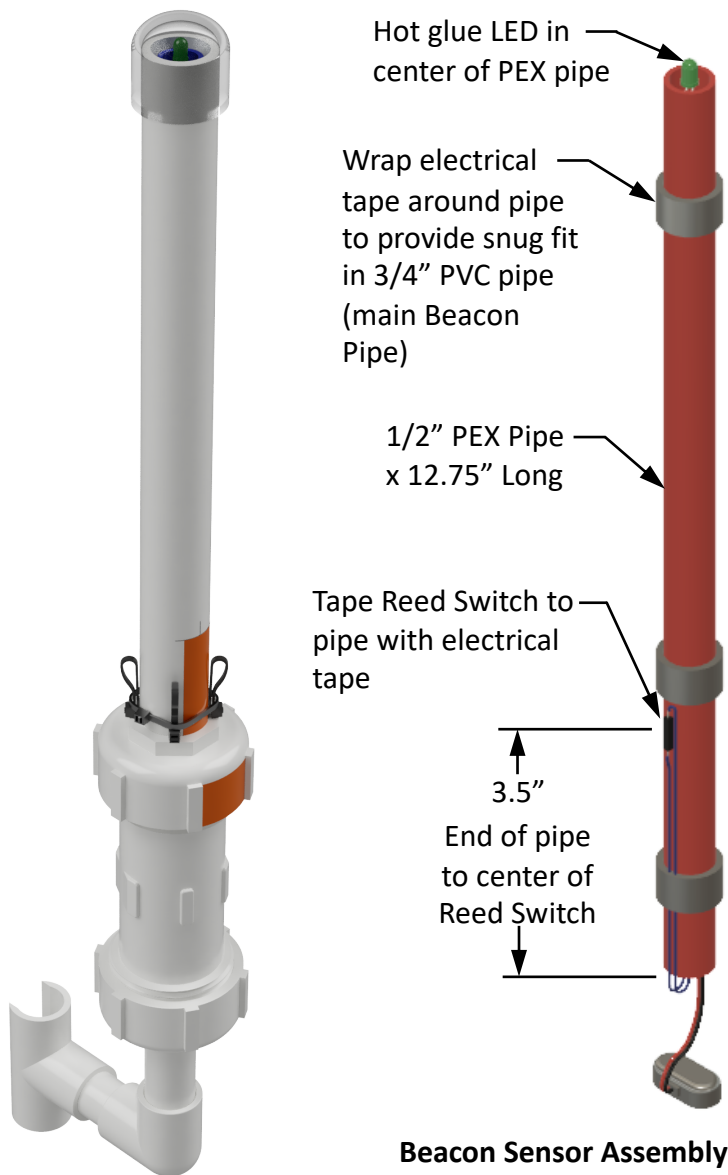


Simplified Circuit Beacon Guide

This guide offers details for a simplified-circuit Beacon for those desiring to use the electronic version with the LED indicator. The simplified-circuit version uses a reed switch (mechanical magnetic switch) instead of a Hall Effect Sensor (electronic magnetic switch) and a single LED to reduce assembly complexity.

