
Subject: Solid State vs. Vacuum Amps
Posted by [frankieg](#) on Fri, 20 Oct 2017 18:35:23 GMT
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What are the differences between solid state amps and vacuum amps? My roommate just started playing the guitar (and already thinks they are a rockstar) and is thinking about getting an amp. I told him I would ask the experts, ie you all. Is one better than the other, or do they just offer different things? Are there other kinds?

Subject: Re: Solid State vs. Vacuum Amps
Posted by [Wayne Parham](#) on Fri, 20 Oct 2017 21:05:13 GMT
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There's a lot to consider, and it's more than just the active elements. You want to also consider the topology: Single-Ended, Push-Pull, Ultralinear, Parafeed, etc. Also consider where feedback is used and how much. Do some searches here or just peruse this forum and you'll find a lot of discussions on these topics.

But to get you started, check out this booklet:
A Taste of Tubes

Subject: Re: Solid State vs. Vacuum Amps
Posted by [The Noise](#) on Fri, 23 Oct 2020 01:18:41 GMT
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It is interesting that Edison was able to patent something, part of the filament I believe, without knowing exactly HOW it worked. Could that even happen these days?

Subject: Re: Solid State vs. Vacuum Amps
Posted by [gofar99](#) on Sun, 25 Oct 2020 02:24:39 GMT
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Hi, there are a number of differences. Start with cost, power consumption and efficiency and heat generation. Add in amount of output power available and finally the one that is controversial is sound qualities. All of the first 4 mentioned tend to favor solid state amps. The last one is where the discussion gets murky. In theory any well designed amp should reproduce the source material well. If response figures, noise levels and distortion are equal the sound would logically be the same for either type. However, all things are seldom equal and the results are that they usually sound differently. Not bad or good, just different. So my suggestion is to listen to a few of each type and decide on what you like best. I personally prefer tube ones, but have a number of high end solid state ones as well. Often you will hear that folks say that tube amps have a "warmer" sound and solid state ones more detail sometimes to the point of being analytical. I don't personally share those thoughts (YMMV). I suspect that those comments probably made

sense in the early days of solid state amps as the components and designs were not always as good as they are now. To be fair there were a lot of poor tube amps as well. Now both technologies are greatly refined and either type can fit most uses.

Subject: Re: Solid State vs. Vacuum Amps
Posted by [hurdy_gurdyman](#) on Tue, 27 Oct 2020 04:23:37 GMT
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Are we talking guitar amps or stereo amps?

Dave

Subject: Re: Solid State vs. Vacuum Amps
Posted by [positron](#) on Mon, 28 Dec 2020 02:11:51 GMT
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Off the top of my head, there are inherent differences between SS and Tube amplifiers due to the amplifying devices themselves. This may seem inconsequential, but I thought it would be beneficial for some.

1. Capacitance within the amplifying device. Vacuum tubes have a vacuum as a dielectric between the elements, hence virtually no DA or ESR/DA characteristics. SS devices, of course, have solid, semi conductor material with high DA and ESR/DF characteristics.
2. Miller Capacitance. The plate to no. 1 grid forms a capacitance, and that capacitance times the ~gain of the stage is called the Miller Capacitance, which the preceding stage "sees".
3. The internal junction capacitance in a FET varies with voltages across the junctions until ~25 volts and higher. Thus the Miller Capacitance varies as the signal varies in amplitude. Fortunately, the Miller Capacitance is low in some phase splitters and in output stages operated as source followers.
4. The power supply is quite different between Tube and SS. Where as vacuum tubes usually use a combination of chokes and small/medium size filter capacitors, SS generally uses vastly larger filter capacitors. The article "Picking Capacitors", by Walter Jung/Richard Marsh, shows that capacitors can have resonance in low khz. (See Below Attachment.)
In typical SS amplifiers, capacitances of 5 fold or more are often used.

This generally has a negative effect on sonics even though a typical sine wave may show low HD distortion. High DA and ESR/DF won't show up on a distortion analyzer.

Hope this helps in general understanding.

pos

File Attachments

1) [Capacitor Resonance Picking_Capacitors_1 pdf.png](#),
downloaded 423 times
