

Sherwood Newcastle A 965 7-channel power amp and R 965 7-channel receiver (power amp section only)

Manufacturer: Sherwood America, 13101 Moore Street, Cerritos, CA 90703; 800/962-3203; www.sherwoodusa.com

Price: A-965 Power Amp, \$1,500; R-965 AV Receiver, \$2,000

Source: Manufacturer loan

Reviewer: David Arthur Rich

A-965 7-channel Power Amp

• **All-Channels-Driven Power 20 Hz-20 kHz:** 10 Watts per channel (x 2) into 8 ohms

• **All-Channels-Driven Power 20 Hz-20 kHz:** 100 Watts per channel (x 7) into 8 ohms

• **All-Channels-Driven Power 20 Hz-20 kHz:** 160 Watts per channel (x 7) into 4 ohms

• **THD for all test conditions above:** Less than 0.02%

• **Signal to noise ratio:** 115 dB (18.7 bits digital equivalent)

• **Dimensions (H x W x D):** 7 5/8" x 17 3/8" x 18"

• **Weight:** 80 lbs.

A 965 AV Receiver (power amp section)

• **Two-Channels-Driven Power 20 Hz-20 kHz:** 120 Watts per channel (x 2) into 8 ohms

• **THD:** Less than 0.02%

• **Dimensions (H x W x D):** 7 5/8" x 17 3/8" x 18"

• **Weight:** 46 lbs.

The Sherwood brand has a lengthy history, but the original management is long gone. Korean Etronics Corp. now has the rights to the brand. Korean Etronics manufactures for a wide variety of well known names in the business and capitalizes on its economies of scale. More impressive is the lean nature of the US operation. Eugene Chavez juggles customer support, technical support, and the service center. Jeff Hipps and Gary Graning handle sales, marketing, and press relations. I almost ran past the CES booth, which had little relation to the size of this company. All these overworked employees are keeping costs down, allowing the savings to pass through to the consumer.

I am currently testing the Sherwood Newcastle R-965 receiver (review to come in a future issue), but the A-965 power amp, which is related to the power amp in the R-965, is the subject of this review. The A-965 is a significant product in its own right and deserves to have the spotlight shone upon it. The front end of the R-965 is a complex piece of electronics that I have reviewed in a separate review. The A-965 sells for \$1,500. The R-965 with the complete AV front end is \$2,000. The standalone front-end of the R-965 is available for \$1,500 as the P-965 AV controller. Sherwood expects most A-965 power amps will ship with P-965 AV controllers (\$3,000 for the two units), but I expect the A-965 to have a wider audience.

The A-965 weighs 80 pounds, with the power supply and the heat sinks providing the center of gravity. Two giant transformers take up most of the space in the unit and the rest is the heat sinks.

With all the metal, the unit will pass FTC with seven channels driven into a 4-ohm load. The power into 4 ohms is 160 watts. That is just about the maximum power that can be expected from a seven-channel amplifier designed to meet the UL-developed safety standards. (Things are not as simple as



looking for the UL label anymore. The Occupational Safety & Health Administration now certifies multiple companies to test consumer equipment for safety. These are called Nationally Recognized Testing Laboratories (NRTL). In most cases the testing standard used is the one developed by UL in the past. If the NRTL is not UL it will use its own Registered Certification Mark. The web site <http://www.osha.gov/dts/otpca/nrtl/nrtlmrk.html> shows marks for each NRTL that would be placed on equipment for each NRTL that could test the unit. One wishes that OSHA would have established a single mark to indicate that an NRTL had certified a product was safe to OSHA standards, but instead we have to deal with many different marks that indicated a product has been tested to OSHA standards of safety.)

Class AB amplifiers running full out are approximately 70% efficient at full power so the power coming out of the wall is 13 amps, which is just under the rating for a standard wall outlet (leaving 2 amps to supply everything else on the same AC loop). Amplifier manufacturers selling 300-watt channels times 7 will not pass UL safety tests and an NSTL label is absent on these amplifiers. I looked high and low at CES and not one of the manufacturers sporting an amplifier rated at 300 watts times 7 had an NSTL label on the back. In reality, you would need to hang a 15-amp 220-volt power cord on these amplifiers to prevent them from popping a fuse. These giant amplifiers do not pop fuses in real life because they rarely approach full power, at least not simultaneously on all channels.

Why has no 300 watt multi-channel power amp been offered with the correct power cable? You guessed it—the high-end dealers would go crazy with thoughts of reduced sales. Imagine them having to advise clients to first call their electrician before proceeding with the sale. These same high-end dealers will, of course, gladly sell you \$1,000 power cords for your 15-amp circuit.

