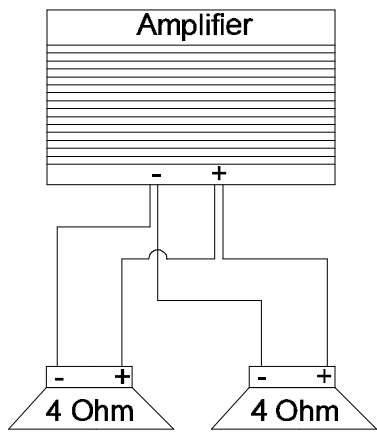
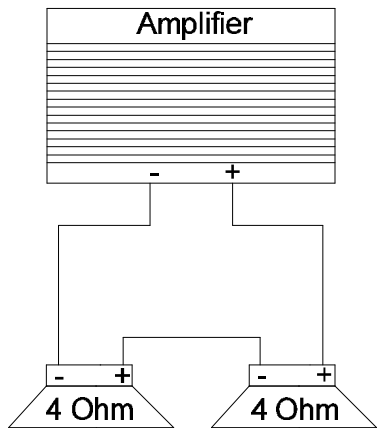


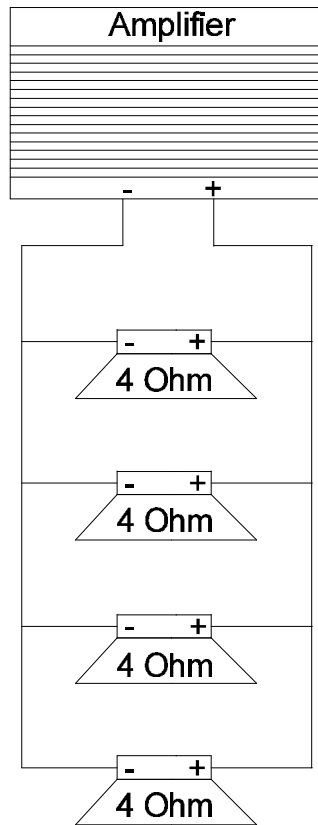
SERIES AND PARALLEL WIRING



*2-4 ohm drivers in parallel
= 2 ohms*



*2-4 ohm drivers in series
= 8 ohms*



*4-4 ohm drivers in parallel
= 1 ohm*

REFERENCE 404s

4/3/2 Channel Power Amplifier

OWNERS MANUAL AND INSTALLATION GUIDE

SOUNDSTREAM TECHNOLOGIES
120 Blue Ravine Road Folsom California 95630 USA
ph 916.351.1288 fax 916.351.0414
rev A - 4.25.96

SOUNDSTREAM[®]
T E C H N O L O G I E S

CONGRATULATIONS!

You now own the **REFERENCE404s Amplifier**, the product of an uncompromising design and engineering philosophy. Your Soundstream REFERENCE404s 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 and installation receipts for future reference.

Soundstream amplifiers are the result of American craftsmanship and the highest quality control standards, and when properly installed, 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 REFERENCE404s amplifier sounds better than anything you've ever heard, exercise caution to prevent hearing damage.

SERVICE

Your Soundstream REFERENCE404s amplifier is protected by a limited warranty. Please read the enclosed warranty card.

SPECIFICATIONS

REFERENCE404s

POWER	4 Ω Stereo (8 Ω Bridged)	2 Ω Stereo (4 Ω Bridged)	1 Ω Stereo (2 Ω Bridged)	1/2 Ω Stereo (1 Ω Bridged)
Watts	50 x 4	75 x 4	100 x 4	100 x 4

THD	<0.1%
Signal to Noise	>100 dB
Frequency Response	20 Hz to 20 kHz \pm 0.5 dB
Stereo Separation	>90 dB
Damping	>200
Input Sensitivity	200 mV - 5.0 V
Input Impedance	12 k Ω

Dimensions

W x D x H: 13.0" x 9.8" x 2.25"

PROTECTION CIRCUITRY

Your REFERENCE404s amplifier is protected against both overheating and short circuits by means of the following circuits:

- Auto High Current™ power supply
- Main power supply fuses
- Circuit breaker on each channel
- Smart Power Supply Thermal Rollback activating at 85°C
- A fail-safe thermal protection circuit activating at 95°C.

