review

BY PAUL J. STAMLER

PreSonus ADL 600 Preamp

A heavy hitter from a famous name in preamp design

First impression: This thing is *heavy*—*28 pounds*! Weight in a preamp is a good thing, since it bespeaks a hefty power supply and lots of iron in input and output transformers, and those qualities suggest good performance. How good? Let's find out.

What it is—and isn't

First, let's get some terminology out of the way. These days, the term "tube preamp" is used by makers of cheap gear to mean a preamp with solid-state amplifying circuits that incorporates an overloaded, voltage-starved, high-distortion tube stage for "warmth", "drive" or some such. The idea, I suppose, is that old recordings were made with tubes, and they sounded good, so throwing a tube into the pot will make modern recordings sound good. That's hogwash—in the old days, the only tubed circuits run under those sort of conditions were broken—but it's been a successful marketing ploy among an audience that's never heard what a good tube preamp can do.

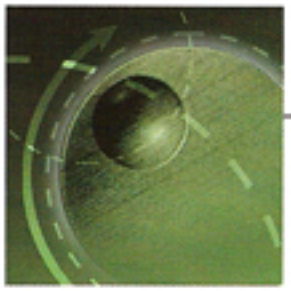
The ADL 600 is in a different league. It was designed by boutique-audio craftsman Anthony DeMaria, who could probably design clean circuits in his sleep, and instead of a voltage-starved tube, he runs this preamp from ±300 V supplies—that's 600 V of juice in toto (explaining the unit's name). DeMaria, recognizing the difficulty of building a box like this on a small scale, entered into a partnership with PreSonus to take advantage of their experience in manufacturing, access to parts at bulk prices, and large dealer network.

Opening the box(es)

So what do you get? The ADL 600 is a two-channel preamp with all audio functions handled by tubes. It has transformer-coupled mic and line inputs (plus unbalanced instrument inputs) and balanced-and-floating outputs, with selectable input loading resistors on the mic inputs. There are switches for 20 dB pads, polarity inversion (called by its right name!), 48 V phantom power, and selectable 6 dB/octave high-pass filters at 40, 80 and 120 Hz. Gains (nominally 30–65 dB) are switch-selected (the switches are marked for the mic inputs, but they affect the line and instrument inputs as well); there is also a continuously-variable gain trim. There's a pair of VU-style meters and corresponding LED ladders; a meter sensitivity switch lets you change the meters' scale to read hotter outputs without pegging.

When I took the lid off, I found very professional-looking innards. The audio transformers—which look like Lundahls—are indeed big; the input trannies look like many competitors' outputs, and the outputs are bigger still! The supply toroid is worthy of a power amplifier. This explains a lot of the weight; the box is also a factor, made of hefty steel rather than aluminum. Supply regulators are robust and mounted on big heat sinks sticking out of the back of the box, which should help long-term reliability—and hey, when was the last time you saw a heat sink on the back of a *preamp*? The tubes include two Electro-Harmonix 6922s and a Ruby 12AT7 for each channel, both from manufacturers with reputations for reliability; they're plugged into ceramic or Teflon sockets with spring retainer clips.

Internal parts quality is excellent; I saw plenty of 1% metal-film resistors and Wima polypropylene capacitors, while the rotary switches and pots are much more rugged than on most consumer gear. The front-panel toggle switches are the large industrial type which are extremely reliable, but don't usually perform well with audio; however, it turns out they don't actually pass any audio. Instead, they control high-quality miniature relays mounted on the circuit boards, along with LED indicators for each function chosen (blue, the color du jour).



Frequency responses

I began by looking at the frequency response, noting en route that the output impedance (at +4 dBu out) was about 105 ohms, and it didn't vary with gain changes. (That means you can drive long cables with no hassles.) High-frequency response into a 10k load varied a bit; on the mic input, at most gain settings it was flat within 0.5 dB out to 20 kHz, with –3 dB points ranging from 45 kHz (65 dB gain) to 75 kHz (35 dB gain). At 30 dB gain, though, the response rose 0.8 dB at 20 kHz with a 2.7 dB peak at 50 kHz before rolling off at 85 kHz. Low frequencies were down 3 dB at 7 or 8 Hz, respectable performance for a transformer-coupled preamp. (All inputs were driven with a 150-ohm resistive source.)

High-frequency responses via the line and instrument inputs were slightly bumpier; at 30 dB gain the responses were up 1.2 dB and 1.8 dB respectively, with 50–55 kHz peaks of 3.9 dB and 4.9 dB respectively. Higher gains had flatter results, but the overall shape of the response remained.

