



# **AX series**

## **Owners Manual and Installation Guide**

Thank you for choosing U.S.Amps! You have purchased the finest product of its type available. Each product is tested and built in our California factory. You won't just listen to your U.S.Amp; you'll experience it. When properly installed, this unit will provide years of trouble-free service.

This manual is written for the experienced installer. ***Please read it ALL before installation!*** You may need to make changes in your installation to properly connect and operate this fine product.

If you are unfamiliar with the terminology and concepts within, we strongly recommend you seek the assistance of an Authorized U.S.Amps Dealer or other car audio professional.

Authorized Dealers can be located on the U.S.Amps' web site: [www.usamps.com](http://www.usamps.com). We can be reached by e-mail at [sales@usamps.com](mailto:sales@usamps.com), but please be patient with us and give us a few days to respond. Remember, ***protect your hearing*** and enjoy your U.S.Amps!

## Table of Contents

Thanks, Caution, and Contacts	1	AX-600DE/3200DE	8
Table of Contents	1	<b>Wiring Instructions</b>	
Did You Buy the Right U.S.Amp?	2	AX-TU600C/1000/2000	9
<b>Installation</b>		AX-TU4360C	10
WARNING	2	AX-5600	11
Amplifier Mounting	2	AX-600DE	12
Ventilation	2	AX-3200DE	13
Amplifier and Crossover Input	2	Power & Fuse Chart	14
Signal Level Input	2	Specifications	15
Gain Control Adjustment	2	Why Tubes?	16
Batteries	3	VTCSD	16
Getting Wired	3	Benefits of Class "DE"	17
<b>Amplifier Controls &amp; Features</b>		Note	18
AX-TU600C	4	Never, Never, Never!	<b>BACK</b>
AX-1000/2000	5	Warranty	<b>BACK</b>
AX-TU4360C	6		
AX-5600	7		

## ***Did You Buy the Right U.S.Amp?***

There is a U.S.Amp for every purpose! From raw power to exquisite sound quality and everything in between, U.S.Amps offers state-of-the-art technology to meet your every need.

## ***INSTALLATION***

***Amplifier Mounting:*** Choose an appropriate location to mount the amplifier(s). Make sure your choice is free from excess heat, moisture, and vibration. Under the vehicle seat or in the trunk are common mounting locations. Be sure the amplifier receives adequate ventilation to its heat sink and is positioned away from flying luggage and people's feet. Do not mount to the speaker enclosures.

***Ventilation:*** It is important to provide the amplifier with adequate ventilation to remove heat from the amplifier heat sink. During high performance applications, in which the amplifier may be exposed to extremely low impedance loads, it may be necessary to provide external ventilation via a fan or some other means. With proper ventilation, the "run time" of the amplifier between thermal protection cycles can be greatly extended.

### **IMPORTANT NOTICE**

The Input of a U.S.Amp **MUST** be GROUNDED for proper amplifier operation.

The use of external ground isolation dividing devices is **UNNECESSARY** and may cause severe amplifier and/or system damage.

***Amplifier Input:*** U.S.Amps feature a unique isolated input section that will accept signal voltages from 1 to 9 volts. The input section also provides amplifier ground isolation for the prevention of system and engine noise. The unique configuration of the U.S.Amps input necessitates a correct input ground, and is not compatible with external ground isolation devices.

***Signal Level (BTL) Input:*** This product will accept line and signal level, and can be used with most BTL "high powered" sources. To use a BTL source, observe the following:

- 1) BTL outputs have two "hot" non-grounded leads per channel. Select ONE per channel, and connect it to the "center conductor" of the RCA input cables going to the amplifier input.
- 2) Insulate and disregard the second wire of each BTL output pair.
- 3) Ground the shield wires of the RCA cable to the metal body of the source unit.

***Gain Control Adjustment:*** Always start with the gain control fully counter-clockwise (all the way down), or just slightly open. Adjust the source unit volume as high as possible without distortion. Increase the amplifier gain until the amplifier distorts, then turn the gain down slightly until the signal becomes clear. It is desirable to operate the amp at the lowest possible gain setting to help reject spurious system noise.

## CARE AND FEEDING OF YOUR BATTERIES

As mentioned before, most batteries are built for the relatively light chore of starting the engine. Unless you have the room and ambition to install an upgraded high-powered alternator, your system current requirements may exceed the charging capability of your car's electrical system. When this happens, you have to rely on the vehicle battery(s) to make up the difference. Another factor to consider is voltage. Although the electrical system is considered to be "12 volt", the battery, when healthy, actually "rests" at 12.6 volts. The average alternator "puts out" 14.4 volts when the engine is on, because it is necessary to "feed" a battery higher voltage in order for it to charge.