Your amplifier also incorporates an innovative Fault Diagnosis system that identifies a blown power supply fuse.

NOTE: If you experience blown main power supply fuses, DO NOT increase values beyond the original fuse value! Doing so will void your warranty and

TROUBLESHOOTING

<i>PROBLEM</i>	<i>CAUSE</i>
No sound and LEDs are not lit	<ul style="list-style-type: none"> • no power or ground at amp • no remote turn-on signal • blown fuse near battery
Fault LED is lit	<ul style="list-style-type: none"> • amp power supply fuse is blown or missing
Repeatedly blown amp fuse, frequent activation of Smart Power Supply Circuit	<ul style="list-style-type: none"> • speaker or leads may be shorted • verify adequate amplifier ventilation
Channels 1,2,3 or 4 experiencing intermittent output	<ul style="list-style-type: none"> • activation of the internal circuit breakers. • check to make sure channels 1-4 are driving a 1/2 ohm per channel load or greater • speaker or leads may be shorted
No output from channels 3 & 4 with 1 pair of RCA inputs	<ul style="list-style-type: none"> • Select "<i>Internal from ch's 1 & 2</i>" on Ch 3 & 4 input on the bottom of the amplifier. (see pages 14 - 17)

TABLE OF CONTENTS

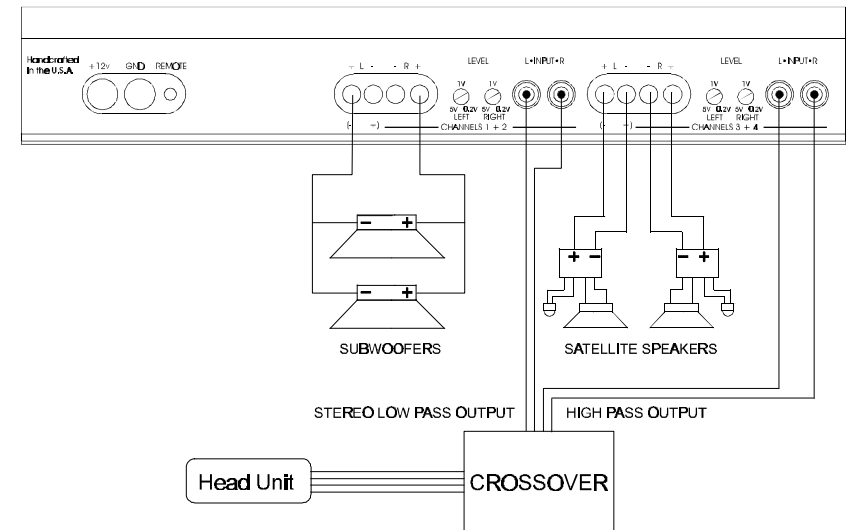
Design Features.....	4 - 5
REFERENCE404s Diagram.....	6 - 7
Auto High Current™ Power Supply.....	8
Selecting Input Modes.....	9
Wiring (with Diagram).....	10 - 11
Installation and Mounting	12
Level Setting	13
System Installation Diagrams.....	14 -17
Protection Circuitry.....	18
Troubleshooting	18
Service	19
Specifications.....	19

