SOUNDSTREAM®

TECHNOLOGIES

D'Artagnan5.1
Theater Amplifier

Owner's Manual
and
Installation Guide

DESIGN FEATURES

- **SLA/SH**™(*S*peaker *L*oad *A*dapting/ *S*ubwoofer *H*yper-Efficient) This new dual function technology currently operates in two different ways in different models. In full bandwidth applications the power supply adapts itself to the impedance of the connected speaker load by continuously varying the internal supply voltage, assuring maximum power output.
  This design improves efficiency and allows for a greater level of installation flexibility. In subwoofer applications the power supply tracks the incoming audio signal and increases of decreases its own voltage level to mirror the input. This design results in enormous low impedance , low frequency stability and maximum efficiency, since no power is wasted maintaining an unnecessarily high voltage level in the power supply.

- **BIO™Port**(*B*ridging *I*n and *O*ut) Enables two identical mono amplifiers channels to be fused together into a single subwoofer load with double the output power.

- **STACT**™ (*ST*abilized *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 (>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.

- **Drive Delay II™** Amplifier section powers up 2 to 3 seconds after the power supply eliminating turn-on and off pops. The 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.

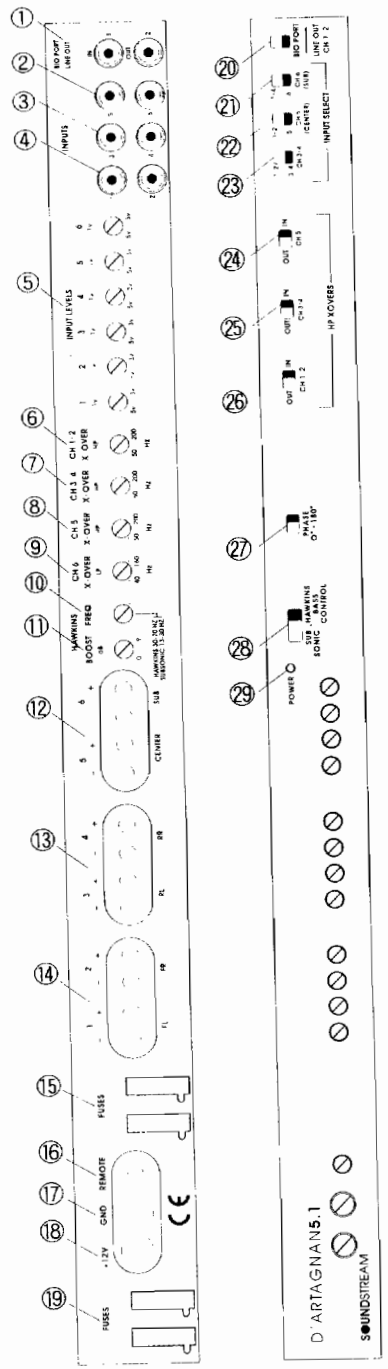
- **Chassisink™** All transistors are ideally located and sandwiched between the circuit board and the heatsink to provide cool efficient amplifier operation.

- **Differentially Balanced RCA Input** eliminates ground loop related noise in the audio.

- **Continuously Variable Crossover Network :** 12dB/Octave highpass crossover variable from 50 to 200 Hz and 24dB/Octave lowpass crossover variable from 40 to 160 Hz.

- **Flexible Input Level Control** allows 300 mV to 5 V input sensitivity.

- **Symmetrical Discrete Balanced Class A Drive Boards** auto-adjust for linear performance while driving low impedance loads.