## GETTING WIRED:

Once you have established the current needs of your system, it will be of the **UTMOST IMPORTANCE** to properly fuse the amplifier. Remember, power connections are always the last thing. There cannot be enough emphasis placed on the importance of proper fusing. Fuses prevent catastrophes. **Always fuse each U.S.Amp product at or less than the recommended amperage.** Another major consideration is wire. If you wish to build a truly high-powered system, you must take into account the **total amperage requirements** of the system and select your wire gauge accordingly. The following chart can be used as a guide:

### WIRE GAUGE and AMPERAGE Guide:

<b>AWG 14</b>	30 Amps	<b>AWG 6</b>	80 Amps	<b>AWG 0</b>	190 Amps
<b>AWG 13</b>	35 Amps	<b>AWG 4</b>	105 Amps	<b>AWG 00</b>	215 Amps
<b>AWG 10</b>	45 Amps	<b>AWG 2</b>	135 Amps	<b>AWG 000</b>	245 Amps
<b>AWG 8</b>	60 Amps	<b>AWG 1</b>	160 Amps	<b>AWG 0000</b>	275 Amps

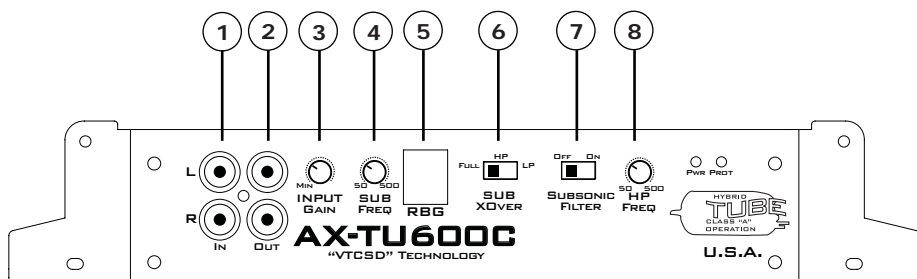
These are real numbers, right out of the 1951 **U.S. Federal Electronics Code Book**.

It takes real wire to do real work.

For each 100 watts, when playing music, count on 10 amps average of average current draw.



## **AX-TU600C** **2-Channel Amplifiers** **Controls and Features**



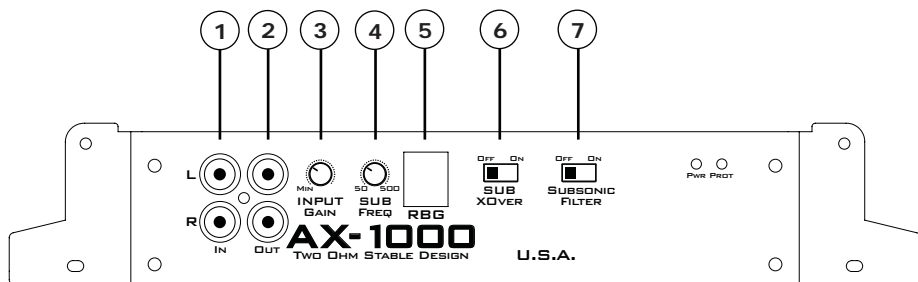
- 1 **Amplifier Input** The amplifier **MUST** receive input on **BOTH** RCA jacks for proper operation.
- 2 **Amplifier Output** The low level output can be connected to other amplifiers.
- 3 **Input Gain** is variable from 1 to 9 volts for full output. Best results are achieved by adjusting the control to the lowest setting in relation to the output of the source unit.
- 4 **Low-pass Crossover Control**  
For the internal amplifier, adjustable from 50 Hz to 500 Hz @ 24dB.
- 5 **Remote Bass Gain** A phone jack that accepts the included RBG control harness to allow the amplifier volume to be controlled from the passenger compartment.
- 6 **Low-pass Crossover 3-way Switch**  
A 3-way switch which selects the full-range/high-pass/low-pass crossover feature.
- 7 **Subsonic Filter** To optimize amplifier power in the audible frequencies, a defeatable 36 Hz subsonic filter provides a 6 dB per octave roll-off.
- 8 **High-pass Crossover Control**  
For the internal amplifier, adjustable from 50 Hz to 500 Hz @ 12dB.

**WARNING:** All U.S.Amps require a grounded input connection.

DO NOT use ground-loop isolation devices or high/low conversion devices on the input of your U.S.Amp!



**AX-1000/2000**  
**2-Channel Amplifiers**  
**Controls and Features**



(Shown here is AX-1000, but the diagram is also applicable to AX-2000.)

- 1 **Amplifier Input** The amplifier MUST receive input on BOTH RCA jacks for proper operation.
- 2 **Amplifier Output** The low level output can be connected to other amplifiers.
- 3 **Input Gain** is variable from 1 to 9 volts for full output. Best results are achieved by adjusting the control to the lowest setting in relation to the output of the source unit.
- 4 **Low-pass Crossover Control**  
For the internal amplifier, adjustable from 50 Hz to 500 Hz @ 24dB.
- 5 **Remote Bass Gain** A phone jack that accepts the included RBG control harness to allow the amplifier volume to be controlled from the passenger compartment.
- 6 **Low-pass Crossover On/Off Switch**  
A 2-way switch which enables/disables the low-pass crossover feature.
- 7 **Subsonic Filter** To optimize amplifier power in the audible frequencies, a defeatable 36 Hz subsonic filter provides a 6 dB per octave roll-off.

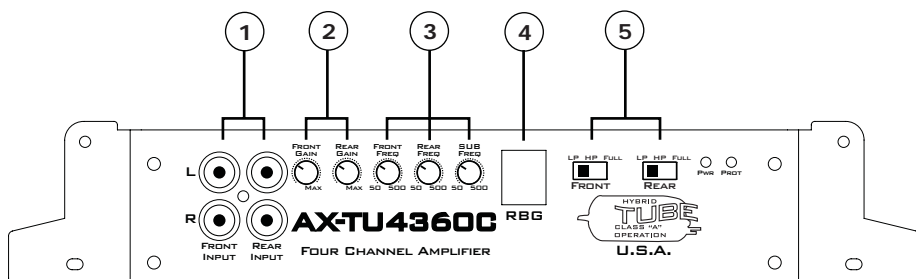
**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!



