



OWNER'S MANUAL

MODEL
XTR500.4
XTR750.4
XTR1000.4
XTR1700.4
XTR2500.4

CONTENTS

Introduction.	2	Amplifier Wiring.	8
What's in the Box.	2	Power Connections	8
Practice Safe Sound™	2	Speaker Connections XTR500.4, XTR750.4, XTR1000.4 XTR1700.4 and XTR2500.4	8 ~ 10
Record Your Serial Number And Date	2	Amplifier Installation	11
End Panel Layouts	3 ~ 4	Choosing Mounting Locations	11
CEA Specifications.	4	Passenger Compartment.	11
Specifications.	5	Trunk Compartment.	11
Amplifier Settings	6	General Precautions and Installation Tips	11 ~ 12
Signal Input and Output Configurations	6	Tools of the Trade	12
Level control	6	Step By Step Installation	13
Line Output Configurations	6	Set Up and Troubleshooting.	14
Internal Crossover Configurations, Flat (full range)	6	Testing the System.	14
Crossover Switch	6	Adjusting the Sound of the System	14 ~ 15
Low-Pass Crossover	6	Amplifier Visual Troubleshooting	15 ~ 16
High-Pass Crossover.	7	Troubleshooting Tips	17 ~ 19
Adjusting Bass Boost	7		
Phase Shift Control	7		
Remote Gain Operation	7		

INTRODUCTION

Thank you for your purchase of Orion's amplifier. Each Orion amplifier is designed to be the leader in its class offering ease of use, advanced features, and the most power. Orion amplifiers are designed as the best affordable high end car audio amplifier money can buy. Listed below are the features of these new Orion amplifiers.

- **XTR500.4** - 90 Watts per channel, four-channel amplifier with built-in high-pass and low-pass 12dB/octave crossover and Bass Boost. The XTR500.4 is capable of 6, 5, 4, 3 or 2 channel operation with a maximum power capability of 500 Watts RMS into two 4Ω Bridged Loads.
- **XTR750.4** - 135 Watts per channel, four-channel amplifier with built-in high-pass and low-pass 12dB/octave crossover and Bass Boost. The XTR750.4 is capable of 6, 5, 4, 3 or 2 channel operation with a maximum power capability of 750 Watts RMS into two 4Ω Bridged Loads.
- **XTR1000.4** - 165 Watts per channel, four-channel amplifier with built-in high-pass and low-pass 12dB/octave crossover and Bass Boost. The XTR1000.4 is capable of 6, 5, 4, 3 or 2 channel operation with a maximum power capability of 1000 Watts RMS into two 4Ω Bridged Loads.
- **XTR1700.4** - 250Watts per channel, four-channel amplifier with built-in high-pass and low-pass 12dB/octave crossover and Bass Boost. The XTR1700.4 is capable of 6, 5, 4, 3 or 2 channel operation with a maximum power capability of 1700 Watts RMS into two 4Ω Bridged Loads.
- **XTR2500.4** - 400Watts per channel, four-channel amplifier with built-in high-pass and low-pass 12dB/octave crossover and Bass Boost. The XTR2500.4 is capable of 6, 5, 4, 3 or 2 channel operation with a maximum power capability of 2500 Watts RMS into two 4Ω Bridged Loads.

The installation of all Orion components will determine the overall performance result. Improper installation will not only limit the performance of your Orion system but also potentially compromise the reliability of this amplifier. To ensure proper sonic results and

component reliability, please refer to your authorized Orion dealer for installation assistance or advice. If you decide to perform the installation yourself, be sure to read the entire manual before beginning the installation.

WHAT'S IN THE BOX

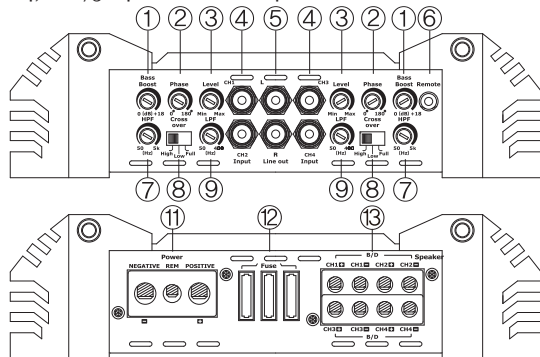
- (1) Amplifier
- (2) Allen wrenches 2mm & 3mm
- (1) Hardware kit
- (1) Owner's manual
- (1) Window decal
- (1) Unique individual amplifier birth certificate
- (1) Remote Kit (Remote Gain Control with cable)

PRACTICE SAFE SOUND™

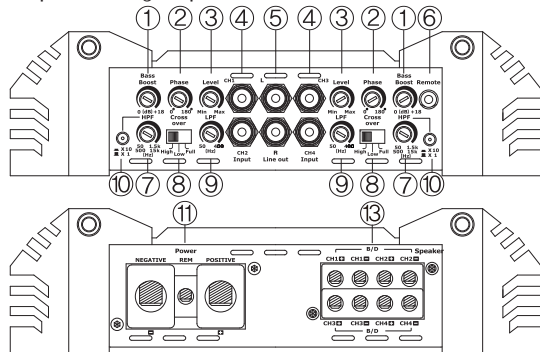
Continuous exposure to sound pressure levels over 100dB may cause permanent hearing loss. High power automotive sound systems can generate sound pressure levels in excess of 130dB. When playing your system at high levels, please use hearing protection and avoid long term exposure.

