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Avedis Audio Electronics

E27 500 Series Equalizer and

PSP Audioware PSP E27 and PSP E27 SE

Classic hardware, powerful software, and the inspirations behind them both

REVIEWS BY PAUL VNUK JR.

Avedis Audio Electronics is based in California and run by namesake Avedis Kifedjian. Avedis is a well-respected gear designer who worked as lead tech for Brent Averill and learned from audio expert Geoff Tanner. Before and after starting his own company, Avedis was responsible for many of the design innovations at Brent Averill Electronics, most significantly his custom-designed Avedis 1122 op amp.

Today we're reviewing the Avedis E27 EQ module, as well as a plug-in version made with Avedis' assistance by Poland's PSP Audioware.

The E27

The E27 is a 3-band equalizer with 9 frequency choices per band. It was first released in 2005 as an update of the earlier E15, which had 5 choices per band. Despite its popularity, it went on hiatus around 2010, but now it's back.

The E27 is a 500 Series format equalizer laid out similarly to a classic API 550A with three dual-concentric controls for frequency selection down the front. That is where any similarities end.

The inner volume knobs are continuously-variable pots with a representation of the signature Avedis triangle logo in beautiful red aluminum. The outer knurled silver aluminum stepped switches (by Grayhill) are Neve-like and classy, with a hearty click when selecting the frequencies. These are laid out on a sea of black with red and white lettering, rounded out by a series of three gray buttons, one for power and two to switch the high and low bands from peaking to shelving EQ.

Each band offers ± 16 dB of boost and cut with a self-adjusting proportional Q of about 0.85–1.1 on the bell frequencies. The high band offers a choice of 6k8, 8k2, 10k, 12k, 14k, 17k5, 20k, 24k and 28k. It's more common now, but back in 2005 the 28k band was seen as unique and quite the conversation piece. Prior to this, only NTI (now Mäag) offered anything similar in their Air Band®.

The mid section offers choices of 680, 800, 1k2, 1k8, 2k5, 3k, 3k8, 4k8, 5k6, and the low band is 33, 63, 82, 120, 200, 300, 370, 430 and 550 Hz. None of the three EQ bands overlap; this is intentional and explained by Avedis on his website.

In the interview below, Avedis takes us through the details of what is inside the E27. For now, know that it is an all-discrete design built with high-end components, coupled with Jensen transformers on the input and output. It has extremely high headroom and a wide bandwidth—from 3 Hz up to 75 kHz, according to Avedis. It can handle a 600 Ω input load and works well with both balanced and unbalanced signals; you could use it on a guitar amp's send/return with zero issues.

Sound and use

The E27 is clear and clean with a touch of silkiness on the top end, especially the extreme top. It's not an overly colored piece, but it does have a sound. Just running signal through it gives you the dimensional lift of the transformers. It's also very forgiving; 1–2 dB of boost or cut can nicely shape your sound, but you will also be surprised at how sweet the low and high bands are when pushed farther.

There is no reason to highlight certain applications—it works great on all of them. However, I will note how brilliant it is on stereo sources and bus work. For me, this is one of very few 500 Series EQs that I have ever truly liked and trusted on my master bus; it's an awesome final polish EQ and adds a beautiful silky air. Another element unique to the E27 is that when you boost a frequency, the peak is clear as a bell (pun intended) while the area around it, there's subtle harmonic distortion, as explained in the interview.

Conclusion

The E27 is simply great; in some ways, you could say it has already achieved "modern classic" status. It's equal parts functional, dimensional, and smooth. The 28k band is magical for opening up the sound in a way that's not obvious or shrill.

The hardware streets for \$1295 which is on the high end of 500 Series EQs, but it is built impeccably and no other 500 series EQ sounds like this—not that I've found, anyway!

PRICE: \$1295

MORE FROM: *Avedis Audio*, www.avedisaudio.com

The PSP E27

The PSP E27 is a 1:1 model of the Avedis hardware. This is one of only a very few spot-on models of existing hardware in the PSP Audioware line. PSP Audioware is better known for creating

meticulous circuit design models, many found in well-known vintage gear, and then recombining them into something unique and new that only exists in the DAW realm... and that many of us wish could exist in hardware.

