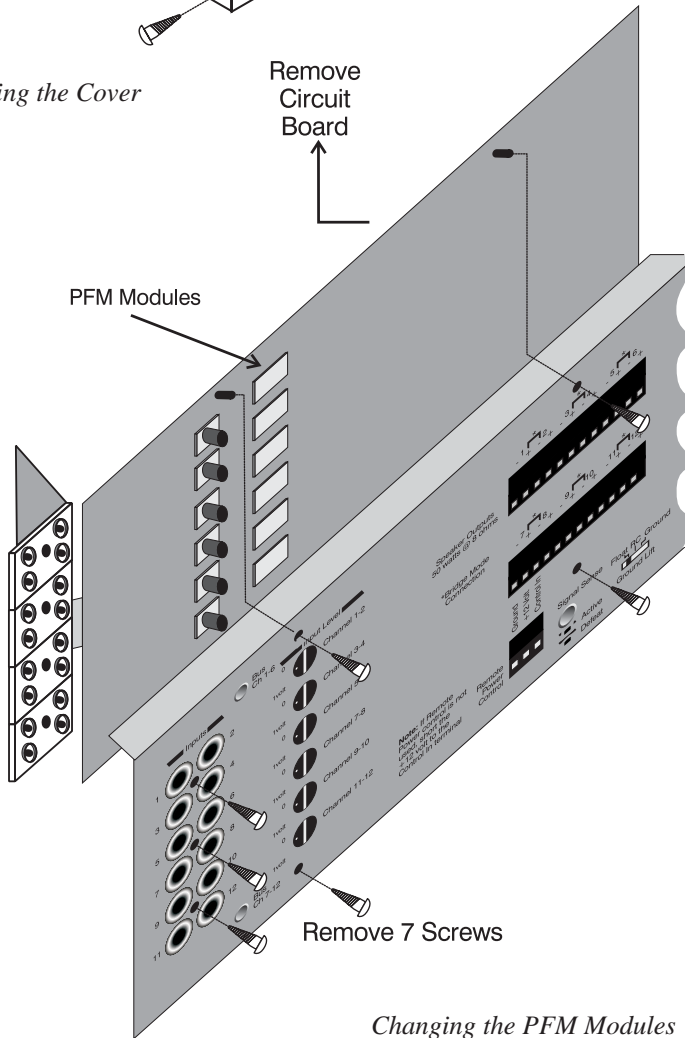


Removing the Cover

The first task in changing the PFM modules is to remove the top chassis of the Architect. To do this, first remove the 18 screws marked in the figure above. Now let your wrist relax for a few moments and survey the innards of this beast. The PFM modules are located on the circuit board that runs along the rear of the Architect (see figure).

Use a small screwdriver to gently pry the existing modules from their sockets taking care not to bend the contact pins. Now you can install the replacement modules. There is **NO POLARITY** to these modules so they can install in either direction.

Now you can put the top back onto the Architect and go back to enjoying your music.



Changing the PFM Modules

Troubleshooting The Architect

Troubleshooting The Architect

Almost all problems can be eliminated by re-checking the wiring and settings of the Architect. If a problem cannot be solved using the guide below, please call the AudioControl factory for further assistance.

1. No Sound:

- Verify Power LED is Blue.
- Verify Protection LED is Blue.
- Verify Channel Status LED for zone is Blue.
- Verify Source unit is operating.
- Check the Speaker Connector plug on the rear panel.
- Check the AC Power Fuse on the rear panel.

2. Protection LED is Blue, but no Channel Status LEDs are on:

- Verify Source unit is operating.
- Try turning up the volume higher.
- Defeat the Signal-Sense using switch on rear panel. All Channel Status LEDs should turn on. If not, call the factory.

3. Channel Status LED is Red:

- Check speaker leads for short. Swap speaker connectors on rear to see if the problem moves with wires.
- If the Architect is excessively hot, turn down the volume and allow it to cool off. The Status LED should turn back to Blue after a short while.
- The speaker impedance may be too low.

4. Protection LED is Red:

- Something seriously wrong has happened inside the Architect. Turn off the main power switch, wait 30 seconds and turn back on. If still Red, please contact the factory.

5. Speaker Buzzing or Cracking at high volume:

- Reduce the equalizer boost at 45Hz or 150Hz.
- Try a higher PFM filter frequency. The factory setting is 40Hz.

6. There is no signal, but the Channel Status LED is still Blue:

- Check the Signal-Sense defeat switch on the rear panel. If it is pressed in, the Channel Status LEDs will stay on as long as the Remote Power Control is enabled.
- The Channel Status LEDs stays on for several minutes after the audio signal has stopped to prevent prematurely turning off during quiet passages or disk changes.



Install Tip - There are no internal fuses in the Architect Series amplifiers. All protection circuits are self-resetting.