END PANEL LAYOUTS

XTR500.4, XTR750.4 and XTR1000.4



XTR1700.4 and XTR2500.4



1. Bass Boost (Channels 1 & 2 / 3 & 4) - continuously adjusts from 0 to 18dB of boost centered at 45Hz

Figure 1

2. Phase Shift Control (Channels 1 & 2 / 3 & 4) - Allows you to change the phase of your subwoofer from 0 to 180 degrees to help compensate for timing differences between drivers.
3. Level Control (Channels 1 & 2 / 3 & 4) - continuous adjustment for full power output
4. RCA Input (Channels 1 & 2 / 3 & 4) - accepts Low Level RCA Inputs (200mV-4V) from a head unit, preamplifier, or equalizer.
5. RCA Line Output - provides easy connection to additional amplifiers. Note that some OEM stereo headunits may sense the attached load and may turn off their speaker outputs if expected load conditions aren't achieved
6. Remote Gain input - connects remote gain control to control the bass level from the driver's seat.
7. High pass filter (Channels 1 & 2 / 3 & 4) - adjusts the frequency of the crossover for the HPF (High-Pass Frequency Control , XTR500.4, XTR750.4 and XTR1000.4 : 50Hz - 5kHz , XTR1700.4 and XTR2500.4 : 50Hz-1.5kHz/500Hz-15kHz)
8. X-Over (cross-over Channels 1 & 2 / 3 & 4) - activates LPF (low pass crossover), Full (all pass), or HPF (high pass crossover)
9. Low pass filter (Channels 1 & 2 / 3 & 4) - adjusts the frequency of the crossover for the LPF (Low-Pass Frequency Control , 50Hz -400Hz)
10. Variable High pass filter X10 Feature - XTR1700.4 and XTR2500.4 50Hz-1.5kHz(Without pressing a button)/ 500Hz-15kHz(press a button).
11. Power connection input
 - * **NEGATIVE(GND)** - power return connection. Connect this terminal directly to the sheet metal chassis of the vehicle, using the shortest wire necessary to make this connection. Always use wire of the same gauge or larger than the (+) 12 volt power wire. The chassis connection point should be scraped free of paint

CEA SPECIFICATIONS

and dirt. Use only quality crimped and/or soldered connectors at both ends of this wire.

DO NOT connect this terminal directly to the vehicle battery ground terminal or any other factory ground points

* **REM** - this terminal turns on the amplifier when (+) 12 volt is applied. Connect it to the remote turn on lead of the head unit or signal source. If a (+) 12 volt remote turn lead is not available, a Remote Power Adapter (P/N #ORRPA) can be used to supply a remote turn on signal. DO NOT connect this terminal to constant (+) 12 volt

* **POSITIVE(+BAT)** - connect this terminal through a FUSE or CIRCUIT BREAKER to the positive terminal of the vehicle battery or the positive terminal of an isolated audio system battery

WARNING : Always protect this power wire by installing a fuse or circuit breaker of the appropriate size within 12 inches of the battery terminal connection.

12. Fuse - XTR500.4(40Ax2),XTR750.4(30Ax3),XTR1000.4(40Ax3),XTR1700.4(None),XTR2500.4(None)
13. Speakers - connect the speakers to these terminals.
(refer to the Speaker Connection section of this manual)

XTR500.4



Power Output: 90 Watts RMS x 4 at 4 ohms and < 1% THD+N
Signal to Noise Ratio: >70 dBA (reference 1 Watt into 4 ohms)
Additional Power: 125 Watts RMS x 4 at 2 ohm and < 1% THD+N

XTR750.4



Power Output: 135 Watts RMS x 4 at 4 ohms and < 1% THD+N
Signal to Noise Ratio: >70 dBA (reference 1 Watt into 4 ohms)
Additional Power: 188 Watts RMS x 4 at 2 ohm and < 1% THD+N

XTR1000.4



Power Output: 165 Watts RMS x 4 at 4 ohms and < 1% THD+N
Signal to Noise Ratio: >70 dBA (reference 1 Watt into 4 ohms)
Additional Power: 250 Watts RMS x 4 at 2 ohm and < 1% THD+N

XTR1700.4



Power Output: 250 Watts RMS x 4 at 4 ohms and < 1% THD+N
Signal to Noise Ratio: >70 dBA (reference 1 Watt into 4 ohms)
Additional Power: 425 Watts RMS x 4 at 2 ohm and < 1% THD+N

XTR2500.4



Power Output: 400 Watts RMS x 4 at 4 ohms and < 1% THD+N
Signal to Noise Ratio: >70 dBA (reference 1 Watt into 4 ohms)
Additional Power: 625 Watts RMS x 4 at 2 ohm and < 1% THD+N

SPECIFICATIONS

Amplifier Section	XTR500.4	XTR750.4	XTR1000.4	XTR1700.4	XTR2500.4
Power Output 4Ω (Watts / RMS) *	90 x 4	135 x 4	165 x 4	250 x 4	400 x 4
Power Output 2Ω (Watts / RMS) **	125 x 4	188 x 4	250 x 4	425 x 4	625 x 4
Power Output 4Ω (Watts / RMS) Bridged	250 x 2	375 x 2	500 x 2	850 x 2	1250 x 2
Nominal Power Output 4Ω (Watts) Bridged	1000Watts	1500Watts	2000Watts	3400Watts	5000Watts
MAX Music Power	2000Watts	3000Watts	4000Watts	6800Watts	10000Watts
Amplifier Efficiency	> 60% into 2 Ω load at max. power				
Signal to Noise ratio at rated output power and lowest impedance	>95dB				
Externally Bridgeable	No				
Distortion at Rated Power	0.05% THD+N				
Frequency Response	20Hz to 35kHz +/- 1dB				
Linear Bandwidth	20Hz to 65kHz +/- 3dB				
Damping Factor	> 100				
Input Sensitivity (rms)	200mV to 4V				
Supply Voltage Range	9 to 16V				
Protection	Thermal, DC offset, reverse polarity, short protection, under-voltage, over-voltage				
Terminal Wire Gauge	Power 4 AWG Remote 10 AWG Ground 4 AWG Speaker 10 AWG			Power 0 AWG Remote 10 AWG Ground 4 AWG Speaker 10 AWG	

