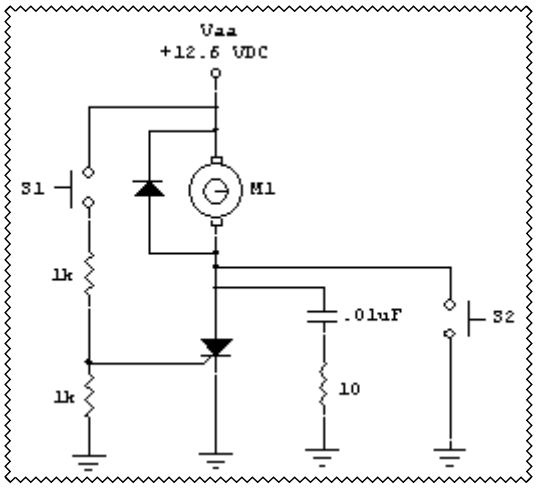
ET 350 Lab 7
SCR Characteristics

Part 1. SCR on DC Power



1. Build the circuit shown. Set the voltage of the power supply (Vaa) to the value shown before you connect it to the circuit.

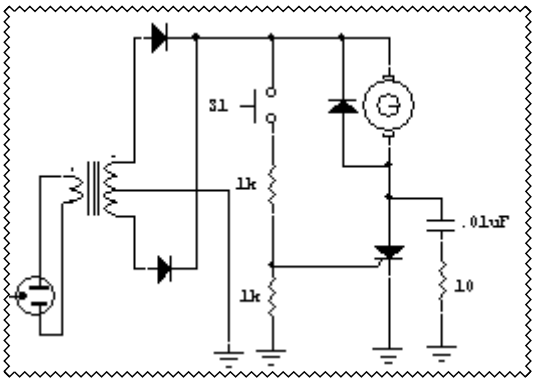
2. Turn off the power supply and wait a few seconds, and turn it on again. Is the motor on or off? Is the SCR on or off?

3. Turn off the power supply to the circuit to turn off the SCR. Then turn on the power supply again. The motor should be off. Depress and release button S1. Is the motor on or off? Is the SCR on or off? What did the push button action do to the gate of the SCR? What is the current through the SCR and motor?

4. Depress and hold button S2. Is the motor on or off? Is the SCR on or off? Actually, this action does turn off the SCR, why? If the SCR is off, why is the motor still on?

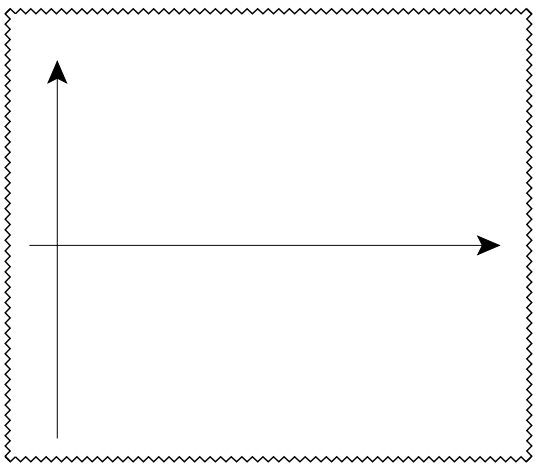
5. Release button S2. Is the motor on or off? Why didn't the SCR keep the motor on?

Part 2. SCR on AC Power; 12.6 V_{rms}, from the secondary of a transformer.



1. Build the circuit shown. Make sure that all connections to the AC power line at the primary side of the transformer are completely covered with wire nuts or electrical tape. For a properly functioning transformer, the circuit powered by the secondary side of the transformer is isolated from the AC power line. The secondary voltage of the transformer is full-wave rectified so that the voltage across the motor and the SCR is always positive.

2. Plug in the AC power cord into the AC power outlet. The motor is off because the SCR has not been turned on yet. Depress and hold button S1. Is the motor on or off? Explain why:



3. Release button S1, does the motor turn off immediately? If so, explain why:

4. Connect the oscilloscope to the top of the DC motor. Draw the observed waveform and calculate the frequency and period. Can you now explain why the SCR turns on and off quickly?