FRED KAPLAN

VTL TL6.5 Series II Signature

LINE PREAMPLIFIER

When I first met Luke Manley, proprietor of VTL, he and his father, David, with whom he ran the company at the time, had recently emigrated from the UK to California. I asked Luke how he liked the West Coast. "Great," he replied. "Much better parts availability." This was about 30 years ago, when I was just immersing myself in high-end audio at a high-toned level. Our exchange gave me a taste of the obsessions ahead, though Luke Manley's single-mindedness through the decades since has been more dogged than many—and, at the same time, less dogmatic.

Once a tube purist (the initials VTL originally stood for Vacuum Tube Logic), Manley realized early on that solid-state had advantages in amplifying current, so he began designing output stages and power supplies based on metal-oxide-semiconductor field-effect transistors (MOSFETs) instead of tubes. When the results struck him as sounding precise but a bit heartless, Manley replaced the MOSFETs with a type of FET that behaves more like a tube. Manley won't discuss just what this FET is, nor can you take a look: it's inside an output module, the casing of which you can't remove without affecting the service contract.

Manley replaced the MOSFETs with a type of FET that behaved more like a tube.

Description & Design

The shift from MOSFETs to FETs is one feature that distinguishes Manley's newest line-stage preamplifier, the TL6.5 Series II Signature ($15,000), from the original TL6.5, which hit the market in 2007. Then and now, the TL6.5 is a one-chassis version of the two-chassis TL7.5, and, throughout their evolution, the singles have trailed the doubles in a good way: Improvements wrought in the TL7.5 Series II were applied to the first TL6.5, and now improvements built into the TL7.5 III are showing up in the TL6.5 II. In other words, the cheaper, single-box preamps have stayed, in one sense, a generation ahead of the costlier, two-box models.

Like the TL6.5, the TL6.5 Series II is powered by tubes: one 12AU7 per channel, only in the gain stage, where voltage trumps current and where, therefore—according to Manley—tubes produce better, more linear results than solid-state devices. The preamp's circuitry is of fully balanced, differential design, and is thus claimed to be less susceptible to noise. The volume control is constructed from

SPECIFICATIONS

Description Hybrid tube (gain stage) and FET (output stage, power supply), dual-mono, fully balanced differential design, zero-feedback line-level preamplifier. Inputs: 3 pairs balanced (XLR or RCA), 5 additional pairs single-ended (RCA only). Outputs: 1 pair balanced (XLR), 2 pairs single-ended (RCA), 2 pairs single-ended buffered Tape outputs. Gain: 19.2dB balanced, 13.2dB single-ended. Volume knob: 95 increments of 0.7dB. Frequency response: 1Hz-200kHz (20Hz-200kHz, +0/-1dB, into 600 ohms with 900pF 20' interconnect). Signal/noise: 88dB. Channel separation: >100dB at 1kHz, >80dB at 20kHz. Input impedance: 50k ohms (20k ohms minimum). Output impedance: 25 ohms (maximum 150 ohms at 10Hz). Power consumption: 150W. Tube complement: two 12AU7 (gain stage). **Dimensions** 17.4" (445mm) W by 6" (153mm) H by 17.4" (445mm) D. Weight: 48 lbs (21.8kg) net, 54.9 lbs (24.95kg) shipping. **Serial number of review sample** 12499970. **Price** $15,000. Approximate number of dealers: 35. Warranty: 5 years to original owner.

Manufacturer
VTL Amplifiers, Inc.,
4774 Murrieta Street,
Suite 10, Chino, CA 91710.
Tel: (909) 627-5944.
Web: www.vtl.com.

relay-switched resistors, which Manley says provides more headroom and higher resolution than a potentiometer. The chassis is made of heavy steel, and the sides are stiffened with an aluminum faceplate, to shield the circuits from external noise and vibrations. There is also internal shielding to isolate the power transformers from the audio circuitry. To that same end, both tubes in the gain stage are shock-mounted on rubber O-rings.

