

Ultimate®

HIGH CURRENT POWER

AMPLIFIERS

UHC5

1 X 150 + 4 X 60W RMS
5 CHANNEL AMPLIFIER

UHC4

4 X 60W RMS
4 CHANNEL AMPLIFIER

UHC2

2 X 60W RMS
2 CHANNEL AMPLIFIER

ULTIMATE®

*138 University Parkway
Pomona, CA 91768
Toll Free: 888-909-9988
Telephone: 909-594-2604
Fax: 909-594-0191*

INTRODUCTION

I. Description

This device is a high power, audio amplifier. Use it responsibly. Very loud music can cause permanent hearing loss. This amplifier is intended for installation in vehicles with a 12-Volt, negative ground electrical system. Attempting to connect or operate the amplifier in another type of electrical system may cause damage to the amplifier or the electrical system.

II. About This Manual

Read the Instructions-

Be sure that you have read all operating instructions and understand all safety precautions before installing and operating the amplifier. We recommend that you have your **UHC** amplifier installed by a specialist.

Follow the Instructions-

The instructions are intended to help you safely obtain the best performance from the amplifier. Carefully follow all installation and operating instructions.

Save the Operating Manual-

Keep the manual in a safe place after installing the amplifier. You may have questions later.

Text Conventions used in this Manual-

Bold-

Headings and important information.

Bold, Underlined-

Very important information.

"Bold"-

As labeled on the amplifier, or quoted from elsewhere in this manual.

III. Safety and Operating Precautions-

Caution!

This symbol warns the user of a potential risk or hazard if instructions are not followed.

⇒ This arrow symbol points to a specific instruction for avoiding a potential hazard.

1. Installation

1.1 Installation- Mounting the Amplifier

Step 1- Disconnect the negative (-) battery cable before mounting the amplifier or making any connections. Check the battery and alternator ground (-) connections. Make sure they are properly connected and free of corrosion

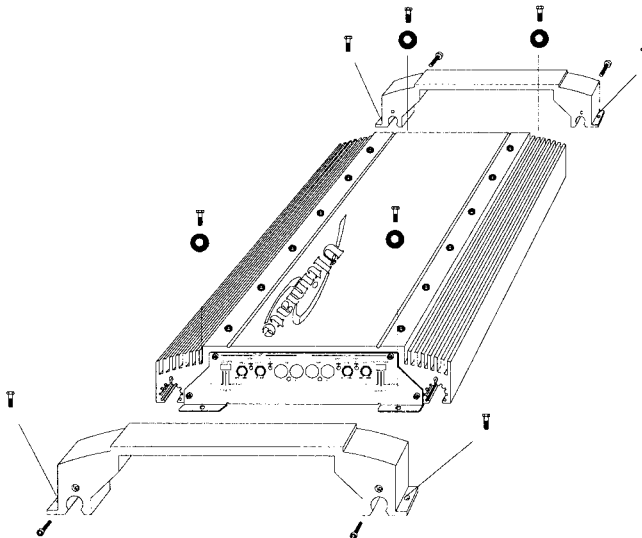
Step 2- Choose a mounting location for your amplifier. Find a location on a flat surface away from heat and moisture. Be sure the mounting location and the drilling of pilot holes for mounting will not present a hazard to any wires, control cables, fuel lines, fuel tanks, hydraulic lines, or other vehicle systems or components. Common mounting locations are under the front passenger seat, or in the trunk area. Choose a location with unimpaired air circulation. The amplifier will dissipate heat more efficiently if mounted vertically.

Step 3- Use the supplied screws and rubber bushings. Press the rubber bushings into the mounting holes at each end of the amplifier. Place the amplifier in the mounting location, and mark the positions of the holes with a marker, pen or pencil. Carefully drill the mounting holes in the marked positions.

Caution!

⇒ Check carefully before drilling any pilot holes.

Step 4- Use the supplied mounting screws to securely fasten the amplifier to the mounting surface.



Step 5- Use the supplied Allen head screws to mount the end caps to the ends of the main heat sink.

Step 6- Use the supplied screws to attach the end caps to the mounting surface.

