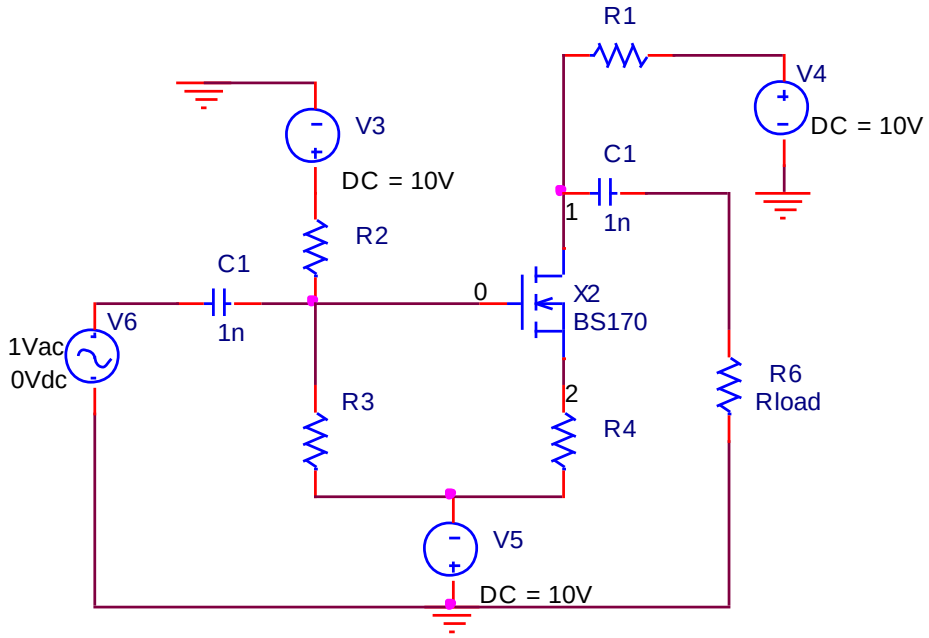
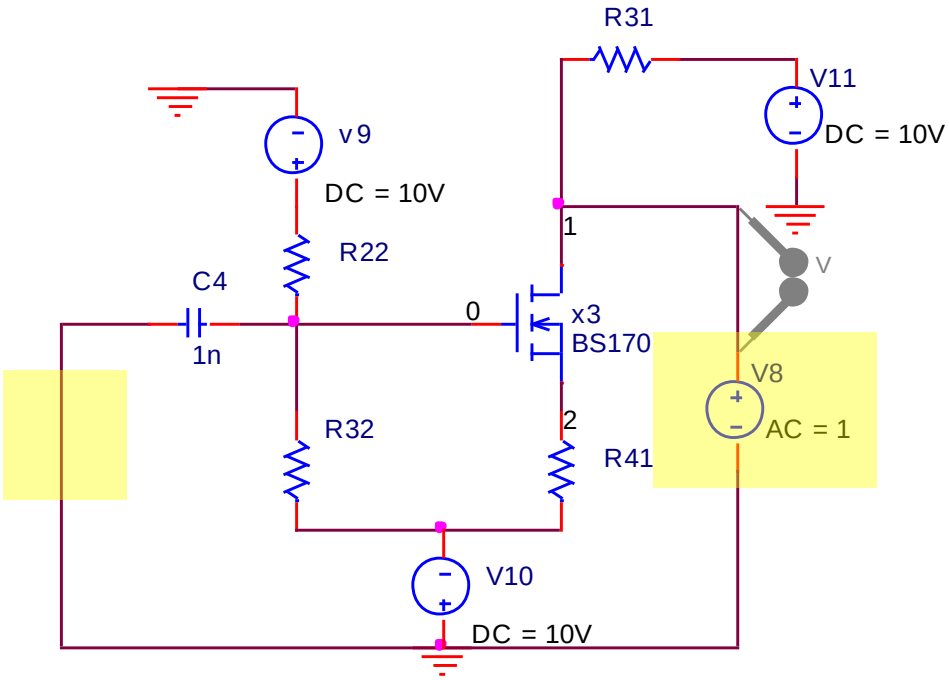
# Finding output impedance for a circuit

