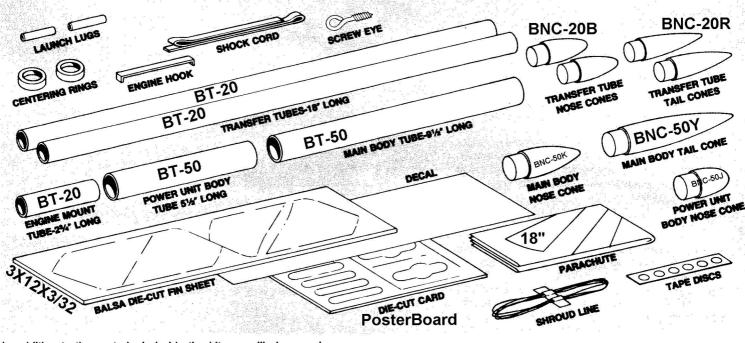


Locate the parts shown below and lay them out on the table in front of you.



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



A. Mark the engine mount tube 1 inch and 2½ inches from one end. Cut a 1/8 inch wide slit at the 2½ inch mark.

B. Gently bend the engine hook so it has a very slight upward bow. Insert one end of hook into slit.

C. Slide a centering ring over the front of the tube and push it down to the 1 inch mark. Apply white glue to both sides of the ring-tube joint.

D. Glue the remaining ring in place on the front end

of the tube.

2.

- A. Lightly sand both sides of the balsa sheet. Run a knife along the die-cut lines to free fins from sheet.
- B. Sand the edges of fins. If desired, the leading edges may be rounded, but leave all other edges square.
- **3.** Note: Proceed only if glue on engine mount is completely dry.

A. Apply a small bead of glue around inside of power unit tube about 1¼ inches from one end.

B. Push the engine mount in until the back of the rear centering ring is even with rear of tube. Apply a film of glue around the ring/body tube joint.

4.

- A. Cut the BT-50 marking guide from front of instructions.
- B. Wrap the guide around power unit tube and tape ends together. Rotate guide until one set of gas port lines is aligned with engine hook. Mark body at all arrow points. Remove guide.
- C. Using a door frame as a guide, draw lines the length of the body at arrow points.
- D. Wrap guide around main body and mark only gas port lines. Extend lines about 3 inches from one end of tube.
- E. Cut BT-20 guide from front page instructions. Mark the transfer tubes in previously described manner. Draw lines about 3 inches from one end of tubes on one side. Draw lines 3 inches from <u>both</u> ends on opposite side.

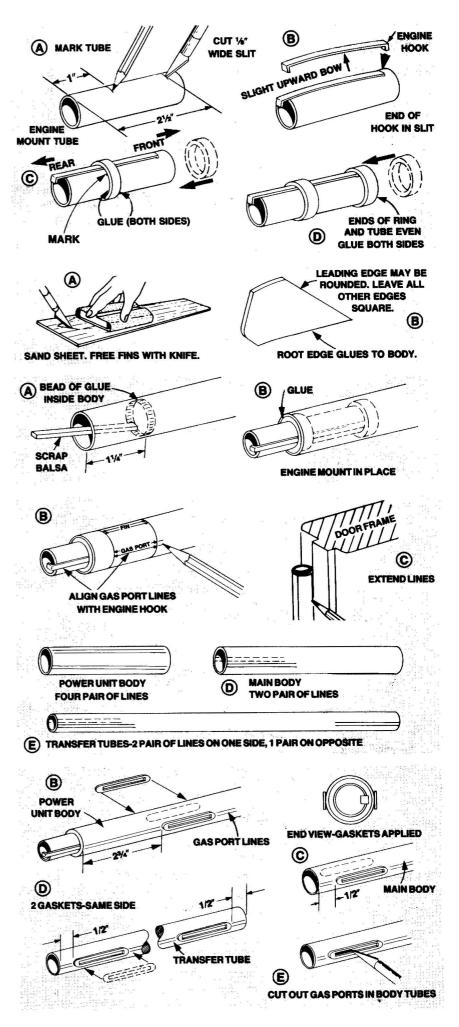
5.

- A. Use a knife to free the gas port gaskets from the die-cut card. Remove the slot from the middle of each gasket.
- B. Place marks on the gas port lines of power unit body 2¾ inches from rear. Glue gaskets to both sides of body as shown. Do not try to press gaskets down to conform to body contour. Let them remain straight. The gaps will be filled with glue later.

C. Mark both sides of main body 1/2 inch from end and glue two gaskets to that tube.

D. Mark each transfer tube 1/2 inch from each end on side that has two sets of gas port lines. Glue two gaskets to each tube. Note that these gaskets are both on same side of each tube.

