

# MARTE MK 2



FLIGHTS  
UP TO  
1000  
FEET!

## FLYING MODEL ROCKET

SKILL LEVEL 3

- Semi-Scale Model of the Italian Air-to-Ship Missile
- Payload Section

Length: 18.25 in. (46.35 cm)

Dia: .736 in. (18.7 mm)

Weight: 1.4 oz. (40.1 g)

Engine Types: A8-3 (First Flight), B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, C6-7

Recommended for ages 10 to adult. Adult supervision suggested for those under 12 years of age when flying model rockets. This is a hobby kit requiring assembly. Engines, launch system, glue and finishing supplies are not included.

#1940



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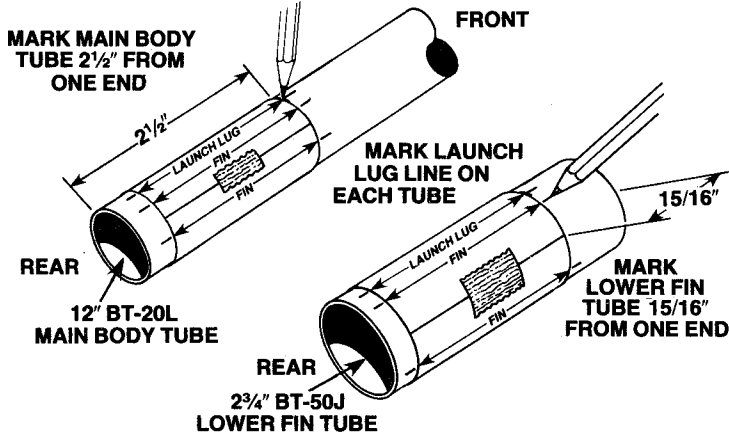


A DANCO COMPANY

ESTES INDUSTRIES  
PENROSE, CO 81240 USA

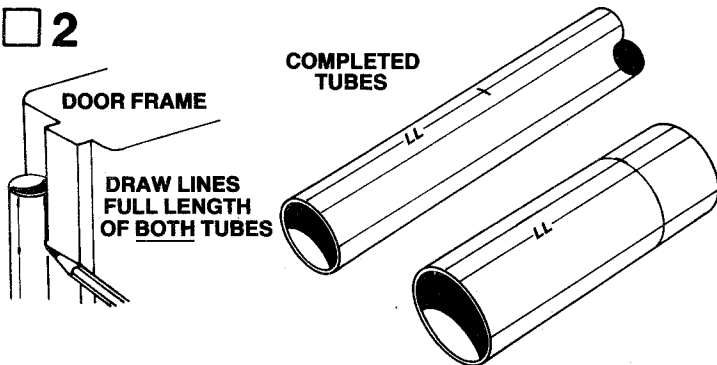
# ASSEMBLY INSTRUCTIONS

**1** MAKE A PENCIL MARK AT EACH ARROW ON BOTH MARKING GUIDES



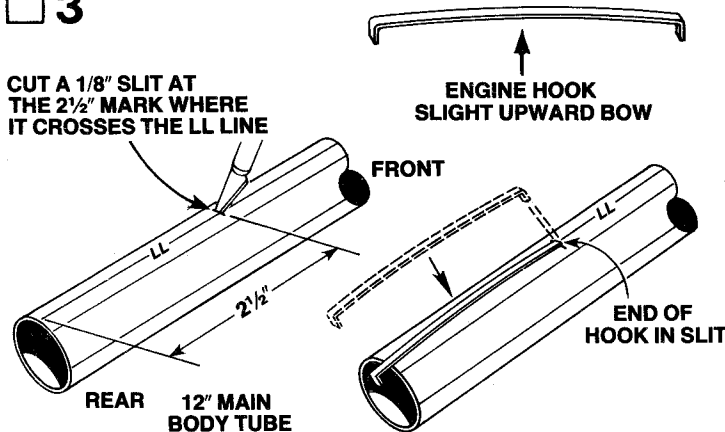
Locate the main body tube (12" long) (part A), and one of the short tubes (2 3/4") (Lower Fin Tube) (part B). Cut out the main body tube marking guide (part C), and the lower fin tube marking guide (part D), both found on page 5. Make a pencil mark 2 1/2" from one end of the main body tube, and wrap the main body tube marking guide, with its front end even with the 2 1/2" mark, around the tube and tape in place. Be sure the launch lug line (LL) on the marking guide is at the location of the 2 1/2" mark. Mark the main body tube at each arrow. Repeat this operation with the lower fin tube and lower fin tube marking guide. Be sure the front of the lower fin tube marking guide is on the 15/16" mark, and draw a line around the tube at this 15/16" mark. **IMPORTANT:** Be sure to mark the launch lug line on each tube with an (LL) before you remove the marking guides.

**2**



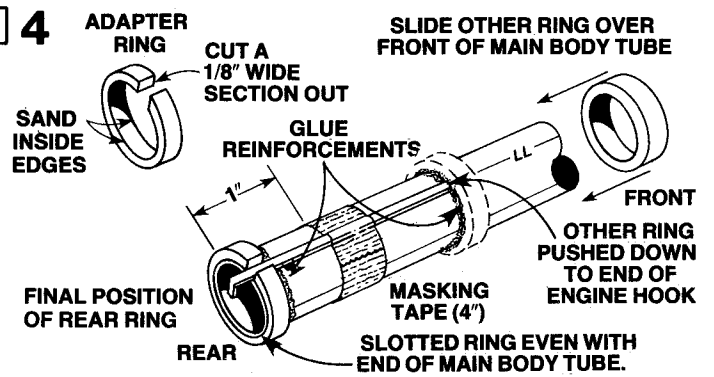
Draw straight lines to connect each set of marks made in step one on both tubes. Extend all lines the full length of both tubes. A door frame inside edge can be used as a guide as shown.

