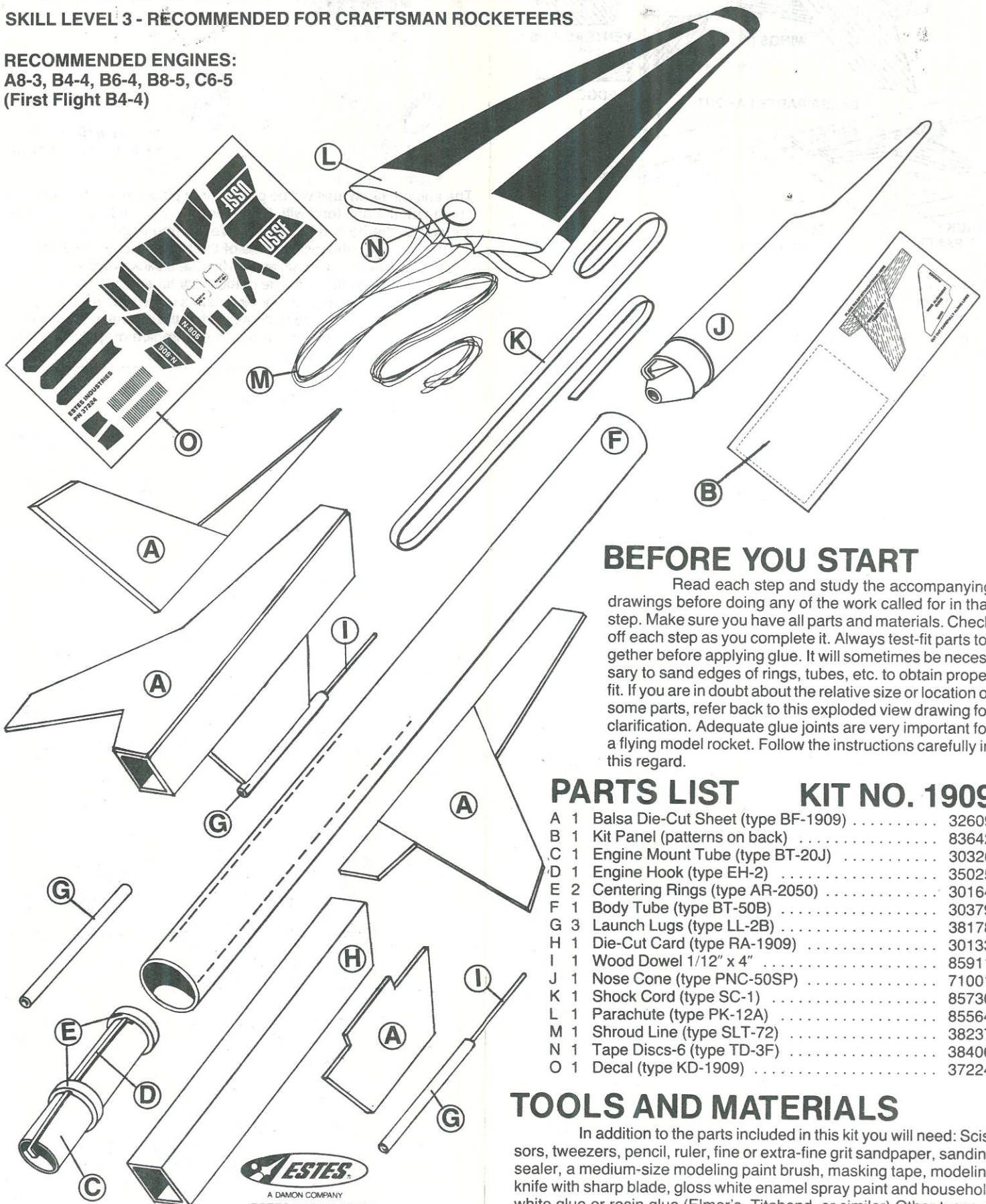


U.S.S.F. FIREFLASH

SKILL LEVEL 3 - RECOMMENDED FOR CRAFTSMAN ROCKETEERS

RECOMMENDED ENGINES:
A8-3, B4-4, B6-4, B8-5, C6-5
(First Flight B4-4)



BEFORE YOU START

Read each step and study the accompanying drawings before doing any of the work called for in that step. Make sure you have all parts and materials. Check off each step as you complete it. Always test-fit parts together before applying glue. It will sometimes be necessary to sand edges of rings, tubes, etc. to obtain proper fit. If you are in doubt about the relative size or location of some parts, refer back to this exploded view drawing for clarification. Adequate glue joints are very important for a flying model rocket. Follow the instructions carefully in this regard.