True to form, PSP Audioware's PSP E27 starts with a modeled version of the hardware E27, but then expands on it in three significant ways.

New tricks

When the plug-in launches, it brings up a GUI of a 2-channel E27. On a mono track, channel two is visible but dormant. When used on a stereo channel, you can link both channels or use them to affect each side of the mix separately, thanks to a Link control on the right of the plug-in window. Below that is a control labeled x2. When activated, this pulls up a second E27 on each channel. This is equivalent to running two hardware E27 units in series; not only can you access more bands at once, you can now overlap some if you wish.

The second trick up the plug-in's sleeve is the ability to switch from stereo to Mid/Side. In both modes, there is a full featured monitoring section to solo the middle, side, or each stereo channel on its own.

The last option is labeled PA11. This opens up a third module at the left of the EQ, a preamp of sorts. There's no such thing as an Avedis PA11; as you will read in the interviews, this is PSP's own design.

It starts with a ± 16 Drive control. This is not an input, it's a very subtle harmonic saturation control. Next is a variable highpass filter from 20 to 800 Hz, followed by a +16/-16 Output control for attenuating the overall level of the whole plug-in.

Last up are four buttons. The one labeled 28k is taken from the Avedis MA5 preamp and adds a +6 dB shelving rise at 28 kHz (this was actually added to the MA5, inspired by the E27 hardware). Button two is for polarity, and the last two are marked by symbols. They are TrafoX, which bypasses the input and output transformers and their harmonics, and AmpX, which gets rid of the filter distortion (described in the interview) at the sides of the EQ peak. Each EQ section and the PA11 can be engaged individually or bypassed.

PSP E27 SE

Also in the package is PSP E27 SE. This is not a light version that lessens sound quality for the sake of processing power. It's simply

intended to be easier to set up quickly, by removing some options. PSP E27 SE only gives you one fixed E27 module (with PA11) that can be mono or stereo, but is not splittable or usable in Mid/Side.

Computer speak

PSP E27 is available for most DAWs on Mac and PC in all the common formats of AU, RTAS, VST, VST3 and AAX. The only thing to be aware of is that it is slightly more processor-heavy than many typical EQ models. On my 15" MacBook Pro Retina, with a 2.3 GHz Intel Core i7 and 16 GB RAM, running Steinberg Cubase 9, twelve mono instances and a stereo master bus instance pushed the CPU meter up to roughly 33%.

Of course I could whine about only getting fourteen channels of this EQ and the PA11, but in the real world I was lucky to be using a pair of them!

In use

Sonically, as it relates to each frequency band, PSP did a great job. The only discrepancy I found was that the cutting and boosting needed to be pushed a few dB more in the plug-in to match the hardware. This is not the first time I have encountered this phenomenon in a plug-in, and I am sure not the last. It's pretty common, and if you use your ears, you can match the two perfectly well. [PSP Audioware reports that this is deliberate, to allow for finer mouse control when working around 0 dB peaks.—Ed.] Of special note is how well PSP captured the 20k, 24k, and

28k bands, with a smoothness akin to the hardware.

In use, note that rather than turning the frequency knobs with a mouse drag, you can choose them just by clicking on the frequency number. This is a nice shortcut, considering the hardware knobs are stepped anyway!

Conclusion

Considering its quality reproduction of the E27, the PSP E27 plug-in (available as a download from the PSP webstore) is a bargain. Even if you already have a hardware E27, you should download and check out the demo, just to hear what it's like when a software emulation truly nails it.

PRICE: \$149

MORE FROM: PSP Audioware, www.pspaudioware.com

Avedis Kifedjian on the E27...

Avedis, you got your start in the LA studio scene as a gear tech and eventually ended up working at Brent Averill Electronics (BAE)?

Avedis Kifedjian: Yes, I got hired there as contract labor after working with ex-Neve employee Geoff Tanner out of Grandmaster Recorders in Hollywood. I designed my own op amp, the model 1122, so I could repair older API gear. Brent really liked it and asked me to incorporate it into his version of the classic API 312, and after a few necessary tweaks, that became the BAE 312A.



Adam Taborowski, Avedis Kifedjian, and Mateusz Wozniak

Tell me about the 1122 op amp. Since it was made to work in older API gear, is it similar to the API 2520 op amp?

