

# **AQUATIC AV®**

products with a watertight reputation

## **AD600.5 COMPACT 5/4/3 CHANNEL WATERPROOF AMPLIFIER**

### **USER / INSTALLATION MANUAL**



**SHOCKWAVE**  
TECHNOLOGY

PLEASE READ THIS INSTRUCTION MANUAL BEFORE  
INSTALLATION AND OPERATION

<b>1 Getting Started</b> .....	3
1.1 Contents.....	3
1.2 Key Features.....	3
<b>2 Installation</b> .....	4
2.1 Installation Precautions.....	4
2.2 Mounting Precautions.....	4
2.3 Wiring Precautions.....	5
<b>3 Connections and Controls</b> .....	6
3.1 Power & Speaker Connections.....	6
3.2 Input Connections & Controls.....	6
<b>4 Input Wiring</b> .....	7
4.1 Low-Level (RCA) Input Wiring.....	7
4.2 High-Level (Speaker) Input Wiring.....	8
<b>5 Output Wiring</b> .....	9
5.1 5 Channel Mode.....	9
5.2 Bridged 5 Channel Mode.....	9
5.3 4 Channel Mode.....	10
5.4 Bridged 4 Channel Mode.....	10
5.5 3 Channel Mode.....	11
5.6 Bridged Mode.....	11
<b>6 Amplifier Operation</b> .....	12
6.1 Setting Operating Level.....	12
6.2 Setting Bass Boost.....	12
6.3 Setting Crossovers.....	12
6.4 Final System Checks.....	13
<b>7 Troubleshooting</b> .....	14
<b>8 Specifications &amp; Dimensions</b> .....	15
8.1 Specifications.....	15
8.2 Dimensions.....	15
<b>9 Warranty Information</b> .....	16

### 1.1 Contents

When first unpacking your new amplifier please check first that the package contains all of the items below. If something is missing, contact the store where you purchased the product.

- Waterproof Amplifier
- Four (4) Stainless Steel Self Tapping Mounting Screws
- User/Installation Manual

### 1.2 Key Features

- Class-D Digital Amplifier
- 600 Watts of Maximum Power Output
- 50 Watts x4 + 200 Watts x1 Continuous @ 4-Ohms
- 75 Watts x4 + 300 Watts x1 Continuous @ 2-Ohms
- 150 Watts × 2 Continuous @ 4-Ohms Bridged
- 2-Ohm Stable
- Low Level RCA Inputs
- High Level Speaker Inputs
- Bass Boost Adjustment (0 to +18dB)
- Low Distortion MOS-FET Power Supply
- 12dB/Oct. Low/High Pass Electronic Crossover
- Signal-to-Noise Ratio:  $\geq 70$ dB
- Variable Gain Controls
- Turn-On/Off Muting Circuitry (Soft Mute)
- Ground Loop Isolation Input Circuit
- Power and Protection LED
- Corrosion Resistant Nickel Plated Connections
- 4 Layer Conformal Coated PCB Assembly
- Waterproof IP65
- Hardwired Input / Output and Speaker Cables
- Low Profile, Compact Footprint

### 2.1 Installation Precautions

If you do not have the necessary skills do not install the amplifier yourself. See your local authorized Aquatic AV dealer for installation recommendations.

This amplifier is for applications with a negative ground, 12V power supply.

### 2.2 Mounting Precautions

Choose a mounting location in that provides adequate ventilation around the amplifier. If possible, mount the amplifier so ventilation air runs along the length of the fins rather than across them.

 *Mounting the amplifier in a tight space without any air movement will damage the unit's internal circuitry over time.*

Mount the amplifier on a rigid surface away from subwoofer enclosures or any area that is prone to vibration. Do not install amplifier on plastic or on any other combustible material.

Check clearances on all sides of the planned installation before drilling any holes or installing any screws.

Take special care when you work near the gas tank, fuel lines, hydraulic lines and electrical wiring.

Never operate the amplifier when it is unmounted. Attach all audio system components securely within the amplifier to prevent damage, especially in an accident.

Do not mount this amplifier so that wire connections are unprotected, in a pinched condition, in contact with any metal surfaces in your vessel, or likely to be damaged by nearby objects.