The Series II's new features—upgrades from the original TL6.5—are considerable. First is the shift, noted above, from MOSFETs to FETs in the output stages. There are now two toroidal transformers (the TL6.5 had just one). But the Series II has the additional benefit of zero global feedback (the original's feedback amounted to 2dB). The elimination of feedback required the gain stage to be, in Manley's words, "completely redesigned," meaning that he readjusted all the voltage and current operating points for the tubes and revoiced the circuits for the capacitors, in some cases switching to different caps or, in the power supply, bypassing the electrolytic caps with Teflon—a move that, he says, extended the high frequencies. Finally, the volume attenuator has been moved back, farther away from the transformers, thus providing still more shielding.

Manley says his goal has been to design a circuit that's as simple as possible while keeping impedance low enough to drive amplifiers of all loads and to handle vast signal swings across all interconnects, regardless of length.

The owner's manual outlines scads of convenience features, including bypasses for home theater and ways to standardize gain levels across all inputs. The remote-control handset is elegant and extremely legible (why can't more high-end companies make such clear, clean remotes?), with buttons for muting and for inverting absolute phase, as well as the other usual functions.

The tubes are expected to last 1500 hours or more, their life expectancy prolonged by a soft-ramp filament circuit that avoids the "flash" that can otherwise occur when a long-cold unit is turned on.

The TL6.5 Series II preamp is heavy (48 lbs), owing to its steel chassis and two transformers, and its casing is a bit clunky, but it sports a cool look, with a nifty three-tone faceplate and asymmetric edges.

Setup

Throughout my time with the VTL TL6.5 Series II Signature, I played LPs on a VPI Classic turntable with an Ortofon Cadenza Blue cartridge, hooked up to a Nagra BPS battery-powered phono preamp. I played CDs and SACDs on a recently purchased dCS Puccini, the best single-box CD player I've heard. The power amp was a Simaudio Moon Evolution 860A, and speakers were a pair of Revel Ultima Studio 2s. For comparisons, I frequently swapped out the TL6.5 II for my Simaudio Moon Evolution 740P line-stage preamp. All electronics were plugged into hospital-grade power outlets wired to a dedicated 20A circuit.

I let the TL6.5 II warm up for a couple of weeks by leaving it powered on all the time and playing it, even at low volumes, as much as possible; after that, I usually turned it off when it wasn't in use. It would sound quite close to peak after about 10 minutes of warmup, and fully up to snuff within an hour. I settled on Nirvana S-L interconnects from the turntable and phono preamp, AudioQuest Wild Blues from CD player to VTL, Kubala-Sosna Elationls from VTL to power amp, and Nirvana S-X speaker cables and output configurations.

S M
MEASUREMENTS

I measured the VTL TL6.5 Series II Signature's electrical performance with my Audio Precision SYS2722 system (see the January 2008 "As We See It," http://tinyurl.com/4ffpve4). Most of the measurements were taken with balanced input and output signals; I repeated some tests with unbalanced signals. The volume control's unity-gain setting was "78" on the front-panel display and the control appears to operate in accurate 0.75dB steps. At the control's maximum setting of "95," the voltage gain at 1kHz, measured at the balanced output jacks, was 13.2dB for both balanced and unbalanced input signals. The gain at the unbalanced output was the expected 6dB lower than this, 7.2dB, for an unbalanced input. The preamplifier preserved absolute polarity (ie, was non-inverting) for all input

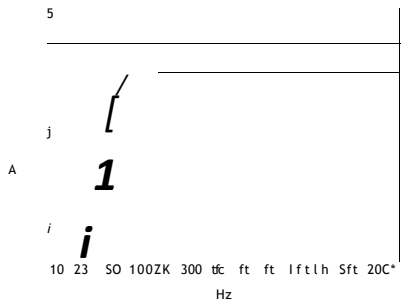


Fig.1 VTL TL6.5 Series II Signature, balanced frequency response with volume control set to maximum gain at 1V, into: 100k ohms (left channel blue, right red), 600 ohms (left cyan, right magenta) (0.5dB/vertical div.).