Amplifier Section	XTR500.4	XTR750.4	XTR1000.4	XTR1700.4	XTR2500.4
Input Impedance	20kΩ				
Balanced Line Inputs	Yes				
Dimensions (inches)	10.3 x 9.3 x 2.5	11.5 x 9.3 x 2.5	14.3 x 9.3 x 2.5	17.4 x 9.3 x 2.5	21.3 x 9.3 x 2.5
Crossover Section					
High Pass Crossover	Continuously variable (50-5kHz)			Continuously variable (50-1.5kHz/500-15kHz)	
Low Pass Crossover	Continuously variable (50-400Hz)			Continuously variable (50-400Hz)	
Phase shift control	0° to 180°				
Bass Boost	0-18dB variable				

* Continuous 4 Ω load 20Hz to 20kHz, < 1% THD, with input voltage at 14.4 VDC.

** Continuous 2 Ω load 20Hz to 20kHz, < 1% THD, with input voltage at 14.4 VDC.

AMPLIFIER SETTINGS

Signal Input and Output Configurations

The input section of the amplifier consists of gain controls, high pass and low pass crossovers controls, Bass Boost control and RCA inputs and outputs. The input section makes it easy to adapt this amplifier to most system configurations.

Level Control

These Orion amplifiers have level adjustments to allow for easy integration with any source unit. The input sensitivity can be adjusted from 200mV to 8V. Refer to Testing the System and Adjusting the Sound of the System sections of this manual for detailed instructions on setting the gain.

Line Output Configurations

The line outputs on Orion amplifiers offer easy system expansion and can be used to route signal from the RCA line outputs to the next Orion amplifier's RCA line inputs in the signal chain.

Internal Crossover Configurations, Flat (full range)

The crossover section of the Orion XTR500.4, XTR750.4, XTR1000.4, XTR1700.4 and XTR2500.4 amplifiers are continuously variable and extremely flexible.

When using Orion loudspeakers, minor deviations from the recommended frequency ranges can provide superior results depending on your speaker locations and your vehicle acoustics. Setting crossover frequencies higher than recommended will not cause damage and

may provide superior sonic results depending on your system's performance goals. Refer to your loudspeaker owner's manual for assistance in choosing the proper crossover frequencies for your system.

WARNING! DO NOT set crossover frequencies lower than the speakers recommended operating range. This can cause driver failure that is not covered by the manufacturer's warranty.

Crossover Switch

Controls the type of filter for the onboard active crossover. The Orion XTR500.4, XTR750.4, XTR1000.4, XTR1700.4 and XTR2500.4 have a switch for the selectable crossover.

Full position does not attenuate any frequencies and is for full range speaker systems.

High attenuates low frequencies and is used for mid-range speakers and tweeters.

Low attenuates high frequencies and is used for subwoofer speakers.

Low-Pass Crossover

When the switch is to the center (FULL position), the low-pass crossover is bypassed. When the switch is to the center, the low-pass crossover is active. The low-pass crossover is continuously variable from 50Hz to 400Hz.

High-Pass Crossover

When the switch is to the right (FULL position), the high-pass crossover is bypassed. When the switch is to the left, the high-pass crossover is active. The high-pass crossover is continuously variable from XTR500.4, XTR750.4 and XTR1000.4 : 50Hz - 5kHz , XTR1700.4 and XTR2500.4 : 50Hz-1.5kHz/500Hz-15kHz(Using x10 feature).

Adjusting Bass Boost

Bass Boost maximizes the performance of a subwoofer and allows for continuous adjustment of low frequency boost on the rear channels. Bass Boost can be adjusted from 0dB to 18dB of boost centered at 45Hz. Initially the Q is very low (wide). As Boost is added, the Q rises (narrows). This allows the amplifier to overcome acoustic deficiencies in your vehicle. The type of enclosure used, the sub-woofer's excursion capability, personal preference, and attitude determine acceptable boost levels.

WARNING! Exercise caution when setting Bass Boost. Maximum boost can potentially cause woofer damage due to over-excursion.

NOTE: While the amplifier allows up to 18dB of boost, it is possible to clip the amplifier with comparatively low output levels in other frequency ranges.

Phase Shift Control

- 0° - leaves output unaffected. The output signal is in phase with
- 180° - inverts the output. The channel is 180° output of phase. This configuration is useful for inverting the phase of subwoofers to improve staging in a vehicle.

Remote Gain Operation

NOTE: Do not use the Remote Gain control when you have an expanded system installed (see Line Output Configurations). The Slave amplifier(s) gain will not be controlled.

The remote gain port provides easy remote access to the internal gain structure of the XTR power amplifier. The Remote plugs into the amplifier via the 1/8" mini jack plug. The Remote can be installed in the front of the vehicle to control the amplifier gain level. The Remote can be used as a bass level control when used on an amplifier dedicated to subwoofers.

