

## UKRoC Rocket Indicative Materials List 2022

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 Body Tube (motor section)	As payload section	34inch(86cm) 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	34inch(86cm) tube cut to suit, to house eggs & altimeter, Estes two tubes 15inch (38cm)
1	BT80 Tube Coupler.	2.25	Vendor or make your own
1	BT80 to BT70 transition	12-15	Vendor or make own bodies see note 3
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 (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	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

### Notes:

1. This is a suggested parts list, NOT A KIT LIST.
2. 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

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access all the latest technology, thinking outside the box with locally sourced parts can provide inexpensive designs.

3. The parts list is based on rockets made from BT70 and BT80 tubes. See mission statement on tube sizes( The rocket external structure must be made up of at least two tubes, each no less than 150mm long, that must be of different diameters. The rocket motor and the eggs must be in different-diameter tubes. Putting a wrap on a tube is not considered to change its diameter for compliance with this requirement.) Note the two eggs are mounted sideways therefore minimum standard tube size is BT80. Motor tube must be different size not necessarily BT70. You will need to procure or make a transition piece to improve the aerodynamics between the two body tubes.
4. 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. Assume minimum four flights (two trial, two self qualifying), with three motors per flight. This does not include the two flights you may need for the national final
7. **Klima D motors** approx £4.50 each. Assume minimum four flights (two trial, two self qualifying) with three motors per flight. This does not include two flights you may need for national final
8. **Cesaroni Reloads** 24mm 2G, or 29mm 1G approx £17 to £20 each. Assume minimum four flights (two trial, two self qualifying) with one motor per flight. This does not include two flights you may need for national final
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. **Aerotech 24mm** Hardware for reloadable motor £60 reloads £12.50 each packs of two. Assume minimum four flights (two trial, two self qualifying) with one motor per flight This does not include two flights you may need for national final
11. **Aerotech 29mm** Hardware for reloadable motor £74 reloads £20. Assume minimum four flights (two trial, two self qualifying) with one motor per flight. This does not include two flights you may need for national final
12. **Aerotech Single use 24mm** £12.5 each pack of two. Assume minimum four flights (two trial, two self qualifying) with one motor per flight. This does not include two flights you may need for national final
13. **Aerotech Single use 29mm** £28 each. Assume minimum four flights (two trial, two self qualifying) with one motor per flight. This does not include two flights you may need for national final
14. Motors identified in section 7-12 are sourced from USA/Canada 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.
15. 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.
16. Miscellaneous items sourced from fishing or hardware stores: wire trace swivels & eye bolts £10
17. Adhesives including PVA Epoxy and superglue - typically £10-20 NB No Hot glue to be used
18. Paint is included in this year's rules £0-20
19. 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

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team NB: Insurance runs from year end to year end so if you have insurance last year it is valid until year end.

20. 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)
21. 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. Indicative costs do not include postage
22. Some or most of the parts can be 3D printed make sure the 3D printed parts are fit for purpose