

# Vacuum Tube Logic TL-5.5 tube line-stage preamplifier

Over the course of several months, during which time I auditioned the Vacuum Tube Logic TL-5.5 tubed line-stage preamp with a variety of power amps and loudspeakers, I began to reassess many long-held notions about the “characters” of solid-state and tube components. Sometimes the TL-5.5 revealed its musical pedigree with all the midrange juiciness and sublime textural detail that one traditionally associates with a triode front-end, while at others it evinced a level of focus, transparency, and frequency extension I more readily associate with solid-state purity—all in a stylish package featuring a remote volume control and a full range of performance enhancements that belied its affordable price.

### Audio Verity

The VTL TL-5.5 owes much of its performance/value pedigree to developmental work done on the VTL TL-2.5 line stage, from which it descends. The two triode line stages share a number of features: toroidal power transformers, robust power supplies for each gain stage, gold-plated RCA jacks, a glass-fiber circuit board with heavy copper traces, chassis of 16-gauge stainless steel, relay switching, and a laser-trimmed Alps remote volume control. In other ways, the 5.5 represents a significant advance over the 2.5.

Luke Manley and the VTL developmental team took a decidedly practical approach to high-end criteria in designing the TL-5.5—the bottom line was to accentuate performance value. So while they’ve observed many audio verities, they’ve disdained others. For instance, while VTL eschews the use of cathode followers in the circuit path, feeling that they rob the signal of brilliance, speed, and dynamic vitality while unduly darkening the sound and adversely affecting soundstaging, they do employ a buffer in the output stage.



VTL TL-5.5 preamplifier

“Lowering impedance and delivering current is the primary function of a buffer,” Manley explained. “Some preamp designers would rather not have a buffer in the circuit, but as far as we’re concerned, the output impedance would be unacceptably high. The buffer we employ on the output stage of the 5.5 (and on the optional MM/MC phono stage) is called a totem-pole buffer, and it’s sonically superior to a straight cathode follower because it works actively on both phases of the signal, where a cathode follower works actively on one phase while using a resistor pull-up—which works passively—on the other phase. A follower that is active in both phases of the signal swing offers symmetrical clipping

at full output, while a straight cathode follower will clip on one phase before the other.”

Likewise, while VTL claims to employ the shortest possible circuit path to maximize sonic purity, in other areas they’re less fussy and doctrinaire than some other high-end designers. As a result, the 5.5 doesn’t invert absolute phase, but does include a high-quality Noble balance control (when aligned at its center detent, it is not in the circuit), as well as phase flip and Mute switches, both of which can be activated manually or by remote control. Housing a separate power supply for each channel in a single chassis is a prudent approach at this price point, VTL putting the money saved toward audiophile-grade Multi-

**Description:** Tubed line-level preamplifier with remote control and optional phono stage. Tube complement: two 12AX7, four 12AT7 (optional MM/MC phono stage uses four 12AX7, two 12AT7). Remote-control functions: Volume, Mute, Phase. Gain: 20dB. Inputs: 6 line-level. Outputs: 2 single-ended RCA, 1 balanced XLR, 1 tape loop, 1 external processor loop, 1 record. Frequency response: 1Hz–60kHz, +0/–3dB. Output

impedance: 195 ohms. Input impedance: 100k ohms (20k ohms minimum). Maximum output: 31V, <1% THD. Channel separation: >80dB at 20kHz, 100dB at 1kHz. Left/right tracking: better than 0.15dB.

**Dimensions:** 19" W by 3.75" H by 14" D. Shipping weight: 30 lbs.

**Finish:** Stainless steel chassis with beveled, offset silver-black aluminum faceplate.

**Serial number of unit reviewed:** 01334582.

Approximate number of dealers: 47. Warranty: 5 years, parts & labor; tubes, 6 months.

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caps in the signal path.

