Tavish Design

Direct-Coupled Hybrid Vacuum Tube Amplifier

Features

- Å 7-tube direct-coupled signal path with a high-current transistor output stage
- Å High bias class-AB output stage delivers first critical watts (up to 5W/ch, user selectable) in pure class A
- Å 140 W/ch 8Ω | 220 W/ch 4Ω
- Å Tempered glass window, ALPS blue velvet motorized potentiometer, lighted switches, and 5 relay-selected inputs
- Å Cool wireless remote control; no need to point, works anywhere in the house
- Å Massive linear (non-switching) power supplies with 108,000µF filter capacitance and low-noise, US-made toroidal transformers
- Å Designed & made in USA, with 6 year warranty

Most other hybrid amplifiers are really just transistor amplifiers with a couple of tubes added in front as a preamp. The Minotaur is something different.

The Minotaur is a predominantly vacuum-tube amplifier, direct-coupled to a transistor output stage. The design uses 7 vacuum tubes to handle the input, voltage gain, and driver stages of the amplifier. The high-bias class-AB (linear, non-switching) output stage uses the well-regarded MJL3281 and MJL1302 devices in a modified Sziklai configuration for outstanding linearity, and it operates in pure class-A up to either 1W or 5 W per channel (user selectable).

In developing the Minotaur, particular attention was paid both to achieving very low distortion, and also to the character of whatever small distortion was produced; at normal levels, the →

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The Minotaur – Combining the natural harmonic character of tubes with the high current punch of transistors

distortion spectrum is dominated by the single-ended 12BH7 vacuum tube driver stage and is predominantly second harmonic, like that of many musical instruments.

The Minotaur is configured as a stereo integrated amplifier with five line-level analog inputs. The standard version has 5 pairs of unbalanced (RCA) input connectors. The balanced version has 2 pairs of balanced (XLR) input connectors and 3 pairs of unbalanced (RCA) input connectors. The XLR inputs offer true balanced operation with more than 120 dB of common-mode rejection at 60 Hz.

The Minotaur features instrument-like construction with high-quality components and connectors throughout. The vacuum tubes are powered from regulated high voltage and heater supplies to achieve minimum noise and operating drift. For user convenience, it has a wireless remote control (no need to point, works anywhere in the house). It uses a classic ALPS blue velvet motorized potentiometer for volume control and OMRON low-signal relays for source selection, with C&K LED lighted pushbutton switches on the front panel. A system microcontroller monitors temperature, offset, and bias conditions.

The Minotaur takes advantage of both the linear, high-voltage-swing capability of vacuum tubes and the high-current-delivery capability of transistors, allowing the tubes and transistors to do what each does best. And, the Minotaur is direct-coupled from the input stage to the output[1], avoiding the use of coupling capacitors at high-signal levels, where they can cause slow recovery from overload transients. The Minotaur is one of very few hybrids on the market to directly couple the tubes to the transistors.

Each Minotaur is individually burned in and re-measured prior to shipment, and individual measurement results are included in your owner's manual.

Parameter	Specification
Rated Power Output	140 W per channel continuous, both channels driven into 8Ω
Power Output vs. Load Impedance	190 W per channel into 5Ω 220 W per channel into 4Ω 240 W per channel into 3Ω
Output Noise	<110 µV RMS C-weighted 30 Hz – 8 kHz >108 dB below rated power
Input Sensitivity and Gain	+0 dBu (0.78 V RMS) for full output, 32 dB gain
Total Harmonic Distortion	Typically <0.08% at any frequency between 20 Hz and 20 kHz and any power level up to 120 W, 8Ω load. <1.0% at full rated power
Input Impedance	≥50 kΩ
Output Impedance (Damping Factor)	40 mΩ at 1 kHz (equivalent to a damping factor of 200)
Bandwidth	3 Hz – 150 kHz (-3 dB, ref. 1 W @ 1 kHz)[1] 3 Hz – 80 kHz (-3 dB, ref. 1W @ 1kHz)
Size	17.2” wide, 17” deep, 6” high
Weight	34 lbs. (42 lbs. shipping weight)
Power Consumption (120 V, 60 Hz)	70-160 W typical, 600 W maximum, <1 W standby
Tube Complement	5751 (or 12AX7) x2, 12AT7 x4, 12BH7 x1
Output Transistors	MJL3281A x4, MJL1302A x4

[1] A single coupling capacitor is used at each amplifier input to prevent a DC offset from the signal source from being applied to the amplifier.

About Us

Tavish Design is a small business dedicated to designing and building affordable, innovative high-end audio reproduction equipment at a variety of price points. Our goal is to provide equipment that not only lets your music sound beautiful, but also looks good and is a pleasure to use. While we certainly don't believe that specs tell the whole sonic story, we do insist on equipment that is reliable and measures well as necessary first steps.

Scott Reynolds founded Tavish Design to pursue an almost lifelong passion for music and audio. He has been designing and building audio equipment as an amateur for more than 35 years and has written articles for *Audioxpress* and *Glass Audio*, starting in 1993. He also holds a PhD in electrical engineering and has more than 25 years of industry experience in design engineering and engineering management, and he has more than 30 US patents. Scott is joined in the business by his son.

Tavish Design – Better Design Means Better Sound