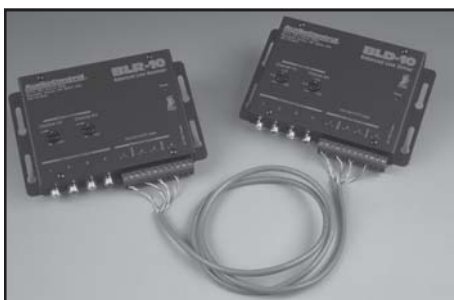


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A Brazen Plug For Other AudioControl Products



BLR-10 and BLD-10 Balanced Audio Drivers. Sends over CAT-5 extends high quality audio up to 1000'.



A Brazen Plug For Other AudioControl Products

AudioControl started out making graphic equalizers in 1977. Our heritage and design experience grew from a background in professional audio, so we were never quite satisfied with what was available for the consumer audio market. Since that time, we have continued to expand our product offerings to become a key part of great home audio systems. We supply the audio components that can make a more substantial improvement in the sound of your system than almost any other addition or upgrade. More bass, better sound, less harshness and the ability to hear music the way you want it.

We make our equalizers easy to use by incorporating features such as pairing channel controls together. We help you make the system sound as good as possible with high quality subsonic filters and, in selected models, built-in test analyzers that let you make accurate adjustments to instantly compensate for main system speaker and room deficiencies. In fact, AudioControl was the world's first manufacturer of a SEVEN CHANNEL equalizer for home theater surround sound use.

AudioControl also provides a full compliment of components for your home theater needs. The Maestro 7.1 is a THX Ultra 2 certified home theater surround processor with exceptional audio and video performance. The Diva 24 bit digital room correction system provides 8 channels of acoustical control to get the most out of your home theater. The Pantages and Avalon power amplifiers round out this theater system. Their audiophile sound quality, cool running Class-H design and exclusive LightDrive protection systems say these amplifiers mean serious business. Together the AudioControl home theater system provides ultimate performance for your ultimate home theater.

Okay, enough commercials.

Once again, we thank you for choosing AudioControl components in your system and hope you enjoy a lifetime of performance and reliability.

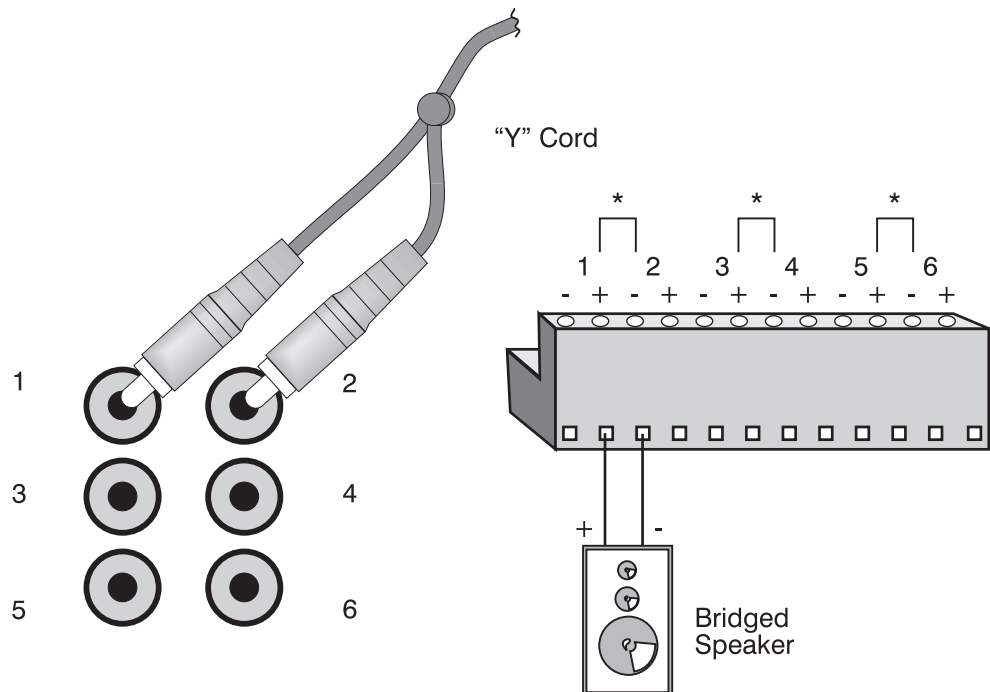
Appendix A - Bridging The Architect



Caution - When bridging a zone, the minimum speaker load impedance on that bridged output is 8 ohms. In a bridged system, each channel of the bridged pair “sees” one half of the speaker load. This means that a bridged amp driving a 8 ohm speaker is operating into a 4 ohm load.