Before making or breaking power connections in your system, disconnect the marine vessel battery. confirm that your head unit or other equipment is turned off while connecting the input jacks and speaker terminals.

Mount the amplifier so that the panel controls are easily accessible after installation.

If you need to replace the power fuse, replace it only with a fuse identical to that supplied with the amplifier. Using a fuse of a different type or rating may result in damage to your audio system or your amplifier which is not covered by the manufacturer's warranty.

### 2.3 Wiring Precautions

Read all wiring precautions before starting any installation. If you are not sure of the connections, please contact your local authorized Aquatic AV dealer.

Before you start, make sure the source unit's power is switched off.

Disconnect the negative battery terminal before doing any electrical work. Always disconnect the negative (-) battery post first, followed by the positive (+), and when it's time to go back together, connect the positive (+) post first, followed by the negative (-). This can minimize the chance of sparks and voltage spikes, and is a good general practice when dealing with any DC electrical system.

Bad grounds under are the number one cause of problem installs.

Always use the shortest length of ground wire possible between chassis ground and the amplifier. Never use a ground wire longer than the one we provide.

A good chassis ground connection is critical to minimize resistance and avoid noise problems. Clean off any paint prior to making connections. Securely connect the ground wire to the chassis and the source unit ground.

The ground wire and power wire are equally important; if either one of them is compromised, the amplifier's performance will degrade or cease to function.

Always route wires and cables safely, avoiding sharp edges and burrs along the way. Use wire loom when possible. Check for proper length to both termination points, knowing where each component mounts, before you cut anything.

When routing RCA cables, always keep these cables away from the power cables and output speaker wiring.

Using cables that are too long can cause signal loss and act as an antenna for noise. Use only high quality RCA cables that are no longer than necessary to make connections between the source unit and amplifier.

Make sure each connection is clean and secure and insulate final connections with electrical tape or shrink tubing.

 *Improper connections may damage equipment.*

Always install a master fuse within 12" of the battery for any additional equipment added to your installations electrical system. The mini-fuse installed on the main amplifier only protects the internal circuitry, not the wiring. In the event of a short, failure to install a fuse near the battery can cause damage to your electrical system or the possibility of fire.

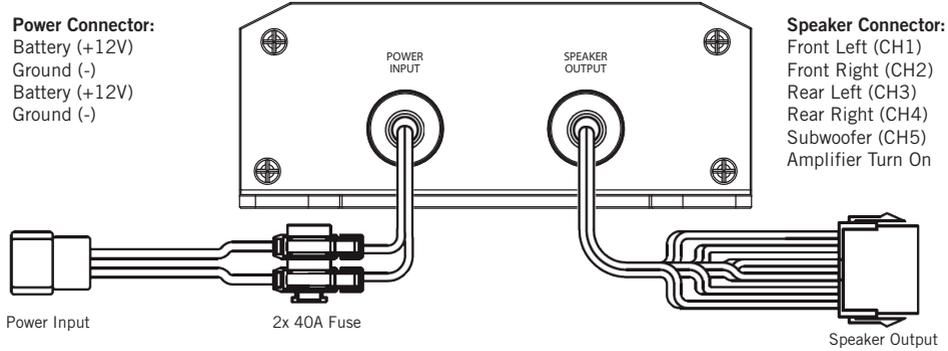
The way speaker wires are marked for polarity (+/-) varies from brand to brand. Some manufacturers use the stripe as positive (+), while others use the stripe as negative (-). Be sure to check the documentation of each component you're dealing with before making connections.

Do not open the amplifier. There are no user-serviceable parts inside. If you require assistance, consult your local authorized Aquatic AV dealer.

