

SOUNDSTREAM DTR1.1400D

Text and Measurements by Garry Springgay // Photos by Soundstream



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Having spent most of my adult life in the audio industry, and most of that time working with car audio, I'll admit to being a bit jaded when someone tells me about their "new and unique" car stereo product. To be honest, it's not all that often that something really fresh and truly different comes along. But after wearing out some serious shoe leather at this year's Consumer Electronics Show, I think I've actually found a few things that are truly new and unique, and this review is all about one of them.

While strolling through the Soundstream booth, I spotted one of their new D Tower vertical standing amplifiers. In a category where mounting space is always at a premium, and installers jump through burning hoops to fit as much gear as possible into tight spaces, this was one of those ideas that screams, "why the hell didn't I think of that!"

There are 6 amplifiers in the series, 5 of them being single channel Class D subwoofer amps ranging in power from 900 watts to 3400 watts, and the sixth is a 4 channel full range Class AB model. I thought it would be cool to review one of these unique looking amps, and a simple request was all it took to put a DTR1.1400D in my hands.

The concept behind this design is to minimize the amount of floor area needed to mount the amplifier, and also to provide as clean and organized an installation as possible. To that end, the DTR1.1400D takes up a mounting area of only 3.3 inches wide x 11.7 inches long and 7.5 inches high. In fact all the models share the same mounting width and height, only the length dimension changes. These

dimensions make the amplifier ideal for tight spaces like regular cab pickup trucks, and because of the way the amp dissipates heat, Soundstream claims that the amp can even be mounted upside down on a sedans rear deck!

The amplifier comes with custom nylon feet that are used to securely mount and electrically isolate the amplifier from the cars chassis to prevent ground loop noise. Just in case you really want to mount the amp in a more traditional fashion, there are a couple of longer mounting feet that will allow the amp to be mounted lying down, but it's not as cool looking.

To make things easy and clean looking, all of the wiring connections are found on one end of the amplifier, and all of the controls are on the opposite end.

The D Tower series amps are finished in a high gloss black powdercoat, and have excellent fit and finish. This treatment is applied to every surface, as the available mounting options could allow any of the sides to be seen, so they all have to be well

finished. Wiring connections are made with sturdy hex head set screws, and thoughtfully, they are all the same size, so you don't have to run back and forth to the toolbox. Power connections will easily accept full spec 4 gauge wire, and the speaker terminals will handle up to 6 gauge cables. There is no on board fuse, but the manual suggests a 100A fuse be installed for this model. A remote mounted level control is optional.

On the control end of the amp, the pots are metal, and mounted flush with the end panel for easy access, but no accidental bumps will change the settings. The pots are also detented, with about 40 clicks covering the 270 degrees of rotation. Controls on the DTR1.1400D include Gain, Low Pass Filter, Subsonic Filter, Bass Frequency and Bass Boost, and a Phase control. Also found on this end of the amp are blue Power and red Protection LED's.

The owner's manual is a straightforward and fairly basic affair, covering the entire series with 10 pages of clearly written information, and well drawn diagrams. Quite frankly, if you can't install and ▶▶

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adjust this amplifier using the included manual, you probably should not be working on a car anyway.

Of course I had to take it apart, and what I found on the inside was just as nicely made as the exterior. The amp uses typical Class D technology, with 10 high current HEXFET MOSFETS in the power supply, and 8 high current MOSFETS in the output stage. Energy storage is handled by 5-2200µF capacitors for the power supply, and 2-4700µF caps for the output. The printed circuit board is high quality FR4 material, and uses very low tolerance surface mount parts where ever possible. The PCB is mounted to one "side" of the amplifier, and I wondered how well the heat would transfer to the other side. As it turned out, the heat generated was dissipated quite equally by both sides of the amp, with temperatures remaining within a few degrees of each other from one side to the other.