To increase the output power of The Architect, you can join (bridge) the two channels of one zone into a single channel of 210 watts (100 watts, Model 735). Accomplishing this is a simple matter. Just connect the audio input to both channels of that zone using a ‘Y’ cord adapter and then connect the speaker terminals as shown in the diagram below.

Bridge connection showing ‘Y’ cord and Speaker Hookup



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Appendix B

Appendix B - Building Your Own PFM Modules

Standard Module Frequencies

18dB/octave (14 pin)

Frequency	Frequency
20 Hz	100 Hz
25 Hz	120 Hz
35 Hz	130 Hz
40 Hz	150 Hz
45 Hz	170 Hz
50 Hz	200 Hz
60 Hz	270 Hz
65 Hz	350 Hz
70 Hz	500 Hz
80 Hz	725 Hz
90 Hz	950 Hz

AudioControl PFM filters use resistor modules for frequency programming. All modules are constructed in the same way, with the exception of the actual value of the resistors used. In each module, ALL resistor values are equal. The resistor value for any given frequency is chosen according to the following equation:

$$\text{Resistor (kilohms)} = 7200 \div \text{frequency (Hz)}$$

Example: To find the resistors needed for 1000 Hz.

$$R \text{ (kilohms)} = 7200 \div 1000$$

$$R \text{ (kilohms)} = 7.2$$

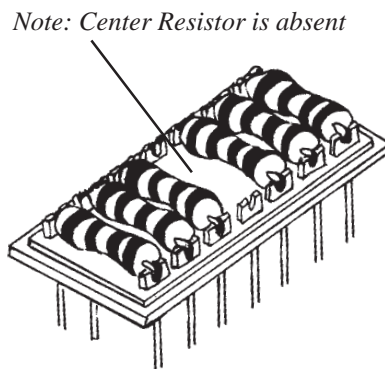
$$R = 7.2 \text{ K} = 7200 \text{ ohms}$$

Building Modules

PFM modules require 6 resistors mounted on a 14-pin DIP header. In the 14-pin modules, the middle resistor position is unused and may be left unconnected. We recommend 5% 1/4 watt carbon film resistors, or if you really want to be spot-on, 1% metal-film resistors (difficult to get).

The DIP headers are available from Radio Shack or other electronic parts distributors. Radio Shack seems to carry more 16-pin headers than 14-pin, so you may have to manufacture a 14-pin unit by cutting off the last 2 pins. It will make things easier if you buy a 16-pin IC socket as well. You can chuck the socket in your vise and have a handy fixture to hold the header while you solder.

Do not be confused by the modules from the factory that do not show individual resistors. They really are there, just encased in plastic.



Frequencies by Resistor Value

Five-percent resistors are available in 24 standard values per decade (this means that from 10 to 100 ohms, there are 24 values). The following table lists the crossover frequencies that result from using these standard 5% values.

Frequency Value		Frequency Value	
965 Hz	7500 Ω	129 Hz	56 KΩ
822 Hz	8200 Ω	117 Hz	62 KΩ
795 Hz	9100 Ω	106 Hz	68 KΩ
723 Hz	10 KΩ	96 Hz	75 KΩ
658 Hz	11 KΩ	88 Hz	82 KΩ
603 Hz	12 KΩ	79 Hz	91 KΩ
556 Hz	13 KΩ	72 Hz	100 KΩ
482 Hz	15 KΩ	66 Hz	110 KΩ
452 Hz	16 KΩ	60 Hz	120 KΩ
402 Hz	18 KΩ	56 Hz	130 KΩ
362 Hz	20 KΩ	48 Hz	150 KΩ
329 Hz	22 KΩ	45 Hz	160 KΩ
301 Hz	24 KΩ	40 Hz	180 KΩ
268 Hz	27 KΩ	36 Hz	200 KΩ
241 Hz	30 KΩ	33 Hz	220 KΩ
219 Hz	33 KΩ	30 Hz	240 KΩ
201 Hz	36 KΩ	27 Hz	270 KΩ
185 Hz	39 KΩ	24 Hz	300 KΩ
168 Hz	43 KΩ	22 Hz	330 KΩ
154 Hz	47 KΩ	20 Hz	360 KΩ
142 Hz	51 KΩ	15 Hz	470 KΩ

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The Warranty

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 Architect 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.

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 AudioControl. It's a warranty that looks out for you and your clients plus 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 send 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 Architect for five (5) 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 installing the The Architect.
2. You must keep your sales receipt for proof of purchase showing when and from whom the unit was purchased. We're not the only ones who require this, so it's a good habit to get into with any major purchase.
3. The Architect 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; or (B) somebody authorized in writing by AudioControl to service the The Architect equalizer. If anyone other than (A), or (B) messes with The Architect, that voids your warranty.
5. The warranty is also void if the serial number is altered or removed, or if The Architect 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 Architect® to level your projection TV); (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 strap it to the front bumper of your Range Rover, something might break.

