Payload Cut Down Bill of Material

3 pages

Part	Schematic Description	Manufacturer/Available From
Arduino Pro Mini 5.0 volts	Arduino Pro mini	
Relay	K1, G5NB-1A4-EL	Mouser
Transistor	T1, 2N5191	Mouser
Resistor	R1, 85 ohms	Mouser, SparkFun
Resistor	R2, 85 ohms	Mouser, SparkFun
Resistor	R4, 75k	Mouser, SparkFun
Battery Clip	9 volts battery clip (not shown on the schematic; see Notes)	Mouser
Battery Holder	Battery holder for 3 AA batteries (not shown on the schematic; see Notes)	Mouser
Lithium Battery	BATTERY, 9 volts	Energizer Lithium
Nichrome Wire	R3, about 2 inches	Amazon
Lithium Battery	CRAA (3), 1.5 volts	Energizer Lithium
Header	0.1” center, 2 pins	
Jumper	Jumper for the header (see Notes)	

Payload Cut Down Notes

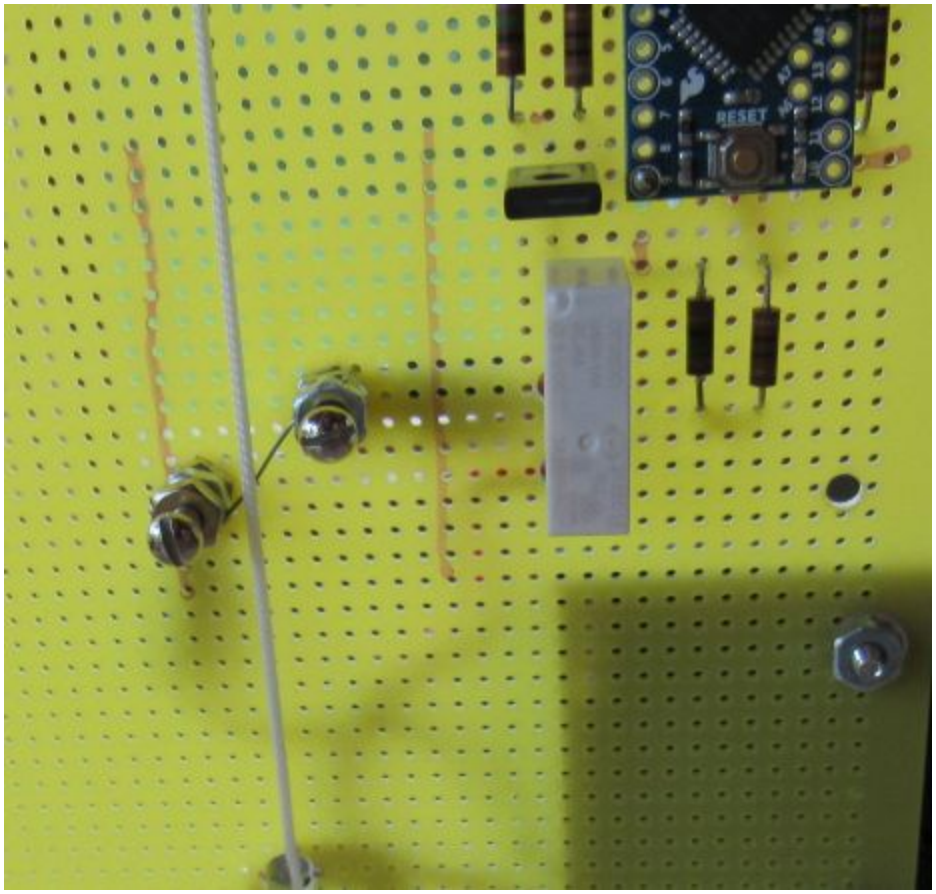
Oct 2020

Arduino Pro Mini	Sparkfun: https://www.sparkfun.com/products/11113

Header and Jumper

The header and jumper were used to set the timing mode of the Cut Down. With the jumper installed, the timing mode was a short duration (10 seconds) for testing the relay and transistor circuit as well as verifying the nichrome wire is hot enough to cut the string. Without the jumper, the timing mode is 2.5 hours.

In this image, the nichrome wire is connected between two screws and held in place with nuts. The string is held against the nichrome wire by the weight of the payload. The relay is the white rectangle, and the transistor appears above it.



This image shows the AA battery holder and the method of connection to the screws that hold the nichrome wire.
The cut down assembly was enclosed to prevent heat loss.
In tests, the separation occurred within seconds of the relay closing the circuit.