Tube Amp 'Compression'

Do tube amplifiers really produce a compressed 'spongy' sound? Yes they can do, but not all tube amplifiers do. So it is incorrect to assume that because an amp has valves in it, that it will automatically exhibit this characteristic.

The reason some amps compress is due to the power supply and the rectifiers which convert the incoming AC mains (line) voltages into the DC which the electronics in the amp needs to function. Some tube amplifiers have tube rectifiers, but most have solid state rectifier diodes. The tube amps that incorporate the latter DO NOT compress the signal. So that rules out about 95% of the popular tube amps on the market. If you particularly like the effect that this kind of compression brings, then you should ask your amp dealer if the amp you are trying has tube rectification.

Amps that compress in this way seem to be very loud when you initially play a clean loud sustained chord and then it soon sinks down into a mushy semi-distorted tone. Under these conditions, the rectifier tube is unable to deliver sufficient current (known as current limiting) to the power amp, so the voltage across the output tubes severely drops to a level where the power is reduced and distortion creeps into the tone. When you stop playing, the power supply returns to its former levels, until you play another loud chord and the same effect repeats. The power supply needs just a fraction of a second to 're-charge', so you don't really notice anything happening.

Usually, it's only low powered amps that have tube rectification. Larger 50-100 watt amps have solid state diodes. This has been the case since about 1963, when higher powered amps first started to come onto the market and tube rectifiers were unable to be economically used, in what were then, just cheap guitar amps. Everything was down to the cost. But really it was an improvement, because everyone wanted loud un-distorted power back then. Remember, these amps were designed long before distortion was a desirable guitar sound. Classic amps like the Fender Twin Reverb, known for it's loud 'n' clean performance, owe their reputations largely to the fact that they have solid state rectification and two very efficient speakers with large magnets.

The classic Marshall 50 and 100 watt 'Super Lead' amps also are equipped with solid state rectification. It was really only the low powered amps up to the 30 watt 'Bluesbreaker' types that had tube rectifiers. VOX AC30s employ (and still do) tube rectifiers, as did the Selmer 'Treble 'n' Bass 50', Zodiac 30 Twin and Thunderbird 50 combo amps - using the famous GZ34 on an octal base, but 50 watts is right on the limits of its current capabilities at 250mA.

Some say that this is exclusive to tube amps, but again, that's not strictly true. Tranny amps behave pretty much in the same way as a tube amp with solid state diodes. However, it is possible to build a solid state power supply for an amp which has intentional, and even adjustable, current limiting. So it would be quite possible to surpass the effects caused by a tube rectifier! Just how useful this would be is another question... but it is easily possible. It's worth saying though, that I have never seen a tranny amp made this way. That's probably due to the fact that it would make it much more expensive and... tranny amps are expected to be cheap. If player's prejudices were reversed at some time... then I'm sure a brilliant tranny amp could be designed that would be a top selling product! A classic in time even?