PARTS LIST KIT NO. 1909

A	1	Balsa Die-Cut Sheet (type BF-1909)	32609
B	1	Kit Panel (patterns on back)	83642
C	1	Engine Mount Tube (type BT-20J)	30326
D	1	Engine Hook (type EH-2)	35025
E	2	Centering Rings (type AR-2050)	30164
F	1	Body Tube (type BT-50B)	30379
G	3	Launch Lugs (type LL-2B)	38178
H	1	Die-Cut Card (type RA-1909)	30133
I	1	Wood Dowel 1/12" x 4"	85911
J	1	Nose Cone (type PNC-50SP)	71001
K	1	Shock Cord (type SC-1)	85730
L	1	Parachute (type PK-12A)	85564
M	1	Shroud Line (type SLT-72)	38237
N	1	Tape Discs-6 (type TD-3F)	38406
O	1	Decal (type KD-1909)	37224

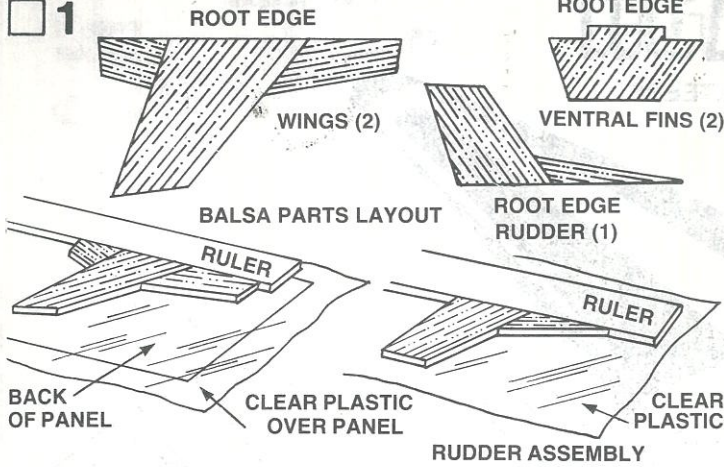
TOOLS AND MATERIALS

In addition to the parts included in this kit you will need: Scissors, tweezers, pencil, ruler, fine or extra-fine grit sandpaper, sanding sealer, a medium-size modeling paint brush, masking tape, modeling knife with sharp blade, gloss white enamel spray paint and household white glue or resin glue (Elmer's, Titebond, or similar) Other types of glue are not recommended.



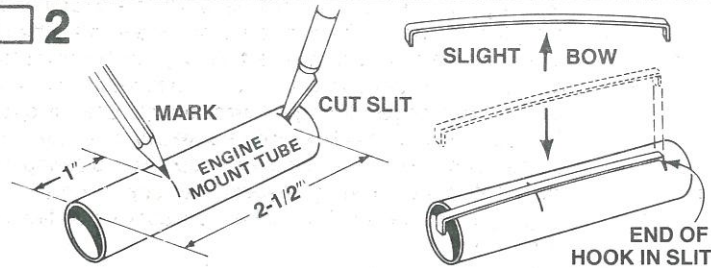
ASSEMBLY INSTRUCTIONS

1



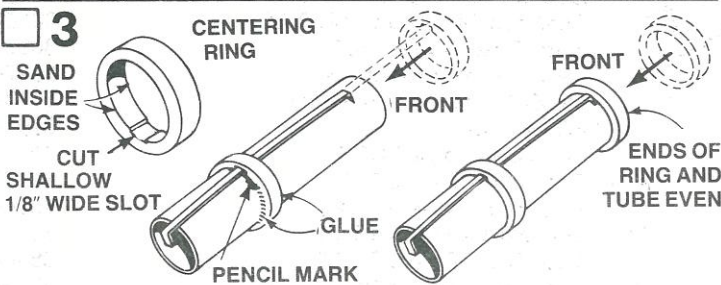
Lightly sand both sides of the balsa die-cut sheet (part A). Carefully free the parts from the sheet by running a knife along the die-cut lines. Lay out the parts according to the drawing above. Cut a section from the plastic kit bag to use as a gluing surface. Place the kit panel (part B) face down on a flat surface. Lay the plastic over the panel. Place 3 wing parts over the wing assembly template printed on the back of the panel. Using a ruler for a straightedge, butt the root edges of the parts against it. If necessary, sand the mating edges of the parts to obtain a perfect fit. Smear a thin film of glue on the mating edges of the parts. Let the glue dry for a few minutes. Smear a second thin film of glue on the mating edges and join the parts together. Make sure the root edges are butted against the ruler. Smear a thin film of glue over the surface of the joints. After the glue has dried, turn the wing over and smear a film of glue over the joints on that side. Assemble the second wing in the same manner. The rudder consists of two pieces and does not require an assembly template. Lay the parts on the plastic, root edges against the ruler, and glue together as previously described.

2



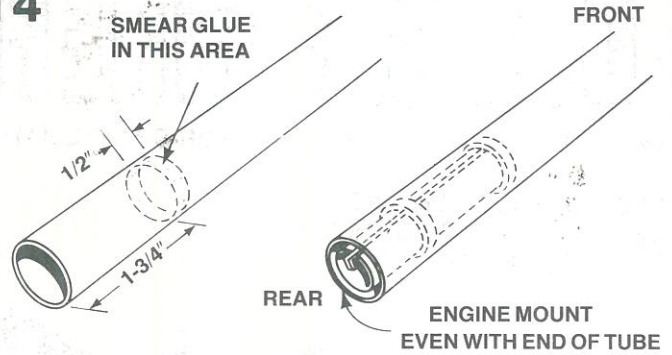
Mark the engine mount tube (part C) at 1" and 2-1/2" from one end. Cut a 1/8" long slit at the 2-1/2" mark. Gently bend the engine hook (part D) so that it bows upward very slightly in the middle. (Study the drawing.—Don't bend the wrong way.) Insert one end of the engine hook into the slit in the tube.