AMPLIFIER WIRING

Power Connections

- Power connections accept up to XTR500.4, XTR750.4, XTR1000.4 4 AWG wire and XTR1700.4, XTR2500.4 0 AWG.
- power and ground wire recommended for optimal performance.
- Connect 12V+ to the battery through fuse holder. This connection provides +12V main power to the amplifier.
- Power wire must be fused no more than 12" from battery.
- Ground amplifier to a good chassis ground as close as possible to the amplifier.
- Recommended fuses are 80A for the XTR500.4, 90A for the XTR750.4, 120A for the XTR1000.4 and 200A for the XTR1700.4, 300A for the XTR2500.4.
- Connect REM terminal to remote turn-on lead from source unit. This connection provides +12V power to turn-on the amplifier.
- Add extra ground wire between the negative terminal of the battery and the chassis.

NOTE: The addition of a ground wire from the battery to the chassis of the vehicle improves the ability of the battery to supply power to the amplifier. This is recommended because the current delivery of the factory electrical system was designed only to accommodate electronics supplied by the auto manufacturer.

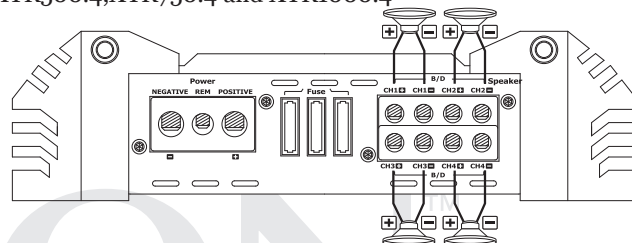
Speaker Connections

The Orion amplifier offers four positive and four negative output terminals for ease of connecting channel 1, 2, 3, and 4 outputs to the speakers. The amplifier is stable to 2Ω per channel. See diagrams below for possible configurations.

Four Channel Stereo Configuration

- Channel 1/2 and channel 3/4 lowest recommended impedance is 2Ω stereo.
- Crossover mode, output, and gain configurations are independently adjustable between the front and rear channels.
- Two-channel or four-channel input can be used for this configuration. For source unit fading, use the four-channel input mode.
- Channels 1/2 and channels 3/4 outputs can be individually configured for highpass, low-pass, or full range operation.

XTR500.4, XTR750.4 and XTR1000.4



XTR1700.4 and XTR2500.4

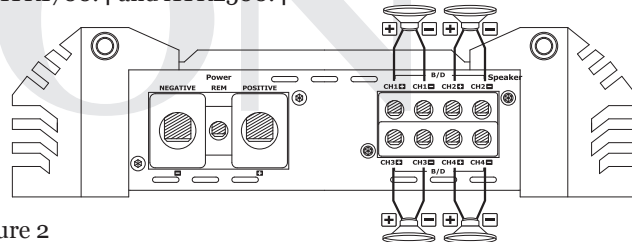
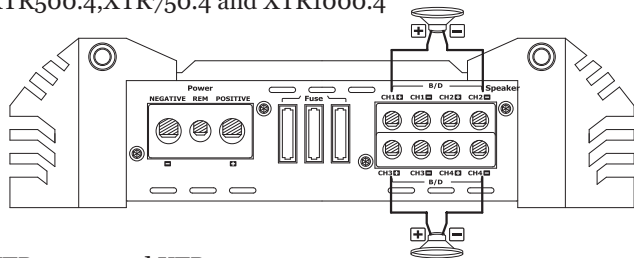


Figure 2

Two Channel Bridged Configuration

XTR500.4, XTR750.4 and XTR1000.4



XTR1700.4 and XTR2500.4

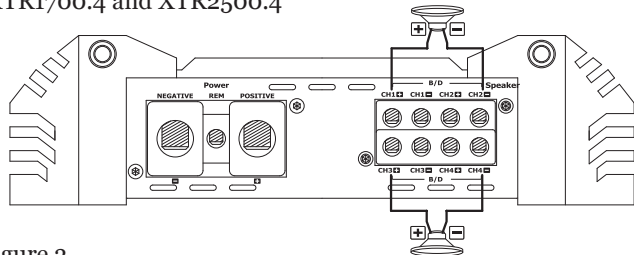


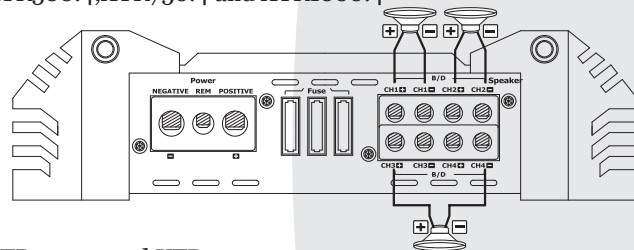
Figure 3

Three Channel Configuration

- Channels 1/2 are configured for 2-channel stereo operation.
- Channel 1/2 lowest recommended impedance is 2Ω stereo.
- Channels 3/4 are configured for a single channel bridged output.
- Channel 3/4 lowest recommended bridged impedance is 4Ω .
- Crossover mode, output, and gain configurations are independently adjustable between channels 1/2 and 3/4.

