

Mackie 1604-VLZ3 16-Channel All Purpose Mixer

Mike Rivers

18 years, Mackie kick-started the emerging 8-track home recording studio with the introduction of the CR1604 mixer. Sporting six “world class” mic preamps, sixteen input channels, bussing and routing that made sense for recording a soloist with a bunch of instruments or small group, all packed in a solid steel chassis (early ads showed Greg Mackie standing on one) and selling for under a grand, the CR1604 was the centerpiece of many personal and small commercial studios. In 1996, a significant facelift brought the 1604-VLZ with a true 4-bus architecture, sixteen improved mic preamps, sweepable mid-band EQ, and a number of other refinements. The VLZ-Pro series in 1999 further improved the input section, and lowered overall distortion.

With Mackie’s introduction of the Onyx series in 2004 with its further sonic improvements, architecture better suited for today’s applications, and optional Firewire computer interface, it seemed the VLZ line would soon be phased out. However, the VLZ-Pro co-existed with the Onyx for the next three years, and in 2007, the third generation VLZ3 line was introduced.

Features

If you’re familiar with the Mackie VLZ product line, and specifically the 1604-VLZ Pro, you know the 1604-VLZ3. This is a proven design, and Mackie didn’t try to fix something that wasn’t broken. The basic setup is sixteen mic/line input channels with Mackie’s third generation XDR2 mic preamps, a three band equalizer with high and low frequency shelving, low-cut filter, and a mid-range sweep, six auxiliary send busses, and four subgroup busses in addition to the main stereo bus. There are four stereo auxiliary returns, separate main and control room outputs, post-EQ/fader direct outputs on channels 1-8, and insert jacks directly following the mic preamp on each channel and just ahead of the main stereo fader.

The Mackie compact mixers have always straddled the fence between studio and live sound applications so there are a number of specific features that primarily support the live sound world. For example auxiliary returns 1 and 2, in addition to going to the main L/R bus, can be routed to auxiliary sends 1 and 2 to provide effects to stage monitors. Auxiliary send 3 can be assigned to submasters 1-2 or 3-4. For studio applications, auxiliary send 4 can be removed from the main mix and sent only to the headphones and control room for those situations where you’re recording the main stereo mix and a musician wants to hear reverb or a click track in his phones. A mono left+right output with a separate level control (on the rear panel) can feed an auxiliary speaker or a mono PA system. A BNC

connector on the top panel provides 12 VDC to power an optional gooseneck light.

With exception of the XLR mic inputs, ¼" TRS jacks are used for all inputs and outputs. Phantom power is controlled by a single switch which affects all channels. With 14 assorted condenser mics connected and powered up, the phantom supply remains within tolerance at 45.7 volts, plenty of poop to power a full load of condenser mics. The power supply is internal with an IEC connector for the power cord on the rear of the chassis. A voltage selector switch accommodates line voltages of 100, 120 and 240 volts.

The VLZ3 series is built totally in China, but there's nothing cheap about the feel or appearance. Construction is similar to the previous 1604VLZ models. The main control surface chassis and I/O connector chassis are separate pieces bolted together and interconnected by a handful of ribbon cables. As shipped, the connector panel is located at the back of the mixer, but it can be easily rotated to put the connectors behind the front panel, facilitating connections when rack mounted. An optional RotoPod bracket allows mounting the connectors chassis with all of the connectors are topside, a convenient arrangement either for rack mounting or for a studio setup where you'll be doing a lot of patching. A pair of rack mounting ears is supplied.

The chassis is heavy gauge steel, assembled with the Mackie standard too-many screws. Under the hood, there are really only three parts; the main circuit board with all the faders, pots, and switches, the rear panel board with the mic preamps and all connectors except the headphone jack (that's on the top panel), and a modular power supply.

When it comes to service, fudgetaboutit. You can clean and re-seat the ribbon connectors, replace the power supply module, and clean the controls, but that's about it. Disassembly to get to the circuit boards takes about an hour, and then there really isn't much component level troubleshooting that you can do without a good road map. Fortunately these mixers have a solid track record, but should it ever need service, expect a bill for at least \$150. The warranty covers materials, workmanship, and functional failures for a period of three years from the purchase date, so obviously Mackie has confidence in the product, and you should, too.

So What's New?