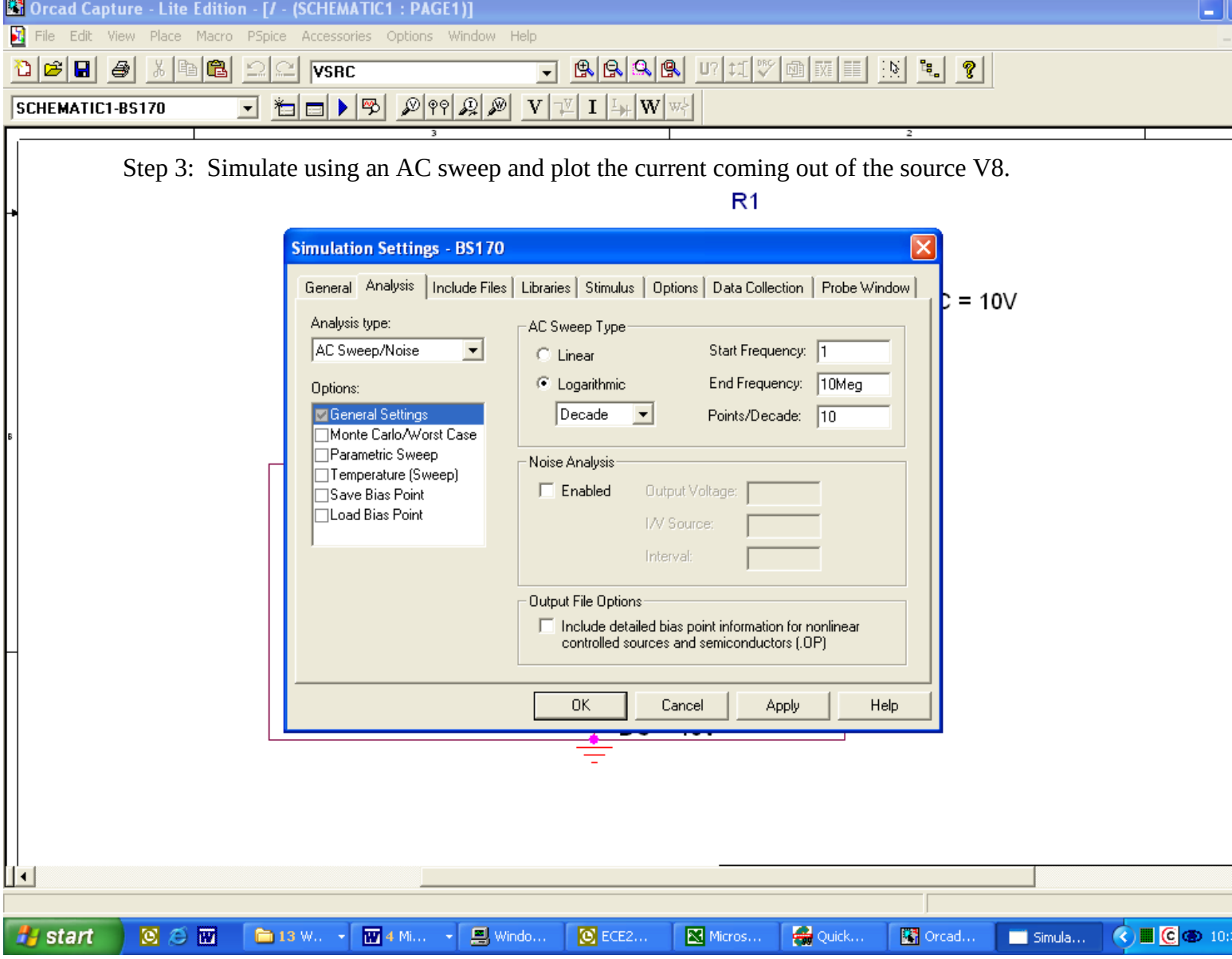
Assume with the circuit below that the output impedance is wanted from the marked voltage node.




Step 1: Remove the input V6 and set it to ground or the input values to zero.
Step 2: Replace the load resistor, R6 with a test source (Current or Voltage for out example) and place V marker and I marker at the node you want to find the resistance.