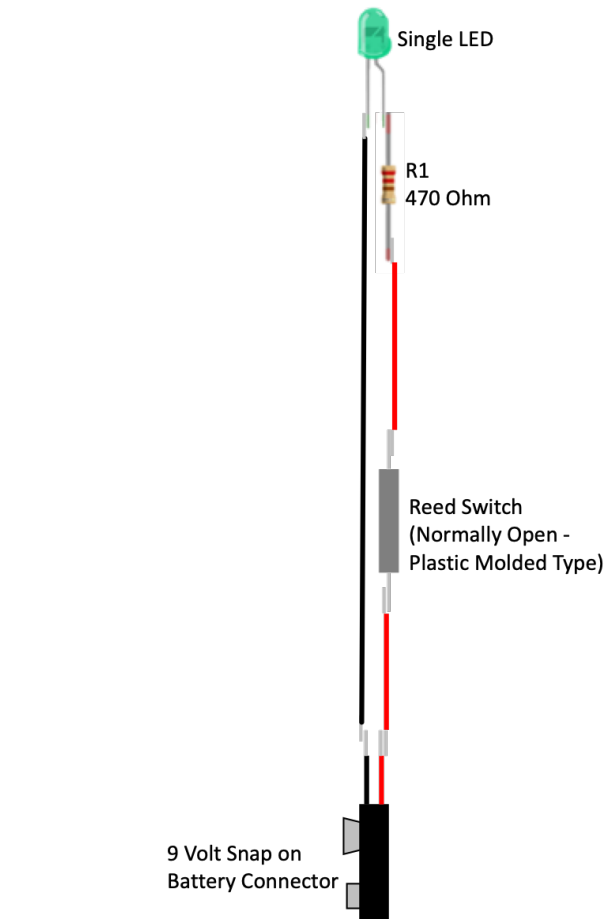
Seaperch Regional Competitions and teams that did not build a Beacon for the 2019 SeaPerch Challenge may choose to build a non-electronic version of the Beacon for the Active Mine for a low-cost, lower-effort alternative to the electronic beacon (see the 2020 SeaPerch Challenge Build Guide).

The housing used in 2019 Beacon will work without modification for those that just want change the circuit.

