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Retro Instruments 176

Vari-mu Compressor-Limiter

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Retro Instruments 176 \$3095



This recreation of a Bill Putnam classic brings back to life the qualities of a long-gone era — and does so in a truly uncompromising fashion.

Bill Putnam's 176 Valve Limiter, the predecessor of the ubiquitous UREI 1176LN, is among the most coveted and sought-after vintage compressors. It is rare these days even in its motherland, the United States, but it's virtually impossible to source one on the European side of the pond. Over here, only a handful of studios can count themselves lucky enough to possess one (and even fewer two) of these valve limiters.

But despite their rarity, the Universal Audio (UA) 176 and its predecessor, the 175, played an important role in the evolution of the dynamics processors we rely on today. When they were introduced in around 1960, Bill Putnam's 2U limiters were not only among the most compact of outboard dynamic processors, they were also among the most versatile. Most of the limiters of this era, by manufacturers including RCA and Gates, are bulky 6U monsters, which, from today's perspective, mostly can be deemed 'one-trick ponies'. In contrast, the 176 offered four selectable ratio settings and variable attack and release controls. It remained in production for most of the 1960s, until it was replaced by the 1176, the first commercially available American-made transistor-based compressor.

When I visited UA in Santa Cruz back in 2009, I asked them about a possible reissue of their valve compressor, but they seemed reluctant to commit to this endeavour. Happily, then, Retro Instruments have come to the rescue of those who can not obtain — or afford — one of the scarce original units. Retro's Phil Moore has received much praise for his first product, a reissue of the Gates Sta-Level, and his recreation of the 176, reviewed here, has gained an enthusiastic following in quite a short time, too: "Bill Putnam would smile!", as Chris Lord-Alge put it. So, find out just why the Retro 176 might have put a smile on the face of the inventor...

Overview

Just like every other compressor developed before the early '60s, the 176 is a valve design that employs its glowing glass cylinders not only in the line stages, but also in the heart of its gain-reduction element — and thus it is described as a variable-mu, or 'vari-mu' design. Phil Moore's creation remains very true to the UA blueprint, but I would not go so far as to call it a 'clone'. In fact, it is slightly different from its predecessor in some respects — but, in my view, only in ways that are an improvement on the original design.

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Pros

- Great sound
- All-valve design
- Many additional features, such as the side-chain filter, asymmetry function and switchable inter-stage transformer

Cons

- None. Even the price, though high, is good in relation to comparable products.

Summary

The Retro Instruments 176 offers versatility, great sound and top build quality at a fair price. Anyone who has an interest in valve compression should do their best to have a look at this meticulous recreation of Bill Putnam's classic and timeless design.

Information

\$3095 each; matched pair \$6365.
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The 176 design shares many functional details with the more commonly used 1176LN. Similarly to the 1176LN, it has a fixed threshold and input/output potentiometers to control compression and output level. This is a very intuitive design, which has proven its value over the course of more than half a century. The 176 offers four ratio settings (2:1, 4:1, 8:1, 12:1), and thus is capable of fairly mild compression as well as heavier limiting. Attack and release are fully adjustable via front-panel potentiometers, and, just as with those on the 1176LN, their fastest settings are in their fully clockwise position.



The rear panel hosts all the valves and transformers.

By nature, the 176 is a fairly fast compressor, with attack values ranging from 0.1-2 ms and release values between 27(!) and 572 ms. Like the 1176, the 176 was originally named 'Limiting Amplifier', and it's a description that's right on the money: it illustrates the muscular, forceful action of the compression much better than the word 'compressor'. The attack/release values given above, referred to by Retro Instruments as 'single mode', are very similar to those on the Universal Audio original, and may be used when the Attack push/pull potentiometer is in the 'out' position. When it is depressed, the 'double' mode is engaged, in which the release is more program-dependent and the compression is smoother and slower overall, backing off from the pretty grabby and brutal gain-reduction that can be achieved in the 'single' mode. The Retro 176 has a side-chain high-pass filter with a fairly wide range, as high as 2.2 kHz (-3dB) in its maximum setting. In the minimum position, it is deactivated with a switch.