**3**



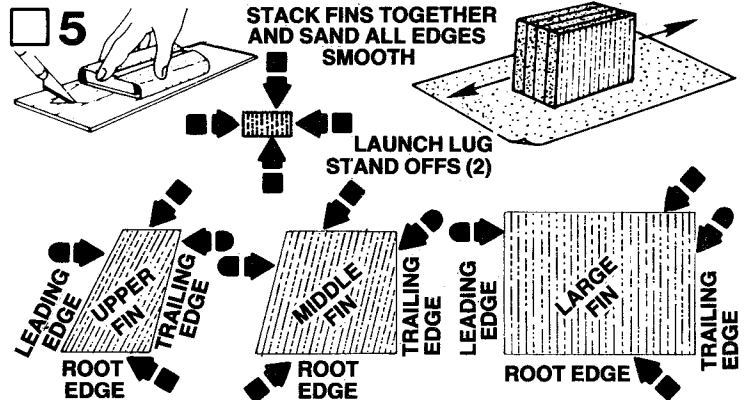
Cut a 1/8" slit in the main body tube where the 2 1/2" mark and the launch lug (LL) line cross. Slightly bow the engine hook (part E) upward and install it in the slit.

**4**



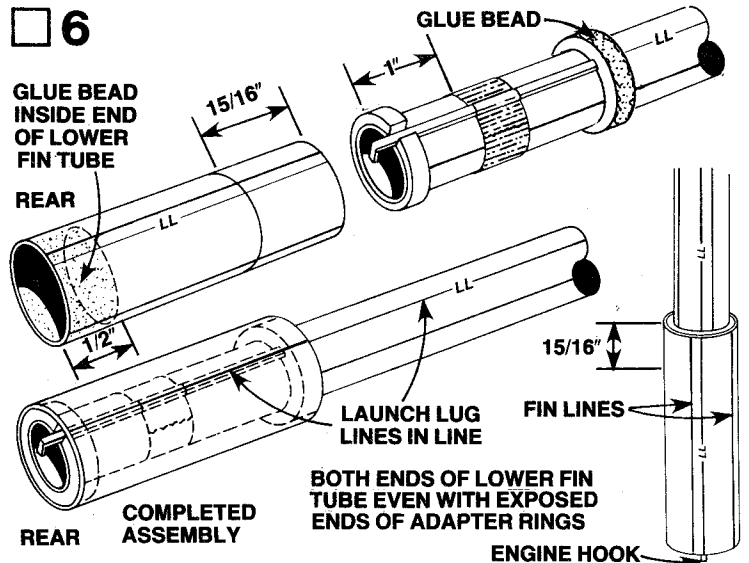
Cut a 1/8" wide section out of one of the centering rings (part F) as shown above. Slide this ring over the rear end of the main body tube/engine hook assembly. This ring should be even with the end of the body tube. Sand the inside edges of both adapter rings so they fit over the body tube without crushing the tube. Be sure the section cut out of the ring does not touch the sides of the engine hook. Wrap a 4" piece of masking tape around the engine hook/body tube assembly to hold the hook in place. Slide the other adapter ring over the front end of the main body tube down to the front end of the engine hook. Apply a glue reinforcement to the rear side of the front ring and the front side of the slotted ring all the way around where ring meets tube, and smooth with your finger. Set the assembly aside to dry completely.

**5**



Fine-sand both sides of the balsa die-cut sheet (part G). Free the fin edges with a sharp knife, then carefully remove the die-cut fins from the sheet. Stack matching sets of fins together as shown and sand all four edges as illustrated. Lightly sand both sides of each fin. Sand the leading edges and trailing edges of each set of fins to make them round. Leave the root (body) edges sanded "flat". The root edges may be identified by careful comparison with the drawings.

**6**



Test fit the lower fin tube on the rear end of the main body assembly. Align the launch lug line or the fin tube with the launch lug line on the main body tube. This should also align the launch lug line with the en-

# MARTE MK 2 BEFORE YOU START

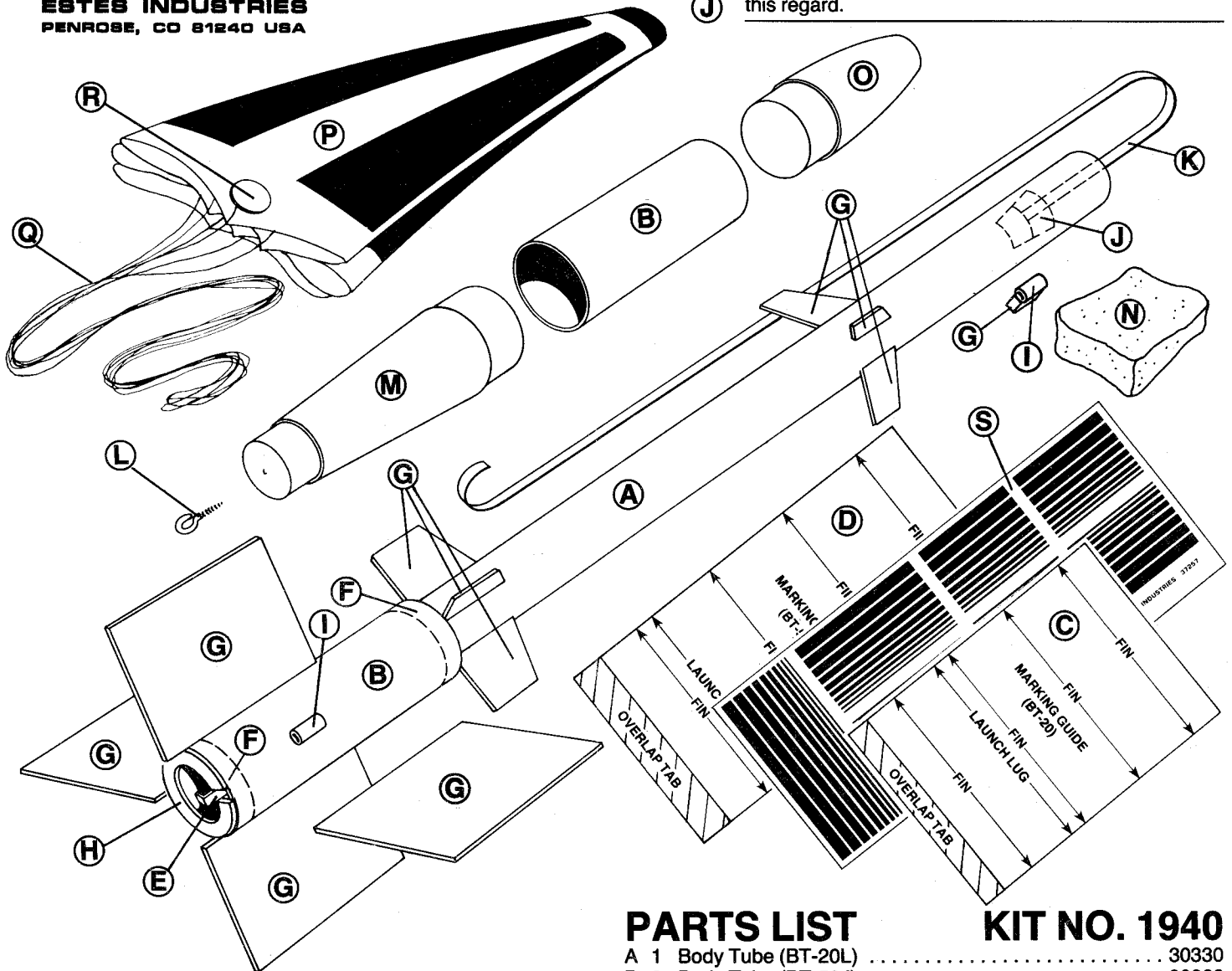
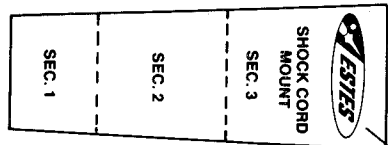
**SKILL LEVEL 3 - Recommended For Craftsman Rocketeers.**