## **AX-TU4360C** **4-Channel Amplifiers** **Controls and Features**

The AX-4360C features a selectable two-way electronic crossover with independent front and rear mid-high frequency adjustment and 2 ohm per channel stability. Power is provided by four 75 watt channels that can be bridged as front and rear pairs into a 4 ohm load for a total of 180 watts per bridged pair.

**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!



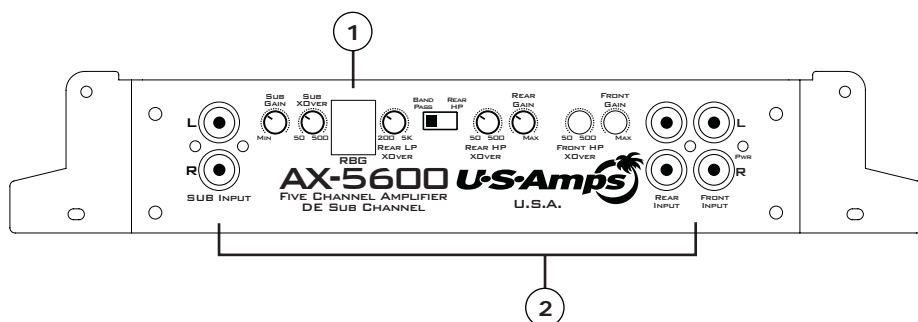
- ① **Amplifier Input** The amplifier **MUST** receive input on **BOTH** RCA jacks for proper operation.
- ② **Input Gain** is variable from 1 to 9 volts for full output. Best results are achieved by adjusting the control to the lowest setting in relation to the output of the source unit.
- ③ **Low-pass Crossover Control**  
For the internal amplifier, adjustable from 50 Hz to 500 Hz @ 24dB.
- ④ **Remote Bass Gain** A phone jack that accepts the included RBG control harness to allow the amplifier volume to be controlled from the passenger compartment.
- ⑤ **Low-pass Crossover 3-way Switch**  
A 3-way switch which selects the full-range/high-pass/low-pass crossover feature.



## AX-5600 5-Channel Amplifier Controls and Features

The 5-channel AX-5600 features a selectable 3-way electronic crossover with independent front and rear mid-high frequency adjustment, dual power supplies, 2 ohm per channel stability, and a Remote Bass Gain.

**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!



- 1 Remote Bass Gain** The AX-5600 comes with an optional "Remote Bass Gain" or "RBG" that can be mounted in the passenger compartment to independently attenuate the low pass output. The "BASS GAIN" located on the terminal endplate of the unit is used both to set the level at the low pass output and control the range of the RBG.
- 2 3-WAY Input** allows the AX-5600 to accept input from modern 3-way head-units allowing front to-rear fading of the mid-highs and Independent frequency and volume adjustment from the passenger compartment.

**Protection** AX-5600 is protected against thermal, over and under voltage and short circuit. The separate power supplies of AX-5600 are individually protected against over-current.

### 2 Ohm Stability

All 5 channels of the AX-5600 are stable to 2 ohms. The power of the mid-high channels increase 17% from 4 to 2 ohms while the subwoofer channel increases a whopping 43%!

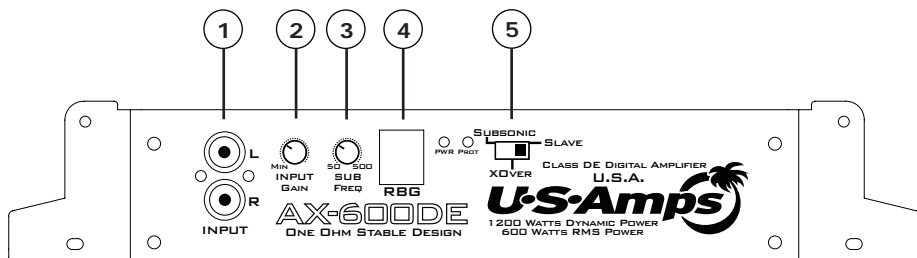
**Amp Power @ 4 Ohms** **800**  
75 W X 4 + 500 W X 1 @ 1Ω **Total Watts**

**Amp Power @ 2 Ohms** **860**  
90 W X 4 + 500 W X 1 @ 1Ω **Total Watts**





**AX-600DE/3200DE**  
**Class "DE" Amplifiers**  
**Controls and Features**



(Shown here is AX-600DE, but the diagram is also applicable to AX-3200DE.)