The 2520 API op amp goes back to the late '60s and had evolved by the mid to late '70s with the Melville and Huntington variations, which are the ones that I studied and measured. It's similar in that it's still a discrete hand-built op amp, but I used different components inside to improve stability, noise performance, and just to make it more reliable—especially since when an op-amp fails you can't fix it.

It's like if somebody gave you the recipe for making chocolate chip cookies. First you make it exactly like that recipe and you learn about it... but once you have learned it, you make little adjustments, right? Brown sugar for white sugar, or whatever. There was certainly some small room for improvement—for example, ceramic caps with a 20% tolerance were horrible for audio. Modern quality ceramic caps have a 2% to 5% tolerance, and can withstand a higher temperature. So why would you not use that?

So how did Avedis Audio Electronics come about?

When I made the 312A for Brent, he actually put my first name on there with a Trademark symbol...

So basically Brent kind of launched the company for you!

Yeah, he put me in a position where I had to trademark my first name [*laughs*]. Avedis is an old Armenian name, but he said, "It'll make a good company name; people don't know what it means." The symbol for the company is a 1960s schematic symbol for an op amp. So that's how it all got started; the first product that I made on my own, using my own symbol and name, was the E15.

Which was the precursor to the E27. Can you tell me about the evolution of the two?

Brent asked me to design an API-style EQ like a vintage 550A. While I put the buttons and knobs in the same place as 550-style EQ, the insides are really different. The calculations, the topology, the way that I used the amplifiers and the filter design, make it unique.

And the E15 was an Avedis product, not BAE?

Yes, and interestingly when the E15 came out in 2003, basically Brent Averill and API were some of the only companies making anything for the 500 Series. There was no other company actively making anything for the 500 Series at that point.

My E15 was the first 500 Series EQ to come out that was all discrete and with a balanced transformer input. All of the API EQs in the 1970s and 1980s were either unbalanced, like the 550A or 553, or they were electronically balanced, such as the 554 and the 560s that used electronically balanced (IC

chip) inputs. Nowadays, how many companies are making 500 Series modules?

I have lost track!

It's so many, which is good, but when I made the E15, I put it out in Brent's shop for people to look at, and back then nobody really cared about 500 Series. Nobody wanted to commit to that format.

What helped out was, Warren G [the rapper] came in to buy some preamps, and he looked at the E15 EQs, and he said "How much are these?" I said "These are \$750." That's how much they were at that time. He said, "What? These little things are \$750 each?" And I say, "Yeah, you know, it's high quality parts... expensive transformers, switches and caps and all that, custom-made knobs, reliability, high headroom, low noise, all this stuff comes at a cost, you can't make it cheap." So he bought a pair and then after that, all these other guys heard them in his studio and ended up buying some. My first customers were all from the LA Gangsta Rap scene.

How did the E27 come about?

It was probably 2005, simply because I found some switches that had more positions and I added more frequencies. That became the E27, and I abandoned the E15. E just stands for Equalizer and 15 means 15 frequencies total: five per band, and there are three bands. E27 is nine frequencies per band over three bands.

I know they visually look similar, are they the same inside?

Yes, it's the same Jensen transformers, the capacitors are German-made Wima or Japanese-made Panasonic, which I can't get any more, so I have to find them from old stock warehouses and buy as many as I possibly can.

I use Grayhill switches; they actually cost a little more money, but the Grayhill switch is PC mount, which makes for more reliable manufacturing. It's a dual stacked circuit board design with the frequency filters on a daughterboard, and the amplifiers and transformers on the motherboard.

That's a lot jammed inside a 500 Series module.

Yes, but should it ever need servicing, it's easy to do and you can get to any component inside. One advantage to through-hole vs. surface-mount components is that many years from now you can still easily service through-hole gear.

What kind of EQ is the E15 and E27?

Unlike the original API 550A, which is a twin-T topology, this is an inductor simulator, which is actually what it does. I like the sound of well-made inductors. so I use a Class-A amplifier and I put the capacitors around it that make it act as if it's got

Series EQ and PSP Audioware PSP E27 and PSP E27 SE

inductor qualities to it. It's partially why the E27 has this rich second- and third-order harmonic distortion; not at the frequency center where you boost it, but around that frequency.