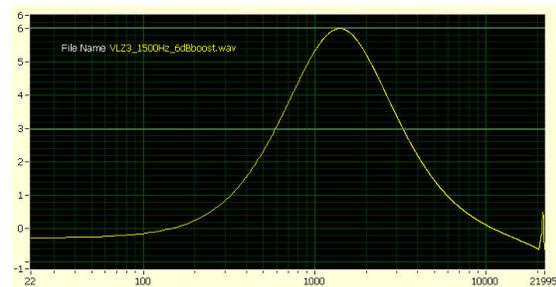
So far, with exception of the multi-voltage AC power supply, it sounds just like the previous model, and functionally and feature-wise, it is. There are some cosmetic improvements - a new color scheme for the knobs and panel (adopted from the Onyx 1640) and slightly larger font for the front panel legends, making it easier for us old folks to find our way around. The wrist rest below the faders is now a hollow aluminum extrusion which doubles as a convenient carrying handle.

There's a recess in the top surface of this strip which doesn't serve any particular purpose (a Sharpie rolls out of it) and it's a little harder to attach a scribble strip, but it looks pretty.

There are some important changes under the hood, however. The low frequency response of the previous generation XDR mic preamps rolls off below 50 Hz, being 5 dB down at 20 Hz when running near full gain (though this isn't a problem when using less than 40 dB of gain). The frequency response of the new XDR2 preamps is dead flat down to 30 Hz at full gain and only 1 dB down at 20 Hz. Mackie claims that distortion is lower on the XDR2 than the XDR, but it's so low that I can't measure it – I'll trust them.

The equalizer section is different from the previous generation. Mackie describes the difference as less interaction between equalizer bands as a result of re-arranging the components so that adjacent equalizer bands don't use op-amps in the same IC. Re-arrangement of the components may make a small contribution to reducing interaction between bands, but the real secret is that the bandwidth of the VLZ3's mid-range EQ is noticeably narrower ($Q=0.63$) than on the VLZ ($Q=0.43$). Both are fairly gentle as equalizer curves go (sometimes described as "musical"), but the narrower bandwidth results in less overlap with the adjacent range, which results, just as Mackie states, in less interaction.

Frankly, I'd prefer to see a narrower mid-range sweep EQ, with a Q of around 1. Since this will be an entry-level mixer for a lot of users, I suspect that Mackie chose a fairly gentle EQ action (the mid-range sweep EQ on the Onyx 1220 is about the same as the VLZ3). You can't solve as many problems with a wide bandwidth as with a narrow one, but neither can you mess things up as badly if you misuse it.



The other significant change with the VLZ3 electronics is that the internal gain structure has been modified. One of the problems with the earlier generations was that with a lot of hot inputs, the sum of the channels was a greater level than the mix bus could handle, resulting in clipping the whole mix. Perceptive operators eventually learned to run the master fader high and keep the channel levels lower, providing more mix bus headroom for when things get louder (as they tend to do in a live show). This raised the noise floor a bit but it was hardly noticeable in a typical show, and a tad more noise is preferable to distortion.

In the VLZ3, Mackie has essentially implemented this master fader trick internally by reducing the output level of the channels and adding make-up gain just ahead of the master fader. Newer generation op amps and quieter resistors has allowed the additional gain at the output without compromising the mixer's noise performance.

In Use

Since for many, this mixer will have its primary use as a set of mic preamps for recording to a DAW, a primary concern is how they sound. No worries here. Mackie has always done well in this area, and the VLZ's preamps have consistently been a solid economical choice for clean, general purpose applications. On some sources, the VLZ3 preamps sounded just a bit smoother than a VLZ-Pro with several mics that I tried, but honestly, it's a tough call. The flatter low frequency response of the VLZ3 may contribute to the overall smoothness and warmth by better conveying low frequency room ambience even though sources such as vocals and acoustic guitars don't extend down into the 20-30 Hz region. On the high end (the dreaded key jangle test, for example) there was very little if any difference between the VLZ-Pro and VLZ3. I threw an Onyx into the comparison and found it to be somewhat fuller all around than either the VLZ-Pro or VLZ3, which is comforting since the Onyx is Mackie's premium mixer.