3



Sand the inside edges of the two centering rings (part E) to remove burrs. The rings should slide easily onto the engine mount tube. Cut a very shallow 1/8" wide slot inside one centering ring so it will fit over the engine hook. Slip the ring onto the front end of the engine mount tube and slide it down to the 1" mark. Make sure the engine hook runs straight down the tube, then apply glue to both sides of this ring. Apply glue around the front end of the engine mount tube and slide the remaining centering ring into place (front of ring even with the end of the tube).

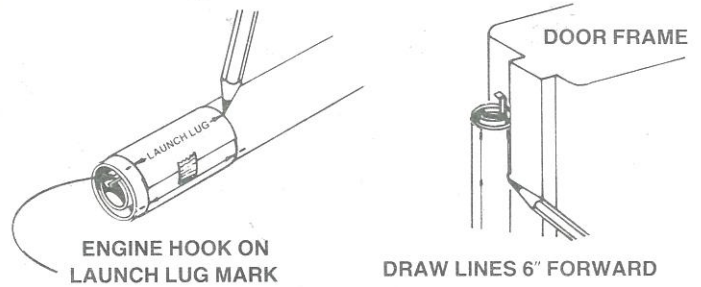
4



The engine mount unit will be pushed into place so that the rear of the engine mount unit (end with the engine hook projecting) is even with the end of the body tube (part F). Test fit the engine mount into the body tube. Sand the inside edge of the body tube and the centering rings, if necessary, to obtain a good fit. Use a stick to apply a generous bead of glue around the inside of the body tube about 1-3/4" from the end. Making sure the engine hook extends to the rear, slide the engine mount into the body tube until the end of the mount is even with the rear of the body tube. Do not pause or the glue may "lock" with the mount in the wrong position.

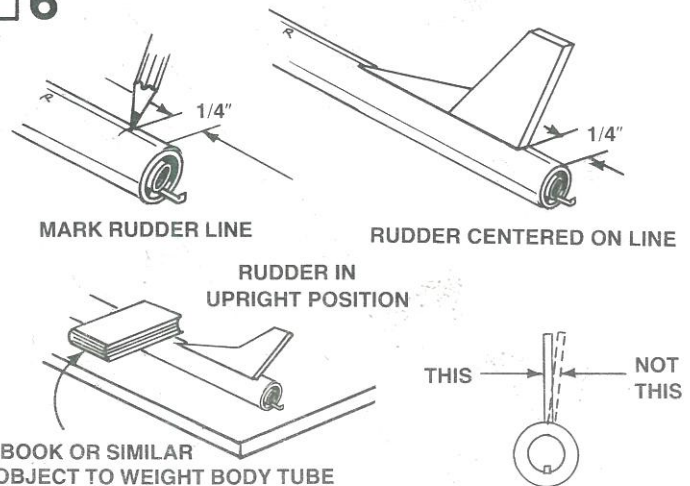
5

MARK TUBE AT ARROWS



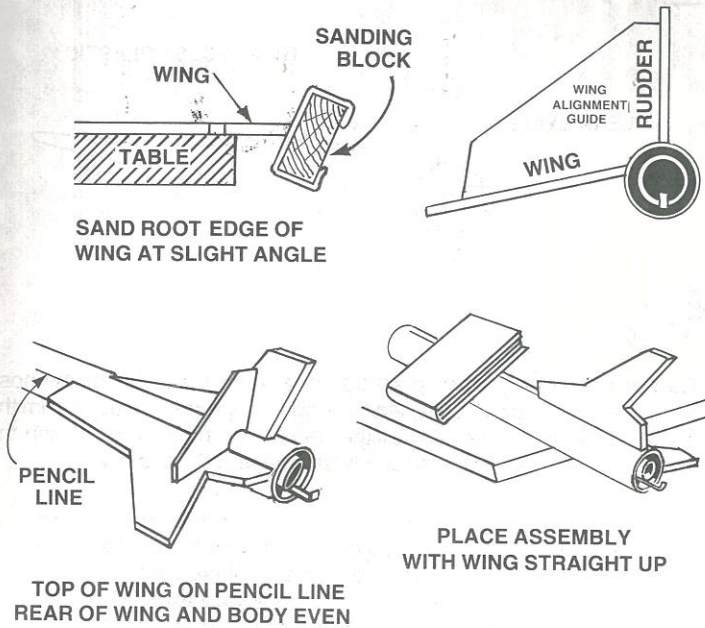
Cut out the tube marking guide from page 5 of the instruction sheet and wrap it around the rear of the body tube. Place the tube marking guide so that the engine hook is lined up with the launch lug line. Mark the body tube at each of the arrow points. Write the letter "R" on the tube next to the marks for the rudder line. Remove the marking guide. Using a door frame as a guide, draw lines connecting each pair of marks. Extend the lines about 6" forward along the body tube.