The large backlit VU meter, made by the American manufacturer Hoyt, can display gain reduction as well as input and output levels. The unit has a power switch (accompanied by a red status light), and also, just as you'd expect on a modern high-end unit, a switchable hard-wired bypass.

For sonic variety, the inter-stage transformer, which is located between the gain-reduction element and the output stage, may be switched in and out of the signal path, and there's also the very interesting 'asymmetry' function, which can be toggled off or into the '+' and '-' positions. The switch determines whether the detector reacts on the full waveform, or only on the positive or negative sides. As the comprehensive manual explains, it "determines which edge of the wave the compression will ride on". This may help to 'open up' the compression on signals with asymmetrical waveforms, such as certain vocal or horn tracks.

Most studio gear from the era of the original 176 is built like the proverbial tank, and the Retro compressor is no exception. Just like the original, the Retro 176 has a hinged front panel, and all valves and transformers are easily accessible on the back panel. Most of the substantial 9kg weight can be attributed to all the 'iron', namely the massive power transformer, the input and inter-stage audio transformers, made by Cinemag, and the output transformer, which is a very special design that I'll explain shortly.



Inside the unit, it's mostly point-to-point wiring (with plug-in connectors).

Most of the circuitry is on one of two PCBs, one for the actual compressor, and a second, smaller one for the power supply. In contrast to vintage units, most of the point-to-point cabling inside the unit employs plug-in connectors. Retro use quality parts, including Alpha potentiometers, and some of the ingredients, such as the valve sockets and some of the valves, are even NOS ('new old stock') parts.

Speaking of valves, the Retro 176 employs six vacuum tubes, just like Putnam's original. At the heart of the design, a 6BC8 dual-triode tube provides the variable gain stage, the actual compression element. A negative bias (the detector or side-chain signal) is applied to the grids of the triode elements, determining the output gain of the valve. The signal is then, via the inter-stage transformer, fed to the output amplifier, which is based on a pair of 12AX7 and 12BH7 dual triodes, operating in a push-pull configuration. The other three valves are not placed directly in the signal path, but they perform some very important duties nonetheless. Firstly, a 5Y3GT power rectifier valve is used in the power supply, a task that nowadays (apart from in certain guitar amps) is most commonly handled by silicon diodes. There's also a second, smaller 6AL5 rectifier valve for the side-chain signal and, finally, an OB2 voltage regulator valve, which feeds the 6BC8.

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Like virtually all compressors of this era, the 176 is a feedback design, whose detector signal is tapped after the gain-reduction element, and the custom-made output transformer plays a very important part in this scheme. Its primary coil has four taps for the various ratio settings. This way, a low driving impedance to the detector helps to maintain fast attack times, and, just as importantly, the four ratio taps counteract the threshold, so that every ratio setting is in the sweet spot of the compressor. Because the detector signal is tapped from the output transformer primary, the bridged-T output attenuator is actually placed after the output transformer, so that this control does not influence the side-chain signal. On the original 176, as on the later 1176LN, the input attenuator is placed before the input transformer, and this is another area where the Retro 176 deviates from Bill Putnam's original design. Phil Moore chose to place the input attenuator after the transformer, an idea he borrowed from the Sta-Level design.

Besides the valves and transformers, the back panel holds the power receptacle, fuse and mains-voltage selector, as well as the XLR connectors for the audio input and output. There's also an RCA jack, which allows stereo coupling of two units via an optional stereo-link panel.

In Use

The entire hardware design and manufacturing, and even the appearance, then, of the Retro 176 inspires confidence, but what is it like in use? You need to take great care when mounting the 176 in a rack — simply because it's so heavy and all those fragile valves are exposed — but once it's mounted, working with it is pure haptic joy! All pots and switches feel very solid, and indeed they ooze the charm of a submarine control panel from the Sean Connery James Bond era. The fact that this device is so much fun to touch and interact with should not be overlooked — this is a musical instrument, after all.



Input section with Interstage Transformer and Asymmetry switches.