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.



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PENROSE, CO 81240 USA



## PARTS LIST KIT NO. 1940

|   |   |                                      |        |
|---|---|--------------------------------------|--------|
| A | 1 | Body Tube (BT-20L)                   | 30330  |
| B | 2 | Body Tube (BT-50J)                   | 30362  |
| C | 1 | Main Body Tube Marking Guide (BT-20) | Page 5 |
| D | 1 | Lower Fin Tube Marking Guide (BT-50) | Page 5 |
| E | 1 | Metal Engine Hook (EH-2)             | 35025  |
| F | 2 | Centering Rings (AR-2050)            | 30164  |
| G | 1 | Balsa Die-Cut Fins (BF-1940)         | 32640  |
| H | 1 | Paper Adapter Ring Set (RA-2050)     | 30124  |
| I | 1 | Launch Lug (LL-2A)                   | 38175  |
| J | 1 | Shock Cord Mount                     | Page 1 |
| K | 1 | Shock Cord (SC-1)                    | 85730  |
| L | 1 | Screw Eye (SE-2A)                    | 38252  |
| M | 1 | Balsa Adapter (TA-2050)              | 70006  |
| N | 1 | Clay Weight (12 Grams)               | 85264  |
| O | 1 | Balsa Nose Cone (BNC-50J)            | 70256  |
| P | 1 | Parachute (PK-12A)                   | 85564  |
| Q | 1 | Shroud Line (SLT-72)                 | 38237  |
| R | 1 | Tape Discs Set (TD-3F)               | 38406  |
| S | 1 | Decal (KD-1940)                      | 37257  |

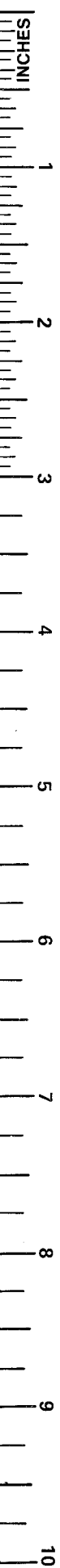
### RECOMMENDED ENGINES:

**A8-3, (1st Flt.), B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, and C6-7.**

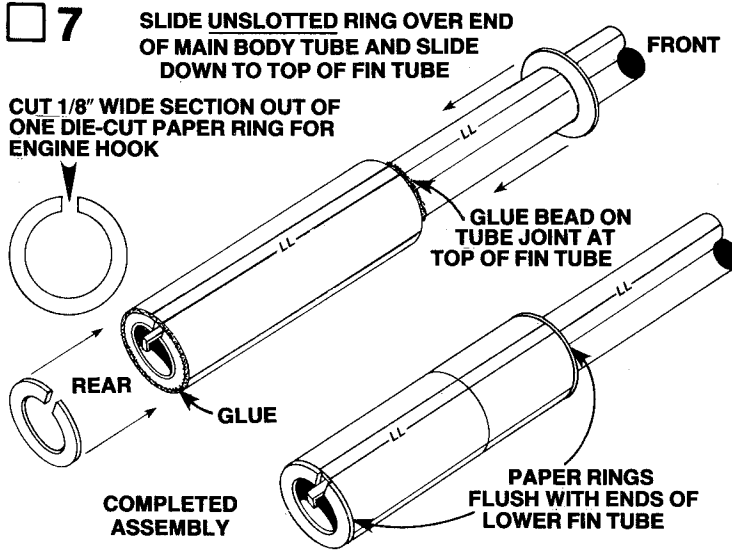
## TOOLS AND MATERIALS

In addition to the parts included in this kit you will need: Scissors, household white glue (Elmer's, Titebond, or similar), pencil, ruler, fine or extra-fine grit sandpaper, sanding sealer, a medium-size modeling paint brush, modeling knife with sharp blade. Gloss white, gloss green & gloss red spray enamel, and Gloss-Cote spray.

