DC and RF Sensing of Changes in R1

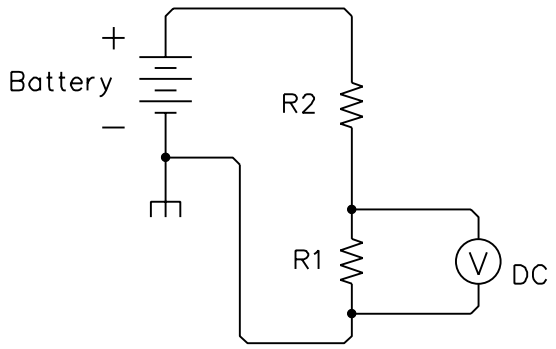

Figure 1

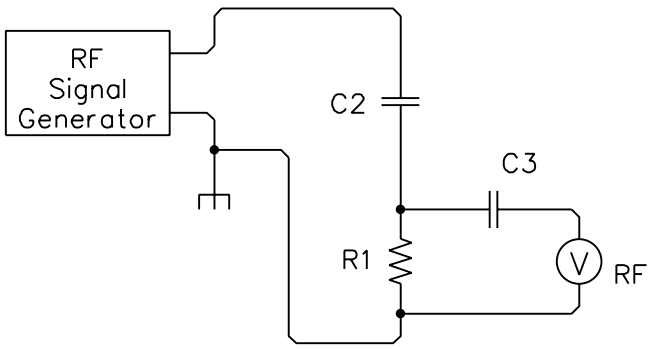

Figure 2

In Figure 1, if the battery voltage and the value of R2 are stable then we can predictably sense changes in the value of R1.

Even if we do not know the battery's voltage or the value of R2 any changes in the reading of the DC Voltmeter will still scale in a predictable way based on the amount of change in the value of R1.

If the DC Voltmeter is sensitive enough then most of the battery's voltage could appear across R2 and we could still predictably sense even small changes in the value of R1.

Figure 2 is the same circuit except that now it operates at a Radio Frequency instead of at DC.

R2 has been replaced with a capacitor C2.

If the Radio Frequency Voltmeter is sensitive enough then C2 could have a small value (a high capacitive reactance at the Radio Frequency in use) and there would still be enough voltage across R1 to predictably sense even small changes in its value.

C3 is shown just to remind us that only AC voltage needs to enter the RF Voltmeter. That is, we could have some additional DC voltage across R1 with no change in the operation of the circuit (just so long as these additional DC components did not draw significant current at the Radio Frequency).

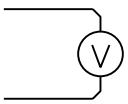

Figure 3

The symbol in Figure 3 represents an ideal Voltmeter that draws zero Input Current and measures the Potential Difference between its two Input Terminals independent of their Voltage with respect to Ground.