

SOUNDSTREAM®

T E C H N O L O G I E S

RUBICON

RUB600-4

**4/3/2 Channel
Power Amplifiers**

**Owner's Manual
and
Installation Guide**

Congratulations!

You now own the Soundstream RUBICON amplifier, the product of an uncompromising design and engineering philosophy. Your Soundstream RUBICON amplifier will outperform any other amplifier in the world.

To Maximize the performance of your system, we recommend that you thoroughly acquaint yourself with its capabilities and features. Please retain this manual and your sales receipt for future reference.

Soundstream amplifiers are the result of American innovation and the highest quality control standards. When properly installed, they will provide you with many years of listening pleasure. Should your amplifier ever need service or replacement due to theft, please record the following information which will help protect your investment.

Model and Serial # _____

Dealer's Name _____

Date of Purchase _____

Installation Shop _____

Installation Date _____

CAUTION!

Prolonged listening at high levels may result in hearing loss. Even though your new Soundstream Rubicon amplifier sounds better than anything you've ever heard, exercise caution to prevent hearing damage.

Table of Contents

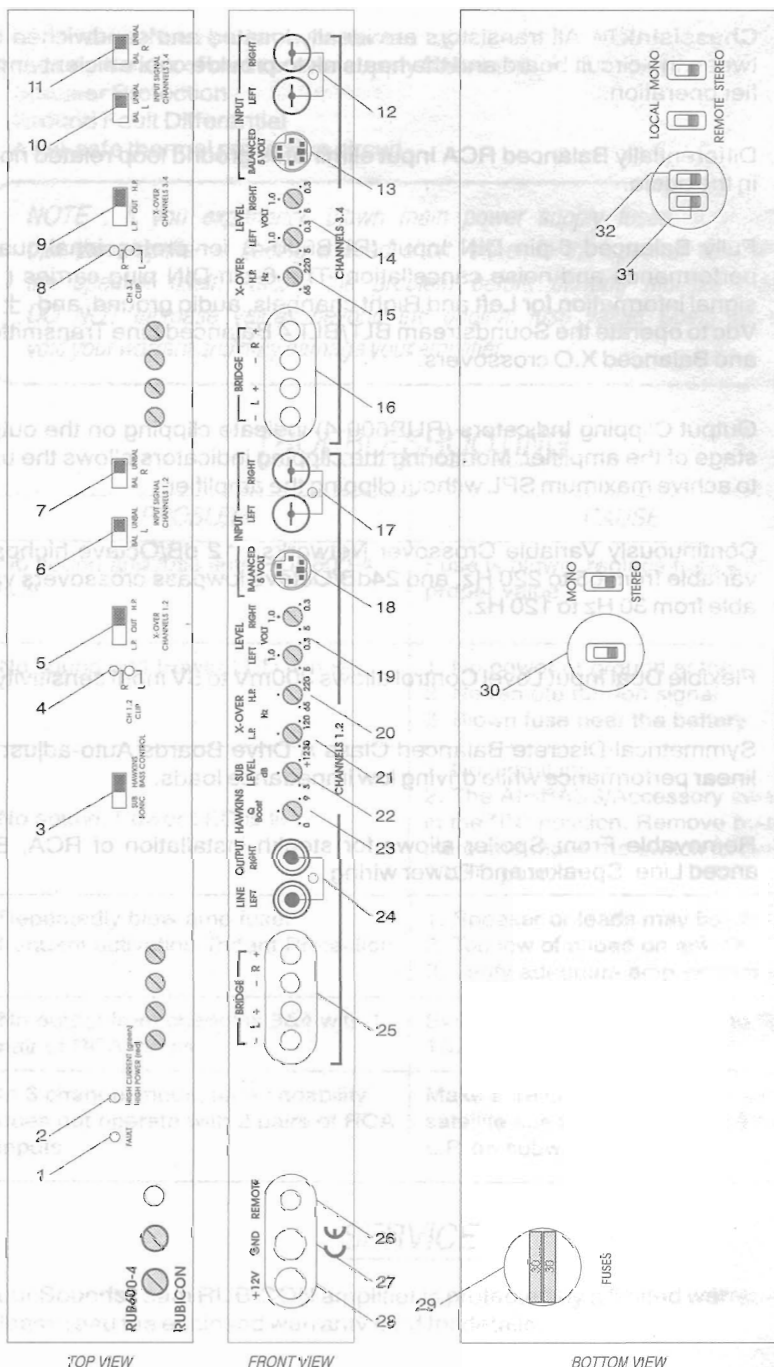
Design Features.....	p 4 - 5
Rubicon RUB600-4 Amplifier Diagram.....	p 6 - 7
Crossover Adjustments.....	p 8
Hawkins Bass Control™ Theory and Use.....	p 9
Installation: Speaker Output Modes.....	p 10
Installation: Balanced / Unbalanced Inputs.....	p 11
Wiring.....	p 12
Installation: Mounting	p 13
Installation: Level Setting and Front Spoiler.....	p 14
Sample System Diagrams.....	p 15
Protection Circuitry, Service and Troubleshooting	p 16
Specifications.....	p 17