While the preamps sound fine, adjusting them was a bit fiddly. The gain trim pot (as on many of Mackie's newer products) has a taper that's substantially different at the ends than in the middle. The 25 dB gain change between the 3 o'clock and 9 o'clock positions is pretty smooth, but there's 20 dB gain change between 3 o'clock and full clockwise (about 5 o'clock). Mackie's design decision was to offer good gain control resolution in the 15 to 40 dB range, a sensible choice for many combinations of mics and sources.

Since I record almost exclusively acoustic instruments and like the sound of some fairly low-sensitivity mics, I often need to set the trims near the top of their range where it's difficult to optimize the setting. This is mostly an academic fidget, because the preamps are quiet enough so that the gain can be run a little low, allowing more headroom.

Equally annoying is that with the gain trim near the top of its range, the control is so sensitive that the gain isn't very stable. On more than one occasion, I set the gain to a specific value for a measurement and ten minutes later it had changed by a couple of dB.

Other rotary gain controls have a more practical taper. Auxiliary sends change by 5 dB over the last 90° of their rotation, and, like the preamp trims, have a 25 dB

range between 9 o'clock and 3 o'clock. When using an auxiliary send for a monitor mix, other than for things that will be fully off in the mix, it's rare that control settings will differ by more than about 6 dB since the preamp trims will determine the basic mix levels. Hence, these controls have a good working range.

These new rotary pots don't feel as mechanically solid as those used in the earlier generation mixers, though that could be because the knobs extend further out from the panel than they used to, putting a longer lever arm on the board-mounted pot shaft.

One welcome mechanical improvement is with the ¼" jacks. It's fairly common to use the channel insert jacks as direct (preamp) outputs for recording by inserting a plug to the first "click." When half-way in, the plug tip picks up the preamp output signal without breaking the jack's normalling contacts, leaving the channel signal path intact. This was always a little risky because the plug was a bit wobbly with the tip grabbed by the ring contact of the jack. The jacks on the VLZ3 grip a plug in the half-in position much more solidly than on the earlier VLZ and Onyx mixers.

Mackie has always made a point that when their output meters read 0 (VU) the main output level is 0 dBu. This is true with the outputs unbalanced (ring grounded or unused), but for a balanced output connection, the level between tip and ring is +6 dBu. So much for standards, even one of Mackie's own. Maximum output before clipping is +20 dBu unbalanced and +24 dBu balanced.

As far as actually using the 1604-VLZ3 for mixing (bet you thought I'd never get around to that) there really isn't much to say. It does what it needs to do, and it does it well, with no surprises. While the low-cut filter works just fine, I've often found the equalizer section in earlier Mackie mixers to be rather ineffective. The VLZ3, with its narrower mid-band section, is more useful, with the difference being most apparent when cutting to clean up proximity effect mud or to reduce lower-mid frequency leakage. With the earlier generations Mackies, it was difficult to get to where I wanted to go - when cutting what I wanted, as much as I wanted, other things changed too much. I found less of this out-of-band action with the VLZ3, resulting in less fiddling with the equalizer knobs and achieving a good mix more quickly.

To confirm what I perceived about the EQ after mixing a couple of live shows, I fed the mixer some rather sloppy multitrack festival stage live recordings. I first mixed the tracks on a 1604-VLZ, then moved the cables over to the 1604-VLZ3 and mixed it again. By golly, it was indeed easier to get a decent mix. Thinking it might have been because I had a practice run, I tried another set of tracks, mixing first on the VLZ3, then on the VLZ, and again, I found that the VLZ3 made it easier and quicker to clean up messy tracks. In each case, I ended up

preferring the sound of the VLZ3 mix, finding that it was cleaner overall and a bit fuller on the bottom end without sounding boomy or muddy.

I confirmed that the change to the internal gain structure does what's intended by pushing the channel gain trims higher than I normally would. Since I've never experienced the oft-discussed problem of bus headroom (likely because of the kind of music I work with) I probably would have overlooked this improvement, but since it doesn't appear to have any disadvantages and it might help in some situations, it's certainly a worthwhile update.

Conclusions and Comments

The 1604 is a good, sensible design. It's been around for a long time because it works well, and now it works even better. The first generation mic preamps sounded decent and have improved with every update, including this one. You don't want to fool around too much with a good thing, and Mackie has followed that mantra.

