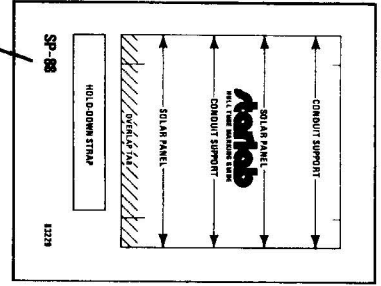
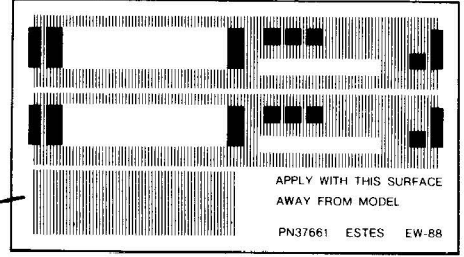
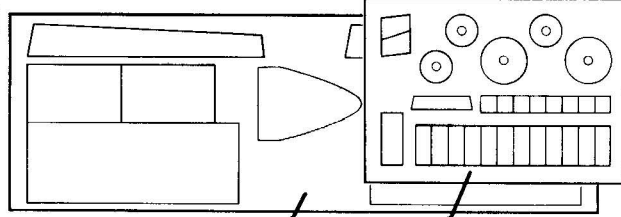
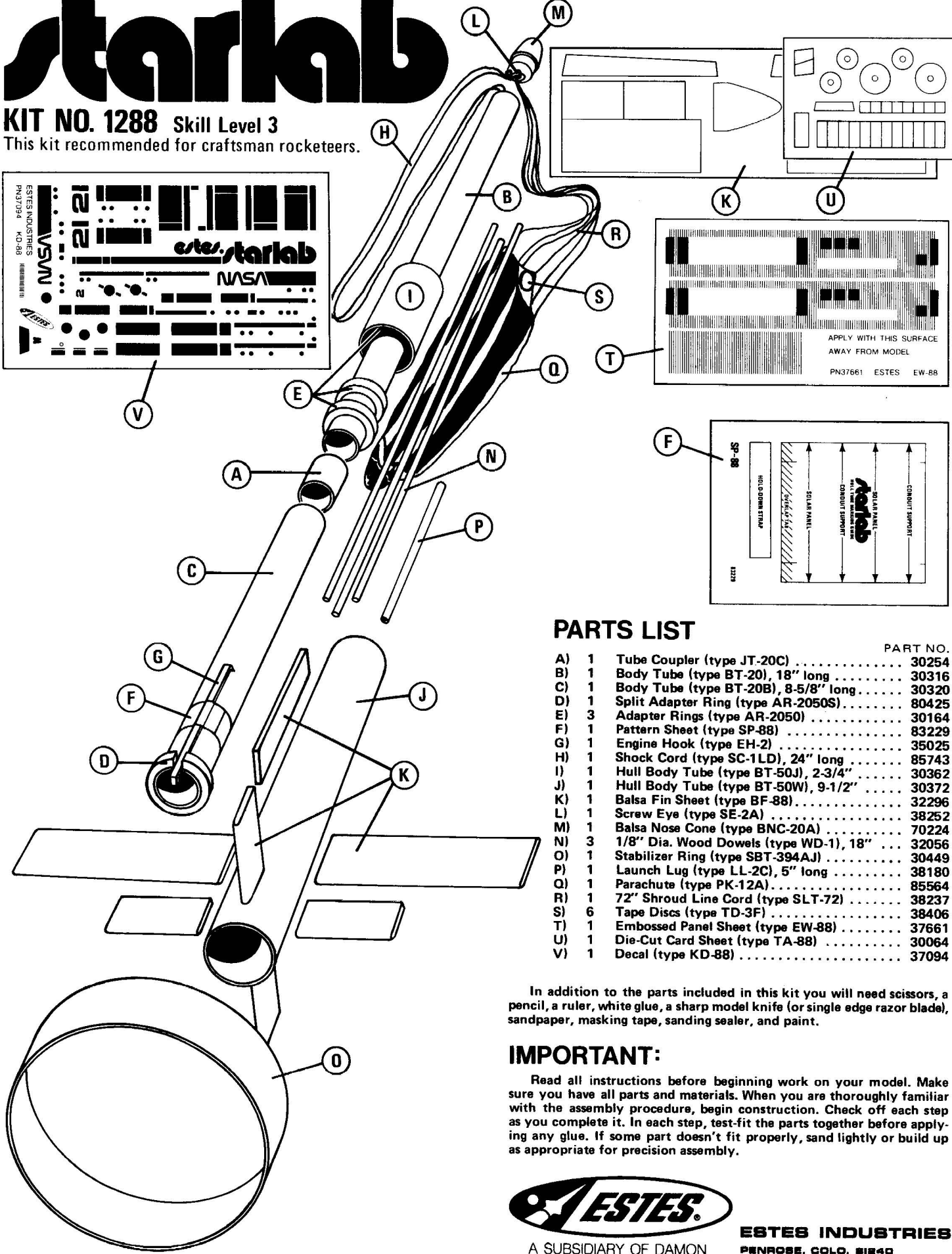
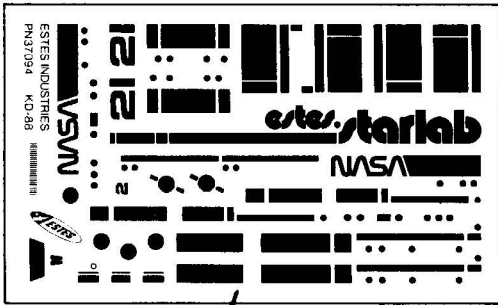




