

SOUNDSTREAM®

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

HUMAN REIGN UNLEASHED

HRU. 2

HRU. 4

Owner's Manual
and
Installation Guide

Congratulations!

You now own a **Soundstream Human Reign Unleashed** amplifier, the product of an uncompromising design and engineering philosophy. Your **Soundstream Human Reign Unleashed** 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 extremely high levels may result in hearing loss. Even though your new Soundstream **Human Reign Unleashed** amplifier sounds better than anything you've ever heard, exercise caution to prevent hearing damage.

Table of Contents

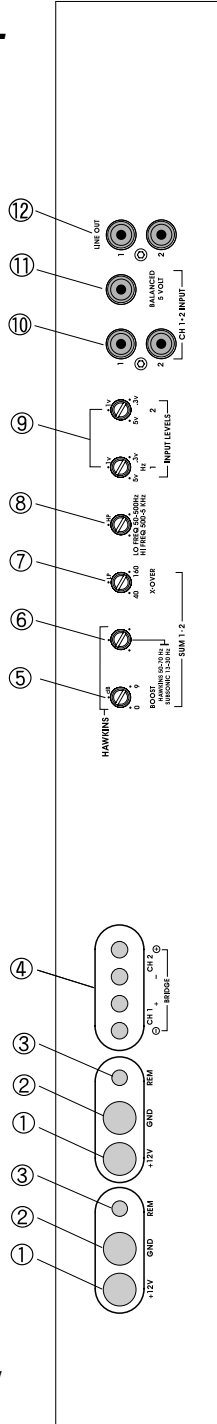
Design Features	p 4 -5
Amplifier Diagram	p 6 - 9
Hawkins Bass Control™ Theory and Use	p 10 -11
Installation: Wiring	p 12-13
Installation: Mounting	p 14
Installation: Level Setting	p 15
Protection Circuitry and Troubleshooting	p 16
Service and Specifications	p 17

DESIGN FEATURES

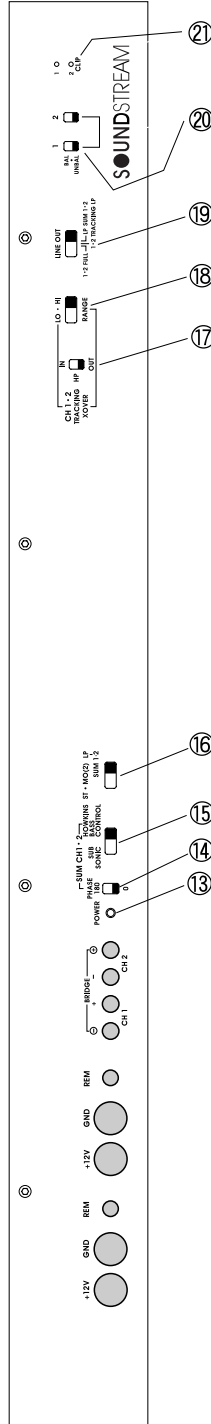
- **RUBI™ (Rapid-Use Branched Impulse)** This new proprietary power supply topology eliminates “power sags” during low frequency reproduction by rapidly increasing the duty cycle, stabilizing the power supply and allowing it to deliver the power required to reproduce low frequencies. Also, greater reserve gate power is stored for low voltage conditions that occur during extreme conditions.
- **STACT™ (Stabilized Apex Current Topology)** 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 (>5 Volts) 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** - Fully adjustable subwoofer equalization circuit providing frequency and boost (“Q”) adjustment for optimum subwoofer performance. A frequency tracking subsonic filter protects woofers from potentially harmful low frequency information and maximizes output in a usable range.

- **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.
- **Output Clipping Indicators** indicate clipping on the output stage of the amplifier. Monitoring the clipping indicators allows the user to achieve maximum Sound Pressure Level without clipping the amplifier.
- **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.
- **Flexible Input Level Control** allow 300mV to 5V input sensitivity.
- **Continuously Variable Crossover Network** : 12dB/octave for the highpass section and 24dB/octave for the lowpass section.