There are a couple of things which I think deserved updating but didn't get it this time around. One is the Tape Outputs. These RCA jacks are tied directly to the main outputs and, like the mains, can put out +20 dBu before clipping. That wasn't a problem back in the day when recorders had real input level controls - the recorder could accommodate any reasonable line level source. Today, however, those Tape Output jacks are more likely to be connected to a pocket sized flash memory digital recorder than to your grandfather's Sony.

Nearly all of the mini recorders that we've tested here at PAR clipped at the front end (ahead of its record level control) when presented with an input signal much higher than about +10 dBu. It would have been good to bring the Tape Outputs down to the old "consumer" level so an external pad isn't needed to prevent a distorted recording. Also, since the Main fader is usually used to control the overall PA volume, it's likely to change during the show. While the Main (post-fader) outputs are fine when using the VLZ3 as a recording mixer, having the Tape Output jacks pre-fader would have been my preference when using it as a PA mixer and recording the board mix.

Unlike the smaller models in the family, the 16 channel mixers (1604 and 1642) have the main outputs on ¼" TRS jacks rather than XLRs. This is a carryover from the previous generations, and it's simply because there's no room for the larger connectors on the panel. Though it would mean eliminating something or increasing the size of the back panel, I wish they could have found a place to put XLRs so I don't have to carry adapters.

Mackie manuals have always been well written and informative, with a sufficient detail and clarity to get a new up and running quickly. The VLZ3 manual is no exception, however, it's just a warmed-over version of the ten year old VLZ

manual. While the mixer topology hasn't changed in the interim, the users and their applications have evolved. The manual makes no mention whatsoever about using the 1604-VLZ3 with a DAW. For many users, this will be their first mixer, they intend to use it with their computer and audio hardware, and they won't find much specific guidance in the manual. Mackie offers the much more complete Compact Mixer Reference Guide (<http://www.mackie.com/support/compactmixer/index.html>) which covers a wide range of applications including DAWs, but you have to know where to find it and either download it (free) or purchase a printed copy.

Should you replace your 1604-VLZ or VLZ Pro with a 1604-VLZ3? I wouldn't rush to the store. You already have a good mixer and there's no compelling reason to switch if it still works for you. This is today's model for today's buyer, one who might be hesitant to purchase a new mixer that was designed ten years ago. I would, though, recommend that a new user buy a new VLZ3 rather than a used VLZ. You'll be getting a better mixer overall, with brand new switches, pots, and connectors – the parts subject to wear.

There are a lot of similar mixers out there, and most of them sound pretty good. You have a lot of choices, but the Mackie 1604-VLZ3 gives me the sense that I'm using a good quality tool. That makes the job easier and more fun. It's a solid, proven design that worked well years ago and works even better now.

Family Ties

The VLZ3 series includes the 1202-VLZ3 and 1402-VLZ3, 1642-VLZ3, and 1604-VLZ3, all upgraded versions of their corresponding VLZ-Pro models. At the Winter 2008 NAMM show, Mackie introduced two new VLZ3 models, more like cousins than siblings, The 802-VLZ3 and 402-VLZ3 are 4 and 8 channels respectively, with the tiny 402 offering two XDR2 mic preamps, one stereo line level input, and two-band EQ on the mic channels. The larger 802 has three mic input channels with 3 band EQ (fixed center frequency as in the 1402), one stereo, and two mono line inputs. The 402, more applicable as a DAW front and back end than a mixer, has no pan pots. Instead, it offers a button which assigns the two mic channels either hard left and right or center panned, solving the monitoring problem that some DAW interfaces have when using a single mic. The 802 is a more conventional mixer design for the user who require just a few inputs with excellent audio quality.

Fast Facts

- Applications: Studio, project studio, broadcast production, live sound
- Key features: 16 mic/line channels with inserts, 3 band EQ with mid-range sweep, 4 subgroup busses, 6 auxiliary sends, auxiliary returns routable to auxiliary sends for effects-to-monitors.
- Price: \$900 typical street price

Product Points

Thumbs Up:

- Excellent sounding mic preamps
- Smooth and unobtrusive EQ
- Plenty of inputs and outputs
- Equally at home in the studio and on stage

Thumbs Down:

- Gain trims difficult to adjust for high and low gains
- Tape Outputs too hot for today's portable recorders