6



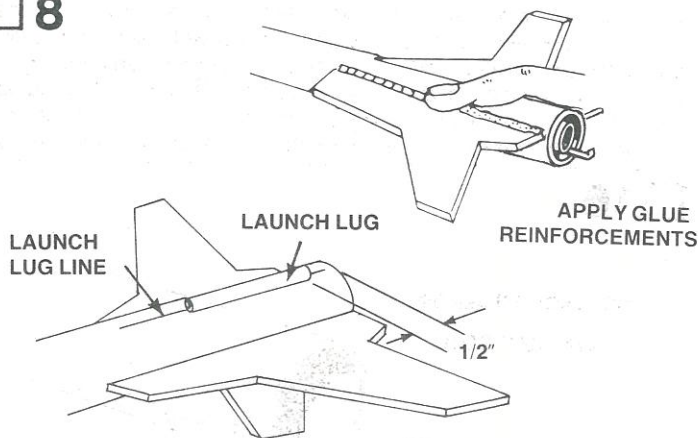
Place a mark on the rudder line 1/4" from the rear of the body tube. Apply a bead of glue to the root edge of the rudder. Hold it for a minute to allow the glue to become tacky, then attach the rudder to the body in the position shown. Make sure the rudder projects straight away from the body tube. Support the body with the rudder in an upright position. Allow the glue to dry completely before proceeding.

7



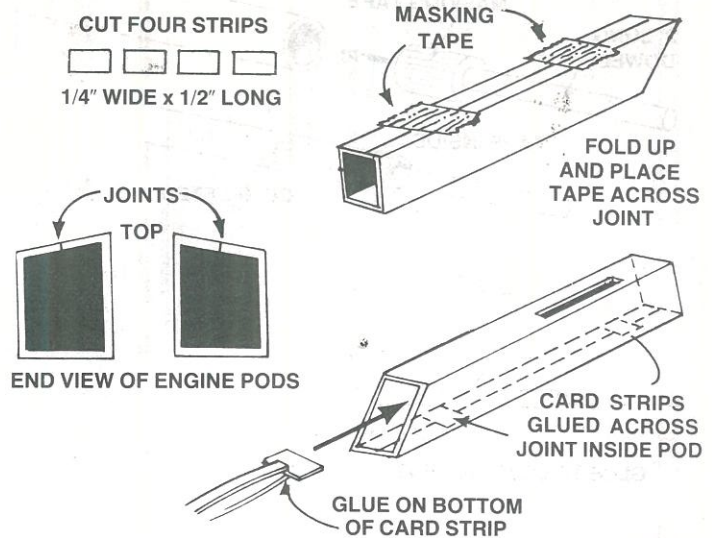
Carefully cut out the wing alignment guide from the back of the kit panel. This will be used to establish the correct "sweep angle" of the wings. The root edge of each wing must be sanded at a slight angle to fit correctly against the body. Make a sanding block by wrapping a piece of sandpaper around a small block of wood. Place a wing on a table with the root portion extending off the edge. Hold the wing flat on the table, set the sanding block at a slight angle and carefully sand the root edge. Check the angle by placing the wing against the body with the top edge of the wing on the pencil line. Set the alignment guide in place and check the fit of the wing root against the body. Once the fit is correct, glue the wing in place as shown. Set the rocket on a table with the rear portion extending off the edge and the wing extending straight up. Weight the front of the body so it will not roll. Check the wing angle with the guide and make any necessary adjustments. After several minutes, place the guide on the assembly once more to make sure the wing is still at the correct angle. Let the glue dry completely before proceeding. Attach the remaining wing in the same manner.

8



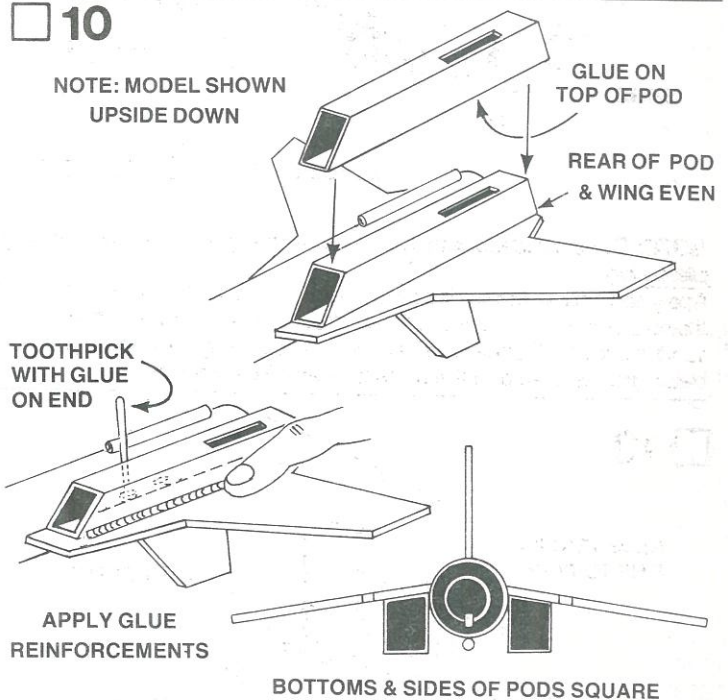
Place a mark on the launch lug line 1/2" from the rear of the body. Apply a bead of glue to one side of a launch lug (part H) and attach it to the body as shown. (NOTE: There are 3 launch lugs. The others will be used later). Make sure the launch lug runs straight along the body. For added strength, apply a light bead of glue to both sides of the launch lug. Wipe away excess glue with your finger. Apply a bead of glue to both sides of the rudder-body tube joint. Pull your finger along the joint to smooth out and remove excess glue. Apply glue reinforcements to the wings in the same manner. On the underside of the wings, use your little finger to remove more of the glue. Too much glue here could interfere with the attachment of the engine pods (next step). Lay the model flat on a table and allow glue to dry.