### 3.1 Power & Speaker Connections

**Power Connector:**

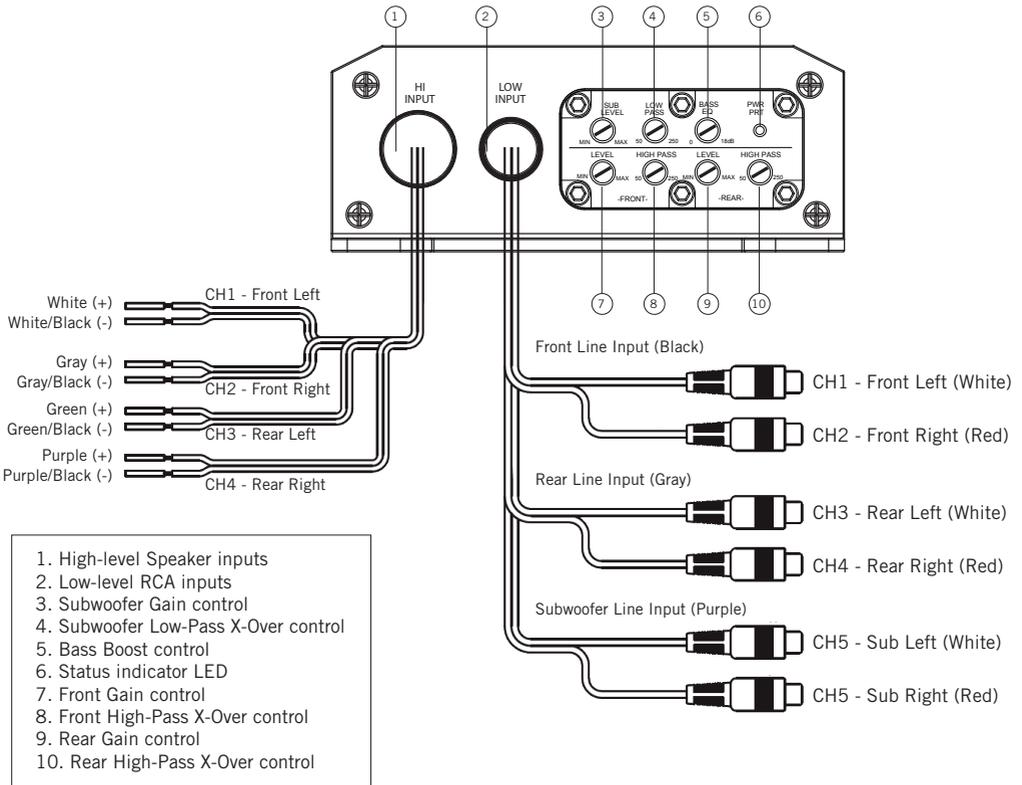
- Battery (+12V)
- Ground (-)
- Battery (+12V)
- Ground (-)



**Speaker Connector:**

- Front Left (CH1)
- Front Right (CH2)
- Rear Left (CH3)
- Rear Right (CH4)
- Subwoofer (CH5)
- Amplifier Turn On

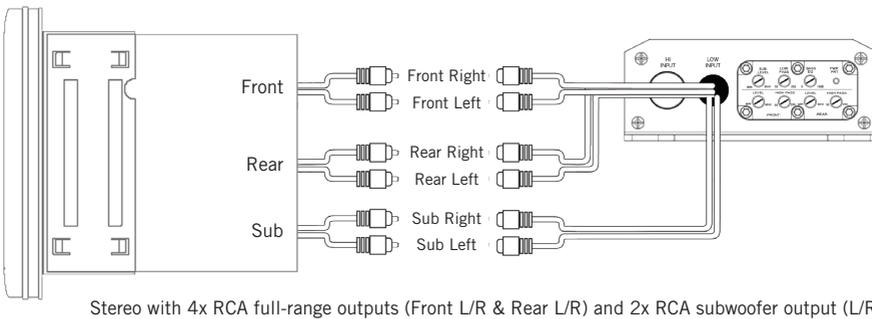
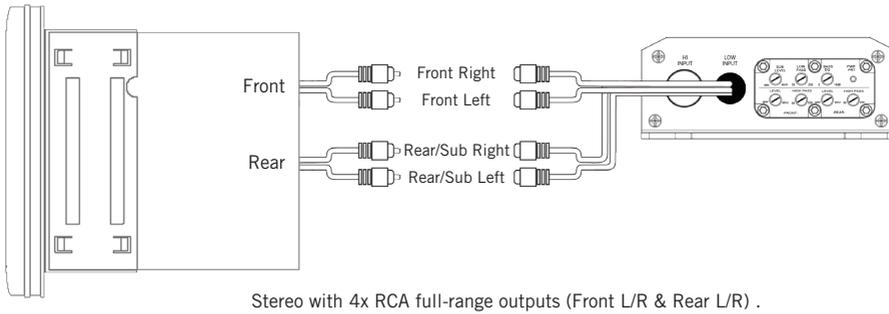
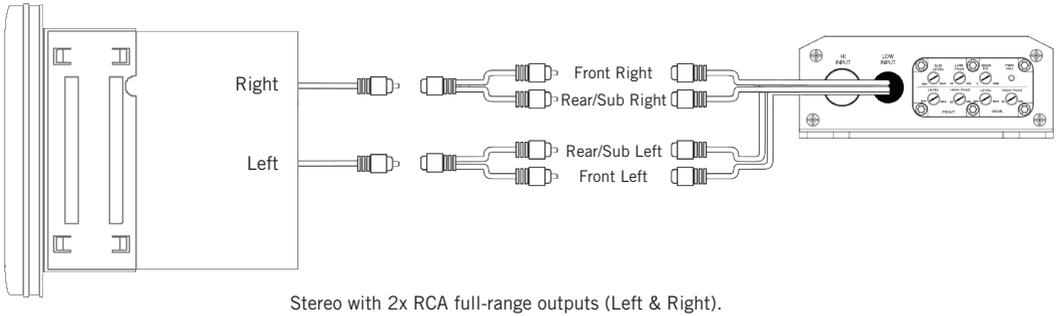
### 3.2 Input Connections & Controls