DESIGN FEATURES

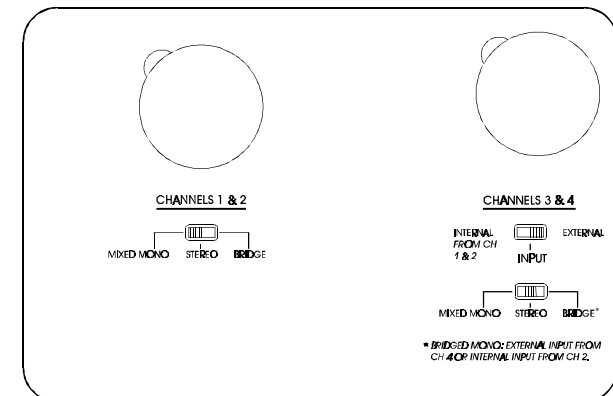
- **Uncompromising Design and Construction** including mil-spec glass epoxy circuit boards and high current custom gold-plated solid brass connections that will accept up to 4 gauge power/ground wire.
- **Auto High Current™** - Soundstream's newest exclusive circuit which automatically customizes your amplifier to its particular application— High Current, low impedance loads (multiple subwoofers, less than 2 ohms mono) or High Power, higher impedance loads (2 ohms mono and up).
- **Coherent Stereo™/Mixed Mono** selection for either “pure” stereo operation or mixed mono for simultaneous stereo and mono.
- **Chassisink™ Darlington Power Array** - Soundstream's “overbuilding” of the output section incorporates multiple output transistors instead of a few for faster, stronger power delivery. The transistors are sandwiched between the circuit board and the heatsink in a design called Chassisink™ to ensure cool, efficient amplifier operation.
- **PowerGrid Power Supply Design** - All power supply components are located near one another, connected by thick, wide PCB traces, which ensures rapid, high current delivery. The entire power supply is isolated on one side of the circuit board while the audio stage is located opposite it, guaranteeing minimal noise.
- **Ultra-Low ESR Capacitance Bank** - Multiple small input power capacitors are used to provide a lower ESR (Equivalent Series Resistance), which *means more power in and out faster*.
- **Smart Thermal Rollback** - Most amplifiers shut off when they get too hot. In the unlikely event the REFERENCE404s amplifier reaches 85° C, it will gradually roll back its average power (without affecting the dynamics). Once the amplifier has cooled off, it returns to full power output. If overheating should continue, a second thermal sensing protection circuit will shut off the amplifier if the heatsink reaches 95° C.
- **Unregulated Power Supply** - 4 ohm power ratings are measured at 12 volts, meaning substantially greater output in the real world when the vehicle is running, where voltages range from 13.2 to 14.4 volts.

SAMPLE SYSTEM #4

2 channels of high pass input with 2 channels of stereo output
2 channels of stereo low pass input with 1 bridged channel of output