Starlab

KIT NO. 1288 Skill Level 3
 This kit recommended for craftsman rocketeers.



PARTS LIST

		PART NO.
A)	1 Tube Coupler (type JT-20C)	30254
B)	1 Body Tube (type BT-20), 18" long	30316
C)	1 Body Tube (type BT-20B), 8-5/8" long	30320
D)	1 Split Adapter Ring (type AR-2050S)	80425
E)	3 Adapter Rings (type AR-2050)	30164
F)	1 Pattern Sheet (type SP-88)	83229
G)	1 Engine Hook (type EH-2)	35025
H)	1 Shock Cord (type SC-1LD), 24" long	85743
I)	1 Hull Body Tube (type BT-50J), 2-3/4"	30362
J)	1 Hull Body Tube (type BT-50W), 9-1/2"	30372
K)	1 Balsa Fin Sheet (type BF-88)	32296
L)	1 Screw Eye (type SE-2A)	38252
M)	1 Balsa Nose Cone (type BNC-20A)	70224
N)	3 1/8" Dia. Wood Dowels (type WD-1), 18"	32056
O)	1 Stabilizer Ring (type SBT-394AJ)	30449
P)	1 Launch Lug (type LL-2C), 5" long	38180
Q)	1 Parachute (type PK-12A)	85564
R)	1 72" Shroud Line Cord (type SLT-72)	38237
S)	6 Tape Discs (type TD-3F)	38406
T)	1 Embossed Panel Sheet (type EW-88)	37661
U)	1 Die-Cut Card Sheet (type TA-88)	30064
V)	1 Decal (type KD-88)	37094

In addition to the parts included in this kit you will need scissors, a pencil, a ruler, white glue, a sharp model knife (or single edge razor blade), sandpaper, masking tape, sanding sealer, and paint.

IMPORTANT:

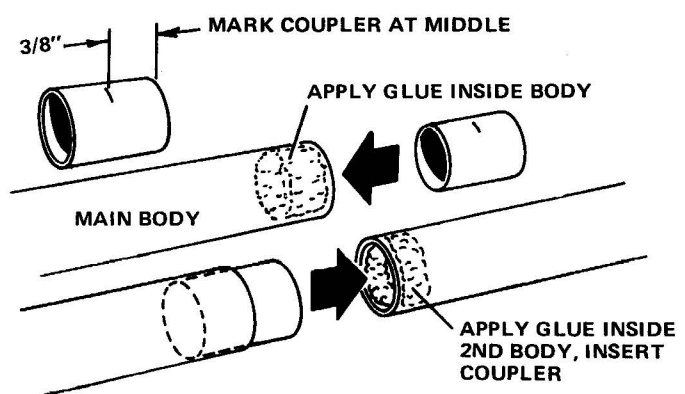
Read all instructions before beginning work on your model. Make sure you have all parts and materials. When you are thoroughly familiar with the assembly procedure, begin construction. Check off each step as you complete it. In each step, test-fit the parts together before applying any glue. If some part doesn't fit properly, sand lightly or build up as appropriate for precision assembly.



