

PACK 12 SPACE DERBY

OFFICIAL RULES 2009



The race is open to all registered Pack 12 Tigers, Cub Scouts, and Webelos Scouts.

Building

1. Only basic materials supplied in the Official BSA kit may be used, including the hanging device in the kit.
2. The nose cone (propeller assembly) **must not be glued in place** on the nose of the rocket. A notch or groove should be formed in the tail of the rocket to seat the band holding dowel. The band-holding dowel **must not be glued in place**. (This rule allows band replacement in case of breaks.)
3. The rocket body may be no longer than 7 inches. This does not include the propeller and fins.
4. There are no restrictions on the weight or design of the rocket. Rockets may be detailed in any way as long as it does not exceed length restrictions, is flight worthy, structurally sound, and does not interfere with another rocket during the race. Rockets with wet paint will be disqualified.
5. Scouts may use graphite powder between the propeller and the bushing if desired.
NO OTHER FORMS OF LUBRICATION ARE ALLOWED.

Pre-Flight (Race Day Registration)

1. Rockets are to be submitted to the registration table, or "*Space Command*", before the race.
2. Each rocket will be inspected per the above building guidelines, registered, and assigned a spacecraft number.
3. After registration, rockets will be held by *Space Command* in the *Space Dock* area until race time.

Racing

1. Prior to each heat, rocket numbers and lane assignments will be announced. Pilots will take their rocket from the *Space Dock* and give them to the *Space Command* Race Official and then take their assigned position near the race line. Upon completion of the heat, *Space Command Officials* will give the rocket back to the pilot to place back in the designated place at the *Space Dock*.
2. After registration, a rocket cannot have any further adjustments made, except for mechanical failure (see 4).
3. The race will be 4 heats, each rocket running on each *space line*.
4. Any entry that experiences a mechanical failure will be allowed to re-race if it can be repaired during the same heat. It will count as a "BYE" if it cannot be repaired prior to the beginning of the next heat. All repairs of this type must be done with "*Space Command*" observing and certifying as to its flight worthiness.
5. Rockets will be judged by measuring the total distance traveled of 4 heats. In the event of a tie, 2 heats on 2 lanes will be run, the winner being the rocket covering the longest total distance.
6. All rulings by *Space Command Officials* are FINAL.

Awards & Recognition

1. All Scouts will receive a participation card and a 'show award' (example "Fastest Looking", "Best use of Cub Scout Colors", etc.).
2. The top 3 overall participating Scouts and the next top 3 Scouts IN EACH RANK, Tiger, Wolf, Bear, & Webelos, will be recognized in the *Winning Pilot's Circle*.

APPENDIX.
COPY OF INSERT FROM OFFICIAL CUBSCOUT SPACE DERBY ROCKET KIT

Space Derby Rocket

Kit Contents

Read complete instructions and review the plan to identify the various parts of the kit. Each kit contains the following parts:

1 - Propeller	1 - Number Sheet
1 - Brass Bushing	2 - Balsa Body Blanks
1 - Nose Button	4 - Rubber Bands
1 - Plastic Tube	3 - Plastic Sheets for Wing or Fins
1 - Wire Propeller Hook	1 - Instruction Sheet/Plan
1 - Hanger Fitting	
1 - Plastic Dowel	

Tools & Supplies Required

Water-based Wood Glue
Paint Brushes
Pliers - to bend the wire
Medium & Fine Sandpaper - to shape the rocket (no knife)

Construction

The rocket design shown is only a suggestion. You can design your own rocket, but you must use the materials provided in the Space Derby kit.