DESIGN FEATURES

- ◆ **RUBI™** (*R*apid-*U*se @*r*anch@d *I*mpulse) This new proprietary power supply topology eliminates “power sags” during low frequency reproduction by rapidly increasing the duty cycle, stabilizing the power supply and allowing it to deliver the power required when reproducing low frequencies. Also, greater reserve gate power is stored for low voltage conditions that occur during extreme conditions.
- ◆ **STACT™** (*S*tabilized *A*pex *C*urrent *T*opology) Reduces power supply stress by 50%. Typical designs degrade the stereo image due to phase reversal of even-order harmonic distortion that occurs between the inverted channels. In the STACT design, inversion is done at the power amplifier drive stage. Since the fully symmetrical power amplifier produces no even-harmonic distortion itself and all preamplifier circuitry is run completely in-phase, no even harmonic distortion phase reversal occurs.
- ◆ **Trident™ Protection Topology** provides three types of protection:
 1. Output protection against short circuits or improper loads.
 2. Ground fault detection: Shuts down the amplifier when a significant voltage (> 5Volts) fluctuation occurs between electrical (turn-on lead) and battery ground.
 3. Thermal Protection: Puts the amplifier into thermal rollback or shuts the amplifier down in extreme thermal conditions.
- ◆ Hawkins Bass Control provides a focused subwoofer boost (0-9dB at 45Hz) and routes otherwise wasted amplifier power back to the audible bandwidth.
- ◆ Harmonic Bass Alignment™ The 2nd and 3rd order harmonic peaks are critically aligned to fundamental peaks at low frequencies. This produces tighter, more accurate bass reproduction.
- ◆ Drive Delay II™ Amplifier section powers up 2 to 3 seconds after the power supply eliminating turn-on pops. Turn off process is reversed: amplifier section turns off first, followed by the power supply.
- ◆ Dynamically Optimized Power Grid™ Power grid is evenly distributed between primary and secondary power supplies, providing greater dynamics and improved RF filtering.

- ◆ **Chassisink™** All transistors are ideally located and sandwiched between the circuit board and the heatsink to provide cool efficient amplifier operation.
- ◆ Differentially Balanced RCA Input eliminates ground loop related noise in the audio.
- ◆ Fully Balanced 6-pin DIN Input (RUB600-4) for professional-quality performance and noise cancellation. The 6-pin DIN plug carries (\pm) signal information for Left and Right channels, audio ground, and ± 15 Vdc to operate the Soundstream BLT/BLT 4 Balanced Line Transmitters and Balanced X.O crossovers.
- ◆ Output Clipping Indicators (RUB600-4) indicate clipping on the output stage of the amplifier. Monitoring the clipping indicators allows the user to achieve maximum SPL without clipping the amplifier.
- ◆ Continuously Variable Crossover Networks : 12 dB/Octave highpass variable from 65 to 220 Hz, and 24dB/Octave lowpass crossovers variable from 30 Hz to 120 Hz.
- ◆ Flexible Dual Input Level Control allows 300mV to 5V input sensitivity.
- ◆ Symmetrical Discrete Balanced Class A Drive Boards Auto-adjust for linear performance while driving low impedance loads.
- ◆ Removable Front Spoiler allows for stealth installation of RCA, Balanced Line, Speaker and Power wiring.

