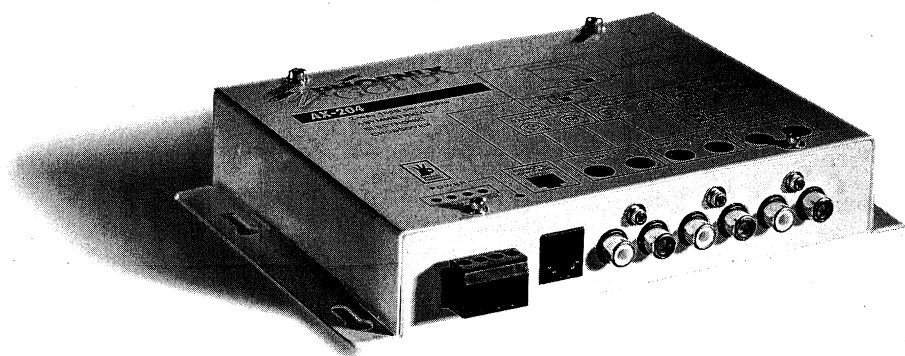


AX-204A

OWNER'S MANUAL



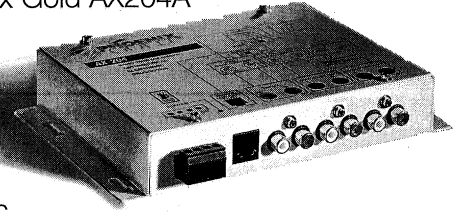
2-CHANNEL ASYMETRICAL
ELECTRONIC CROSSOVER

Phoenix Gold

AX204A ELECTRONIC CROSSOVER

2 Way 18dB Per Octave Asymmetrical Crossover

Thank you for purchasing the Phoenix Gold AX204A Electronic Crossover. In doing so you've demonstrated a desire to own the finest in audio reproduction equipment. Properly installed, your Phoenix Gold electronic crossover will provide years of high quality sonic reproduction. The AX204A is a sophisticated signal processor that offers the flexibility to expand with any car audio system.



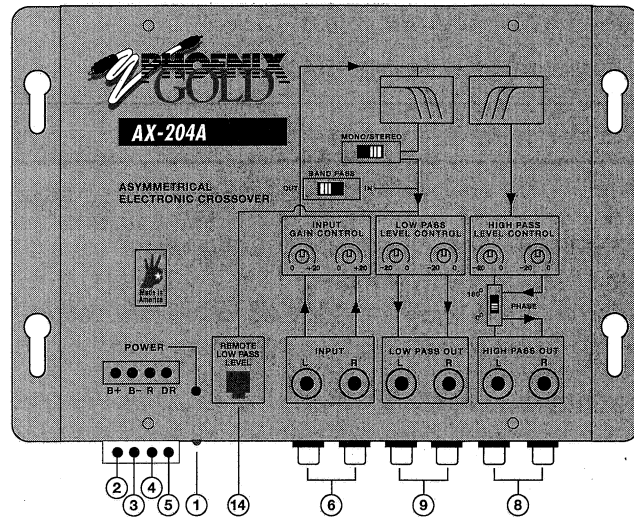
To achieve maximum performance from the AX204A we recommend that you read this manual thoroughly before installing this crossover in your vehicle. It contains detailed diagrams as well as valuable information relating to your installation.

TECHNICAL SPECIFICATIONS

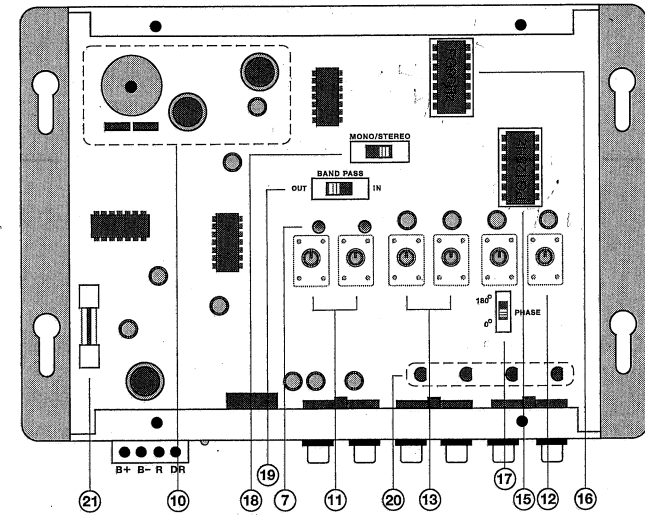
Distortion: 0.02% THD at 1 KHz 0.02% I.M. at 1 KHz
Frequency response: 10 Hz—30 kHz +1/-3 dB
S/N ratio (A weighted): 105 dB
Crossover frequencies: Plug-in resistor module-any frequency
Crossover slope rate: 18 dB per Octave (Sallen Key)
Input impedance: 100K Ohms
Output impedance: 510 Ohms
Input gain: 20dB
Max Output voltage: 8 volts RMS max.
Power source 18 volts DC negative ground
Input current: 0.5 amp max.
Dimensions: 7.5" W x 1.30" H x 5.5" D
191mm x 33mm x 140mm