Caution!

⇒ Make sure to mount the amplifier using the supplied screws and rubber bushings. Do not mount the amplifier by the end caps alone.

1.2 Installation- Power Connections

Step 1- Run a power cable from the battery to the amplifier mounting location. Use rubber grommets to protect the cable anywhere it has to go through metal.

UHC5, UHC4 - Use #4 AWG or larger power and ground cable.

UHC2 - Use #8 AWG or larger power and ground cable.

Step 2- Connect one end of an in-line fuse holder to the power cable. Connect the other end of the fuse holder to the positive battery post with 20 cm (or less) of the same cable. This fuse location will protect the system and the vehicle against the possibility of a short circuit in the power cable. Be sure to use a fuse and fuse holder adequate for the application. Do not place a fuse in the holder at this time. The fuse rating is depending on the power- and ground cable size. The maximum fuse rating for each amplifier in the **UHC** series is:

UHC5 - 80 Amp

UHC4 - 80 Amp

UHC2 - 40 Amp

Caution!

⇒ **Bridging fuses or replacing a fuse with one of a higher rating may cause damage to the amplifier and the vehicle's electrical system.**

Step 3- Run a remote turn on cable from the switched +12V source you will be using to turn on the system components. This may be a toggle switch, a relay, or your source unit's remote trigger wire, or power antenna trigger wire. Run this lead to the amplifier mounting location. Use #18 AWG wire or larger.

Step 4- Locate a secure grounding connection as close to the amplifier as possible. Make sure the location is clean and provides a direct electrical connection to the frame of the vehicle. Connect one end of a short piece of the same size cable as the power cable to the grounding point. Run the other end of the cable to the amplifier mounting location.

Step 5- connect the ground cable to the screw terminal labeled **“POWER, (GND)”**.

Step 6- Connect the power cable to the amplifier at the screw terminal labeled **“POWER, +12V”**.

Step 7- Connect the remote turn on cable to the screw terminal labeled “POWER, (REM)”.

1.3 Installation- Speaker Connections

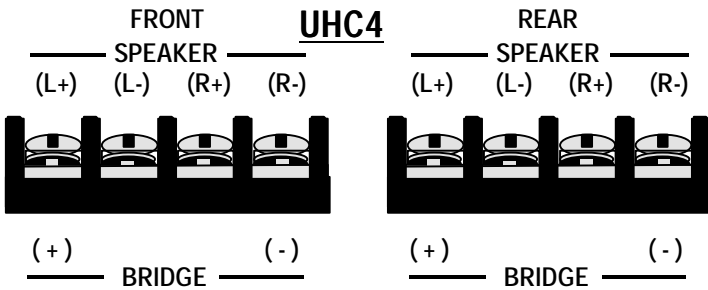
Step 1- Run #16 AWG or larger connecting wire from your speakers to the amplifier mounting location. Keep speaker wires away from power cables and amplifier input cables. Use grommets anywhere the wires have to pass through holes in the metal frame or sheet metal. Connect to the speakers according to the type of terminals on each speaker.

Step 2- Strip 3/8" of insulation from the end of each wire and twist the wire strands together tightly. Make sure there are no stray strands that might touch other wires or terminals and cause a short circuit.

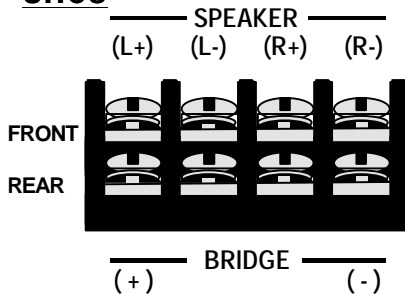
Step 3- Crimp spade lugs over the wire ends or tin the ends with solder to provide a secure termination.

Step 4- Connect the wire ends to your amplifier as follows:

UHC5, UHC4- "FRONT" and "REAR" SPEAKER TERMINALS

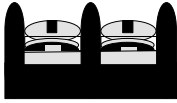
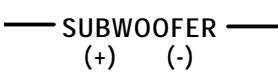


UHC5



Follow the left, (L+) (L-), and right, (R+) (R-), channel and polarity markings, making sure they match the channel and polarity of the connections at the speakers.