RUB600-4



KEY TO CALLOUTS

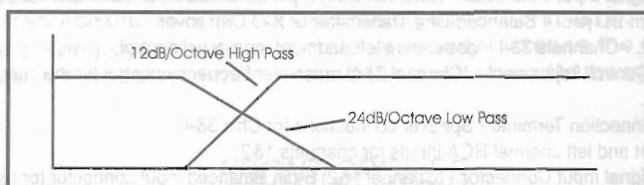
1. FUSE LED - indicates blown fuse.
2. Power LED - indicates amplifier power, either in High Power or Auto High Current.
3. Subsonic / Hawkins Bass Control Switch - "SUB SONIC" to engage the Sub Sonic filter at 13 Hz. "Hawkins Bass Control" to engage the high pass filter @ 45 Hz with variable boost (Q) for optimum bass for any channel in Low Pass.
4. Clip Indicators - (Channels 1&2) Indicates the signal output level is too high and the output stage of the amplifier is clipping.
XOVER Switch - (Channels 1&2) Select "L.P." for use with the internal low pass filter, "IN" for use with the internal high pass filter, or "OUT" for use with external crossover.
6. Left Channel Balanced/Unbalanced Input Selector - (Ch 1) Select "BALANCED" to use the 6 pin Balanced signal input. Select "UNBALANCED" to use the RCA signal inputs.
7. Right Channel Balanced/Unbalanced Input Selector - (Ch 2) Select "BALANCED" to use the 6 pin Balanced signal input. Select "UNBALANCED" to use the RCA signal inputs.
8. Clip Indicators - (Channel 3&4) Indicates the signal output level is too high and the output stage of the amplifier is clipping.
9. XOVER Switch - (Channel 3&4) Select "L.P." for use with the internal low pass filter, "HP." for use with the internal high pass filter, or "OUT" for use with external crossover.
10. Left Channel Balanced/Unbalanced Input Selector - (Ch 3) Select "BALANCED" to use the 6 pin Balanced signal input. Select "UNBALANCED" to use the RCA signal inputs.
11. Right Channel Balanced/Unbalanced Input Selector - (Ch 4) Select "BALANCED" to use the 6 pin Balanced signal input. Select "UNBALANCED" to use the RCA signal inputs.
12. Inputs - Right and left channel RCA inputs for channels 3&4.
13. Balanced Signal Input Connector - (Channel 3&4) 6-pin Balanced input connector for use with the Soundstream BLT/BLT4 Balanced Line Transmitter or X.O Crossover.
14. Input LEVEL - Channels 3&4 independent left and right input level control.
15. High Pass Control Adjustment - (Channel 3&4) crossover frequency control for the internal high pass filter.
16. Speaker Connection Terminal - Speaker connections for Ch's 3&4.
Inputs- Right and left channel RCA inputs for channels 1&2.
18. Balanced Signal Input Connector - (Channel 1&2) 6-pin Balanced input connector for use with the Soundstream BLT/BLT4 Balanced Line Transmitter or X.O crossover.
19. Input LEVEL - Channels 1&2 independent left and right input level control.
20. High Pass Control Adjustment - (Channels 1&2) crossover frequency control for the internal high pass filter.
21. Low Pass Control Adjustment - Crossover frequency control for the internal low pass filter.
Applies to any channel with the low pass filter engaged.
22. Subwoofer Level Control - Additional level control (± 6 dB) to any channel receiving information from the low pass filter.
23. Hawkins Bass Control "Boost" Adjustment - Varies from 0 to +9 dB of boost when the Hawkins Bass Control is engaged. Note : Applies to any channel with the low pass filter engaged.
24. Line Outputs - Full range outputs to external amplifier. Note : Signal is driven from channel 1&2 inputs.
25. Speaker Connection Terminal - Speaker connections for Ch's 1&2.
26. REMOTE - Remote turn-on input from the head unit. Accepts +12V.
27. GND - Main ground connection. Bolt to a clean chassis point in the vehicle.
28. +12V - Connected to a fuse or circuit breaker, then to the battery's positive terminal
29. Main Fuse - Main power supply fuses.
30. Stereo/Mono Switch - (Channels 1&2) Select "MONO" for bridged mono output (use right level and RCA input only). Select "STEREO" for stereo output.
Channels 3&4 INPUT SELECT - Selectable inputs from internal (from channels 1&2) or external (from channels 3&4 local RCA inputs).
32. Stereo/Mono Switch - (Channel 3&4) Select "MONO" for bridged mono output (use right level and RCA input only). Select "STEREO" for stereo output.
- Subwoofer Level Control - Additional level control (± 6 dB) to any channel receiving information from the low pass filter.

