



API's six-slot Lunchbox housing sparked a movement toward using 500 Series format modules as outboard processors. Shown here are the six modules tested this month: (left to right) Pendulum Audio OCL-500, AnaMod AM660, Inward Connections VC500 and OPT1A, Chandler Limited Little Devil, and Purple Audio Action.

Compression Gone Modular

Six 500 Series Compressors Under \$1,300

By Eli Crews

The market for 500 Series units has exploded in the last few years, with many manufacturers adapting current models or designing new products for the compact, modular system. Developed by Automated Processes (API) founder Saul Walker more than 40 years ago, the original design wasn't originally intended as a standalone module system, but it allowed API to readily configure customized mixing consoles for customer needs, based on interchanging combinations of modules in a console frame. Later, API and other companies developed lunchbox carriers and rackmount units that were equipped with standard I/O connections and a power supply, allowing the modules to be used as outboard equipment.

One benefit of the modular approach is the small form factor: Several channels of processing can fit into a relatively small amount of vertical rack space. Modularity is another plus; a mic pre used for tracking can be swapped out with a compressor for mixdown, for exam-

ple. And as the individual modules have no onboard power supply or I/O jacks, this helps keep the cost down for the modules themselves. Drawbacks also exist: The power specs are lower than what is possible in a standalone unit, and the faceplate's small (1.5x5.25-inch) real estate limits the size and layout of the front panel controls.

There are many types of preamps and processors available in this format. In this article, we'll focus on six compressors/limiter modules priced under \$1,300 each. To some, that may seem like a lot of money for one channel of compression. However, while gaining popularity, 500 Series modules still have a somewhat limited market. Manufactured in small numbers by boutique audio companies, these devices tend to have high-end component selection and build quality. As an indication, most feature custom transformers and proprietary discrete op amps, and all offer true hardware bypass, a testament to their manufacturers' dedication to pristine audio quality.

Aside from API itself, a few companies make 500 Series housings, usually in either six- or 10-slot configurations. The lunchbox six-slot racks have a handle and feet for tabletop use, and the larger units are three-rackspace designs. Both styles have integrated power supplies providing juice to each installed module, as well as XLR I/O for each slot. Purple Audio kindly provided the rack I used for these tests, a 10-space chassis called the Sweet Ten. One cool feature of the Sweet Ten is there is an extra jack for each module, which provides easy stereo linking capabilities for its own Action modules, as well as any other dynamics modules with the appropriate pinout (API's 525 and 527 compressors, for example).

ANAMOD AM660

AnaMod (anamodaudio.com) was formed by Greg Gualtieri of Pendulum Audio and Dave Amels of Bomb Factory fame. As the name implies, the company is devoted to the fully analog modeling of revered vintage gear. For the



Pendulum Audio OCL-500 (left) and AnaMod AM660 (right)

absent is an output/makeup gain control. To achieve a desired gain reduction versus output level, you have to carefully balance the input gain and threshold controls.

CHANDLER LIMITED LITTLE DEVIL

Of the six compressors I tested, the Little Devil compressor (\$1,180) has the most interesting feature set. Wade Goeke at Chandler Limited (chandlerlimited.com) is a master of innovation, and the FET-based Little Devil is a culmination of a number of his past products, most notably the Germanium Compressor (see my review in the April 2008 *EM*, available at emusician.com). As on the Germ Comp, Wade has left specific value numbers off, opting for a simple 1-6 scale for each of the controls, rather than decibel or millisecond values, to make the process

of setting the controls more intuitive and less analytical. Continuous controls include Input, Output, Attack, and Mix, the latter of which lets users enable the Little Devil as a parallel compressor without having to split the signal to two channels. Like that of the Purple Action, the Little Devil's attack range is wide, allowing for a large amount of influence over the tone and contour of the compressed sound with this single control. There are three-position switches for determining both the Ratio (Hi/Med/Lo) and the Release (Fast/Med/Slow), and a six-position switch for choosing the sidechain hi-pass filter frequency (Out, 30Hz/60Hz/90Hz/150Hz/300Hz). Three of the other compressors in this roundup have sidechain HPFs, but the Little Devil is the only one offering variable frequency selections, which are handy for sculpting the sound of a kick drum or bass or for preventing the low-end energy from triggering compression on a sub-mix or on the stereo bus. Lastly, a Curve switch allows changing the knee of the compression curve from Germanium to Zener—the former