I do not know about you, but I would worry about a power amp sitting in my living room that was not tested to UL standards by an OSHA-certified laboratory. Apparently, products without NRTL labels are available for sale in all states but Oregon. Go Beavers!

OK, back to the Sherwood A-965 and R-965, which proudly display their UL labels. From a practical perspective, the R-965 is about as big and heavy as an AV receiver can get. The single transformer of the R-965 AV receiver distinguishes it from the A-965. The R-965 also has less room for heat sinks since all the front-end electronics fills half the box. Otherwise, the differences are minor. With all the metal taken out of the R-965, it can only pass FTC into 8 ohms with two channels driven at a slightly higher power rating of 120 watts per channel. Making that compromise saves \$1,000 over the A-965/P 965 combo.

Both Sherwood units share a nicely designed circuit topology and some high quality parts. Attached to the big heat sinks are expensive Sanken 2SA1216/2SC2922 complementary-pair power transistors. These transistors mean business packaged in the MT 200 plastic package that measures 1.5 inches wide. For a single 10 msec burst, they can source 35mA. While you can achieve the same thing more economically by putting multiple transistors in parallel, you would have a hard time achieving as low of junction capacitance. The devices have a unity current gain frequency (the frequency that a piece of wire would do as well) of 40MHz. That's twice as fast as most power transistors in this class, which is why the 2SA1216/2SC 2922 are more than twice the normal price. Faster is better, because the amplifier can be made more stable when driving complex loads at audio frequencies. The A-965 has two pairs of paralleled pairs of 2SA1216/2SC 2922 per channel while the R-965 has one pair. In all other respects, the electronics on the power supply board are the same.

To generate enough current at the base of the 2SA1216/2SC 2922, a two-transistor compound common-collector common-emitter pair is employed instead of a single transistor pre-driver stage. For the voltage gain stages, the amplifier starts with a differential pair with an active current-mirror load to ensure excellent common-mode rejection. By biasing the differential pair with a Wilson current-mirror, the rejection ratio is further improved. A high common-mode rejection ratio improves the distortion performance of an amplifier when used in a non-inverting feedback configuration, which is the standard topology for

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most power amps.

In prior articles, I have yammered about the need to isolate the differential pair from the second voltage gain stage to ensure low distortion, especially at 20 kHz. In the Sherwood, this is done with a novel complementary emitter-follower configuration. The common-emitter stage that follows is also complementary. Complementary circuits yield lower open-loop distortion. The Sherwood amplifier topology is unique in that it combines a complementary topology past the differential pair while still maintaining the high common-mode rejection ratio of a differential pair with active current mirrors. All these added electronics allow the amplifier to achieve full power ratings from 20 Hz to 20 KHz of 0.02%, which is 6 to 14 dB better than similarly priced competitive units.

There are two other notable differences between the A-965 and R-965: the A-965 adds 12,000 uFd of primary filter capacitance to the 27,000 uFd found in the R-965. Since the amplifiers under full power in the A-965 draws more current than in the R-965, the power supply capacitors must store more charge to prevent the power supply rails from sagging. The A-965 also has a DC servo circuit that eliminates the electrolytic capacitor in the DC feedback path.

The manufacturer's rated signal-to-noise ratio of 115 dB certainly contributes little noise to your system. The radically more expensive (\$3,250 per monoblock channel) Spread Spectrum Technology amplifier reviewed in a previous issue of TSS does 12 dB better The McIntosh MC207 matches the SNR of the A-965 but it has 1/2 the distortion of the Sherwood which again is unlikely to yield any

audible improvement. The MC207 can produce 200 wpc continuous into 8 ohms continuous with all 7 channels driven but you need to throttle the DC voltage rails back (it has a switch in the rear) for 4 ohms continuous performance, which is also 200 wpc. Without that switch, the MC207 would likely not be NTRL-certified for a 120V line. You do get the cool-looking McIntosh blue meters and glass face plate with the MC207, but it will set you back \$6,000. It should come as no surprise the MC207 also comes in at a little above 80 pounds.

The A-965 passes FTC preconditioning with 160 watts into 4 ohms, all channels driven, and still gets the UL safety stamp of approval. Combine that with a power amp designed for low distortion and high bandwidth before the feedback loop is closed, and the price of \$1,500 is a real bargain. Unlike the front ends of AV receivers, which will continue to evolve and require replacements at a rate faster than your PC turnover rate if you want all the goodies found in the latest AV controller, the power amp can remain the same. If you want about the most horsepower that you can get out of one AC outlet in a 7-channel AV configuration, this 80-pound monster should fit the bill and remain state-of-the-art for many years to come.

-DAR

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