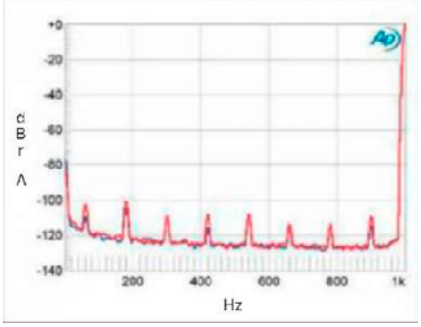
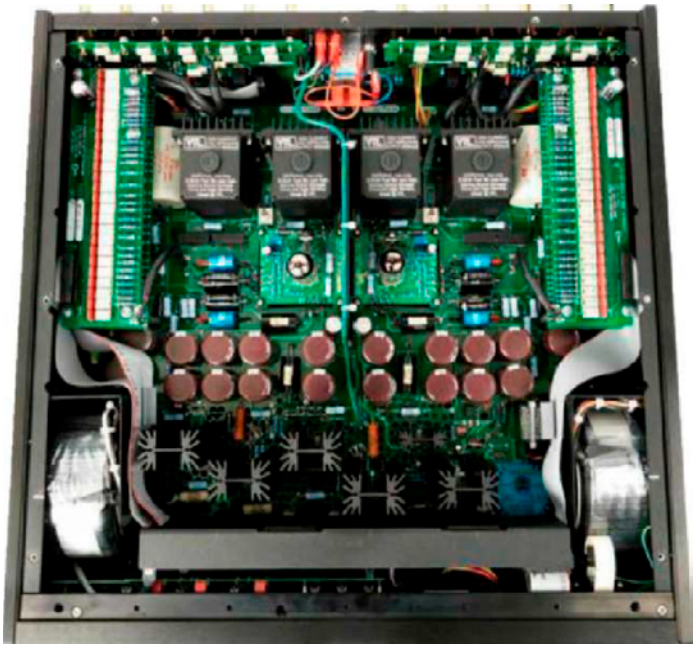


Fig.2 VTL TL6.5 Series II Signature, balanced spectrum of 1kHz sinewave, DC-1kHz, at 1V into 100k ohms (left channel blue, right red) (linear frequency scale).

The balanced input impedance was 34k ohms at low and middle frequencies, dropping inconsequentially to 33k ohms at the top of the audioband. The unbalanced input impedance was half these values, as expected. The balanced output impedance was 358 ohms at 20Hz, dropping to a low 32 ohms at 1kHz and above. The unbalanced output impedance was half the balanced figure, again as expected.

With the volume control set to "95," the TL6.5 II's frequency response into 100k ohms was flat almost up the 200kHz limit of my measurement system, with superbly close channel matching (fig.1, blue and red traces). Reducing the load impedance to a demanding 600 ohms rolled off the low frequencies, due to the increased output impedance in this region, the response reaching -3dB at 25Hz (fig.1, cyan and magenta traces). However, it is very unlikely that the TL6.5 will encounter this low a load impedance in practice. The audioband response was

to the Revels. I briefly ran Nordost Frey 2 interconnects from the turntable and phono preamp, but this was a poor match: highs sounded harsh and lows sounded tepid, maybe because, in my limited experience, Nordosts tend to tilt the frequency balance upward, which the VTL didn't need. I placed three of Black Diamond Racing's Mk.4 Cones under the TL6.5—two in front, one at back-center, all points down—which noticeably tightened the bass. The comments below do not reflect when the Nordosts were in use; they do reflect use of the BDR cones.



Two transformers, no waiting. A look inside the TL6.5 Series II Signature.

Sound

I never heard the original TL6.5—reviewed by Larry Greenhill and Wes Phillips in the June 2007[1] and July 2008[2] issues, respectively—so I can't judge whether, or to what extent, the Series II marks an improvement. But by any measure, this is a very fine preamp.

Luke Manley stressed in several e-mails that his No.1 goal has long been to achieve linearity throughout the audioband, and even before I read those observations, that was the first thing I noticed while listening to the TL6.5 Series II. It was the smoothest-sounding preamp I've heard in my system—and I don't mean *smooth* in a pejorative sense. What I heard wasn't at all your stereotypical lush in the midrange, flabby in the bass, clipped in the highs "tube sound": instead, from bottom to top, the TL6.5 II's sound was very nearly seamless and neutral. (I'll elaborate on the qualifier "very nearly" soon enough.)

This was especially true on top: High frequencies stretched higher than I'd thought my system (or some of my records) capable of—and not in any boosted way, the overtones zapped with some homogenous fizz. No, these highs were pure, natural, clearly of a piece with the instruments and ambience that produced them.

