



A1500.2 / A1500.4

Mobile Audio Amplifier

Owner's Manual



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About the design

When you pick up the 1500.2 / 1500.4, you might realize this amplifier is a bit different than most. The A series amplifiers were originally developed from a Class A home audio amplifier that our founders built for their own personal use. They decided to connect it to the front stage of a car one day for fun back in 2012. The sound of that system blew them away and drove them to develop a mobile amplifier of the same exact circuitry. They replaced the 120V AC power supply with a 12V DC version and repackaged the amplifier into a mobile audio amplifier chassis. The A series was born. High end home audio for the car.

The A series amplifiers are based on a 3 stage Lin design. This amplifier topology is the foundation for some of the world's best home audio hifi amplifiers. They took the design, improved on it and made it suitable for car audio by physically separating the 3 stages for reduced noise; Input section, voltage amplifier, current amplifier. They also made the voltage amplification stage have two identical circuits, mirror images of one another and run them in pure Class A for the sonic characteristics generated by this topology. Then added high current capability (1 ohm drive for 1500.2 and 2 ohm drive for 1500.4) and a high efficiency DC/DC converter switching power supply.

The power supply uses MOSFETs, 12 of them rated for 75 Amps each. The output section uses high power bipolar junction transistors, 32 of them rated for 15 Amps each in an emitter-follower design connected directly to your speakers (direct coupled). This direct coupling is partially responsible for the hard hitting dynamics and lifelike realism these amplifiers deliver.

About the design (cont.)

The heat that MOSFETs and transistors create is sucked out of them by using ceramic aluminum oxide wafers between the devices and the solid aluminum billet heatsinks. We want the heat in the heatsinks, not the transistors and MOSFETs.

FUSE IT

These amplifiers DO NOT have internal fuses for the battery connection to the vehicle. **A 150 AMP FUSE IS REQUIRED FOR EACH HALF** of the amplifier. We recommend high quality ANL fuse type. **Please pay close attention to B+ and GND Connections, accidentally reversing these will cause irreversible damage to the amplifier** that will not be covered under warranty. Please take your time and take care to ensure correct battery connection polarity.

MOUNT IT

This is a very heavy amplifier. When it is mounted in a car that is going 50 MPH and crashes the amplifier might continue traveling at 50 MPH and cause destruction and/or bodily injury if proper mounting techniques are not used. Use #6, #8, or M4 machine screws in six places to mount this amplifier to something very secure in the vehicle. The bottom plate is electrically grounded, so it is best to mount it to something not grounded to avoid ground loops.

Power Requirements

Operating Voltage Range 10V – 16V

A1500.2

Max current (sine wave, 14.4V B+)

4Ω X 2 resistive load, to clipping 40A X 2

2Ω X 2 resistive load, to clipping 85A X 2

1Ω X 2 resistive load, to clipping 145A X 2

A1500.4

Max current (sine wave, 14.4V B+)

4Ω X 4 resistive load, to clipping 86A X 2

2Ω X 4 resistive load, to clipping 147A X 2

Balanced or Unbalanced?

The A1500.2 / A1500.4 amplifiers have RCA inputs for unbalanced or balanced (differential) analog audio. Almost all audio source units / DSPs use unbalanced audio output connections. As such the A1500.2 / A1500.4 are shipped configured for unbalanced input operation. If this amplifier is to be used with a balanced output device, the top cover can be removed and the unbalanced / balanced switches located on the Class A voltage amplifier cards should be switched to “balanced”. Do not switch these to balanced if an unbalanced source is being used.

How do I know what kind of source I have?

Most likely you have an unbalanced source, in which case no adjustment to the amplifier switches need to be made. The easiest way to know is to use a digital volt/ohm meter. With the RCA cables connected to the source but NOT to the amplifier, measure Ohms from the RCA outer shell to battery ground.

Unbalanced = 0 to 1000 ohms

Balanced = Over 1000 ohms

The LED meters

The LED meters on this amplifier are kind of special so we thought they required their own section in the manual.

Some history - VU meters and commonly called (albeit incorrectly) "Power Meters" on audio amplifiers have been around since the beginning of hi-fi audio. They add a visual element to the music and they offer a rough idea of how hard an amplifier is being pushed, or more exactly how close the output signal is to being as big (loud) as it can be without clipping. These meters are just AC voltmeters that are calibrated in such a way so that when the amplifier output voltage is as high as it can be the meter is at its maximum position.