- Two-channel or four-channel input can be used for this configuration. For source unit fading, use the four-channel input mode.
- Channel 1/2 and 3/4 outputs can be configured for high-pass, lowpass, or full range operation.
- Channel 3/4 outputs are configured for summed bridged operation for subwoofer

XTR500.4, XTR750.4 and XTR1000.4



XTR1700.4 and XTR2500.4

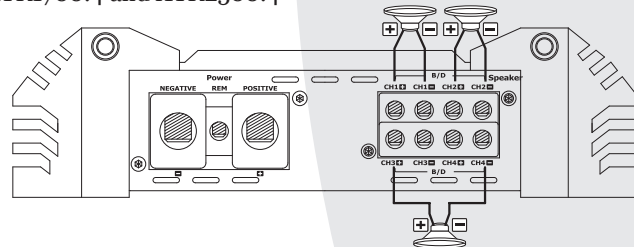


Figure 4

Tri-Mode Six Channel Configuration

- Lowest recommended impedance is $2\ \Omega$ stereo and $4\ \Omega$ bridged mono.
- Front and rear outputs must be set for full range operation.
- Passive crossovers must be used on all components and frequencies must not overlap.

WARNING! Failure to observe these requirements may result in damage to the amplifier.

XTR1700.4 and XTR2500.4

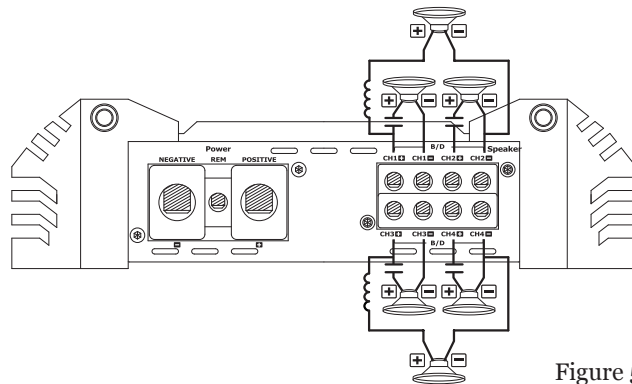


Figure 5

NOTE: To get full output in this configuration, band limiting filters as shown in this diagram may need to be used to prevent the impedance from dropping too low and engaging protection circuits.

XTR500.4, XTR750.4 and XTR1000.4

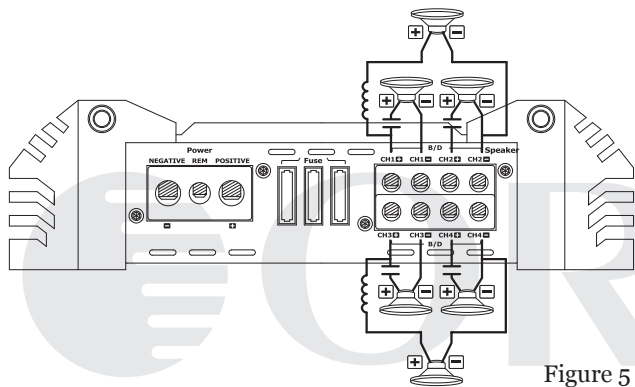


Figure 5

AMPLIFIER INSTALLATION

Choosing Mounting Locations

The location of your amplifier will depend on several important issues. Due to the low profile size of the Orion amplifiers, there are many possible installation locations that will yield satisfactory amplifier performance. Always mount the amplifier in a place that protects the amplifier from the elements. In addition, mount the amplifier on a stable, flat surface.

NOTE: Mounting amplifiers upside down is not recommended and may cause premature thermal shutdown.

WARNING! Do not mount any amplifier in the engine compartment. Amplifiers are not designed to endure the harsh environment of the exterior elements.

Passenger Compartment

If you are going to mount the amplifier in the passenger compartment, make sure you have adequate room for ventilation. The amplifiers have been designed to make under-seat mounting possible. When mounting your amplifier under a seat or similar area, keep a minimum of 1" of clearance around the amplifier for adequate cooling.

Trunk Compartment

Mounting your amplifier in the trunk provides excellent performance as long as you do not restrict the airflow around the heatsink of the amplifier. For optimal results, mount the amplifier with as much clearance as possible. This type of mounting will yield the best cooling due to the convection effect of the amplifier chassis.

General Precautions and Installation Tips

WARNING! Be careful not to cut or drill into gas tanks, fuel lines, brake lines, hydraulic lines, vacuum lines, or electrical wiring when working on your vehicle.

Disconnect the vehicle's ground wire at the battery before making or breaking connections to the audio system's power supply terminals.

Do not use this amplifier unmounted. Failing to securely mount the amplifier can result in damage or injury, particularly in the event of an accident. An unmounted amplifier becomes a dangerous projectile in the event of a crash. Never mount the amplifier where it might get wet. Mount the amplifier so the wire connections will not be pulled. Route the wires where they will not be scraped, pinched or damaged in any fashion.

The +12V power supply wire must be fused as close as possible to the battery terminal, ideally within 12". Use the recommended fuse size or circuit breaker listed in the Power Connections section of this manual.

If you need to replace the fuse plugged into the side of the amplifier, replace the fuse with the same size and type fuse that came with the amplifier. If you are not sure as to the correct value, refer to the Power Connections section of this manual for details. Using a higher current fuse may result in damage to the amplifier that is not covered under warranty.

NOTE: Make sure all the equipment in the system is turned off when making or breaking connections to the input RCAs or speaker terminals. Turn on the system and slowly turn up the volume control only after double checking all wire connections.

Power for systems with a single amplifier can be supplied by most automotive electrical systems. Systems with multiple amplifiers may require a higher capacity battery, alternator or the use of a storage capacitor. We strongly recommend the use of a Directed Audio Essentials power capacitor with an extra battery in larger stereo systems.