### System & Cables

It took 50–100 hours for the VTL TL-5.5 to open up and breathe enough to resemble what I ultimately determined to be its true sound signature. During this burn-in phase I was reviewing a pair of Meadowlark HotRod Shearwater loudspeakers — see September 2002, p.103 — and I became more conscious of the 5.5's noise floor than I was with the Joseph RM33si Signatures I also used for my listening. The left channel was more noisy than the right, although neither could be heard from more than a few feet away. I opened the chassis to ensure that all tubes were firmly seated in their sockets and after the VTL had been powered up again, I wasn't disturbed by background noise any longer.

The TL-5.5 line stage offers two sets of single-ended outputs as well as a fully balanced out, which proved useful in running long lengths of Acoustic Zen Silver Reference interconnects to the power amps on my double-decker PolyCrystal amp stand: a 15' single-ended run to the Musical Fidelity Nu-Vista 300 and Rogue Audio Magnum M-120 monoblocks (review to come), and a 20'

balanced run to the VTL MB-450 monoblocks on a sturdy timber table to the rear. Most of my critical listening was done on the Nu-Vista 300.

After returning to the familiar sound of the

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tube/solid-state Nu-Vista preamp and leaving it on more or less continuously, I alternated between the tubed VTL TL-5.5 and the Blue Circle Galatea until I'd gotten a sense of their distinguishing characteristics. Switching from a more or less solid-state line stage to a fully triode front-end, I was expecting the hybrid Nu-Vista preamp to be, if not significantly

brighter, then much more open and extended in the top end. But instead of a slightly diffused, velvety top end, the 5.5 had a profoundly crystalline sound — remarkably clear, sweet, and extended.

I was thus inspired to play my best solo piano recordings to hear the true impact of each line stage on the transition from the upper midrange to the lower treble, where reside, in my experience, much of the air, inner detail, and depth of character of music. I used Acoustic Zen's Silver Reference interconnects and Hologram speaker cable, for their ability to depict that mid-treble transition in such a natural, unforced manner — they're never merely bright but sparkling, open, and expansively detailed. They also have an ease and depth of midrange presentation, and a tuneful, well-damped bass that is dynamic, revealing, and unobtrusively pure.

To bring out the best in my preamps, I used the same massive yet flexible JPS Labs Aluminata AC cords I obsessively use with my power amps and Equi=Tech Balanced Power Transformers (review in the works). The fact that, dollar for dollar, one of these anaconda-sized AC cords retails for as much

## Measurements

The VTL preamp offered a maximum voltage gain of 20.5dB into 100k ohms and was noninverting from both its balanced and unbalanced outputs with the Phase LED green. The input impedance at 1kHz was 12k ohms, while the unbalanced output impedance was 184 ohms across most of the audioband, rising to a still low 409 ohms at 20Hz.

As a result of the increase in source impedance at low frequencies, the low-frequency response rolled off to reach -3dB at 16Hz into the punishing 600 ohm load (fig.1, bottom pair of traces below 200Hz). However, into 100k ohms the TL-5.5's infrasonic response was well-extended (fig.1, top pair of traces below 200Hz). The ultrasonic response is also a little less extended into the low load impedance. However, the bandwidth changes with the setting of the volume control: at its maximum position, the HF response is -3dB at 200kHz; at unity gain (1:30), the -3dB frequency decreased to 105kHz. However, as there was no significant change in the audioband rolloff, this behavior is probably insignificant.

Channel separation was excellent in the low treble, at 100dB L-R and 90dB R-L (fig.2), but this worsened at higher frequencies due to capacitive coupling, and at lower frequencies due (presumably) to increasing power-supply impedance. The A-weighted signal/noise ratio ref. 1V output with the volume control at its maximum and the

input jack short-circuited was a high 89.3dB, this worsening to 73.5dB with an unweighted wideband measurement.

