Tubes with common screen grid (G2)

The Problem:

There exist tubes with two tetrode sections (or two pentode sections) where the screen grids of the two sections are connected to a common socket pin.

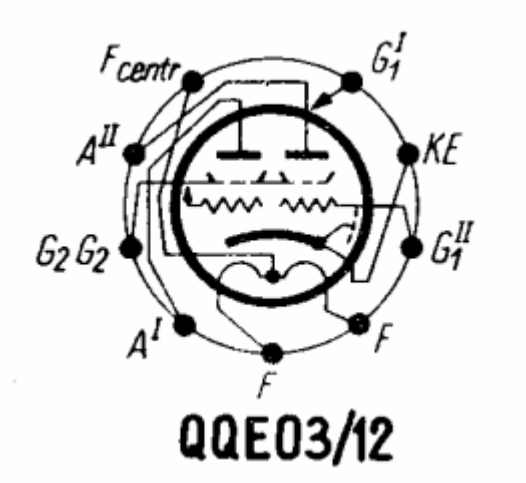
This causes the following problem in measurement: When one section is measured the other (unmeasured) section also has the full screen grid voltage, but no anode voltage and no grid voltage. Since the cathodes of both sections are emiting electrons, all electrons emitted in the second section are absorbed by the screen grid. The common screen grid is thus overloaded. Then, because an excessive current is dectected, the RoeTest shuts down. Any measurement is impossible.

Solution:

The unmeasured section must be disabled. This is easisly achieved by placing a high negative voltage on the control grid (G1) of the unmeasured section, driving that section into cutoff.

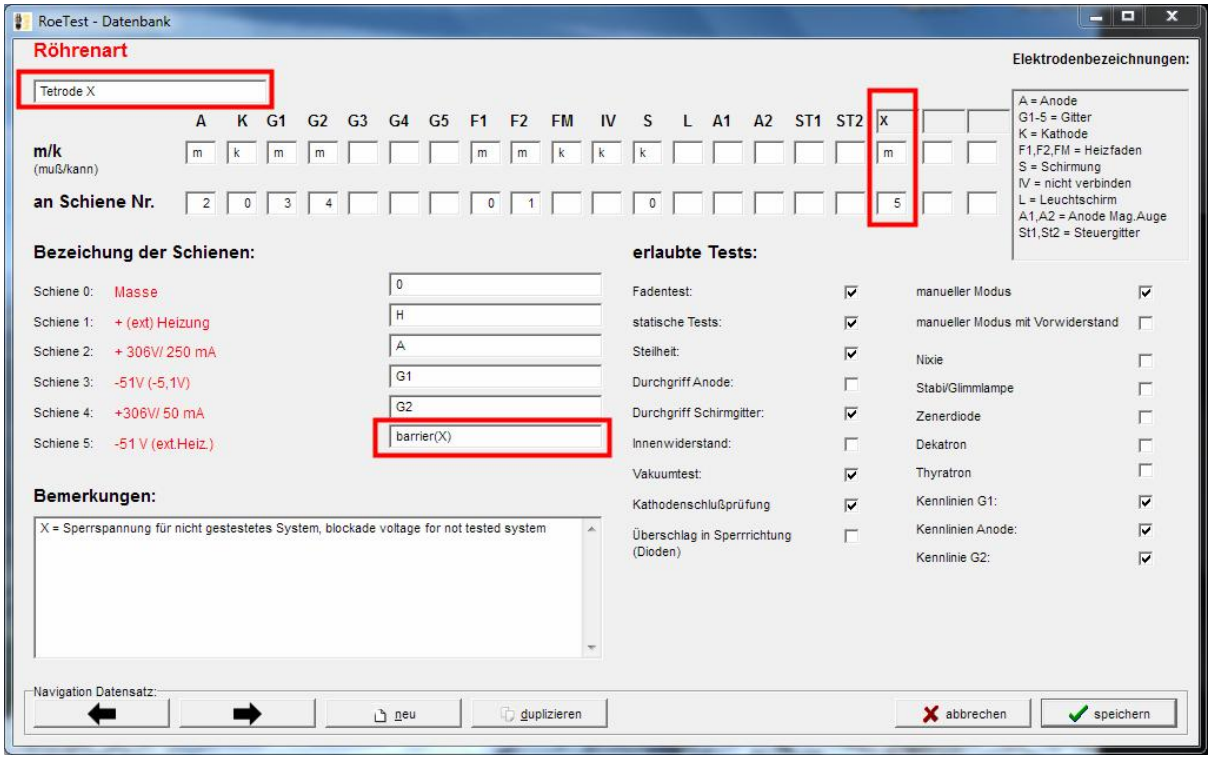
Implementation in RoeTest:

The RoeTest provides a convenient way to do this, since a second negative-voltage source is available. As an example, refer to the type QQE03-12. This is a double tetrode with common screen grid connection.



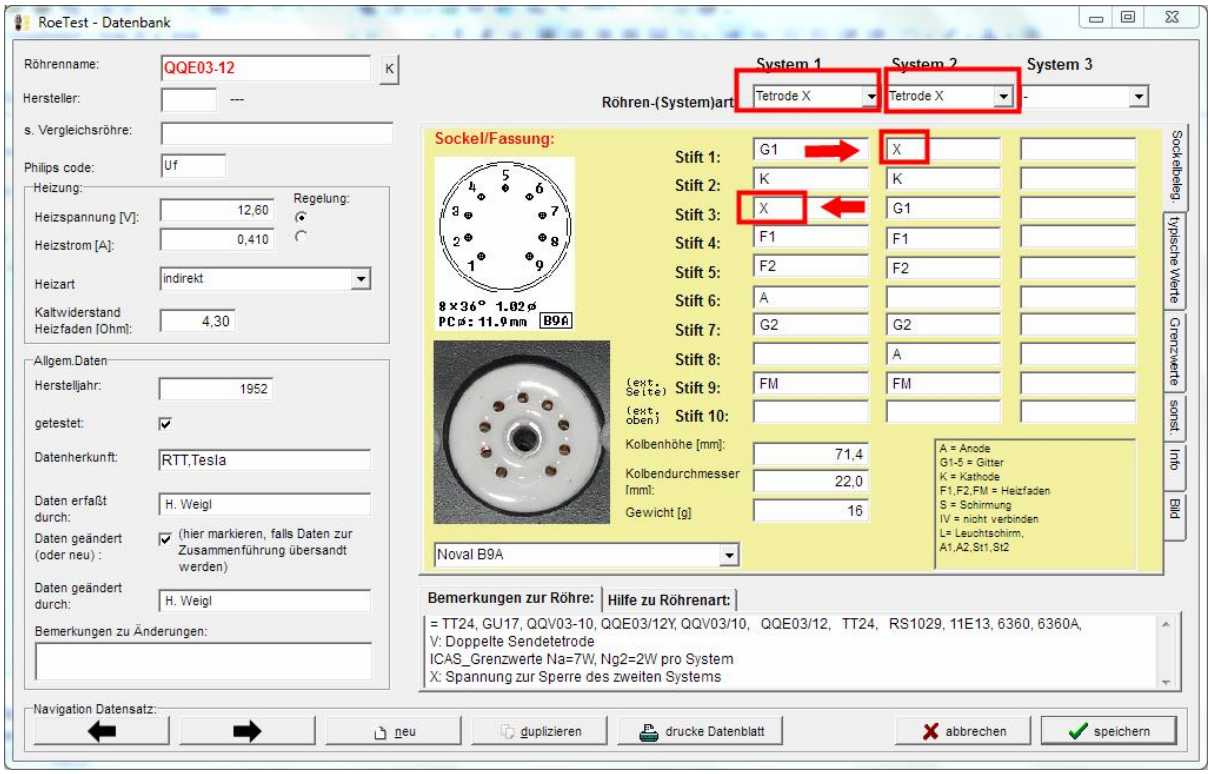
As he socket diagram shows, the screen grids of both sections are connected to pin 7.

