ADL 1700 Liquid Mu

Valve Limiter

Anthony Demaria's limiter is based on a classic Bill Putnam valve design — but does it live up to its illustrious heritage?

HANNES BIEGER

New York-based Anthony Demaria Labs (ADL) were 'boutique' manufacturers long before that phrase was even coined. Over the course of almost 20 years they've brought us several recreations of classic compressors, including the Teletronix LA-2A and Fairchild 670. The latest addition to their product range draws its inspiration from a legendary limiter that was sometimes referred to as a lighter, less bulky — yet in no way less impressive-sounding — alternative to the Fairchild behemoth, Universal Audio's 175, 176 and 177 units, which were the variable-mu forebears of the ubiquitous UREI 1176LN.

ADL 1700 Liquid Mu
£1920

PROS

- Classic, simple and easy-to-use layout.
- Thick, warm tone.
- Fast compression.
- All-valve signal path.

CONS

- Gain reserves of the output stage could be a bit higher.
- Loud 'pop' and output sag when the side-chain filter is engaged.

SUMMARY

Far from being a one-trick-pony, this is a high-quality workhorse that offers great sonic versatility. It's a strong and characterful compressor, combining the fast, grabby action of Bill Putnam's classic vari-mu design with ADL's own distinctive warm, rich sonics. Although not exactly inexpensive, the only direct competition is pricier still.

Unlike previous ADL units, the 1700 has been given not only a model number, but also a name. According to designer Anthony Demaria, the term 'Liquid Mu' was based on the idea that "water seeks its own level", a reference to the classic qualities of the Universal Audio units. Many such designs from the tail end of the valve era still convince due to their huge, bold, yet somehow natural sound quality, with their smooth and effortless handling of the transients.

With the 1700, Demaria has added a few features that weren't available on Putnam's designs, and he has also modified the circuitry in some respects. Thus, the 1700 is not really a 'clone', but rather a slightly modernised recreation. I was very keen to find out whether the more modern approach complemented or detracted from the classic, fluid tone of the Putnam designs.

Overview

Before I discuss my sonic impressions of the 1700, let's take a closer look at the controls, the feature set, and what's hidden from view inside the box. As with their more famous transistorised successor, the UA 175/176 were designed with a combination of fixed threshold and separate input and output level controls, and the Liquid Mu adheres to this intuitive approach — when turning up the knobs, you always achieve 'more': more input gain means both more compression and more output level. Both level controls run smoothly across their entire range, with plenty of smooth gain reduction at your fingertips to iron out even the unruliest of input signals.

According to Demaria, most sections of the circuitry are practically identical to the original. But the world has turned a few times since Putnam's unit was developed, and he saw good reason why a couple of twists here and there could make the original concept even more useful today. Like the originals, the ADL 1700 employs a 6BC8 dual-triode valve as a variable gain stage, whose amplification is determined by a negative bias applied to the grids of the triode elements — the familiar variable-mu circuit topology that was the foundation of most compressors of the valve era.