The VTL preamp was both very linear and capable of swinging very high voltages into real-world loads. Fig.3 plots the percentage of THD+noise in the TL-5.5's output against output voltage into 100k, 10k, and 1k ohms. The preamp clips (1% THD) at around 16V into the higher impedances, and will still drive 7V into 1k. The downward slopes of the traces at the left of this graph indicate that, below 600mV or so, the reading is dominated by noise. The true distortion level is a hair over 0.02% (-74dB). Fig.4 plots the THD+N against frequency at 1V into both 100k and 600 ohms. A slight but in-

consequential rise in distortion is evident at the frequency extremes into the lower

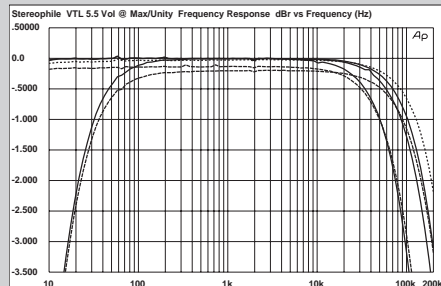


Fig.1 VTL TL-5.5, unbalanced frequency response (from top to bottom at 150kHz) into 100k ohms with volume control at maximum and unity gain, and into 600 ohms with volume control at maximum (0.5dB/vertical div).

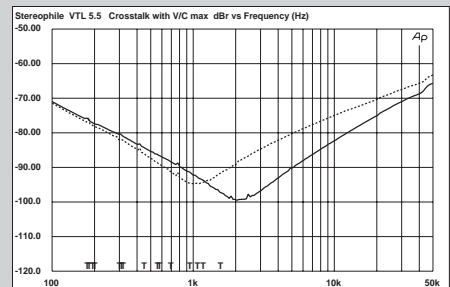


Fig.2 VTL TL-5.5, unbalanced channel separation (R-L dashed, 10dB/vertical div).

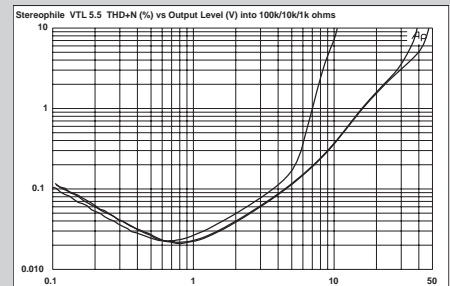


Fig.3 VTL TL-5.5, distortion (%) vs unbalanced output voltage into (from right to left at 10% THD): 100k, 10k, and 1k ohms.

as the VTL TL-5.5 itself is laughable, but they offer me galactic-black silences, electron-microscope resolution, and enhance the speed and dynamic range of high-current devices by letting them operate at optimum efficiency, making it sound as if I've doubled my power and added an octave of bass.

### Sweet & Lovely

I first played Arcadi Volodos' remarkable live-to-DSD CD of Schubert's Sonata in G (Sony Classical SS 89647), which I'd used in my evaluation of Simaudio's i-5 integrated amplifier — though since that review I've purchased the SACD edition. For a contrasting perspective, I turned to pianist Ito Ema's dazzlingly ambient recording of Bach's *Goldberg Variations* (M•A MO24A).

The 5.5 offered me a very moving emotional connection with the Volodos performance; I was taken aback by the top end-extension and up-close detailing, which was neither etched and analytical nor unnaturally bright and peaky. Smooth, sweet, and richly detailed, without glare or sibilance, the 5.5 gracefully tracked all of Volodos' extreme dynamic contrasts with exceptional speed and clarity, while translating the subtleties of

the pianist's touch, the instrument's spectral decay, and the wealth of room cues with rhythmic ease and spatial aplomb. The VTL delivered all the enhanced depth, transparency, and dimensional realism that this definitive SACD mastering promises.

Likewise on the Bach: The 5.5 offered richly rewarding insight into the lateral imaging and more distant, symmetrical perspective that producer-engineer Todd Garfinkle achieved by removing the vintage Steinway's lid and floating his stereo array of mikes well above the performer. This God's-eye view serves to emphasize the linear aspects of Bach's conception.