LISTENING

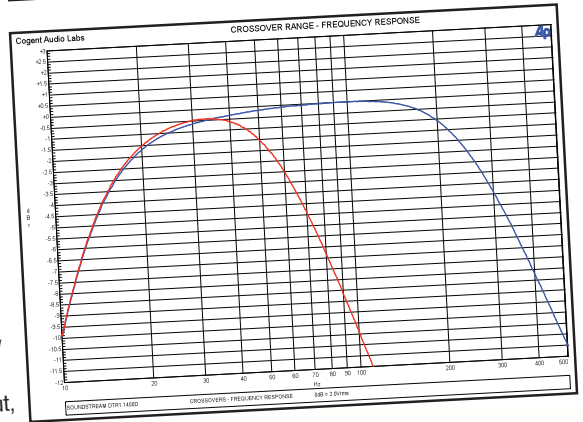
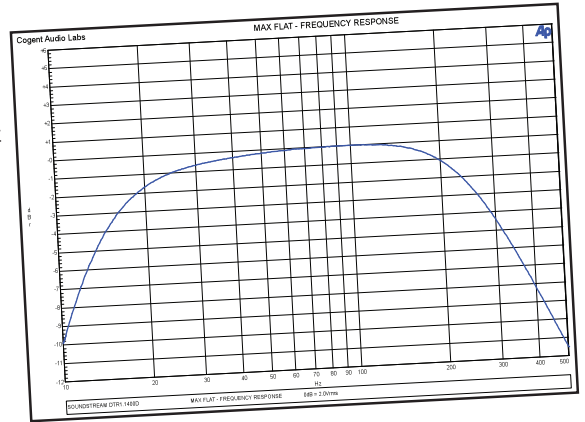
I connected the DTR1.1400D to my 2 ohm reference system, and after setting the controls to my listening preferences, I refilled my coffee cup, and sat down to do some listening. As expected, the Soundstream amp delivered plenty of power and authority, and after a bit of tweaking of the phase control, I was really pleased with how well the subwoofers integrated with my full range speakers. The bass was quite tight and natural sounding, with pretty good control of cone inertia. Fast bass lines had good definition, and the subsonic filter could be turned low enough to reproduce the very lowest of notes. I like the ability to adjust the frequency of the bass EQ, and with a frequency range of 30-90Hz, the DTR1.1400D will give you all the control you'll need. I was also quite impressed with the general efficiency of the amp while playing music. Even when at pretty serious volume levels, the average current draw was easily within the capabilities of a stock charging system. The blue Power LED is very bright, and cast a glow all the way across my listening studio.

PERFORMANCE/BENCH MEASUREMENTS

Before I get into the specific performance of this amplifier, I thought I should explain a bit about a common problem "bench techs" have when measuring some Class D amplifiers. A common issue with Class D amplifiers is the amount of noise in their output signal, which is caused by the high frequency square "carrier" waveforms used to generate the audio output. While this noise is well above any audible frequencies, (typically 50-80kHz) it is measured by test equipment, and is easily seen on an oscilloscope.

With the Soundstream DTR1.1400D, perhaps because the signal cables are on the same end of the amp as the power supply, and that convenience requires a signal cable be routed all the way through the internals of the amp, the amplifier had quite a bit of high frequency noise on it's outputs, more in fact than many competitive products. But, because this noise is well above the audible spectrum, and most certainly higher than any subwoofer could ever reproduce, it's generally not a problem. That is, until you attempt to measure power using a standard distortion/noise specification as a limit. The industry standard is 1.0%, but this limit is difficult for many Class D amplifiers to stay below, because of the high frequency noise they generate.

As a result, Soundstream does not spec the power of these amplifiers using the 1.0% limit, instead it would appear that they use the point at which the amplifier begins to clip, which is a real world indication of the power limits of the amp in the intended application. >>



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Disregarding the 1.0% limits because of the noise issue, I measured the output power of the amp using the clipping point as the limit, and my results were extremely close to the advertised specifications. Efficiency was good at about 89% at full power and still 78% at 1/3 power, where most of the listening is actually done. Signal to noise with an A-weighted filter was also pretty good at -70dBA at 1 watt. (The

switching noise is so far above the audio spectrum, it typically does not have a significant effect on S/N ratio measurements)

The amp has under and over voltage protection, as well as thermal and short circuit protection. All of these circuits worked perfectly. Phase adjustability was 122 degrees of adjustment at 100Hz. The built in Bass EQ with its adjustable frequency as well as