On "Amelia," from Joni Mitchell's *Hejira* (LP, Asylum/Rhino R1 01087), the ringing from Victor Feldman's vibes billowed forth in waves as I'd never heard before (if I had synesthesia, I'm sure I'd have seen bright balls of color), while never obscuring the surrounding guitar strums or Mitchell's voice, which all seemed distinct but enveloped in the same, cohesive space. In "Walking by Flashlight," the first track of Maria Schneider's *The Thompson Fields* (CD, ArtistShare AS-0137), the accordion, even when submerged in the background, never lost its squeeze-box airiness; ditto the flute's steel-blown air.

The TL6.5 II also proved to be a fast preamp, especially at delivering the front edge of transients. On the Beatles' *Abbey Road* (LP, EMI PCS-7088), the rinky-dink piano that

1 See www.stereophile.com/tubepreamps/607vtl/.

2 See www.stereophile.com/content/vtl-tl-65-signature-line-preamplifier-wes-phillips-july-2008.

measurements, continued

still flat at lower settings of the volume control, but the ultrasonic extension was reduced. At unity gain, for example, the output was down by 1.4dB at 200kHz. The picture was similar for unbalanced operation, even at the volume control's maximum setting.

Channel separation (not shown) was superb, at >120dB in both directions below 10kHz. The unweighted wideband signal/noise ratio, measured with the input shorted to ground but the volume control set to "95," was very good, at 80.6dB (average of both channels) ref. 1V output. Restricting the measurement bandwidth to the audioband increased the ratios to 95dB left and 92dB right; an A-weighting filter further increased the ratios, to 98.3dB left and 95.9dB right. Spectral analysis of the output signal (fig.2) revealed that the level of random noise was very low, but with low-level spuriae present at the AC power-line frequency of 60Hz and its harmonics. These are most likely due to magnetic interference from the power transformer being picked up by ferrous circuit elements, perhaps the tubes' steel pins. Nevertheless, these spuriae are very low in absolute level and will not affect sound quality.

The TL6.5 II offers enormous dynamic range, the preamplifier's balanced output not clipping (ie, when the THD+noise reaches 1%) until 27V into 100k ohms (fig.3). Even into 600 ohms, the preamp didn't clip until >9V. The unbalanced output clipped at 18V into 100k ohms. Note the downward

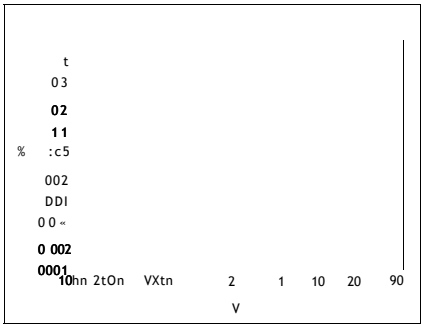


Fig.3 VTL TL6.5 Series II Signature, balanced distortion (%) *vs* 1kHz output voltage into 100k ohms.

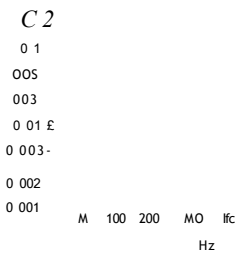


Fig.4 VTL TL6.5 Series II Signature, balanced distortion (%) *vs* frequency at 2V into: 100k ohms (left channel blue, right red), 600 ohms (left cyan, right magenta).

someone starts playing in the middle of "You Never Give Me Your Money" sounded rinky-dinkier than I'd heard it before. In "Nuages," the first track of James Carter's *Chasm' the Gypsy* (CD, Atlantic 83304-2), the percussive hand instruments clicked and clacked with eye-blinking ferocity. The same was true, plus some, of Neil Young's hard guitar strumming in "Don't Let It Bring You Down," from his *Live at the Cellar Door* (LP, Reprise 535854-1). While mentioning that album, recorded by Henry Lewy in 1970, I should add that Young's voice burst forth into the space of that small nightclub, bushels of air surrounding him, his guitar, and—on the few songs when he walked over to play it—the piano. I've long considered this the best-sounding live, solo pop album in my collection, but the TL6.5 Series II seemed to pull back yet another curtain that had previously veiled my listening room from the experience of the concert.