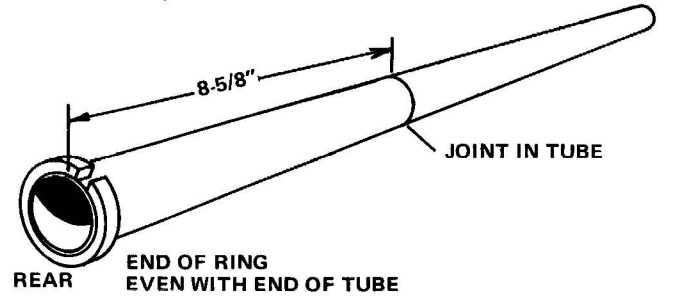
A SUBSIDIARY OF DAMON

ESTES INDUSTRIES
 PENROSE, COLO. 81240

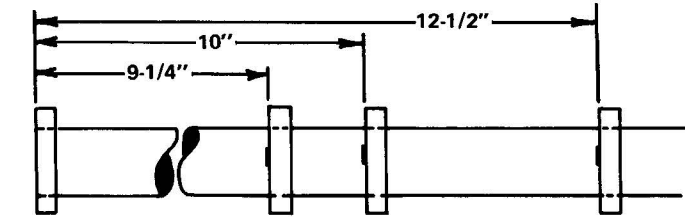
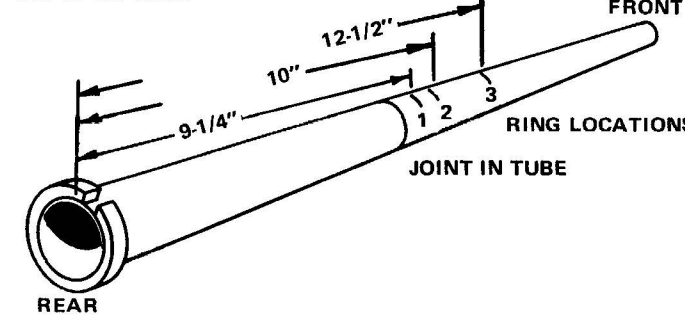
ASSEMBLY INSTRUCTIONS



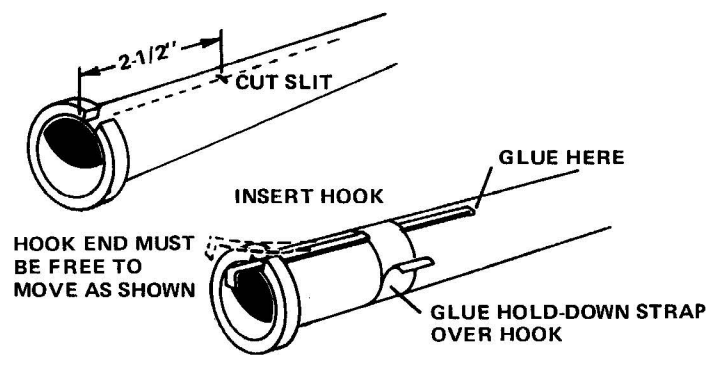
1 Assemble the main body. Mark the tube coupler (part A) as its middle. Smear glue around the inside of one end of the 18" body tube (part B). Insert the coupler into the glued body end so half of the coupler is in the tube. Let the glue set, then smear glue inside one end of the 8-5/8" tube (part C) and slide glued end onto the coupler to join the tubes. Lay the assembly on a flat table top and roll gently to make sure the tubes are straight.



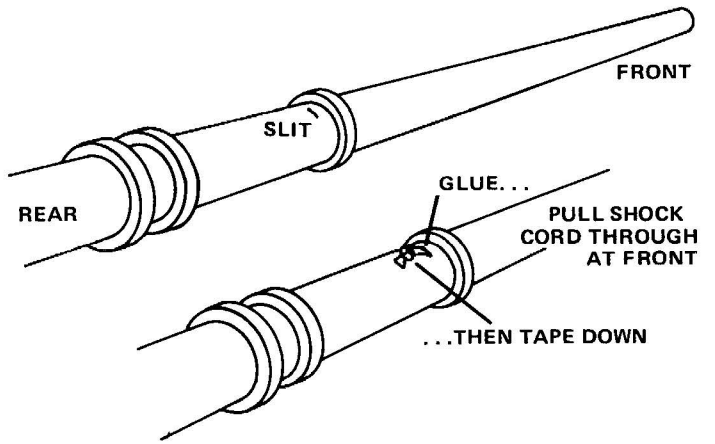
2 Glue the split adapter ring (part D) to the main body at the end nearest the joint in the tube. This end is the rear of the rocket. The rear of the ring should be even with the rear of the tube.



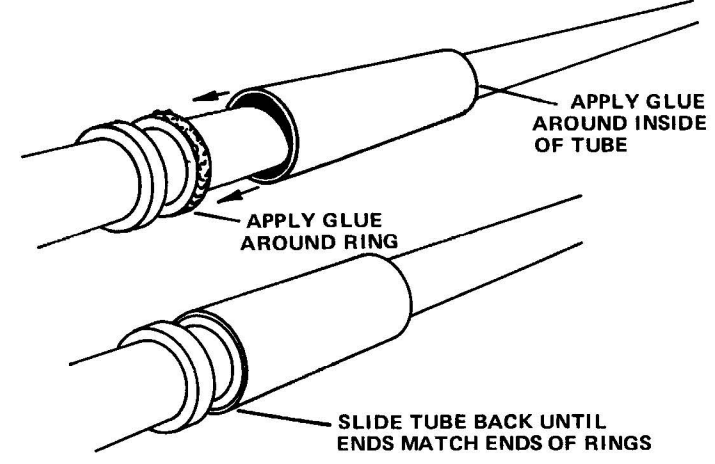
3 Mark the tube for the rear edge locations of the remaining three adapter rings (part E). Mark the tube at 9-1/4", 10" and 12-1/2" from the rear. Starting with the ring which will be nearest the rear, apply a line of glue around the tube about 1/4" in front of the 9-1/4" mark. Slide a ring onto the tube from the front and slide it back until the rear of the ring is on the mark. Repeat at the 10" location and finally at the 12-1/2" location.