Head to head, the VTL TL-5.5 split the difference aesthetically between the creamy, laid-back intimacy of the Galatea and the smooth, cool immediacy of the Nu-Vista. The Blue Circle offered a touch more holographic depth, but the Nu-Vista was more transparent and extended. The VTL handled the high frequencies in a more vibrant, involving manner — not softly inflected like the Blue Circle, but smoothly and infinitely extended, like the Nu-Vista, which contributed to the transient speed and exquisitely layered, textured dimensionality of its soundstaging. When I listened

through the VTL TL-5.5, both pianos sparkled and glowed with high-frequency effervescence and midrange illumination. More significant, when the VTL was mated with the Nu-Vista 300 power amp, visitors to my den of iniquity never rushed to conclude that they were in the thrall of a tubed line stage.

I always found its midrange to be the Galatea's glory, but the TL-5.5 trumped it. I satisfied myself that the VTL was comparably juicy and detailed, but blissfully free of euphony with Alison Kraus's devotional vocal performances from T Bone Burnett's Grammy Award-winning production of the soundtrack to *O Brother, Where Art Thou?* (Lost Highway 088 170-069-2). We're talking about the difference between midrange *tone* and midrange *character* — between *my-ode* and *triode*. The mids of the Blue Circle and VTL were both very detailed and inviting, but the Galatea tended to smooth things over, while the 5.5 invited me deeper and deeper into the vivid acoustic of Kraus, Gillian Welch, and Emmylou Harris on "Didn't Leave Nobody But the Baby." While fleshing out all manner of distant, teasing sonic artifacts (such as the faintest echo of a musical saw), the VTL local-

impedance, but the right channel can be seen to be even more linear than the left.

The spectrum of the TL-5.5's distortion into 8k ohms, which is about the lowest impedance the VTL will be called on to drive, is shown in fig.5. The second harmonic is the highest in level, but will be subjectively innocuous at -78dB (0.013%). Similarly, the level of intermodulation distortion products (fig.6), even into the demanding 1k ohm load, is low. The difference product at 1kHz is the highest in level, but at -76dB (0.015%) will be insignificant.

All in all, the VTL TL-5.5 seems to be a well-engineered preamp, with nothing to indicate that its use of tubes has compromised its performance. —John Atkinson

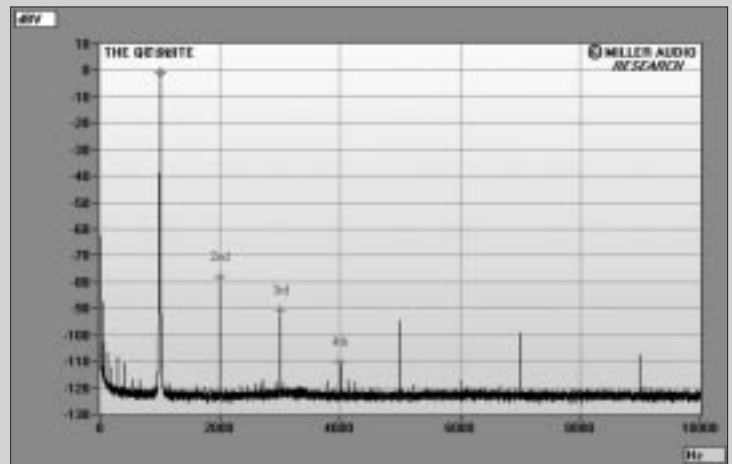


Fig.5 VTL TL-5.5, unbalanced spectrum of 1kHz sine wave, DC–10kHz, at 1V into 8k ohms (linear frequency scale).

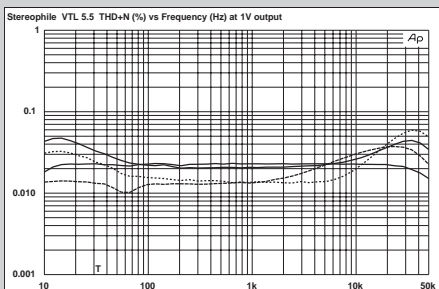


Fig.4 VTL TL-5.5, unbalanced THD+noise vs frequency at 1V into 100k ohms (bottom) and 600 ohms (top) (right channel dashed).