AM660 limiter (\$1,295), the target piece of gear was the Fairchild 660 limiter, the Holy Grail of vintage compressors that can fetch tens of thousands of dollars used. All of the Fairchild's electronics—including its compression curves, time constants, and transformers—are modeled by the AM660's analog computer, which AnaMod describes thusly: "Instead of writing software code to describe how a complex audio system behaves, we developed special analog building blocks that are 'coded' to emulate the behavior of the audio system." Never having used an actual Fairchild myself, I was less concerned with the accuracy of the modeling than with the sound and usefulness of the AM660 relative to the other compressors in my rack. The AM660 has Input Gain and Threshold knobs, as well as a rotary switch for choosing one of eight Time Constant settings, three of which are designed specifically for vocals and two of which are multislope release times based on the original Fairchild's parameters. Other than that, there is only a classic-looking VU meter and a switch for the hard bypass. Notably

being a harder, more aggressive sound, and the latter being extremely gentle.

INWARD CONNECTIONS OPT1A

The OPT1A limiter (\$1,095) is a solid-state opto cell limiter, based roughly on Inward Connections' (inwardconnections.com) own TSL-3 Vac-Rac tube limiter, the favored vocal dynamic controller of many an engineer. There are only two knobs on the unit—Gain Reduction and Output Level, plus a recessed trim pot for setting the zero level of the vintage-style VU meter. The OPT1A is the only one of this group of compressors that allows you to meter either the output of the unit or gain reduction; the rest only indicate gain reduction. There is also a switch for engaging the 250Hz sidechain HPF, a switch for stereo linking (again through pin 6 of the edge connector), and a hard bypass. There are transformers present in the input as well as output stages. This is the only unit in this lineup that doesn't offer any control over the attack and release times; they are set at 3.5ms and 500ms, respectively, although they vary slightly with the amount of gain reduction induced. This lack of control can sometimes be a good thing, as long as the time constants complement the program material, as it gives the user less to mess up.

INWARD CONNECTIONS VC500

The sole VCA-type compressor in my lineup was Inward Connections' \$1,095 VC500, designed by longtime gear guru Steve Firlotte. This compressor has the most standard controls of the lot: Gain Makeup, Threshold, Ratio (2:1 to infinity:1), Attack (0.2ms to 20ms), and Release (100ms to 3sec). It also sports a 250Hz sidechain HPF, stereo linking (via pin 6 of the edge connector, and therefore via the stereo link jack of the Purple Sweet Ten), and hard bypass. The input stage is differential transformerless, but there is a transformer on the output stage. Gain reduction is shown on the fast-acting, 10-segment LED meter, from 2dB to 20dB of attenuation.

PENDULUM AUDIO OCL-500

The OCL-500 (\$1,295) is a solid-state version of Pendulum Audio's (pendulumaudio.com)



Inward Connections OPT1A (left) and VC500 (center), and Chandler Limited Little Devil (right)

tube-based OCL-2 compressor, designed by Greg Gualtieri. It uses an opto cell in the compression detection circuit, like many renowned models of yesteryear (such as the UREI/Teletronix LA-2A), but provides more control over the attack and release times than on vintage optical compressors. The continuous controls are Threshold, Ratio (1.5:1 to 15:1), and Output. There's a 150Hz sidechain hi-pass filter, a hard bypass, and a rotary switch for choosing one of six time constants (Fast, Average, Vintage 1 and 2, and Manual 1 and 2). Manual 1 has medium attack and release times; Manual 2 features slow time constants. The Class-A, transformerless audio path helps provide a high-fidelity method of controlling dynamics without coloring the sound of your signal.