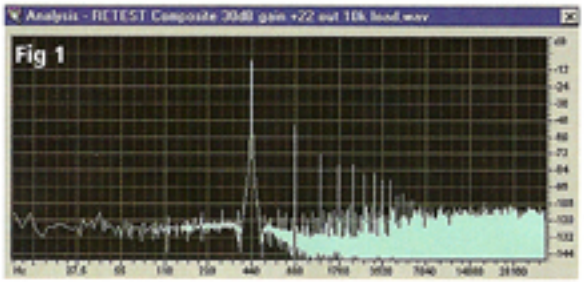
These results were measured into a 10 k load; when the preamp drives a low-impedance load the results were quite different. Into a measured 669-ohm load, the ADL 600's response was –3 dB at 15.6 kHz, which will certainly be audible. This is a perfect example of how a low load impedance increases the damping on a transformer—to learn why this is, please see "When Mikey Met Ohmy", my article on loading that immediately follows this review on page 38. It's worth remembering, though, that these days the only low-impedance line-level loads found in most studios are vintage compressors and equalizers (or their clones and imitators), and they'll mess with the sound anyway.

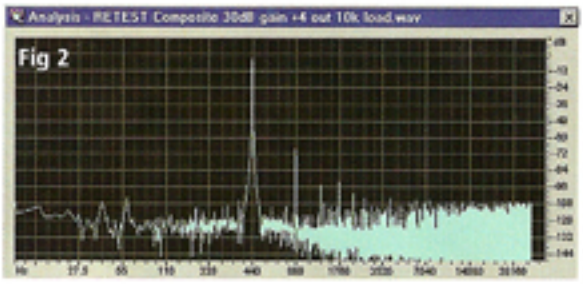
If you're operating into the typical impedances of a multitrack recorder or computer soundcard, I don't think frequency response will be an issue on the mic inputs, although it might affect the line and instrument inputs.

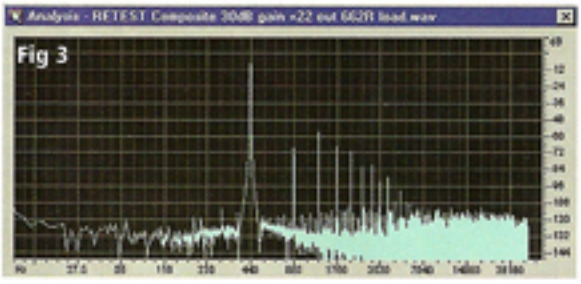
Distortion and noise

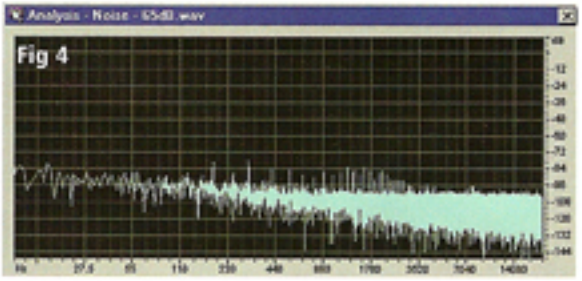
What about distortion? I did a bunch of tests, and won't bore you with most of them; suffice to say that this preamp is unusually clean. Figure 1 shows the distortion spectrum into a 10k load at +22 dBu, just under the clipping point for a typical soundcard with nominal +4 dBu sensitivity. If you must have distortion (and with audio electronics, some distortion is inevitable) this is the kind of spectrum that's preferred: steadily decreasing amplitude with higher harmonics, and the overall distortion level respectable. At lower levels, distortion goes down to remarkably low levels for a tubed preamp, and the relatively small odd-harmonic products are noteworthy (Figure 2). The distortion performance doesn't change with different gains; I suspect most of it is generated in the output stages, rather than the variable-gain stages.

Into a 663-ohm load the spectrum changes slightly but the overall level is still more than respectable (Figure 3). This is quite unusual performance; it's *not* easy to make a tubed preamp that will put out +22 dBu cleanly into a low-impedance load.









Overall, I'd say that unless you deliberately drive the preamp into overt overload (and attenuate the signal between the preamp and the recording device) you won't hear any distortion. That's good.

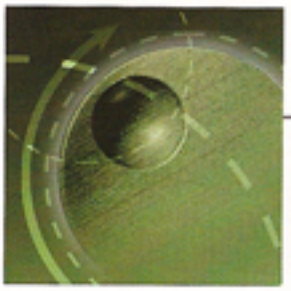
Measuring noise figures was tough, with setup-related gremlins dogging me, but it looks like the specified equivalent input noise (EIN) of –125 dB, A-weighted, is accurate. That number beats the quoted EIN specs for many other tube preamps on the market, sometimes by a hefty margin, and puts the ADL 600 into the middle category of noise performance when considering *all* preamps, tube *and* solid-state; I wouldn't use it for the very quietest input signals, but for most voices and instruments, particularly using condenser mics, it should be fine. (See Figure 4 for a noise spectrum.) Oh, the EIN is best at the highest gains, which is as it should be.

