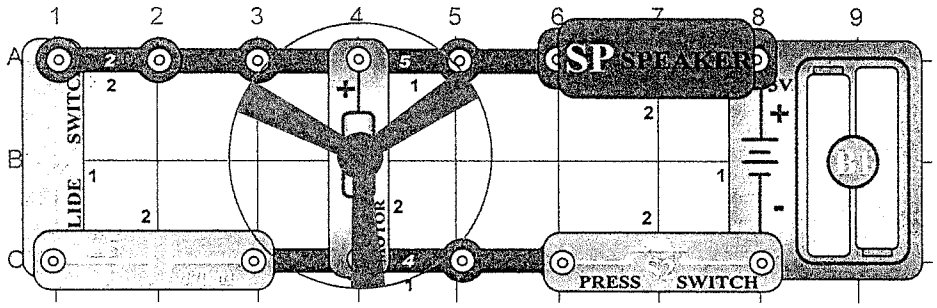
Project #296

Quieting a Motor

OBJECTIVE: To show how capacitors can filter out electrical disturbances.



WARNING: Moving parts. Do not touch the fan or motor during operation. Do not lean over the motor.

Place the fan on the motor (M1) and turn off the slide switch (S1). Press the press switch (S2) and listen to the motor.

As the motor shaft spins around it connects/ disconnects several sets of electrical contacts. As these contacts are switched, an electrical disturbance is created, which the speaker converts into sound.

Turn on the slide switch and push the press switch again. The fan spins just as fast, but the sound is not as loud. Capacitors, like the 470µF capacitor (C5), are often used to filter out undesired electrical disturbances. If you replace C5 with one of the other capacitors in your set then the sound will not be changed as much.

Draw the circuit diagram below using the symbols on the parts

Describe how the circuit behaves and how adding the capacitor to the circuit changes the behavior.