NOTE: Due to continuous improvements, specifications and designs are subject to change without notice.

CONTROLS, FUNCTIONS AND FEATURES OF THE AX204A ELECTRONIC CROSSOVER



1. **Power ON LED Indicator:** This light indicates when the unit is operational.
2. **Power Input Terminal:** Connect this terminal to the vehicle's positive 12 volt supply.
3. **Ground Input Terminal:** Connect this terminal to the vehicle's chassis ground.
4. **Remote Turn-On Input Terminal:** This allows the AX204A to be controlled via power on/off of your source unit. Connect the remote +12v and/or power antenna lead from source unit to this terminal.
5. **Delayed Remote Turn-On Output Terminal:** Connect to all other signal processors remote turn-on input terminal. This connection delays the turn-on/off of the down-line components. This delay helps eliminate on/off thump sometimes caused by brand incompatibility.
6. **Stereo Signal Input Jacks:** Accepts up to 8 volts RMS AC input. Connect to pre-amp outputs of source unit.
7. **Peak Overload LEDs:** These LEDs are used to accurately adjust input sensitivity. See Input Level Adjustment Section...
8. **High Pass Output:** Connects to the High Pass (mid and tweeter) amplifier. Frequency is selectable via internal plug-in IC module.
9. **Low Pass Output:** Connects to the Low Pass (subwoofer) amplifier. Frequency is selectable via internal plug-in IC module.
10. **Pulse Width Modulated Power Supply:** High performance power supply that uses hard regulation to provide the best performance and noise immunity.



11. **Input Gain Controls:** Allows independant adjustment of the left and right input Gains from 0 to +20dB.
12. **High Pass Output Level Controls:** Provides correct level matching with the High Pass (mid and tweeter) amplifier. See level Adjustment Section.
13. **Low Pass Output Level Controls:** Provides correct level matching with the Low Pass amplifier. See Level Adjustment Section.
14. **Low Pass Level Controller Input:** (Optional) This dash mount control enables the user to control the Bass gain from the front of the vehicle.
15. **High Pass Crossover Plug-In Module Socket:** This is the IC socket that the High Pass crossover resistor modules plug into.
16. **Low Pass Crossover Plug-In Module Socket:** This is the IC socket that the Low Pass crossover resistor modules plug into.
17. **Phase Inverter Switch:** Engaging this switch shifts subwoofer output signal 180 degrees relative to High Pass output signal.
18. **Subwoofer Stereo/Mono Switch:** Engaging this switch changes the sub-woofer output from stereo to mono mode operation.
19. **Bandpass Switch:** Controls crossover operation mode. When this switch is engaged, the Low Pass outputs become Bandpass outputs and the High Pass outputs become All Pass outputs.
20. **Fully Muted Output Circuitry:** Attenuates the AX204A outputs 25dB during turn on/off.
21. **Reverse Polarity Protection:** A 1 AMP internal fuse protects the unit against improper power wire connections.

CROSSOVER INSTALLATION PLANNING

Should I have the AX204 Professionally Installed?

While physical installation is relatively easy, selection of the plug-in frequency modules and final level control adjustments can be quite difficult. For optimum sonic performance, we suggest that you have the AX204A adjustments done by an authorized Phoenix Gold Team Dealer equipped with a real time analyzer.

A. CAUTION

1. Always disconnect the system from the battery before attempting to make or alter any battery or signal connections.
2. For proper operation of the product check and make sure the vehicle's battery is in good condition.
3. The AX204A is *only* designed for use in 12 volt negative ground electrical systems. Installing this product in any positive ground electrical system could cause serious damage.
4. If this product is installed or used in any method other than those outlined in this manual, it could reduce its performance capabilities and void the warranty.
5. Do not route audio cables and power cables together! This can produce audible engine noise in your audio system.
6. Never mount the AX204A directly to the chassis of the vehicle.

