

## UKRoC Rocket Materials List 2020

Detailed on this page are suggested materials which could be useful in the construction of your rocket.

Quantity	Item	Approx cost per Item-£	Description/Comments
1	BT70 Nose Cones	17	Various designs from vendors or make yourself from your designs
1	BT70 Body Tube (payload section}	6-7 standard or heavier	34" tube cut to suit, to house eggs & altimeter
1	BT70 Body Tube (motor section)	As payload section	34" tube cut to suit
1	BT70 Coupler	2	Vendor or make your own
1	BT80 Nose Cones	6.50-16	Various designs from vendors or make yourself from your designs
1	BT80 Body Tube (payload section}	7.25 standard- 7.50 heavier 6.75	34" tube cut to suit, to house eggs & altimeter, plus a device for safe recovery of motor section. Can be custom made Estes two tubes 15"
1	BT80 Body Tube (motor section)	As payload section	34" or 15" tubes
1	BT80 Tube Coupler.	2.25	Vendor or make your own
1	Parachute (Diameter TBD)	Estes chutes plastic 3-4 Nylon chutes 8-12	Vendor or custom made. All rocket parts descend together by parachute - number unspecified
1	Parachute Protection	4-8	Nomex sheet, wadding, mechanical means ie piston or baffle
2	Launch Lugs	1-7	Button, rail guide or 6mm launch lugs from vendors or own custom alternatives
1 per motor	Motor Mount Tube (19 mm, 24mm or 29 mm)	2.5-6.5	19mm Klima D 24mm Estes D 24mm Cesaroni 29mm Cesaroni Klima & Estes need motor stops & motor retention Cesaroni needs motor retention plastic screw-on (24mm or 29mm) provided by Estes All these items will be sized to the length of the motor and several motor mounts can be cut from supplied tube which is 12-34 inches long
2	Motor Centering Rings	3.5-5.50	From vendors or laser cut your own from Lite Ply or Bass wood
1-2	Bulk Head	2	As above
1	Fin Material – 1/8" Balsa 4" x18"	2.5 per sheet	Cut to suit your design. Other materials can be used
5 metres	Shock Cord	10	To suit design wire/Kevlar elastic
1	Altimeter Bay	0	To house altimeter, to be custom made
1	PerfectFlite Apra altimeter	35.00	These altimeters are all approved for UKRoC
1	PerfectFlite Pnut altimeter	60.00	As above
1	PerfectFlite Fire fly altimeter	28.00	As above

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### Notes:

1. This is a suggested parts list, NOT A KIT LIST.
2. The approximate costs for the budget for one team & one rocket - starting out with no previous experience/parts, and buying from vendors would be £350-400 including motors and insurance (but no launch equipment). There are substantial economies which can be obtained by fabricating your own parts. Teams which have previously entered and already have parts ie motor casings/altimeters/launch equipment would also have reduced costs.
3. Teams are strongly advised to make their own design decisions. The competition is intended to encourage innovation and use of available/novel technology. Whilst not all teams will be able to access all the latest technology, thinking outside the box with locally sourced parts can provide inexpensive designs.
4. The parts list is based on rockets made from BT70 or BT80 tubes. There is a free choice this year on tube diameter ie not limited to 70mm/80mm. The numbers are for one rocket. Teams should consider having spares.
5. **Colours** in the list are three categories: Pink - BT70 specific, Green - BT80 specific, Yellow - general parts which may need adjusting to tube size ie Bulkheads.
6. **Estes D12-5 motors** approx £4.50 each. Assuming two trial flights and three flights at regional finals, with three motors per rocket, would cost approx. £67.50. This does not include the National Finals which would be another £27.50. Will need added cost of multiple ignition system - see note 9
7. **Klima D motors** approx £3.80 each. Assuming two trial flights and three flights at regional finals, with three motors per rocket, would cost approx £57.40 plus national final with two flights would cost approx. £23.00. Klima tape and ignition sticks available for approximately £20 sufficient to launch 50 motors see also item 9
8. **Cesaroni Reloads** 24mm 2G, or 29mm 1G approx £17 to £20 each. Assuming two trial flights and three flights at regional finals, with one motor per rocket, would cost £100, plus national final would cost approx. £40
9. **Cesaroni hardware** 24mm 2G casing approx £20 29mm 1G similar. 24/29mm closure approx £11.50. Prodat delay cutter £16.50 with 24mm insert at £2.75. With 29mm insert £2.75.
10. Igniters for single motors are included by the manufacturer. For multiple motors, see the UKRoC website on ignition. Cost for kit for multi-motor launches using Tape match and fast Visco fuse is approx £40 for about 100 launches. Teams should consider sharing. See also item 6 for Klima system
11. Miscellaneous items sourced from fishing or hardware stores: wire trace swivels & eye bolts £10
12. Adhesives including PVA Epoxy and superglue - typically £10-20
13. Paint is included in this year's rules £0-20
14. BMFA Membership is mandatory. The youth group insurance requires one adult £38 and at least four unnamed young people at 1/3 of the junior rate £13 rate. You require one membership per team therefore minimum fee for up to four teams will be £51. NB: Insurance runs from year end to year end so if you have insurance last year it is valid until year end. Current advice is that the subscription will not change in 2020.
15. Launch and ignition system: Simple 6mm rod system with Estes D ignition system, approx £30. Rail with stand and Estes pro ignitions system approx £100. (The organiser will provide rods, rails and ignition systems for the regional/national finals)

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