**COUNTDOWN AND LAUNCH**

**IMPORTANT:** The Estes E™ Controller is recommended.

**ESTES LAUNCH SUPPLIES (Sold Separately)**
- Estes Porta-Pad® E-Launch Pad (#2338) or Estes Porta-Pad® III Launch Pad (#302215)
- E™ Launch Controller (#22230)
- 3/16" (5 mm) Max™ Launch Rod (#302244) or 1/4" (6 mm) Launch Rod (included with #2338 E-Launch Pad)
- Recovery Wadding (#302214)
- Igniters and Igniter Plugs (included with Engines)
- Estes Engines: 2 each D12-5 or 2 each D12-7

**KEY ALWAYS OUT UNTIL FINAL COUNTDOWN!**

**1...**

**PORTA-PAD®, or**

**E-LAUNCH PAD**

**2...**

**MASKING TAPE**

**3...**

**HOLD KEY DOWN AND PRESS LAUNCH BUTTON UNTIL LIFT-OFF!**

**4...**

**INSERT KEY, PUSH DOWN, FIRMLY AND HOLD**

**5...**

**E-ENGINE LAUNCH CONTROLLER**

**PRECAUTIONS**

**NAR Safety Code**

**NO DRY GRASS OR WEEDS**

**PRES- LAUNCH CHECK**

For safety, never launch a damaged rocket. Check the rocket’s body, nose cone and fins. Also, check the engine mount, recovery system and launch lug. Repair any damage before launching the rocket.

**FLYING YOUR ROCKET**

Choose a large field (500 ft x 152 m) square free of dry weeds and brown grass. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great. Launch only with little or no wind and good visibility. Always follow the National Association of Rocketry (NAR) SAFETY CODE.

**MISFires**

Take the key out of the controller. Wait one minute before going near the rocket! Disconnect the igniter cables and remove engine. Take the plug and igniter out of the engine. If the igniter has burned, it worked but did not ignite the engine because it was not touching the propellant inside the engine. Put a new igniter all the way inside the engine without bending it. Push the plug in place. Repeat the steps under Countdown and Launch.

**SUPPLIES**

In addition to the parts included in the kit you will also need:

- Scissors
- Pencil
- Ruler
- Fine Sandpaper
- Carpenter’s Glue
- Modeling Knife
- Masking Tape
- Hobby Saw
- Plastic Cement
- Spray Primer (White)
- Spray Paint (Red, Black, Light Gray)
- Clean-Up Sprays (Optional)

**ASSEMBLY TIP:** Read all instructions before beginning work on your model. Make sure you have all parts and supplies.

**TEST FIT ALL PARTS TOGETHER BEFORE APPLYING ANY GLUE!**

If any parts don’t fit properly, sand as required for precision assembly.

**IMPORTANT:** The Estes E™ Controller is recommended in order to ignite two engines at once.

**PARTS**

Locate the parts shown below and lay them out on the table in front of you. Do not use this drawing to assemble your rocket.

**36 D SQUARED**

**FLYING MODEL ROCKET KIT INSTRUCTIONS**

**KEEP FOR FUTURE REFERENCE**

**ESTES COX CORP.**

1335-1 3rd Street
Penrose, CO 81240

PRINTED IN CHINA
1. ASSEMBLE ENGINE MOUNT (2 ENGINE CLUSTER)

**NOTE:** Steps A through G must be done for BOTH engine tubes.

**A.** Measure and mark both engine tubes as shown.

**B.** Cut 1/8" (3 mm) slits at the 2-1/2" (6.4 cm) marks.

**C.** Mark yellow spacer tool at 1/4" (6 mm).

**D.** Using scrap balsa from edge of balsa sheet, smear glue 2-1/2" (6.4 cm) inside engine mount tubes.

**E.** Push engine block into engine mount tubes with spacer tool to 1/4" (6 mm) mark. Remove spacer tool IMMEDIATELY.

**F.** Apply glue around tubes just in front of the 1" (25 mm) marks. Insert engine hooks into slots as shown.

**G.** Slide black retainer rings onto engine mount tubes up to the 1" (25 mm) marks. Let dry.

**H.** Carefully remove centering rings from both ends. Sand edges smooth.

**I.** Hold the tubes as shown. Apply glue around the tubes at the 1/4" (6 mm) mark and slide rear centering ring (NOTCHED) up to the mark. Apply glue around the tubes at the 3-3/4" (9.5 cm) mark. Slide front centering ring (NOTCH) down to the mark. Let dry.

**J.** Apply glue fillets to both sides of centering rings. Let dry.

PREPARE PARACHUTE FOR FLIGHT

- A. Insert 6-8 squares of loosely crumpled recovery wadding into rocket.

- B. Spike parachute.

- C. Fold.

- D. Roll.

- E. Wrap lines loosely. Insert chute, shock cord and nose cone into body tube.

**IMPORTANT:** Parachute should slide easily into body tube. If it is too tight, unroll and repack.

PREPARE ENGINES

**WARNING:** FLAMMABLE

To avoid serious injury, read instructions & NAR Safety Code included with your engines. PREPARE YOUR ENGINE ONLY WHEN YOU ARE OUTSIDE AT THE LAUNCH SITE PREPARING TO LAUNCH!

