

Multi-Engine Rocket Launch Circuit

Body:

During spring 2017, a multi engine F-engine rocket was built by Aeronautics and Rocketry club at the University of Texas at San Antonio with a 3d printed engine holder and special body tube, the rocket was ready to take off. The only problem was, how to ignite all engines simultaneously. A special circuit was required in order to achieve this. With a little background on circuits, this could all be done with a simple parallel circuit.

Components:

- ✓ Conductive Wire
- ✓ electronic Matches/igniters
- ✓ momentary switch
- ✓ 12 Volt battery

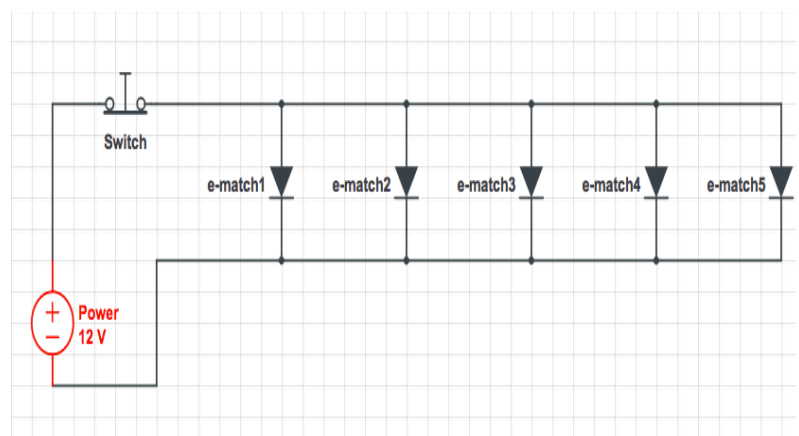
How it Works:

Parallel circuits are used extensively in many applications, one very familiar application is the lights on a Christmas tree. Notice if one light bulb goes out, all the others remain lit. This is because these lights are in parallel, allowing current to continuously flow without disturbances. Unlike a series circuit

where if one light goes out the rest will follow and stop current from flowing.

This special circuit required two different colored wires to differentiate between ground and power. The system can be replicated very easily.

The circuit schematics are given below.



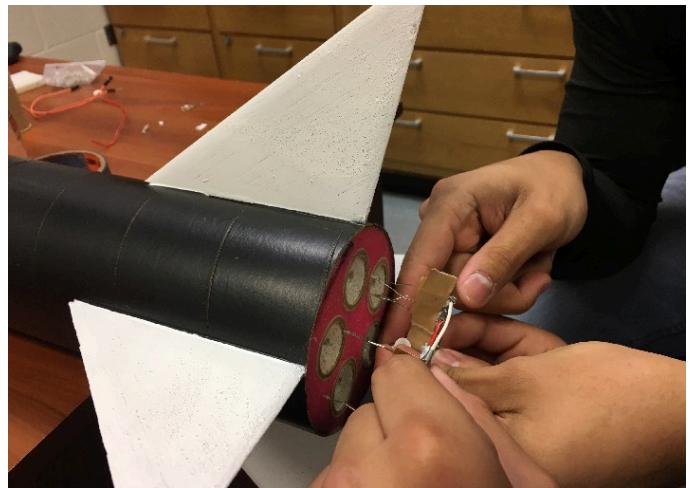
(Multi-engine parallel circuit diagram)

Important notes on building the circuit:

The dimensions of the rocket engines are positioned symmetrically circular. The wire and nodes must be adjusted accordingly. Shaping the wire into a similar circle makes the installation much easier to work with; thus, it's a good idea to work around the dimensions first, once you know the position that each igniter will take place, mark the locations with a marker and strip a slight piece from that wire. Solder the igniters directly into the slits and insulate to prevent shorting the circuit.

Finishing up with the circuit, It was also noted that to assure conductivity, testing the circuit was done with an

ammeter, verifying current flowing through each igniter. Finally, install and secure the igniters inside the engines and the system is ready to launch.

Finished Product:

(Circuit being installed into multi-engine rocket)