- ① **Amplifier Input** The amplifier **MUST** receive input on **BOTH** RCA jacks for proper operation.
- ② **Input Gain** is variable from 150 mV to 3 volts for full output. Best results are achieved by adjusting the control to the lowest setting in relation to the output of the source unit.
- ③ **Low-pass Crossover Control**  
 For the internal amplifier, adjustable from 50 Hz to 500 Hz @ 24dB.
- ④ **Remote Bass Gain** A two-position removable plug that accepts the included RBG control harness to allow the amplifier volume to be controlled from the passenger compartment.
- ⑤ **The Magic Switch** The far left "Subsonic Filter" position makes more efficient use of amplifier power by discarding frequencies below 36Hz.  
 The center "XOver" defeats the Subsonic Filter for amplifier operation down to 5 Hz.  
 The far right "Slave" position defeats all amplifier controls to receive information through the Remote Bass Gain wires from another "master" amplifier.  
 This can be repeated as often as necessary with all slave units receiving Identical gain, frequency, and subsonic functions from the master amplifier.  
 A single Remote Bass Gain can be connected at any point to universally control the volume of the entire amplifier bank.

**WARNING:** All U.S.Amps require a grounded input connection.

DO NOT use ground-loop isolation devices or high/low conversion devices on the input of your U.S.Amp!

# Wiring Instructions for AX-TU600C/1000/2000

## Power Output

### AX-TU600C

165W X 2 @ 4Ω

300W X 2 @ 2Ω

### AX-1000

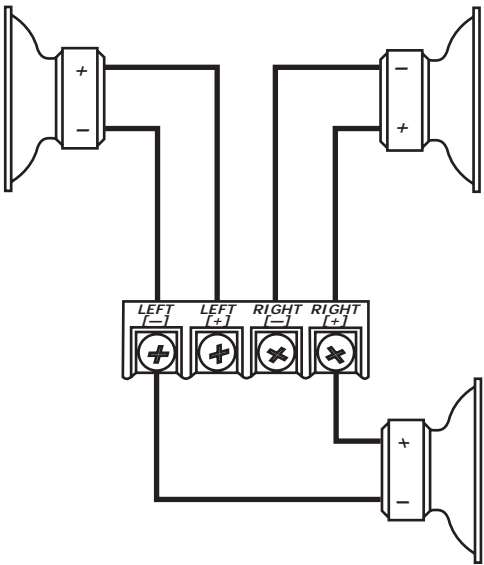
300W X 2 @ 4Ω

500W X 2 @ 2Ω

### AX-2000

600W X 2 @ 4Ω

1000W X 2 @ 2Ω



## Bridged Output

### AX-TU600C

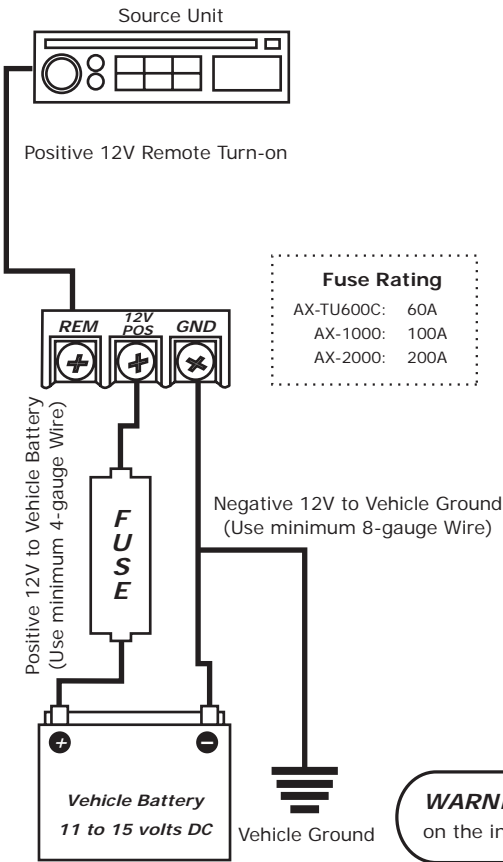
600W X 1 @ 4Ω

### AX-1000

1000W X 1 @ 4Ω

### AX-2000

2000W X 1 @ 4Ω



## Fuse Rating

AX-TU600C: 60A

AX-1000: 100A

AX-2000: 200A

**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!

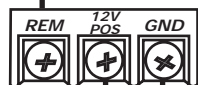
# Wiring Instructions for AX-TU4360C

Source Unit



Positive 12V Remote Turn-on

**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!

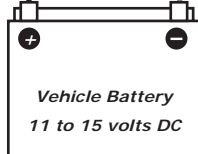


Positive 12V to Vehicle Battery  
(Use minimum 8-gauge Wire)

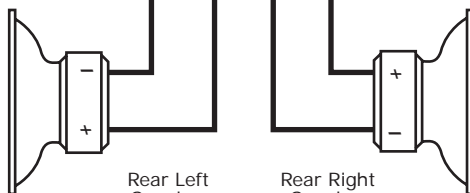
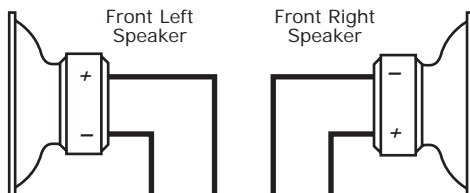
Negative 12V to Vehicle Ground  
(Use minimum 8-gauge Wire)



60A



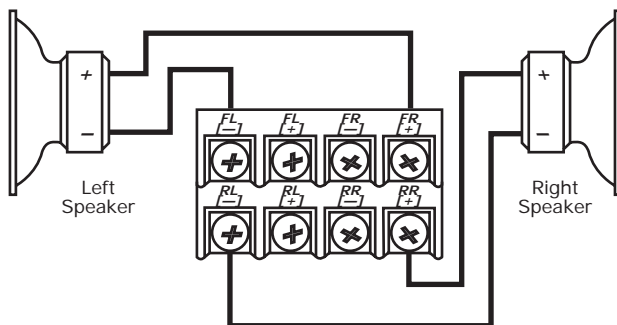
Vehicle Ground



[4 channel Operation]