nt View

Top View

KEY TO CALLOUTS

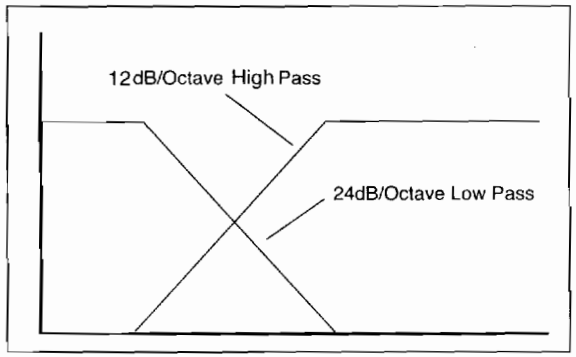
1. **Bio Port/Line Out -** RCA input and output connections for bridging two identical amplifiers. In BIO mode connect between the master amplifier's BIO OUT to the slave amplifier's BIO IN. This will bridge the amplifiers and bypass the preamplifier controls on the slave amplifier. In line output mode signal from CH1&2 is passed through on these RCAs.
2. **RCA Inputs -** Center and Sub channel RCA inputs.
3. **RCA Inputs -** Rear Right and Left channel RCA inputs.
4. **RCA Inputs -** Front Right and Left channel RCA inputs.
5. **Input Levels** - Input level control variable from 300mV to 5V.
6. **High Pass Filter Control Adjustment-** Frequency adjustment control for the High Pass Filter for satellite CH1&2.
7. **High Pass Filter Control Adjustment-** Frequency adjustment control for the High Pass Filter for satellite CH3&4.
8. **High Pass Filter Control Adjustment-** Frequency adjustment control for the High Pass Filter for center CH5.
9. **Low Pass Filter Control Adjustment-** Frequency adjustment control for the Low Pass Filter for sub CH6.
10. **Subsonic/Hawkins Bass Control Adjustment** - Frequency adjustment control for the Hawkins Bass Control filter or the Sub Sonic filter.
11. **Hawkins Bass Control "Boost" Adjustment -** Varies from 0 to + 9 dB of boost when the Hawkins Bass Control circuit is engaged.
12. **Speaker connection Terminal -** Speaker connections for center and sub CH5&6.
13. **Speaker connection Terminal -** Speaker connections for satellite CH3&4.
14. **Speaker connection Terminal -** Speaker connections for satellite CH1&2.
15. **FUSES -** Subwoofer channel power supply fuses. Warning: Replace only with the same value fuses!
16. **REMOTE -** Remote turn - on input from the head unit. Accepts +12V.
17. **GND -** Main ground connection. Bolt to a clean chassis point in the vehicle.
18. **+12V -** Connected to a fuse or circuit breaker, then to the battery's positive terminal.
19. **FUSES -** Satellite channels power supply fuses. Warring: Replace only with the same value fuses!
20. **BIO/LINE OUT Switch -** Switches RCA function from BIO Port to pass through of CH1&2 to feed additional amplifiers.
21. **Input Select CH6 -** Switches RCA input signal between CH6 or CH1-4.
22. **Input Select CH5 -** Switches RCA input signal between CH5 or CH1-2.
23. **Input Select CH3&4 -** Switches RCA input signal between CH1&2 or CH3&4.
24. **HP XOVER -** Switches HP crossover on or off for CH5.
25. **HP XOVER -** Switches HP crossover on or off for CH3&4.
26. **HP XOVER -** Switches HP crossover on or off for CH1&2.
27. **Phase Selector -** Select between 0 or 180° of output on subwoofer channel.
28. **Subsonic / Hawkins Bass Control Switch** - Selectable subwoofer enhancement circuit. Select "SUB SONIC" to engage the Sub Sonic filter with no boost. Use the knob indicated by callout #10 to set the frequency: 13-30Hz. Select "Hawkins Bass Control" to engage the Sub Sonic filter with available boost and the knob indicated by callout #10 to set the frequency: 30 to 70Hz.
29. **Power LED -** Indicates amplifier power.

CROSSOVER & PHASE ADJUSTMENTS

The **D'Artagnan5.1** amplifiers incorporate an on-board staggered electronic cross-over. No external electronic crossover is necessary. The low pass portion of the crossover can be set independently of the rest of the system.

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 D'Artagnan5.1 has an always on low pass crossover that is independently variable from 40 to 160 Hz at 24 dB/Octave.

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



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 D'Artagnan5.1 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.

Hawkins Bass Control - Theory and Use

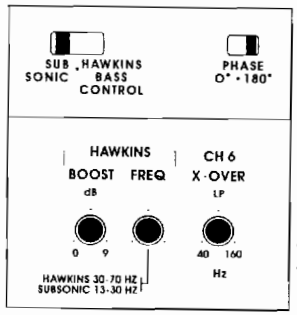


FIG. 1 BASS CONTROL

Hawkins Bass Control(*parametric*)is a unique subwoofer control circuit included with the Soundstream D'Artagnan5.1 amplifier. 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 (Hz) adjusts the starting point of the subsonic filter. On the Rubicon D'Artagnan5.1 the high pass filter has two frequency ranges. When the bass control switch is set to "SUB SONIC", the high pass filter frequency can be adjusted from 13 Hz up to a maximum of 30Hz. 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 70Hz. In this setting, there is an available boost control of 0 to +9dB.

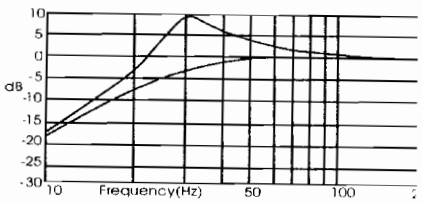


FIG. 2 VARIABLE "Q"

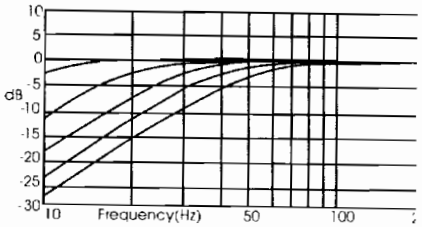


FIG. 3 VARIABLE HIGH PAS

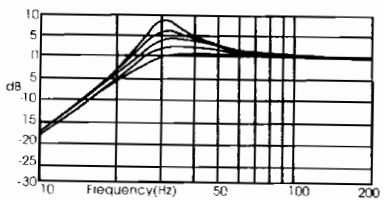


FIG. 4 VARIABLE BOOST

The Boost control adjusts the amount of lev applied at the set frequency.
This is adjustable from flat (0dB) to +9dB. (Se figure 2)

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

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 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.