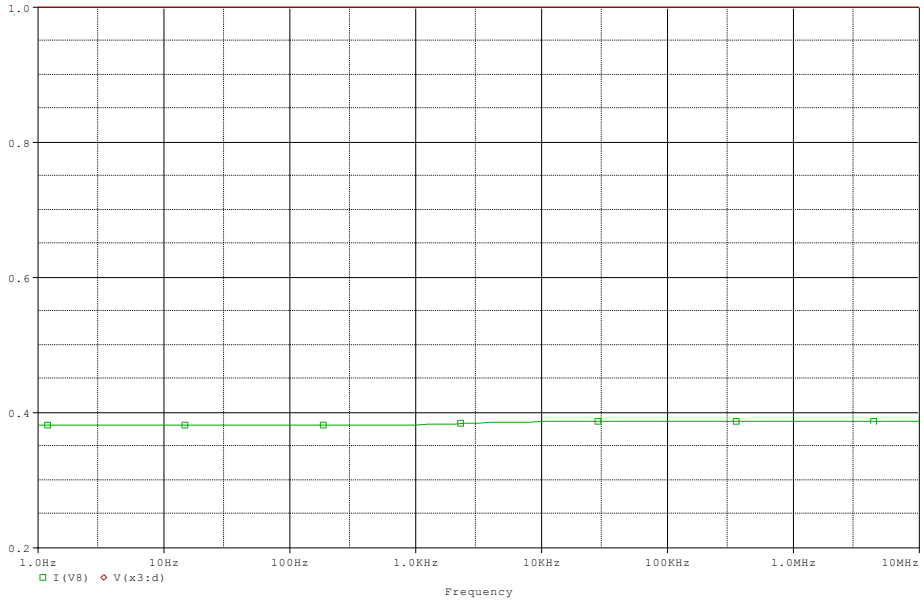


Step 3: Simulate using an AC sweep and plot the current coming out of the source V8.