E. After glue has dried, cut out the portion of body tube inside the slot in each gasket. Make several light cuts to cut through the tubes. Remove cut out sections.



**6.** Note: Because of the force of the ejection gasses passing through the tubes, the nose and tail cones must be securely glued into the body tubes.

A. Locate the power unit nose cone (shortest BT-50 cone). Test fit into front of power unit tube. If fit is too tight, lightly sand shoulder of cone. If fit is loose, apply a film of glue to shoulder and let dry.

B. Apply an even film of glue around the inside end of tube. Apply a thin film of glue to the shoulder of cone and smooth into the wood with your finger. Push nose cone into tube using a twisting motion.

C. Using same procedure, glue the tail cone into the same end of the main body tube to which the gaskets were attached.

D. The rear of the transfer tubes is the end on which the fin lines were drawn. Glue a tail cone into the rear of each transfer tube, then glue a nose cone into the front of each tube.

E. The main body nose cone is NOT GLUED into the body. Check the fit of this cone into main body. This cone should fit loose enough to slide out of the body easily, but not so loose that it wobbles. Sand shoulder or add glue film as necessary. Thread the screw eye into the rear of this nose cone. Remove screw eye, squirt glue into hole, then re-insert screw eye.

7.

A. If any of the cones bulge out at the base, correct the problem at this time. Wrap a piece of cellophane tape around the end of the body tube to protect it from the sandpaper. Use a sanding block with medium grit sandpaper to sand the cone down to the same diameter as the tube. Lightly sand the forward portion of the cone to restore a smooth even curve. Remove the cellophane tape.

B. Apply sanding sealer to all the balsa cones, including the main body nose cone. Let sealer dry, then lightly sand with fine sandpaper. Repeat sealing and sanding process until all grain lines are filled.

8.

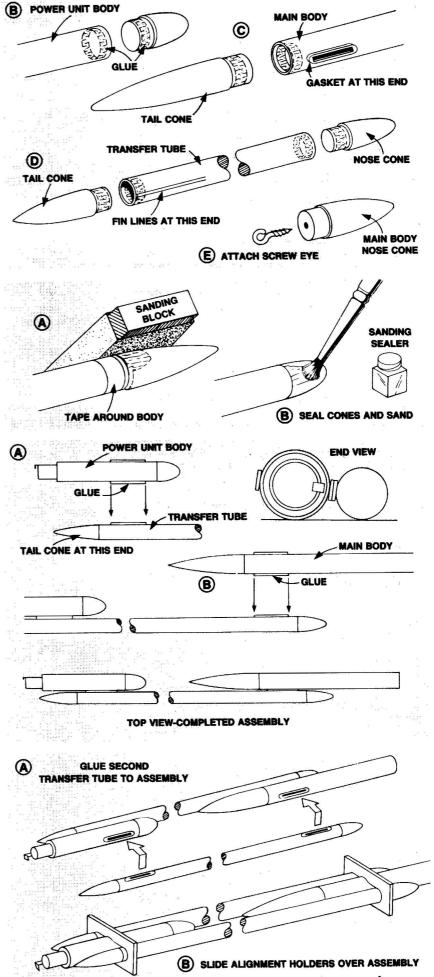
A. Place one transfer tube on a flat work surface. Apply glue to the flat surface of one gasket on the power unit body. Align gasket with the <u>rear</u> gasket on the transfer tube and press together. Make sure both tubes are flat on the work surface and that gaskets are aligned as shown in the end view. Let glue dry before proceeding with step B.

B. Apply glue to one gasket on the rear of the main body and attach it to the front gasket on the transfer tube. Make sure the gaskets are aligned and that the whole assembly is lying flat on the work surface. Let assembly lie until glue is completely dry.

9.

A. Remove the two alignment holders from the die-cut card. Apply glue to both gasket surfaces on the remaining transfer tube. Attach this to the opposite side of the body assembly.

B. Slip one holder over the front of the tubes and the other over the rear. Check gasket alignment and make any necessary adjustments. Let glue dry.



A. Apply a bead of glue to a gasket joint. Pull your finger along the joint to smooth the glue and to

remove any excess glue.

B. Use a toothpick to apply small fillets of glue to the ends of the gaskets. Repeat this process to both sides of all gasket joints. Lay the assembly flat in the alignment holder "cradle" and allow glue to dry. As the glue dries, it will shrink into the joint. Repeat the filleting process one or two more times (until joints are smooth and even).

Slide the rear alignment holder forward so it is clear of the area where the fins are attached.

B. Lay a straight piece of cardboard across rear of body. Align cardboard on transfer tube/tail cone joints. Draw a line across fin lines on power body tube. Turn assembly over and mark opposite side of power tube in same manner.

