

preamp. For prototypes, you could replace a 100k plate resistor with a 100k linear pot, with the wiper connected to the coupling cap (or tone stack) and the outer terminals connected to the plate and to the B+. (Most pots are not designed to be subjected to raw DC like this, so this is only a temporary measure to determine which pair of fixed resistors to use on each stage.)

## Details

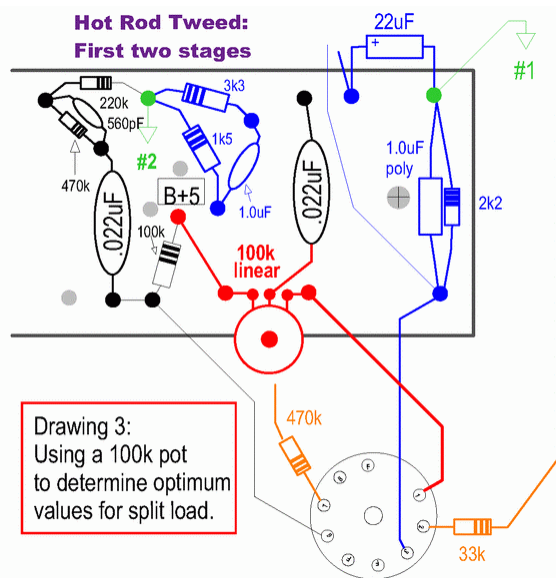
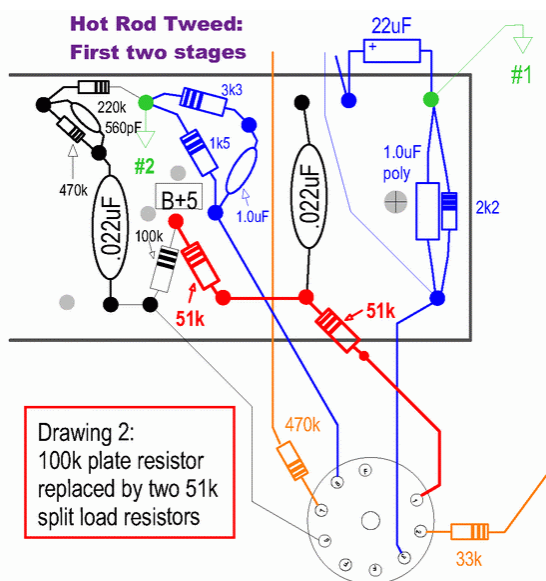
I had heard about split loads a few years ago, but figured it would be too much of a hassle to implement them in my existing amps. Once I overcame my initial reluctance I found that they are much easier to use than I thought. With an eyelet board if you have already decided what values to use for the pair, you wire up one of them on the board exactly where the original plate resistor was located and then add the other one to the lead that goes to the tube socket [see Drawing 2]. When adding resistors to flying leads connected to tube sockets, if the signal is going into the tube, I will place the resistor right at the tube socket; if it is an output signal is coming from the tube I will place the resistor at the other end of the lead. This practice seems to improve the signal-to-noise ratio a bit.

To determine which values to use for your split load pair can be more complicated. You can wire in the 100k linear pot so that the two outer terminals are connected exactly as the two leads from the 100k plate resistor were connected. You then need to move the lead from the coupling cap to the wiper of the 100k linear pot [see Drawing 3 below].

## Final notes

“Split loads” can solve many problems in a tube amp design by reducing the audio signal level without drastically affecting the tone. You can set the bias for any preamp stage as you like, and then set the output level from that stage independently. If you find that a particular tube stage is distorting too much, you could first try a split load on the plate of the preceding stage and then observe the results. In some cases you might want to use the split load even earlier in the circuit.

A common request is to increase the headroom of a blackface Fender amp so that it doesn't start breaking up so soon; adding a split load to the initial preamp stage would allow you to reduce the signal level going into the tone stack. Using a 10k resistor on the plate and a 91k resistor going to B+ would reduce the signal level roughly 10%; to reduce it further you might try an 18k resistor on the plate and an 82k resistor going to the B+. This is just one example; split loads can be used throughout your amp



design to fine-tune the gain structure.

Although not suggested by the title of this article, split loads can also be used on the cathode of a cathode follower; that is a good way to reduce the signal level going into a 5F6A or Marshall-style tone stack. You could also try split loads on both the plate and cathode of a cathodyne phase inverter to reduce the signal level going to the output tubes; replacing each 56k resistors with a pair of 27k resistors as shown in [this drawing](#) should reduce the signal level by a factor of two.

Many thanks to both of the experts over at AMPAGE who introduced us to “split loads”.

Good luck!

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<http://www.blueguitar.org/>

### **Schematics which use split load plate resistors:**

**Blues Express Plus (Revision A9k)**

<http://www.blueguitar.org/bluexp12.pdf>

**More... (to be added later)**

[http://www.blueguitar.org/split\\_ld.zip](http://www.blueguitar.org/split_ld.zip)