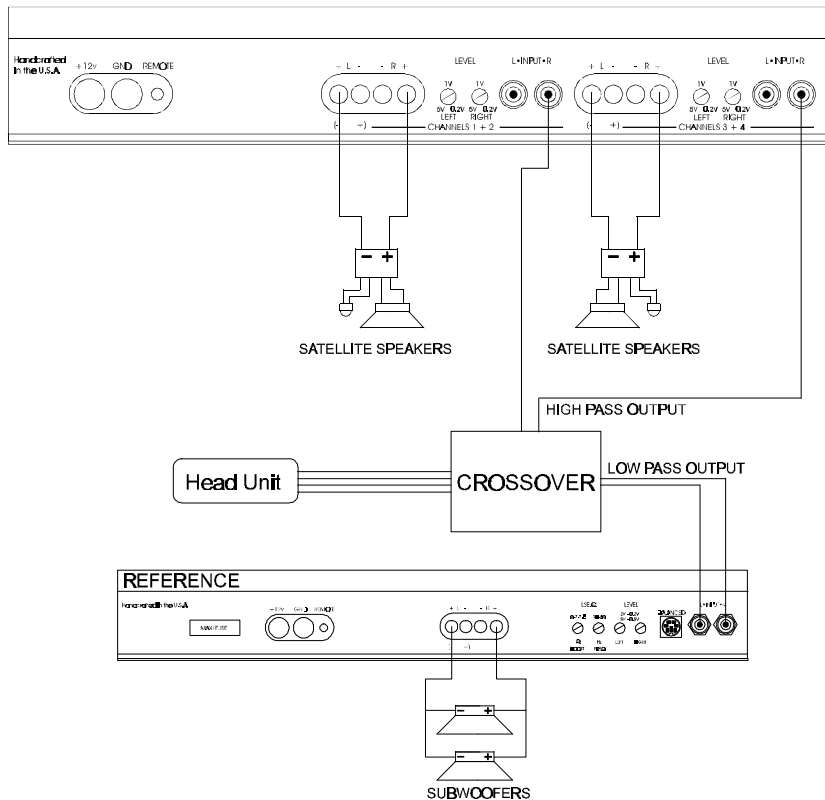


REFERENCE404s BOTTOM PLATE SWITCH SETTINGS

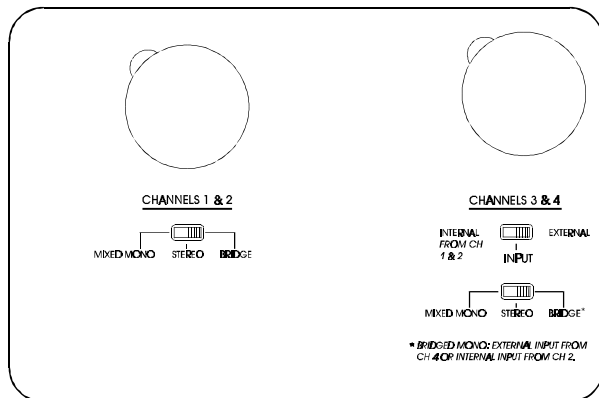


SAMPLE SYSTEM #3

2 channels of input with 2 channels of bridged high pass output
External input to channels 3 & 4 with an external crossover