9



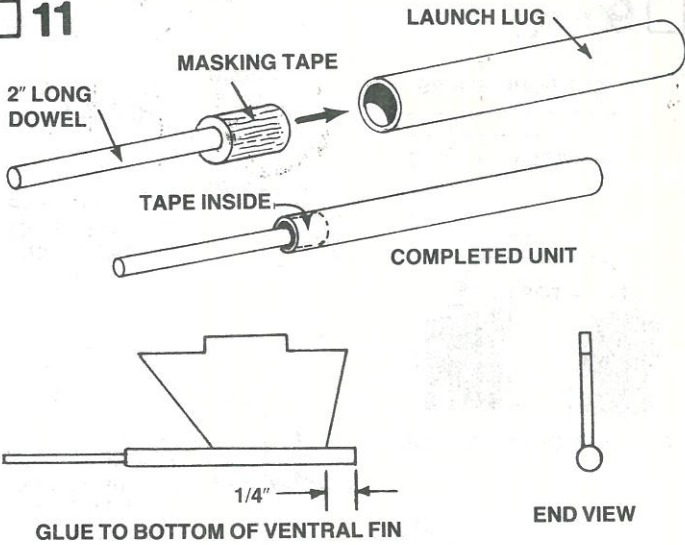
Use a knife to free the two engine pods from the die-cut card (part I). Fold the pods at the scored lines. When folded, the pods will appear as shown above. The tops of the pods are angled to match the sweep of the wings. The joint in each pod must be tack-glued to facilitate gluing the pod to the model. Fold the pods to shape, butt the ends together and place a couple of strips of masking tape across the joints. Cut a 1/4" wide strip from one end of the die-cut card. Cut four 1/2" long pieces from this strip. Place the pods, joints down, on the table. Pick up one of the strips with a pair of tweezers and apply glue to one side of the strip. Position the strip about 3/4" inside one end of a pod and press down firmly across the joint. Glue a second strip inside the other end of the pod. Repeat with the other pod. When the glue has dried, remove the masking tape from the outside of the joints.

10



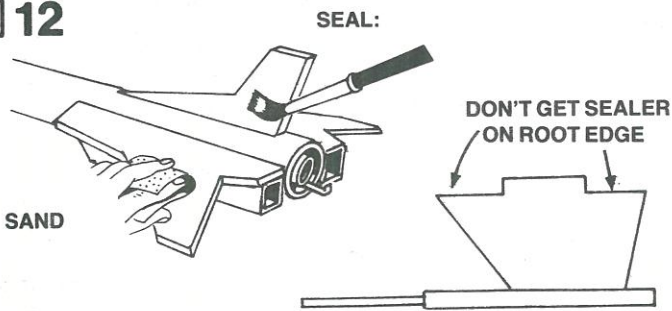
The pods are glued beneath the wings, against the body tube as shown. The rear edges of the pods are even with the rear of the wings. Apply glue to the top surface of one pod and attach it to the appropriate wing. Glue the second pod beneath the other wing. Use a toothpick to apply several drops of glue to the inside of the pods where they join the body tube. Apply beads of glue to the outside of the pods where they join the wings. Smooth the glue with your finger. Make sure the bottoms and sides of the pods are square as shown. Lay the model flat on the table and allow glue to dry.

11



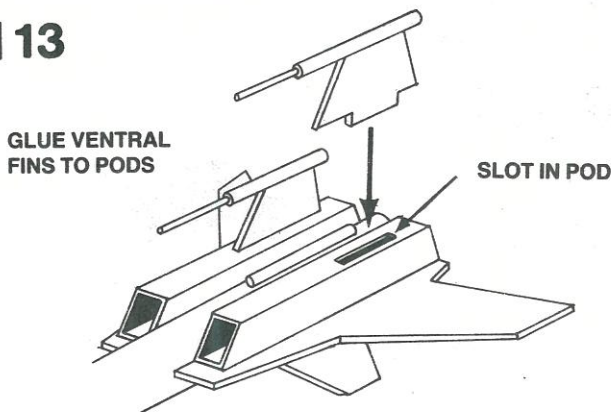
Locate the two remaining launch lugs (part G) and the wood dowel (part I). Cut the dowel into two 2" lengths. Wrap a 3" long piece of 3/4" wide masking tape tightly around one end of one dowel. Test fit into one of the launch lugs. If it will not fit, unwrap and cut off a short piece of tape. If the fit is too loose, add a bit of tape. Squirt glue into the end of the launch lug and push the taped end of the dowel into the lug as shown. Repeat with the remaining dowel and launch lug. Glue the units to the bottoms of the ventral fins as shown. Reinforce the joints with additional glue as previously described.