**Power Output**

75W X 4 @ 4Ω  
90W X 4 @ 2Ω



[2 channel Operation]

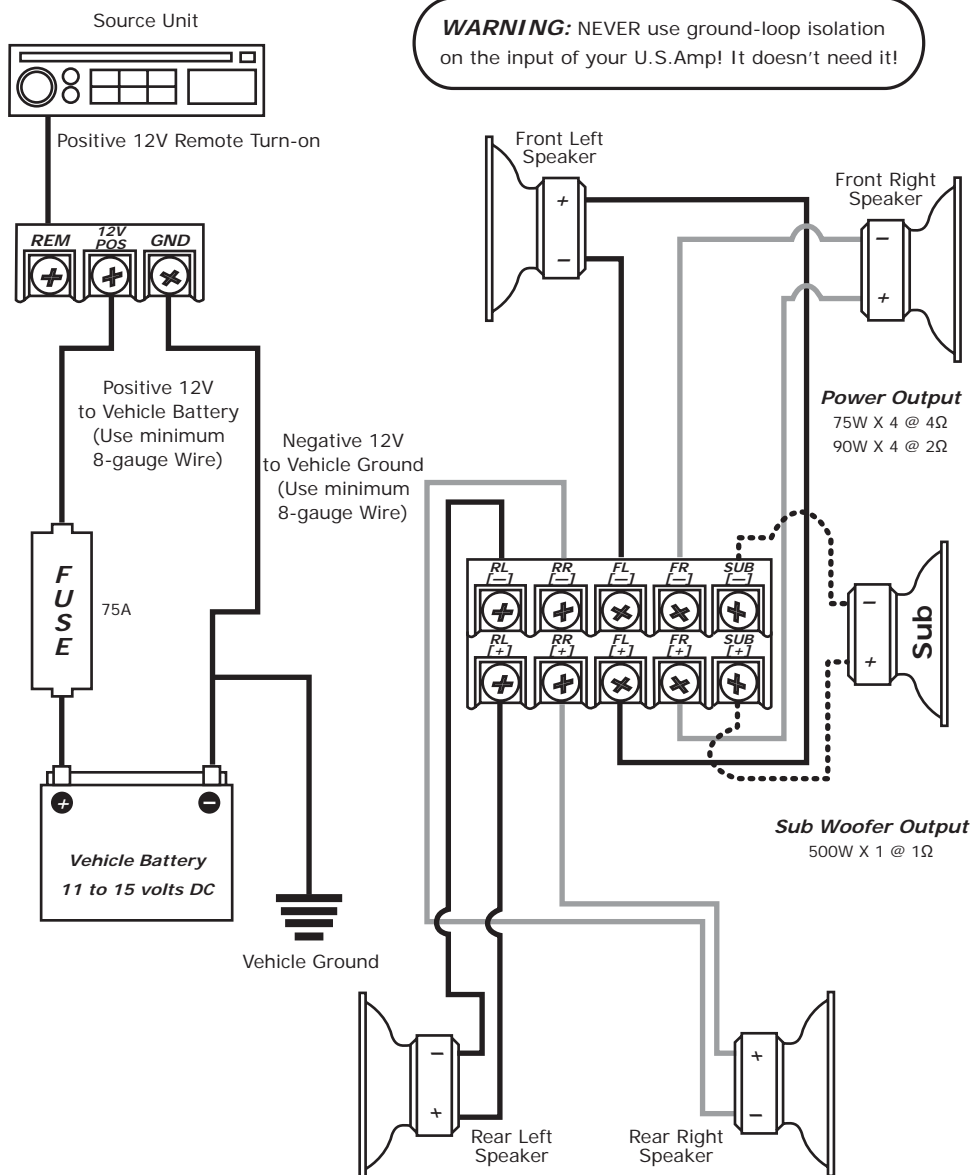
**Bridged Output**

180W X 2 @ 4Ω

**DO NOT OPERATE AX-4360C BRIDGED MONO  
AT LESS THAN 4Ω PER BRIDGED CHANNEL**

# Wiring Instructions for AX-5600

**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!

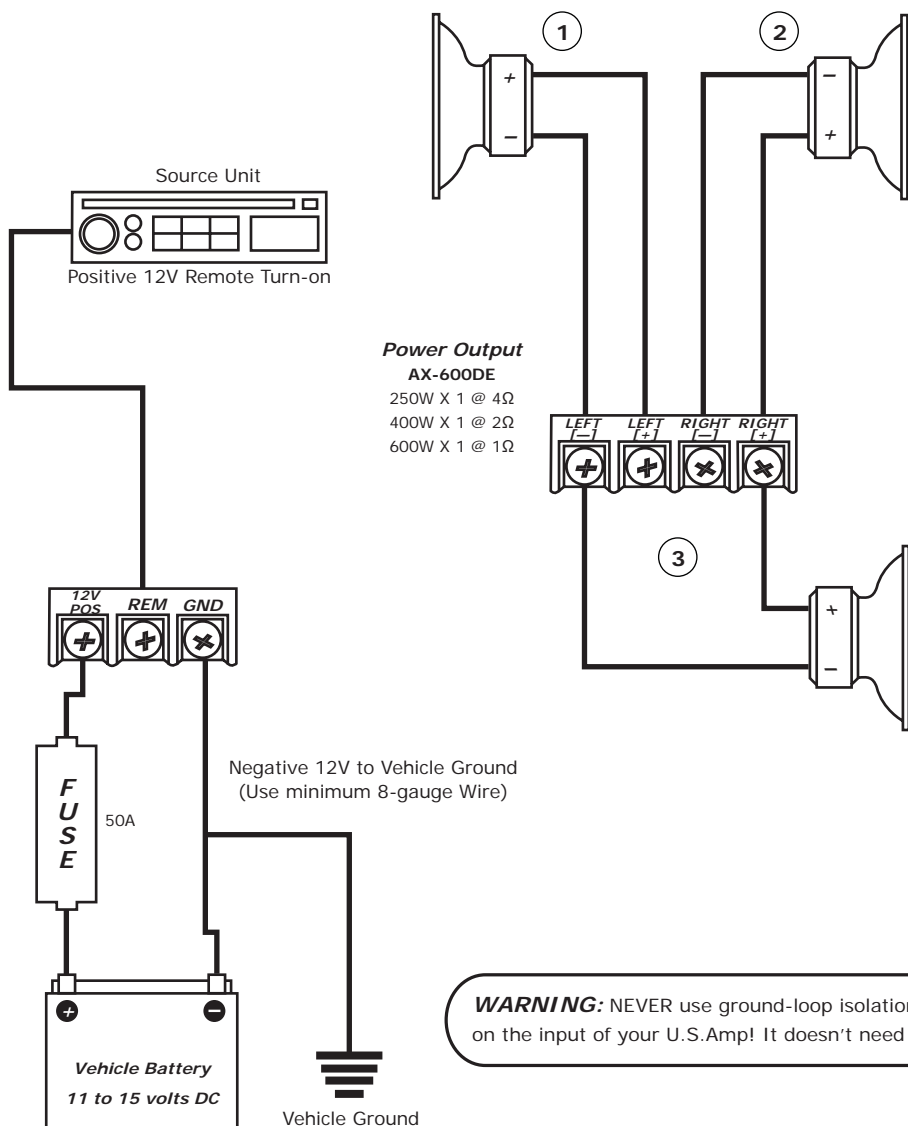


(Note: The front and rear channels of the AX-5600)