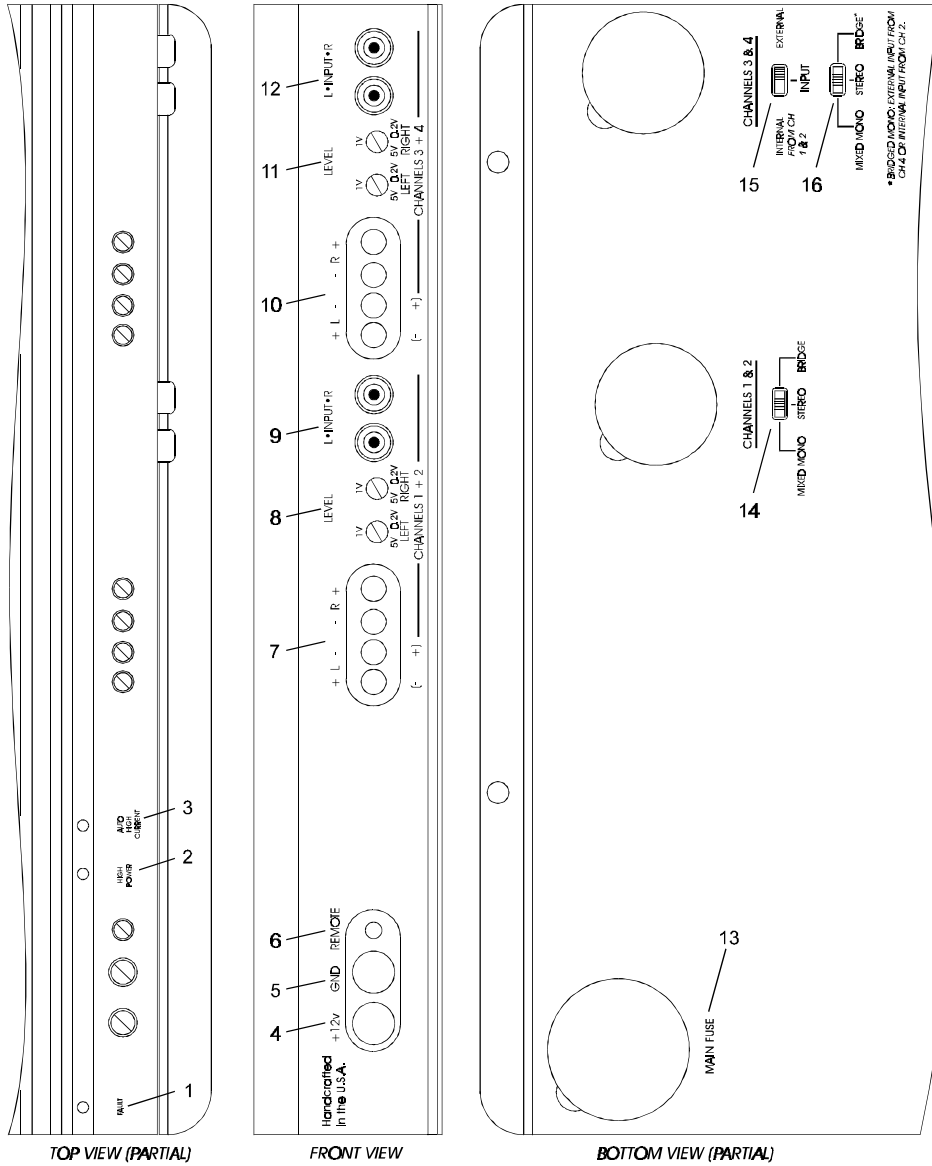


REFERENCE404s BOTTOM PLATE SWITCH SETTINGS



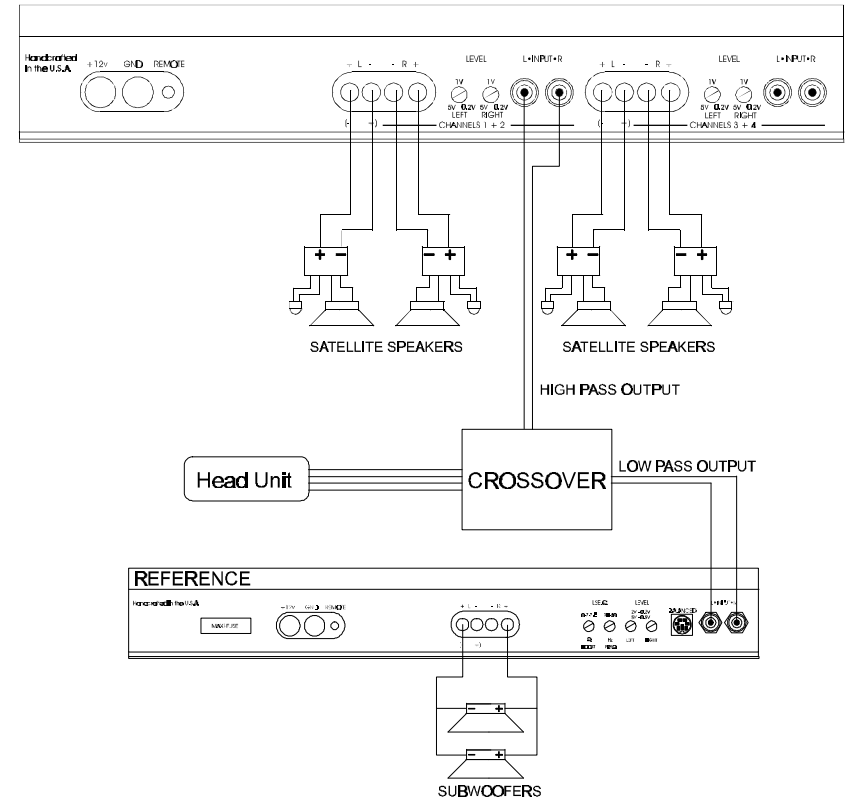
- **Fault Monitor LED** on the top panel notifies you of blown power supply fuses.
- **1/2 ohm Drive Ability** - The REFERENCE404s amplifier is designed to drive virtually any load—all the way down to 1/2 ohm stereo (per channel) or 1 ohm mono.
- **Four Independent Dual Discrete Class A Drive Stages** - Over six times the drive current of most amps, which maintains performance into low impedance loads.
- **Drive Delay™ Muted Turn-on/off Circuit** - A unique circuit which completely eliminates any amplifier-related turn-on/off noises.
- **Flexible Input Sensitivity** accepts voltages from 200 mV to 5.0 V, permitting maximum output from the amplifier with virtually any source unit.