12



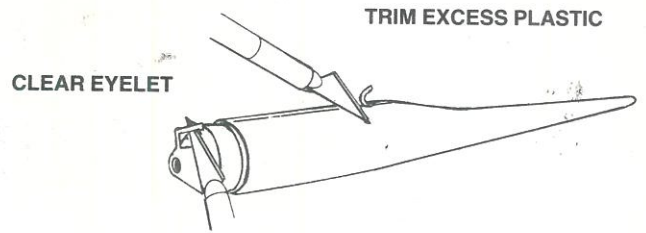
NOTE: Do not proceed with this step until the glue on all parts is completely dry. Apply sanding sealer to all exposed portions of the balsa parts (except the root edges of the ventral fins). Allow the sealer to dry, then lightly sand the parts. Repeat the sealing and sanding procedure until the balsa grain is filled and the parts look and feel smooth.

13



Apply glue to the root edges of the ventral fins and attach them to the bottoms of the engine pods as shown. Make sure the fins extend straight down from the pods. Allow glue to dry, then apply glue reinforcements to the joints.

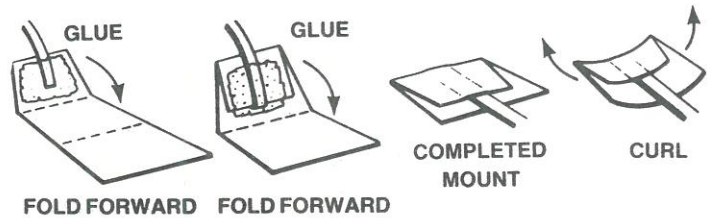
14



Trim or sand any excess plastic from around the sides of the nose cone (part J). Use a sharp knife to remove any excess plastic from the inside of the molded eyelet at the rear of the nose cone. Wash the nose cone with lukewarm soapy water, rinse well, and dry.

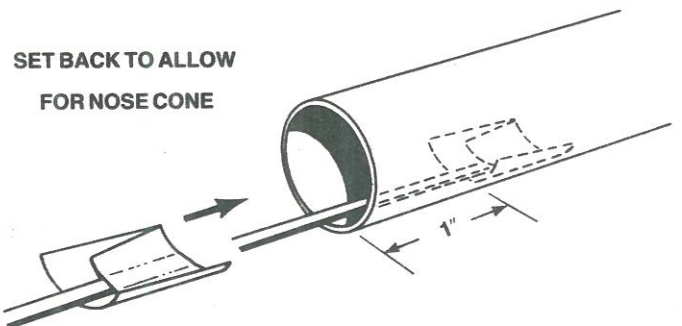
NOTE: Nose cone should separate easily from rocket body tube, but should not be extremely loose. If fit is too tight, sand inside of body tube and shoulder of nose cone with fine sandpaper. If fit is too loose, add a wrapping of transparent tape or masking tape to the shoulder of the nose cone.

15



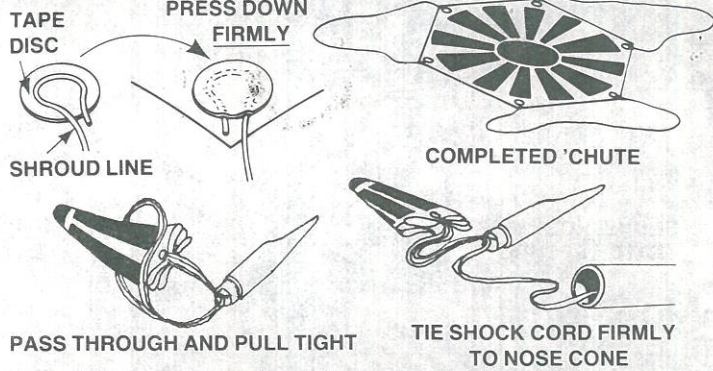
Cut out the shock cord mount from page 5 of the instruction sheet. Fold on dotted lines, then unfold and apply glue to Section 1. Lay the end of the shock cord (part K) into the glue. Fold over and apply glue to the back of Section 1 and the exposed portion of Section 2. Fold again to complete mount. Curl the edges of the mount up so it will match the contour of the body tube and hold with your fingers until the glue sets.

16



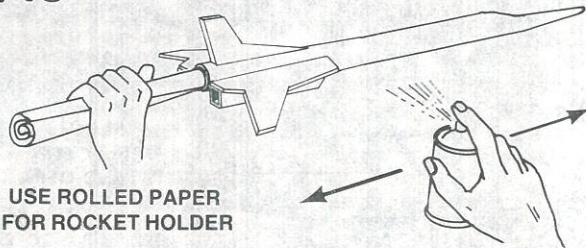
Use a finger or stick to apply glue to the inside of the front of the body tube, 1" to 2" from the front of the tube. Press the shock cord mount firmly into position in glue far enough from the front edge of the tube to allow clearance for the nose cone to fit into place. To insure a good bond use a stick or your finger to smear a film of glue over the mount and surrounding area in the body tube.