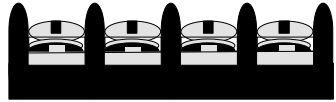
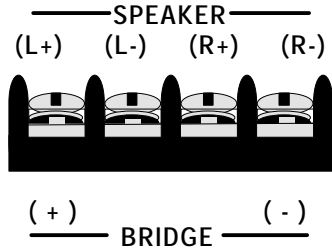
UHC5- SUBWOOFER TERMINALS



Follow the polarity(+) (-) markings first. You may want to experiment with reversing the (+) and (-) connections to see which way sounds best. The subwoofer channel is 1Ω stable, and can drive up to four 4Ω subwoofers connected in parallel.

UHC2- SPEAKER TERMINALS

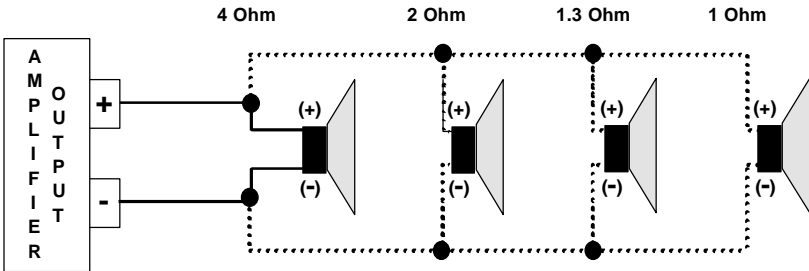
Follow the left, (L+) (L-), and right, (R+) (R-), channel and polarity markings, making sure they match the channel and polarity of the connections at the speakers.



MULTIPLE SPEAKER CONNECTION

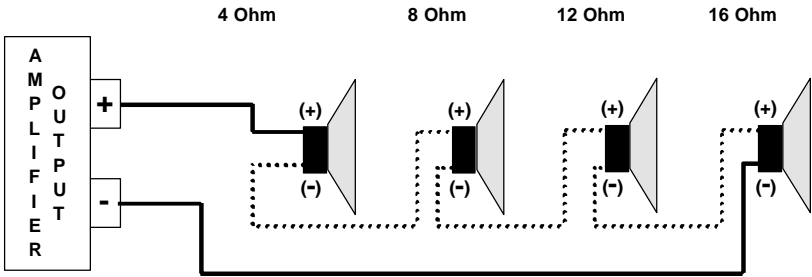
PARALLEL- Each additional speaker decreases the load impedance for the amplifier. The amplifier delivers more current and works harder.

PARALLEL CONNECTION USING 4 OHM SPEAKERS



SERIES- Each additional speaker increases the load impedance for the amplifier. Impedances higher than 8 ohms are rarely used for car audio.

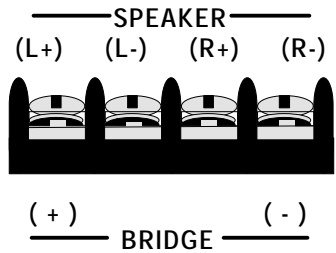
SERIES CONNECTION USING 4 OHM SPEAKERS



1.4 Installation- Self-Bridging, 2+1 Mode

BRIDGED MONO- UHC4, UHC2

Connect a 4Ω or 2Ω ohm speaker or multiple speaker load to the terminals marked “(+), **BRIDGE**, (-)”, making sure they match the polarity of the connections at the speakers.



Caution!

⇒ Speaker or multiple speaker loads totaling less than 4 ohms are not recommended for “**Bridged**” or “**2+1 Mode**” to the 4 channel output terminals of the **UHC5**, and may damage the amplifier.