Sonically, the Retro 176 is every bit as convincing as its feel and appearance promise. The compressor/limiter seems to lend a sense of urgency to any audio that's fed through it. In a similar way to the sonic behaviour of a well-maintained Blackface UREI 1176LN, the audio gets brighter and more present in the mix, which makes the 176 an ideal tool for bringing important tracks, such as lead vocals, guitar solos or bass lines, forward, even in a dense production. You can get more of a feel for the sound of this device by listening to the audio examples on the SOS web site at [/sos/mar13/articles/retro176media.htm](https://www.soundonsound.com/reviews/retro-instruments-176).

Thanks to its ratio settings and the continuously variable attack and release controls, the 176 can produce a wide range of effects, going from fairly mild gain reduction to the most brutal squeeze. These results can be refined even more, making use of the numerous additional features such as the two time-constant ranges, accessible via the attack push/pull pot, the side-chain filter and the asymmetry function. Retro Instruments claim that the 176 has the largest feature set of any valve compressor, and while that's a bold claim, they may be right. Of course, one has to get the hang of all these functions to be able to make the most of their sonic potential, but exploring the 176 and all its possibilities is sheer joy.

While the fastest attack value of the 176 is considerably slower than that of the more widely known 1176LN (although it's still pretty fast), its release can be set much faster — too fast, in fact, for many applications, and that's why Phil Moore added the 'double' mode. With very short attack, and especially release, values (have a listen to the audio examples) the 176 can sound even more aggressive than an 1176 set to stun, which is quite amazing. In most cases, you'd wish to back off these parameters a bit for a smoother, rounder sound, but it's worth pointing out because it really puts into perspective just how versatile the 176 is. The Retro device is certainly not limited (sorry!) to aggressive drum-room squashing, but should you wish to really crush a track in that way, the 176 won't disappoint.

Interestingly, the 176 sounds thicker and rounder when the inter-stage transformer is not engaged. The compression seems to be more dense then, with the transients being shaved a little harder. When the inter-stage transformer is switched into the signal path, the sound becomes brighter and more open. This option seems to lift the 'air' band above 12kHz by approximately 3dB, which can add a nice presence to some material. Of course, it may prove too much in other cases, so it's great that Phil Moore has made this one of the switchable options.

The only situation in which I felt the need to be a little more sensitive was when feeding bass-heavy signals into the 176. In certain cases, the 176 breaks up on loud bass transients pretty fast, so it might be good advice to back off such signals before they enter the device — unless you actually prefer this slightly aggressive tone, that is! The 'double' mode, the side-chain filter, and sometimes also the asymmetry function can help further when you prefer to avoid distortion.

Conclusion

Offering an unusually wide range of tonal options, the Retro Instruments 176 is clearly a processor you have to know inside out if you are to make the most of its undeniably vast potential. It's capable of producing great results when used for mild compression, making any signal smoother, more even and more dense. But you can also go much further and unleash the beast that is hiding behind the benign phrase 'limiting amplifier', and in most cases this will add brightness and urgency to the source. Results will, though, remain, quite cultivated until you push it to the extremes.

The build quality is exceptionally good: I didn't find a single aspect of this that I'd like to see improved. While the Retro 176 can in no way be described as a cheap product, it seems quite affordable when assessed in relation to similar alternatives. Importantly, the incredibly rare vintage original seems to sell for at least twice the price, and all of Phil Moore's changes — or rather improvements — to the original concept make his unit even more versatile. With no direct competition in the market, the Retro 176 is a great choice for those looking for a multi-faceted and great sounding valve compressor!

Alternatives

Most of the mono all-valve compressors on the market, such as the Mercury 66 or EAR 660, are based on the venerable Fairchild 660 —and they are much more expensive than the Retro Instruments 176. Those interested in characterful variable-mu units should also have a look at Retro's own Sta-Level reissue or the Lisson Grove R124, modelled on the legendary EMI/Altec RS124 that was used for so many Beatles recordings. Although they're transistor compressors, the Universal Audio 1176LN and the Purple Audio MC77 have some similarities to the 176; they are clearly part of Bill Putnam's family of dynamics processors.

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