



UKRoC Rocket Indicative Materials List 2023

Detailed on this page are indicative materials and costs which could be useful in your rocket project.

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Quantity	Item	Approx cost per Item-£	Description / Comments
1	Body Tube (motor section)	As payload section	34inch (86cm) tube cut to suit
1	Coupler	2	Vendor or make your own
1	Nose Cones	6.50-16	Various designs from vendors or make yourself from your designs
1	Body Tube (payload section)	7.25 standard- 7.50 heavier 6.75	34inch (86cm) tube cut to suit, to house eggs & altimeter, Estes two tubes 15inch (38cm)
1	Tube Coupler.	2.25	Vendor or make your own
1	Transition (only if design Requires this item)	12-15	Vendor or make own bodies see note 3
2	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
2	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 (18 mm, 24mm or 29 mm)	2.5-6.5	18mm Klima D 24mm Estes D 24mm Cesaroni 29mm Cesaroni 24mm Aerotech 29mm Aerotech Klima & Estes need motor stops & motor retention. Friction fit is not acceptable Cesaroni/Aerotech need 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
2	Motor Centering Rings	3.5-5.50	From vendors or laser cut your own from Lite Ply or Bass wood
1-2	Bulkhead	2-4	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 (this altimeter is out of production if you have any or find a supply they are still useable)
1	PerfectFlite Pnut altimeter	60.00	As above
1	PerfectFlite Firefly altimeter	28.00	As above

Notes:

This is a suggested parts list, NOT A KIT LIST:

1. 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.
2. Teams are encouraged to look at vendors' websites and to discuss directly with them to verify parts availability and ordering lead times.
3. See mission statement and rules on tube sizes ie there are no restraints on tube size or requirement to have a transition. The egg (one) can be mounted in any orientation however main axis, vertical, is strongest. Egg mounting is your own choice. However, Apogee components in USA manufacture custom egg nests.
4. The numbers are for one rocket. Teams should consider having spares.
5. **Estes D12-5 motors** approx £4.50 each. Assume minimum five flights (two trial & three at regional finals), with three motors per flight. This does not include the one to two flights you may need for the national final.
6. **Klima D motors** approx £4.50 each. Assume minimum five flights (two trial & three at regional finals) with three motors per flight. This does not include one to two flights you may need for the national final.
7. **Cesaroni Reloads** 24mm 2G, or 29mm 1G approx £17 to £20 each. Assume minimum five flights (two trial & three at regional finals) with one motor per flight. This does not include one to two flights you may need for the national final.
8. **Aerotech Single use 24mm** £12.5 each pack of two. Assume minimum five flights (two trial & three at regional finals) with one motor per flight. This does not include one to two flights you may need for the national final.
9. **Aerotech Single use 29mm** £28 each. Assume minimum five flights (two trial & three at regional finals) with one motor per flight. This does not include one to two flights you may need for the national final.
10. **Cesaroni hardware** 24mm 2G casing approx £20. 29mm 1G – similar price. 24/29mm closure approx £11.50. Prodat delay cutter £16.50 with 24mm insert at £2.75. With 29mm insert £2.75.
11. **Aerotech 24mm** Hardware for reloadable motor £60
12. **Aerotech 29mm** Hardware for reloadable motor £74
13. Motors identified in section 5-12 are sourced from overseas manufactures and may have long delivery lead times if not in stock. You will need to discuss availability and delivery with vendors. A month for out-of-stock motors is a minimum timescale and may be much longer be warned.
14. 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.
15. Miscellaneous items sourced from fishing or hardware stores: wire trace swivels & eye bolts £10.

16. Adhesives including PVA Epoxy and superglue - typically £10-20 NB No Hot glue to be used.
17. Paint is included in this year's rules £0-20
18. BMFA Membership is mandatory. The youth group insurance requires one adult £40 and at least four unnamed young people at 1/3 of the junior rate £18 rate. You require one membership per team NB: Insurance runs from year end to year end. As the BMFA cover is not named for the students, suggest you apply for one adult and the minimum four students. (£64)
19. 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)
20. On project costing it is very dependent on motor selection how much material you have from previous projects & how much you are able to make yourself. It is therefore suggested that an early activity will be to prepare a project cost estimate for your particular circumstances.
21. Some or most of the parts can be 3D printed. Make sure the 3D printed parts are fit for purpose ie exposure to heat and loading.