# Wiring Instructions for AX-600DE

## SPECIAL NOTE:

Class "DE" amplifiers are single-ended mono designs, and are not bridgeable. BE SURE the TOTAL LOAD of ALL connected speakers does not fall beneath 1Ω. Choose one of three possible connections shown below.

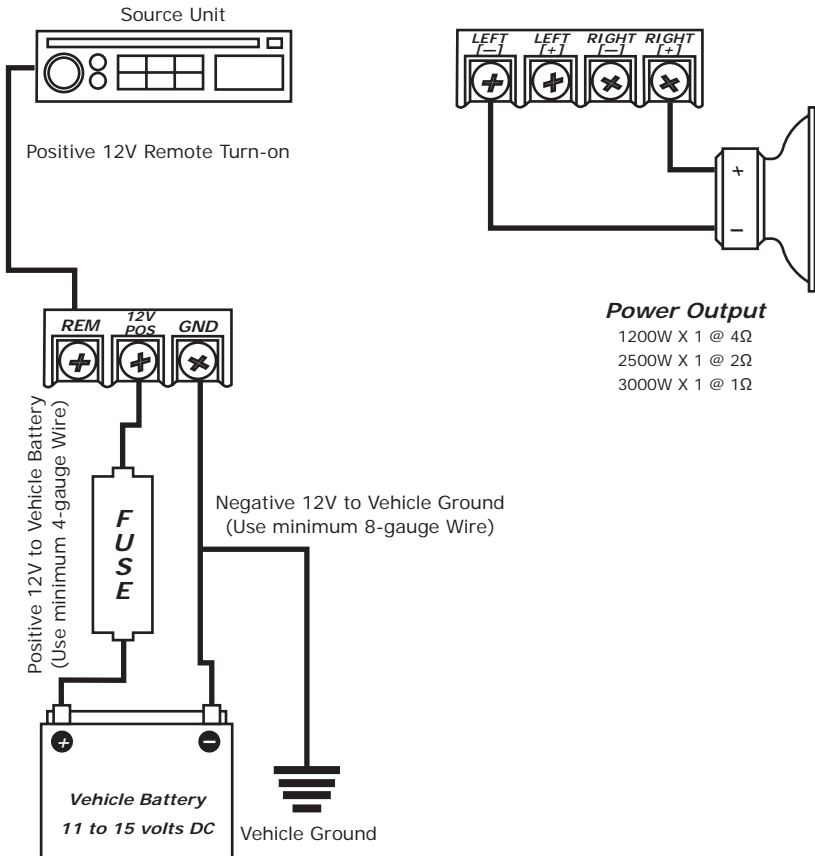


# Wiring Instructions for AX-3200DE

## SPECIAL NOTE:

Class "DE" amplifiers are single-ended mono designs, and are not bridgeable. BE SURE the TOTAL LOAD of ALL connected speakers does not fall beneath 1Ω.