Orion amplifiers generate a certain amount of heat as part of normal operation. Be sure the area around the amplifier is unobstructed to allow adequate air circulation. Remember, beach blankets, last week's laundry, school books and homework papers located on top of the amplifier do not improve air flow and may become damaged.

You must first remove the end caps to mount the amplifier (mounting holes are within). (1) Remove the screws first, (2) lift the end cap straight up to detach from unit and then (3) pull away from the amplifier. Once mounted replace end caps by following this process in reverse.

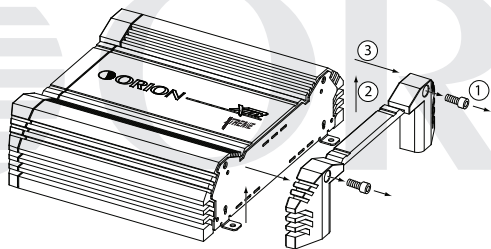


Figure 6

Tools of the Trade

Listed below are the majority of the tools required to perform an installation. Having the proper tools will make the installation that much easier. Some of these tools are necessities; some will just make the job easier.

- Allen Wrenches (2mm and 3mm)
- DMM or VOM
- Electric drill with assorted drill bits
- Grommets
- Heat shrink tubing
- Marking pen
- Nylon tie straps
- Phillips and flat blade screw drivers
- Pliers (standard and needle nose)
- Reference CD with 1 kHz Sine Wave at 0dB level (all bits high)
- RTA (real time analyzer)
- Soldering iron and solder
- Utility knife
- Wire brush or sandpaper for chassis grounding
- Wire crimper
- Wire cutters
- Wire strippers

Step By Step Installation

NOTE: Connect all input, power and speaker connections to amplifier before mounting the amplifier in its final location.

1. Determine the location for the amplifier. Refer to the Choosing Mounting Locations section of this manual for detailed information.
2. Decide on the system configuration for your amplifier. For system suggestions, refer to the Speaker Connections section of this guide.
3. Run all the wires from the amplifier location to the speakers, source unit, and battery. Do not connect the battery at this time. Be sure to run RCA's and power and speaker wires away from factory electrical wires and system as they pose a great potential for induced system noise.
4. Remove end caps before mounting the amplifier (see figure 11, previous page).
5. Pre-drill amplifier mounting holes. Be sure to "think before you drill". Gas tanks, fuel lines, and other obstructions have a nasty way of hiding themselves. For best results use a marking pen to mark the mounting holes and pre-drill these holes with a standard 1/8" drill bit.
6. Mount the amplifier. Make sure the amplifier is mounted on a flat surface. If this is not possible, do not over tighten the screws so that the chassis of the amplifier is twisted or bent.
7. Turn the vehicle's key switch to the off position.

8. Disconnect the vehicle's battery ground terminal.
9. Connect power wires to the amplifier (ground first, then 12 V(+) and REM). Power wire must be fused near the battery. Be sure to remove the fuse from the fuse holder at this time.
10. Connect the RCA and speaker wires to the amplifier. Check the quality of your speakers and signal connections. This will determine the ultimate performance of your Orion amplifier. Refer to the Signal Input and Output Level Controls and Speaker Connections sections of this manual for correct wiring instructions.
11. Reconnect the ground terminal to the battery after power, speaker, and RCA connections are completed.
12. Set crossovers. Refer to the Internal Crossover Configuration section of this manual for detailed instructions.
13. Set gain control to a low level before turning on the amplifier. Adjust gain control as needed after the system is playing. (see adjusting the sound of the system)
14. Once satisfied that all connections and settings are correct, install the fuse located near the vehicle's battery and proceed to the Testing the System section of this manual.
15. After all connections and adjustments are made, install end caps if they are to be used.

WARNING! Never exceed the recommended fuse size of this amplifier. Failure to do so will result in the voiding of your warranty and possible damage to the amplifier.

SET UP AND TROUBLESHOOTING

Testing the System

After you have completed the installation, you need to test the system. This will help ensure years of trouble-free operation. Please refer to the listed steps below when testing the sound of your Orion system.

1. Check all the wiring connections to be sure they are correct and secure.
2. Turn the signal source volume control all the way down. Set any tone controls to their flat or defeated positions. This includes the loudness control.
3. Turn the level controls of the amplifier to their minimum positions.
4. Turn the source unit on. Check to see if the power LED located on the top of the amplifier is on. If not, please refer to the Power Connections and the Troubleshooting Tips sections of this manual for instructions.
5. If using an aftermarket source unit, turn the level controls of the amplifier about one quarter of a turn. Slowly increase the volume level of the source unit to so that you can hear the output of the system. If no sound is heard or if the output is distorted, turn the system off immediately. Refer to the Power Connections and the Troubleshooting Tips sections of this manual to solve your installation problems.
6. Check to make sure the output for each channel is correct. If the active crossovers are used, check to make sure that each output is correct from the amplifier. When using active crossovers on

midrange and tweeters, do not use crossover frequencies lower than recommended. If the system is not configured properly, refer to the Internal Crossover Configuration section of this manual and take corrective action.

7. If the output is clear and undistorted, continue to the Adjusting the Sound of the System section of this manual.

Adjusting the Sound of the System

Once you have checked the system's operation, adjust the sound of the system. Adjusting the sound of the system is accomplished by setting the level controls and adjusting the internal crossovers.