### 4.1 Low-Level (RCA) Input Wiring

The AD600.5 requires all six of the amplifier's RCA inputs to be connected for all five output channels (front left, front right, rear left, rear right and subwoofer) to have operational output. If required, please use RCA 'Y-connectors' to allow all six of the amplifier's RCA inputs to be connected.

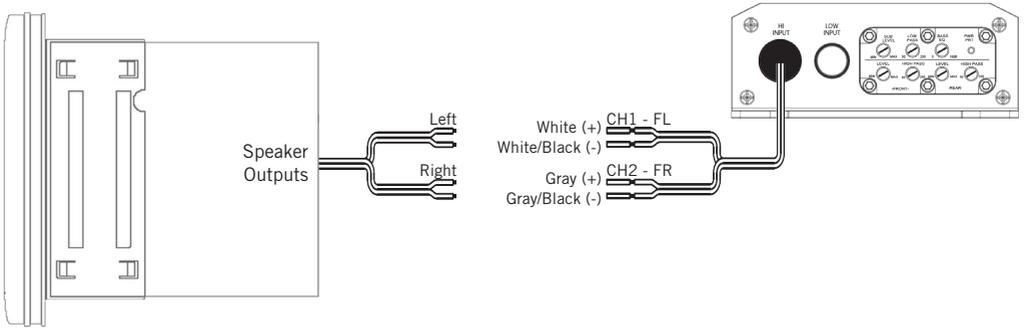
Always use high-quality RCA cables for best audio performance.



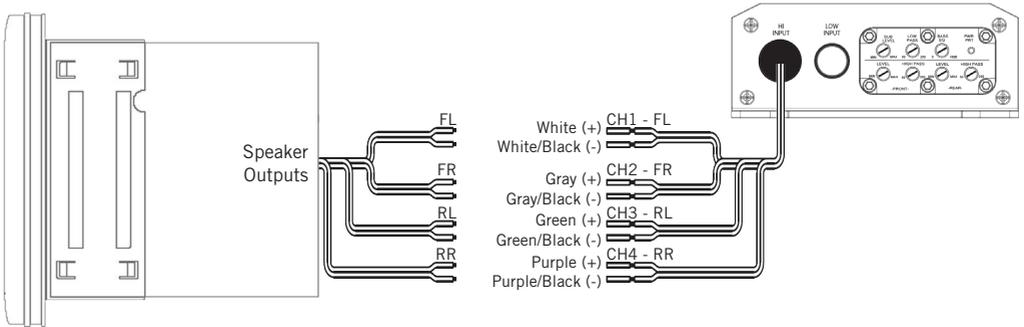
### 4.2 High-Level (Speaker) Input Wiring

The speaker level inputs provide connections for a stereo without RCA outputs. Use them if your source unit does not have RCA outputs.

The subwoofer outout channel will always be operational when using the high-level speaker inputs.



Stereo with 2x full-range speaker outputs (Front L/R).