Front View



Top View

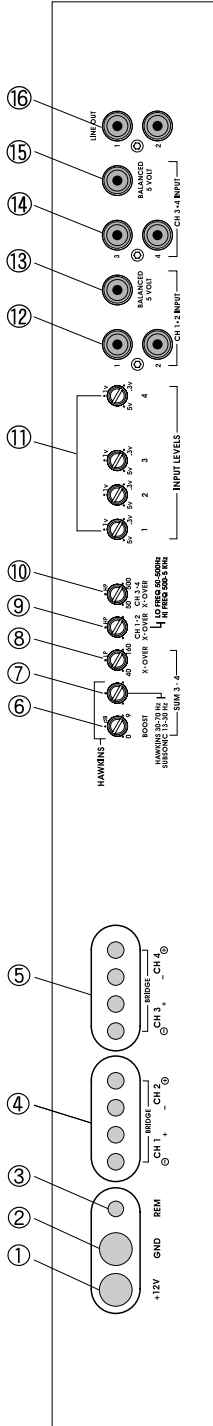


KEY TO CALLOUTS

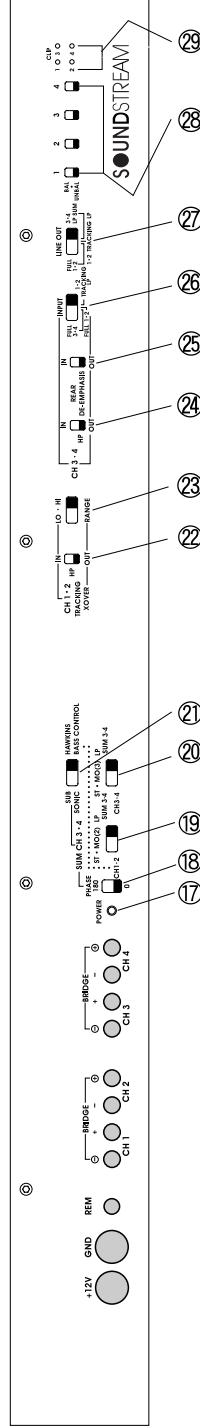
1. **+12V** - Connected to a fuse or circuit breaker, then to the battery's positive terminal.
2. **GND** - Main ground connection. Bolt to a clean chassis point in the vehicle.
3. **REMOTE** - Remote turn - on input from the head unit. Accepts +12V.
4. **Speaker connection Terminal** - Speaker connections for satellite CH1 & 2.
5. **Hawkins Bass Control "Boost" Adjustment** - Varies from 0 to + 9dB of boost when the Hawkins Bass Control circuit is engaged.
6. **Subsonic/Hawkins Bass Control Adjustment** - Frequency adjustment control for the Hawkins Bass Control filter or the Subsonic filter.
7. **Low Pass Filter Control Adjustment** - Frequency adjustment control for the Low Pass Filter, 40 - 160Hz.
8. **High Pass Filter Control Adjustment** - Frequency adjustment control for the High Pass Filter, 50 - 500Hz or 500 - 5kHz.
9. **Input Levels** - Input level control variable from 300mV to 5V.
10. **RCA Inputs** - 1 & 2 channel RCA inputs.
11. **BALANCED Signal Input Connector** - Channels 1 & 2 ; 6-pin Balanced signal input connector for use with the Soundstream BLT Balanced Line Transmitter.
12. **Line Out** - Line level RCA output to drive an external amplifier.
13. **Power LED** - Indicates amplifier power.
14. **Phase Switch** - Adjusts the speaker phase to either 0 or 180 degrees.
15. **Subsonic/Hawkins Bass Control Switch** - Selectable subwoofer enhancement circuit. Select "SUBSONIC" to engage the Subsonic filter with no boost. Use the knob indicated by callout #6 to set the frequency: 13- 30Hz. Select "Hawkins Bass Control" to engage the Subsonic filter with available boost. Use the knob indicated by callout #6 to set the frequency : 30Hz to 70Hz.
16. **ST/MO(2)/LP Switch** - "MONO" for bridge mono operation with a single input signal (Channel 2 only). "SUM" for bridged mono operation summing two input signals (1CH and 2CH). "ST" for normal stereo operation.
17. **High Pass X-OVER Switch** - (Channels 1 & 2) Select "IN" for use with the internal crossover or "OUT" for use with external crossover.
18. **Frequency Range Selection switch** - Switching to "LO" selects the 50-500Hz range. Switching to "HI" selects the 500-5kHz range.
19. **Line Output Switch** - Select "1-2 FULL" for full range signal outputs. Select "1-2 TRACKING LP" for a lowpass signal at the frequency for highpass at #8. Select "LP SUM 1-2" for a summed signal channels 1-2 (more bass output signal).
20. **Channel Balanced / Unbalanced Input Selector Switch** - Select "BALANCED" to use the 6-pin Balanced signal input. Select "UNBALANCED" to use the RCA signal inputs.
21. **Input Overload Indicators** - Indicates the signal input level or input gain level is too high.