CROSSOVER ADJUSTMENTS

The RUB600-4 amplifiers incorporates an on-board staggered electronic crossover, with full range RCA outputs to drive an external amplifier. No external electronic crossover is necessary. The high and low pass portions of the crossover can be set independently of one another.

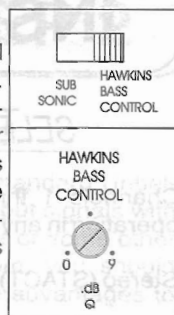
In many car audio installations, there is a tendency for a "midbass boom." Because of their interior dimensions, most cars will resonate or ring at these midbass frequencies. If we design the system so there is reduced output in this region, the final response is very smooth and natural sounding. The high pass crossover is independently variable from 65 to 220 Hz at 12dB/Octave, and low pass crossover is independently variable from 30 to 120 Hz at 24 dB/Octave.

For initial crossover setup, try setting the low pass filter to approximately 60Hz, and the high pass filter to approximately 100 Hz. Change the crossover points to accommodate a good mixture of frequency response, power handling, and personal preference.



Hawkins Bass Control - Theory and Use

Hawkins Bass Control (variable) is a unique subwoofer control circuit included with the Soundstream RUB600-4 amplifier. It is capable of removing subsonic energy in program material below 45 Hz at 12 dB/Octave, while boosting subwoofer frequencies. The circuit consists of two controls. One engages a subsonic High Pass filter at 45 Hz, and the other adjusts the amount of boost (0 to +9dB). The Hawkins Bass Control functions on either pair of channels (1&2 or 3&4) if their low pass filter is engaged.



The **Boost Control** adjusts the amount of level applied at the set frequency, and is adjustable from 0 to +9dB (see figure 2). When the boost is set to 0, Hawkins Bass Control acts as a subsonic filter only. The simple act of removing potentially harmful low frequencies can improve system output by as much as 3dB.

Application

Subwoofer drivers in general have excellent power handling characteristics over their operational bandwidth. This bandwidth is determined by many factors, including driver design, and enclosure type. It is possible to overdrive any subwoofer driver by sending powerful signals outside of its operational bandwidth. These

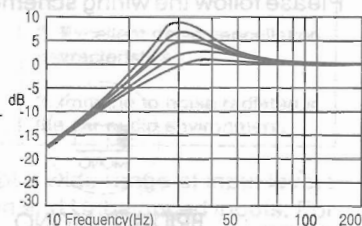


FIG. 2 VARIABLE BOOST

potentially damaging signals can be removed by adding a subsonic filter.

Figure 3 shows the effectiveness of the Hawkins Bass Control on woofer excursion in a vented properly adjusted, this excursion can be reduced to less than 1 mm. This is of great benefit to lowering woofer distortion and increasing output.

Adjustment

An easy method of optimizing your existing subwoofer enclosure with Hawkins Bass Control is as follows:

1. Adjust the boost control to full counter clockwise (0) position.
2. Set the bass control switch to "HAWKINS BASS CONTROL"
3. Play moderate to loud bass material.

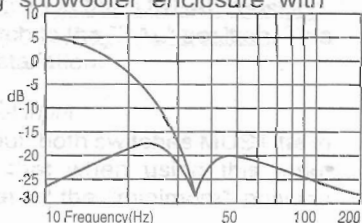


FIG. 3 Limited Excursion

4. Adjust the boost (Q) control until you reach the desired level.

With Soundstream's Hawkins Bass Control, the boost and frequency control can provide the "tailoring" needed for any type of "assisted" design and any woofer in any type of installation.