PURPLE AUDIO ACTION

Although Purple Audio's (purpleaudio.com) \$725 Action compressor has its roots in UREI's

venerable 1176 compressor, designer Andrew Roberts makes it clear that it's no 1176 clone. The controls, however, are the same: An Input pot drives the custom input transformer (taken from Purple's revered MC77's design); an Output pot drives the output transformer, continuously variable Attack (from 20µs to 800µs) and Release (50ms to 1.1 sec) controls; and a five-position rotary switch determines the Ratio (4:1, 8:1, 12:1, 20:1, or infinity:1). The infinity setting is modeled after the 1176's popular "all buttons in" mode. There are also switches for engaging the hardwire bypass, and one that either engages stereo linking (via an additional rear-panel jack on the Sweet Ten) or bypasses the FET-based compression, leaving the amplifiers and transformers in the audio path. The Action excels at adding girth and grit to whatever is passing through it, even with no gain reduction. Gain reduction is measured by an eight-segment LED ladder, which shows 1dB to 12dB of peak attenuation.

CAN I KICK IT?

On bass drum, the Purple Action immediately showed its mettle. With a fast release time, a semislow attack, a 4:1 ratio, and about 5dB of gain reduction, the Action really thickened up the sound, providing extra attack and a solid, tight low-end punch without getting woofy. The Little Devil also shone, getting quite grabby while in the Germanium curve setting, but sounding much less apparent in Zener mode. The wide range of attack times, variable high-pass sidechain filter, and Mix control let me dial in a superb kick sound with the ideal beef-to-attack ratio. I liked the Little Devil's filter in this application set to 30Hz, having all the other compressors' sidechain HPFs had too high of a corner frequency to function ideally with bass drum. I did find a good sound with the OCL500, with the ratio set to about 10:1, the Average time constant and the threshold set with around 5dB of gain reduction. The VC500 gave me a wide range of peak taming possibilities, but I found myself wanting the release time to go a little faster than the 100ms minimum. The OPT1A did a good job at evening out the dynamics in the performance, but it didn't quite have the sound I was looking for, because of its relatively slow attack and release times. The AM660 gave me a nice, even sound with its fastest time constants, but with no sidechain filtering, I any more than about 3dB of gain reduction sounded too squashed.

CAUGHT IN A SNARE

On snare drum, every compressor gave me a sound I really liked, although they were quite different. On the Little Devil (in Germanium mode, with a low ratio, slow attack, and fast release), the snare had a nice heft while it seemed brightened up a little at the same time. Switching the ratio to the high setting, it was feeling a little too squashed, but adjusting the HPF to 150Hz let the snare's body come through in a pleasing way. The Action, with a slow attack and fast release, yielded an excellent *thwack* that I'd been missing on the dry signal. In Vintage 1 mode, the OCL-500 brought life to the performance, as if the drummer started hitting the snare harder, even at only 3dB of gain reduction. With the VC500, dialed in a setting that tamed the performance signifi-

cantly, but retained a richness to the sound, with a full-bodied low end and a crackly top end. The OPT1A also provided a rich, round sound (especially with the sidechain filter engaged), increasing the drum's sustain without making it too ringy. The AM660 truly impressed me in this application; cranked up to provide more than 10dB of gain reduction, it imparted a special vitality to the performance while keeping the dynamics completely in check. Time Constant 6, with its fast attack and triple-slope release time, was my favorite for this snare drum, although Time Constant 1, the setting with the fastest release, also sounded good.

