

## **RoeTest - Computer Tube Tester / Tube Measuring System**

(c) - Helmut Weigl [www.roehrentest.de](http://www.roehrentest.de)

### **Grid voltage 120V**

#### **Preliminary:**

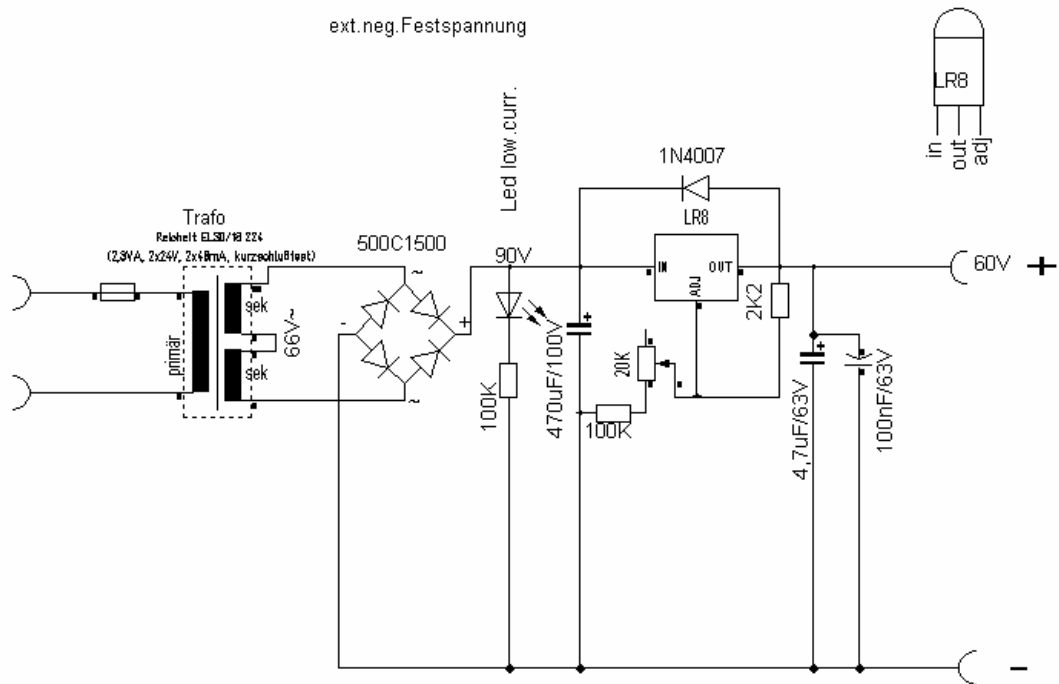
The hardware of the RoeTest provides a negative grid voltage up to -63 V. This suffices for measuring of 99,9% of all tubes. There are very rare cases when a higher grid voltage is desirable. This applies for example to old triodes, like the 300b, when those are operated at higher anode voltage levels.

#### **Solution:**

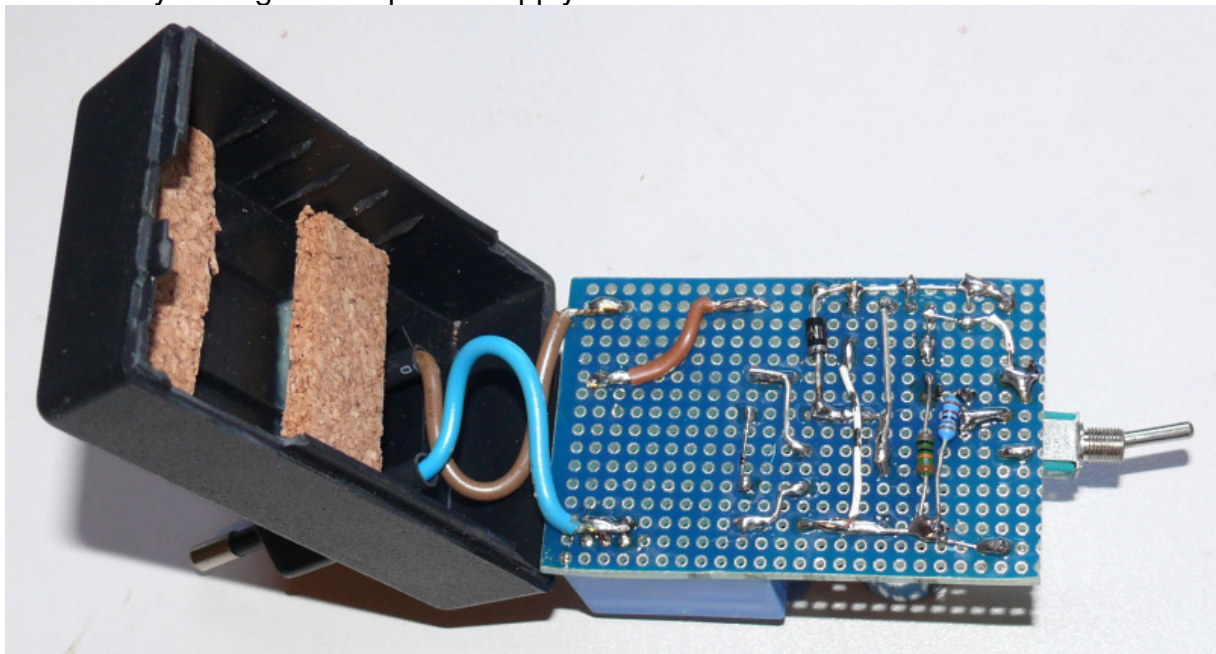
The solution is just simple: If hardware is missing, just add some more hardware. As the RoeTest works with dc voltage another voltage can be connected in series to the inside available 0 to -63 V (this is done the same way as already practiced with the 600V anode voltage range). So every arbitrary grid voltage can be established. I built an external power supply with 60V that I connect in series. This yields a grid voltage range from -60 to -123V.

