Congratulations on your **Unity Amplifier** purchase, and welcome to the world of Hybrid Audio Technologies!

We realize that you have a choice in amplifiers, and are thrilled that you have chosen the Unity Amplifiers. For more information about Hybrid Audio Technologies, our philosophies regarding high-end mobile audio, and for information about our other products, please visit us at: hybrid-audio.com

High-end mobile audio is our passion! When installed and set-up properly, the Unity Amplifier you have purchased will make a remarkable improvement in the sound quality of virtually any mobile audio sound system and give years of superior performance.

With the publication of this manual, it is our goal to assist the “do it yourself” enthusiast and professional installer alike in getting the highest level of performance out of this Unity Amplifier, using straight-forward installation advice.

Thank you, and happy listening!

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Welcome and Introduction by Scott Buwalda - Founder
Your new high fidelity bridgeable/stereo amplifier is designed to deliver maximum enjoyment and years of trouble-free service. Please take a few moments to read this manual thoroughly as it will explain the features and operation of your Unity amplifier and help ensure trouble free installation.

Unity Amplifiers

Features

Unity U4A / U5A / U6A
- Class “D” High-Current Operation
- Dual Discrete Drive Stages
- MOSFET PWM Power Supply
- Bridgeable & Tri-Mode Operation
- Continuously Variable 12dB/Octave High Pass & 12dB/Octave Low Pass Crossovers
- Subwoofer Variable Crossover for Bass Control
- Nickel Plated RCA, Power & Speaker Terminals
- Soft Start & Muting
- DC, Thermal and Short Circuit Protection

Unity U1A
- Class “D” High-Current Operation
- 2 Ohm Stable
- Spec Audiophile Grade Components
- High Efficiency PWM Power Supply
- Multi-Stranded Power Toroid
- MOSFET Transistors
- Oversized Capacitor Banks
- Discrete Mount Power & Speaker Terminals
- Variable Low Pass Crossover 50 - 250 Hz
- Circuit, Thermal and Overload Protection
- Power and Protection Indicator
- Remote Level Control

CONTINUOUS EXPOSURE TO SOUND PRESSURE LEVELS OVER 100dB MAY CAUSE PERMANENT HEARING LOSS. HIGH POWERED AUTO SOUND SYSTEMS MAY PRODUCE SOUND PRESSURE LEVELS WELL OVER 130dB. USE COMMON SENSE AND PRACTICE SAFE SOUND.

Precautions

If after reading this manual you are uncomfortable about installing the amplifier into your vehicle, or not equipped to do so, the amplifier should be installed by an authorized installer.

You must disconnect the negative battery terminal before making any electrical connections.

Choose a location that provides substantial ventilation for the amplifier. The best locations are in your vehicle’s trunk, under the front seats or on the back wall of a truck.

The location chosen should provide at least 2” of clearance above the amplifier for proper ventilation.

If the amplifier is mounted vertically make sure it is in a place where adequate air will flow along the length of its heatsink fins for cooling.

Never mount the amplifier upside down, this will cause the heat to rise back into the amplifier causing thermal shutdown or possibly cause permanent damage.

Never mount the amplifier in a location that is subject to direct sunlight or exposed to moisture.

Be sure to mount the amplifier to a strong, solid surface which will not give way under the stress of a sudden stop or accident.

Make sure that the mounting screws will not penetrate the gas tank, brake and fuel lines, wiring or other critical parts of your car when installed.

Never operate the amplifier without proper power and ground wire, 10-gauge minimum.

Never operate the amplifier without proper fusing. Proper fusing requires the location of the fuse holder to be within 18-inches of the battery. This fuse is to protect the vehicle, not the electronics. In the case of a short, the fuse will blow instead of the wire burning up. Using anything other than the recommended fuse ratings at the battery and the amplifier may cause damage to the amplifier and will void your warranty.

Do not run wiring underneath or outside the car since exposure to the elements may cause the insulation to deteriorate rapidly, resulting in short-circuits and intermittent operation.

All cables should be run beneath carpets and inside trim pieces.

It is best to run the power cables along the opposite side from the audio cables to minimize interference with the audio signal.

Wherever wires pass through metal, rubber or plastic grommets must be used to prevent the metal from wearing through the installation and causing a short.