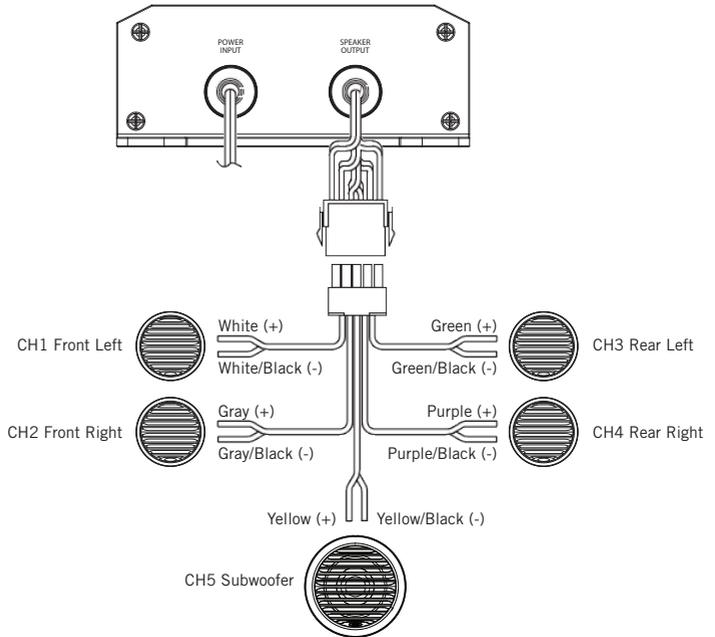


Stereo with 4x full-range speaker outputs (Front L/R & Rear L/R).

### 5.1 5 Channel Mode

In this application the AD600.5 is used to power four full-range speakers and a subwoofer.

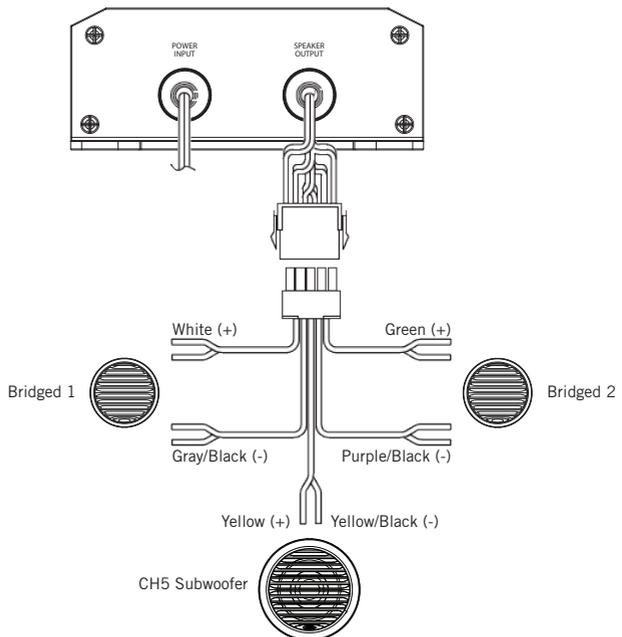
2 ohm and 4 ohm stable in stereo mode.



### 5.2 Bridged 5 Channel Mode

In this application the AD600.5 is used to power two full-range speakers with increased power and a subwoofer. See section 5.6 for further details on Bridge Mode operation.

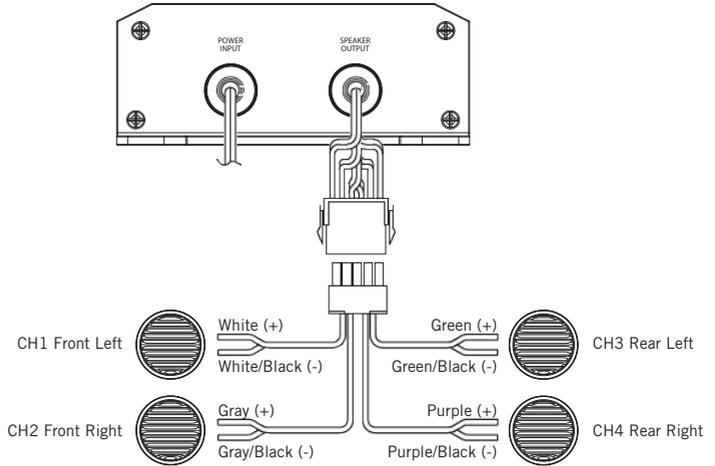
2 ohm and 4 ohm stable in bridge mode.