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.



What to do if you need service

What to do if you need service

First, contact AudioControl, either by phone (425)775-8461 or FAX (425)778-3166. We'll verify if there is anything wrong that you can fix yourself, or that it needs to be sent back to our factory for repair. Please include the following items with the returning unit:

- 1) A copy of your proof of purchase (that sales receipt we've been harping about). No originals please. We cannot guarantee returning them to you.
- 2) A brief explanation of the trouble you are having with The Architect. (You'd be surprised how many people forget this.)
- 3) A return street address. (No PO Boxes, please)
- 4) A daytime phone number in case our technician has a question about the problem you are having.

You're responsible for the freight charges to us, but we'll pay the return freight back as long as the unit is under warranty. We match whatever shipping method you use to send it to us, so if you return the unit overnight freight, we send it back overnight. We recommend United Parcel Service (UPS) for most shipments.

Repair service is available at:

AudioControl

Attn: Service Department
22410 70th Avenue West
Mountlake Terrace, WA 98043 USA
Phone 425/775-8461 • FAX 425/778-3166

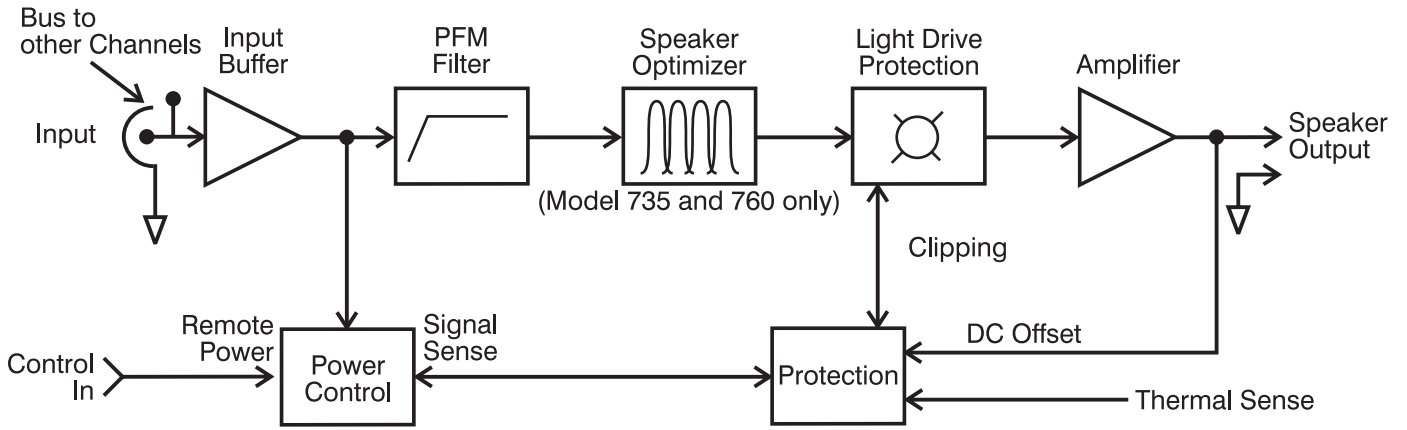


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Block Diagram



Specifications

SPECIFICATIONS

Model 735

Model 560 & 760

Power Rating (all channels driven)	35 Watts @ 8 ohms	60 Watts @ 8 ohms
Bridged Power	100 watts @ 8 ohms	210 watts @ 8 ohms
Minimum Recommended Speaker Load	4 ohms	4 ohms (2 ohms in limited zones)
Damping Factor	Greater than 200	Greater than 200
EQ Center Frequencies	45Hz, 150, 300, 700, 2500 and 12kHz	45Hz, 150, 300, 700, 2500 and 12kHz
S/N ratio	>100 dB, A-wtd, ref. Full Output . . .	>100 dB, A-wtd, ref. Full Output
Total Harmonic Distortion	0.05% (8 ohms 20-20K)	0.1% (8 ohms 20-20K)
Input Sensitivity	0-1V variable	0-1V variable
Crosstalk	>75 dB (1 kHz, Any channel to channel)	>75 dB (1 kHz, Any channel to channel)
Input Impedance	100 Kilohms	100 Kilohms
Protection	Clipping, Thermal, Short Circuit, DC Offset	Clipping, Thermal, Short Circuit, DC Offset
Power Consumption (all channels driven full power) .	650 watts	1100 watts
Weight	32 pounds	35 pounds
Dimensions	17"W x 16"D x 5.25"H	17"W x 16"D x 5.25"H
US Patent Number		5,708,577
Country of Origin	U.S.A.	U.S.A.

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This manual was written, designed, printed and stuffed into the box in the U.S.A. Probably on a really soggy day considering where we live.

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AudioControl

For Those Who Consider Perfection Possible®

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