B. LOCATION TIPS

1. Select a mounting location that is both convenient for your system design and easily accessible.
2. Never mount the AX204A near the engine or any heat-generating ducts, it can damage the unit.
3. Make sure the AX204A is isolated from metal. Mounting it on metal surfaces will have adverse effects on your system - you may pick up radio signals from other planets...

C. MOUNTING HINTS

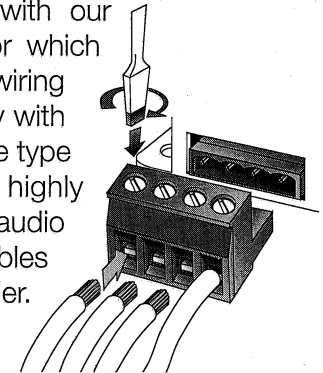
1. Use the AX204A module as a template and mark the location to drill mounting holes.
2. Make sure the AX204A is mounted to a solid surface. This protects connections from stress and damage.

D. TRIAL LAYOUT

Pre-planning the best routes to run the wiring will save installation time. Once you have determined the desired location for all the components, make sure they can be easily accessed later without having to disassemble each component in order to make adjustments.

ELECTRICAL INSTALLATION

The Phoenix Gold AX204A is equipped with our exclusive removeable termination connector which allows you to build your own custom length wiring harness. Note: Unit must be fused externally with 1A fuse. Audio cables are not included as the type and length used often varies. We highly recommend our "Super Triple Shielded" audio cables. These fully RFI/EMI shielded RCA cables are available at your local Phoenix Gold Dealer.



PRELIMINARY ADJUSTMENTS

Pre-setting the system provides a necessary starting point for fine-tuning the entire audio system to complete the other necessary adjustments (Input Level, Output Level and Phase).

1. Preset each amplifiers input gain to minimum.
2. Before turning the audio system on, pre-adjust the High Pass and Low Pass output level controls to -20dB.
3. Turn input levels to 0dB.
4. Activate the radio power on/off switch. Be careful! Overdriving the system could damage the audio components.

INPUT GAIN & OUTPUT LEVEL ADJUSTMENTS OF SIGNAL PROCESSOR

1. To adjust levels of the signal processor, first set the tone controls, balance and fader of your source unit to the center (flat) positions. Do not adjust any other controls or outputs at this time.
2. Use a very dynamic recording for adjustments. Set the volume control on the source unit to approximately 3/4 of maximum. Make sure the music is not clipping. This is very important!
3. Now take the input gains of the processor and turn them up slowly until the clip LED turns on.
4. Using the output levels on your crossover, turn up the level until your amplifier starts to clip.
5. Set the volume control on the source unit to a comfortable listening level to determine the actual performance quality of the system. Now, proceed by turning the volume knob to several

different levels for each program source, and fine tune the output levels at each volume setting.

6. Listen carefully for good tonal balance; i.e: level of bass, mid range and highs. In the event that the mid/tweeter/subwoofer volume levels are not well balanced after pre-setting the levels, adjust the Low Pass and High Pass outputs accordingly.

OUTPUT PHASE ADJUSTMENT

The acoustics of an automobile vary from vehicle to vehicle. The audio system in certain automobiles may be out of phase (i.e: no bass or the bass seems to lag behind the highs). This may be the result of acoustical time delay between the sub-woofer and the mid-range/tweeter systems caused by the relative distance of the two systems inside a vehicle. Listen to the audio performance while switching the PHASE switch from one position to the other. Leave the switch in the position where it gives you the most bass output in the sub-woofer to woofer crossover point.

SUBWOOFER STEREO/MONO ADJUSTMENT

If your audio system has only a single sub-woofer installed, set the Stereo/Mono switch to the MONO position. If your audio system has more than two subwoofers installed, this switch can be set to either the Mono or Stereo position. Better stereo separation can be achieved when the switch is in the Stereo position. With this switch in the mono position, the result is higher bass volume level, but no low (bass) frequency stereo separation.

DETERMINING CROSSOVER FREQUENCIES

1. To determine crossover frequencies, set tone controls to their center (flat) positions, center the balance control, and center the fader control.
2. Set the volume control on the source unit to 3/4 of maximum.
3. Evaluate the sub-woofer crossover frequency first. The factory installed subwoofer crossover frequency is 90Hz.
4. Listen to the bass quality. If it is "boomy", adjust the crossover frequency lower. Sub-woofer crossover frequency settings of 70 Hz or lower are common. Be sure to make the adjustments for good sound quality.