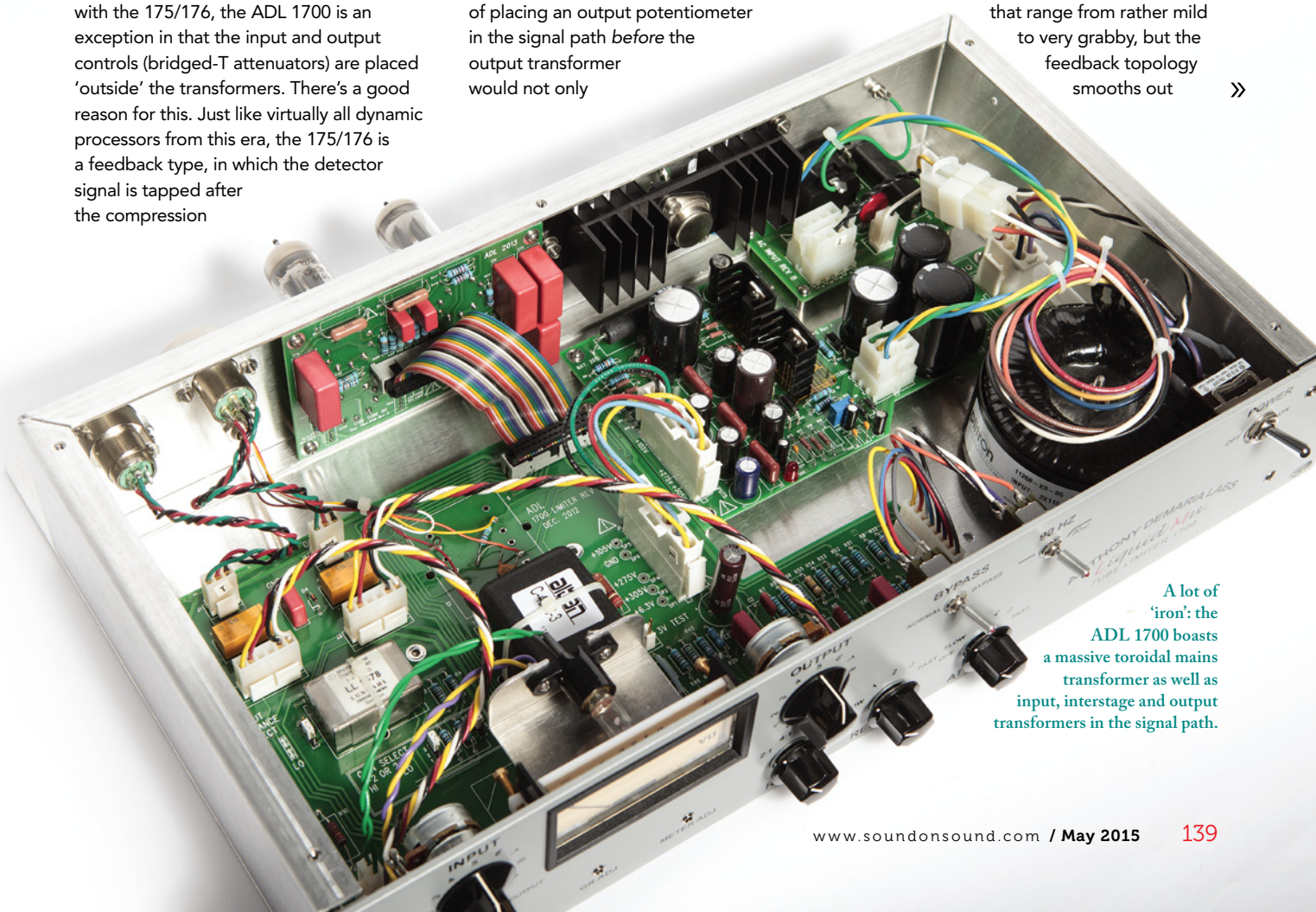
After the compression takes place, the audio signal is fed through the push-pull output stage, comprising two 12AX7 and 12AU7 dual-triode valves. This valve complement differs slightly from the original design, which works with a 12AX7s and a 12BH7; the 12AU7 is a less expensive and more reliable alternative, the only real trade-off being that it offers slightly less gain. As with the original, though, there are only three active stages in the signal path. That's a good thing in my view, as such simplicity typically helps to maintain the purity and integrity of the program material. The compression element and output stage are bracketed by input and output transformers, and there's also an 'interstage' transformer in between the two valve stages. However, unlike the Retro

Photos: Hannes Bieger

Instruments 176, which is the only other currently available commercial recreation of Bill Putnam's design, the interstage transformer can not be bypassed. That feature, not available on the vintage unit, was added by Retro Instruments to increase the number of tonal options.