INSTALLATION STEP 1

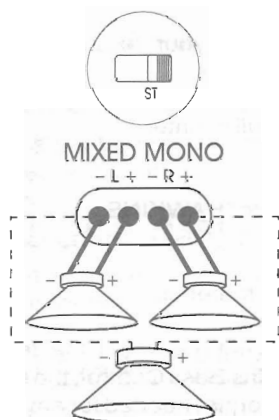
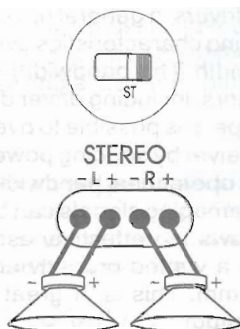
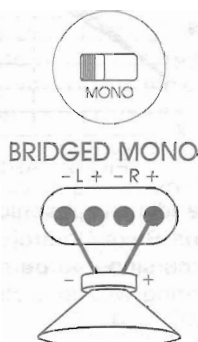
SELECTING THE SPEAKER OUTPUT MODE

Channels 1 through 4 of the RUB600-4 amplifiers have the ability to operation in any one of the following modes :

Stereo (STACT) : Use this mode for stereo operation (left and right channels).

Bridged Mono : Use this mode to get a bridged mono output while using only the right channel input and gain control per pair of channels (for use with a singular mono input.)

Please follow the wiring schemes below for the correct operation :



INSTALLATION STEP 2

BALANCED / UNBALANCED INPUT

The RUB600-4 amplifier has the ability to accept either a standard Unbalanced RCA signal input, or a Balanced "Pro Audio" style input signals with the use of the Soundstream BLT Balanced Line Transmitter or some other balanced line audio source. Before installing your system, you should decide upon which signal type you wish to run. There are advantages to both:

	UNBALANCED INPUT	BALANCED INPUT
ADVANTAGES	<ol style="list-style-type: none"> 1. Most pre amplifier / source units have Unbalanced RCA outputs (Industry Standard). 2. No Interface module is necessary. 	<ol style="list-style-type: none"> 1. Improved Signal to Noise Ratio (S/N Ratio) 2. Excellent noise cancellation characteristics. 3. Immune to noise radiated in the car audio environment.

The RUBICON amplifier's signal inputs accept a wide range of input level : from 300mVrms to 5.0 Vrms for both Balanced and Unbalanced inputs. For the best S/N Ratio, we recommend that the input level controls be set as far down as possible (rotated counter-clockwise), while maintaining an acceptable level of output.

Using the "Unbalanced" RCA Input

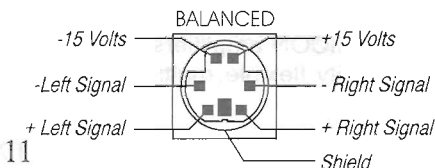
When using the Unbalanced RCA input, the RIGHT channel input signal switch **MUST** be in the "UNBAL" position. Also, when first installing the amplifier using the input configuration, we suggest that the left channel input signal switch be in the "UNBAL" position as well. If you experience alternator whine or other installation noise with both switches in the "UNBAL" position, try moving the LEFT channel input signal switch to the "BAL" position. This should remove any system noise due to the installation.

Using the "Balanced" RCA Input

When using the Balanced 6-pin DIN audio input, both switches **MUST** be in the "BAL" position. Also, we recommend that when using this input configuration, the input level controls be set to the "minimum" position (rotated counter-clockwise).

The system can gain should then be adjusted on the BLT Balanced Line Transmitter, other balanced line audio source. For the pin configuration, see the diagram below:

NOTE : The pin configuration shown in the diagram is the view looking into the Balanced input jack on the amplifier



INSTALLATION STEP 3

WIRING

POWER AND GROUND

To ensure maximum output from your RUBICON amplifier, use high quality, low-loss power and ground cables and connections (4 gauge for RUB600-4). The RUBICON amplifiers will accept up to 8 gauge power and ground cables. Determine from the chart below the minimum gauge power and ground wire for your application.

	Up to 10'	Up to 20'
RUB600-4	4 or 8 gauge	4 gauge only

CIRCUIT BREAKERS AND FUSES

EXTERNAL

Like all audio components, the RUBICON amplifiers must be fused near the battery. A fuse or circuit breaker must be located within 18" of the battery. This will prevent a fire in the event of a shorted cable. See the chart below to determine the correct fuse value.

