

VTV Octal Line Stage Project

By Eric Barbour and Charles Kittleson

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After a dozen years of listening to "peanut tube" preamps using 12AX7s or 6DJ8s, I asked Eric Barbour to design a simple, good sounding octal-based pre-amp. As many of you know, the reason there are so many "peanut tube" preamps is because these tubes are small and cheap. By the way, so is their sonic performance. Miniature dual triode tubes typically have a small soundstage, tinny sound, are subject to microphonics and can be irritating to listen to. Short of using obsolete 56 or 76 triodes, we decided to use the venerable 6SN7, that can still be found for reasonable prices. The 6SN7 typically has a larger soundstage and is super smooth. As with all tube types, different brands and batches can have noticeably different sonic signatures. The beauty of this line stage is that you can experiment with the literally dozens of 6SN7 types to get exactly the sound you want.

We were not willing to use an ordinary aluminum box for the enclosure, so I contacted SpireAudio. (Note: Unfortunately, at press time, SpireAudio was out of business.) We used a 10x17x2.5 inch aluminum chassis that was powder coated black. All input, output, power, fuse, and switch holes were cut by SpireAudio. The beefy solid aluminum knobs were obtained from Ron Welborne. The result is a professional-looking instrument with lots of room inside for improvements and upgrades in the future.

The circuit design of this project is a classic cathode follower driven by a gain stage. Two 6SN7s are used, one per channel. Overall gain of the line stage is about 12, which should be adequate for most applications. It is possible to use this pre-

amp with some solid-state power amps, but not all.

A 5Y3GT tube rectifier is used in this design, (Figure 1), because tube rectifiers add more "magic" and 3D to the music when compared to typical cheap silicon diodes.

With this transformer, you could also use a 5V4G, but do not use a 5U4, because the filament current is too high. DC heater

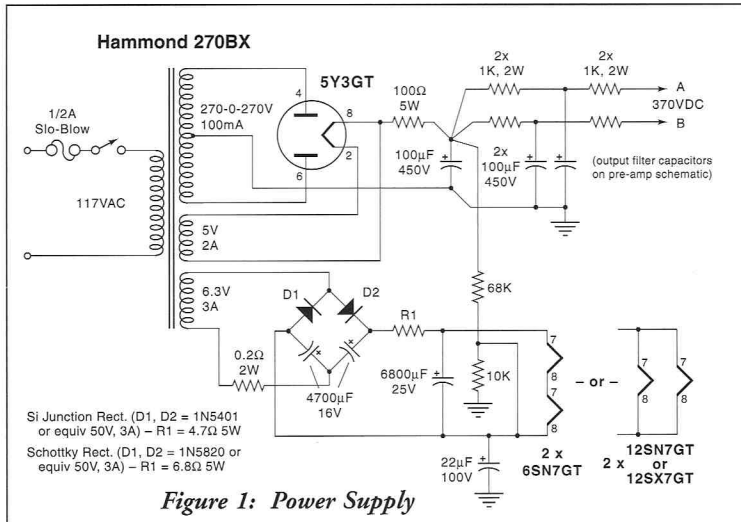
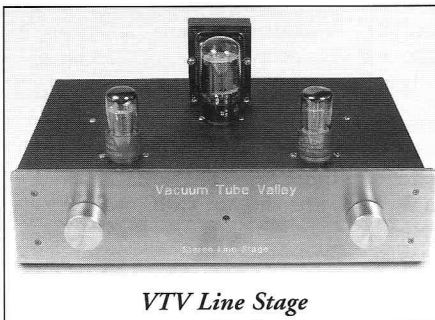


Figure 1: Power Supply

The volume control is a Noble dual 100K type. Performance was improved significantly when we installed a Gold Point dual 100K stepped attenuator. Adding the Gold Point cleaned up the sound and reduced any mistracking of the channels.

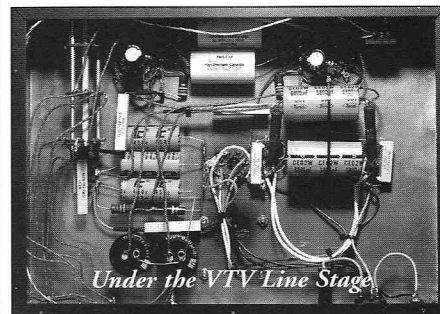


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power is derived using Schottky diodes. In order to keep hum to a minimum, copious amounts of filter capacitance were needed to keep hum below the 1 millivolt level.

The power transformer is a **Hammond 270BX** (550V C.T., 5V@2A and 6.3V@2A) which allows for a 370V plate voltage on the 6SN7s. Higher voltages make the tube more linear and more "exciting" sounding. The power supply schematic, (Figure 1), also shows how to wire this preamp for 12SN7s or 12SX7s if you desire.

Figure 2 shows one side of the line stage and indicates all component values. Note that the line stage has switching for three inputs. We used an old Dynaco PAS-3 selector switch for this task, but you can use a higher quality gold or silver contact switch. Coupling capacitors used are the Ultra-Tone Silver Foil in oil rated at 0.47μf @650V. These caps are clear, deep and huge sounding.



Under the VTV Line Stage

This preamp is a super smooth sounding unit and is very easy to listen to for extended periods without listener fatigue. In fact, we listened to over 30 types of 6SN7s with this unit and loved every minute. Overall, the VTV line stage is a preamp that you can live with for a very long time, perhaps a lifetime.

NOTE: High voltages are used in this project. Use caution and never work on tube equipment when power is applied. VTV assumes no responsibility if you do something careless or stupid while building or using this line stage.

A special thanks to Fred Slaven at SpireAudio in Sacramento for assisting us with the chassis used in this project. Also, thanks to John Atwood, VTV Tech Editor for fine-tuning the circuit.

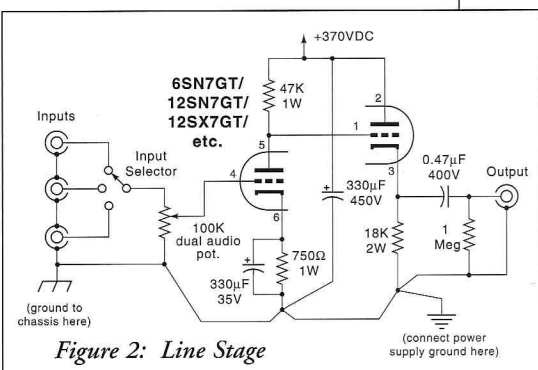


Figure 2: Line Stage