GET A ROOM

One of my favorite applications for using compressors is on drum room mics, and I had to hear each of these boxes perform that task. I'm often looking for a lot of character when compressing the room mics, and the AM660 was the star in this function. Slammed hard, the drums exploded, and the best part is that the cymbals didn't get overly brash like they often can during heavy compression. Time Constant 6 sounded the most natural, whereas Time Constant 1's faster release provided the best pumping, overcompressed sound of the lot. The OCL500, VC500, and Action all offered a wide range of sonic possibilities that I would readily employ in a mix. Neither the Little Devil nor the OPT1A were my favorites in this application. They both sounded too good, not giving the nasty compression artifacts I was looking for, even when pushed hard.

BASS FOR YOUR FACE

On bass guitar, however, the lack of artifacts was exactly what drew me to the OPT1A. Even at gain reduction values up to 7dB or 8dB, with the sidechain filter in, the OPT1A provided extremely smooth leveling on a dynamic performance, and the sound thickened without getting boomy. The Little Devil also helped

Purple Audio Action



thicken the sound, and the variable filter made it easy to let the lowest fundamentals through while still smoothing out the attacks of each note. With its super-fast attack capabilities, the Action really grabbed the transients and darkened the tone a bit. Reducing the attack slightly brought more life back into the performance, with the dynamics still being deftly controlled. The AM660, with Time Constant 2a, also made the bass seem more alive, and more three-dimensional, even at very small amounts of gain reduction. Pushing the input hard resulted in a very pleasant distortion, just enough to give the bass a

little extra teeth in the mix. The OCL-500, with the sidechain filter engaged, got rid of some of the clacky finger and fret noises while retaining the body of the bass. With its versatility of control, the VC500 was adept at taming the performance inconsistencies unobtrusively.

VOCALS

Each vocal performance demands a different kind of compression, yet two of these devices consistently impressed me on all kinds of vocals across different genres, tempos, and intensities: the OPT1A and the AM660. I got excellent results with the other four as well, but these two stood out as superb tools for the job. Even at high amounts of gain reduction, they both just worked, taming the dynamics but also providing that intangible finish that makes a vocal just sit in the right place. For lower vocals, the sidechain filter on the OPT1A helped the bottom end push through a little more, whereas higher vocals usually sounded better with the filter off. The best-sounding time constants of the AM660 varied from song to song, but I usually settled on one of the three vocal-specific settings. It's easy to see why the predecessors of these two compressors (the Vac-Rac and the Fairchild, respectively) are widely renowned as first-choice processors for vocals.

STEREOPHONIC

I had two units of only two models, the Actions and the Little Devils, so I tried these in stereo applications. The Little Devils don't employ stereo linking, but thanks to the third jack on the Sweet Ten, I was able to test the linking function on the Actions, which reduced gain roughly the same on both sides (as long as the settings of the two units were the same). On stereo drum subgroups, both sets of compressors gave me highly desirable results, thickening up the drums and giving the cymbals more sustain. The Mix knob on the Little Devils let me easily dial in the (phase-coherent) compressed sound to my taste. I also liked both pairs on the stereo bus. Between the Mix knob and the sidechain HPF, there was far more control on the Little Devils, but the Actions had a special warmth and charm, and ended up getting used on the 2-bus on quite a number of final mixes for a recent record project.

TAKE A FEW; THEY'RE SMALL

Comparing this many high-quality compressors literally side-by-side was a blast, but also an educational and illuminating experience. While each unit had its strengths and weaknesses, any one of these modules would make an excellent addition to your 500 Series collection. The price/performance ratio is definitely tipped in favor of the Purple Action, since it's \$300 cheaper than the other models and sounds fantastic. The Little Devil has the most interesting and extensive feature set, and the ability to run parallel compression within the unit itself is a huge bonus. Both the AM660 and the OPT1A have simple yet effective controls, and provide very smooth compression at high gain reduction amounts, especially for vocals. Both the OCL-500 and VC500 proved extremely versatile, with perhaps more fidelity and less character than the others in this lineup. If you have a 500 Series rack with a few open spaces and a love for high-quality compressors, give each of these six models a listen. You may find it hard to part with any of them once you do. *

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