

LINEA RESEARCH 44M20

Looking into a new DSP amplifier platform.

by Craig Leerman

UK-based Linea Research, for years a designer and manufacturer of OEM power amplifiers with sophisticated digital signal processing for several top pro audio companies, has now launched products under its own name. The Linea line includes 8- and 4-channel DSP amplifiers for both touring and installation applications, as well as a digital system controller.

Here we're going to take a look at the 44M20, a 4-channel DSP amplifier for live sound/touring. It's housed in a 2RU package specified as delivering (per channel) 1,500 watts at 8 ohms, 3,000 watts at 4 ohms, and 5,000 watts at 2 ohms, all channels driven. The class D amplifier designed has a stated frequency response



three.) It's only 14 inches deep behind the rack ears and weighs in at a scant 27.5 pounds. Note that while light in weight, if the amp is mounted in a mobile rack, it's important that the rear is supported with the rear rack mounting kit.

The front panel offers input and output meters as well as individual channel output mute buttons. A nicely sized LCD screen occupies the middle, flanked by six menu buttons and two rotary encoders. The bottom is dominated by a large air inlet covered with an intake filter that's easily removed for cleaning.

The rear panel provides all I/O, including Neutrik SpeakON connectors for loudspeaker outputs. Each amplifier channel has an XLR input and output, and there's also AES I/O. Dante primary and secondary ports and a RJ45 port for computer control are located next to a recessed software reset button and Phoenix connector that can relay fault information. For power, a 32A Neutrik

Linea Research 44M20 DSP amplifier.

er-centric approach to controlling, designing and recalling configurations. A Drive Module consists of different "blocks" of DSP, one for the input and several for the outputs that are used for control and monitoring of the associated loudspeakers.

Further, presets can be broken apart into components, allowing any output to be used for any loudspeaker or even specific transducer in a system. For ease of use, Overlay Groups allow various input parameters to be adjusted in all modules in a group while maintaining independent parameter values across each group. For example, EQ could be adjusted for every group without having to access each channel's Drive Module.

In addition to gain, EQ, and delay parameters, the software also provides access to a new type of crossover filtering called LIR. This response filtering results in a linear phase crossover that has a constant delay regardless of frequency. The shape of the LIR filter is quite similar to a 4th order or 24 dB/octave Linkwitz-Riley filter, and the factory states it maintains zero phase difference between the adjacent bands across the crossover region to keep the polar response "rock steady."

Control of the 44M20 is provided by the System Engineer PC application that offers features such as flexible management of presets and overlay grouping of mutes, gains, delays, and EQ across an entire sound system. In addition to the DSP, each output can be optimized to drive either a low impedance load (8, 4 or 2 ohms) or a constant voltage setting (25-, 70- and 100-volt line) in the output menu.



The I/O facilities on the back panel of the 44M20.

of 7 Hz – 30 kHz (-2.5 dB) at 4 ohms, low inter-channel crosstalk (better than -85 dB at 1 kHz), and a low total harmonic distortion rating of <0.05 percent (typical at 4 ohms with a 1 kHz signal).

Analog and AES inputs are standard, with Dante inputs an option. (The unit provided for this evaluation had all

PowerCon-type locking AC connector is provided. All Linea models are designed to operate on 50/60 Hz AC power, and the power supply automatically configures itself for either 115- or 230-volt nominal voltage at turn on.

FRESH APPROACH

The processing offers a new way of ordering and grouping channels called Drive Modules that provide a more loudspeak-

POWER TO SPARE

Unpacking the unit from the box, I was immediately impressed with the power to weight ratio. The 44M20 only weighs about 25 pounds yet can put out 20,000 watts? Whoa. And that's not a "peak" or "burst" power number; the factory states that the amp can deliver 5,000 watts at 2 ohms per channel with all channels driven simultaneously. Back when I started in pro audio, my first real amp rack contained four amps that weighed in at more than 200 pounds while delivering 2,400 watts in total.

Our company warehouse manager Wes and I set up a passive loudspeaker system so we could give the unit a listen. It was easy to dial in the DSP. First we hooked up a few full-range loudspeakers for critical listening test, and the loudspeakers sounded noticeably better with the 44M20 than with the 15-year-old amp technology we currently use it.

Next, we adjusted the DSP and then hooked up a couple of subwoofers. With all four channels running, we played some bass heavy electronic music to see if the bass through a pair of channels would make the amplifier sag a bit. But it just chugged along with the subs thumping and the tops sounding great. There was also very little heat coming out of the amp. Wes was really impressed and placed the sonic quality at the same level as some studio monitors that he'd recently mixed a project with. We've had the loudspeakers for years and have never heard them sound as good.

We also tested the Dante networking with one of our Soundcraft mixers as well as a Mackie DL32R compact rack-mount mixer also in the shop for evaluation. I'm a big fan of Dante and have switched to it instead of analog as much as possible. Both mixers and the laptop running Dante controller found the amplifier and easily patched it into the network.

GENUINE PERFORMANCE

Confident in the capabilities of the 44M20, the next step was to take it to



Control is provided by the System Engineer application.

some gigs. At a corporate meeting where we normally use powered 15-inch loudspeakers, we swapped in a pair of passive 15-inch (also horn loaded) models in order to drive them with the amplifier. Rik Kirby of Allied SMD (alliedsmd.com), the North American distributor for Linea, had included a PowerCon-to-Edison cable with the unit so we could plug the it into a single outlet for testing. Of course, we weren't going to be able to run it at full power from a 15-amp wall circuit, but for this average-sized room, we only needed a few hundred watts to adequately drive the PA.

The 44M20 made that pair of passive loudspeakers sound great, and sat in the corner running cool all day. If there were more time available, we could have set the DSP to match the loudspeakers perfectly, but the production ended up being a rush so we just ran two channels of the amp, full range.

Supporting a live band at an event came next. Basically, we deployed the same system configuration that we'd set up in the shop – two full-range top boxes pole-mounted over two subs. In this case, however, the loudspeakers were higher end, and they're normally driven by three amplifiers (two of them bridged running one per sub at 4 ohms and the other running the tops in stereo). In contrast, just the single 44M20 supplied 3,000 watts at 4 ohms for each sub and 1,500 watts for each top, more audio power than the three amps we normally use, plus the DSP is built in. It also made the rig sound

noticeably better.

I'm confident that if we bought our current amp rack components new, the cost would be more than the 44M20. Using it to drive the mains and a smaller Linea 4-channel model for monitors would make for a small, light and therefore easy-to-transport power solution that could take the place of two of our 16-space racks.

The band sounded great through the rig, and during sound check the singer stood by the mix position and commented how fantastic the rig sounded. Before the show and during the breaks we played some of the test tracks used at the LSI Loudspeaker Demos. They sounded amazing, so much so that I even listened to Jennifer Warnes' "The Hunter" for the 17,345th time with a smile on my face. Suffice to say that the unit worked flawlessly and my creaky old back appreciated not having to move around a heavy amp rack.

The Linea Research 44M20 represents the highest caliber of professional audio technology. It very well could be the best sounding power amplifier I've ever heard. It's also flexible, not only in terms of the DSP but that it can be optimized for 70-volt systems and networked seamlessly in live and installed systems, large and small.

U.S. MSRP: \$7,500 **LSI**

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