Reference404s

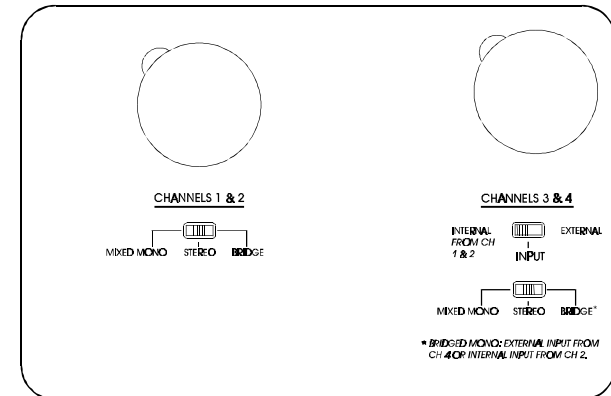


SAMPLE SYSTEM #2

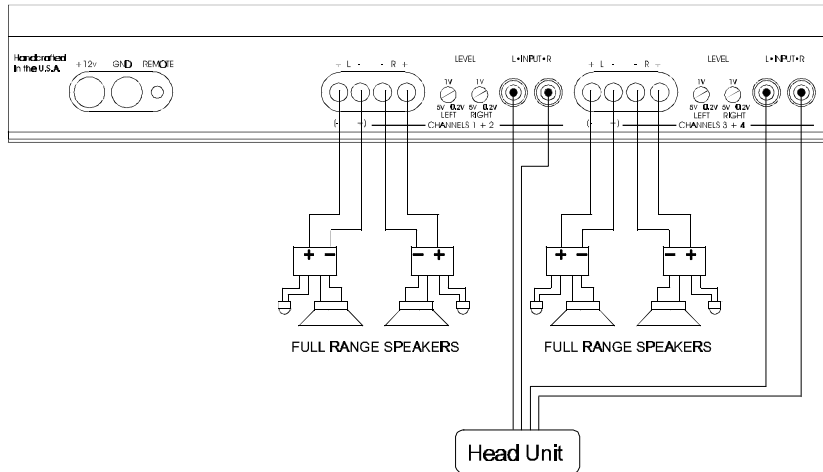
2 channels of input with 4 stereo channels of high pass output
Internal input to channels 3 & 4 with an external crossover



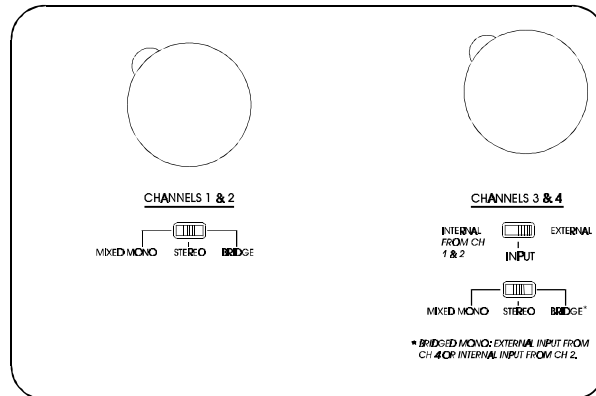
REFERENCE404s BOTTOM PLATE SWITCH SETTINGS



SAMPLE SYSTEM #1
4 channels of input
4 channels of full range output



REFERENCE404s BOTTOM PLATE SWITCH SETTINGS



Key to Callouts

- Fault LED** - Indicates a blown fuse.
- High Power LED** - Indicates amplifier power on in "High Power" mode.
- Auto High Current™ LED** - Indicates amplifier power on in "High Current" mode.
- +12V** - Connected to a fuse or circuit breaker, then to the battery's positive post.
- GND** - Main ground connection. Bolt to a clean chassis ground in the vehicle.
- REM** - Remote turn-on input from the head unit. Accepts +12V.
- Speaker Output Connections - Channels 1 & 2.**
- Input Level - Channels 1 & 2 independent input level controls.**
- Inputs - Channels 1 & 2 RCA inputs.**
- Speaker Output Connections - Channels 3 & 4.**
- Input Level - Channels 3 & 4 independent input level controls.**
- Inputs - Channels 3 & 4 RCA inputs.**
- Main Fuse** - Main power supply fuse. Replace only with the same value fuse.
- Coherent Stereo™/Bridge Mono / Mixed Mono Switch - Channels 1 & 2;** Select "Bridge" for bridged mono operation (use right channel input). Select "Stereo" for coherent stereo operation. Select "Mixed Mono" for simultaneous stereo / bridged mono operation.
- Channels 3 & 4 Input Select -** Selectable inputs from internal (from channels 1 & 2) or external (from channels 3 & 4 local RCA inputs).
- Coherent Stereo™/Bridge Mono / Mixed Mono Switch - Channels 3 & 4;** Select "Bridge" for bridged mono operation (use right channel input). Select "Stereo" for coherent stereo operation. Select "Mixed Mono" for simultaneous stereo / bridged mono operation.