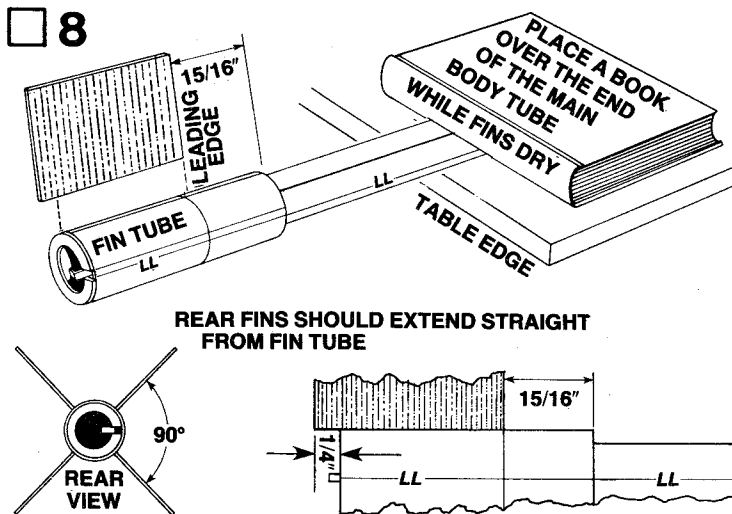
For easy and positive alignment of the rear fins on your model, we recommend the use of Estes' Fin Alignment Guide, Part No. 2231.



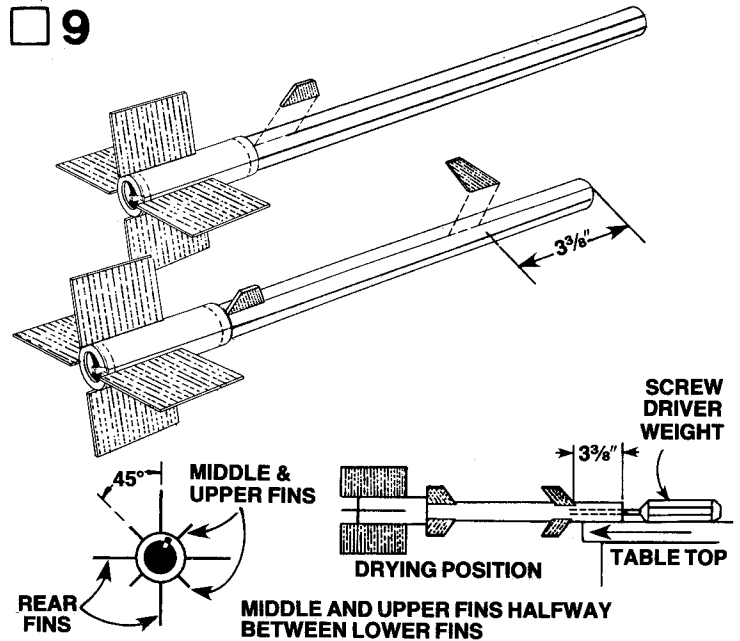
gine hook. Note that the fin lines on the main body tube will be half way between the fin tube fin lines. The fin lines should not line up with each other! If they do, go back to Steps 1 and 2 and correct your error. When all lines look like the above drawings, run a generous bead of glue in the rear end of the lower fin tube (the end opposite the line drawn 15/16" from the front end of the fin tube in Step #1), and on the front ring on the main body tube. Push the fin tube onto the rings on the main body tube in one smooth motion and be sure that the launch lug lines and engine hook are in alignment. (Be sure the ends of the lower fin tube are even with the exposed ends of the adapter rings.) Wipe any excess glue from both ends of the fin tube and set aside to dry completely.



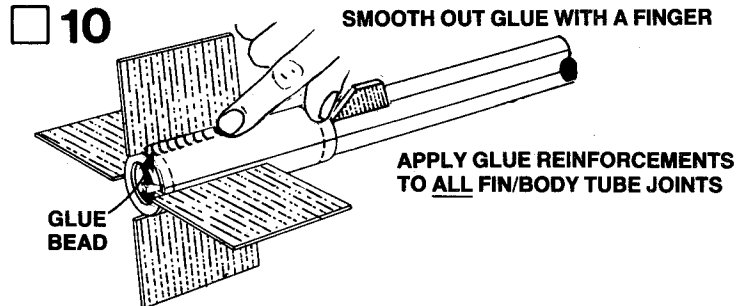
Carefully remove the die-cut paper rings (part H) from their card. Lightly sand inside and outside edges of both rings. Cut an 1/8" wide section from one ring as shown in the above illustration. Glue this ring to the rear edge of the fin tube with the slot over the engine hook. Slide the other ring over the front end of the main body tube. Be sure this ring slides easily down the main body tube and stops flush with the top of the fin tube. Slide this ring back up the main body tube 2" or 3". Apply a bead of glue around the top edge of the fin tube and slide the ring back down to the top of the fin tube into the glue. Hold the ring in place until it is firmly glued in position and there are no gaps between the ring and the top of the fin tube.



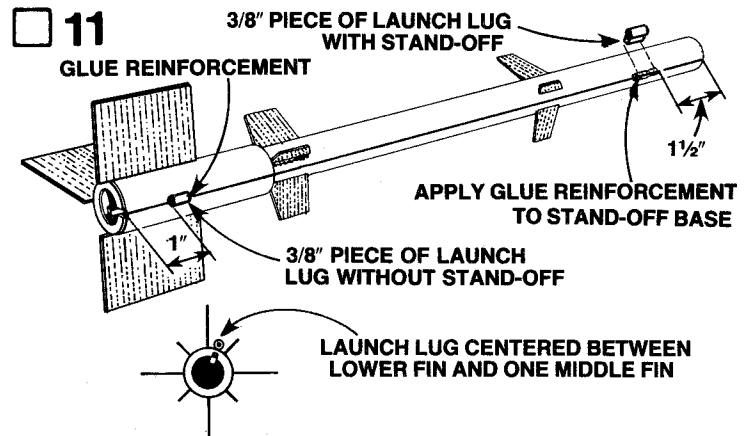
Locate the large fins you removed from the balsa sheet and sanded in Step #5. Run a bead of glue along one fin root edge and attach it to the fin tube so that its leading edge is on the 15/16" line and its trailing edge extends 1/4" beyond the rear end of the fin tube. Repeat this operation with the other 3 large fins. Be sure all fins extend straight away from the fin tube as shown above. Place the completed assembly on a table with the fins hanging over the edge and place a weight on the main body tube to hold it in place until the fins are dry. Do not place the model on its fins while they are drying.