5. Determine the High Pass crossover frequency depending on the size and location of the mid and high speakers. The factory installed High Pass crossover frequency is 125hz which may be to low for some smaller speakers and to high for larger speakers, but this is a great starting point.
6. After performing the crossover frequency adjustments in a stationary vehicle, test drive the vehicle to check for sound quality. Due to road noise inside a moving vehicle, you may want to re-adjust the output level of the subwoofer relative to the mid range again.

DESIGNING AND BUILDING YOUR OWN CROSSOVER MODULES

Your local authorized Phoenix Gold Dealer stocks a wide range of plug-in modules. However, if you cannot locate a module you need, you can build your own modules by following a few guidelines.

Locating The Right Parts

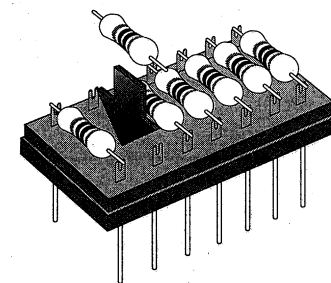
You will need 2 items: a 14 pin DIP Header and seven 5% resistors. These items can be obtained at your local Radio Shack or electronics store.

Resistor Values

To compute the resistor value for the module you need, use the following formula:

$$\text{Resistor value in K ohms} = \frac{18,800}{\text{Desired Frequency}}$$

Example: Desired frequency = 200Hz; $18,800 \div 200\text{Hz} = 94 \text{ K ohms}$
NOTE: Resistors should be at least 5% and metal film for sonic quality (Phoenix Gold uses only 2% - 1/8 watt Mil-spec) and all seven resistors must be the same value.



LPL44 - REMOTE LOW PASS LEVEL CONTROL

This Subwoofer/Bass gain control is a radical new development from the "Crazies" at Phoenix Gold's R & D Department. It slices it dices and is the coolest thing since Phoenix Gold Amps. This little gem boosts your bass level up and down from the comfort of your front seat. Now, you too can blow out your window seals.

The LPL44 even comes with it's own mounting apparatus and cable. If you own a AX204A and don't have this "Thunder Knob" you're not taking full advantage of this signal processor.

It's as if you have one of those "Fake Bass" type signal processors at a 1/10th of the cost. You can purchase the LPL44 kit at your local Phoenix Gold dealer...get one today!

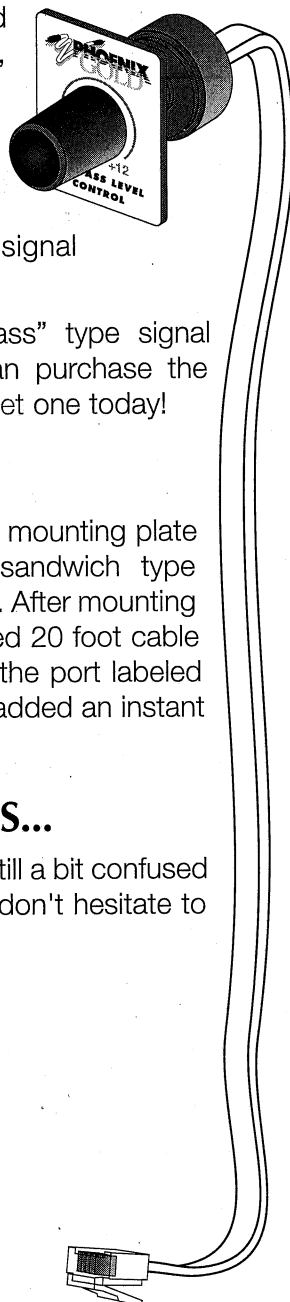
HOW IT WORKS

The LPL44 kit includes a potentiometer with a mounting plate and hardware. This kit is set up for a "sandwich type dashmount" with a maximum thickness of 1/2". After mounting the unit in the desired location, run the supplied 20 foot cable to the AX204A. This cable plugs directly into the port labeled "Remote Low-Pass Level". And violá you just added an instant subwoofer gain control.

STILL HAVE QUESTIONS...

If you have questions about the LPL44 or are still a bit confused about some of the features on your AX204A, don't hesitate to give us a call at (503) 288-2008.

We are here to help...





Phoenix Gold International
One Phoenix Gold Way • 9300 North Decatur • Portland, Oregon 97203
Tel 503.288.2008 • Fax 503.978.3380