TARC Craftsmanship Skills

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The TARC 2017 challenge features several novel craftsmanship challenges, including:

- The application of a colored surface finish for all teams participating at the National Finals, and
- The use of transitions between multiple body tube diameters.

- https://www.youtube.com/watch?v=NQFx1qe6zww

Painting your rocket

4 Steps to painting your rocket:

1. Prepare and prime the surfaces
2. Paint the “Base” color coat
3. Paint the “Trim” color coat
4. Paint the “Gloss” coat

1. Surface Preparation and Priming

- Sand the surfaces that will be painted, and clean the dust off
- Account for overspray – cover surface, use gloves, mask
- Prime the surfaces surface – use a spray “Sandable” primer
- Sand the primed surfaces, and clean the dust off

2. “Base” Color Coat – Light Color First

- Avoid inside tube or launch lug, and shoulder of nosecone and coupler(s)
- Use smooth motion up and down or side to side
- Hold paint a more or less a constant distance (6”-12”) from rocket
- Paint from beyond one side (or end) to beyond the other side (or end) to avoid runny paint
- Start with lightly spraying on one coat, let set, add additional coats as desired
- Let dry thoroughly (24 hours, or as recommended) before continuing to next color

3. “Trim” Color Coat – Darker colors as desired

- Mask the parts of the rocket you do not want to paint.
  - Use tape on the edges
  - If you have large areas that will not be painted, you can use newspaper to cover these areas
  - Press edges of tape to assure paint does not “bleed under the tape edge
- Use smooth motion up and down or side to side, at 6”-12” from rocket, from beyond one side (or end) to beyond the other side (or end) to avoid runny paint
- Start with lightly spraying on one coat, let set, add additional coats as desired.
- Let dry thoroughly (24 hours, or as recommended) before continuing to next color

4. “Gloss” Color Coat – For that shiny smooth rocket

(You can also use a non-gloss coat to seal decals, pinstriping, etc., onto the surface.)

- Let dry thoroughly, at least one week, before applying a gloss coat
- Use smooth motion up and down or side to side, at 6”-12” from rocket, from beyond one side (or end) to beyond the other side (or end) to avoid runs
- Start with lightly spraying on one coat, let set, add additional coats as desired.
- Let dry thoroughly (24 hours, or as recommended) before excessive handling

Transitions – TARC 2017 Rules

Rockets … must use body tubes of two different diameters for their exterior structure.

- The smaller-diameter of the two must be used for the lower (motor and fin) end of the rocket and must not be greater than 42 millimeters (1.65 inches, corresponding to body tubes generally called BT-60) in diameter, and
- The larger one must be large enough to contain the egg (which may be up to 45 millimeters) plus padding and altimeter.

Transitions – TARC 2017 Rules

Simplification:

- The lower body tube, with the motors, can be no more than a BT60 (42 mm in diameter)
  - Must be at least 150 mm long
  - This tube will also hold TWO parachutes, as well as flame retardant or flash suppressor materials to protect your parachutes
- The upper body tube, with the egg and altimeters, will probably be a BT70 (56 mm), or a BT80 (66 mm)
  - Must be at least 150 mm long

How do you connect two different sized body tubes?

Transitions!

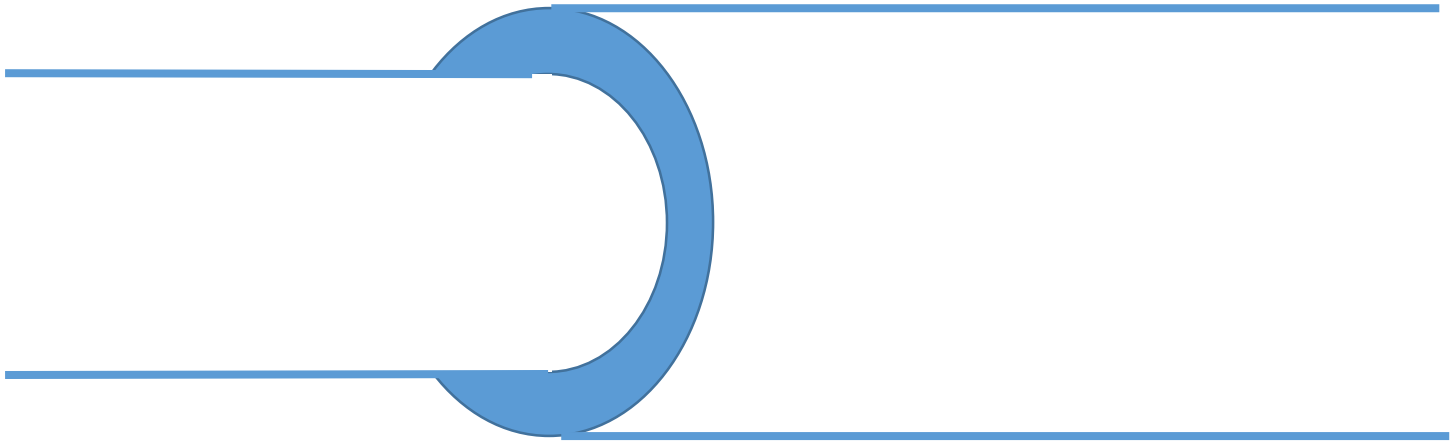
- One end is sized to fit into the lower body tube
  - BT60 inner diameter = 40.5 mm
- One end is sized to fit into the upper body tube
  - BT70 inner diameter = 55.4 mm
  - BT80 inner diameter = 65.7 mm
- Typically there is a conical section between upper and lower shoulders of the transition
- Can be wood, or plastic, or paper