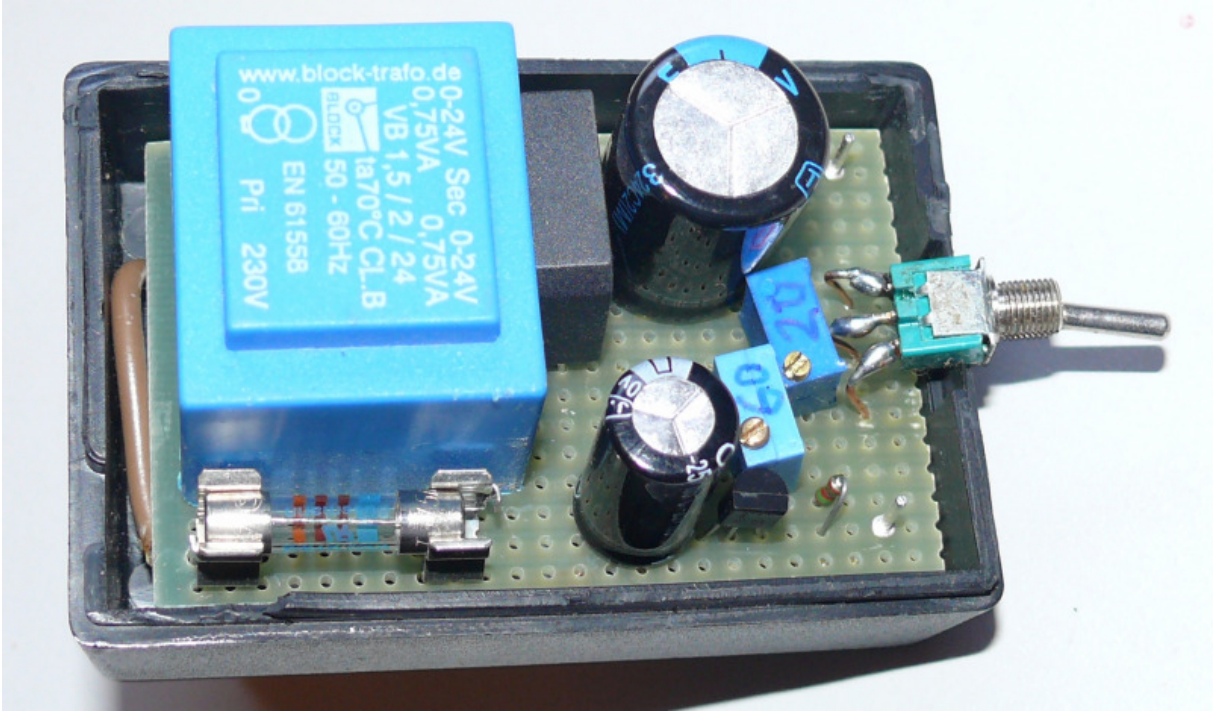
#### **External power supply unit:**

First we need an external power supply unit with exactly 60V. The power supply only has to source a few mA as no grid current will flow. I use the following circuit that I assembled experimentally on a breadboard and placed it into the housing of a cannibalized wall power supply:



Additionally I designed the power supply unit switchable for 60V and 20V.