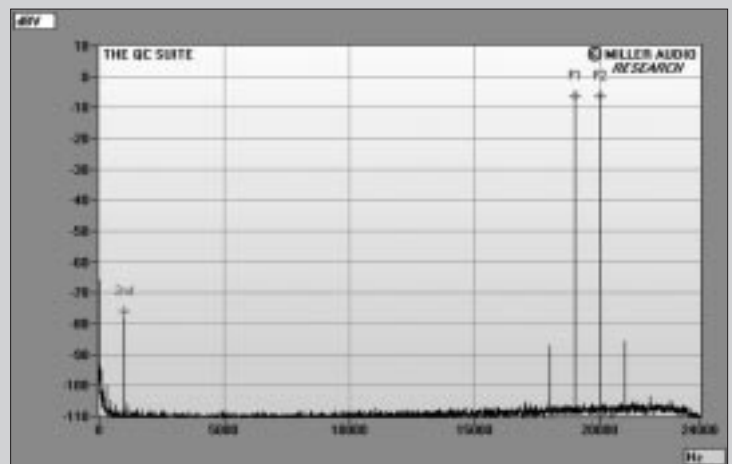


Fig.6 VTL TL-5.5, unbalanced HF intermodulation spectrum, DC–24kHz, 19+20kHz at 1V into 1k ohms (linear frequency scale).

ized the beckoning images and sultry tonal signatures of these three Appalachian sirens in a devoutly intimate manner.

But the VTL's luminous midrange really shone in its portrayal of the cumulous waves of vocals accompanying Kraus's angelic performance of the hymn "Down to the River to Pray." Voices seemed to manifest out of silence and recede into nothingness, suggesting the eerie presence, ambient potency, and harmonic weight of tubes, as well as the tranquil iridescence, soothing stillness, and lifelike distinction of solid-state.

But in the end, it was my experience of the 5.5 with a cornucopia of jazz and blues recordings that really gave this sonic pilgrim some of that old-time religion. On a spectral performance of "Minor Mystery," from Roy DeNunn's classic 1959 recording of that most masterful of jazz guitar trios, *Pollwinners Three* (Contemporary OJCCD-692-2), the VTL got the signature rhythm, pacing, dynamics, and tonal balances of a jazz combo just right. It was all there: the fundamental tonality and shimmering overtones of Shelly Manne's cymbal; the earthy bottom and woody, transient snap of Ray Brown's bass; the pungent attack and indigo intricacy of guitarist Barney Kessel's horn-like lines and chordal fanfares. The 5.5 delivered a soulful emotional connection to the collective and individual aspects of this improvised performance, just as I hear them in the mind's ear of a musician who himself plays drums, bass, and guitar.

#### Associated Equipment

**Analog sources:** Rega Planar 25 turntable, Rega RB600 tonearm, Grado Statement Master cartridge; Marantz PMD430 portable cassette recorder.

**Digital sources:** Sony SCD-777ES SACD/CD player, California Audio Labs CL-20 DVD-V/CD player and Delta 24-bit/96kHz DAC.

**Preamplifiers:** Musical Fidelity Nu-Vista, Blue Circle Galatea, Rogue Audio Magnum Ninety-Nine.

**Power amplifiers:** Musical Fidelity Nu-Vista 300, Mesa Baron, VTL MB-450, Rogue Audio M-120.

**Loudspeakers:** Joseph Audio RM33si Signature, Meadowlark HotRod Shearwater.

**Cables:** Interconnect: Acoustic Zen Silver Reference (balanced, single-ended, coaxial). Speaker: Acoustic Zen Hologram. AC: JPS Labs Aluminata, Kaptovator, Kaptovator Power AC Outlet Centers, Synergistic Research Designers' Reference<sup>2</sup> Master Couplers (with Active Shielding), Acoustic Zen Gargantua.

**Accessories:** Equi-Tech 2Q Balanced Power Transformer, Monster Cable AVS 2000 Automatic Voltage Stabilizer, PolyCrystal equipment racks and amp stand, Ringmat 330 and Signal Guard II Isolation Stand (turntable), Shakti Stones, PolyCrystal cones, Argent Room Lens, Echo Busters Bass Busters and Absorptive and Diffusive Panels.