C. Lay each fin over the template printed on back of kit panel and place a mark on fin at point indicated.

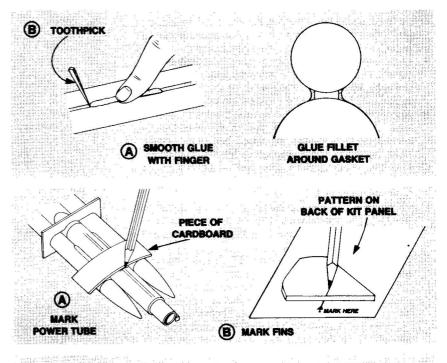
## 12.

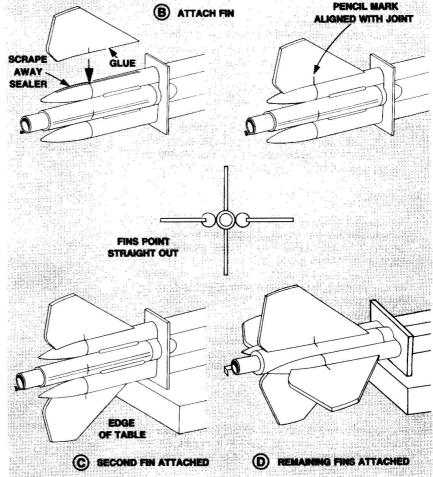
A. Place one fin with a curved root edge on a transfer tube and align the pencil mark on the tail cone/tube joint. Check the fit of the fin. Lightly sand root edge, if necessary, to obtain a good fit.

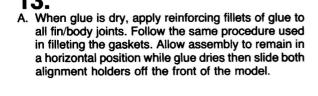
B. Scrape away the sealer on the tail cone in the area where the fin will be attached. Apply a bead of glue to the root edge of the fin and attach to body. Make sure the fin is aligned on the body/tail cone joint and that fin points straight up. Let assembly set until glue is dry.

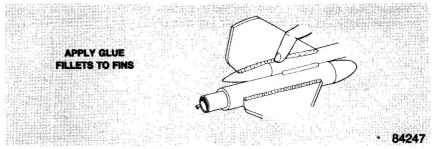
C. Attach remaining contoured root edge fin to the opposite transfer tube in the same manner. When attaching second fin, position cradle so the fins extend over edge of table.

D. The two remaining fins are glued to the power unit body. Align the marks on the fins with the lines you drew in step 11.









14.

A. Glue the launch lugs over one pair of front and rear gaskets as shown. The lugs will automatically center themselves between the tubes.

 B. Using a toothpick, apply small fillets of glue to both sides of each launch lug.

15.

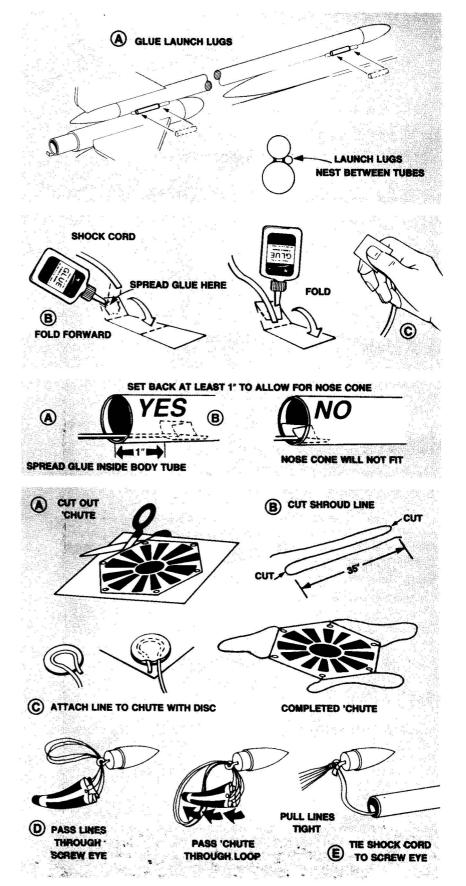
- Cut shock cord mount from front page of instructions.
- B. Crease on dotted lines by folding. Spread glue on section 1 and lay end of shock cord into glue. Fold over and apply glue to back of first section and exposed part of section 2. Lay shock cord as shown and fold mount over again.
- C. Clamp unit together with fingers until glue sets.

## 16.

- A. Apply glue to inside front of main body tube to cover an area no less than 1 inch to 2 inches from end. The glued area should be same size as shock cord mount.
- B. Press mount firmly into glue as shown.
- C. Hold until glue sets.

# **17.**

- A. Cut out parachute on edge lines.
- B. Cut three 35 inch lengths of shroud line.
- C. Form small loops with ends of shroud line and press onto sticky side of tape discs. Attach tape discs with line ends to top of parachute as shown. Press tape discs <u>firmly</u> into place until tape discs and parachute material are molded around shroud line loops.
- D. Pass shroud line loops through screw eye on nose cone. Pass parachute through loop ends and pull lines tight against the nose cone.
- E. Tie free end of shock cord to nose cone screw eye.