**WARNING:** NEVER use ground-loop isolation on the input of your U.S.Amp! It doesn't need it!



## ***U.S.Amps Amplifier Power & Fuse***

<i><b>MODEL</b></i>	<i><b>Watts per Channel*</b></i>			
	<i><b>4 <math>\Omega</math></b></i>	<i><b>2 <math>\Omega</math></b></i>	<i><b>1 <math>\Omega</math></b></i>	<i><b>FUSE</b></i>
<i><b>AX-1000</b></i>	300W X 2	500W X 2	N/A	100A
<i><b>AX-2000</b></i>	600W X 2	1000W X 2	N/A	200A
<i><b>AX-5600</b></i>	75W X 4	90W X 4	500W X 1(Sub)	75A
<i><b>AX-600DE</b></i>	250W X 1	400W X 1	600W X 1	50A
<i><b>AX-3200DE</b></i>	1200W X 1	2000W X 1	3000W X 1	300A
<i><b>AX-TU600C</b></i>	165W X 2	300W X 2	N/A	60A
<i><b>AX-TU4360C</b></i>	75W X 4	90W X 4	N/A	60A
<i><b>AX-2000HC</b></i>	150W X 2	300W X 2	N/A	200A

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\*Specifications are subject to change without notice

## ***U.S.Amps Amplifier Specification***

<i><b>MODEL</b></i>	<i><b>Bridged Output</b></i>	<i><b>THD @ 4Ω</b></i>	<i><b>S/N Ratio</b></i>	<i><b>Damping Factor**</b></i>	<i><b>Slew Rate</b></i>
<i><b>AX-1000</b></i>	1000W X 1 @ 4Ω	<0.025%	>95 dB	>600	150 Vus
<i><b>AX-2000</b></i>	2000W X 1 @ 4Ω	<0.025%	>95 dB	>1000	150 Vus
<i><b>AX-5600</b></i>	N/A	<0.025%	>95 dB	>200	150 Vus
<i><b>AX-600DE</b></i>	Mono	<0.1%	>86 dB	>250	N/A
<i><b>AX-3200DE</b></i>	Mono	<0.1%	>86 dB	>250	N/A
<i><b>AX-TU600C</b></i>	600W X 1 @ 4Ω	<0.05%	>95 dB	>600	150 Vus
<i><b>AX-TU4360C</b></i>	180W X 2 @ 4Ω	<0.05%	>95 dB	>200	150 Vus
<i><b>AX-2000HC</b></i>	600W X 1 @ 4Ω 2000W X 1 @ 1Ω	<0.025%	>95 dB	>1000	150 Vus

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\*\*Measured at 4Ω/14.4V at the circuit board.



## Why Tubes?

You may know that a transistor is a modern, efficient, less expensive version of a vacuum tube, which is the device that made sound recording and reproduction possible in the first place. Now, the electronics industry has been trying for many years to equal the sound quality available from tubes. They have been able to make transistor amps louder, cooler, more abusable, and less expensive than tubes, but to this day, they've been unable to make any solid state amp sound as good as a tube amp.

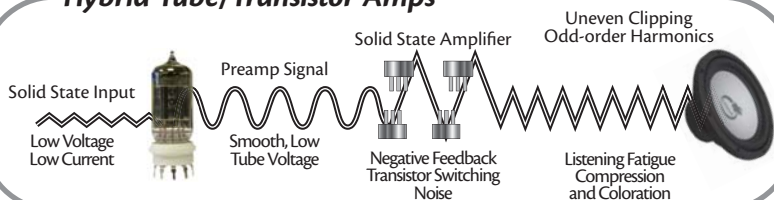
So, our engineer got to wondering, "What if I combined the sonic character of a vacuum tube with the drive capabilities of solid state?"

Well, the result is the U.S.Amps' **VTCS**D hybrid amps. Using the signal path directly out of the tubes as a "steering" signal and the following drive signal wave from the transistors as the "motor," with absolutely no negative feedback as a corrective to the transistor's waveform, we achieved the most detailed, pleasing, articulated sound available in mobile audio today.

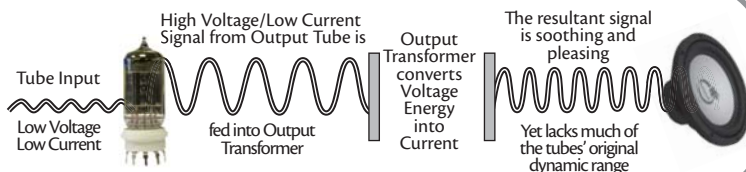


### Tube In, Tube Out **VTCS**D (Vacuum Tube Current Sync Drive)

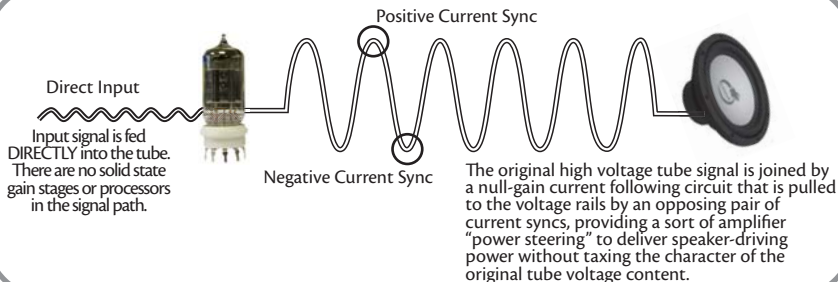
#### Hybrid Tube/Transistor Amps



#### Classic Vacuum Tube Amps w/Output Transformer



#### Vacuum Tube Current Sync Drive



## ***VTCSO (continued)***

VTCSO "follows" the high voltage tube signal STRAIGHT INTO THE SPEAKERS, adding only current in a form of "amplifier power steering" — free from voltage gain or negative amplifier feedback!