2+1 MODE- (TRI-MODE)

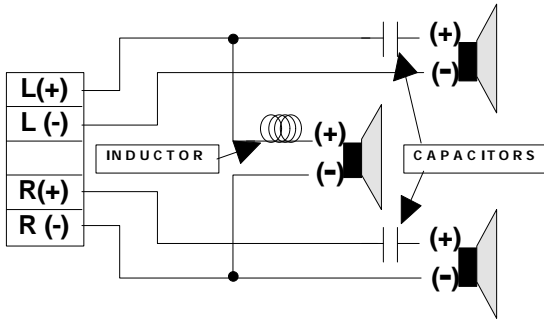
Simultaneous stereo and mono operation, “**2+1 Mode**”, requires a passive crossover to send low frequencies to the mono speaker and higher frequencies to the stereo speakers. The following table lists the component values for a 6 dB/Octave crossover at common frequencies using 4 ohm speakers:

FREQUENCY	INDUCTOR	CAPACITOR
80 Hz	7.5 mH	470 uF
100 Hz	6.5 mH	330 uF
120 Hz	5.5 mH	330 uF
150 Hz	4 mH	220 uF

2+1 MODE WIRING DIAGRAM-

Use 100 Volt, non-polar capacitors, and connect them in series with the stereo speakers as shown in the diagram. Connect the inductor in series

with the mono speaker as shown in the diagram. Be sure the inductor is rated to handle the power of your amplifier.

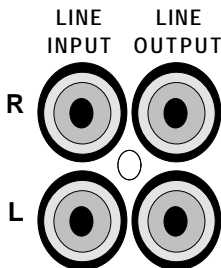
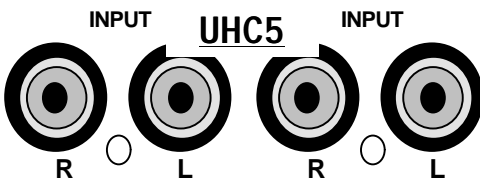
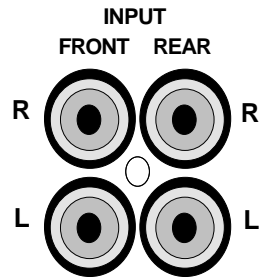


1.5 Installation- Input Connections

Low Level, High Impedance, Gold Plated RCA

Input Jacks-

For connecting to a source providing preamp level outputs. Use heavy duty RCA patch cords designed for mobile applications . Run the patch cables carefully, maintaining as much distance as possible from power, speaker, and accessory wiring. Make sure the RCA plugs fit tightly for a secure connection.



UHC2- High Impedance, Gold Plated RCA

Input and Output Jacks- The UHC2 features a pair of preamplifier output jacks to provide an input signal to another amplifier or component in the system. The output signal is preamplified to maintain signal quality.

UHC5- SUBWOOFER CHANNEL

The UHC5 subwoofer channel is connected internally to the RCA input jacks. There are no separate inputs for the subwoofer channels.

1.6 Installation- Check all Connections

Recheck all connections before reconnecting the negative(-) battery cable. Insert the correct value fuse in the fuse holder at the battery before attempting to turn on the system.

2. Operation

2.1 Operation- Input Level adjustments



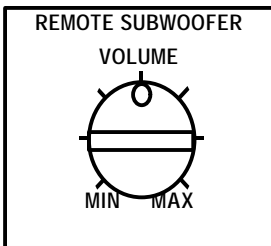
Adjust the input level for the marked channel(s) with a small screwdriver through the opening marked "LEVEL". Turn **CW**(clockwise) to increase the level, **CCW**(counterclockwise) to decrease. Amplifiers will run cooler and produce less system noise at lower level settings.

Consult an experienced installation specialist for assistance in balancing the levels in multi-amplifier systems, or systems with signal processing accessories.

UHC5- SUBWOOFER CHANNELS

The subwoofer channels have frequency adjustment and level controls but no separate RCA input jacks. Use a small screwdriver to adjust the low pass level through the opening marked "SUBWOOFER, LEVEL".

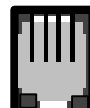
2.2 Operation- Optional Remote Subwoofer Level Control



Mount the optional accessory remote level control in an accessible location and run the connecting cable back to the **UHC5**. Connect the subwoofer remote level control by plugging the telephone plug at the end of the accessory cable into the RJ-11 telephone jack on the **UHC5**. Set the "Low-Pass" output level to the

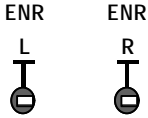
maximum level possible (full **CW**). Adjust the remote level control **CW** to increase the subwoofer level, **CCW** to decrease the subwoofer level.