Speed and extended highs usually bode palpable spatial cues, and the TL6.5 II affirmed the correlation. Voices, instruments, orchestral sections—whatever a recording hoisted up onto the soundstage—were arrayed from left to right and from front to back, without excessive beam on either of the speakers or in the center between them (unless the album was engineered that way, as indeed quite a few albums were, especially in the early years of stereo).

At this point, you're probably starting to wonder about that foreshadowing phrase "very nearly," dropped a few hundred words back, when I noted that the TL6.5 II was "very nearly seamless and neutral." I don't mean to be ominous; there is no big thud afoot, no italicized *"However ... "* crouching in the next paragraph, ready to unfurl a list of fatal flaws. As I also wrote earlier, this is a damn fine preamp—but no preamp is perfect, and every design involves some trade-offs.

I raised that caveat in the context of discussing the TL6.5 Series II's *smoothness,* and while I re-emphasize that I don't mean the word in its pejorative sense (especially as it's sometimes used to describe tubed hi-fi gear), the TL6.5 II did seem a *little* too smooth in one sense—in handling microdynamic contrasts: the slight variations in loudness or softness when a singer stresses a note or relaxes the next one, when a violinist bows a little harder or softer through a complex phrase, when a pianist presses down or eases up on a pedal, when a drummer taps a cymbal in a very slightly different way. By this measure of musical sound, the TL6.5 fell a *little* short of some other preamps in its price class.

For instance, with Joni Mitchell's *Blue* (LP, Reprise 74842), my Simaudio Moon Evolution 740P preamp[3] did a slightly better job of tracking the wavering shifts of her vocalizing. The Simaudio also caught a few more of Scott Robinson's subtle phrasings on alto clarinet in Maria Schneider's "Walking by Flashlight."

These sorts of differences were more noticeable in the low frequencies. On "Hat and Beard," from Eric Dolphy's *Out to Lunch* (2 45rpm LPs, Blue Note/Music Matters Jazz MMBST-84163), the Simaudio let me hear a bit more of Richard Davis's bass plucking, which let me distinguish the bass a bit more clearly from Dolphy's bass clarinet when the two play in unison. On David Zinman and the London Sinfonietta's recording of Gorecki's Symphony 3 (CD, Elektra/Nonesuch 79282-2), the Simaudio let me hear the *bowing* of the double basses a bit more clearly, especially as the cellos, violas, and violins entered with their crisscrossing points and counterpoints.

None of this should suggest that the VTL TL6.5 Series II was bass-shy, or that it muddled complex phrasings. It wasn't and it didn't. In fact, the bass dipped deep and remained musical to the end. For instance, I could hear distinctly all six of the notes that double bassist Paul Chambers plucks near the start of "So What," on Miles Davis's *Kind of Blue* (LP, Columbia CS 8163)—and that's something that can't be said of a lot of otherwise quite good *all-transistor* amps.

Neither did the VTL quite match the uncanny front-to-

3 See my review in the May 2015 issue: www.stereophile.com/content/simaudio-moon-evolution-740p-line-preamplifier.

measurements, continued

slope of the trace below 600mV in fig.3, which suggests that the actual distortion lies under the noise floor below this level, and is very low in absolute terms. I therefore measured how the THD+N varied with frequency (fig.4) at a level, 2V, where I could be sure I was looking at actual distortion. Even so, the percentage remains constant at all audio frequencies, though it's a bit higher in the left channel (blue and cyan traces) than in the right (red, magenta).

With nonlinear distortion, what matters more than the absolute level is the harmonic signature. Fig.5 reveals that the VTL's dominant harmonic was the subjectively benign second, though this was still at a low level: -89dB in the left channel, -96dB in the right (0.004% and 0.0015%, respectively). The third harmonic lies at -100dB (0.001%) in both channels, around the same level as the third harmonic of the powerline frequency. The second harmonic didn't change into the low 600 ohm load, though the third harmonic rose to -96dB. There was a higher level of second harmonic with unbalanced drive, at -70dB (0.03%). Intermodulation distortion was also very low (fig.6).