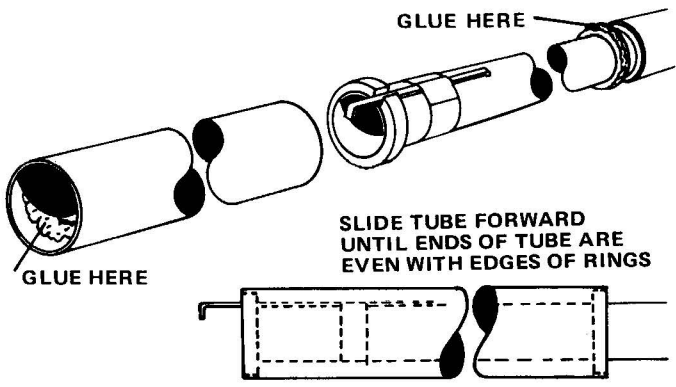
4 Cut a 1/8" slit in the body, directly in line with the gap in the split adapter ring, 2-1/2" from the end of the body. Cut out the hold-down strap from the pattern sheet (part F). Insert one end of the engine hook (part G) into the slit and lay the hook along the body so the other end passes through the gap in the split ring. Smear glue over one side of the hold-down strap and wrap it around the body, centered over the hook. Apply a drop of glue over the forward end of the engine hook.



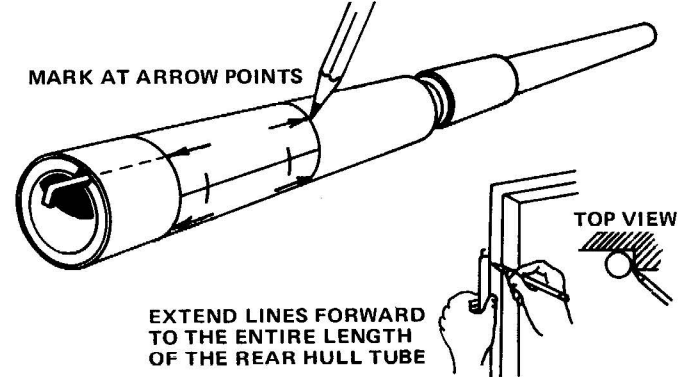
5 Cut a 1/8" wide slit in the body just behind the forward ring. Tie a knot in one end of the shock cord (part H). Poke the other end of the shock cord into the slit, working it through the hole until you can finally pull the knot tight against the body. Apply glue to the hole and knot to seal the hole. Apply a piece of tape over the knot to hold the end of the cord down out of the way for later assembly steps.



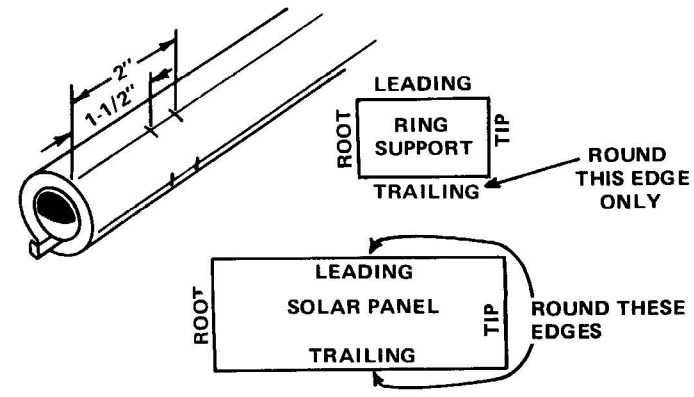
6 From the front, slide the shorter outer hull tube (part I) onto the forward ring and almost to the next ring. Use a toothpick to apply a ring of glue just inside of the front end of the hull tube. Apply glue around the outside of the second ring. Slide the hull tube back until the ends of the tube are even with the edges of the rings as illustrated. Wipe away excess glue.