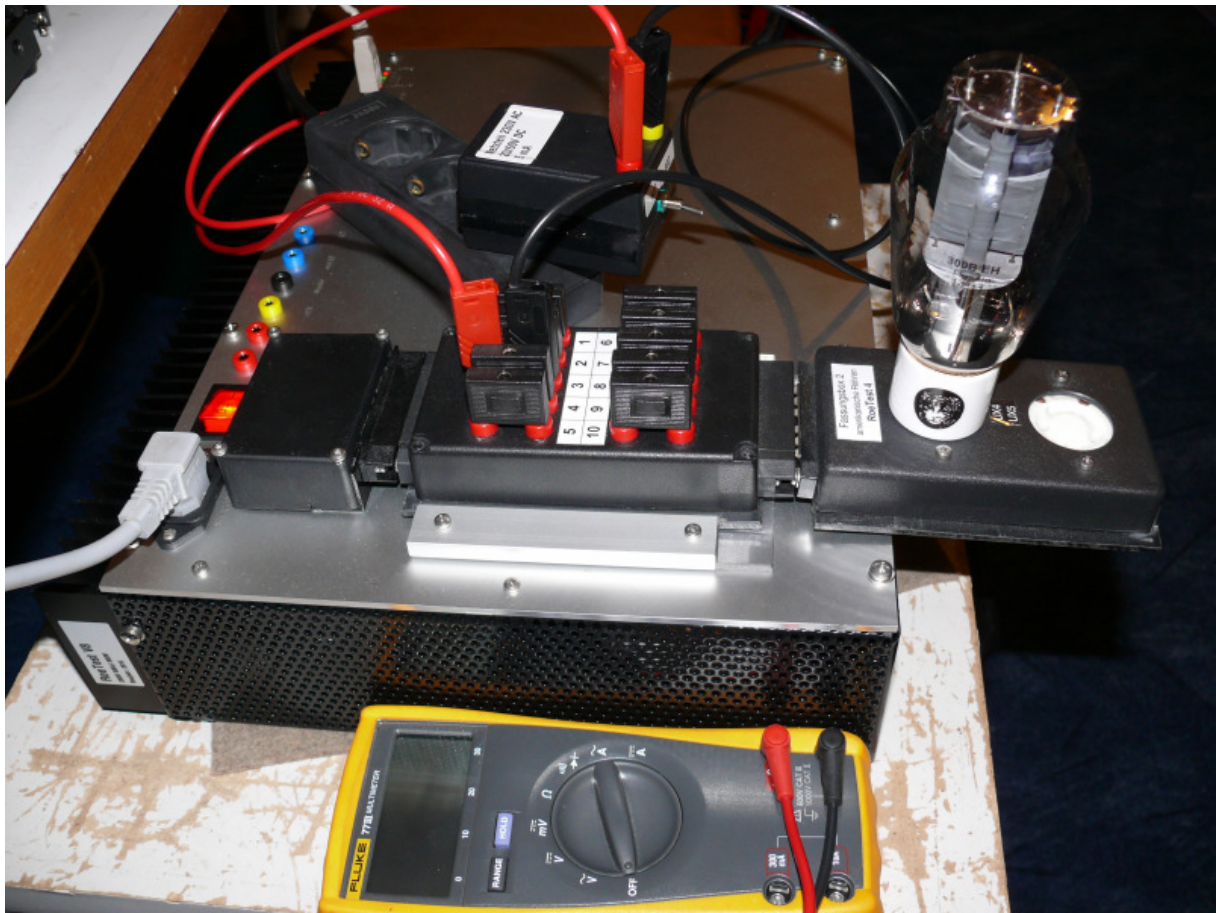


**Netzteil 230V AC**  
**20/60V DC**  
**5 mA**





The power supply unit is simply looped-in ahead of the socket box. For this purpose I use the already existing insert box:



