

A Robust Argument In Support Of Solid State Guitar Amps

Transistor (solid state) and tube (thermionic) amplifiers pretty much do the same job. But how they do it is not really quite the same. Although, they're not hugely different either, so if you're interested in learning more, then please read on.

I accept that guitarists can 'see' that some amps do not have tubes in them... so it's not hard to see why they assume that must be the reason there's a sonic difference. The fact that a tube amp sounds subjectively better for guitars actually has nothing to do with whether it has tubes in it or not. The real reason is with 'how' the speaker is being driven via an 'output transformer'. The output transformer drives the speaker by a method called 'constant current'. Whereas SS amps have tended to be by a method called 'constant voltage' and this makes a big difference between them.

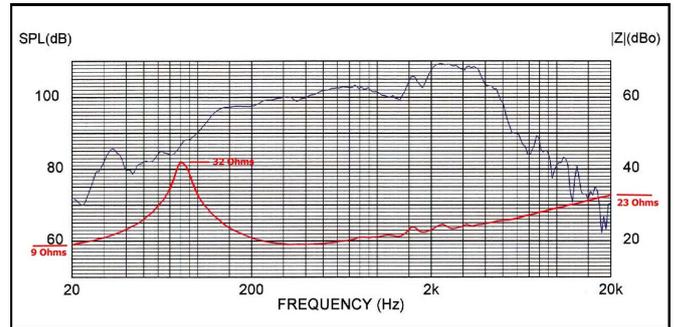
It's a fact of life that it is possible to design a SS amp that does not require an output transformer, but not so for the tube amp. So any tube amp a guitarist encounters will have the obligatory output transformer... which is both heavy and expensive and will automatically come equipped with 'constant current' speaker drive.

However, the output transformer plays a unique role in giving the tube amp the characteristics it exudes! What we all refer to as 'the tube amp tone'. But it's NOT the tubes responsible... and I know you will hate me for saying that. But I'm not God and I cannot alter the laws of physics. Like it or not, physics is what makes a guitar amp possible in the first place... not folklore or any other hairy-fairy ideas about 'toobs'! Don't get me wrong, I don't hate tubes... I just can't see a need for them any longer!

The Guitar Speakers' Role

Most guitarists think of a guitar speaker as, probably, that big black lump in the back of the amp that gets really dusty and makes a loud noise when you play the guitar and not thinking about it much more. But it's the most important tone creating component in any guitar amp!

Guitarists know they come in different impedances, but not many know that their impedance changes according to the frequency of the notes being played through the amp. So, for example, an 8 Ohm speaker is only that at frequencies at around 200-1000Hz. Either side of this frequency range, the speaker's impedance rises to about 20-40 Ohms at 10,000Hz and about 30-40 Ohms at approximately 80Hz. You can see a graph of a G12T 75 speaker's impedance curve in the picture on the right. The red line is what you should note.



Yesteryear's 'Constant Voltage' Drive SS Amps

These are what cause the tone you think of when anyone mentions SS guitar amps. Yep, some were pretty dreadful.

An 'old design' **100W SS amp** with a **28.28Vrms constant voltage** driving a speaker with a 'nominal' impedance of 8 Ohms, will produce 100W only when the speaker is at 8 Ohms! Therefore, frequencies in the 200 - 1000Hz range would be most dominant. When the signal's frequency changes upward or downward, then the output power of the amplifier will reduce too! That means an output power of just 34.77 Watts @ 20kHz and a mere 25 Watts at 80Hz at best. Its tonality is rather 'cold' sounding. The sound can be affected in other ways too.

A Tube Amp With 'Constant Current' Drive

Conversely, with a **tube amp** employing 'constant current' drive, thanks to the output transformer, the voltage applied to the speaker terminals is able to increase as the speaker's impedance rises... therefore, the full 100W output power remains pretty constant at all frequencies.