—Chip Stern

#### Conclusions

When I find in a component as much to *kevell* about as I did in the VTL TL-5.5, I can't help wondering if I've gushed too fulsomely. But in head-to-head listening sessions against quality preamps that have afforded me enormous pleasure over the past few years, the TL-5.5's quickness, clarity, depth of resolution, layered soundstaging, and arresting midrange depth always proved warmly involving and musically compelling.

Richly detailed, tonally accurate, and nonfatiguing, the VTL TL-5.5 is a fine example of the midrange liquidity and human character that a finely tuned, non-invasive tube design can add to any signal chain by fleshing out a realistic palette of earth tones—even as its bass control, midrange smoothness, sparkling highs, and quiet authority suggest the performance of solid-state.

With a minimum of fuss and primping, the VTL TL-5.5 delivers useful features, no-compromise build quality, and audiophile authority at a most competitive price point. You'd have to spend a lot more to make this preamp take a back seat to any line stage, tubed or otherwise. ☒

## Follow-Up

Chip Stern



### Reprinted from October 2002

#### VTL MB-450 Signature monoblock power amplifier

This Signature update of Vacuum Tube Logic's MB-450 monoblock features a fully balanced input stage, remote voltage turn-on trigger, revised bias points and trim pots, new ground-loop circuitry, and a hair-trigger, fast-blow fuse for the B+ power rail, which (as I can attest to from several blown fuses) prevents a bad tube or a serious power anomaly from frying your circuits. Topping things off are a set of sophisticated new Multicaps in the signal path.

With eight 6550 tubes per monoblock and an output stage that's switchable between 200W triode and 339W tetrode into 8 ohms, the MB-450 also features a significantly larger version of the Signature Output Transformer than VTL's MB-185 (100W triode, 220W tetrode), which had offered me my only previous extended, in-home experience of VTL monoblocks. (That was in 1997, when I used a pair to review the Joseph Audio RM22si loudspeakers.

In tandem with the VTL TL-5.5 tube line-stage preamplifier—review to appear next

month—the MB-450 monoblock evinced larger-than-life levels of midrange liquidity and dynamic drive, massive bass control, captivating high-frequency purity, and out-of-this-world, holographic layering and depth. I've never had anything in my system that delivered more goosebumps per square inch than this combo. The MB-450 had all the textured majesty and dulcet intimacy I'd expect from more modestly configured triode amps, but with reserves of dynamic headroom that put SET amps to shame. More than equal to the demands of even so power-hungry a loudspeaker as the Joseph RM33si, the MB-450 simply bristled with energy when coupled with more sensitive loudspeakers such as the Joseph RM7si and RM22si and the Meadowlark Shearwater. But I was even more impressed by how much sweeter and smoother the MB-450's tetrode sound was than that of the MB-185, which tended to develop a touch of glare and midrange hardness when pushed.

Depending on the music and my mood, my tastes goes back and forth between warmth and brilliance, between a laid-back presentation and

one that's in my lap and more deeply holographic. Older recordings and smaller-scale works benefited from triode's rich textural complexity, warm intimacy, and gentle, small-scale perspective, while more modern recordings and those with greater instrumental complexity profited from tetrode's transient speed, immense dynamic headroom, and the way it permitted a liquid descent into blackness.

At Home Entertainment 2002, I auditioned a much-touted, ludicrously configured SET colossus from Italy whose signal fell apart like a dry cracker when confronted with the enormous bass-drum transients in Valery Gergiev's recording of Stravinsky's *The Rite of Spring* (Philips 289 468 035-2). Playing that disc in triode or tetrode mode, the MB-450 simply shrugged. Both modes had a rapturous midrange, but, top to bottom, triode was more centered and sweet, with greater air and inner detail; tetrode was more three-dimensional, if a touch less revealing, with a level of absolute authority in the low end that conveyed a sense of physical presence that must be experienced to be believed. ☒