Wherever possible, use cable ties, mounting clamps and similar wiring aids (available from an electrical supply or auto parts store). Adding stress relief loops to wiring is also advisable to prevent straining or breakage.

It is best to test the system before the amplifier is permanently mounted and the interior of the car is reassembled.

If the temperature inside the vehicle reaches extreme levels (such as sitting locked for several hours in the hot sun or exposed to a very cold winter day) the amplifier may go into protection mode and shut off. Leave the unit off until the ambient temperature returns to normal.

The amplifier operates with any vehicle using a 12-volt negative ground system. If you are not sure of the type of electrical system in your vehicle, consult your authorized dealer or qualified mechanic.

Never ground the speaker leads and NEVER allow the speaker leads to come in contact with each other. Speaker wire should be 18 gauge or larger.

Remote turn on wire must be switched by the radio does not have a remote turn on or antenna output, connect to wire that has a positive 12 volts when the key is turned to the accessory. If the amplifier does not turn off the battery will die.

Do not listen to high volumes for extended periods of time as hearing damage may occur.
Mounting
1. After reading the precautions on the previous page, please decide where you are going to install the unit. Also, see Fig.1.
2. Once the location is determined, place the amplifier into position. Using a felt tip pen or pencil mark the four holes to be drilled for mounting. Never use the amplifier as a template for drilling. It is very easy to damage the amplifier surface in the manner.
3. Remove the amplifier. Drill four 3.5 mm holes into the mounting surface. If you want to mount the amplifier to MDF or a wood panel, drill four 3.0 mm diameter holes into the mounting surface.
4. If possible, test the system to ensure it is operating correctly before final mounting of the amplifier.
5. Mount the amplifier using the (4) supplied self-tapping screws.

NOTE: Do not ground the amplifier to the “frame of the car” the frame on most cars and trucks is not grounded to the chassis(body). Use Solder or a clamp ring to connect the ground wire. Pre-drill the prepped chassis to bolt the ground ring terminal with nut, bolt and lock washers. Insulate metal and connector with paint or silicon to prevent rust and oxidation. Silicon also works great to prevent nuts and bolts from working loose in a harsh environment of an automobile. Upon completion of the ground connection, grab the wire or connector and confirm that it is a solid connection. To prevent engine noise in the audio system, it is recommended to ground the head unit and other audio electronics in the same location.

REM = Connect the remote wire (power antenna output) from the head unit to the remote turn-on wire of the amplifier. If the head unit is not equipped with a remote/antenna output, locate a wire that is controlled by the accessory position of the key. It is important to have the amplifier turn off with the radio or key. If the amplifier remains on, the result will most likely be a dead battery.

12v = connect the proper gauge power wire to the amplifier “B+” terminal. Run wire towards the fuse holder that is no greater than 0.5 meters from the battery. Remember, the fuse is to protect the safety of the car in the case of a short. Connect the power cable to the fuse holder to the battery, but do not install the fuse at this time.
Unity Amplifiers

4-Channel System Wiring Diagram (U4A)

INPUT MODE

2CH: Connect input signals only to LINE IN CH1/CH2 RCA jacks or speaker level inputs CH1/CH2, the unit will sum CH1/CH2 signals to CH3/CH4 and you can get 4CH outputs.

4CH: Connect input signals to LINE IN CH1/CH2/CH3/CH4 RCA jacks or speaker level inputs CH1/CH2/CH3/CH4 respectively, the unit will amplify the input signals and you can get outputs from CH1/CH2/CH3/CH4.

5-Channel System Wiring Diagram (U5A)

INPUT MODE

SUB: Accepts only low level input. The input MODE selector doesn’t function on SUB channel.

CH1/CH2/CH3/CH4

2CH: Connect input signals only to LINE IN CH1/CH2 RCA jacks or speaker level inputs CH1/CH2, the unit will sum CH1/CH2 signals to CH3/CH4 and you can get 4CH outputs.

4CH: Connect input signals to LINE IN CH1/CH2/CH3/CH4 RCA jacks or speaker level inputs CH1/CH2/CH3/CH4 respectively, the unit will amplify the input signals and you can get outputs from CH1/CH2/CH3/CH4.
**Unity Amplifiers**

**6-Channel System Wiring Diagram (U6A)**

**INPUT MODE**

2CH: Connect input signals only to LINE IN CH1/CH2 RCA jacks or speaker level inputs CH1/CH2, the unit will sum CH1/CH2 signals to CH3/CH4/CH5/CH6 and you can get 6CH outputs.