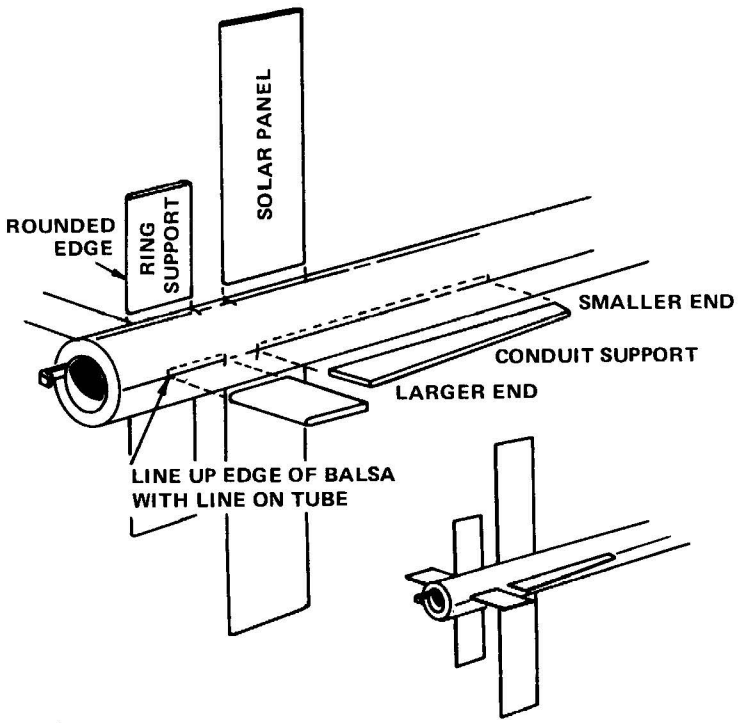
7 From the rear, slide the longer outer hull tube (part J) onto the split ring and almost to the next ring. Apply glue around the inside of the rear end of the hull tube. Apply glue around the exposed outer surface of the ring in front of the tube. Slide the hull tube forward until the ends of the tube are even with the edges of the rings as illustrated. Wipe away excess glue.



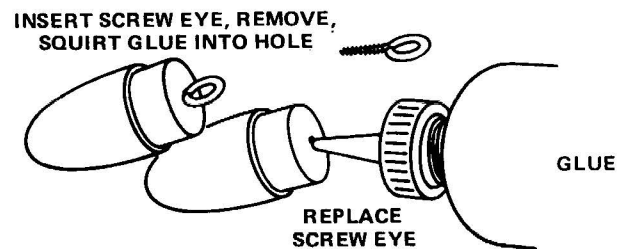
8 Cut out the hull tube marking guide from the pattern sheet. Wrap it around the rear hull tube near the rear of the model and mark the tube at each arrow point as shown. Use the edge of a door frame as a guide to draw a straight connecting line between each matching pair of marks. Extend the lines forward the entire length of the rear hull tube. Draw two of the lines (on opposite sides of the tube) so they continue the length of the forward hull tube.



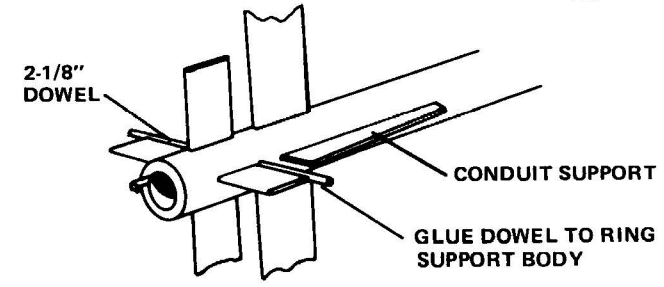
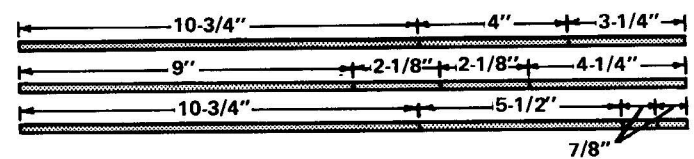
9 Mark each of the lines drawn in step 8 at points exactly 1-1/2 inches and 2 inches from the rear of the tube. Fine-sand both sides of the balsa sheet (part K), then carefully remove the die-cut parts from the sheet. Free the edges with a sharp knife. Sand the leading and trailing edges of the "solar panel" fins round. Sand to round the trailing edge only on the ring support pieces. Leave all other edges square.



10 Glue the ring support pieces to the outer hull. Match the square front edge of each with the mark 1-1/2" from the end of the tube. The edge of each piece should be aligned carefully with the guide line on the tube. (Make sure each piece is to the same side of the guide line.) Glue solar panels and conduit supports in place with the rear of each on a mark, 2" from the tube end. Be certain each part is directly in line with the ring support behind it. Adjust all these parts so they project straight away from the tube. Do not lay the rocket on its side while the glue is wet.