### 5.3 4 Channel Mode

In this application the AD600.5 is used to power four full-range speakers.

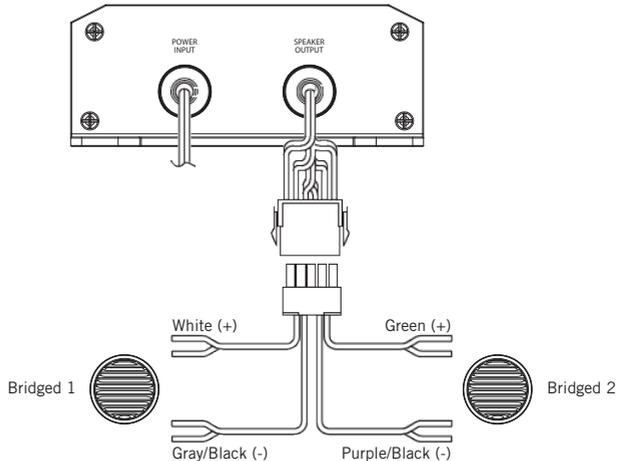
2 ohm and 4 ohm stable in stereo mode.



### 5.4 Bridged 4 Channel Mode

In this application the AD600.5 is used to power two full-range speakers with increased power. See section 5.6 for further details on Bridge Mode operation.

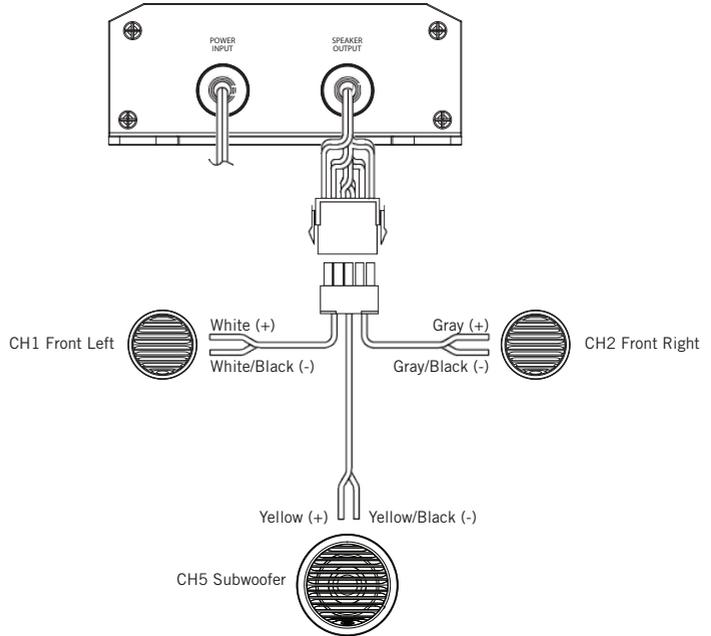
2 ohm and 4 ohm stable in bridge mode.



### 5.5 3 Channel Mode

In this application the AD600.5 is used to power two full-range speakers and a subwoofer.

2 ohm and 4 ohm stable in stereo mode.



### 5.6 Bridged Mode

Bridged Mode operation allows you to combine the power of two output channels into a single output channel. Each bridged channel can power one full-range 4 ohm speaker.

### 6.1 Setting Operating Level

The gain control allows the nominal operating level of the amplifier to be set from 200mV to 4V for RCA inputs or 600mV to 10V for speaker level inputs.

After installation follow these steps and then follow section 6.4 'Final System Checks'.

1. Turn the gain control all the way counter clockwise.
2. Turn the ignition switch on.
3. Turn the source unit on.
4. Turn loudness off and set all tone or equalisation controls to flat positions.
5. Play music content from the source unit and set the volume to 75% of full level.
6. Slowly increase the gain control. Stop when you hear a slight distortion in the signal and decrease the gain slightly below this threshold.

### 6.2 Setting Bass Boost

The amplifier includes a Bass Boost circuit which acts much like an equalizer with variable gain fixed at 50Hz.

Use this control to tune low-frequency (bass) responses. The added boost produces rich, full bass tones that are normally difficult to reproduce.

