

ARC AUDIO KS 300.2 AMPLIFIER

Text by **Garry Springgay** // Photos by **Manufacturer**

To be able to build high power and physically small amps that don't overheat, requires a great deal of attention to the overall efficiency of the amplifier. That means the goal is to waste as little power as possible to the generation of heat, and put that power where it belongs, at the outputs used to drive your speakers.

Making full use of the design and engineering brilliance of Robert Zeff, the folks at Arc Audio are quickly gaining a reputation for building very good sounding, small footprint amplifiers. Some months back we looked at an Arc Audio mini amplifier that used Class G/H topology to achieve these goals, and it was an excellent performer. This time we're going to look at another Class G/H model from Arc Audio, the KS 300.2, which is a two channel, bridgeable design rated at a serious 350 watts per channel into 2 ohms. However, the amp is roughly half the size of what you'd expect from a chassis capable of producing over 700 watts of power. How do they do it? A Class G/H amplifier has variable "rail" voltages, which are modulated with rise and fall with the input signal. Thus the amplifier increases efficiency by reducing the wasted power at the output transistors, at all power levels. Many people don't realize that a typical Class AB amp that has a full-power efficiency of 75% is only about 20% efficient at low power levels (1/3 full power) where we do most of our listening. That means that for every 100 watts of power consumed, 80 watts is wasted as heat!



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Obviously, when you increase efficiency, you build an amp that generates less heat per watt of power consumed, and you can use a smaller heat-sink. Generally speaking, Class G/H amplifiers are significantly more efficient than class AB, but a bit less efficient when compared to Class D. However, Class G/H designs are not saddled with the negative EMI effects and output filtering requirements

of Class D designs. Some will argue that this makes the Class G/H amplifier an inherently better sounding design. I have heard good and bad examples of both, and the Arc Audio example is definitely one of the good ones.

FEATURES

The Arc Audio KS 300.2 has power ratings of 180 watts per channel at 4 ohms, and a whopping 350 watts per channel at 2 ohms. Yet the KS 300.2 measures only 2.375"H x 8"W x 11.25"D which is small for a 700 watt amplifier.

Cosmetically, the amplifier is definitely more substance than flash, with a simple stamped- steel smooth cover finished in matte black powdercoat. A silver oval badge is attached via adhesive to the cover, resulting in very simple and understated cosmetics, almost bordering on plain. The stamped cover has perforations running down each side providing air supply to the internal fan, which exhausts the hot air out each end of the amp.

Connections for power and speakers are found on one end of the chassis, and signal input and control functions are on the opposite end. The wire terminals are beefy and solid, with 4 gauge power terminals and 10 gauge speaker connections. Over-current protection comes from a trio of 30A ATC fuses, found adjacent to the power connections.

Signal input and control features are what you'd expect, with good quality potentiometers for gain, bass boost, and frequency selection. The crossover

functions can be set for high-pass, low-pass or full range, with a variable frequency range of 55Hz to 5500Hz, a very wide range of adjustment thanks to the incorporation of a x10 multiplier switch. The crossover slopes are -12dB/Oct.

Another handy feature is the amplifiers ability to sum the L+R channels, which is very useful in providing a true summed mono output to a subwoofer connected to the bridged outputs. And if you should ever have a problem, the Arc Audio KS 300.2 also includes a handy diagnostic tool to help you find the problem and get it rectified without having to call for help. The normally green power LED will turn red and flash a coded signal if the built in microprocessor detects a short, over voltage, or an overheating condition exists. By counting the number of flashes and referring to the codes in the owner's manual, you can quickly tell what the issue may be, and get it corrected.

Internally, the KS 300.2 uses a top quality PCB, and extensive use of surface mount components. There is plenty of onboard capacitance, and all of the transistors are the large case TO-247 style for maximum reliability and current transfer.

LISTENING

I have listened to several of Mr. Zeff's Class G/H amplifiers before, and I always came away impressed with the sonics and the overall efficiency, especially at fractional power levels where we do most of our listening. I'm happy to report the KS 

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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
180 x 2 @ 4 Ω	167 x 2 @ 4 Ω	222 x 2 @ 4 Ω
350 x 2 @ 2 Ω	274 x 2 @ 2 Ω	364 x 2 @ 2 Ω
700 x 1 @ 4 Ω	557 x 1 @ 4 Ω	736 x 1 @ 4 Ω
Signal to Noise Ratio referenced to 2V output. (CEA-2006A) [1 watt @ 4 ohms]		-87.3dBA
Signal to Noise Ratio referenced to full output.		-110.7dBA
THD+N at rated 4 ohm power		0.035%
CEA-2006A rated 4 ohm Power (minimum power per channel developed over the entire intended audio bandwidth)		185 watts @ 20Hz
Maximum Efficiency at full 2 ohm power per ch.		66.9%
Efficiency at 1/3 rated power.		45.7%
Idle Current		1.4A
Input Sensitivity		248mV- 3.7V
Maximum Current @ full power, lowest rated impedance		75.6A
Frequency Response [-3dB]		11Hz - 57kHz
High Pass Crossover		55Hz - 5.5kHz -12dB/Oct
Low Pass Crossover		55Hz - 5.5kHz -12dB/Oct
Bass EQ boost		+16dB @ 45Hz
Phase Adjustment [degrees of shift @ 100Hz]		N/A