INTERNAL

The RUBICON amplifiers are fused with automotive-type fuses. In the event of blown power supply fuses, replace with the correct value fuse found in the chart below. Never replace the fuse with a higher value than what is supplied. This may result in amplifier damage and will void the warranty!

RUBICON Amplifier Fuse Values

	Amplifier Fuse	Battery Fuse/Circuit Breaker
RUB600-4	(2) 30 amp automotive	80 amp

REMOTE TURN-ON

Connect the "Remote" line to the turn-on lead from the source unit. When +12Volts is received, the amplifier will turn on.

SIGNAL CABLE

Use a high quality cable that will be easy to install and has minimal signal loss to guarantee optimum performance.

SPEAKER CABLE

The RUBICON amplifiers will accept up to 8 gauge speaker cable. Use a high quality, flexible, multi-strand cable for best performance and longevity.

INSTALLATION STEP 4

INSTALLATION AND MOUNTING

AMPLIFIER LOCATION

The RUBICON amplifier employs highly efficient circuitry, a custom-engineered heatsink, and a unique Chassisink construction to maintain lower operating temperatures. Additional cooling may be required if the amplifier is located in a tightly confined area or when driving especially low impedance loads at extremely high levels.

When mounting the amplifier, it should be securely mounted to either a panel in the vehicle or an amp board or rack that is securely mounted to the vehicle. The mounting location should be either in the passenger compartment or in the trunk of the vehicle, away from moisture, stray or moving objects, and major electrical components. To provide adequate ventilation, mount the amplifier so that there are at least two inches of freely circulating air above and to the sides of it.

MOUNTING THE AMPLIFIER

- Using the amplifier as a template, mark the holes on the mounting surface.
- Remove the amplifier and drill the holes for the mounting screws.
- Secure the amplifier to the mounting surface using the supplied hardware.

WIRING

- Run and connect the audio signal and remote turn-on cables to the amplifier from the source unit.
- Carefully run the positive cable from the amplifier to a fuse or circuit breaker within 18" of the battery.
- Connect the fuse or circuit breaker lead to the battery. Leave the circuit breaker off or the fuse out until everything is bolted down.
- Secure the ground cable to a solid chassis ground on the vehicle. It may be necessary to sand paint down to raw metal for a good connection.
- Double check each and every connection!
- Re-connect the fuse or circuit breaker.

POWER UP

Power up the system and look at the Power LED; there may be a 2-3 second delay from the time the source unit is turned on to the time that the LED on the amp turns on, which is normal. Once the amplifier LED is on and the source unit is playing, you should have sound coming from the speakers.

INSTALLATION STEP 5

LEVEL SETTING

The input level controls are located on the front of the amplifier. This is a unique dual-stage circuit that adjusts both level and gain. This topology maintains better S/N Ratio even when using sources with minimal output.

In the ideal situation, all components in the audio system reach maximum undistorted output at the same time. If you send a distorted signal to an amplifier, it is simply going to amplify distorted information. This same holds true if an onboard processor or crossover begins to distort before you have maximum output from the amplifier. By setting all components to reach clipping at the same time, you can maximize the output of your system. For your RUBICON amplifier, follow these steps for setting the input levels:

1. Turn the amplifier's input levels to minimum position (counter-clockwise)
2. Set the source unit volume to approximately 3/4 of full volume.
3. While playing dynamic source material, slowly increase the amplifiers' input level until a near maximum undistorted level is heard in the system.

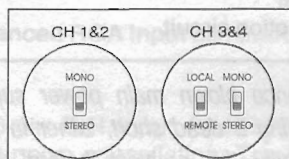
FRONT SPOILER

Once the amplifier is installed and the proper levels set, place the front spoiler in position, and secure it using the supplied hardware.

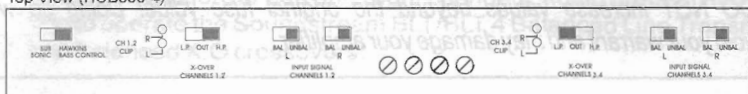
SAMPLE SYSTEM # 1

4 channels of input
2-way with fader subwoofer level control
2 channels of Z-way high-pass, 2 channels of bridged low pass.