To enable the software to apply the voltage to the control grid of the unmeasured section, we must first create a new tube type. I have called it "Tetrode X". There is also "Pentode X" for pentodes with a common G2 connection.

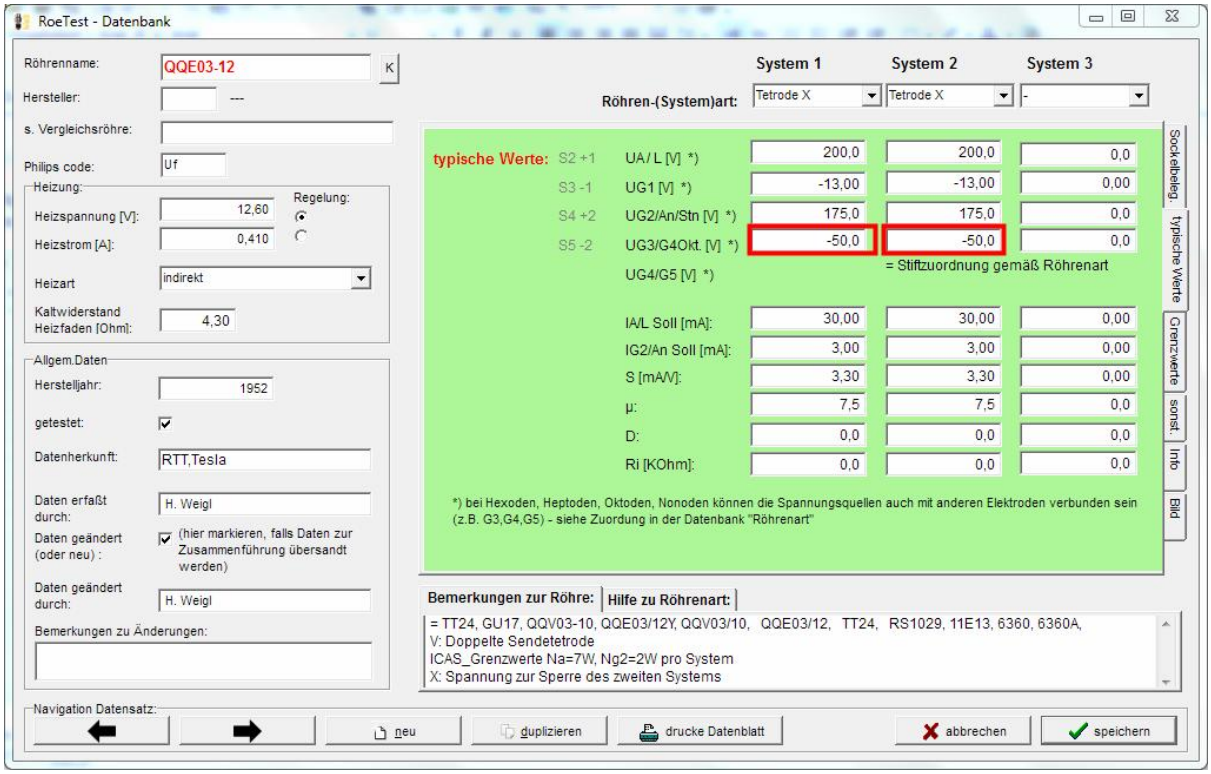


Here an electrode (X) is defined. This electrode is assigned to rail 5 (the second negative-voltage source in RoeTest).

In the Tube database, an entry is created for the QQE03-12 like this:



The tube type "Tetrode X" is selected for both systems. As you can see, as each section is measured, the control grid of the other section is connected to the X negative-voltage source.



In the tube data, the X voltage is set to the high negative value of -50V.

As a result, during the measurement, -50V is applied to the control grid of the non-measured section resulting in complete cutoff . Thus the other section can be measured as usual with no overcurrent shutdown.