If you do not use your prepared engines, remove the igniters before storing your engines.

- A. Separate igniter plugs and igniters.

- B. Hold engine upright, drop in igniter.

- C. Insert igniter plugs.

- D. Firmly push all the way in.

**NOTE:** Before installing the engines in your cluster rocket, pack the front of the engine above the ejection cap with 1/4 to 1/2 sheet of wadding. This lessens the possibility of one engine’s ejection charge igniting the ejection charge of another engine. This may prevent damage to your rocket if one engine fails to ignite at liftoff.

- E. Insert engines in rocket and rotate so igniter leads are positioned as shown.

- F. Twist the ends of the igniter leads together as shown. Be sure they make good contact with each other; but do not twist so much that the igniters are pulled loose.

END VIEW

GOOD!

BAD!
10. INSTALL SHOCK CORD MOUNT

- Cut out shock cord mount from above.
- Apply glue. Fold forward.
- Squeeze tightly and hold for one minute.
- Glue mount 1 1/16" (25 mm) inside upper body tube (not payload section). Hold until glue sets. Let dry.
- YES

NO

11. ATTACH PARACHUTE AND SHOCK CORD

- Spike parachute and form loop.
- Pass loop through eyelet.
- Pull tight.
- YES

NO

12. FINISHING YOUR ROCKET

- First spray entire rocket including fins with white primer. Do not get primer or paint inside engine mount. Let dry and sand. Repeat until fins and rocket are smooth.
- For color, follow the paint scheme on the package using red, black, and gray spray paint. The diagram below shows the color breakdown.
- When paint is dry, decals should be applied to the model where shown below.

TO APPLY WATERSLIDE DECALS:
- Cut out an individual section of the decal and dip it in lukewarm water for about 10 seconds (one section at a time).
- When the decal slides freely away from the backing paper, slip it onto the model and position in place.
- Use a napkin or tissue to blot away any excess water and allow the decal to dry completely.
- Repeat the process for remaining decals.
- OPTIONAL: Clear coat entire rocket when complete.

2. PREPARE FINS

- Sand both sides of laser-cut balsa sheet with fine sandpaper.
- Carefully remove fins with modeling knife.
- Stack fins and sand root edge as shown. Sand contour of fins as shown.

3. ASSEMBLE FORWARD CENTERING RINGS AND TUBE SKIRTS

- Carefully cut the molded tube skirt assembly in four places where shown using a hobby saw.
- Mark the tubes 1/8" (3 mm) and 1 1/16" (24.8 cm) from front end.
- Slide tube skirts over tubes as shown. Noa position of skirts.
- Apply glue just above the 1 3/4" (8.8 cm) mark. Slide rear centering ring (notched) up to the mark. Let dry.
- Apply glue just above the 1 3/8" (3 cm) mark. Slide front centering ring (notched) up to the mark. Let dry.
- Apply glue fillets to both sides of centering rings. Let dry completely.

4. ASSEMBLE BODY TUBES

- Mark inside of upper body tube 9/16" (14 mm) from end.
- Slide lower body tube over assembly until end is flush with engine tubes.
- Slide upper body tube over assembly until 9/16" (14 mm) mark is even with bottom centering ring.
- Front
- Rear
- Bottom Centering Ring

Continued...
4. ASSEMBLE BODY TUBES (continued)

D. Use scrap balsa to apply glue fillets to all four centering ring/body tube joints. Make sure body tubes are aligned. Let dry.

5. ASSEMBLE TUBE SKIRTS

A. Apply a ring of plastic cement just inside the lower body tube. Slide tube skirt down until flush. Let dry.

B. Apply a ring of plastic cement just inside the upper body tube. Slide tube skirt forward until flush. Let dry.

6. MARK FIN AND LAUNCH LUG LINES

A. Cut out tube marking guide from top of page 2. Wrap around lower body tube and secure with masking tape. Align launch lug line with parting line of skirt. Make a pencil mark at each arrowhead (total of four). Label the launch lug line "LL".

B. Using a door frame, extend fin lines along lower body tube. Extend launch lug line to upper body tube also. (See below)

7. ATTACH FINNS

A. Apply thin layer of glue to root edge of fin, wait one minute. Apply second layer and attach fin to body tube, noting fin direction. Align edge of fin with fin line, flush with end of tube. Repeat for remaining fins.

B. Check alignment of fins as shown.

NOTE: Fins must be attached correctly for stable flight!

C. Stand rocket on flat table until glue dries completely.

8. ATTACH LAUNCH LUG AND APPLY FILLETS

A. Apply glue to a launch lug and center on "LL" line, flush with end of tube.

B. Repeat for front launch lug.

C. Apply glue fillets to both sides of fin and launch lug joints. Smooth each fillet with your finger. Let dry completely.

9. ASSEMBLE PAYLOAD SECTION

A. Carefully remove flash from adapter and nose cone. Remove flash from eyelet on adapter. Be careful not to cut off eyelet.

B. Apply a ring of plastic cement inside rear end of tube. Insert adapter.

C. The top section may be used as a payload section by "friction fitting" the nose cone to the body tube rather than gluing. (See "HELPFUL HINT")

Or, if you don't want a payload, apply a ring of plastic cement inside front end of tube. Insert nose cone. Let dry.