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An Annoying Speaker Related Problem

Stop spending money replacing pickups, when it might be your speakers and cabinet causing the problem!

Q. Does your electric guitar sound great until you hit open E on the sixth string and you hear a huge bass increase? Have you spent good money on replacing pickups and hours adjusting their height... only to find it's still there? So, what can the cause be?

A. It's probably your guitar speakers. What? Yes, they have what is known as a 'free air resonance' (Fs) at about 75-90Hz. When you play a note at open E (82Hz), F, F# or G, the speaker jumps into resonance and require very little power to produce a huge acoustic output volume. This is very noticeable with a guitar speaker fitted into an open back cabinet of a valve amp, or one of the newer design solid state amps with Current Feedback (Output Transformer Emulation) built into the power amp section.

So what's the solution to this? If it really annoys you, then you'll have to replace your guitar speakers with a type giving an Fs at around 55-60Hz.

This problem also occurs when the same 'regular' guitar speakers are fitted into a closed back cabinet, except that the resonance increases in frequency to around 110Hz, open A on the fifth string. The closed back has the effect of 'stiffening' the speaker's cone, thereby making it resonate at the higher frequency quoted.

A pair of G10 Vintage drivers in an open back cab will resonate at around 110-115Hz, whilst replacing the open back with a closed back will 'tune up' the cab to around 160Hz, open D on the fourth string. This is a great way of getting more warmth out of your guitar rig.

It's also a very good idea to mix speaker types in a 2 or 4 x12" cab to obtain more low frequency output over a wider spectrum. Some boutique amp makers do this already to give better low frequency coverage and overall warmth to the tone.

A Vintage 30 (Fs=75Hz) and a G12M Greenback (Fs = 88Hz) make a possible combination, but limited to a 2 x 12" cabinet with 50 watts power handling or a 100W 4 x12". This would also be true with other speaker makes too.

Another combination, for higher 120W power handling would be a Vintage 30 and a G12 ClassicLead 80 (Fs=85Hz) in a 2 x 12" or a 240W 4 x 12" cab. Sometimes a 2 x 12" cab with two speakers the same can be just too much when both speakers are at full resonance, making the bass 'get in the way' on certain types of music. This is quite common, I've found, with big Fender amps like the Twin Reverb, for example.

Have Fun!!

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Guitar amp designer since 1967

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