

The Prejudice Against Solid State And Pritchard Amps

Musicians who play first ask, “What tubes are in that Pritchard amp?” Musicians who ask first, ask if the amps are tube or solid state, this is because solid state has the reputation of being tonally inferior. This prejudice against solid state is well earned after four decades of numerous claims by engineers and manufacturers that solid state is as good as or better than vacuum tubes. However, just as these claims are flawed, this seemingly accurate assessment has a serious flaw – it is an overstatement and an oversimplification of the facts.

The impact of the circuitry associated with the tubes or transistors must be acknowledged because there are bad tube amps as well as good ones. Certainly, everyone knows examples. Although tubes can make a difference, *the circuits and other components do have a substantial impact also.*

Perhaps with some doubt now in your mind, you might ask why? Just how can this happen? There are two reasons, one physical and one philosophical. The underlying philosophy of engineering ignores the concerns of artists. Engineers believe that the electronics should not be part of the art and should merely replicate the input accurately without any embellishments. On the other hand, musicians judge their electronics upon the embellishments. Two people could not be more contradictory.

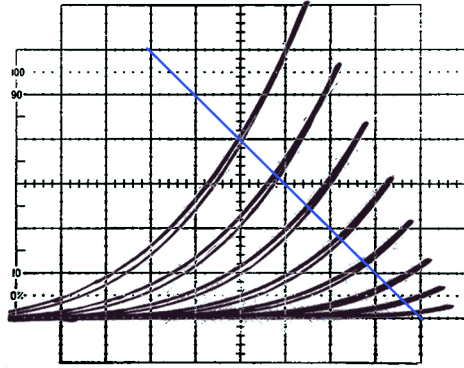
One place this philosophy shows up, is in the bias circuits for solid state versus tubes. Tube bias and more particularly the variation of the bias in tubes is only a small fraction of the total supply voltage and generally smaller than the maximum signal. Conversely, the variation of the proper bias of solid state devices is a substantial fraction of their supply voltage and generally larger than the signal. This demands compensating circuits and those circuits, particularly when overdriven, create part of the sonic differences between tubes and transistors that is ignored by engineering philosophy. And this is only one example.

“Tube Emulators” When individual solid state devices failed to get close to the tube sound, “tube emulators” were incorporated into products. Unfortunately, these circuits failed too because they did not do the whole job. But since they took a step in the general direction of tube behavior, they were hyped and solid state continued its infamy.

Eric Pritchard and Pritchard Amps

The goal for Eric Pritchard’s research was to produce the greatest amplifier and do it with solid state. Consequently, he spent many years exploring the many dead ends of electronics until there was nowhere to go but to question the foundations of engineering itself. Eric found that most audio design is not based upon fact, but opinion and approximation. With this mind opening satori, Pritchard recreated his musical engineering from the reactions of musicians to the many prototype amplifiers created to explore the musicians’ desires and needs. This 15-year effort produced 13 U.S. patents on artistic amplifier circuits and a radically new approach – an approach that has produced truly great guitar and instrument amplification.

This research began with the design of the PRS Harmonic Generator amplifiers. While some basic concepts were found, the most important result of the Harmonic Generator experience was the realization that the tube amplifier stages should be addressed individually instead of in a group like preamplifier and output stages. This led to the various tube emulators and eventually to a tube exaggerator, now known as the triode XGPA™ technology. This technology (U.S. patent 5,434,536, “Semiconductor Emulation of Vacuum Tubes”) lets Eric virtually design his own “tubes”. The figures below show the plate characteristics of a 12AX7 vacuum triode and one of Eric’s XGPA™ triodes.

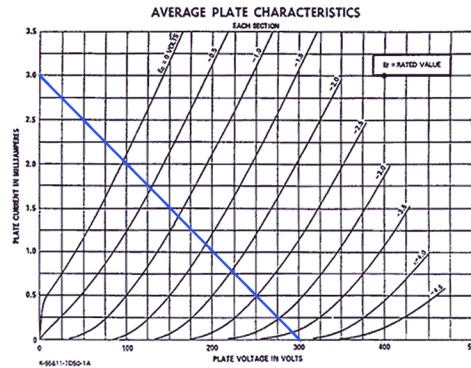


— Load Line

Depicts XGPA Triode Plate Character

Pritchard Amps Technical Data of XGPA™
Technology Semiconductor Emulation of
Vacuum Tubes

US Patent 5,434,536 07/18/95



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Depicts 12AX7-A Plate Character

GE Electronics Innovations in Action Tube
Twin Triode, 12-1970, pg 1

The artistic character of the vintage output stage was much more difficult, but with the triode stages proven by comparison with Russell Hamm’s data (“Tubes Versus Transistors – Is There an Audible Difference?”, *Journal of the Audio Engineering Society*, May 1973), it was a mountain that had to be climbed to reach truly great tone. Its research uncovered generally unknown characteristics, such as ripple modulation and expansive harmonic generation, in addition to the better-known sag and compression. These effects produced numerous U.S. patents:

- 5,636,284 Solid-State Emulation of Vacuum Tube Audio Power Amplifiers
- 5,734,725 Tube Emulator Amplifier System
- 5,761,316 Variable and Reactive Audio Power Amplifier
- 5,761,317 Tube Amplifier Fat Emulation Structure
- 5,805,713 Solid State Circuit for Emulating Push-Pull Tube Amplifier
- 5,848,165 Fat Sound Creation Means

These and other patents disclose special portions of circuitry to bring true artistry to solid state. This great artistry plus the versatility of the Voice Knob™ and the Watts Knob™ plus the inherent reliability of conservatively designed solid state gives you the best of all worlds.

The seemingly unbelievable artistry of the XGPA™ technology is in musicians’ reactions. Players who play first and ask questions later ask “What tubes are in it?” They aren’t quite sure because they are hearing an exaggeration of the tube phenomenon. Owners tend to sell or store their old tube amps.

Experiencing a Pritchard amplifier will have you convinced. Try one !

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