1. Set the Bass Boost control to off.
2. Listen to a variety of music styles and increase the bass boost control until you notice an increase in low bass response.

If you don't want to boost the bass frequencies, set this control to minimum.

 *if you hear a pop caused by speaker over exertion, lower the bass boost to prevent damage to speaker.*

### 6.3 Setting Crossovers

Using both the High Pass and Low Pass controls you can set the crossovers according to your speakers frequency response. Setting the crossovers correctly allows for a louder and clearer sound without damaging the speakers or amplifier.

For detailed information on how to tune the crossover correctly contact your local authorized Aquatic AV dealer for tuning recommendations.

### 6.4 Final System Checks

1. Turn on the power to your audio system and ensure the stereo source unit is also powered on.
2. The amplifier's status LED will turn red during 'start up' and after a few seconds will then turn blue to indicate the amplifier is operational.

**i** *If the LED remains red this indicates the amplifier is in Protect mode. Turn the amplifier off, check all wiring and turn on again. If LED continues to stay red, contact your local Aquatic AV dealer.*

3. Once the LED illuminates blue, wait at least two seconds then slowly increase the volume control and listen to the audio. If you hear any noise, static, distortion or no sound at all, check all the connections and refer to Troubleshooting. Depending on your system, the volume may become quite loud even at low level settings. Use care when adjusting the controls.
4. Turn the source unit's balance controls to extreme positions (left and right) and listen to the results. Audio output from the speakers should match the source unit settings (i.e. audio from left speaker when balance is left).
5. Increase the volume and ensure the amplifier produces the audio at full frequencies and without distortion. If you hear any distortion check the connections and verify that the gain control is set correctly and/or Refer to troubleshooting.

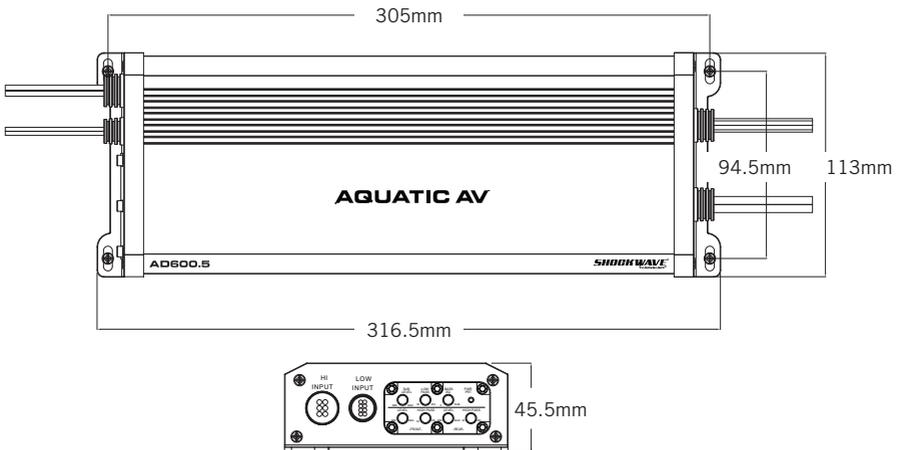
### 7.1 Troubleshooting

Problem	Probable Cause	Solution
No Audio	Low or no remote turn-on voltage.	Check remote connections at the amplifier and source unit.
	Blown amplifier fuse.	Replace with a new fast-blow fuse of the same rating.
	Power wires not connected.	Check battery and ground wiring at the amplifier and check the battery connections.
	Speaker leads shorted.	Check speaker continuity to ground. It should not show a common ground.
	Speakers not connected or are blown.	Check speaker connections at the amplifier. Measure speaker coil impedance.
Audio cycles on and off	Thermal protection circuits are shutting the amplifier off.	Check the installation for adequate ventilation. Consult an authorized Aquatic AV dealer.
Distorted audio	Gain is not properly set or the speaker cones are damaged.	Review instructions for setting gain. Inspect each speaker cone for signs of damage, such as frozen cone or burning smell.
Amplifier fuse keeps blowing	Wiring is connected incorrectly or there is a short circuit.	Review the installation precautions and diagram in this manual and Check all wiring connections.
Whining or ticking noise when engine is turned on	Amplifier is picking up alternator or radiated noise.	Turn down input gain.
		Move audio cables away from the power wires.
		Check the power and ground connections on the amplifier and install an in-line noise filter on the stereo's power wires.
		Check alternator and/or voltage regulator. Test for a weak battery or add water to the battery.