300.2 offered more of the same, as well as gobs of power when needed. Connected to my reference listening system in my very quiet listening room, I began my auditions with the amp set to full range output. The amp may be on the small side and rather ordinary looking, but the sonic performance was anything but ordinary. I always make notes as I listen to several dozen of my favorite tracks for sound quality evaluations.

During this session, I found myself writing the same two words several times... "Smooth" and "Natural" were my most frequent observations, as the amplifier simply sounded natural and didn't add any character or coloration of its own to the music. I also noted it was quite good at re-creating a sense of space in my recordings that were done in large venues, and none of the detail or ambience was missing. The amp sounded very much like a good Class AB design, but with far greater efficiency. Dynamics were excellent, and there was absolutely no trace of distortion caused when the amplifier would modulate its rail voltage. I usually have some concern about the added noise of a fan cooled amplifier, but throughout my session, I never heard the fan at all, and in fact I forgot it was even there.

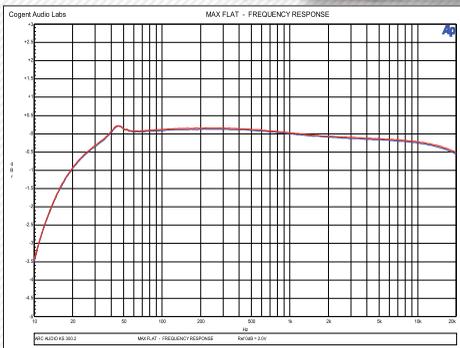
Changing things around and connecting the amp to my subwoofer system, I set the crossover to 100Hz low-pass, and summed the output signal. The first note I made in this mode was "Authority". The KS 300.2 showed an abundance of power and retained the ability to control the woofer well. The sound was tight and articulate, and when I increased the level, my ears cried uncle well before the KS 300.2 ran out of steam. This is one of those amplifiers that you can use with equal success on your components or your subs, and never get tired of listening to it.

PERFORMANCE/BENCH MEASUREMENTS

On the bench the KS 300.2 measured very respectably in all areas. It exceeded its rated power levels, and all of the features and controls worked very well. Signal to noise was excellent as well, as was stereo separation, and THD vs frequency measurements. The single gain pot provided excellent tracking of the gain of each channel, with never more than 0.2dB of difference between them. This is much better than average, and speaks to Arc Audio's choice of very good quality components. Thermal testing showed excellent performance as well, the inherent efficiency of the design, coupled with a well designed cooling system means this amp should very seldom have a thermal problem.



MAX FLAT RESPONSE



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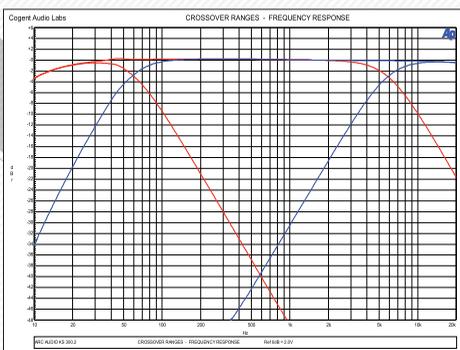
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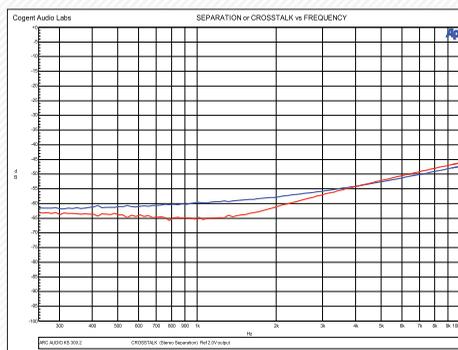
Combining the latest technology and the true artistry of a world class designer, the Arc Audio KS 300.2 represents one of the best examples of real world efficiency and sonic performance. Very few amplifiers pack this much power into a chassis this small, and sound this good while doing it. And at a suggested retail price of only \$399 (U.S.) the KS 300.2 is also one of the best watt per dollar values in the high efficiency amp market. **PAS**



CROSSOVER ADJUSTMENT RANGE



CROSSTALK



BASS EQ