AUTO HIGH CURRENT™ POWER SUPPLY

The REFERENCE404s amplifier employs an extremely efficient *Auto High Current™* power supply (patent pending). This new power supply circuitry automatically customizes your amplifier for optimum efficiency and power output into virtually any impedance load. When other brand amplifiers are driven at low impedances (i.e., 1 ohm or less), they shut down, squash dynamics and power output (called current limiting), or waste huge amounts of power (i.e., low efficiency). All of which reduce the "realworld" power the amplifier can produce in the car. Soundstream's *Auto High Current™* power supply allows the REFERENCE404s amplifier to be one of two types of amps: either producing maximum power at higher impedances (perfect for satellites) or at lower impedances (usually with multiple subwoofers). This is done by letting the amplifier's power supply continuously monitor the impedance of the load the amplifier is driving. If the impedance drops too low, the power supply will automatically switch into *High Current* mode. It will stay in this mode until the amplifier is turned off. The next time it is powered up, it will be in the *High Power* mode.

Unlike other amplifiers, Soundstream's REFERENCE amplifiers can be configured to drive virtually any impedance *and* make maximum power! The major advantages of this power supply are:

- awesome dynamic power capabilities
- added continuous power with higher voltages
- increased amplifier efficiency and reliability

Because of the dynamic properties of most music, all audio components should be able to react accordingly. Thanks to their unique power supplies, the REFERENCE404s amplifier can comfortably exceed its rated power for

OTHER COMMENTS:

If you blow fuses with the REFERENCE404s amplifier, 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!***

LEVEL SETTING

The input levels are adjusted by means of the input level controls located on the front of the amplifier. This is a unique dual-stage circuit that adjusts both level and gain. This topology maintains better Signal to Noise ratios 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. The reason is because an amplifier will only make what comes into it bigger. So, if you send it a distorted signal from the head unit, the amplifier is going to amplify distorted information. The same thing holds true if an outboard 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 the REFERENCE404s amplifier, follow the below procedure for the quickest, easiest means of setting the levels.

1. Turn the amp's input levels to minimum position (fully counter-clockwise).
2. Set 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.

NOTE: *Even though the S/N ratio with low output sources is better with the REFERENCE404s amplifier than others, your best combination of output level and Signal to Noise ratio will be achieved when the input levels are set*

INSTALLATION STEP 3

INSTALLATION AND MOUNTING

1. AMPLIFIER LOCATION

The REFERENCE404s amplifier employs highly efficient circuitry and a unique Chassisink™ design 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.

2. SWITCHES

Set the Coherent Stereo™/ Bridged Mono / Mixed Mono and Channel 3 & 4 input switches to the appropriate positions (see pages 14 - 17).

3. MOUNTING THE AMPLIFIER

- Using the amplifier as a template, mark the mounting surface.
- Remove the amplifier and drill the holes.
- Mount the amplifier to the surface using the provided hardware.

4. 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 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.

NOTE: There may be a small spark when connecting the power and ground lead to the amplifier for the first time. This is caused by current rushing into the amplifier to charge the power supply capacitors, and is completely normal.

- Double check each and every connection!
- Re-connect the fuse or circuit breaker.

5. POWER UP

Power up the system and look at the red "High Power" LED. There may be a

INSTALLATION STEP 1

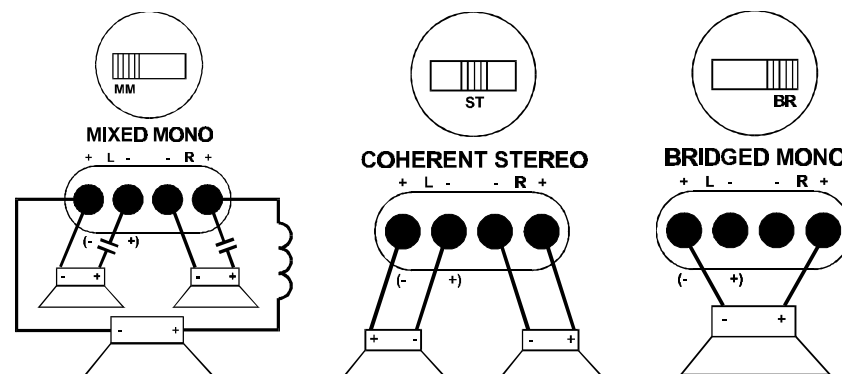
COHERENT STEREO™ / MIXED-MONO / BRIDGED MONO

The REFERENCE404s amplifier has the ability to operate in any one of the following modes:

Coherent Stereo™ with identical left and right stereo channels for maximum fidelity. Best choice for satellite speakers. Use this mode unless Mixed-Mono is necessary.