On most transformer-equipped audio processors the circuitry is actually terminated by the transformers but, as with the 175/176, the ADL 1700 is an exception in that the input and output controls (bridged-T attenuators) are placed 'outside' the transformers. There's a good reason for this. Just like virtually all dynamic processors from this era, the 175/176 is a feedback type, in which the detector signal is tapped after the compression element (a principle that helps to stabilise the compression behaviour). In order to achieve this, the ADL 1700, like the UA original, employs a very special output transformer with different taps on the primary winding. This helps to achieve two goals: a low driving impedance, which is important to keep the attack times short; and it ensures the different ratio taps counteract the threshold, so that the compression always takes place in the level sweet-spot of the circuitry. The alternative of placing an output potentiometer in the signal path *before* the output transformer would not only influence the output level but also the amount of compression, which is not desirable in this case.

Both the attack and release parameters can be adjusted in five steps, the attack options being between 0.1 and 1 millisecond, and the release from roughly 30 to 530 milliseconds. These almost brutally fast time constants give us a clue as to why Bill Putnam described his designs as 'limiting amplifiers'. With just four ratios between 2:1 and 12:1 this compressor offers gain-reduction actions that range from rather mild to very grabby, but the feedback topology smooths out »



A lot of 'iron': the ADL 1700 boasts a massive toroidal mains transformer as well as input, interstage and output transformers in the signal path.

All four valves and the Cinemag transformer are placed on the rear panel. Unfortunately the unit doesn't offer much protection for the fragile glass cylinders!

» results that, on paper, may appear very drastic. Even with a fast attack setting and a high ratio, this processor seems to work 'with' the audio signal, not against it. Some feed-forward VCA designs might be more technically 'accurate', but they can seem to impose their compression in a rather unmusical way. By contrast, the ADL 1700 leaves the flow of the program material intact, even when flexing its muscles.

An additional Off position on the attack switch disengages the side-chain from the compression valve, and with this setting selected the ADL 1700 acts as a pure valve amplifier. This means that when dialing in more extreme settings on the input and output attenuators it may be employed as a meaty saturation processor.

The face-plate offers a number of toggle switches for power, bypass and a side-chain filter, the latter two being neatly illuminated by red status LEDs inside the shafts of their levers. The filter, operating with a corner frequency of 90Hz and a 6dB-per-octave slope, proves a very useful addition to the original feature set. Today's recordings contain a lot more heavy bass energy, and the presence of such a filter greatly helps to adapt the compressor's settings to these signals.

Online Examples

Audio examples can be found on the *SOS* web site. These comprise a number of sources — drum room mics, bass guitar, vocals and electric guitar — being run through the ADL 1700 at several different settings, and they're accompanied by a detailed description of what to listen out for. (For the best quality, download the WAV files.)
W http://sosm.ag/may15media

The slightly military appearance of the 1700 oozes the workhorse charm of typical valve-era designs: uncompromising, unrefined, but with a lot of character. Overall, the build quality is excellent. The rugged, solid enclosure contains quality components such as Grayhill switches and audio transformers by Cinemag, Lundahl and Altran — an unusual mixture, which, according to the designer, was settled on after conducting numerous 'real-world' listening tests with a group of audio engineers using prototype units. The large backlit Sifam VU meter displays gain reduction as well as input and output levels, and the 1700's face plate also boasts trim pots for gain reduction and meter adjustment. I'll offer no prizes for guessing that XLR connectors for the audio signals, the mains inlet and the mains fuse holder are placed on the rear of the unit. All four valves sit here as well, which is sensible from the points of view of heat dissipation and ease of service, but it also means that little protection is provided — the fragile glass tubes sit in their sockets without covers to shield them or keep them held in place. The bottom lid protrudes a couple of centimetres to the back to act as a barrier against damage, which is better than nothing, I suppose, and is more than offered by the Retro 176. But great care should be taken when moving the ADL 1700 around or while mounting it in a rack.