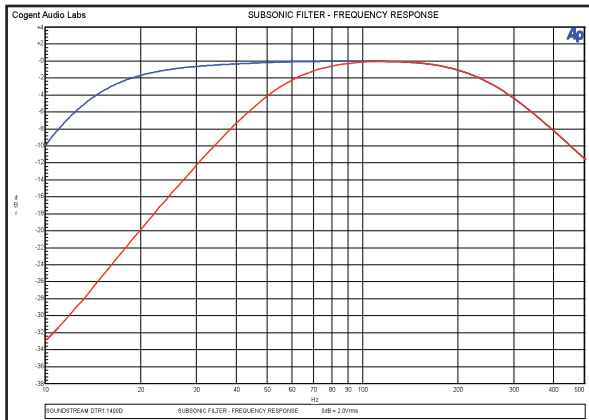
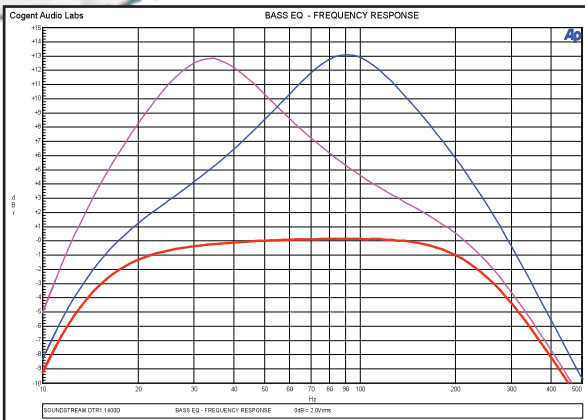
boost, worked exactly as indicated. The crossover and subsonic filters are -12dB/octave designs, and were accurate and easy to adjust.

TECHNICAL DATA

The following power measurements were obtained using industry standard methods. (1kHz @ 1.0% THD+N - Battery voltages shown +/- 0.2V)

MEASURED PERFORMANCE SPECIFICATIONS

| MANUFACTURERS RATED POWER | ACTUAL MEASURED POWER @ 1.0% THD+N @ 12.6V BATTERY | ACTUAL MEASURED POWER @ 1.0% THD+N @ 14.4V BATTERY | ACTUAL MEASURED POWER @ CLIPPING @ 14.4V BATTERY |
|---------------------------|--|--|--|
| 450 x 1 @ 4 Ω | 384 x 1 @ 4 Ω | 435 x 1 @ 4 Ω | 514 x 1 @ 4 Ω |
| 900 x 1 @ 2 Ω | 653 x 1 @ 2 Ω | 506 x 1 @ 2 Ω | 887 x 1 @ 2 Ω |
| 1400 x 1 @ 1 Ω | n/a | n/a | 1341 x 1 @ 1 Ω |



CONCLUSION

The D Tower series from Soundstream is a fresh look at an old problem. The mechanical design is well engineered and properly executed, and I expect these amps to be quite reliable. Yes, this sample had some excessive switching noise on it's outputs, but in the real world this noise is basically inconsequential, and you'll never know it's there. I like the highly efficient design, both in terms of the current demands as well as the ability to dissipate heat. Add those benefits to the ability to mount this amp in a place where few others will fit, and you really do have something new and unique! **PBS**



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| Signal to Noise Ratio referenced to 2V output. (CEA-2006A) (1 watt @ 4 ohms) | -70dBA |
| Signal to Noise Ratio referenced to full output. | -96.4dBA |
| THD+N at rated power | >1.0% |
| CEA-2006A rated 4 ohm Power (minimum power per channel developed over the entire intended audio bandwidth) | 435 watts |
| Maximum Efficiency at full 2 ohm power per ch. | 88.8% |
| Idle Current | 1.3A |
| Input Sensitivity | 185mV- 5.0V |
| Maximum Current @ full power, lowest rated impedance | 118A |
| Frequency Response (-3dB) | 16Hz - 260Hz |
| High Pass Crossover | n/a |
| Low Pass Crossover | 40Hz - 220Hz -12dB/oct |
| Bass EQ boost | +13dB @ 35-90Hz |
| Phase Adjustment (degrees of shift @ 100Hz) | 122° |