The problems with traditional meters – First, since they are just voltmeters they know nothing about what the impedance of the speakers being driven is, making them not "power meters" at all. As such, most home audio power meters are calibrated in Watts @ 8Ω , sometimes they have additional markings for other impedances.

The LED meters (cont.)

This way the user has a rough idea of how much power the amplifier is putting out IF the impedance was 8Ω or 4Ω . Since the amplifier is meant to drive various load impedances, and the impedance of the speaker changes depending on the frequency being reproduced, the meters are never actually calibrated "power meters."

Secondly, most audio amplifiers (including this one) use unregulated power supplies. Unregulated power supplies do not output a fixed voltage. Instead, the output voltage of the power supply will vary based on the input voltage to it. The output voltage of the power supply will also vary based on amplifier load impedance. These types of supplies are commonly used because they are more efficient than a regulated power supply, and arguably produce a more dynamic sound by offering more headroom than a regulated design. This can be problematic for typical output meters. Example, an amplifier with a unregulated power supply might clip at 42V RMS output when connected to a 8 ohm load, but 35V RMS when connected to a 4 ohm load. So a typical output meter might indicate clipping when it is not, or vice-versa (worse!)

The solution - In order to avoid the issues outlined above, we have designed our meters with a dynamic maximum. That is, instead of the maximum end of the meter scale being set by a fixed voltage, our meter's full scale position is relative to the power supply's high voltage rails. In this way they will much better indicate that the signal is close to clipping no matter the load on the amplifier or the input voltage to the amplifier. An industry first as far as we know ☺.

The LED meters (cont.)

Our meters are calibrated in 3dB steps with the final RED segment indicating the output is near or at clipping. As such in normal use it is okay for the meters to flash red on occasion but if they are solid RED for any length of time the output is probably clipping and the output level should be reduced to avoid speaker damage.

The LED Meters and fault conditions

Since our meters require some brains to run them (we are using an Atmel ATMEGA microprocessor) we decided to make them do some other useful things as well. Meter special functions listed below.

Blue, 1st segment illuminated = Power On, condition normal.

Blue, 1st segment blinking on and off = Low B+ Protection. This indicates that the battery voltage level dropped below 9.5 Volts DC during use. The amplifier will mute and flash the first segment of the meter for approximately 10-15 seconds after which the amplifier will unmute and continue provided the B+ is above 9.5V

Amber, 10th segment blinking on and off = Thermal protection. This indicates that the temperature of one or more of the heatsinks has exceeded 85C (185F). This is still within safe operating parameters for the amplifier but since the heatsinks are exposed we chose to shut the amplifier down if this temperature is exceeded. Once the temperature is below 78C (172F) normal operation will resume.

The LED Meters and fault conditions (cont.)

Red, 11th segment blinking on and off = overcurrent protection. This indicates that too much current is flowing through the output devices. This can happen because either the impedance of the load is too low, or the speaker or speaker wire has a short circuit or is damaged in some way. The amplifier will automatically reset and try to play music once again after 20 seconds or so. If it happens again, please shut the system down and investigate the problem to avoid damage to the amplifier or vehicle. Minimum load impedance for the A1500.2 is 1Ω stereo or 2Ω bridged. Minimum load impedance for the A1500.4 is 2Ω stereo or 4Ω bridged.

Red, 11th segment on solid = overvoltage protection. This indicates that B+ exceeded 16.2V, the amplifier will mute and reset after 20 seconds or so. Please check the vehicle's charging system and ensure the B+ stays below 16V.

How to remove the cover

The cover can be removed for various reasons. One reason may be to convert the amplifier from unbalanced inputs to balanced (differential) inputs. DO NOT OPERATE AMPLIFIER WITH COVER REMOVED AS HIGH VOLTAGE EXISTS ON VARIOUS COMPONENTS WHICH WILL BITE YOU IF YOU TOUCH THE WRONG 2 THINGS AT THE SAME TIME

1. Start by removing all wires connected to amplifier
2. Screw all set screws on speaker connectors and battery connectors all the way into connector
3. Remove the nuts on the RCA jacks, and the stepped washers
4. Remove the 2 screws from the sides of battery connectors and one screw from above each speaker connector
5. Remove 5 screws from front panel to top cover
6. Remove front panel, place aside
7. Remove 4 screws from perimeter of top cover, one on each side and two on the back
8. Lift top cover straight up **carefully as the fans are still connected to it and the circuit boards**
9. Stand the lid behind the amplifier on the edge the fans are on or disconnect fans from PCB to completely remove cover
10. Reverse procedure to reinstall, RCAs should have one washer behind front panel and one in front of front panel.