4CH: Connect input signals to LINE IN CH1/CH2/CH3/CH4 RCA jacks or speaker level inputs CH1/CH2/CH3/CH4, the unit sum CH1/CH2 CH3/CH4 signals to CH5/CH6 and you can get 6CH outputs.

6CH: Connect input signals to LINE IN CH1/CH2/CH3/CH4/CH5/CH6 RCA jacks respectively, the unit will amplify all the 6CHs signals and you will get 6CH outputs.

**1-Channel System Wiring Diagram (U1A)**

NOTE: Do not connect both the high level and low level inputs from your receiver to your amplifier at the same time.
This amplifier can operate in one, two, or three channel mode. The minimum impedance for single channel (bridged/mono) operation is 4 or 8 ohms. Tri-channel power is referred to stereo and mono at the same time. Minimum impedance remains the same for three channel (front/subwoofer) systems as long as proper passive crossovers are used. Connect right and left speaker wire to the corresponding speaker output terminals of the amplifier. Be sure to have the positive wire from the speaker connected to the speaker terminal of the amplifier and the negative wire from the speaker must connect with the negative speaker terminal of the amplifier. Reversing any of these connections will result in the speaker cones moving out of phase which causes bass cancellation. See Fig.3 Speaker Output Connections.

4 CHANNEL SPEAKER WIRING DIAGRAM (U4A)

Bridged mode

Four Channel mode

5 CHANNEL SPEAKER WIRING DIAGRAM (U5A)

Bridged mode

Five Channel mode

FIG.3
This amplifier can operate in one, two, or three channel mode. The minimum impedance for single channel (bridged/mono) operation is 4 or 8 ohms. Tri-channel power is referred to stereo and mono at the same time. Minimum impedance remains the same for three channel (front/subwoofer) systems as long as proper passive crossovers are used. Connect right and left speaker wire to the corresponding speaker output terminals of the amplifier. Be sure to have the positive wire from the speaker connected to the speaker terminal of the amplifier and the negative wire from the speaker must connect with the negative speaker terminal of the amplifier. Reversing any of these connections will result in the speaker cones moving out of phase which causes bass cancellation. See Fig.3 Speaker Output Connections.

**Speaker Connections 6-Channel (U6A)**

**Six Channel mode**

6 CHANNELSPEAKER WIRING DIAGRAM (U6A)

Bridged mode

**Speaker Connections 1-Channel (U1A)**

The Class “D” amplifier is a SINGLE CHANNEL dedicated subwoofer amplifier. Unlike other amplifiers, the Class “D” operates as a single channel and cannot be bridged. Don’t be fooled by the outputs. Two outputs are used strictly for convenience and are paralleled internally on the amplifier. This means that if both outputs are used with one driver each. The amplifier sees the same load as if the same drivers are connected to only one output terminal. See diagram below.

In both diagrams, the amplifier sees a 1 ohm load.
## Unity Amplifiers
### Specifications & Parameters