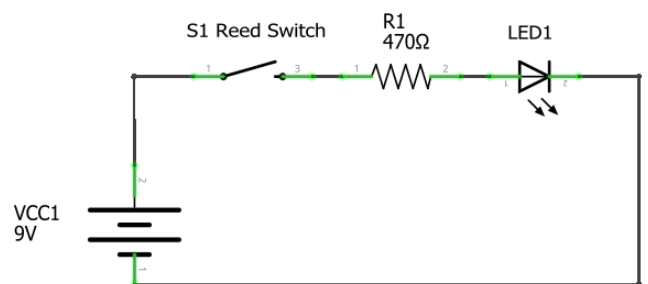


Beacon Sensor Assembly

Beacon Assembly



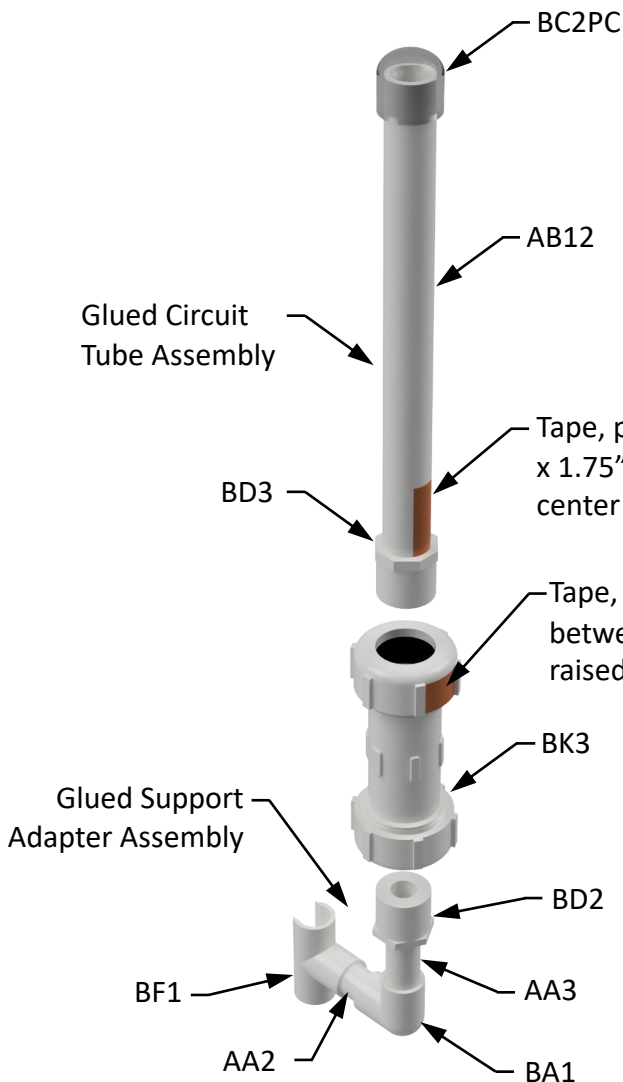
Beacon Wiring Illustration



Beacon Circuit Schematic

Simplified Circuit Beacon – Bill of Materials & Exploded View

Bill of Material									
Beacon Circuit									
Drawing Part Number	Item	Unit	Qty.	Est. Cost Each	Extended Cost	Suggested Vendor	Part Number	Vendor Link	
	LED, 5mm Green, 20mA, 3.2V	Each	1	\$ 0.25	\$ 0.25	Digi-Key	C503B-GCN-CY0C0791-ND	LED - Digi-Key	
	Reed Switch, SPST-NO (normally open), 350mA 140V	Each	1	\$ 1.97	\$ 1.97	Digi-Key	HE552-ND	Reed Switch - Digi-Key	
	470 Ohm Resistor, ±5%, 1/4W Through Hole	Each	1	\$ 0.10	\$ 0.10	Digi-Key	CF14JT470RCT-ND	Resistor - Digi-Key	
	9-Volt Snap on Battery Connector with 4" wire leads	Each	1	\$ 0.57	\$ 0.57	Digi-Key	36-81-4-ND	Battery Clip - Digi-Key	
	26-AWG Stranded Hookup Wire, Red, per foot	Each	2	\$ 0.81	\$ 1.62	Digi-Key	A132378-DS-ND	Red Wire - Digi-Key	
	26-AWG Stranded Hookup Wire, Black, per foot	Each	2	\$ 0.81	\$ 1.62	Digi-Key	44A0111-26-0-US-DS-ND	Black Wire - Digi-Key	
				Total	\$ 6.13				
Beacon Hardware									
BC2R	3/4" Sch 40 PVC Coupler	Each	1	\$ 0.18	\$ 0.18	PVC Fittings Online	429-007	PVC Fittings Online	
BC2PC	3/4" Sch 40 Clear PVC Cap	Each	1	\$ 6.48	\$ 6.48	PVC Fittings Online	447-007L	PVC Fittings Online	
BA1	1/2" Sch 40 PVC Elbow	Each	1	\$ 0.20	\$ 0.20	PVC Fittings Online	406-005	PVC Fittings Online	
BF1	1/2" PVC Sch 40 Snap-on Saddle Tee	Each	1	\$ 0.44	\$ 0.44	PVC Fittings Online	463-005	PVC Fittings Online	
BK3	1" Spears PVC Compression Coupling S110-10	Each	1	\$ 4.74	\$ 4.74	PVC Fittings Online		PVC Fittings Online	
BD2	1" X 1/2" Sch 40 PVC Reducing Bushing	Each	1	\$ 0.37	\$ 0.37	PVC Fittings Online	437-130	PVC Fittings Online	
BD3	1" X 3/4" Sch 40 PVC Reducing Bushing	Each	1	\$ 0.37	\$ 0.37	PVC Fitting Online	437-131	PVC Fittings Online	
AA2	1/2" Sch 40 PVC Pipe X 2" Lg	Each	1	\$ 0.04	\$ 0.04	Local/Home Depot		Home Depot	
AA3	1/2" Sch 40 PVC Pipe X 3" Lg	Each	1	\$ 0.06	\$ 0.06	Local/Home Depot		Home Depot	
AB12	3/4" Sch 40 PVC Pipe X 12" Lg	Each	1	\$ 0.62	\$ 0.62	Local/Home Depot		Home Depot	
AAP12.75	1/2" PEX Pipe X 12.75" Lg	Each	1	\$ 1.86	\$ 1.86	Local/Home Depot	1002405017 (5 foot piece)	Home Depot	
				Total	\$ 15.36				



Notes:

1. Glue pipes and fittings using suitable PVC solvent cement for watertight seal.
2. Do not lubricate compression coupling gaskets.
3. Spears brand compression couplings have been tested and are leak proof for this application. Other brands have leaked and are not recommended.