I remember that by 2008, the E27 had developed a very dedicated following, but around 2010 or 2011 they were discontinued. What happened?

I just got really busy. Around that time, Brent Averill sold his company so I was helping out BAE for about five years with the transition, developing the product line. When I was designing for BAE, I just couldn't have time for making the E27, so I had to discontinue it.

When Mark [Loughman] had BAE going strong, I was able to fade from there and get back to spending more time at my own shop. Later, I got some great help with Jeff Watson and I brought it back again.

I know lots of folks are glad you did. Lastly let's talk about the plug-in from PSP; how did it come about?

A friend of mine said, "You know, this EQ should definitely be a plug-in." And I thought about it and I said, "Yeah, it's unique enough in its circuitry, it could happen." So after considering a few companies, my friends said, "This company from Poland, PSP, they're really good."

At a NAMM Show, I went over to their booth and introduced myself, and the possibility of making the E27 into a plug-in. They thought about it, and by the end of the day they said, "Yeah, I think we would be interested." So I handed them an E27 right from my booth and they took it to Poland, and for that entire year we worked together. I sent them THD graphs from an Audio Precision analyzer, and I sent them schematics, and they used those to program the algorithms.

I did some side-by-side comparisons with the real thing and the plug-in, and frequency-wise, they totally nailed it. In fact, the only thing I noticed was a bit of hardware/plug-in level difference when boosting or cutting.

Yeah, you're spot on. Your ears are not lying to you. We noticed about a 1.2 dB difference between the E27 software and the hardware, given the same frequency. The hardware is louder.

I was most impressed by how smoothly they matched the 28 kHz band.

That took Adam at PSP Audioware some time to figure out, and it's interesting to talk to him about it. He had to oversample the top end, and that's how he was able to make the 28 kHz sound nice and smooth. Otherwise, you know what top end sounds like with digital, right? Kind of jagged. The first time I listened to the top end, I was like, "Really? This is really good!"

I was expecting to stress out over it because of how digital plug-ins can be... but they got it, the curves were there, it's smooth. You can really use it without regretting that you used it, you know? And the software has some advantages, like the Mid/Side feature, and you can use as many of them as you want...

What is the PA11 module on the plug-in—is that one of your preamps we haven't heard about?

The PA11 is actually PSP's preamp design. The only thing they took from me was the 6 dB boost at 28 kHz button from my MA5.

From here, I think we will leave the rest of the interview to the plug-in guys. This has been really informative and it was great talking to you.

OK, likewise, Paul.

...and PSP Audioware's Mateusz Wozniak on the PSP E27

Mateusz, this is PSP Audioware's first one-to-one model of a specific hardware piece since the Lexicon PCM 42. Why have you waited so long to do a specific model vs. the hybrid approach you have been taking?

Mateusz Wozniak: We are a company grown mostly on our own experience and solutions inspired by good gear. Even if we do a plug-in based on hardware we still like to have an influence on its final shape, adding extra features and so on.

Doing specific hardware is a different story. In this case we have to strictly follow its behavior, study schematics with care, and do a lot of detailed measurements, instead of looking for a solution which best meets our needs. Sometimes a decision to make a specific hardware piece is a matter of luck. We need to be inspired by a piece of gear and need to have a relation with its designers.

Were there any challenges creating the E27 plug-in?

We usually try to do plug-ins which allow us to learn something new, like the E27. Adam Taborowski (the main developer and

algorithm designer of PSP E27) had to deal with lots of analog phenomena. The other big challenge was the reconfigurable GUI.

Who decided to add the dual E27 / 6-band mode?

We came to this in a team, and also consulted with Avedis, who was very supportive and open to the ideas on our feature list.

Avedis told me that the PA11 was your preamp design?

We knew we needed an extra analog input module for level adjustment; we decided that a good idea would be to add a highpass filter and controls for the E27's amplifier stages and transformer emulation. Thus we allow the user to control the amount and character of analog-like flavor that the plug-in introduces. It's a subtle influence, because Avedis uses such topnotch components which don't disturb the sound... we just wanted to help to polish it.

You guys did a great job on this, and I know it will see lots of use in my sessions!

Thanks, Paul. We are happy to have it in our collection. ☺