<table>
<thead>
<tr>
<th></th>
<th>U4A</th>
<th>U5A</th>
<th>U6A</th>
<th>U1A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 Ohm RMS Output</strong></td>
<td>75W x4</td>
<td>75W x4 + 400W x1</td>
<td>75W x6</td>
<td>600W x1</td>
</tr>
<tr>
<td><strong>2 Ohm RMS Output</strong></td>
<td>110W x4</td>
<td>110W x4 + 600W x1</td>
<td>110W x6</td>
<td>1000W x1</td>
</tr>
<tr>
<td><strong>4 Ohm Bridged RMS Output</strong></td>
<td>220W x2</td>
<td>220W x2</td>
<td>220W x3</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Low Pass Filter (Variable)</strong></td>
<td>60 Hz - 6 kHz (Ch 1/2)</td>
<td>600 Hz - 6 kHz (Ch 3/4)</td>
<td>60 Hz - 6 kHz (Ch 3/4)</td>
<td>50 - 250 Hz</td>
</tr>
<tr>
<td><strong>High Pass Filter (Variable)</strong></td>
<td>50 - 200 Hz (Ch 3/4)</td>
<td>15 Hz - 6 kHz (Ch 1/2)</td>
<td>15 Hz - 6 kHz (Ch 1/2)</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Subsonic Filter</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>15 - 200 Hz (Ch 5/6)</td>
<td>10 - 40 Hz</td>
</tr>
<tr>
<td><strong>Phase</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0 - 180 Degrees</td>
</tr>
<tr>
<td><strong>Frequency Response (+/- 1dB)</strong></td>
<td>10 Hz - 30 kHz (Ch 1-4)</td>
<td>10 Hz - 30 kHz (Ch 3/4)</td>
<td>10 Hz - 30 kHz (Ch 3/4)</td>
<td>10 - 250 Hz</td>
</tr>
<tr>
<td><strong>Signal-to-Noise Ratio (<strong>A</strong>Weighted)</strong></td>
<td>&gt;100 dB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input Sensitivity</strong></td>
<td>350 mV - 6 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input Impedance</strong></td>
<td>22k Ohm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Speaker Impedance @ Stereo</strong></td>
<td>2 Ohm</td>
<td>2 Ohm (Mono)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fuse Rating</strong></td>
<td>25A x2</td>
<td>30A x3</td>
<td>35A x2</td>
<td>30A x3</td>
</tr>
<tr>
<td><strong>Dimensions (185 x 55 x D) mm</strong></td>
<td>290</td>
<td>410</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CAUTION always check your speaker load with a multimeter before hooking up to the amplifier. These digital amplifiers are only 2 Ohm stable. Any impedance (load) smaller than 2 Ohm will damage the amplifier. Such damage is not covered under warranty either, so pay strict attention to what connections are made to the amplifier.

### ADJUSTMENTS

1. Set to the “HPF” position when the amplifier is used to drive a tweeter/midrange system. The frequencies below the crossover point will be attenuated at 12dB/octave. Permits adjustment of the crossover frequency, by rotating the knob to select any frequency between MIN and MAX value marked on the panel.

2. Set to the “LPF” position when the amplifier is used to drive a subwoofer. The frequencies above the crossover point will be attenuated at 12dB/octave. Set adjustment of the crossover frequency, by rotating the knob to select any frequency between the MIN and MAX value marked on the panel.

3. Set to the “FULL” position when the amplifier will be used for driving full-range speakers. The full frequency bandwidth (20Hz – 20kHz) will be output to the speakers without high or low-frequency attenuation.

4. Level adjustment – The sensitivity adjustment is to allow the amplifier to work with many different brands of head units. It allows the input signal to vary between 250 millivolts to 8 volts from the head unit or other signal processor. Start by setting the sensitivity adjustment to the “MIN” (8 volts) Using a cassette or compact disc that you are familiar with, turn on the head unit to the 3/4 volume setting. Slowly turn up sensitivity adjustment towards the “MAX” (250 millivolts) using a flat head screwdriver. Stop turning on the onset of distortion and turn back just slightly. The 3/4 volume setting is now the “maximum” volume for the head unit. The goal is to keep the level control to the lowest setting yet still have enough signal to drive the amplifier. This is done to prevent overdriving the amplifier and to maintain the system noise to a minimum. It is important not overdrive speakers (at the point of distortion) this will cause permanent damage to the speakers. Also, if the amplifier itself is over driven it could be damaged.

5. The “BASS” function can be selected to increase low-frequency response output, or decrease frequency response output. The “BASS” function will be working at only “FULL” or “LPF” position. The BASS is adjustable from 0 ~ 12dB boost at 45Hz.
# Unity Amplifiers Troubleshooting Guide

This section provides you with various amplifier symptoms and their probable causes with solutions. Please make sure the vehicle’s electrical system is working properly by verifying that other electrical items (such as headlights, power windows, etc.) still function correctly.