Bottom View
(RUB600-4)



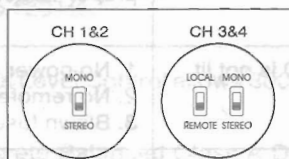
Top View (RUB600-4)



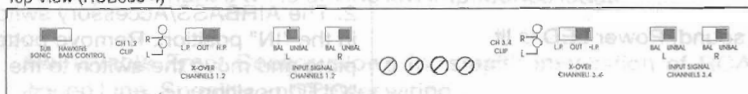
SAMPLE SYSTEM # 2

4 channels of input
4 Channels of 2-way high pass
Full range line output to external amplifier driving subwoofers

Bottom View
(RUB600-4)



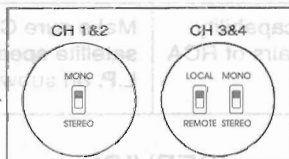
Top View (RUB600-4)



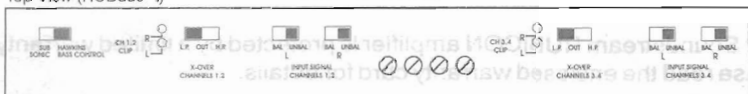
SAMPLE SYSTEM # 3

2 channels of input
2 channels bridged in low pass driving subwoofers
Full range line output to external amplifier driving satellite speakers

Bottom View
(RUB600-4)



Top View (RUB600-4)



TRIDENT PROTECTION CIRCUITRY

Your RUBICCN amplifier is protected against both overheating and short circuits by means of main power supply fuses and the following circuits :

- ◆ Speaker Protection
- ◆ Ground Fault Differential
- ◆ A fail-safe thermal protection circuit

NOTE : If you experience blown main power supply fuses, it is likely that the amplifier is seeing a dead short, either in the speaker wire or in the speaker itself. Rectify the problem before blowing multiple fuses! DO NOT increase values beyond the original fuse value! Doing so will void your warrant and may damage your amplifier.

TROUBLESHOOTING

PROBLEM	CAUSE
No sound and fuse light RUB600-4 is lit.	Fuse is blown, replace fuse with proper value.
No sound and Power LED is not lit.	1. No power or ground at the amp. 2. No remote turn-on signal 3. Blown fuse near the battery
No sound, Power LED is lit.	1. No signal input. 2. The AIRBASS/Accessory switch is in the "IN" position. Remove bottom plate and move the switch to the "OUT" position.
Repeatedly blow amp fuse; frequent activation Trident Protection	1. Speaker or leads may be shorted 2. Too low of a load on amplifier 3. Verify adequate amp ventilation
No output from channels 3&4 with 1 pair of RCA inputs	Switch CH 3&4 Input Select to "CH 1&2" on the top of the amp.
In 3 channel mode, fade capability does not operate with 2 pairs of RCA inputs	Make sure Ch's 1&2 are H.P. on satellite speakers and Ch's 3&4 are L.F. on subwoofer speakers.

SERVICE

Your Soundstream RUBICON amplifier is protected by a limited warranty. Please read the enclosed warranty card for details.

SPECIFICATIONS

MODEL	4 Ω Stereo (8 Ω Bridged) (12.5 Vdc)	2 Ω Stereo (4 Ω Bridged) (12.5 Vdc)	1 Ω Stereo (2 Ω Bridged) (12.5 Vdc)	TOTAL POWER
RUB600-4	80W x 4 (160W x 2)	150W x 4 (300W x 2)	150W x 4 (300W x 2)	600

THD	<0.1%
Signal to Noise	>100dB
Frequency Response	20Hz to 20 KHz \pm 0.5dB
Stereo Separation	>50dB
Damping	>200
Input Sensitivity	300mV to 5.0 Volts
Input Impedance	10 k Ohms

Crossover Specifications

Low Pass : 30Hz - 120 Hz at 24dB/Octave

High Pass : 65Hz - 220 Hz at 12dB/Octave

Hawkins Bass Control

0 to +9dB Boost (Hawkins Bass Control "IN")

Boost Frequency = 45Hz

Sub sonic filter frequency = 13Hz

Dimensions (W x D x H)

RUB600-4: 17.25" x 9.8" x 2.25" (437mm x 250mm x 57mm)