- HRU. 4 -

Front View



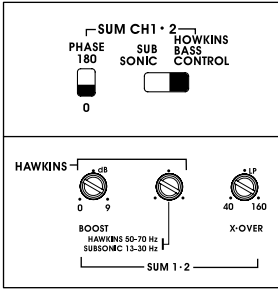
Top View



KEY TO CALLOUTS

- +12V** - Connected to a fuse or circuit breaker, then to the battery's positive terminal.
- GND** - Main ground connection. Bolt to a clean chassis point in the vehicle.
- REMOTE** - Remote turn - on input from the head unit. Accepts +12V.
- Speaker connection Terminal** - Speaker connections for satellite CH1 & 2.
- Speaker connection Terminal** - Speaker connections for satellite CH3 & 4.
- Hawkins Bass Control "Boost" Adjustment** - Varies from 0 to +9dB of boost when the Hawkins Bass Control circuit is engaged.
- Subsonic/Hawkins Bass Control Adjustment** - Frequency adjustment control for the Hawkins Bass Control filter or the Subsonic filter.
- Low Pass Filter Control Adjustment** - Frequency adjustment control for the Low Pass Filter, 40 - 160Hz.
- High Pass Filter Control Adjustment** - Frequency adjustment control for the High Pass Filter, 50 - 500Hz or 500 - 5kHz for CH1 & 2.
- High Pass Filter Control Adjustment** - Frequency adjustment control for the High Pass Filter, 50 - 500Hz for CH3 & 4.
- Input Levels** - Input level control variable from 300mV to 5V.
- RCA Inputs** - 1 & 2 channel RCA inputs.
- BALANCED Signal Input Connector** - Channels 1 & 2 ; 6-pin Balanced signal input connector for use with the Soundstream BLT Balanced Line Transmitter.
- RCA Inputs** - 3 & 4 channel RCA inputs.
- BALANCED Signal Input Connector** - Channels 3 & 4 ; 6-pin Balanced signal input connector for use with the Soundstream BLT Balanced Line Transmitter.
- Line Out** - Line level RCA output to drive an external amplifier.
- Power LED** - Indicates amplifier power.
- Phase Switch** - Adjusts the speaker phase to either 0 or 180 degrees.
- ST/MO(2)/LP Switch** - "MONO" for bridge mono operation with a single input signal (Channel 2 only). "SUM" for bridged mono operation summing two input signals (1CH and 2CH). "ST" for normal stereo operation.
- ST/MO(3)/LP Switch** - "MONO" for bridge mono operation with a single input signal (Channel 4 only). "SUM" for bridged mono operation summing two input signals (3CH and 4CH). "ST" for normal stereo operation.
- Subsonic/Hawkins Bass Control Switch** - Selectable subwoofer enhancement circuit. Select "SUBSONIC" to engage the Subsonic filter with no boost. Use the knob indicated by callout #7 to set the frequency: 13- 30Hz. Select "Hawkins Bass Control" to engage the Subsonic filter with available boost. Use the knob indicated by callout #7 to set the frequency: 30Hz to 70Hz. In Hawkins Bass Control Mode, there is a tracking Subsonic filter to protect woofers.
- High Pass X-OVER Switch** - (Channels 1 & 2) Select "IN" for use with the internal crossover or "OUT" for use with external crossover.
- Frequency Range Selection Switch** - Switching to "LO" selects the 50 - 500Hz range. Switching to "HI" selects the 500 - 5kHz range.
- High Pass X-OVER Switch** - (Channels 3 & 4) Select "IN" for use with the internal crossover or "OUT" for use with external crossover.
- CH3&4 Fill De-emphasis Switch** - (Channels 3 & 4) Select "IN" to activate 6dB/Octave filter @ 8kHz.
- Channel 3&4 Input Mode** - "FULL 3-4" requires 4 signal inputs. "FULL 1-2" uses the same signal from 1-2 for 3-4. "1-2 TRACKING LP" sends a lowpass signal to 3-4 derived from the highpass sent to 1-2 via #9.
- Line Output Switch** - Select "FULL 1-2" for full range signal output. Select "1-2 TRACKING LP" for a lowpass signal at the frequency for highpass at #8. Select "3-4 LP Sum" for a summed signal of channels 3-4 (mono bass output signal).
- Channel Balanced / Unbalanced Input Selector Switch** - Select "BALANCED" to use the 6-pin Balanced signal input. Select "UNBALANCED" to use the RCA signal inputs.
- Input Overload Indicators** - Indicates the signal input level or input gain level is too high.