Doing it myself

I looked at the meters and the gain switches, and found a couple of anomalies. First, the two output meters were calibrated differently; when the preamp was set so that each measured 0 VU, the left channel was putting out +5.8 dBu while the right produced +8.2 dBu. That could play hob with anyone using the preamp for something like crossed-pair recordings. Luckily, the block diagram in the manual told me there were trim adjustments for the meters; I found them and adjusted the meters to read 0 VU when the output was +4 dBu into 10 k. Be aware that you can check and tweak this yourself—a nice touch.

While playing with the meters, I found the LED bar graphs to be less useful; the problem is that light spills from the VU meter backlights into the back of the bar graphs, overwhelming the LEDs and making it tough to tell which were on and off. Some strategically-placed electrical tape would solve the problem.

I also checked the gains with the trim controls centered, and found the channels didn't quite match; with the switch set for 45 dB of gain, the left channel was 0.7 dB high while the right was 1.1 dB high. Suddenly a light-bulb flashed on in my head: PreSonus had scotch-taped a small Allen wrench to the instruction manual without saying why it was there. Indeed, it fit the screws on the trim control knobs, and I adjusted both channels to exactly 45 dB gain. When I'd done that, the two channels now tracked within 0.2 dB at all settings with the trim controls centered—unusually good. The measured gains



were pretty close to the indicated numbers, except for the 65 dB setting, which yielded 63.2 dB and 63.3 dB of actual gain on the left and right channels.

My Inner Bitch suggests that a preamp with a street price of $2000 ought to have these adjustments done at the factory, but it's very good to be able to set up the ADL 600 for excellent performance and to keep it there yourself.

Checking input impedances

The other anomaly I measured was the input impedances. These are marked on the selector switch as 1500, 900, 300 and 150 ohms, but when I measured them, what I found was quite different (see Table 1). The range of impedances available from the ADL 600 is considerably less than stated, and an input impedance >1 k (as recommended by most makers of condenser microphones) is only available with the 20 dB pad switched in. (Of course, condenser mics are hotter, so using the pad would probably be a reasonable choice.)

Measured input impedance (Z) at 1 kHz

Z setting (ohms)	Measured Z Pad out	Measured Z Pad in
1500	785	1256
900	526	696
300	453	560
150	177	270

PreSonus confirmed my results; the discrepancy is due to a jumper resistor that was used in tests and was left on the first production run of these preamps, which can be easily removed if the user desires impedance settings that match the front panel specs. Concerned users should contact PreSonus about how to do this; my feeling is that the effect will be audible but small—it'll make condensers sound a bit better than they do already, and with dynamic mics you'll want to futz with the control to get the best sound anyway.

The input measurements also showed significantly lower impedance at high frequencies. That's par for the course with transformers, and provides increased damping for dynamic mics at high frequencies (again, see "When Mikey Met Ohmy"). I'd expect this preamp to have a softer high end than many of its competitors.

Put down calculator—open ears

Numbers are useful, but we don't listen to numbers. So I ran some listening tests, being very careful to adjust gains on the ADL 600 and my reference preamp (a variant of the project-r published in these pages several years ago) so they matched within 0.1 dB. I did all the listening tests with the impedance switch set to 1500, the pad off (except as noted) and the highpass filter out of circuit.

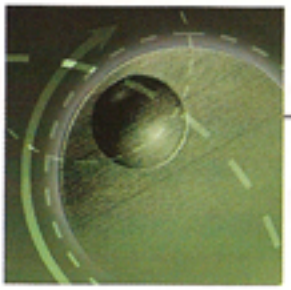
First came my acoustic guitar. With a Microtech Gefell M930 (a transformerless condenser which is not very sensitive to loading), at first the two preamps had pretty similar tonal quality, although the PreSonus seemed to have a tad more depth and three-dimensionality. Coming back to the recording with fresh ears, I found that the PreSonus also had a bit less bite in the high frequencies.

Which of them was accurate, and which was coloring the sound? *There's* a question for Werner Heisenberg; there's really no way of knowing, since I can't listen to the microphone by itself. In any case, they both sounded good.

I switched to an Electro-Voice RE15 dynamic mic, and suddenly the distinction between preamps wasn't subtle at all. The PreSonus gave it a very different sound in the upper midrange, almost like someone pulled a shelving eq down a dB or two. It sounded like a different microphone, and there was again more depth and space around the instrument (pretty good for a mono recording!) I couldn't decide which I preferred on this instrument, but on a brighter guitar like a Taylor the PreSonus would probably win hands down.