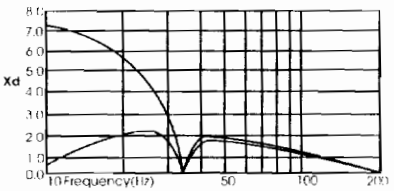


FIG. 5 LIMITED EXCURSION

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 CCW 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.

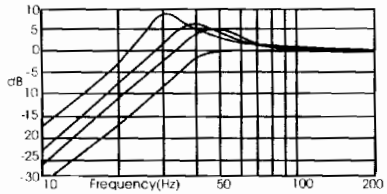


FIG. 6 VARIOUS SETTINGS

INSTALLATION STEP 1

WIRING

POWER AND GROUND

To ensure maximum output from your **D'Artagnan5.1** amplifier, use high quality, low-loss power and ground cables and connections. The **D'Artagnan5.1** amplifiers will accept up to 4 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´*
D´Artagnan5.1	4 or 8 gauge	4 gauge only

CIRCUIT BREAKERS AND FUSES

EXTERNAL

Like all audio components, the **D'Artagnan5.1** 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 **D'Artagnan5.1** amplifiers are fused with an automotive-type or Maxi-fuse. 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!**

D'Artagnan5.1 Amplifier Fuse Values

	Amplifier Fuse	*Battery Fuse / Circuit Breaker*
D´Artagnan5.1	(4) 30 amp automotive	150 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.

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 **D'Artagnan5.1** amplifiers will accept up to 8 gauge speaker cable. Use a high quality, flexible, multi-strand cable for best performance and longevity.

SYSTEM CONSIDERATIONS

The **D'Artagnan5.1** is an amplifier designed specifically for car theater applications. Its dual power supplies are capable of tremendous dynamic output on all six of its channels. All of these channels are discrete channels with minimal shared circuitry; because of this the satellite channels are not bridgeable. Also, as with any state of the art theater system, the use of an outboard surround sound signal processor is required. It is also important to note that the driver of the vehicle should not participate in any distracting activities, such as watching a movie, while operating a moving vehicle.

BIO PORT BRIDGING OPTION

The subwoofer channel of the **D'Artagnan5.1** amplifier has the ablity to be bridged to another identical amplifier for double the output by using the BIO Port. When this feature is used, the master amplifier's level and crossover switches affect both amplifiers (the slave amplifier's controls are totally bypassed). By switching the phase switch to 180° on the slave amplifier and connecting a RCA cable from the BIO OUT on the master amplifier to the BIO IN on the slave amplifier both amplifiers are synchronized. Then connect a positive speaker cable to the slave amplifier's positive terminal. Finally connect the speaker wires to a single load no less than 2 ohms. This will supply twice the power of a single amplifier.

INSTALLATION STEP 2

INSTALLATION AND MOUNTING

AMPLIFIER LOCATION

The **D'Artagnan5.1** amplifiers employ highly efficient circuitry,a custom-engineered heat sink, 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

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 form the source unit.
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 may be 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 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 D'Artagnan5.1 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.

TRIDENT PROTECTION CIRCUITRY

Your D'Artagnan5.1 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 Beyound the original fuse value! Doing so will void your warranty and may damage your amplifier.

TROUBLESHOOTING

PROBLEM	CAUSE
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. Move it to the "OUT" position.
Repeatedly blow amp fuse; frequent activation of Smart Power Supply Circuit	1. Speaker or leads may be shorted 2. 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 D'Artagnan5.1 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

Satelite Channels

POWER	4 Ω Stereo (12.6 Vdc)	2 Ω Stereo (14.4 Vdc)	Maximum Rated Output
D´Artagnan5.1	65W x 5	100W x 5	500 Watts

Subwoofer Channel

POWER	4 Ω Mono (4 Ω BIO Bridged) (12.6 Vdc)	2 Ω Mono (2 Ω BIO Bridged) (14.4 Vdc)	1 Ω Mono (1 Ω BIO Bridged) (14.4 Vdc)	Maximum Rated Output
D´Artagnan5.1	200W x 1 (800W x 1)	400W x 1 (1000W x 1)	500W x 1 (NA)	500 Watts

THD	<0.1%
Signal to Noise	>90dB
Frequency Response	20Hz to 20kHz ±0.5 dB
Damping	>200
Input Sensitivity	300 mV t o 5.0 Volts
Input Impedance	10k Ohms

Crossover Specifications00

Low Pass: 40Hz - 160Hz at 24dB/Octave
High Pass: 50Hz - 200Hz at 12dB/Octave

Hawkins Bass control

Sub Sonic Filter: No boost, High Pass filter from 13 to 30 Hz.
Hawkins Bass control : 0 to +9 dB Boost; Boost and Sub Sonic filter, variable from 30 to 70 Hz.

Dimensions (W x D x H)

D'Artagnan5.1: 19.0" x 9.8" x 2.25"

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