

Product Review

Behringer Eurorack Mixers

Reviewed by Gary Galo

Behringer Eurorack MX802A and MX2004A Mixers. Behringer USA, 144 Railroad Ave., Suite 210, Edmonds, WA 98020, 425-672-0816, FAX 425-673-7647, e-mail: sales@behringer.com, www.behringer.de/eng/. MX802A: \$179; MX2004A: \$379. Warranty: One year parts and labor.

Behringer International GmbH is probably unfamiliar to most readers. Based in Germany, Behringer specializes in affordable professional audio equipment, including digital effects processors, loudspeakers, microphones, compressors, and limiters. They also manufacture a line of vacuum-tube audio accessories, including a mike and line preamp, a parametric equalizer, and an eight-channel tube interface, which allows you to add a user-controlled amount of “tube sound” to the signal path.

They have rapidly become best-known for their Eurorack line of mixing consoles. Behringer has clearly targeted the Eurorack series to directly compete with the VLZ-series from Mackie Designs, an American pro-audio manufacturer based in the state of Washington. The Eurorack mixers are designed in Germany but manufactured in China. Behringer products were originally distributed in the US by Samson Technologies, a New York-based company. About a year ago, Behringer set up their own US distribution in Edmonds, Wash., in the backyard of their principal American competitor.

MX802A

There are seven mixers in the Eurorack line, ranging from six to 32 inputs. In terms of complexity, the two models reviewed here represent the middle and lower end of the product line. The compact MX802A is billed as an eight-input, stereo out mixer (*Photo 1*). Four input

channels, 1 through 4, are mono, and will accept both balanced mike (XLR) and line (¼” phone) inputs. Standard +48V phantom powering is available at each microphone input. The line inputs will accept balanced (tip-ring-sleeve) or unbalanced (tip-sleeve) inputs.

Each mono input has a gain trimpot, a switchable 75Hz, 18dB/octave low-cut (i.e., high-pass) filter, a three-band equalizer, two auxiliary sends (pre- and post-fader), a pan control, and a level control. To make the mixer as compact as possible, all level controls are rotary pots, rather than slider-type faders. A peak light is included in each of the mono input channels to monitor mike preamp overload.

The stereo inputs are line-level only, and arranged in left-right pairs, channels 5-6 and 7-8. Each stereo input accepts two ¼” mono phone plugs, balanced or unbalanced. Input level for each stereo pair is controlled by one pot, with a pan pot functioning as a left-right balance control.

A bit of logic has been built into the stereo inputs. If you connect a mono input signal to the left input, it is also routed to the right. In other words, if you connect an input to channel 5 only, this input is also routed to channel 6. The three-band equalizers and two auxiliary sends are also included on the stereo inputs.

The two auxiliary send buses feed unbalanced outputs. Two pairs of left and right balanced auxiliary returns are included, with the return level of

each pair controlled by a separate pot. The main left and right outputs of the MX802A are balanced, and controlled by the stereo main mix level pot. A separate pair of control-room outputs are unbalanced, with level controlled by the same pot used to control the volume at the stereo headphone jack.

The MX802A also includes RCA tape-out and tape-in jacks. The tape outputs are in parallel with the positive legs of the main left and right outputs. You can switch the tape inputs to the main mix, or to the control-room monitor. Left and right output metering is accomplished with two rows of 12 LEDs. Green LEDs indicate levels of -20 to -6dB, yellow for +2 to +10dB, and red for clipping.

MX2004A

The MX2004A is similar in conception to the MX802A, but with more inputs and greater flexibility. The MX2004A is billed as a 20-channel mixer, and if you



PHOTO 1: Behringer MX802A mixer. The compact design still offers a wide array of features and excellent performance. All audio input and output connectors are on the mixer top plate, as shown.



PHOTO 2: Behringer MX2004A mixer. Up to 20 inputs, and considerable flexibility are offered in this fine performer. The logarithmic input and output faders feature a 60mm travel.

include the two pairs of stereo auxiliary returns, it indeed is. Eight mono input channels feature XLR balanced mike and ¼" phone balanced line inputs. Switchable +48V phantom powering is available on all eight mike inputs. Input gain trimpots and an 18dB/octave low-cut filter are included, just like the MX802A. The four unbalanced stereo input channels are line-level only. All input level controls are logarithmic slider-type faders, with 60mm travel.

The three-band input channel equalizers are enhanced to include a center frequency adjustment on the mid control—1kHz to 5kHz. Auxiliary send #2 is wired post fader, but #1 is switchable, pre or post. A solo button on each input channel allows that input to preempt all others at the monitored output, though these buttons never affect the main outputs.