### 8.1 Specifications

Type.....	Class-D Digital Amplifier
Output Modes.....	Mono, Stereo, Bridge
Waterproof.....	Yes - IP65
Conformal Coated PCB.....	Yes
Input Channels.....	5x RCA
Speaker Level Input.....	5 channels
Output Channels.....	5/4/3
Input Impedance.....	22k (RCA), 470 Ohms (speaker)
Output Impedance (per channel).....	2 Ohms / 4 Ohms
Power Output (max).....	600W
Power Output (max) @ 4 Ohms, THD ≤1%.....	4x 50W + 1x 200W
Power Output (max) @ 2 Ohms, THD ≤1%.....	4x 75W + 1x 300W
Power Output - Bridged @ 4 Ohms, THD ≤1%.....	2x 150W
S/N (A-weighted, 1W @ 4 Ohms).....	≥70dB
Frequency Response.....	10-20kHz (1CH to 4CH), 10-250Hz (5CH)
Channel Separation.....	≥ 48dB
Input Sensitivity (Low Level).....	200mV to 4V
Input Sensitivity (High Level).....	600mV to 10V
Bridge Mode.....	Yes (CH1 - CH4)
Bass Boost Adjustment.....	Variable 0 to +18dB (Sub CH)
Bass Boost Frequency.....	50Hz
High Pass Electronic Crossover (12dB/Oct.).....	Variable 50 - 250Hz
Low Pass Electronic Crossover (12dB/Oct.).....	Variable 50 - 250Hz
Current Draw.....	<2mA standby
Gain Control Type.....	Variable Gain Control
Ground Loop Isolation Input Circuit.....	Yes
Allowable Battery Voltage.....	10.8V - 15.6V
Power Fuse.....	Yes in Power Cable
Additional Features.....	Nickel plated connectors LED Indicator Remote Turn-On Turn-On/Off Muting Circuit (Soft Mute)

### 8.2 Dimensions



Aquatic AV offers a limited warranty of our products on the following terms:

**Length of warranty**

2 years on audio systems, electronics, speakers, and accessories (receipt required).

**Coverage**

This warranty covers only the original purchaser of a Aquatic AV product purchased from an authorized Aquatic AV dealer in the United States. In order to receive service, the purchaser must provide Aquatic AV with a copy of the receipt stating the customer name, dealer name, product purchased and date of purchase.

**Defective products**

Products found to be defective during the warranty period will be repaired or replaced (with a product deemed to be equivalent) at Aquatic AV's discretion.

**What is not covered**

Damage caused by accident, abuse, improper operations, theft. Any cost or expense related to the removal or reinstallation of product. Service performed by anyone other than an authorized Aquatic AV service center. Any product with the serial number or tamper labels defaced, altered, or removed. Subsequent damage to other components. Any product not purchased from an authorized Aquatic AV dealer.

**Limit on implied warranties**

Any implied warranties including warranties of fitness for use and merchantability are limited in duration to the period of the express warranty set forth above. Some states do not allow limitations on the length of an implied warranty, so this limitation may not apply. No person is authorized to assume for Aquatic AV any other liability in connection with the sale of the product.

**How to obtain service**

You must obtain a return material authorization number (RMA) to return any product to Aquatic AV. You are responsible for shipping charges of returned products to Aquatic AV.

**Priority Customer Support & Free Extended Warranty**

In order to receive the best customer support from Aquatic AV we recommend you register your product for a free extended warranty.

Register your product for extended warranty and priority support at [www.aquaticav.com/register](http://www.aquaticav.com/register)

Please record the model and serial number[s] of your equipment in the space provided below as your permanent record and will assist us with your factory warranty coverage. These numbers can be found on the underside of the amplifier.

Model number[s]:	Serial number[s]:



FCC ID:  
MADE IN CHINA

### FCC Statement to the User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
3. Increase the separation between the equipment and receiver.
4. Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation



### California Proposition 65 Warning



**WARNING:** This product contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm.

*For more information: [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)*

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