Hawkins Bass Control - Theory and Use



Hawkins Bass Control (*parametric*) is a unique subwoofer control circuit included with the Soundstream Human Reign Unleashed amplifiers. It is capable of removing subsonic energy in program material while boosting subwoofer frequencies. The circuit consists of two controls. One adjusts the frequency of operation and the other adjusts the range of boost. With both controls adjusted fully counter-clockwise, no boost is applied and the amplifier is flat in response down to 20 Hz.

The frequency control adjusts the starting point of the subsonic filter. The high pass filter has two frequency ranges. When the bass control switch is set to "SUBSONIC", the high pass filter frequency can be adjusted from 13 Hz up to a maximum of 30 Hz. In this setting, no boost "Q" control is available. This control is useful for setting the lowest frequency that your subwoofer will see (see figure 1).

When the bass control switch is set to "HAWKINS BASS CONTROL" the high pass filter frequency can be adjusted from 30 Hz to a maximum of 70 Hz. In this setting, there is an available boost control of 0 to +9dB.

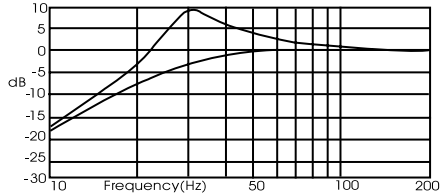


FIG. 2 VARIABLE "Q"

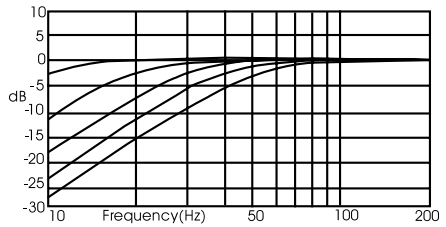


FIG. 3 VARIABLE HIGH PASS

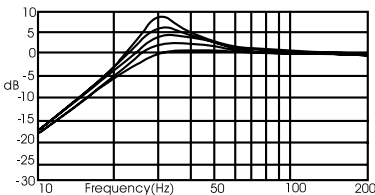


FIG. 4 VARIABLE BOOST

The Boost control adjusts the amount of level applied at the set frequency.

This is adjustable from flat (0dB) to +9dB. (See figure 2)

When the Boost is set to 0, Hawkins acts as a sub-sonic filter only. (See figure 3) The simple act of removing potentially harmful low frequencies can improve system output by as much as 3dB.(see figure 4)

Application

Subwoofers 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 potentially damaging signals can be removed by adding a subsonic filter. Figure 5 shows the effectiveness of the Hawkins Bass Control on woofer excursion in a vented enclosure. The woofer travels 7.5 mm at 10 Hz. With Hawkins Bass Control properly adjusted, this excursion can be reduced to less than 1 mm. This is of great benefit to lowering woofer distortion and increasing output.

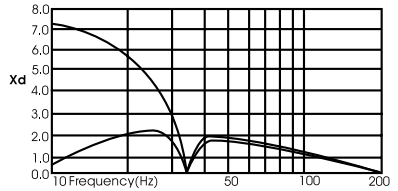


FIG. 5 LIMITED EXCURSION

Figure 5 shows the effectiveness of the Hawkins Bass Control on woofer excursion in a vented enclosure. The woofer travels 7.5 mm at 10 Hz. With Hawkins Bass Control 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' "Hz" control is as follows:

1. Adjust frequency and boost control to full COUNTER - CLOCKWISE position.
2. Set the bass control switch to "HAWKINS BASS CONTROL".
3. While listening to music with strong bass content at a moderate level, slowly adjust frequency control clockwise. Listen for a reduction of bass response. Now, rotate frequency control slightly backwards. This serves the purpose of removing the "subsonic" bass energy.

With Soundstream's Hawkins Bass Control, the boost and frequency control can provide virtually any combination of boost and cut to suit your designs.

So, Hawkins Bass Control can provide the "tailoring" needed for any type of "assisted" design and any woofer in any type of installation.

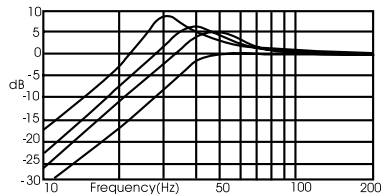


FIG. 6 VARIOUS SETTINGS

Phase Switch

In many car audio systems placement of the subwoofers can cause them to be out of phase with the rest of the system. This may cause poor subwoofer performance due to varying arrival times. To eliminate this the **Human Reign Unreashed** incorporates a 0 to 180° phase switch. By playing low frequency music and experimenting with the subwoofer phasing better sound quality and bass imaging may be obtained.