Vacuum tubes are renowned for their high dynamic range and smooth emphasis of even-order harmonics. The transformer-less VTCSO circuit brings out hidden qualities of the vacuum tubes, including excellent frequency response, smooth "clipping" and high signal-to-noise ratio.

VTCSO divides audio signal amplification in two separate areas, voltage and current. By starting with the vacuum tube as a source of high voltage (vacuum tubes operate at four times the voltage of transistors), VTCSO adds a second solid-state "amperage amplifier." The "amperage amplifier" is a null-gain circuit driven by "current syncs" that mirror the voltage signal and provide "torque" to the speakers in perfect synchronization with the voltage content, that neither distorts or colors the original tube sound!

The result are astonishing. All of the intensity, transience, and frequency response of the vacuum tube, which can operate at MUCH higher output voltage than audio transistors.

### ***Benefis of Class "DE"***



U.S.Amps continues to push the technological envelope with the introduction of two new digital models that combine the attributes of "D" lass amplifiers with the versatility and practical fidelity usualy experienced only with standard Class "AB" designs. Thsi bold leap forward in digital technology allows for 90% effieciency under extreme dircumstances that turn other digital amplifiers to toast. As cars become more and more energy efficient and provide less available battery power, Class "DE" represents the best power output-to-current consumption available on the market today!

- Combines class "D" attributes with the versatility and practical fidelity of class "AB" designs
- Allows for 90% efficiency under extreme circumstances that turn other digital amplifiers to toast
- Represents the best power output-to-current consumption

## NOTE

## ***NEVER, NEVER, NEVER!***

**NEVER USE A U.S.AMP WITH A GROUND LOOP ISOLATOR ON THE RCA'S OR AN ISOLATED INPUT SIGNAL.** U.S.Amps are input-isolated at the factory and require an input ground for proper operation.  
**NEVER INSTALL OR MOUNT YOUR AMPLIFIER DIRECTLY TO A SPEAKER ENCLOSURE OR ANYWHERE ELSE WHERE SEVERE VIBRATION IS PRESENT.** Protect your investment. Use Common sense. Make sure the spot you choose is well-ventilated and free from dirt and moisture.

**NEVER USE YOUR U.S.AMP BELOW THE RATED MINIMUM IMPEDANCE.** Remember, when you bridge your amplifier, each channel "sees" one half of the load, hence at 4 ohms bridged each channel is operating at 2 ohms. U.S.Amps makes the FAILURE TO OBSERVE THIS BASIC RULE WILL RESULT IN A SENSELESS WASTE OF POWER AND PERFORMANCE, and could damage your amplifier.

## ***Limited Warranty:***

U.S.Amps warrants all manufactured electronic products to be free from defects in material and workmanship for a period not to exceed TWO YEARS from the date of purchase.

**IMPORTANT WARRANTY NOTICE: U.S.Amps will only warrant and service products displaying valid U.S.Amps serial numbers. WARRANTY SERVICE WILL ONLY BE PERFORMED WHEN THE UNIT IS ACCOMPANIED BY A COPY OF THE ORIGINAL SALES RECEIPT FROM AN AUTHORIZED DEALER. All product returned to U.S.Amps for service MUST be accompanied by a Return Authorization Number, issued by U.S.Amps in advance of shipment. The Return Authorization Number must be clearly and conspicuously displayed on the shipping carton or U.S.Amps will refuse delivery.**

For Return Authorization Numbers, first call your U.S.Amps dealer you purchased the products from. The dealer will help you to obtain Return Authorization Numbers.

This warranty extends only to the original purchaser and is not transferable. Defective equipment must be returned within the warranty period, freight prepaid, to the U.S.Amps Factory or an Authorized U.S.Amps Warranty Station.

This warranty covers only defects in materials and workmanship of manufactured electronic products (amplifiers). Incidents of misuse, abuse, neglect, or unauthorized modification will not be covered within the terms of this warranty.

U.S.Amps reserves the right to refuse warranty service under such conditions.

**U.S.AMPS WILL NOT BE RESPONSIBLE FOR ANY DAMAGES, WHETHER INCIDENTAL OR CONSEQUENTIAL, RELATED TO THE USE OF THIS OR ANY OTHER PRODUCT BEARING OR SOLD UNDER THE U.S.AMPS BRAND NAME. USE THIS PRODUCT AT YOUR OWN RISK. IMPROPER USE OF THIS PRODUCT CAN RESULT IN PROPERTY DAMAGE, BODILY HARM, AND OR OTHER DAMAGE. U.S.AMPS ASSUMES NO RESPONSIBILITY FOR YOUR HEALTH OR SAFETY.**

