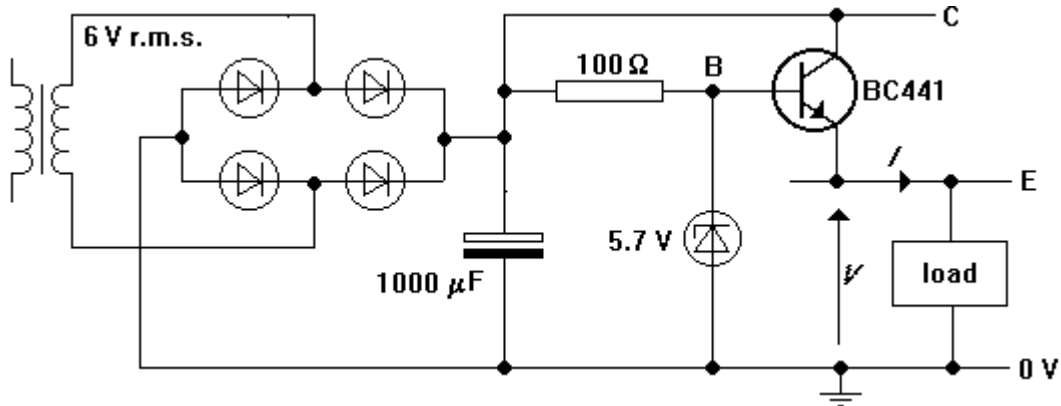


Investigating a stabilised power supply

1. Assemble the circuit shown below. Use power diodes and a power transistor. Start off with a load of $100\ \Omega$. The variable transformer (a.c. power pack) will need to be set at $6\ \text{V r.m.s.}$



2. Switch on. Use an oscilloscope to check that the peak voltage at C is $+7\ \text{V}$. Adjust the setting of the variable transformer (a.c. power pack) if necessary.
3. Verify that B is a steady $+5.7\ \text{V}$ with very little ripple. E should be a steady $+5.0\ \text{V}$.
4. The $100\ \Omega$ load draws a current of $I = 5/100 = 0.05\ \text{A}$ or $50\ \text{mA}$ from the circuit. Sketch the appearance of the signals at C and E for this load current. Measure the ripple at C and E.
5. Use two $100\ \Omega$ resistors in parallel as the load. This should draw a current of $100\ \text{mA}$ from the circuit. Sketch the appearance of the signals at C and E for this load current. Measure the ripple at C and E.
6. Repeat stage 5 for three, four and five $100\ \Omega$ resistors in parallel as the load.
7. Use your results to plot graphs showing how the ripple at C and E depend on the load current. Explain their shapes, with the help of some calculations.