Specifications

	A1500.2	A1500.4
CTA 2006-C Power Ratings		
4Ω	350 x 2	325 x 4
2Ω	650 x 2	500 x 4
1Ω	1000 x 2	-----
4Ω Bridged	1350 x 1	1000 x 2
2Ω Bridged	2000 x 1	-----
D'Amore Engineering Ratings		
Power, 12.6V <0.05%THD		
4Ω	275 x 2	250 x 4
2Ω	500 x 2	500 x 4
1Ω	800 x 2	-----
4Ω Bridged	1000 x 1	750 x 2
2Ω Bridged	1600 x 1	-----
Music Power Ratings 14.4V		
IHF-202 Dynamic Standard		
4Ω	470 x 2	400 x 4
2Ω	900 x 2	750 x 4
1Ω	1500 x 2	-----
4Ω Bridged	1800 x 1	1500 x 2
2Ω Bridged	3000 x 1	-----
Frequency Response		
10 – 40,000 Hz	+/- 0.4dB	+/- 0.4dB
5 – 80,000 Hz	+/- 1dB	+/- 1dB
S/N Ratio A-wgt re: full power	>109dB	>107dB
Damping Factor 20Hz	>800	>700
THD ½ power 4Ω	0.025%	0.027%
Channel separation	>100dB	>80dB
Idle Current at 20C	3 - 4A x 2	3 - 5A x 2
Efficiency at CTA power 4Ω	> 67%	> 65%
Efficiency at hard clipping 4Ω	> 75%	> 73%
Input Impedance	10kΩ	10kΩ
Slew Rate	> 30 V/μS	> 30 V/μS

Specifications (cont.)

Dimensions, inches	23.25 x 11.0 x 2.25
Dimensions, mm	590 x 280 x 57
Weight, Lbs. / kg	27.7 / 12.6

TEST RESULTS DURING PRODUCTION

THIS AMPLIFIER SERIAL # _____
AD-1 Amplifier Dyno Test Results @14.4V

	CH1	CH2	CH3	CH4
Certified Power 4Ω				
Certified Power 2Ω				
Certified Power 1Ω				
Certified Power 4Ω Bridged				
Certified Power 2Ω Bridged				
Dynamic Power 4Ω				
Dynamic Power 2Ω				
Dynamic Power 1Ω				
Dynamic Power 4Ω Bridged				
Dynamic Power 2Ω Bridged				

TESTED BY _____
DATE _____

Limited Warranty

D'Amore Engineering warrants this product to be free of defects in materials and workmanship for a period of one year. This warranty is not transferrable and applies only to the original purchaser from an authorized D'Amore Engineering dealer. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction, D'Amore Engineering will (at its discretion) repair or replace the defective product with new or remanufactured product at no charge.

Damage caused by the following is not covered under warranty: accident, misuse, abuse, product modification or neglect, unauthorized repair attempts, misrepresentations by the seller. This warranty does not cover incidental or consequential damages. Cosmetic damage due to accident or normal wear and tear is not covered under warranty. **Warranty is void if the product's serial number has been removed or defaced.**

Any applicable implied warranties are limited in duration to the period of one year beginning with the date of the original purchase. No warranties 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, and you may also have other rights which vary from state to state.

If you need service:

All warranty returns should be sent to D'Amore Engineering accompanied by proof of purchase (a copy of the original sales receipt). Warranty expiration on products returned without proof of purchase will be determined from the manufacturing date code. Non-defective items received will be returned COD. Customer is responsible for shipping charges and insurance in sending the product to D'Amore Engineering. Shipping damage on returns is not covered under warranty.

**To obtain service worldwide please e-mail D'Amore
Engineering at
Info@DAmoreEngineering.com**

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