This happens because the output transformer generally has an internal impedance of about 4 Ohms which is in series with the speaker. So as the speaker's impedance rises, the current flowing through the speaker decreases causing the voltage across the speaker to rise to compensate... due to



Ohms Law. This maintains a 'constant current' flowing through the speaker at all frequencies... therefore, full output at any frequency is achieved. This is exactly what a tube amp has always done and why most players like a 'good tube amp'! The resulting better efficiency at the higher and lower frequencies produces a much more satisfying tone and vitality for amplification of electric guitar. The amp also sounds a tad louder, due to the increase in high and low frequency power output. Chime and warmth are just two words often used to describe the end results... the old 'constant voltage' SS amps just can't deliver this cuddly and vibrant tone.

Modern SESSION SS Amps with 'Constant Current' Drive

We call our power amps equipped with this tone enhancing circuitry 'RetroTone™'. It exactly copies the tube amp tone and the extra 'apparent' loudness too - although both amps can be still the same power ability!

The nice things about SS amps are that they are cheaper to make, more reliable, run cooler and less cost to maintain... as there's lower heat to damage other components and do not need to have expensive tubes replaced regularly. Heat is the most destructive by-product of tube amps which shortens component life. This is even more true if you live in a hot country, as you will find that electrolytic 'filter' capacitors will need replacing after about ten years of regular use. None of this is applicable to SS amps. So, the net outcome is that RetroTone™ design power amps provide all the benefits of SS... but with the tone and vitality we all expect from a tube amp. This means you can have absolutely everything you could possibly wish for!

If any SS amp does not have RetroTone™ built in, then it won't sound right. RetroTone™ powered SESSION amps can easily compete with any similarly power rated tube amp. RetroTone™ power is just as loud as tube power. This is why we offer the RetroTone™ Upgrade for our older 1980s SS amps!

New Award-Session SS Guitar Amps

BluesBaby single channel amps were created to provide great 'tube amp' tones without the running costs, reliability and weight implications of a traditional tube guitar combo. If we're all truly honest with ourselves, we know these to be the most valid reasons NOT to buy tube amps?

Some of you might say there is not any way a SS amp can sound like a tube amp. And yes, there have been many bad sounding SS amps... but then, many bad sounding tube amps too.

We've heard those comments and arguments hundreds of thousands of times. But, why would SESSION make an amplifier that does not do what we say? Surely, we would have been out of business ages ago? Unless, of course,

cynical guitarists believe the only customers we have are those with seriously poor hearing problems! Or perhaps, that we have terrible hearing too! Hmmm, our customers might not agree with that!

How about looking at SS amps differently?

1. Players use SS pedals with all-tube guitar amps... and they achieve the sounds they want.
2. Other players use amps that have SS preamps... and they sound just fine. Marshall's JCM800/900 being classic examples, or MusicMan amps have mostly SS preamps driving a tube power amp section... hybrids!
3. Effects pedals employ exactly the same type of SS components that are used in SS amplifiers.

All of these are permutations embraced fully by world class pro players... so they clearly do deliver!

OK, so if SS pedals and preamps work well with amplifiers that incorporate tube power output, but not so well with amps that have SS power amps, then surely it should be obvious that the problem is NOT really the fact that SS is useless for guitar... but to do with the fact that the amps used are not equipped with 'constant current' speaker drive!

- SESSION's RetroTone™ power amp designs have revolutionised SS guitar amp tone and brought our products in direct competition with tube amps.
- They work well with all your favourite pedals... just as they do with any tube amp.
- No signal compression used at the instrument input like digital amps do!
- They are completely free of any 'digital' amplification or processing... totally analogue for truer tone.
- Toroidal power transformers used which generate up to 70% less hum radiation... brilliant with P-90 pickups!
- SESSION can warrant you will not hear any difference. Only captivating guitar tone... reliably, for less money and an amp built to truly professional standards. No 'jumper lead' connectors!
- SESSION amps are built with top quality components, transformers and speakers; and backed by a 30 day 'money back' warranty.

SESSION amps represent a new benchmark in SS guitar amplification. We are convinced you would never know the difference... if you were to try one!

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Tube & SS Guitar amp designer since 1967

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