While I had the RE15 out I sang into it. The same change in tonality happened, and here my preference was clear: the region that the PreSonus pulled back was precisely the area where I have a nasal resonance I don't like, so it was clearly the preamp of choice. The project-r, in comparison, sounded a bit thin.

I hooked up a modern ribbon microphone, the Beyer M260, and pulled out my mandolin, a bright and plinky one. Boy,



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could I hear the difference; the mandolin sounded bright and ringy through the project-r, actually a little annoying. Through the PreSonus it sounded smooth, rich and enjoyable. I've seldom heard a more dramatic example of how much difference a preamp makes in the sound of a microphone.

I tried my electric bass through the instrument input and it sounded good, but then this pawnshop bass always sounds good via a DI (perhaps compensating for almost never sounding good through an amp). I tried the electric guitar through my Good Little Bad Amp, miking it with an E-V RE200, another transformerless condenser, using the 20 dB pad. On softer "chicken-pickin'", the PreSonus actually sounded a bit brighter, with slightly less bottom. The project-r (with an in-line 20 dB pad) sounded more like a DI feed than a miked amp, while the PreSonus sounded more like an object in space. On the bridge pickup alone, the PreSonus actually sounded a bit less trebly, and when I switched to shredding on the neck pickup, the PreSonus was definitely darker, the project-r slightly more forward and present. The differences in tone were subtle, although the difference in dimensionality was clear.

Then I plugged my electric guitar (G&L Tele-type) into the PreSonus's instrument input. I seldom like the results of this guitar via DI, and the specified input impedance on the instrument jack was 100 k, which usually produces dull and lifeless sound. So I didn't expect much.

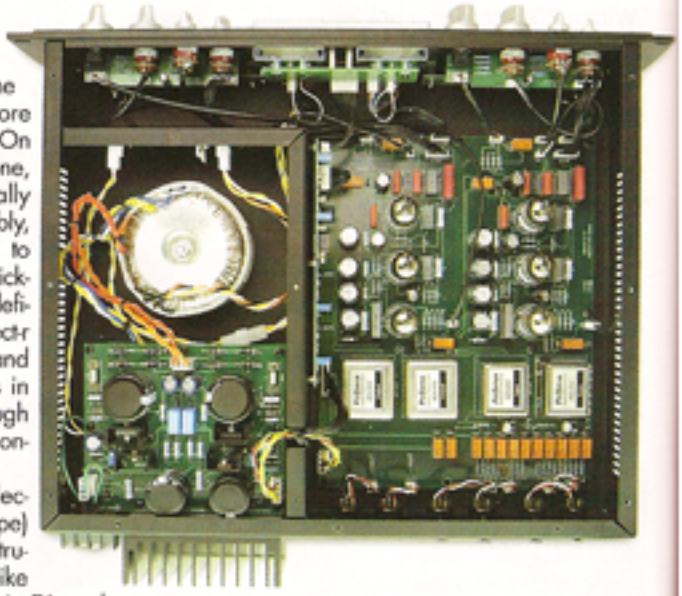
Boy, was I wrong. My guitar sounded like my guitar, not a cheap acoustic; it had bite and even some sustain, most unusual on a clean input, and a particular surprise given the low input impedance. I was impressed enough to try some messing around: I added a 20 dB pad to the preamp's output (so as not to overload my sound card) and cranked the PreSonus's gain to 65 dB, which pegged the meter but good.

I didn't get shred, nor the sound of a stack o' Marshalls. Instead, I picked up just a bit of "clean edge", rather like a Fender Twin (if a Twin ever had flat frequency response). At that point I quit testing and started playing, because suddenly I was having a *lot* of fun! In between riffs, I tried hanging a 663 ohm load on the preamp, but the magic went away, and it sounded like I expect a DI to sound on this instrument—lifeless—so I took away the load and got back to having fun.

At the end of the day, the ADL 600 equalled or beat the homemade preamp that I designed and use as my reference standard, every time.

Summary

I was impressed with the sound of the ADL 600, and with its ergonomics too; it's a well-thought-out design. I'd be happier if PreSonus would tweak the meters and gain trims before shipping, rather than leave that to the customer (particularly since they don't include directions in the manual). I'm also concerned that the high-frequency rolloff into 600-ohm loads is well within the audible range.



Those are small quibbles, though. If you're looking for a tubed preamp with good sound, excellent build quality, and a lot of flexibility, you should definitely give the ADL 600 a listen; I think you'll like what you hear. (Just get someone to help you lift it.)

Price: $2299

More from: PreSonus Audio Electronics, 7257 Florida Blvd., Baton Rouge, LA 70806. 225/215-7887, www.presonus.com.

Paul J. Stamler (stamler@recordingmag.com) is a recording engineer, producer, musician, and lover of elegantly designed audio electronics, living, working, and playing in St. Louis.