1. Turn the signal source volume control all the way down. Set any tone controls to their flat or defeated positions. This includes the loudness control.
2. Turn the level controls of the amplifier to their minimum positions.
3. Choose music with high dynamic content that you like, with which you are familiar, and will be used most often in the system.
4. Turn the source unit's volume control up to its highest undistorted output level. If you lack test equipment, this point occurs between 3/4 to full volume depending on the quality of your source unit. Listen for any audible distortion. If any distortion is audible, reduce the volume of the source unit until you have an undistorted output. Leave the volume control at this position during your system tuning.
5. While listening to your chosen dynamic music, turn up the level control corresponding to the midrange output until you hear

- slight distortion and turn the level control back slightly for an undistorted output. Depending on your system, the midrange and tweeter output may be on the same output channels.
6. Turn up the level control corresponding to the tweeter output until you hear slight distortion and turn back the level control slightly for an undistorted output. Depending on your system the midrange and tweeter output may be on the same output channels.
 7. Fine-tune the output level between midrange and tweeters. Refer to the Internal Crossover Configuration section of this manual for detailed instructions.
 8. Repeat Steps 5-7 for the rear speakers. If you do not have rear speakers continue to Step 10.
 9. Set levels between the front and rear midrange and tweeters for optimum front/rear balance.
 10. Turn up the level control corresponding to the woofer output until you hear slight distortion and turn back the level control slightly for an undistorted output.
 11. Fine-tune the output level between satellite speakers and the woofers. Refer to the Internal Crossover Configuration section of this manual for detailed instructions.
 12. Enjoy your awesome Orion sound system.

Amplifier Visual Troubleshooting

Your new XTR amplifier has three indicator lights (LED's) mounted on the top plate of the amplifier as seen in the next figure. These lights are very useful in trouble shooting possible amplifier problems and issues.

Power LED: This LED lights up green when the amplifier is turned on. This represents normal operation if the Protection and Thermal LED's next to it are off.

Protection LED: This LED lights up red if the amplifier goes into protection. Below is a description of reasons the amplifier could engage the protection circuit. The protection indications will self reset once the condition has been fixed.

- **Short:** Speaker wires pinched or shorted together or to ground (frame of vehicle).
- **Overcurrent:** Check for possible speaker issue(s) or speaker wiring pinched in a door or other metal. Make sure speaker(s) load is not below the minimum impedance load.
- **DC Offset:** This can happen if the installation inadvertently connects the power wire to the speaker input(s). This can also happen if the amplifier has an internal problem.
- **Under voltage:** Vehicle charging system is not supplying enough voltage to the amplifier. This can also occur if you use too small a gauge wire or the terminals connecting the amplifier power to the electrical system are dirty or corroded.

- **Overvoltage:** Vehicle charging system is supplying too much voltage or over the amplifiers rated DC input. Usually this occurs when there is a problem with the electrical system. Turn off the headunit when jump-starting the car.
- **Reverse Polarity:** Any instance when the battery polarity or wires from the battery to the amplifier are reversed.

Thermal LED: This LED lights up red if the amplifier overheats. An amplifier can thermal many different ways and below is a description of reasons the amplifier could engage the Thermal Circuit.

- Speaker loads lower than the amplifiers minimum load will ause the amplifier to draw more current and may result in overheating. This can be avoided by using speakers or wiring methods that result in an Ω load greater than the amplifiers minimum Ω load input.
- The amplifier can also overheat if it is not receiving proper ventilation, when mounting a amplifier make sure it has room for air to circulate and keep it cool. Amplifiers will get hot because they produce energy and care and consideration should be taken into account when installing any amplifier.
- The temperature inside the car where the amplifier is mounted is extremely hot. This can occur in desert climates. It is not uncommon for temperatures inside a parked car to reach in excess of 140°F (60°C). If airflow is restricted to the mounting area, the main car cabin may cool down before the rest of the car has dropped appreciably.

Amplifier Top Plate

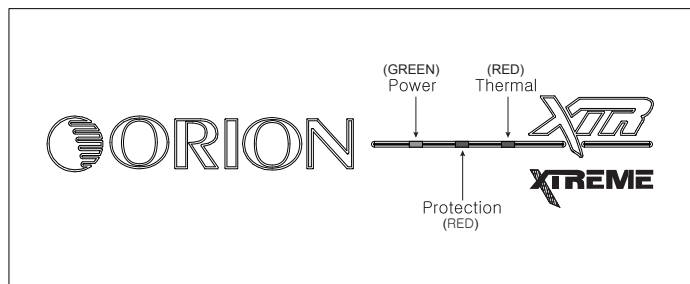


Figure 7

Troubleshooting Tips

Symptom	Probable Cause	Action To Take
No output		
	Low or no remote turn-on	Check remote turn-on voltage at voltage amplifier and repair as needed.
	Fuse blown	Check power wire's integrity and check for speaker shorts. Fix as needed and replace fuse.
	Power wires not connected.	Check power wire and ground connections and repair or replace as needed.
	Audio input not connected.	Check RCA connections and repair or replace as needed.
	Speaker wires not connected	Check speaker wires and repair or replace as needed.
	Speakers are blown	Check system with known working speaker and repair or replace speakers as needed.
Audio cycles on and off		
	Thermal protection engages when amplifier heat sink temperature exceeds 75° C (167° F)	Make sure there is proper ventilation for amplifier and improve ventilation as needed.
	Loose or poor audio input	Check RCA connections and repair or replace as needed.
	Loose power connections	Check power wires and ground connections and repair or replace as needed.
Distorted output		
	Amplifier level sensitivity set too high exceeding maximum capability of amplifier	Readjust gain. Refer to the Adjusting the Sound of the System section of this manual for detailed instructions.
	Impedance load to amplifier too low	Check speaker impedance load, if below 2Ω , rewire the speakers to achieve higher impedance.
	Shorted speaker wires	Check speaker wires and repair or replace as needed.