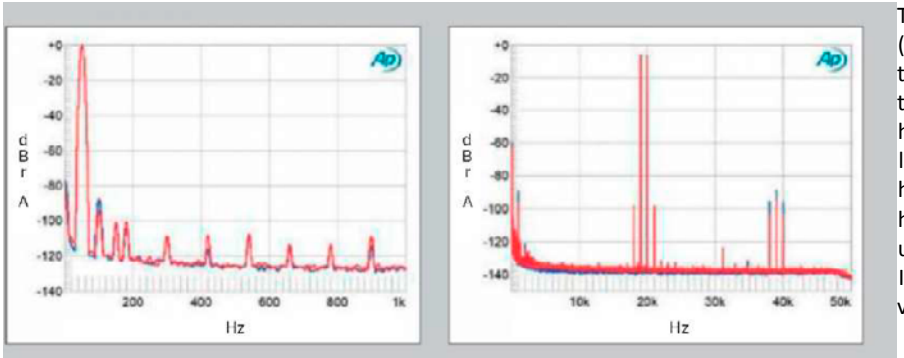


Fig.5 VTL TL6.5 Series II Signature, balanced spectrum of 50Hz sinewave, DC-1kHz, at 1V into 100k ohms (left channel blue, right red) (linear frequency scale).

Fig.6 VTL TL6.5 Series II Signature, balanced HF intermodulation spectrum, DC-50kHz, 19+20kHz at 2V into 100k ohms (left channel blue, right red) (linear frequency scale).

The TL6.5 Series II Signature is a well-engineered preamplifier—as I have come to expect from VTL.

—John Atkinson

back transparency of the Pass Laboratories XP-30,[4] which costs only $1500 more, though I should add that: a) the VTL was still very transparent, b) the XP-30 is probably the world-beater for transparency in this price range, and c) this comparison is based on memory, and is therefore imperfect, as I no longer had an XP-30 in my house while listening to the TL6.5 Series II.

Conclusions

I've recently reviewed or commented on a few preamps priced in the low five figures (the ones mentioned above, plus the Balanced Audio Technology Rex II[5]), and they're all—no shock here—very good. This seems to be the point at which designers are no longer severely impeded by the necessity of compromise: they can unfurl their wings, approach the sound they've been seeking with far fewer vexing trade-offs, and push to the max one or two of their most cherished aspects of musical sound, while doing minimal harm to the others.

In this sense, VTL's TL6.5 Series II Signature hits an optimal point, doing everything that Luke Manley has said he's wanted a preamp to do. I suspect it would cost quite a lot more money to do all that it does *and* close the few shortfalls. Whether you prefer the TL6.5 Series II, the Simaudio Moon Evolution 740P, the Pass Laboratories XP-30, or the BAT Rex II will depend, in large part, on your listening tastes and those products' interactions with your system's other components. For each of these preamps, we're talking about a large pile of money—shockingly large to people who don't keep up with our strange passion.

Then again, one morning last April, 198,000 people lined up to purchase the new Tesla 3 electric car—which, after a wait of three years, will set each of them back roughly $42,000. And a car just gets you from Point A to Point B on a map in the present tense. It can't transport you to the Cellar Door in 1970, to Rudy Van Gelder's studio in 1964, or any other thousands of roads where you'd like to go time-traveling with a mere push of a button or lowering of a tonearm. •

4 See www.stereophile.com/content/pass-laboratories-xp-30-line-preamplifier.

5 See my review in the January 2016 issue: www.stereophile.com/content/balanced-audio-technology-rex-ii-line-preamplifier.

ASSOCIATED EQUIPMENT

Analog Source VPI Classic turntable with JMW tonearm, Ortofon Cadenza Blue cartridge.
Digital Source dCS Puccini SACD/CD player.
Preamplification Nagra BPS battery-powered phono preamp, Simaudio Moon Evolution 740P line-stage preamplifier.
Power Amplifier Simaudio Moon Evolution 860A.
Loudspeakers Revel Ultima Studio 2.
Cables Interconnect: AudioQuest Wild Blue, Kubala-Sosna Elation!, Nirvana S-L. Speaker: Nirvana S-X. AC: manufacturers' stock.
Accessories Black Diamond Racing Mk.4 Cones (under VTL), Audiodesksysteme Glass Vinyl Cleaner, LAST stylus cleaners, AC power from dedicated 20A circuits.

—Fred Kaplan