A red solo light in the metering panel gives a visual indication that one of the solo buttons has been engaged. Each input channel also has a mute button, which also routes the input signal to the Alt 3 and 4 outputs. On the stereo inputs, the pan control functions as a left-right balance control, like the MX802A.

Each input channel is equipped with unbalanced channel inserts, for connection of outboard effects devices. Electrically, these insert points are located be-

room outputs are configured like the MX802A. The output control section of the MX2004A features separate left and right output faders, plus a stereo ganged fader for the Alt 3 and 4 outputs. Control of the auxiliary sends and returns is, again, like the MX802A, with one important difference: you can route the Auxiliary 2 signal either to the main mix or to the cue feed. The MX2004A uses 13 rectangular LEDs per channel for output level indication, with the same color scheme as the MX802A.

CIRCUITRY

Behringer does not include a schematic diagram with its products, only a block diagram. Specific circuit details are not possible, but you can make a few observations. Both the MX802A and MX2004A mixers come with outboard power transformers. These are not wall-warts! The transformers have both primary (120V AC) and secondary cords, which allows for more flexible placement. Six-foot cables on the outputs of the supplies ensure that the transformer hum field is kept far away from the mixer circuitry. The DC power connector is a screw-on, three-pin type, similar to the mike connectors used on CB and other communications equipment. Standard three-terminal IC regulators are in the mixer chassis.

tween the input pre-amplifier and the equalizer circuitry. You can switch the MX2004A's main balanced XLR outputs for line or mike level. A resistive attenuator is switched in to drop the output to mike level, if selected. A second set of unbalanced ¼" main outputs operate at line-level only. The Alt 3 and 4 output pair are unbalanced and line-level.

The auxiliary send and return connections, tape in and out, and the control

Behringer prides itself on the extremely quiet performance of its mixers. Their ultra-low noise microphone preamps feature discrete input stages with matched, high-current transistors. All mixers in the Eurorack line incorporate the same mike preamp circuitry as their flagship Eurodesk 9000, which retails for \$2600. In addition to their low noise levels, these mike preamps have an ultra-wide bandwidth of 100kHz.

Behringer engineers have also been especially careful in their selection of the IC op amp. The NJR NJM4580 is used throughout the Eurorack series. The 4580 was designed for low noise and low audio distortion. This dual op amp features a slew rate of 5V/μs, a gain bandwidth product of 15kHz, and harmonic distortion of 0.0005%. Input voltage noise is specified at 0.8μV RMS. The 4580 is the highest-performance dual op amp I've seen in an affordable mixer.

PERFORMANCE

Tables 1 and 2 list the manufacturer's specifications for the MX802A and MX2004A mixers. I was able to verify the Behringer claims for these mixers. I did note a slight peculiarity in the

**TABLE 1
MANUFACTURER'S
SPECIFICATIONS—MX802A**

MONO INPUTS

Mike input: Electrically balanced, discrete input configuration
 Bandwidth: 10Hz–60kHz ±3dB
 THD+N: 0.007% at +4dBu, 1kHz
 Mike E.I.N. (22Hz–22kHz): –129.5dBu, 150 source
 –130dBu, input shorted
 Gain range: +10dB to +60dB (mike); +10dBu to
 –40dBu (line)
 Equalization: 12kHz ±15dB
 2.5kHz ±15dB
 80Hz ±15dB

STEREO INPUTS

Bandwidth: 10Hz–55kHz ±3dB
 THD+N: 0.007% at ±4dBu, 1kHz
 Equalization: Same as mono inputs

MAIN MIX SECTION

Maximum output: +22dBu balanced
 Auxiliary send maximum output: +22dBm unbalanced
 Control-room output: +22dBm unbalanced
 Signal-to-noise ratio: 112dB, all channels at unity gain

PHYSICAL

Dimensions: 20/25mm × 160mm × 210mm
 Net weight: 3.0kG (power supply not included)
 Gross weight: 4.6kG

THD+N measurements for both mixers.

Below an output level of 0dB (reference to the metering on both mixers), the distortion is dominated entirely by noise. Beginning at an output level around 0dB, a slight nonlinearity shows up in the distortion waveform. This nonlinearity looks like a very slight power-supply instability. The THD+N still remains within the manufacturer's claim, however.

I have had an opportunity to use both mixers in recording and sound reinforcement applications at The Crane School of Music, SUNY at Potsdam, and have been extremely pleased with their performance. I normally used a high-end, two-channel microphone mixer for my live concert recording—a Sontec MB-1 that retailed for about \$1000 when we purchased it about ten years ago. I certainly can't say that the Behringers are the sonic equal of my thousand-dollar stereo mike preamp, but I am amazed at just how good they really are.