INSTALLATION STEP 1

WIRING

POWER AND GROUND

To ensure maximum output from your **Human Reign Unleashed** amplifier, use high quality, low-loss power and ground cables and connections. The **Human Reign Unleashed** amplifiers will accept up to 2 gauge power and ground cables. Determine from the chart below the minimum gauge power and ground wire for your application.

	<i>less than 10'</i>	<i>more than 10'</i>
HRU. 2	2 or 4 gauge	2 gauge only
HRU. 4	2 or 4 gauge	2 gauge only

CIRCUIT BREAKERS AND FUSES

EXTERNAL

Like all audio components, the **Human Reign Unleashed** amplifier 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 **Human Reign Unleashed** amplifiers need to be fused with an automotive-type fuse or circuit breaker. In the event of a blown power supply fuse(s), 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!

Human Reign Unleashed Amplifier Fuse Values

	<i>Battery Fuse / Circuit Breaker</i>
HRU. 2	200 amp
HRU. 4	140 amp

REMOTE TURN-ON

Connect the “Remote” line to the turn-on lead from the source unit. When +12Volts received, the amplifier will turn on. Use 16 guage wire minimum.

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

INSTALLATION STEP 2

INSTALLATION AND MOUNTING

AMPLIFIER LOCATION

The **Human Reign Unleashed** amplifiers employ highly efficient circuitry and a custom-engineered heat sink 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

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

WIRING

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

POWER UP

Power up the system, there may be a 2-3 second delay from the time the source unit is turned on to the time that the amplifier 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 3

LEVEL SETTING

The input level is adjusted by means of the input level control located on the control panel 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 the distorted input. By setting all components to reach clipping at the same time, you can maximize the output of your system. For the **Human Reign Unleashed** amplifiers, follow these steps for setting the input levels:

1. Turn the amplifier's input level 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 amplifier's input level until a near maximum undistorted level is heard in the system.
4. If Possible, use a volt meter & measure the A/C voltage out of the RCAs with a sine wave. Then adjust the input level accordingly for true level matching.

TRIDENT PROTECTION CIRCUITRY

Your **Human Reign Unleashed** amplifier is protected against both overheating and short circuits by means of main power fuses and the following circuits:

Speaker Output Protection

Ground Fault Differential

Smart Power Supply Thermal Rollback & 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 warranty and may damage your amplifier

TROUBLE SHOOTING

PROBLEM	CAUSE
No Sound and power LED is not lit	<ol style="list-style-type: none">1. No power or ground at the amp2. No remote turn-on signal3. Blown fuse near the battery
No Sound , power LED is lit	No signal input
Repeatedly blow amp fuse; frequent activation of Smart Power Supply Circuit	<ol style="list-style-type: none">1. Speaker or leads may be shorted2. Verify adequate amp ventilation.
Distorted output	Output signal level is too high and the amplifier output is clipping. Reduce the level either at the source or at the input level controls.

SERVICE

Your **Soundstream Human Reign Unleashed** amplifier is protected by a limited warranty. Please read the enclosed warranty card for details. As with all Soundstream products, a Return Authorization (available from Soundstream) is required for service of this amplifier.

SPECIFICATIONS

Satellite Channels

POWER	4 Ω Stereo (8Ω Bridged) (14.4 Vdc)	2 Ω Stereo (4Ω Bridged) (14.4 Vdc)	TOTAL POWER
HRU. 2	500W x 2 (900W x 1)	900W x 2 (1800W x 1)	1800
HRU. 4	140W x 4 (240W x 2)	240W x 4 (480W x 2)	960

THD	0.005%
Signal to Noise	105dB
Frequency Response	10Hz to 40kHz \pm 0.5 dB, -3dB @ 71kHz
Damping	1800 @ 100Hz, 960 @ 10kHz
Input Sensitivity	300 mV to 5.0 Volts
Input Impedance	10k Ohms

Crossover Specifications

Low Pass: 40Hz - 160Hz at 24dB/Octave

High Pass: 50Hz - 5KHz at 12dB/Octave

Hawkins Bass control

SubSonic Filter: No boost, High Pass filter from 13 to 30 Hz.

Hawkins Bass control : 0 to +9 dB Boost and SubSonic filter variable from 30 to 70 Hz.

Dimensions (W x D x H)

Human Reign unleashed(inch) : 11.125 X 22.0625 X 2.6875

Human Reign unleashed(mm) : 282.5mm X 560.4mm X 68.3mm

SOUNDSTREAM TECHNOLOGIES

1550 Maple Avenue., Montebello, CA 90640 U.S.A.

Phone 323-722-3333 fax. 323-722-1122

www.soundstream.com