REMOTE
BASS



RJ11

2.3 Operation- Electronic Noise Reduction(ENR[™])



It is usually not necessary to change the factory **ENR[™]** setting. The **ENR[™]** adjustment capability allows you to fine tune the balanced input circuits through the openings marked "**ENR[™], L, R**" for maximum noise rejection.

To properly adjust the **ENR[™]** requires:

A small, non-metallic, alignment tool that will fit through the opening. One is supplied with your **UHC** amplifier.

A small speaker that you can hold up to your ear while it is connected to the amplifier.

The amplifier must be installed correctly, and connected to the source and any other components normally used in the system.

Caution!

⇒ Never insert anything metallic into any openings in the amplifier side panels.

1. With the system turned off, disconnect the main speakers from the channels you are going to fine tune.
2. Mark the position(s) of the "**LEVEL**" control(s) for the channel(s) you are going to fine tune.
3. Turn the "**LEVEL**" control(s) fully **CW** for the channel(s) you are going to fine tune.
4. Connect the small speaker to the channel you want to adjust.
5. Make sure the source unit volume is fully **CCW** (volume completely turned down).
6. Start the engine, and turn on the system.
7. Use the small screwdriver to adjust the **ENR[™]** for the channel the speaker is connected to. Listen to the speaker, and adjust for the minimum noise level.
8. Repeat for any other channel you wish to fine tune.

2.4 Operation- Built-in Crossovers

UHC5, UHC4, UHC2- CROSSOVER SELECTION

CROSSOVER



FULL-LPF-HPF

The **UHC** amplifiers have built-in low-pass and high-pass crossovers for bi-amplifying your system. Select "**FULL, LPF, or HPF**" by moving the position of the slide switch for each pair of channels. Selecting "**FULL**" defeats the crossover functions

UHC5, UHC4, UHC2- FREQUENCY ADJUSTMENT



After selecting the crossover function, adjust the low pass or high pass frequency with a small screwdriver through the opening marked "**FREQ.**". Turn **CW** to set to a higher frequency, **CCW** to set to a lower frequency.

UHC5- SUBWOOFER CHANNEL

Use a small screwdriver to adjust the low pass frequency through the opening marked "**SUBWOOFER, FREQ.**"

2.5 Operation- Protection Circuits and L.E.D. Indicators

PWR.



"PWR." L.E.D. INDICATOR- Provides a visual indication that the amplifier is turned on.

PROT.



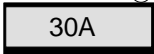
"PROT." L.E.D. INDICATOR- Provides a visual indication that a problem exists and the protection circuitry has protected the amplifier by shutting it down. Turn the system off and correct the problem before turning the system back on.

THERMAL PROTECTION- The amplifier will shut down if its temperature exceeds a safe operating level. The amplifier will remain off until it cools to a safe operating temperature. Exercise care, the exterior of the amplifier may get uncomfortably hot to the touch before shutting down.

OVERLOAD AND SHORT CIRCUIT PROTECTION- The amplifier will shut down if a short circuit condition exists, or if electrical current demands exceed safe levels.

D.C. OFFSET PROTECTION- The amplifier will shut down if an unsafe D.C. offset condition exists.

FUSE 30A ○

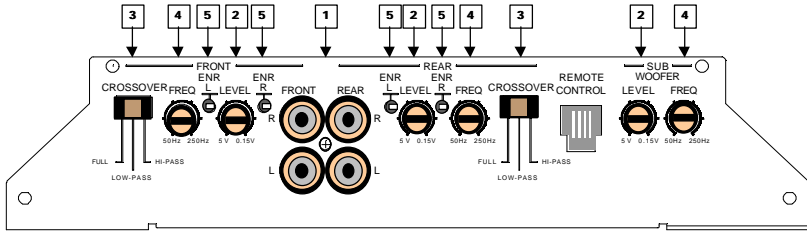


FUSE PROTECTION- A blown fuse indicates a problem that should be corrected before the fuse is replaced. Always replace with the same value fuse. Never substitute a larger value fuse.