17



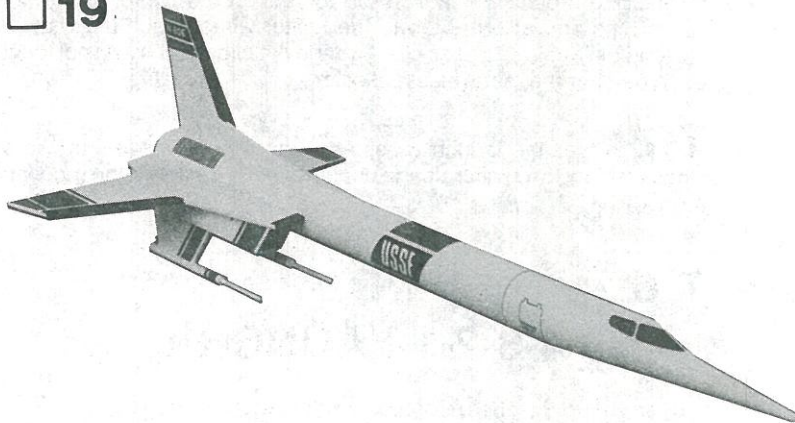
Cut out the parachute (part L) on its edge lines. Cut three equal lengths of shroud line (part M). Attach line ends to the top of the parachute with tape discs (part N) as shown. Form a small loop in the end of a shroud line. Holding loop, gently center loop inside tape disc on the sticky side. Then carefully press tape disc onto its proper place on the top of the parachute. Firmly press the tape disc into place until both tape disc and parachute material are molded around the shroud line loop. Repeat for other shroud-line ends and tape discs. Pass the shroud line loops through the eyelet on the nose cone. Pass the parachute through the loop ends and pull the lines tight against the nose cone. Tie the free end of the shock cord firmly to the nose cone loop. A square knot or strong double knot should be used. Pack 'chute and shock cord into body and socket nose cone in place.

18



Paint the entire model gloss white. Follow instructions on the spray can for best results. We recommend spray enamel. Do not paint the model with lacquer paint. Shake can before spraying. Hold the can straight up and spray in long, smooth "strokes". Spray the model with several light, dry mist coats of paint to avoid "runs". Shake can periodically. Be sure paint is completely dry before applying decals.

19



When all paint is dry, apply the decals (part O) in the positions shown. (A) Cut only one decal at a time from sheet. (B) Submerge decal in lukewarm water until decal slides on backing paper (usually 15 to 30 seconds). (C) Gently slide decal from backing paper onto model. (D) Move decal into exact position and carefully blot away excess water with a soft cloth. (E) If the decal "sticks" before you have it in position, apply water over the decal with a brush. This will permit the decal to be moved. (F) Smooth out all wrinkles and air bubbles before the decal dries. Refer to the photograph for decal positions.

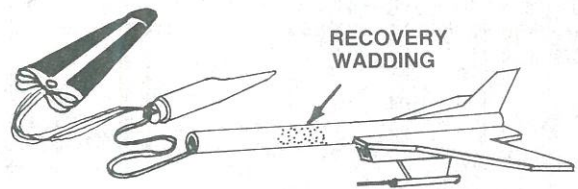
LAUNCHING COMPONENTS

To launch your rocket you will need the following items:

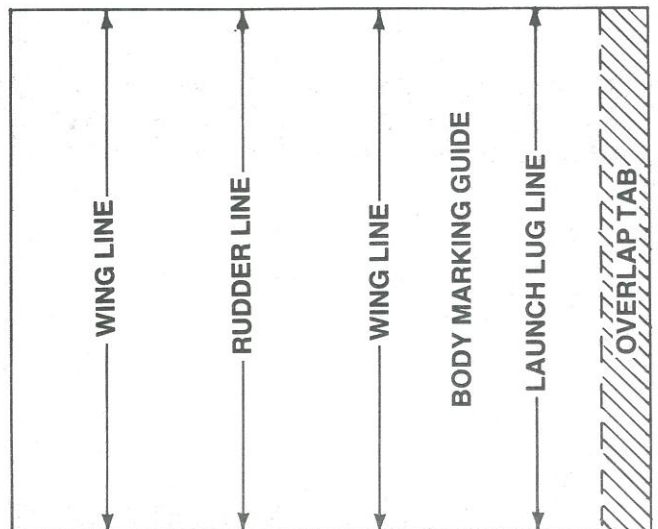
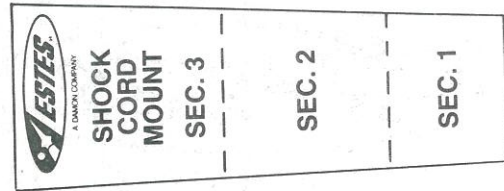
- A model rocket launching system
- Flame Resistant recovery wadding (Estes Cat. No. 2274)
- Estes A8-3, B4-4, B6-4, B8-5, or C6-5 model rocket engines. Use a B4-4 engine for your first flight.

Be sure to follow the HIAA-NAR* Model Rocket Safety Code when carrying out your model rocket activities.
 *HIAA—Hobby Industry of America
 *NAR—National Association of Rocketry

COUNTDOWN CHECKLIST T-13

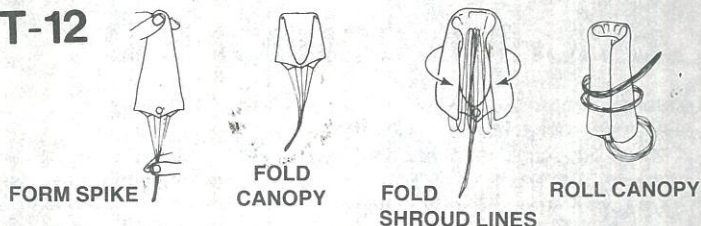


Pack 3 or 4 squares of loosely crumpled recovery wadding into the body tube. Usually this will fill the body tube for a distance equal to about 1-1/2 times its diameter.