Locate the middle fins from Step #5. Run a glue bead along one middle fin root edge and glue it to the main body tube up tight against the front edge of the fin tube/main tube junction. Repeat this operation with the other 3 middle fins. Make marks 3 3/8" from the front of the main body tube at each of the four upper body fin lines. Now glue the four upper fins to the main body tube being sure to place the tip of each fin's leading edge at the 3 3/8" marks. Sight down the body assembly from the rear and make sure the middle and upper fins extend straight away from the main body tube, and that they are exactly between the lower fins. When all fins are properly aligned, place the model on the edge of a table and use a heavy screw driver in the end of the tube to hold it in place while the fins dry.



Apply a bead of glue to both sides of one fin/body tube joint and smooth out with your finger, being sure to wipe off excess glue. Repeat with all twelve fins. When all glue reinforcements are done, rest the model on a table edge as you did in Step #9.

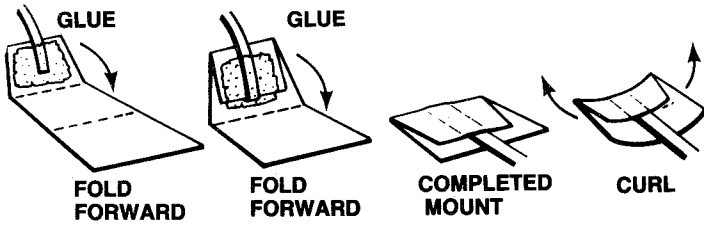


Cut two 3/8" pieces from the launch lug (part I). Glue one of the launch lugs to one of the standoffs found on the balsa sheet. You will not need the other standoff! Glue the launch lug with the standoff 1 1/2" from the front of the main body tube. Glue the other launch lug directly to the fin



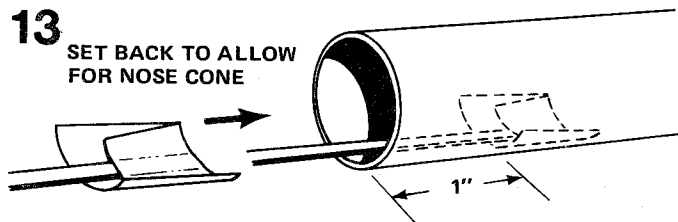
tube 1" from the rear edge of the fin tube. Make glue reinforcements where each launch lug/body tube joint is. Be sure the launch lugs are centered on the launch lug line and are in alignment with each other.

**12**



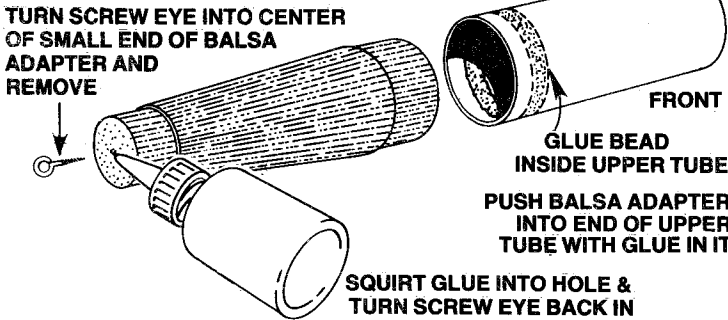
Cut out the shock cord mount (part J) found on page 1. Fold on dotted lines, then unfold and apply glue to Section 1. Lay the end of the shock cord (part K) into the glue. Fold over and apply glue to the back of Section 1 and the exposed portion of Section 2. Fold again to complete mount. Curl the edges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

**13**



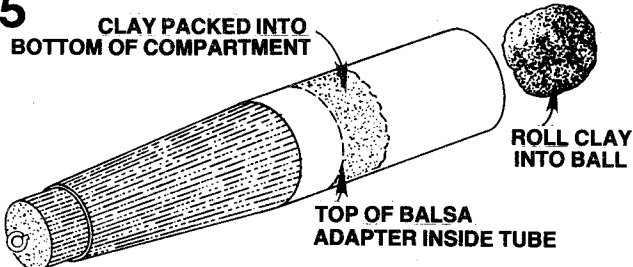
Use a finger or stick to apply glue to the inside of the front of the body tube, 1" to 2" from the front of the tube. Press the shock cord mount firmly into position in glue far enough from the front edge of the tube to allow clearance for the nose cone to fit into place. To insure a good bond use a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

**14**



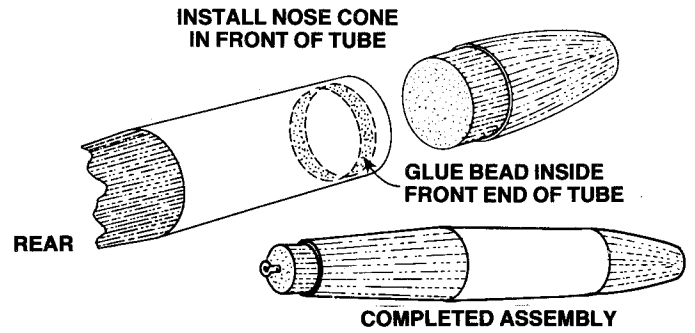
Locate the metal screw eye (part L) and the balsa adapter (part M). Turn the screw eye into the center of the small end of the balsa adapter and then turn it back out to remove it. Squirt glue into the hole made by the screw eye and reinstall it. Locate the other short body tube (part B) and run a bead of glue in one end of this tube. Push the large end of the balsa adapter into the end of the tube where you put the glue. Allow this assembly to dry.

**15**



Roll the clay weight (part N) into a ball that will fit into the upper tube. Place the clay in the tube, and pack it down against the top of the balsa adapter inside the tube with a pencil or dowel.

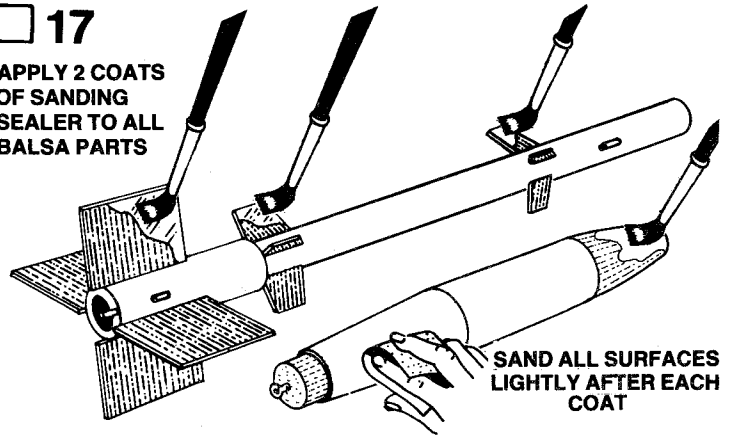
**16**



Run a bead of glue around the inside of the front of the tube and push the nose cone (part O) into place tight against the top of the tube. Allow the completed assembly to dry (thoroughly).