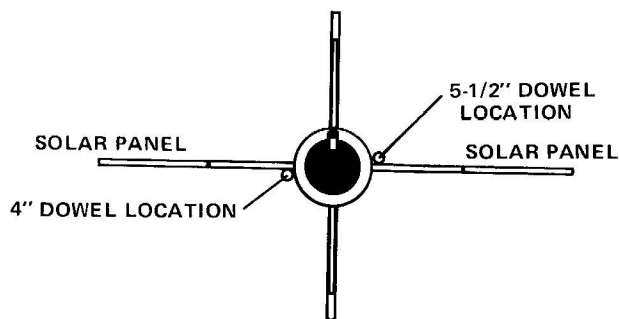
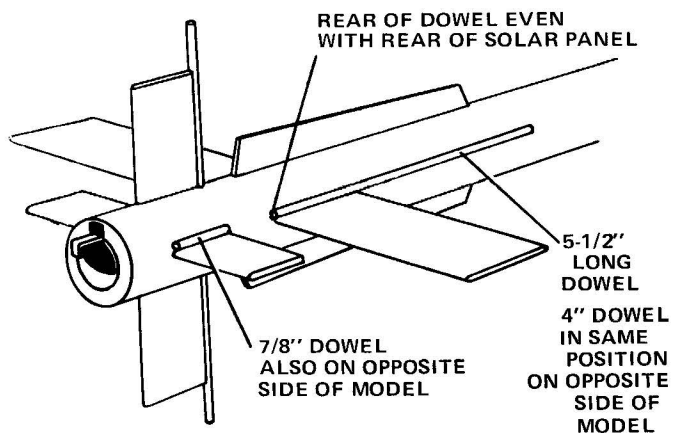


11 Insert the screw eye (part L) into the base of the nose cone (part M). Remove the screw eye and squirt a small amount of glue into the hole. Re-insert the screw eye.

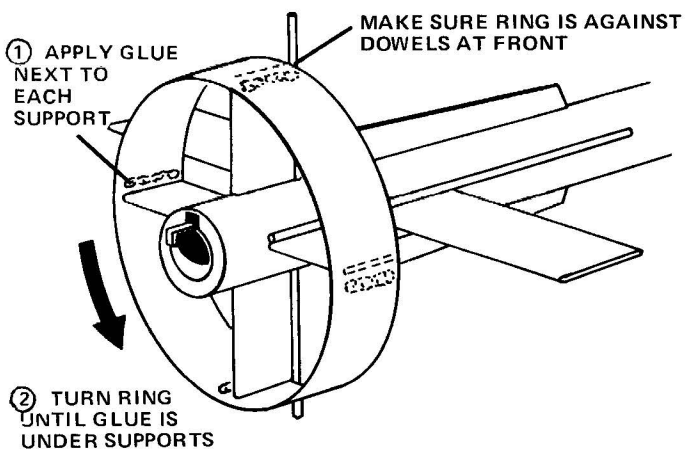


12 Measure, mark, and cut the dowels (part N) into the lengths shown. Glue the two 2-1/8" pieces to the front edge of the two opposite ring supports which are in line with the con-

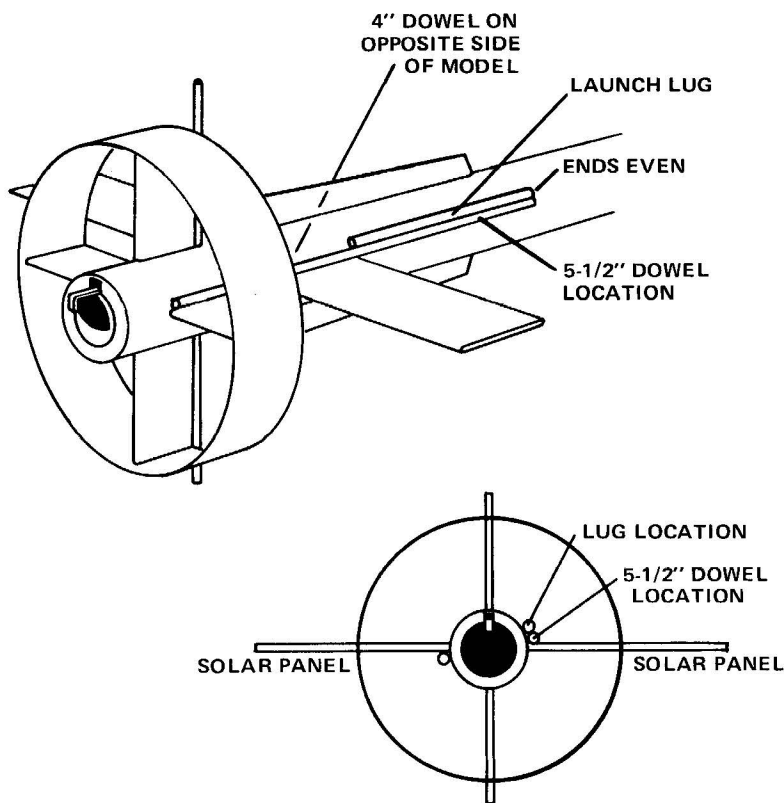
duit supports. One end of each piece should be glued against the hull tube. (Save the other dowel pieces for use in later steps.)



