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A clear case of "more than the sum of its parts," the VT-747sp from Avalon Design combines a tube-based, opto-stereo compressor, sidechain processor and discrete transistor program equalizer in a two-rackspace package. This stereo



line-level processor is designed for stereo bus compression/EQ, signal conditioning of stereo keyboards, input or output processing for DAWs and analog stereo mastering. It's one of a few new pieces of equipment that exemplifies a current trend: clever signal routing and interconnections coupled with advanced control features making for new and more powerful analog signal manipulation.

The 747 looks similar to Avalon's VT-737sp mic/EQ preamp with its backlit push button switches, oval-shaped gain reduction VU meter and overbuilt mil-spec appearance. Pushing each switch reveals that all in/out switching and routing of each section is by any one of 22 sealed silver contact bypass relays. For example, if you have the compressor switch out, the signal does not flow through that stage. I like the "feel" of working this unit with its knurled metal knobs and positive detents on the Input, Output gain controls, 0dB center-position EQ faders and center detents on the Side-Chain Threshold controls.

Operation of the 747 is intuitive for any engineer who knows compressors and equalizers. There is a single stereo tracking input level control accepting maximum levels of up to +36 dB. This is not a concentric control, so it is not possible to offset input levels for the left and right channels separately: You'll have to do that in front of the 747. There is a +10dB pushbutton that jumps the level up if you are working with -10dB levels from synths or semipro recording equipment or want to change the internal gain structure by "overloading the front end" with super-hot levels. Both the +10dB button and input control affect compression as you would expect.

The Threshold control adjusts the level when compression begins from -20dB to +20dB, and

the Compression control sets ratios from 1:1 to 20:1. A passive optical attenuator is used for gain reduction, introducing very little additional noise or artifacts to the sound. I like the small blue LED that flashes with small gain reductions that may go unnoticed on the meter. Attack times are adjustable from 1 ms to 200 ms while the Release control adjusts release times from 50 ms to seven seconds. These are slightly faster values than the compressor section of the VT-737sp unit.

The large VU meter reads only gain reduction with a 20dB range and offers good resolution of the important first 5 dB of gain reduction. As this unit is stereo, the meter indicates a summed value of GR for left and right channels with no way to monitor the channels individually. This reminded me again that you cannot separately process two mono signals with the 747, as both channels' functions are inexorably linked. The Make-Up gain control adjusts the output of a discrete transistor variable gain Class A amplifier from 0 dB to +10 dB. When TSP (Twin Signal Path) mode is used, an additional single-triode tube buffer stage is inserted directly after the compressor before this make-up amp.

Furthermore, in TSP mode the discrete transistor Class A output amplifier after the main equalizer is swapped for a dual-triode tube line amp. Final output level is controlled by a single stereo tracking Output control with a range of -20 dB to +6 dB. A gain, not a concentric control that you could individually set left and right output levels. I found final output levels closely matched switching between TSP and the default solid state path. The sonic difference between these two paths is subtle unless the unit is operated at maximum throughput levels, where near-distortion characteristics of these two classic paths become more noticeable. I did notice a little more grunge when compressing very hard and using the TSP mode. TSP is the smoother, rounder, warmer glowing path...all those tube words. Finally, a pair of high-resolution LED meters with 60 dB of range measure the output level.

Avalon refers to the VT-747sp's frequency-conscious sidechain section as Spectral-Opto-Compression. This part of the unit is an improvement over the simpler method used in the VT-737sp, where 2-band sections of the 4-band parametric EQ are re-routed to the sidechain path. In the 747, there are dedicated high-frequency and low-frequency parametric controls that adjust frequency-dependent compression. They are not part of the main equalizer. The high-frequency control covers from 600 to 10k Hz with a Q of 1.0, and the low-frequency control overlaps from 60 to 1k Hz with a Q of 0.7. Each of these controls has separate boost and cut ranging from -15 dB to +15 dB.

When you use Side-Chain, these boost/cut controls act as compressor threshold adjustments for the frequency selected on the HF and LF controls. By selecting 100 Hz and cut, the compressor will clamp more at frequencies at and around 100 Hz. By making the compressor more or less sensitive at certain frequencies, you can create unusual tone shapes and treatments, or fix real-world problems like excessive sibilance (de-essing) or resonant peaks encountered in live sound work. The Side-Chain Listen button monitors the sound of the sidechain signal and lets you precisely "tune" in the frequencies you want to dynamically change. In use, I found this another compelling reason to own this unit, as it was easy to stress certain bands by diminishing their level in the sidechain and reducing the need for overall compression.

This feature worked well on program sources when I wanted a compressed bottom end and an open and transparent high end. I think this unit would be an instant favorite with live sound mixers for use on the stereo front-of-house mix. The Spectral Compression was useful with a synth patch where the internal chorus rolling through resonance caused a giant level jump. I couldn't fix the chorus itself (I was mixing a client's tape that I didn't record), so by finding the center frequency of the resonance peak while in Side-Chain Listen, I was able to squash just enough to level the peaks only.

The final section of the 747 is the 6-band stereo graphic program equalizer with a hard-wired EQ bypass switch. There is a switch that places this passive equalizer either before or after the compressor section, which I liked. As it is a graphical equalizer, you can see from across the control room which bands are being equalized--another nice touch. The six frequencies and performance of the equalizer are: +/-24dB of 15Hz shelving; +/-8dB at 125Hz peaking type; +/-4dB at 500Hz peaking; +/-4dB at 2kHz peaking; +/-10dB at 5kHz shelving; and +/-20dB at 32kHz shelving. The midrange equalizers have a Q of 0.1, while the high- and low-frequency shelves have a Q of 0.2--both very broad program EQs.

I liked the equalizer a lot for mastering work and in use across the stereo output of a low-cost digital mixer I have been using lately. The 32kHz band is a popular holdover frequency from the Avalon VT-737sp. Boosting 32 kHz and 15 Hz provided a wonderful sound for studio playback listening hype and live sound work. Boosting 32 kHz definitely affects all the way down to pedestrian frequencies around 10 kHz; likewise, changing 15 Hz affects most of the low frequencies, too. As much as I liked it, I could use two other in-band frequencies (20 to 20k) for most studio and mastering work. (How about a 16/32kHz and a 15/30Hz octave switch?) Strangely, none of the frequencies or the boost/cut values are silk-screened on the front panel. A good way to ensure job security for the engineer who is familiar with the 747, but maybe not endearing to the casual or first-time user. Again, since the 747 is a strictly stereo unit, there is no way to have different EQ curves for left and right channels.

The VT-747sp, priced at \$2,495, is a "finishing" tool that updates the process of stereo mix compression with advanced control and superb sound. Its precise control over the interaction of dynamics and equalization provides endless sonic sculpting and polishing possibilities for the creative engineer.

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