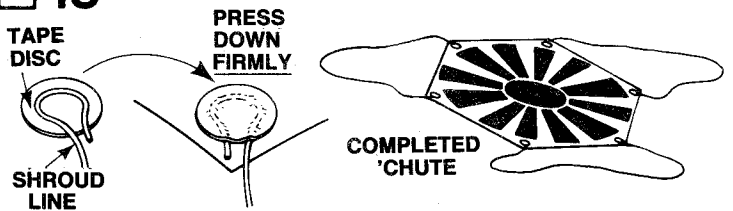
**17**

APPLY 2 COATS OF SANDING SEALER TO ALL BALSAs PARTS



Proper application of sanding sealer makes the rocket look better and reduces drag so that the rocket will fly higher. However, this step is not essential to make a safe, attractive rocket. Apply a coat of sanding sealer to all balsa parts. When sealer is dry, lightly sand all the sealed surfaces. Repeat sealing and sanding process until balsa grain no longer shows.

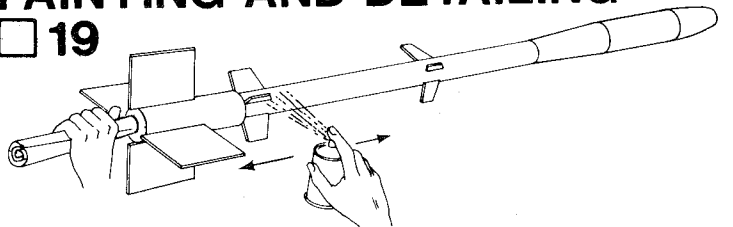
**18**



Cut out the parachute (part P) on its edge lines. Cut three equal lengths of shroud line (part Q). Attach line ends to the top of the parachute with tape discs (part R) 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. Set completed parachute aside until needed in Step 24.

**PAINTING AND DETAILING**

**19**



After the sanding sealer is completely dry, 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

# LAUNCHING COMPONENTS

To launch your rocket you will need the following items:

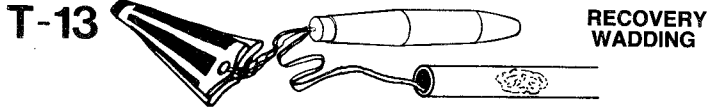
- An Estes model rocket launching system
- Flame resistant recovery wadding (Estes Cat. No. 2274)
- Estes A8-3 (1st flight), B4-4, B4-6, B6-4, B6-6, B8-5, C6-5, or C6-7 model rocket engines.

Use an A8-3 engine for your first flight.

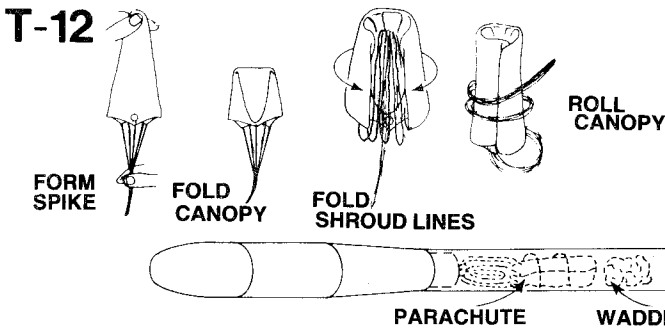
Be sure to follow the HIAA-NAR\* Model Rocket Safety Code when carrying out your model rocket activities.

\*HIAA – Hobby Industry Association of America  
NAR – National Association of Rocketry

## COUNTDOWN CHECKLIST

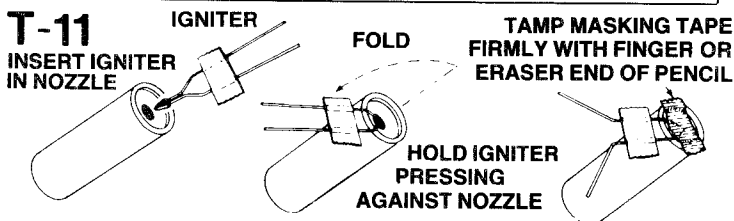


Slide 3 or 4 squares of loosely crumpled recovery wadding into the body tube. Usually this will fill the body tube for a distance equal to about 1-1/2 times its diameter.



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 line back along parachute and then back down to the 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 payload section into place.

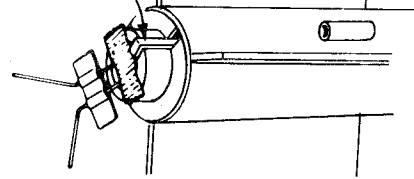
**NOTE:** DO NOT pack parachute until you are actually ready to launch. For maximum parachute reliability, lightly dust the 'chute with ordinary talcum powder before each flight, especially in cold weather.



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, B4-6, B6-4, B6-6, B8-5, C6-5, or C6-7 made by Estes.

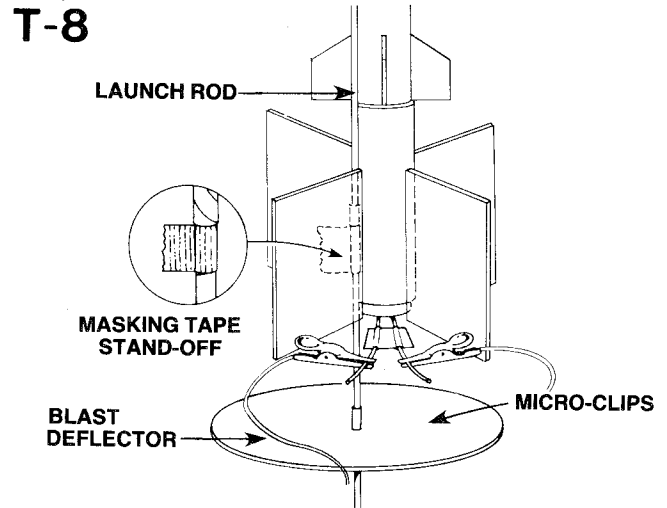
Use an A8-3 engine for your first flight.