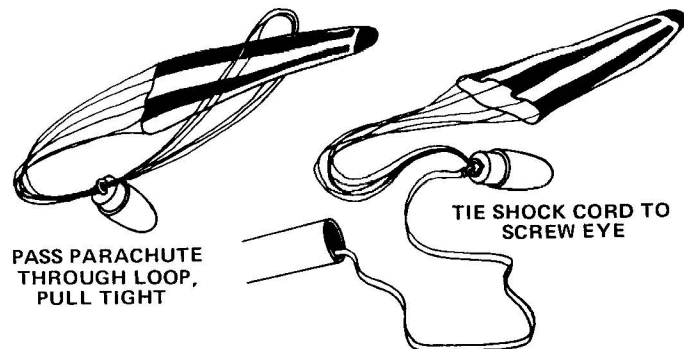
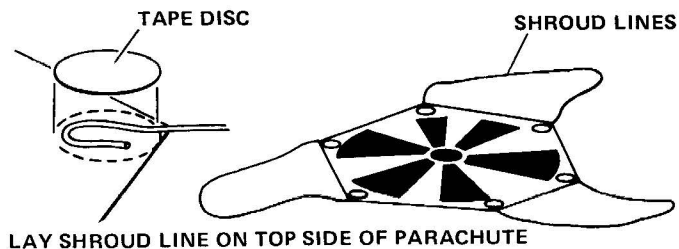
13 Glue the two 7/8" dowels, the 5-1/2" dowel, and the 4" dowel in place on the hull body as shown. Notice the locations for the dowels in the illustration--the rear of each dowel is even with the rear of the balsa part it is next to.



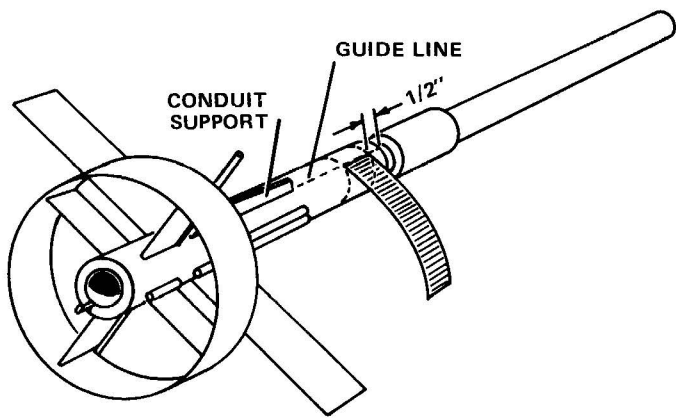
14 Test the fit of the ring (part O) on the ring supports. The ring should fit evenly on the four supports with its front touching the leading edge dowels. If necessary, sand the supports carefully to get a good fit.
Glue the ring to the supports. Apply a line of glue to the inside of the ring next to each support (each glue line to the same side of its support). Turn the ring to bring the glue between supports and ring.



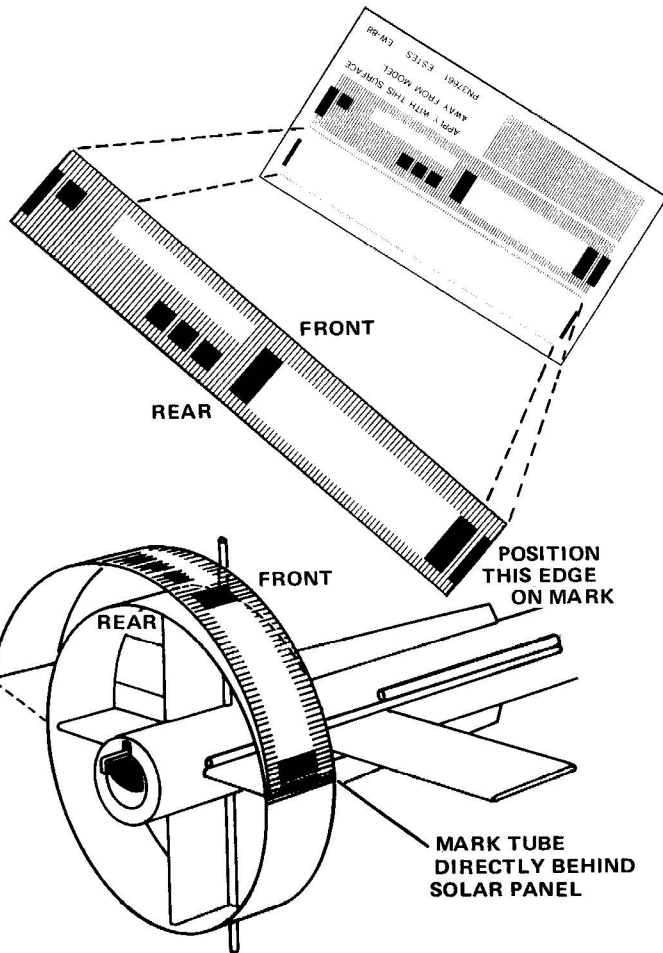
15 Glue the launch lug (part P) to the outer hull alongside the longest dowel from step 13. The front of the lug should be even with the front of the dowel. Notice that the lug is on the side of the dowel away from the solar panel.