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBABLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Audio</td>
<td>Low or N.C Remote.</td>
<td>Check remote turn-on voltage at amp and head unit.</td>
</tr>
<tr>
<td></td>
<td>Turn-on connections.</td>
<td>Replace with new fast-blow fuse.</td>
</tr>
<tr>
<td></td>
<td>Blown Fuse.</td>
<td>Check butt splices or solder joints.</td>
</tr>
<tr>
<td></td>
<td>Power wires not connected.</td>
<td>Check ground and battery connections.</td>
</tr>
<tr>
<td></td>
<td>Blown or non-speakers connected.</td>
<td>Use VOM or DVM to measure speaker coil impedance; check speaker wiring connections.</td>
</tr>
<tr>
<td>Distorted Audio</td>
<td>Input Sensitivity not set properly or damaged speaker cones.</td>
<td>See adjustment procedure and check each step; Refer to head unit owner’s manual.</td>
</tr>
<tr>
<td></td>
<td>Low turn-on voltage.</td>
<td>Inspect each speaker for damage and repair or replace suspected component.</td>
</tr>
<tr>
<td>Audio Level Low</td>
<td>Mute circuit on head unit is on.</td>
<td>Check electrical system for low voltage; Check ground connection.</td>
</tr>
<tr>
<td>Audio Lacks Output</td>
<td>Speakers wired with wrong polarity, causing cancellation of bass frequencies.</td>
<td>Check polarity of wires from amplifier to each speaker as defined by the system design.</td>
</tr>
<tr>
<td>External Fuse Blowing</td>
<td>Incorrect wiring or short circuit.</td>
<td>Refer to electrical installation and check each installation step.</td>
</tr>
<tr>
<td>Whining noise on audio with engine running</td>
<td>Amplifier is picking up alternator noise.</td>
<td>Install in line noise filter on the head unit’s power wire; Check alternator routing diodes or voltage regulator for proper operation.</td>
</tr>
<tr>
<td>Ticking noise on audio with engine running</td>
<td>Amplifier is picking up radiated spark noise.</td>
<td>Check all grounds, battery voltage, and RCA cables.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check RCA audio cable; Install an inline noise filter on the head unit’s power wire.</td>
</tr>
</tbody>
</table>

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Unity Amplifier Warranty

Hybrid Audio Technologies extends a limited one year warranty to the original purchaser when self-installed, and three years warranty when installed by a certified Hybrid Audio Technologies dealer (United States only), and hereby certifies that this product will be free from defects in materials and workmanship under normal and proper use for one year from the date of purchase.

Hybrid Audio Technologies' responsibility under this warranty is limited to replacing or repairing, at Hybrid Audio Technologies' option, products or parts determined by Hybrid Audio Technologies to be defective either in materials, or workmanship. To attain warranty service, the customer must deliver the product or the defective part(s), appropriately packed with proof of purchase date, to an authorized Hybrid Audio Technologies dealer. In the event that a direct return from a consumer is required, the consumer must obtain from Hybrid Audio Technologies a return authorization number, and ship the defective product directly to Hybrid Audio Technologies. All shipping expenses are the customer's responsibility. If the product has been updated or superseded, a replacement will be made with a current model of the same quality and function. Warranty of the replacement parts is limited to 90 days or the unexpired portion of the warranty period of the product on which the parts are being used, whichever is longer.

This warranty does not cover any defects or costs caused by: (1) modification, alteration, repair or service of this product by any persons or company other than Hybrid Audio Technologies; (2) physical abuse to, overload of, or misuse of, the product or operation thereof in a manner inconsistent with the use indicated in the instructions; (3) any use of the product other than that for which it was intended; or (4) shipment of the product to Hybrid Audio Technologies for service. This warranty does not cover labor costs.

Hybrid Audio Technologies is not liable for any special incidental or consequential damages, including, but not limited to, personal injury, property damage, damage to or loss of equipment, loss of profits or revenue, costs of renting or buying replacements and/or any other additional expenses, even if Hybrid Audio Technologies has been informed of the prospect of such damages. Any express warranty not provided herein, and any remedy which other than the warranty contained herein might arise by inference or operation of law, is hereby excluded and disclaimed including the implied warranties of merchantability and of the fitness for a particular purpose.

Thank You!

Hybrid Audio Technologies is delighted that you have chosen a Unity Amplifier for your high-end mobile audio sound system. We are convinced that a great product offering, backed up with unsurpassed customer service and technical support will advance the Hybrid Audio Technologies namesake in the coming years. We are pleased that you have joined us in our “new generation of in-car audio.”

If there is anything we can do to help you get the most out of your Unity installation, please do not hesitate to email us: support@hybrid-audio.com, by phone: 770.888.8200, or by visiting us at: hybrid-audio.com