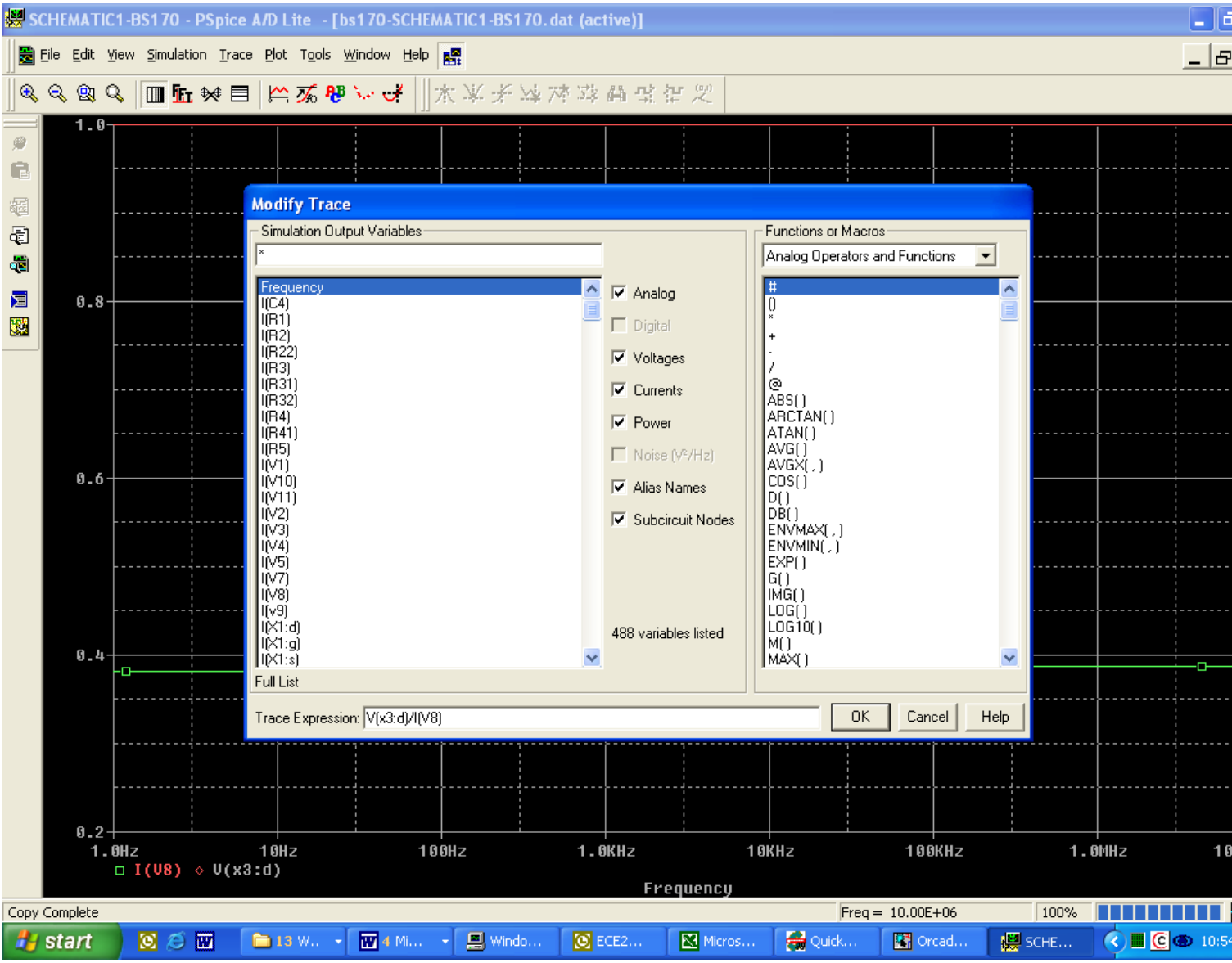



Step 4. Determine the output impedance vs frequency value =>

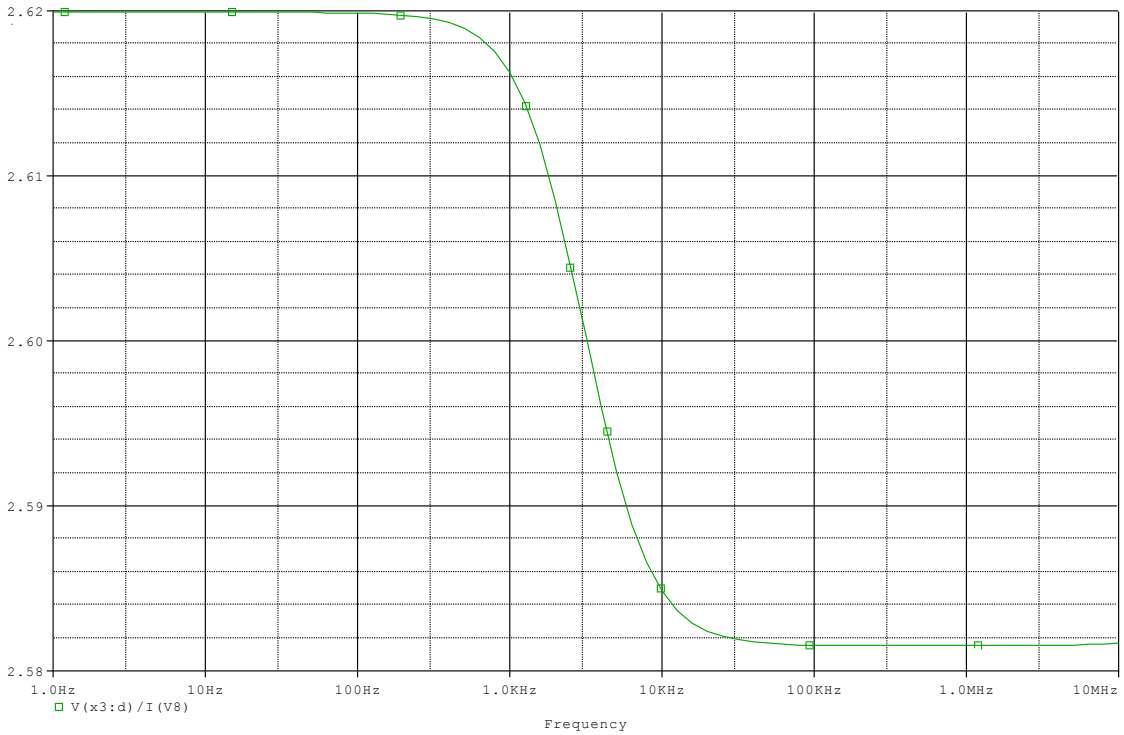
a. The following plot comes up of I and V on it.