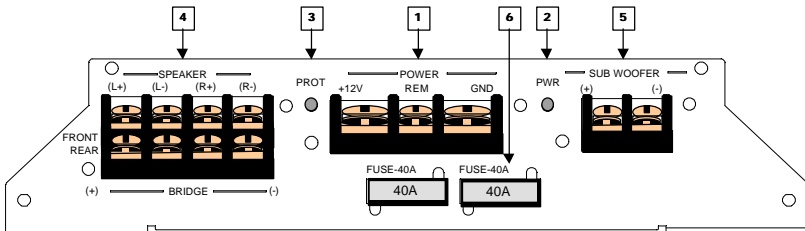
2.6 Operation- Location of Terminals, Controls and LED indicators

UHC5

1. RCA input jacks
2. Input level adjust
3. Crossover select
4. Frequency adjust
5. ENR™ adjust

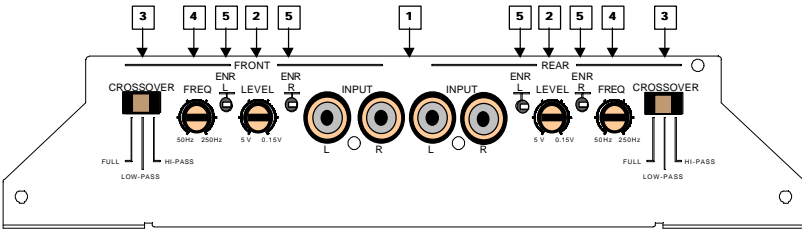


1. Power terminals
2. Power L.E.D.
3. Protection L.E.D.
4. Speaker terminals
5. Subwoofer terminals
6. Fuses

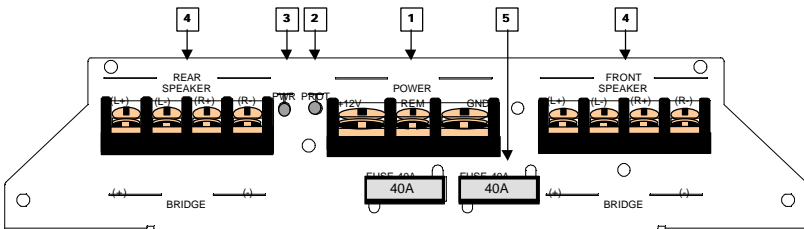


UHC4

1. RCA input jacks
2. Input level adjust
3. Crossover select
4. Frequency adjust
5. ENR™ adjust

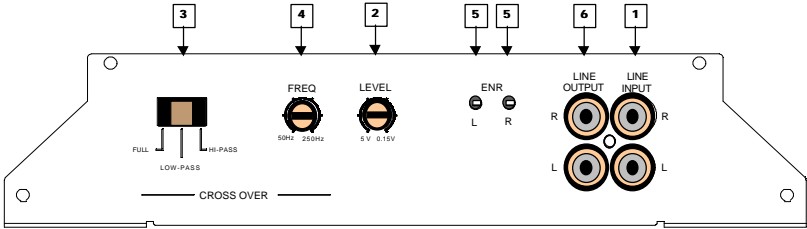


1. Power terminals
2. Protection L.E.D.
3. Power on L.E.D.
4. Speaker terminals
5. Fuses

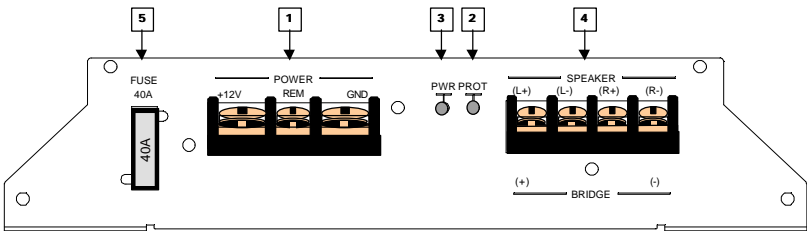


UHC2

1. RCA input jacks
2. Input level adjust
3. Crossover select
4. Frequency adjust
5. ENR™ adjust
6. RCA output jacks



1. Power terminals
2. Protection L.E.D.
3. Power on L.E.D
4. Speaker terminals
5. Fuse



Appendix A: Features and Specifications

Standard Features-

	UHC5 5 CHANNEL POWER AMPLIFIER	UHC4 4 CHANNEL POWER AMPLIFIER	UHC2 2 CHANNEL POWER AMPLIFIER
Circuit Board	Double sided, glass epoxy, through hole mounted		
2Ω Stable	Yes		
1Ω Stable	Subwoofer Channel	Yes	Yes
Bridgeable	Channel 1-4 8Ω, or 4Ω	8Ω, 4Ω, or 2Ω	8Ω, 4Ω, or 2Ω
Tri-mode	Yes, self-bridging		
Terminals	Gold plated RCA jacks, speaker and power terminals		
Soft Start	Yes		
Input Circuitry	BIC Floating ground, balanced input circuitry for maximum noise rejection		
Electronic Noise Reduction™	Yes, adjustable for maximum effectiveness		
Line Output (full range)	-	-	- RCA line out
Built-in Crossover	Yes, Low Pass, High Pass, 12dB/Octave, 50-250Hz.		
Protection	Protected against thermal and electrical overload, short-circuit and DC offset		
MOSFET, PWM Power Supply	Regulated, Pulse Width Modulated, MOSFET power supply		
Supply Voltage	+12VDC, Negative ground		

Performance Specifications-

	UHC5 5 CHANNEL POWER AMPLIFIER	UHC4 4 CHANNEL POWER AMPLIFIER	UHC2 2 CHANNEL POWER AMPLIFIER