**T-10** **ENGINE HOOK MUST LATCH SECURELY**



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!**



Slide the launch rod through rocket launch lugs and place rocket on launch pad. Make sure the rocket slides freely on the launch rod. Clean the micro-clips and attach them 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.

**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

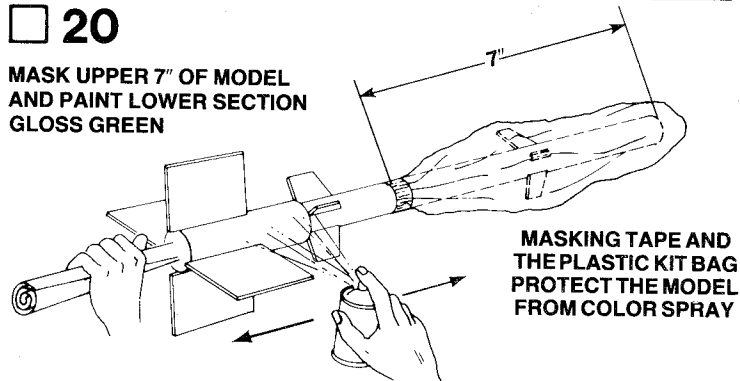
Disarm the launch panel. Wait one minute before approaching the rocket on the launch pad. Remove the rocket, clean the igniter residue from the nozzle of the engine, and carefully install a new igniter. Repeat the Countdown Checklist.

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.

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. To obtain a gloss, final coat should be applied slightly heavier. Let this dry overnight. Be sure paint is completely dry before painting colored sections.

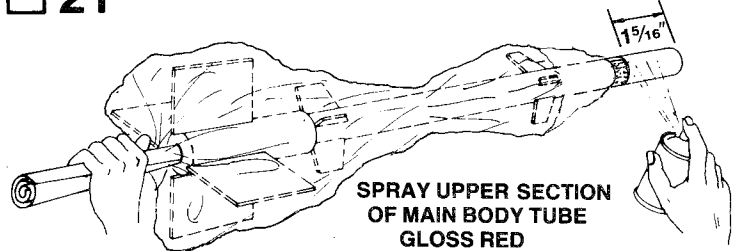
**20**

**MASK UPPER 7" OF MODEL AND PAINT LOWER SECTION GLOSS GREEN**



Wrap a piece of masking tape around the body 7" from the front of the tube. Be sure to remove the upper section of the model. Take the plastic bag your model came in and tape it to the masking tape on the body tube. Holding the model by the rolled up newspaper, paint the lower portion of the model gloss green. Apply paint as in Step 19 to obtain a glossy finish. Remove the masking tape and plastic bag and allow the model to dry thoroughly.

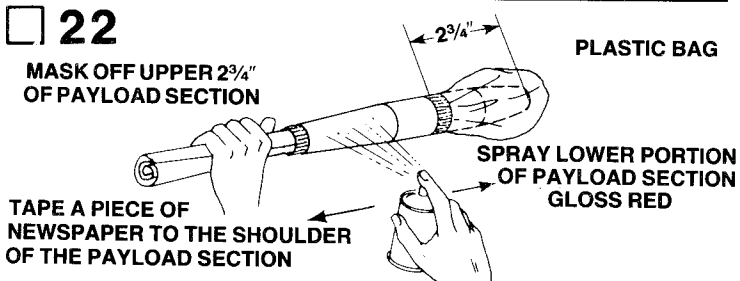
**21**



Wrap a piece of masking tape around the main body tube 15/16" from the front of the tube. Tape the kit bag over the portion of the model behind (to the rear) of this tape line. Spray the upper 15/16" of the main body tube gloss red. Remove the tape and bag and allow to dry completely.

**22**

**MASK OFF UPPER 2 3/4" OF PAYLOAD SECTION**

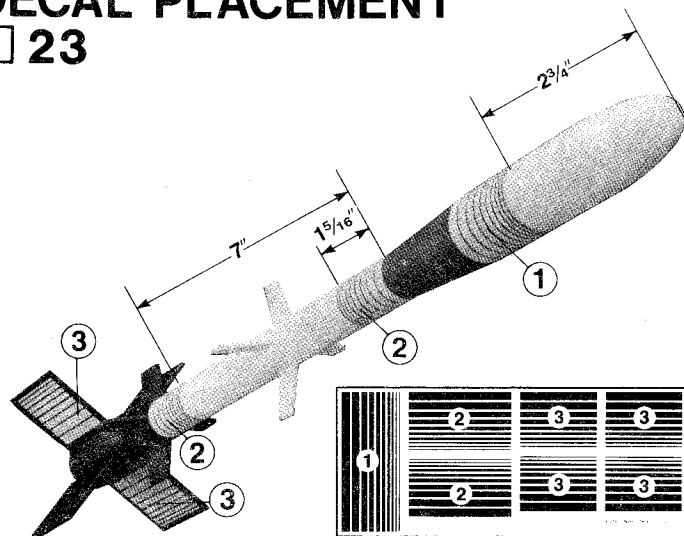


Wrap a piece of masking tape around the shoulder to completely cover it. Place a piece of masking tape along one edge of a piece of newspaper and wrap it around the balsa adapter shoulder on which

you put the masking tape. This will serve as a handle while you paint. Run a piece of masking tape around the payload tube 2 3/4" from the tip of the nose cone. Tape the kit's plastic bag over this strip of tape to protect the upper portion of the payload section. Now spray the lower portion of the payload section gloss red. Remove the masking tape and plastic bag, and allow paint to dry overnight.

