Tone capacitors

by **twizzle** » 28 Nov 2013, 15:24

Why does the tone pot have a capacitor and what does it do ?. Why has my Les Paul have difference values to my Tele.

twizzle

Re: Tone capacitors

by **Dirk** » 28 Nov 2013, 17:43

Basically, the capacitor is the component that rolls off the treble controlled by the tone pot.

Your tele has a different value because it has single coil pickups instead of your LP's humbuckers.

Dirk

Re: Tone capacitors

by **twizzle** » 28 Nov 2013, 18:18

So if i keep my treble pot fully on all the time there is no need for a cap. The cap only helps with the treble turned down. What happens if i reduce the value say to 0.1uf on the single pick up or increase the value. Will it make any difference

twizzle

Re: Tone capacitors

by **Dirk** » 28 Nov 2013, 19:31

Some players cut out the tone control completely, cause to their ears it does matter.
Personally, I like having a tone control for backing down the treble a little on some songs.

Dirk

Re: Tone capacitors

by **nathanscribe** » 28 Nov 2013, 19:32

The short answer is yes. A resistor (in this case a variable resistor) and a capacitor, depending on the arrangement, make either a low-pass or high-pass filter. The cut-off frequency is determined by the values of both, but often you'll get a fixed capacitor and a variable resistor to sweep the frequency with.

http://www.muzique.com/schem/filter.htm

nathanscribe

Re: Tone capacitors

by **twizzle** » 28 Nov 2013, 20:35

Ive got a day off tomorrow so am going to have a fiddle with different ones Thanks for the help chaps

twizzle

Re: Tone capacitors

by **twizzle** » 30 Nov 2013, 17:55

Right got myself some caps. 0.1uf, 0.22uf and 0.45uf will i notice the difference between them ?. Will they make it bassier or tinning at lower volume levels

twizzle

Re: Tone capacitors

by **zombiwoof** » 30 Nov 2013, 18:39

I think you mean .022uf and .047uf.
The higher the value, the more treble is cut as you turn down the tone pot. So, a higher value cap will make the pickup sound more bassy and muddy at the lowest position of the tone knob than a lower value. Most guitars ship with .022uf these days, many Gibson guys sub an .015 for the neck pos to get a more usable sound when the tone is completely rolled off.

Al

zombiwoof

Re: Tone capacitors

by **twizzle** » 30 Nov 2013, 18:48

Got you. So the 0.1uf will give me more natural treble as i turn it down

twizzle

Re: Tone capacitors

by **nathanscribe** » 30 Nov 2013, 20:12

A smaller cap will give a smaller sweep range and broadly work at higher frequencies. The frequency of the filter is 1/(2πRC). As the resistor is what varies as you turn the knob, the cap determines the range of its effect - that is, the minimum and maximum ends of the range. You can pick your working desired frequency range and choose a cap to fit the purpose.

nathanscribe

Re: Tone capacitors

by **twizzle** » 30 Nov 2013, 21:14

I think the best way to get my head around this the to try each one so i can hear the difference.

twizzle

Re: Tone capacitors

by **zombiwoof** » 01 Dec 2013, 18:03

> *twizzle wrote:*
> *Got you. So the 0.1uf will give me more natural treble as i turn it down*

No, you're confusing the tone caps with the "treble bypass" cap/resistor mod that helps retain treble as you turn down the volume. The .1uf tone cap is going to more bassy and muddy at the lowest position of the tone control. Lower values will by less bassy at the lowest setting of the tone. At "10" on the tone control, there will be little or no difference between the different values of tone cap. Treble bypass caps are added across the legs of the volume pot, and usually range somewhere between .001uf down to about half that value (.0047uf)

Al

zombiwoof

Re: Tone capacitors

by **twizzle** » 01 Dec 2013, 18:45

I've already got a Russian paper in oil cap on the volume pot The one am on about is the cap that is soldered to the tone pot connector then runs to the volume pot connector then earth's to the top of the volume pot

twizzle

Re: Tone capacitors

by **zombiwoof** » 02 Dec 2013, 18:12

OK, that's the tone pot, and to answer your question different values will not help with treble retention as you turn down the volume, that's what the treble bypass cap you already have does.

Al

zombiwoof

Re: Tone capacitors

by **twizzle** » 02 Dec 2013, 20:43

> *OK, that's the tone pot, and to answer your question different values will not help with treble retention as you turn down the volume, that's what the treble bypass cap you already have does.*

Ok what's the other small cap on the tone pot for.

twizzle

Re: Tone capacitors

by **twizzle** » 02 Dec 2013, 20:59

It's the green cap am wondering about. I have the large tone bypass cap soldered to the 2 bottom contacts on the volume pot

twizzle

Re: Tone capacitors

by **zombiwoof** » 03 Dec 2013, 18:42

As it says, it's the tone cap. Usually .022uf is the standard value these days for Fenders and Gibsons, I said in an earlier post what subbing different values will accomplish.

Al

zombiwoof

Re: Tone capacitors

by **twizzle** » 03 Dec 2013, 18:47

Thank for the great info. Bit thick on things like this. What does it do ? Does it need to be these

twizzle

Re: Tone capacitors

by **nathanscribe** » 04 Dec 2013, 18:11

See my previous post. In combination with the value of the tone pot, it determines the frequency above which your sound rolls off. When you move the tone control round, you effectively change its resistance, thereby changing the frequency. Changing the tone cap will change the frequency range of that filter. I linked to a site that show you the simple maths behind it.

nathanscribe

Re: Tone capacitors

by **twizzle** » 05 Dec 2013, 21:31

Thanks Nathan. Don't know what i would do without this site

twizzle

Re: Tone capacitors

by **nathanscribe** » 06 Dec 2013, 16:19

It's not so hard to work out once you get your head round it - pick up a few different caps and see what they sound like. But having the maths to look at should give a better idea what might or might not work. Good luck!

nathanscribe

Re: Tone capacitors

by **twizzle** » 06 Dec 2013, 16:51

Bought some caps from Maplins a long with the other i already have so muck about time on Sunday

twizzle

Re: Tone capacitors

by **charmonder** » 06 Dec 2013, 19:53

That's a good idea, it's hard to really visualize what electronic components do without some hands on experience. You might want to get a small breadboard if you don't already have one, that way you can test out cap values without having to resolder every time.

charmonder

Re: Tone capacitors

by **sclitheroe** » 07 Dec 2013, 01:11

Soldering some leads with mini alligator clips on the end into the guitar wiring is a great way of testing tone caps. You can put the entire guitar back together and have the cap on the outside for quick changes.

I also found this three part series to be the best one on Youtube for reviewing the entire quagmire that is tone caps: http://youtu.be/92G-jw4TqS4

sclitheroe