

A Key Difference In Guitar Amp Design That Guitarists Ought Be Aware Of

It's not just the type of valves or quality of components that make the various tonal differences between guitar amps. It's many things. There's something hardly ever thought about and I hope this article will help you make a wiser choice the next time you buy a new amp.

It's the circuit 'topology'! That means where the different parts, and in what order, the essential 'tone effecting' circuitry appear in the amp's design. The amp's designer can decide on these matters according to the kind of sound the amp is required to make.

On this occasion I'm just talking about the EQ circuit (what our American friends call the 'Tone Stack') and the 'distortion circuit.' These two circuit blocks are vitally important in how the amplifier's sound (or 'tone') is arrived at. Many will be aware that there's 'Fender', 'Marshall', 'Vox' and various other EQ arrangements which help those make sound the way they do. There's also subtle variations on these EQ circuits used too.

The distortion circuits can also take many forms and use all kinds of techniques to create the distortion you like... and often the distortion you don't like too! How the distortion is created is not the subject of this article... but more to do with where the distortion and EQ circuitry appears in relation to each other in the overall amplifier circuit, and how that affects the amplifier's sound (tone).

A Brief Background To Amplifier Development

In the early days of guitar amps, there were no distortion facilities in amplifiers at all... at least, not intentional. You only had the Input, a Volume, Tone or three band EQ and that was it. However, if you turned up those amps too loudly, then you would hear distortion... more in some amps than others. This was due to the power amp valves being overdriven by a signal that was too big! So, this means that the amp's EQ was before the point that the distortion took place.

This is pre distortion EQ and the nice thing about it is that adjusting the EQ would emphasise which band of frequencies would distort first. You see, an EQ is really just a separate Volume Control for each of the Treble, Middle and Bass frequency ranges! Simplz!

Clever players soon realized they could make their amp distort more on the high frequencies than the low ones by turning up the treble and keeping the bass and mids set relatively low. Hence the early blues sounds were born!

Rock guitarists soon started demanding super-high output pickups to drive the amp into distortion much more easily! As time went on, additional gain was added to the front end of amplifier preamps to facilitate this requirement and amp volumes got ridiculously loud! The average gigging musician soon found gig organizers complaining!

Coming to the rescue in the nineteen-seventies were amps with 'front-end' distortion which had a gain control to set the amount of distortion and a Master Volume control to set the loudness of the amp's volume making distortion available at more manageable volumes. These soon became popular, however, they had some drawbacks... the super-high gain made the EQ controls appear to have very little effect on the tone. In fact their effect was washed out by the gain!

To overcome this problem, in the early nineteen-eighties, amp manufacturers started to shift the EQ circuit to after the distortion circuitry. This certainly solved that problem and has become the standard that most 'rock' orientated amps employ today. However, the overall tone is not the same! The two styles of amp have very different tonal outcomes... differences which seem to have been forgotten about... differences which can enhance your guitar tone depending on what kind of music you play! Here's some helpful pointers...

Pre Distortion EQ Amps

Advantages: It enables the EQ to be employed to emphasise higher frequency bands, thus making the high notes overdrive before the low notes.

Disadvantages: Cannot cope with ultra-high gain too well as already mentioned. Can sound a little 'screwed up' when you turn it to high levels of distortion.

Tonality: Its distortion sounds 'squeezed' and rather 'smoky' toned in low distortion modes. Like an overdriven AC30 perhaps. Does not sound too aggressive. Transition from clean to distorted seems much more subtle. Can sound a little raggy or 'confused' in deep distortion mode. Great (the best) for 'on-the-edge' playing styles.

Conclusion: Ideal for styles of guitar playing that require low amounts of 'on-the-edge' distortion like country and blues. Roy Buchanan's sound was created with this style of amp.

Known Examples: Fender Hotrod DLX & Blues DLX. Session Sessionette:75 & Roskette:30 and Mesa Boogie Lone Star.

Cont'd...

Post Distortion EQ Amps

Advantages: EQ is very effective when the amp is run at high levels of distortion. The distortion tone can be made to sound very aggressive.

Disadvantages: Unable to use EQ to determine which frequency bands distort first. A little un-subtle for traditional music styles

Tonality: A more 'mid' orientated tone that works quite well for many styles of playing, but really most suited to rock styles. A much more 'in-your-face' type of distortion character... and often a common flaw of it being way too loud when the Master Volume is set to only '1' on the dial!

Conclusion: This style of amp is not for everybody, it has to be said. But because the guitar amp market is heavily focussed towards rock, it's what most of us end up with unwittingly. Usually because we trust the brand name too much, maybe? It's also probably the reason some of us are always dissatisfied with our tone if we play blues or country!

Known Examples: Just about every Marshall and other 'rock' designated amps. The Fender Blues Junior strangely - it's the odd one out in the Hotrod Series! Session BluesBaby 22 and 1997+ Sessionettes.

How can I tell which type of EQ topology my amp has?

Well, when you play in deep distortion and your EQ controls work efficiently and the distortion tone becomes very brittle as you increase the treble... then this is almost certainly POST-Distortion EQ... of the 'rock' amp type. Most will be like this now.

Hope you found this interesting and helpful.

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Guitar amp designer since 1967