RMS Power, 4Ω, THD<0.05%	1 X 150 + 4 X 60 Watts RMS	4 X 60 Watts RMS	2 X 60 Watts RMS
RMS Power, 2Ω, THD<0.2%	1 X 300 + 4 X 100 Watts RMS	4 X 120 Watts RMS	2 X 120 Watts RMS
Bridged RMS Power, 4Ω, THD<0.2%	(1 X 150) + 2 X 200 Watts RMS	2 X 240 Watts RMS	1 X 240 Watts RMS
Signal to Noise Ratio, "A" Weighted	-100dBA	-100dBA	-105dBA
Damping Factor	>200	>200	>200
Frequency Response	10Hz. – 50kHz.	10Hz. - 50kHz.	10Hz. - 50kHz.
Stereo Separation "A" Weighted	-65dBA	-65dBA	-65dBA
Input Sensitivity	150mV – 5.0V	150mV - 5.0V	150mV - 5.0V
Input Impedance	25kΩ	25kΩ	25kΩ
Fuse	2 X 40A	2 X 40A	40A

These specifications are subject to change in the continuing effort to improve the product.

Appendix B: Troubleshooting

Condition	Possible Cause	Possible Solution
No sound	Low or no remote turn on voltage, or no remote turn on connection	Check the remote turn on connection and the voltage at the amplifier and source unit
	Blown fuse(s)	Check all system fuses
	Wiring problems	Recheck all connections Check for short circuits
	Blown speakers	Check speakers on another amplifier
Amplifier shut down	Protection circuit protecting against overheating or overload	Check for adequate ventilation Check load impedance(2 ohm stereo, 4 ohm bridged) Check speaker wiring for short to the vehicle chassis Reduce input level
Distortion	Input level not properly adjusted Speaker damage	Readjust amplifier input level Check speakers on another amplifier
Poor bass response	Speakers out of phase	Recheck speaker wiring Reverse polarity of one channel
Ticking noise	Radiated noise from spark plug wires	Reroute amplifier input wiring Install a noise filter Adjust ENR™
Whining noise	Alternator noise caused by poor grounding of amplifier, source, other component, battery, or alternator	Check all ground connections Install a noise filter on the source unit's power cable Install a coupling transformer in the signal path to improve ground isolation for the signal path Adjust ENR™