Note that the current is I(V8) and the voltage is V(x3:d) =>



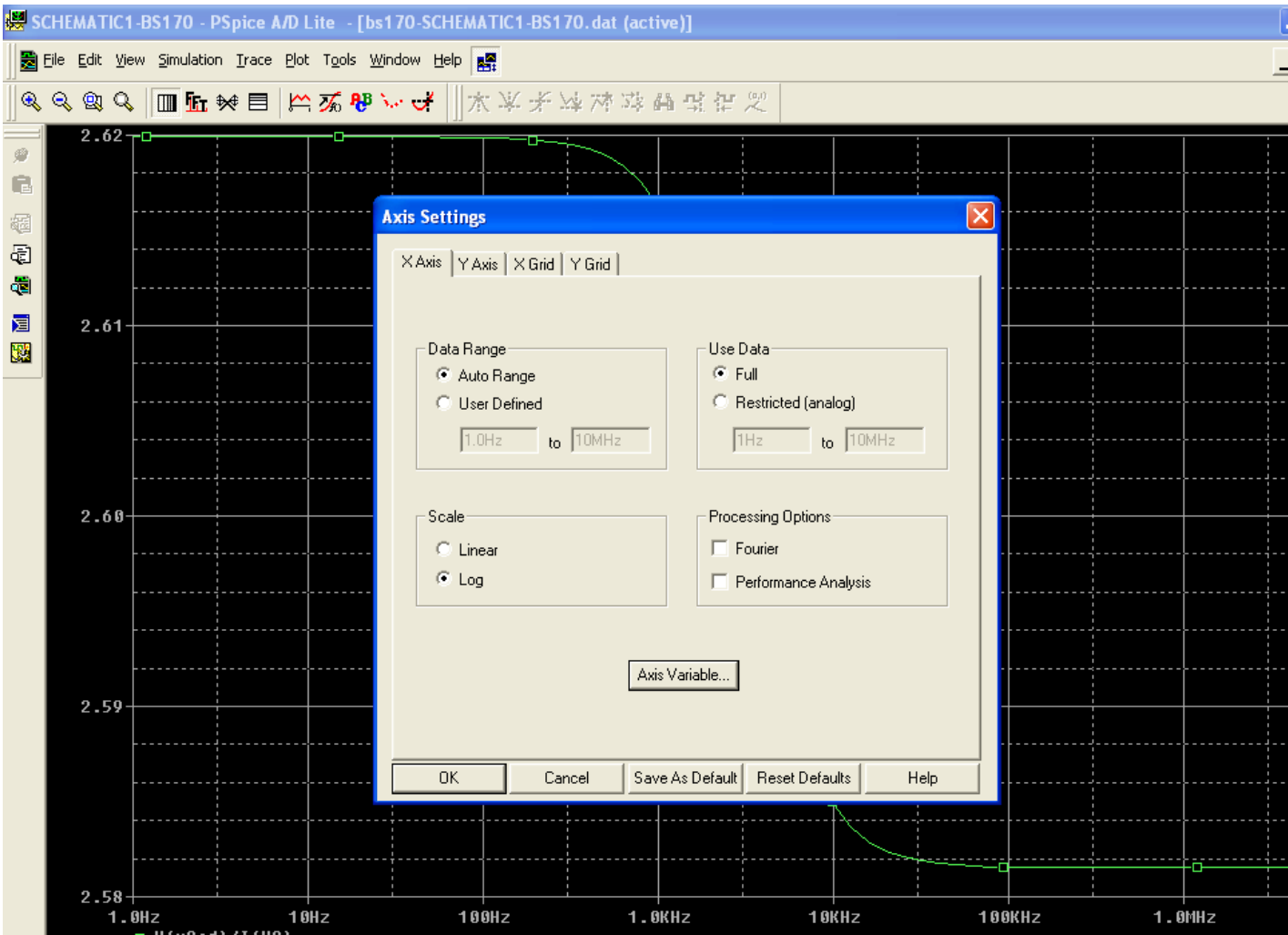

Get to the Modify Trace window (either by double clicking on the variable I(V8) or a different variable or through the menus. Replace the Trace Expression with V/I to give you the graph of resistance vs frequency. Trace Expression: V(x3:d)/I(V8) {your node voltages will be different than mine}. The resultant plot should look something like the form below:



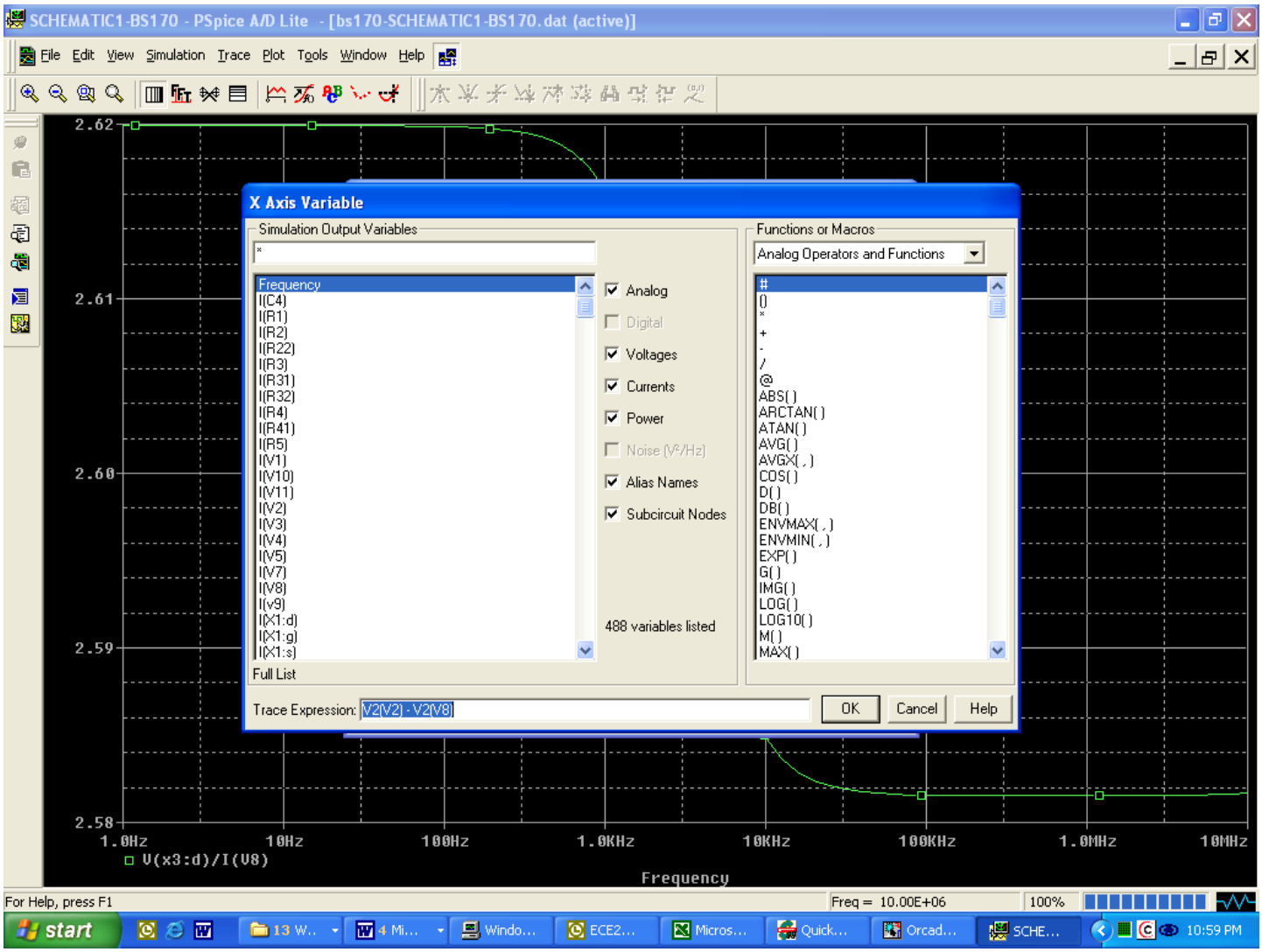

where this shows Rout = 2.62 when it is under 200 Hz.

## Plotting to create a VGS x-axis:

Step 1. Create graph of Vout vs VG. Double click on the x-axis to get the following:



Under the x-axis tab => click on axis variable.




Change the Trace Expression to be the VG node – VS node (depends on your circuit).
Click OK and this changes the axis to be the above expression instead of just VG.