Symptom	Probable Cause	Action To Take
	Speaker not connected to amplifier properly.	Check speaker wires and repair or replace as needed. Refer to the Speaker Connections section of this manual for detailed instructions.
	Internal crossover not set properly for speakers	Readjust crossovers. Refer to the Internal Crossover Configuration section of this manual for detailed instructions.
	Speakers are blown	Check system with known working speakers and fix or replace as needed.
Poor bass response		
	Speakers wired with wrong polarity causing cancellation at low frequencies.	Check speaker polarity and fix as needed.
	Crossover set incorrectly	Reset crossovers. Refer to the Internal Crossover Configuration section of this manual for detailed instructions.
	Impedance load at amplifier is too low.	Check speaker impedance load if below 2Ω , rewire speakers to achieve higher impedance .
Battery fuse blowing		
	Short in power wire or incorrect wiring.	Check power wires and ground connections and repair or replace as needed.
	Fuse used is smaller than recommended.	Replace with proper fuse size.
	Actual current exceeds fuse rating.	Check speaker impedance load if below 2Ω , rewire speakers to achieve higher impedance.
Amplifier fuse blowing		
	Fuse used is smaller than recommended.	Replace with proper fuse size.

MEMO

Symptom	Probable Cause	Action To Take
	Impedance load at amplifier is too low.	Check speaker impedance load if below 2Ω , rewire speakers to achieve higher impedance.
	Speaker is blown with shorted outputs	Check system with known working speakers and fix or replace as needed.
	Actual current exceeds fuse rating.	Check speaker impedance load if below 2Ω , rewire speakers to achieve higher impedance.

LIMITED TWO MONTH CONSUMER WARRANTY AND ONE YEAR CONSUMER WARRANTY WHEN PURCHASED AND INSTALLED FROM AUTHORIZED ORION DEALER

Electronics Limited Warranty

Please keep your original box. Orion warrants this product to be free from defects in materials and workmanship under normal use for a period of TWO (2) months from the date of original purchase receipt. When purchased and installed from an AUTHORIZED ORION dealer it is warranted for a period of ONE (1) Year from the date of the original purchase receipt. The ORIGINAL Receipt must be provided for all claims. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction during the warranty period. ORION will repair or replace (at its discretion) the defective merchandise with equivalent merchandise with equivalent merchandise at no charge. Warranty replacements may have cosmetic scratches or blemishes. Discontinued products may be replaced with more current equivalent products.

This warranty is valid only to the original purchaser and is non-transferable to any other person or party. Any applicable implied warranties are limited in duration to a period of the express warranty provided herein beginning with the date of the original purchase at retail, and no warranties, whether express or implied, shall apply to this product thereafter. Some states do not allow limitations on implied warranties; therefore these exclusions may not apply to you. This warranty gives you specific legal rights; however you may have other rights that vary from state to state.

What to Do if you need Warranty or Service

Defective merchandise should be returned to your local authorized ORION dealer for warranty service. Assistance locating an authorized dealer can be found at the products main website

If it becomes necessary for you to return DEFECTIVE merchandise directly to ORION, call the ORION Customer Care number for a Return Merchandise Authorization (RMA) number. Package all defective items in the original container or in a package that will prevent shipping damage. The shipping address and instructions will be given to you by our customer care representative upon their issuing the RMA number.

The RMA number must be clearly marked on the outside of the package. Please return only defective components. The return of functioning items increases your return freight charges. NON- DEFECTIVE items will not be exchanged. You will be contacted by customer care advising you of such situations, and product will be returned to you upon your payment of freight charges for the return of such product back to you.

Include a copy of the original receipt with the PURCHASE DATE clearly visible, and a "PROOF OF PURCHASE" statement listing the CUSTOMERS NAME, DEALER's NAME and INVOICE number, and product purchased. Warranty expiration on items without "PROOF OF PURCHASE" will be determined from the type of sale and manufacturing date code. FREIGHT on defectives products returned must be PREPAID by you or your authorized dealer; items sent freight collect, or COD will be REFUSED.

What is not covered?

The warranty is valid only if the product is used for the purpose for which it was designed and does NOT COVER the following;

- Damage due to improper installation and sound settings, excessive or insufficient voltage spikes, and use of inferior low grade wiring.
- Subsequent Damage to other components
- Damage caused by exposure to moisture, excessive heat, chemical cleaners, and/or UV Radiation.
- Damage through negligence, misuse, accident or abuse. Repeated returns for the same damage may be considered abuse.
- Any cost or expense related to the removal or installation of product. No Installation Fee reimbursements.
- Items previously repaired or modified by any unauthorized repair facility
- Return shipping costs from ORION to you on non-defective items
- Products with tampered or missing barcode labels
- Products returned without a Return Merchandise Authorization (RMA) number
- Freight Damage
- The cost of shipping product to ORION, from you to Orion
- Service performed by anyone other than Orion
- Damage related to Acts of Nature, lightning, hurricanes, flood, tornadoes, and wildfires.
- Products Sold outside of United States have NO WARRANTY expressed or implied

How long will it take?

ORION strives to maintain a goal of 7 day service for all electronics products (amplifiers, equalizers, electronic crossovers, etc.) returns.

Delays may be incurred if lack of replacement inventory or parts is encountered.



MD AUDIO
ENGINEERING INC