Mixed-Mono in order to drive stereo and mono simultaneously; works well for center channels. It can be used anytime you need a summed mono channel. Somewhat sacrifices sonic accuracy as additional circuitry is introduced to one channel. **In Mixed-Mono, the left channel is inverted, see diagram below or on the bottom of the amplifier.**

Bridged Mono for dedicated single channel operation; ideal for driving subwoofers. It is also used when large amounts of power are necessary for single speakers. **In bridged mono, only the right channel input is active.**



In bridged mono, only the right channel input is active.

NOTE: If you intend to drive the REFERENCE404s amp in mono but have stereo outputs from your crossover or source unit, you can put the switch in Mixed-Mono but follow the normal wiring for Bridged Mono.

INSTALLATION STEP 2

WIRING

POWER AND GROUND

To ensure maximum output from your REFERENCE404s amplifier, use high quality, low-loss power and ground cables. The REFERENCE404s amplifier will accept up to 4 gauge power and ground cables. Determine from the chart

	up to 10'	up to 20'
REFERENCE404s	Soundstream Power40 or Power80 (4 or 8 ga.)	Soundstream Power40 (4 ga.)

CIRCUIT BREAKERS/FUSES

EXTERNAL

Like all audio components, the REFERENCE404s 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 REFERENCE404s amplifier is fused with automotive-type fuses. In the event of blown power supply fuses, the "Fault" indicator on the front panel will light. The fuses are accessible via a plastic plug on the bottom of the amplifier. See the chart below to determine the fuse value. **Never replace the fuses with a higher value than what is supplied. This may result in amplifier damage and will void the warranty!**

REFERENCE404s Amplifier Fuse Values

Amplifier	Amplifier Fuse	Battery Fuse
REFERENCE404s	(2) 25 amp automotive	60 amp

WIRING (cont.)

REMOTE TURN-ON

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

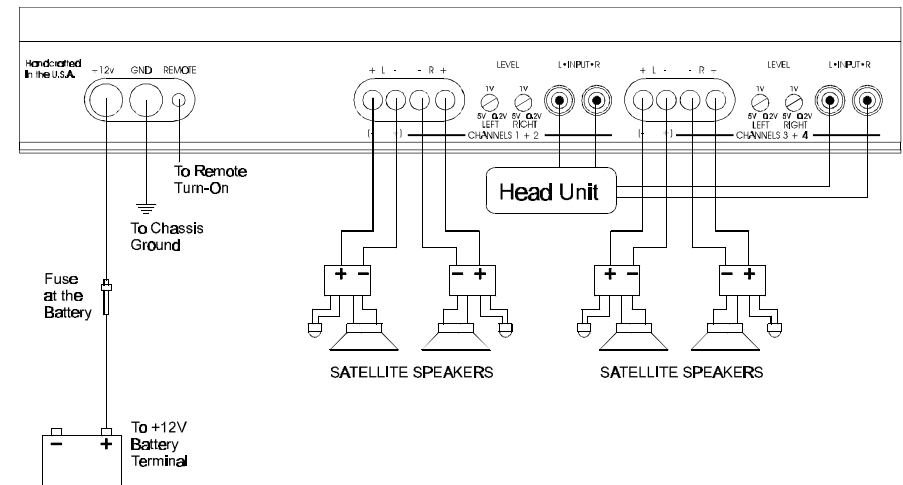
SIGNAL CABLE

Use a high-quality cable that will be easy to install and has minimal signal loss to guarantee optimum performance. Soundstream's DL 1 and SL 1 are ideal.

SPEAKER CABLE

The REFERENCE404s amplifier will accept up to 8 gauge speaker cable. Use a high quality, flexible, multi-strand cable for best performance and longevity.

WIRING DIAGRAM



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