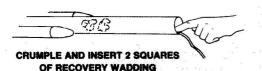


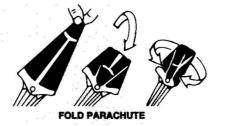
18.

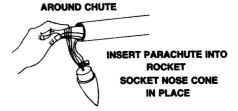
Pack the 'chute and shock cord into the body and socket nose cone in place. Seal and sand the balsa fins. Insert a dowel or tightly rolled piece of paper into engine mount tube to serve as a painting holder. The model on the panel was painted Krylon® Pearl Gray. Gloss white would also look good with the decals.

After the paint has dried, apply the decals. Cut a decal from the sheet, dip in water until decal slides on backing (20 to 30 seconds). Slide decal from backing onto model. Using panel photo as a guide, position decal exactly where you want it. Let decal set for a minute or two, then gently blot away excess water and smooth out any air bubbles. Apply remaining decals. A clear gloss enamel sprayed over the model will protect the decals. This should not be applied until the decals have set for several hours.

## **ROCKET PREFLIGHT**

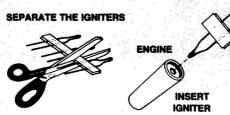






WRAP LINES LOOSELY



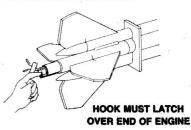


IGNITER TIP MUST TOUCH PROPELLANT DEEP INSIDE NOZZLE OPENING

APPLY AND FIRMLY
PRESS MASKING
TAPE IN PLACE
FOLD OVER

BEND LEADS IN U SHAPES





## **LAUNCH SUPPLIES**

To launch your rocket you will need the following items:

- -Estes Electrical Launch System
- -Estes Recovery Wadding No. 2274
- -Recommended Estes Engines: B4-4, B6-4 and C6-5.

To become familiar with your rocket's flight pattern, use a B4-4 engine for your first flight.

Use only Estes products to launch this rocket.

#### **FLYING YOUR ROCKET**

Choose a large field away from power lines, tall trees, and low flying aircraft. Try to find a field at least 250 feet square. The larger the launch area, the better your chance of recovering your rocket. Football fields and playgrounds are great.

Launch area must be free of dry weeds and brown grass.

Launch only during calm weather with little or no wind and good visibility.

Don't leave parachute packed more than a minute or so before launch during cold weather. [Colder than 40° Fahrenheit (4° Celsius)].

Parachute may be dusted with talcum powder to avoid sticking.

## **MISFIRES**

Failure of the model rocket engine to ignite is nearly always caused by incorrect igniter installation. An Estes igniter will function properly even if the coated tip is chipped. However, if the coated tip is not in direct contact with the engine propellant, it will only heat and not ignite the engine.

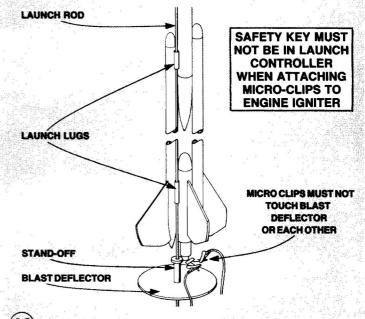
When an ignition failure occurs, remove the safety key from the launch control system and wait one minute before approaching the rocket. Remove the expended igniter from the engine and install a new one. Be certain the coated tip is in direct contact with the engine propellant, then tape the igniter leads firmly to base of engine as illustrated above. Repeat the countdown and launch procedure.

# FOR YOUR SAFETY AND ENJOYMENT

Always follow the NAR-HIA\* MODEL ROCKETRY SAFETY CODE while participating in any model rocketry activities.

\*National Association of Rocketry-The Hobby Industry of America

## **COUNTDOWN AND LAUNCH**



- 10 BE CERTAIN SAFETY KEY IS NOT IN LAUNCH CONTROLLER.
- Remove safety cap and slide launch lugs over launch rod to place rocket on launch pad. Make sure the rocket slides freely on the launch rod.
- 8 Attach micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the metal blast deflector. Attach clips as close to protective tape on igniter as possible.
- Move back from your rocket as far as launch wire will permit (at least 15 feet).
- (6) INSERT SAFETY KEY to arm the launch controller.

Give audible countdown 5...4...3...2...1

#### LAUNCH!!!

PUSH AND HOLD LAUNCH BUTTON UNTIL ENGINE IGNITES

REMOVE SAFETY KEY FROM LAUNCH CONTROLLER. REPLACE SAFETY KEY AND SAFETY CAP ON LAUNCH ROD.

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