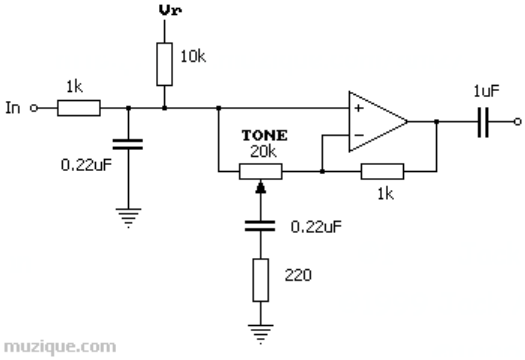
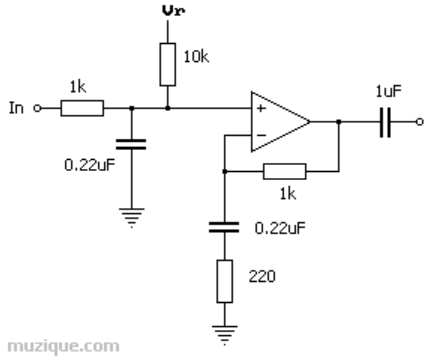
AMZ Tone Control Mods

Expanding the TS-9 Tone Control



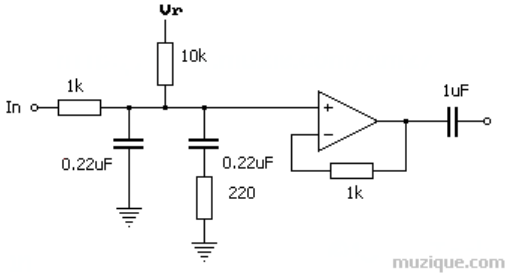
This is the classic tone control from the TS-808, which was also used in the TS-9 and its related versions. It is a simple and effective control section but is limited by some elements of the design.

To get a better idea of what is happening with the tone control, we can examine the response at the extremes of the tone pot rotation.



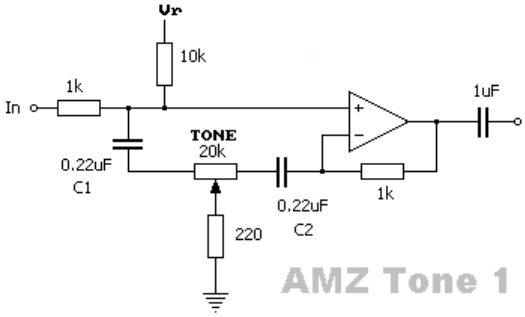
When the tone knob is all the way to the treble side, the gain stage is essentially as shown here. The 20k variable resistor is essentially out of the circuit so we can drop it for clarity.

Note that the 1k/0.22 RC low pass network on the input side is always in the signal path and it rolls off the highs above 720 Hz. This is part of what makes the TS so mid-range heavy. However, since the clipping stage is ahead of the RC network, it does help to take some of the fizz out of the fuzz.



If we roll the tone control back to the bass side, we get a circuit much like this example. The signal path is now heavily filtered by the 220/0.22uF pair that is now positioned in parallel with the input RC network.

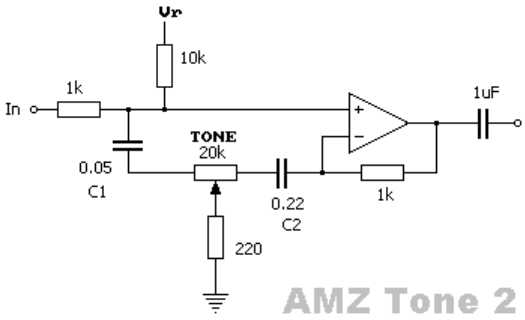
The low pass corner frquency is now at 360 Hz., but with a bit of a kink in the response caused by the 220 ohm resistor. This is heavy filtering for any guitar signal.



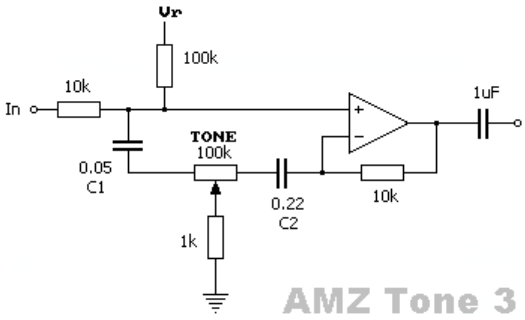
In this novel example, the parts are all the same values as in the original but by moving them around, a different tone control circuit is formed. Compare the modified circuit to the first schematic on this page.

You will see that the 0.22uF near the input is no longer directly grounded but instead is connected to the tone control pot and grounded through the wiper and its resistor.

The deep low pass filtering is no longer present as the control is opened up.



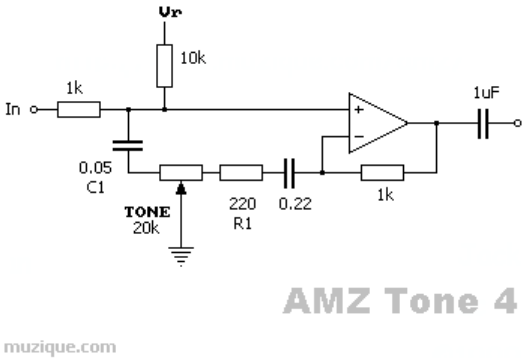
Another advantage of this tone control is that we now have independent control over the low pass (C1) and high pass (C2) filter components. In this version, the C1 capacitor is made smaller so that there are more highs passed, even when the pot is turned to the bass side. This opens up the tone control and allows more useful range.



Another way to modify the response of the tone control is to change the resistor values. This example has had all of the resistors altered to illustrate.

The values shown make a perfectly acceptable tone control.

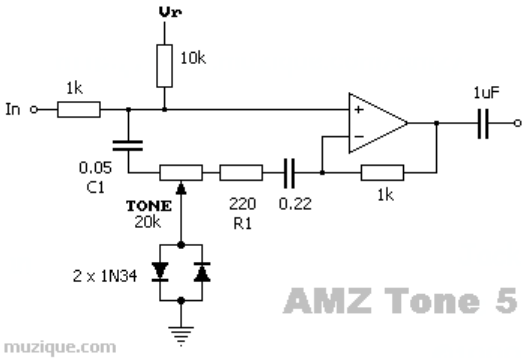
There is more gain on this version when the treble is boosted and the opamp may be driven into distortion, which adds a bit of grit to the sound.



A further rearrangement of components gives one of my favorite versions. The resistor on the wiper of the pot has been moved to the non-innverting opamp side of the control and the wiper connects directly to ground.

The advantage here is that the bottom end of C1 can go directly to ground and give complete rolloff without a shelf in the response.

All of these tone control networks work well with overdrive pedal designs and can be a pleasant alternative to the stock TS-9 type control, especially where it is desired to removed some of the mid-range heavy character.



Lagniappe -*noun* An unexpected benefit or bonus (frequently used in south Louisiana)

Our lagniappe is a quirky clipping circuit derived from the modified tone control.

Give this circuit a test if you are looking for an out-of-the-ordinary clipping signal!

Use this idea as you wish but **give credit** to where you learned about the idea! A link would be nice too...