The UA original and the Retro 176 are both true all-valve designs: as well as having a valve signal path, they employ a rectifier valve in the power supply and a voltage regulator valve to feed the 6BC8. The ADL unit doesn't compromise the all-valve signal path, but the other tubes I mentioned just now have been replaced with semiconductors, which should increase reliability while reducing manufacturing costs. However, the 1700 also employs the same 6AL5 dual-diode side-chain rectifier valve that's found in the other two units.

In Use

I quickly discovered that this compressor's vintage lineage shines through in every minute of use. It oozes classic valve charm, and there are a few little quirks here and there to remind us of the simple and clever design concept of the 175/176, as well as Demaria's adaptations. Just as I'd expect of such a compressor (or should I say 'limiter'?), it acts in a very muscular way, with a distinct attack curve and a basic nature that is best described as powerful and grabby, especially when working with high ratios and for heavy gain-reduction. However, by selecting the 2:1 ratio and going for a more reasonable degree of compression, the 1700 can be tamed, and in this way it serves as a beautiful vocal limiter; the density and the overall RMS level can be increased in more than healthy proportions, but without altering the sound character too much. Yet, the fast and forceful nature of this design lurks behind every potentiometer. By that, I don't mean to say that the overall 'sweet spot' of this unit is small, or that it's ever difficult to find an appropriate setting, because that's not the case, but there's never any attempt to hide its strong character.

The sound examples provided on the *SOS* web site (see box) demonstrate well the two defining qualities of the ADL 1700: its distinct sound, and it's extremely versatile nature. It works a charm on vocals, it can add punch to bass lines, it is capable of some gritty saturation and distortion artifacts, and when it comes to crushing drum rooms it's second to none.

That's a pretty wide range of applications for a single unit, and testament to Bill Putnam's engineering genius.

Overall, the 1700's audio stages sound thick and warm, boasting a rich, almost smoky colour palette. It 'slows down' unruly, thin signals, and balances 'nervous' material with a beautiful calmness, which is a nice contrast to the powerful action of the actual gain reduction. This, to me, was an interesting difference to the Retro 176, which sounds rather bright and forward.

But with light comes shadow, and although I didn't discover any major problems, there are two points worth mentioning. The first is that the gain available at the output stage was a bit more conservative than I'd hoped — perhaps the original's 12BH7 would have been a better choice, or the unit might be calibrated in a different way with the existing 12AU7. But there were a few times when I couldn't reach the desired output level with certain input/gain-reduction settings. The second is that some of the switches, including the ratio control, but particularly the side-chain filter switch, cause a very audible 'pop', which is followed by an output-level sag when toggled to another position. This is not dangerous, and neither is it a huge issue, but I did find it a bit disturbing. I suppose it's one of the quirks inherent in such an old design concept.

Conclusion

Producers and engineers interested in this classic compressor design don't have many options these days. Vintage originals are scarce and rather pricey, and between the ADL 1700 and the Retro Instruments 176 there are only two current production units based on this legendary Putnam design. Neither is a direct clone of the original, as both units alter the original design in various aspects. The Retro Instruments version has more features and a circuit design that navigates slightly closer to its muse, whereas the ADL costs a lot less without cutting any major corners.

Both units can convince with their sound and build quality, so when the ultimate decision doesn't come down to cost it will probably be based on the very distinct difference of their sound characters. Boasting a very similar compression behaviour to the ADL unit, the Retro 176 sounds bright and open, whereas the 1700 offers a rich, thick and warm character. In fact, for the lucky ones among us who can afford both units, they would complement each other very well indeed!

Alternatives

While a few DIY projects are based on the 175 and 176 (from **Drip Electronics** and **AC Sound**, for example), the **Retro Instruments 176** is the only other commercial version of this classic Bill Putnam design. Albeit solid state, the **Universal Audio 1176LN** shares many similarities with its valve-based predecessors, and many products draw inspiration from that design, including the **Purple Audio MC77**, **Slate Pro Audio**'s **Dragon**, **Wes Audio**'s **Beta 76** and the **Warm Audio WA76**.

£ £1920 including VAT.
T KMR Audio +44(0)208 445 2446
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