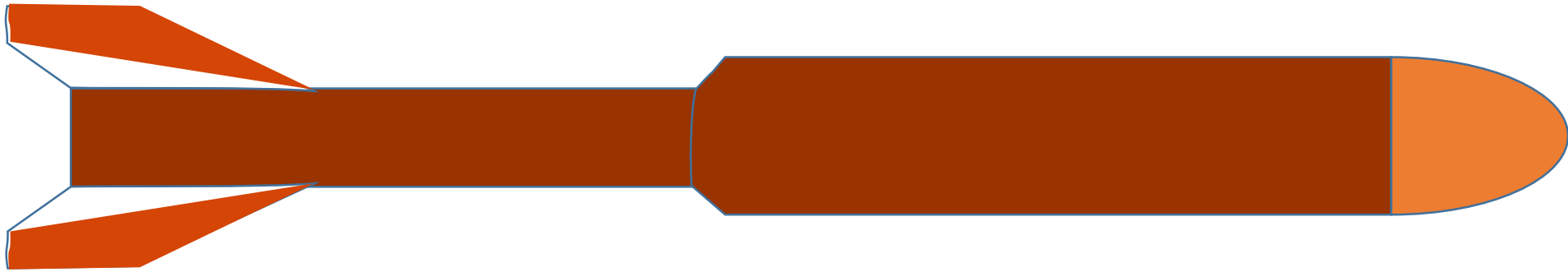
An Alternative Approach

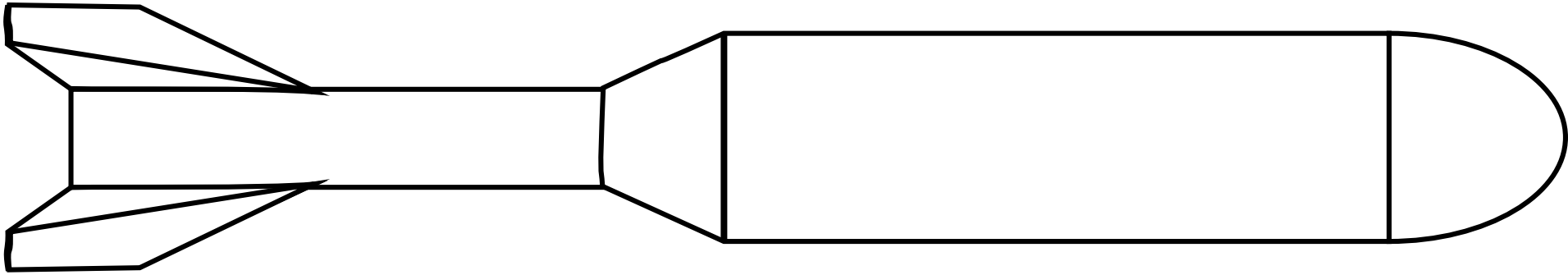
Use a Coupler and Centering Rings :

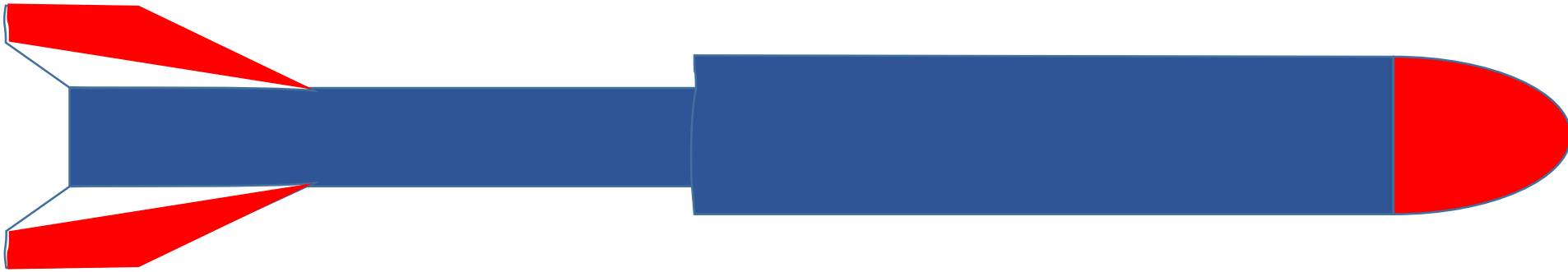
- Use a coupler – a short body tube that **snugly** fits inside your lower body tube (for a BT60, that means the outer diameter is 40.5 mm)
- Use a centering ring (or two) to fit the coupler into the base of the upper body tube. A centering ring is a disc whose outer diameter matches the inner diameter of the larger body tube (BT70 = 55.4 mm) and whose inner diameter matches the outer diameter of the smaller body tube (BT60 coupler = 40.5 mm)
  - Can be wooden, foamcore, plastic, paper, …

Centering Ring as a Transition









(Not to scale)