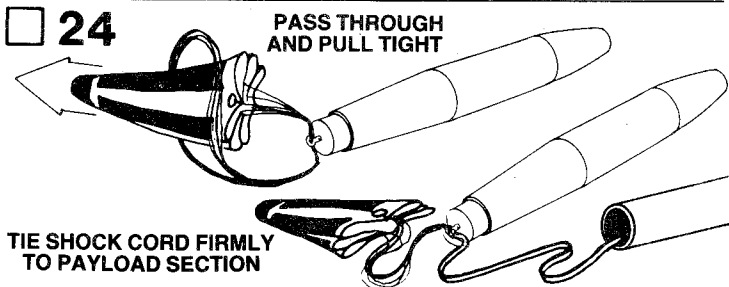
**DECAL PLACEMENT**

**23**



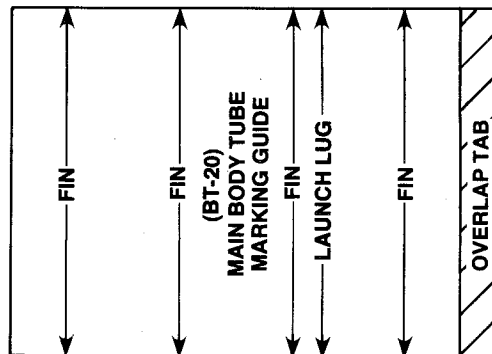
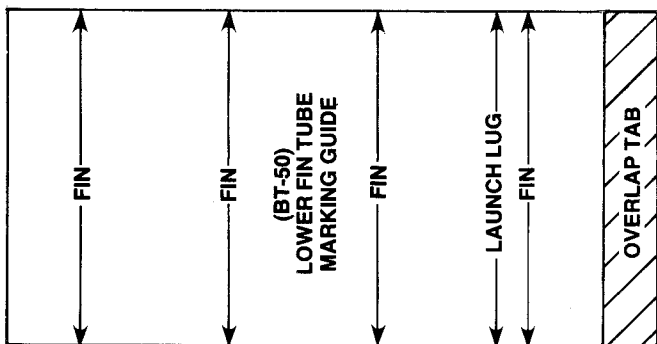
When all paint is dry, apply the decals (part S) in the positions shown. (A) Cut only one decal at a time from sheet. (B) Submerge decal in lukewarm water until decal slides on backing paper (usually 15 to 30 seconds). (C) Gently slide decal from backing paper onto model. (D) Move decal into exact position 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. We recommend that the completed model be sprayed with Testor's "Gloss Cote". This is a clear gloss spray paint that protects the model's finish.

**24**



Pass the shroud line loops through the screw eye on the payload section. Pass the parachute through the loop ends and pull the lines tight against the screw eye. Tie the free end of the shock cord firmly to the screw eye. A square knot or strong double knot should be used.

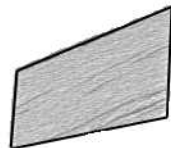
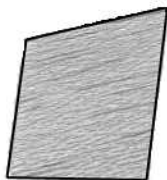
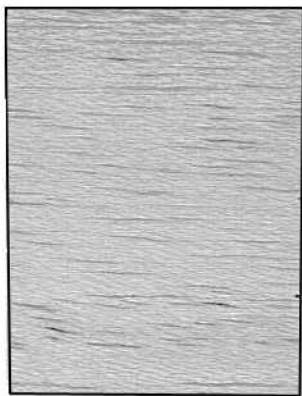
NOTE: The payload section should separate easily from rocket body tube, but should not be extremely loose. If fit is too tight, sand inside of body tube and shoulder of payload section with fine sandpaper. If fit is too loose, add a wrapping of masking tape to the shoulder of the payload section.



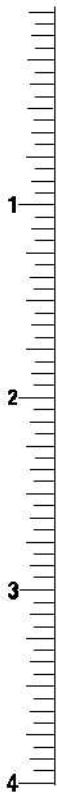


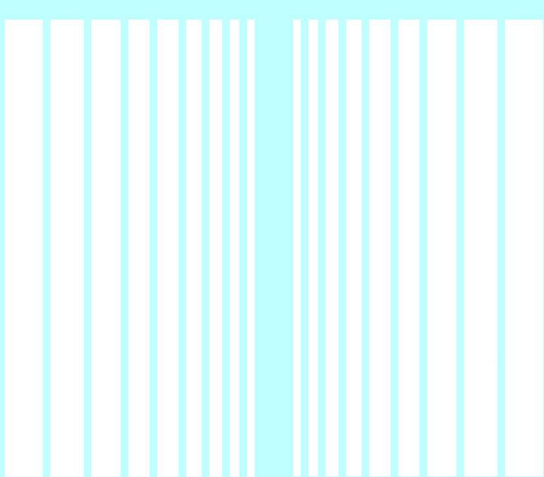
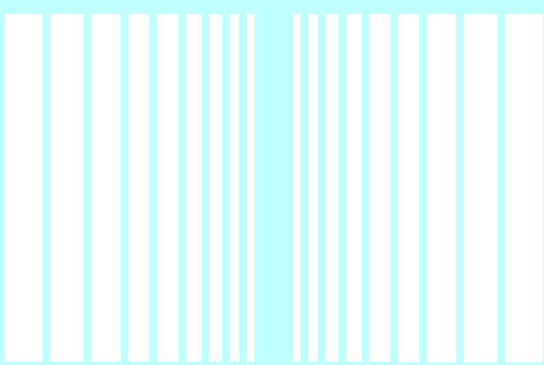
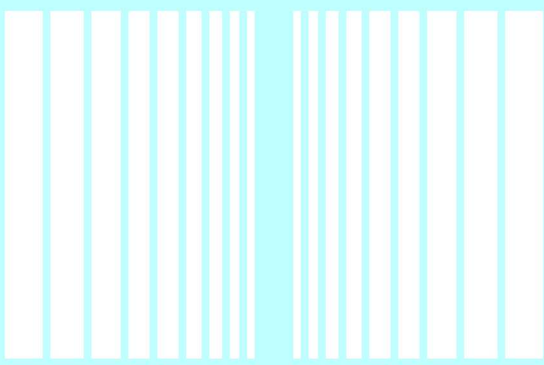


## Make 4 of Each Fin - 3/32" Balsa



## Make 2 Standoffs





ESTES INDUSTRIES 37257