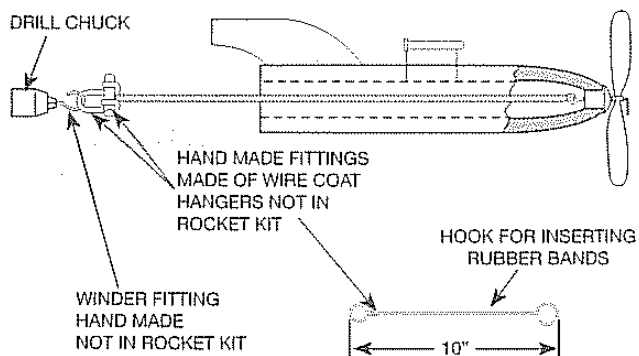
1. First, cement the two Balsa body blocks together, using only a water-based wood glue. Before the glue dries, align the blocks evenly, then insert the nose button temporarily in place, to be used as a guide when sanding the rocket. After glue is completely dry, shape the rocket body, using only sandpaper (no knife). Grooves for the hanger fitting & fins can be scored onto the Balsa, using a pointed object such as a pencil (see plan for location).
2. Coat the rocket with at least two coats of base paint. While paint is drying you can cut the fins to your design and assemble the propeller unit, as shown on the drawing.
3. When paint is thoroughly dry, sand entire rocket with a fine grade sandpaper, then finish painting the rocket in your favorite color and design.
4. Carefully glue the hanger fitting and fins in place, using the same glue as is used for the body blocks. Note: The fins and hanger fittings can be glued in place either before or after you paint the rocket. You may find it easier to glue the fins and hanger in place, after painting, but care must be taken not to use too much glue, or you can mar your finish.
5. The rubber band motor is most important for achieving top performance. The rubber should be lubricated with a rubber lubricant. In the test flight, first try two rubber bands to determine if they provide enough power for the weight of your rocket. If not, increase to three rubber bands. An extra rubber band is provided in the kit.
6. Do not over-wind your motor on your first flight. Wind fifty (50) turns, then release; wind one hundred (100) turns, then release, etc., until you are satisfied with the performance. Maximum wind should be approximately 150 turns. The more turns in the rubber band motor, the faster the rocket will fly, but remember, the rubber has just so much elasticity before it will break. Therefore, those few extra turns can produce either a winner or a broken rubber band. **BE PREPARED!**

General Information

Rockets are flown on guide lines of 50 lbs. test monofilament fishing line. The suggested length is 40 feet, suspended between two posts as tight and as level as possible. Lines can be lengthened at your discretion. No rocket carrier is included in this kit. If you wish to test your rocket prior to the race, you may wish to purchase your own Rocket Carrier (Catalog #17098) at your Scout Distributor. For a pack Space Derby, see instructions and information on the Launching Rack described in the "Cub Scout Leader-How To" book (Catalog #S33831).