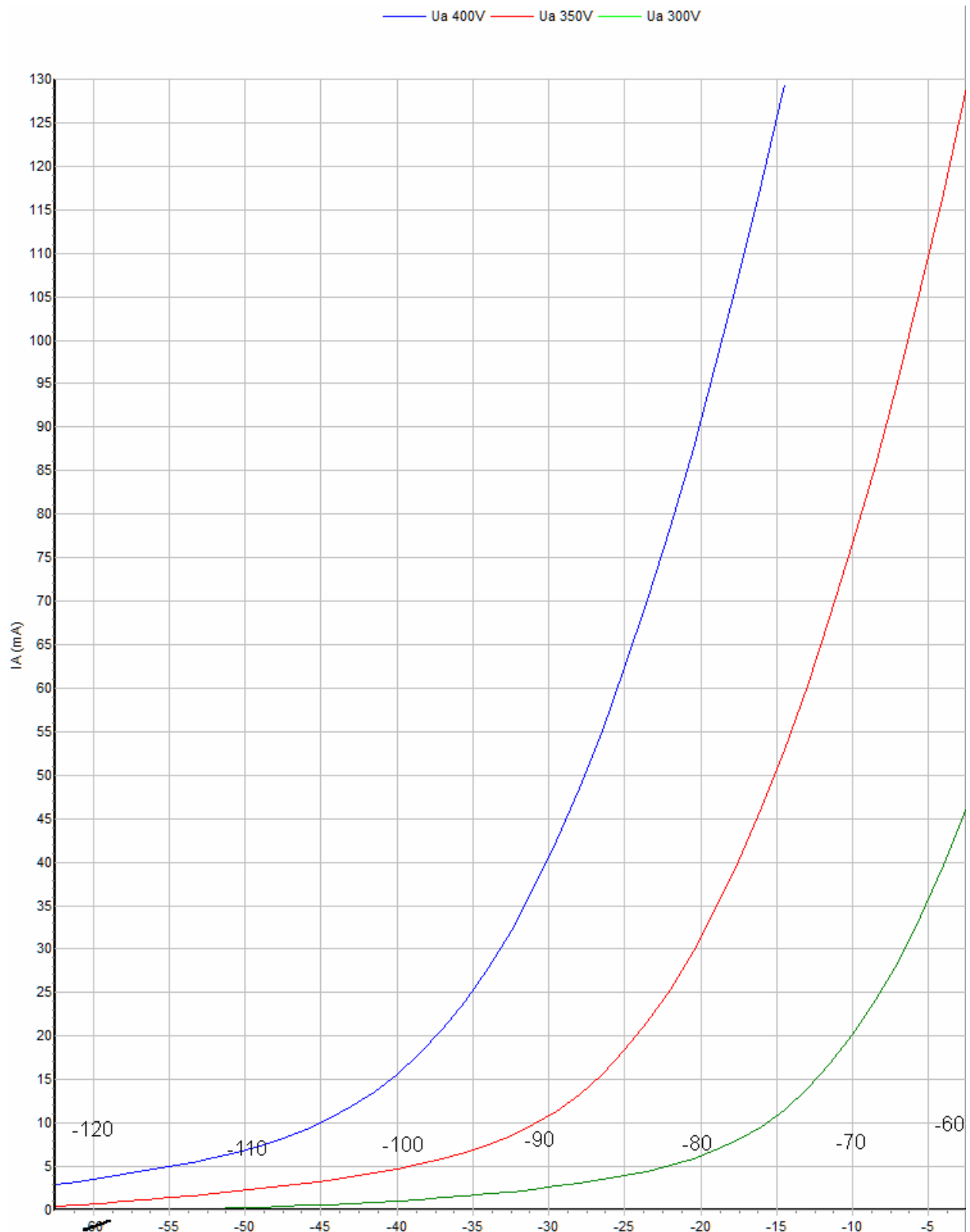
With the 300b the grid is located at pin 3. So we loop-in the external 60V there. The negative pole is connected to the tube and the positive pole is connected to the RoeTest. With a multimeter the sum voltage (internal grid voltage of the RoeTest + external power supply unit voltage) can be monitored.

Now we create a new data set with the desired voltages. For safety reasons I generated a new specific tube type "Triode G1ext" and blocked the short circuit test for that one (the external connected voltage would interfere with that).

Subsequently the static tests or automatic characteristic curve measuring can be started as regular.

In the following the input characteristic of a new 300b EH at 400V, 350V and 300V is shown. The grid voltage was varied from -120V to -60V.

For the labeling of the x-axis you have to add the external voltage in thought (so instead of -60V to 0V else -120V to -60V). I manually added the right values to the diagram.



Of course you can also connect external voltages other than 60V. When you build a switchable power supply unit you get all degrees of freedom desired for the height of the grid voltage.

**Hint:**

If you need these high grid voltages frequently and still have space available in the RoeTest housing, you can mount the additional power supply unit into the cabinet and inject the voltage between the G1-board and the relay matrix via a switch. So the external wiring is omitted. Please always ensure that this switch is set to the off position when not used!

**Warning:**

There are high voltages available which can be dangerous to life. Everyone experimenting with that should be aware of the dangers present. I assume no liability.