TABLE 2 MANUFACTURER'S SPECIFICATIONS—MX2004A

INPUT CHANNELS

Mike input: Electrically balanced, discrete input configuration
Bandwidth: 10Hz–60kHz ± 3 dB
THD+N: 0.007% at +4dBu, 1kHz
Mike E.I.N. (22Hz–22kHz): –129.5dBu, 150 source –132dBu, input shorted
Gain range: +10dB to +60dB (Mike); +10dBu to –40dBu (line)
Max input: +12dBu (Mike); +22dBu (line)
Channel fader range: +10dB to –85dB

EQUALIZATION

High shelving: 12kHz ± 15 dB, "Q" fixed at two octaves
Mid Bell: 100Hz–8kHz ± 15 dB, "Q" fixed at one octave
Low shelving: 80Hz ± 15 dB, "Q" fixed at two octaves
Low-cut filter: –3dB at 75Hz, 18dB/octave

MAIN MIX SECTION

Bus noise, fader 0dB, channels muted: –100.0dB (ref. +4dBu)
Bus noise, fader 0dB, all input channels assigned and set to unity gain: –88.5dB (ref. +4dBu)
Maximum output: +28dBu balanced; +22dB unbalanced
Auxiliary send maximum output: +22dBm unbalanced

GENERAL

THD+N: 0.007% at +4dBu, 1kHz; below 0.02%, 22Hz–22kHz, normal operating levels, any input to any output.
Frequency response: 10Hz–120kHz, ± 3 dB, any input to any output

PHYSICAL

Dimensions: 40/90mm \times 410mm \times 385mm
Net weight: 6.0kG (power supply not included)



PHOTO 3: Behringer MX2004A rear panel. The XLR main outputs can be switched from line to mike level. Channel inserts for the eight mono inputs, 1/4" main outputs, and the Alt 3 and 4 outputs are on the rear panel.

What is especially impressive is the subjective absence of noise. These are among the quietest mixers I have ever used. The sound is also clean and detailed, and largely free of harshness and other unpleasant side effects.

Both of these Behringer mixers excel in sound-reinforcement situations, and if you need more inputs and even greater flexibility, several other more complex mixers in the Eurorack line should fit the bill. I am particularly enamored with the little MX802A, because so much has been packed into such a small space. For simple sound-reinforcement jobs—where only a couple of mike and line sources are needed—it is a great little mixer. It is also handy as a sub-mixer, augmenting your main board if you run out of inputs. And, its surprisingly clean sound will make it very attractive for location recording, especially where portability is an issue. Even at the suggested retail price of \$179, it is a great value. At the street price of around \$130, it is an unbelievable steal.

Some time ago Mackie upgraded its VLZ-series to the VLZ-Pro line, which features its XDR[®] (Extended Dynamic Range) microphone preamps. These preamps offer noise performance and dynamic range comparable to the Behringer mike preamps. At Crane we have a Mackie 1402-VLZ Pro mixer in the recording booth of our small lecture/recital hall. The 1402 is comparable in inputs and features to the Behringer MX2004A, but with only six microphone inputs.

So far, I have a slight preference for the Behringer in sound quality. Both mixers are noise-free, but the Behringer seems just a bit more transparent. This may be due to Behringer's use of the superior 4580 op amp. Mackie uses the 4560, which

is a bit slower (4V/ μ s versus 5V/ μ s) and narrower in gain-bandwidth product (10MHz versus 15MHz). The 4560 also has lower output current and a slightly higher noise level than the 4580.

Price also tips the balance in Behringer's favor. The US-built Mackie retails for \$629, and the typical street price is around \$435. The Chinese-made Behringer retails for \$379, and usually sells for around \$275. I have spoken with other users, and two pro-audio dealers, and can't find a clear consensus regarding a sonic preference for the Mackie versus the Behringer products. Both firms seem to have enthusiastic followers.

Behringer's English instruction manuals are very clear and well-written. But, Mackie definitely wins the prize when it comes to user-friendly, nonintimidating manuals. The Mackie manuals include an abundance of connection diagrams. Construction quality on the Mackie products is excellent, perhaps a bit more robust than the Behringer mixers. But, the two Behringer samples under consideration here are still very well-made.

I did have one problem with the MX2004A—the channel 2 input fader was intermittent. Behringer referred me to a factory-authorized service center in New York City. The input fader was replaced, with a total turnaround time of about two weeks, including shipping, which I consider very reasonable.

Behringer has made two very impressive contributions to the low-priced mixer war with the MX802A and the MX2004A. These products offer amazing performance and flexibility for the money, and are highly recommended. ❖