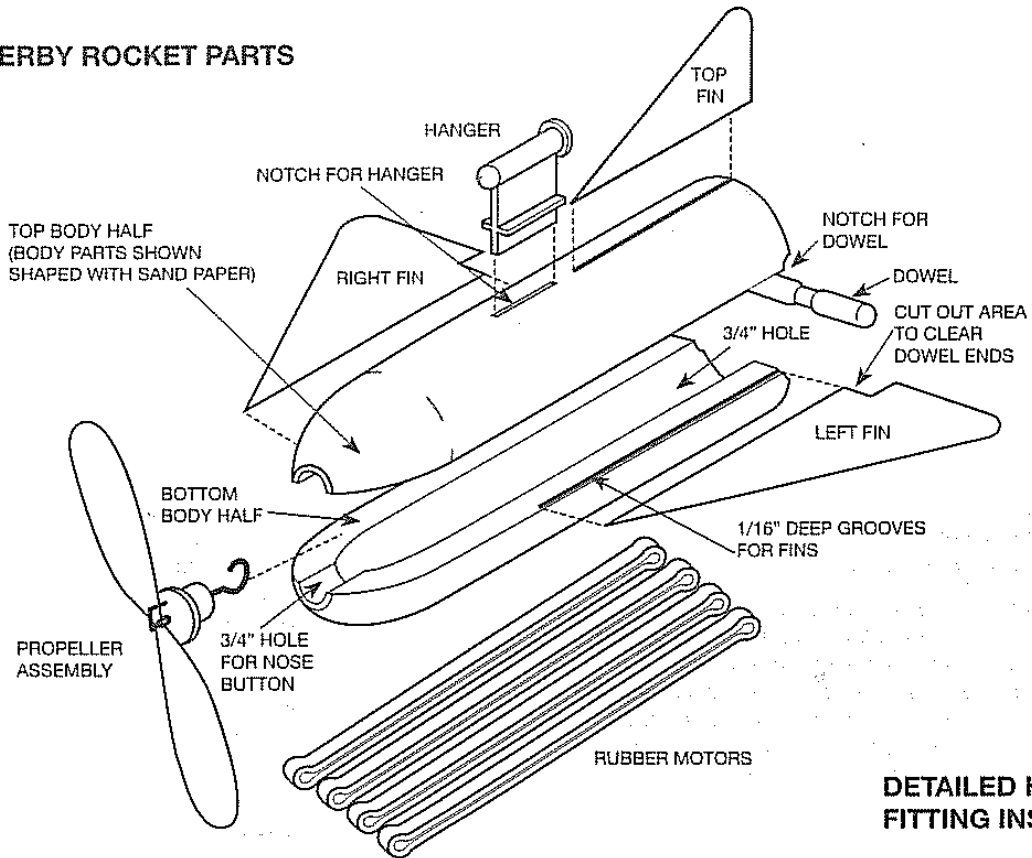
Helpful Suggestions

A small hand drill, as illustrated below, is excellent for winding the rubber band motor, and also helps to speed up the event. When using a mechanical winder, it is advisable to have one person hold the rocket and propeller while the other person stretches the band about twelve (12) inches. Then, as you wind, gradually shorten the distance between the winder and the rocket (see illustration). Winder fitting and the hook for inserting the rubber band are hand-made from coat hanger wire. They are not included in this kit (see Space Derby Accessories). When using the wire winding fitting, remove any sharp edges on the tips.

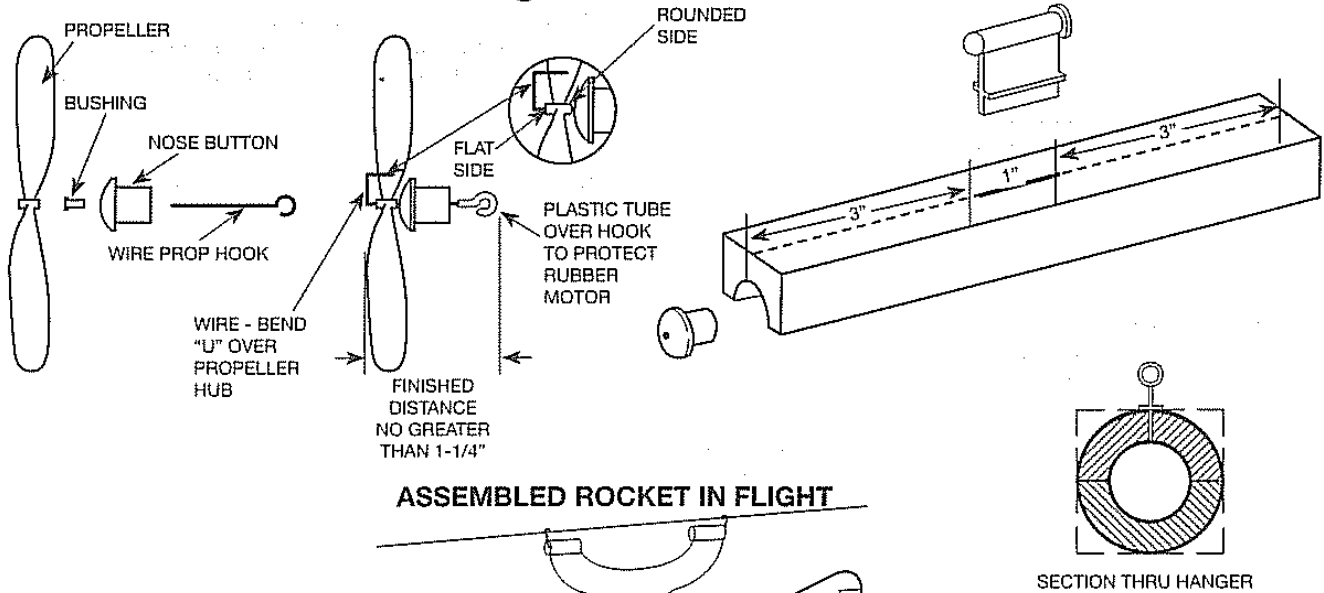


Space Derby© Plan

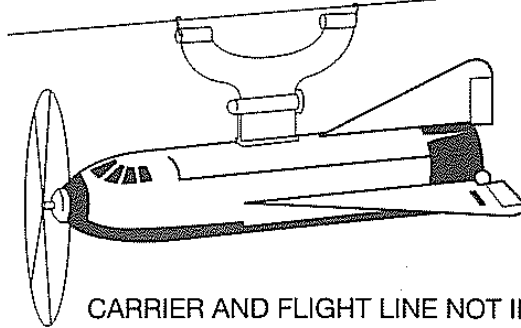
SPACE DERBY ROCKET PARTS



DETAILED HANGER FITTING INSTALLATION



ASSEMBLED ROCKET IN FLIGHT



CARRIER AND FLIGHT LINE NOT IN KIT

APPENDX (CONTINUED).

EXPANDED VIEW OF THE PROPELLER SET-UP