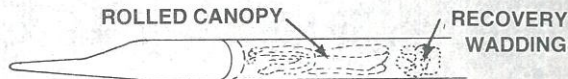


CUT OUT HERE

T-12

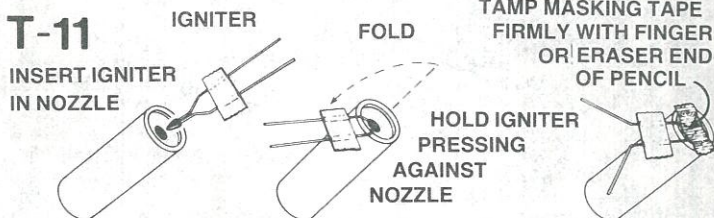


Hold the parachute at its center and pass the other hand down it to form a "spike" shape. Fold this spike in half. Fold shroud lines back along parachute and then back down to lower edge of parachute to reduce length of shroud line "left over". Roll parachute into tube shape to fit easily into body. Any remaining shroud line should be loosely wrapped around parachute. Pack chute into the body tube on top of the wadding. Pack the shroud lines and shock cord in on top of the parachute and slip the nose cone into place.



NOTE: DO NOT pack parachute until you are actually ready to launch. For maximum parachute reliability, lightly dust the chute with ordinary talcum powder before each flight, especially in cold weather.

T-11



Select an engine and install an igniter as directed in the engine instructions. The engines recommended for use with this rocket are the A8-3, B4-4, B6-4, B8-5 and C6-5 made by Estes. Use a B4-4 engine for your first flight.

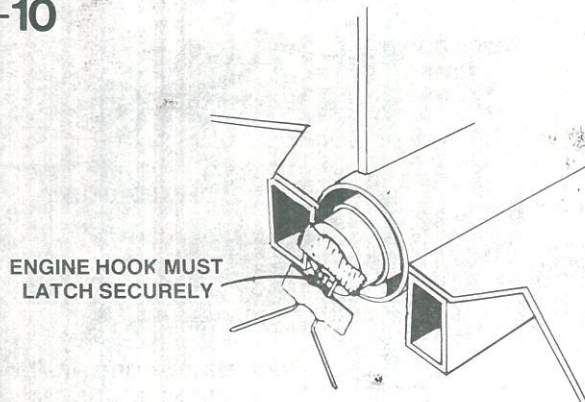


A DAMON COMPANY

U.S.S.F. FIRE FLASH

**ESTES INDUSTRIES
PENROSE, CO 81240 USA**

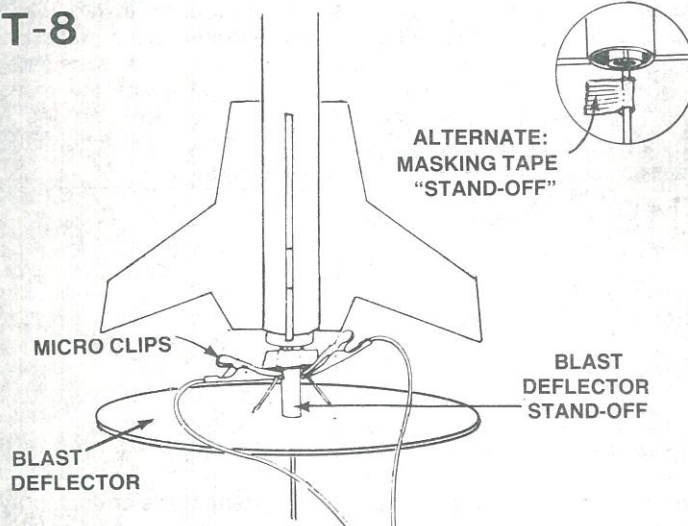
T-10



Insert engine into rocket engine mount. Engine hook must latch securely over end of the engine.

T-9 Disarm the launch panel—REMOVE SAFETY KEY!

T-8



Slide the launch rod through rocket launch lug. Make sure the rocket slides freely on the launch rod. The rocket must be supported by a "stand-off" to keep the igniter wires from touching the metal blast deflector. If your launch system does not have a stand-off, wrap a piece of masking around the launch rod to support the rocket. Clean the micro-clips and attach them to the igniter wires. Attach the clips as close to the engine as possible. Arrange the clips so they do not touch each other or the metal blast deflector.

T-7 Clear the launch area. Alert recovery crew and trackers. Check for low flying aircraft and unauthorized persons in the recovery area.

T-6 Arm the launch panel—INSERT SAFETY KEY!

5-4-3-2-1-LAUNCH!!

Repeat Countdown Checklist for each flight.

MISFIRE PROCEDURE

Disarm the launch panel. Wait one minute before approaching the rocket on the launch pad. Remove the rocket, clean the igniter residue from the nozzle of the engine, and carefully install a new igniter. Repeat the Countdown Checklist.

Failure of the rocket engine to function properly is nearly always caused by a failure to install the igniter correctly. This failure permits the igniter to heat and burn into two pieces without igniting the engine.