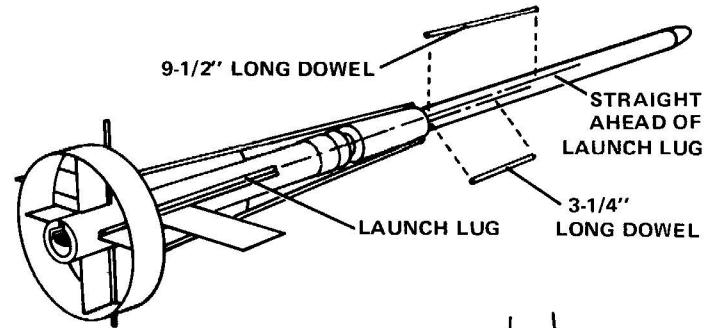
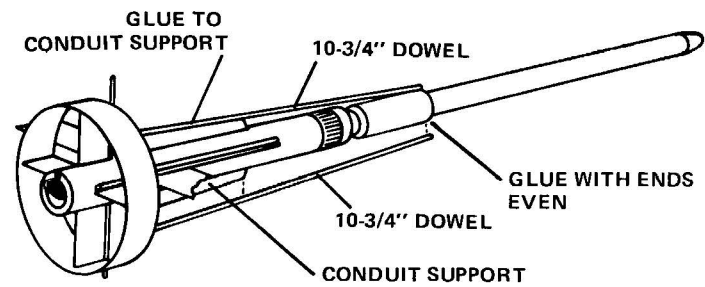
16 Cut out the parachute (part Q) on its edge lines. Cut three 24" lengths of shroud line (part R). Attach line ends to top of parachute with tape discs (part S) as shown. Pass shroud line loops through screw eye in nose cone. Pass parachute through loop ends and draw lines tight against screw eye. Set knot with a drop of glue. Tie free end of shock cord to screw eye.



- 17 Separate the embossed panels (part T), using a sharp knife to free their edges. The small panel fits on the rear hull tube, 1/2" from its front. Wrap the panel around the tube in the correct position and mark around the tube with a pencil along the front of the panel. Remove the panel, apply a thin layer of glue to its back side, and wrap it around the tube, starting at the guide line ahead of a conduit support. Hold the ends of the panel until the glue sets.



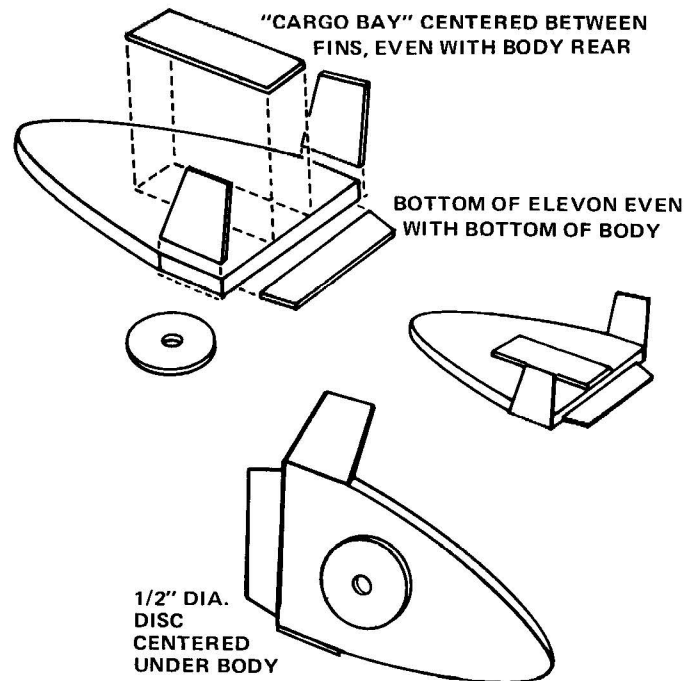
- 18 Mark the ring directly behind a solar panel as shown. Apply a thin layer of glue to the back side of one of the remaining embossed panels. Turn the embossed panel so the three small squares are to the rear as in the drawing. Wrap the panel onto the ring, covering one half of the ring, starting with the panel end of the mark. Hold ends down while the glue sets. Apply the remaining panel the same way.



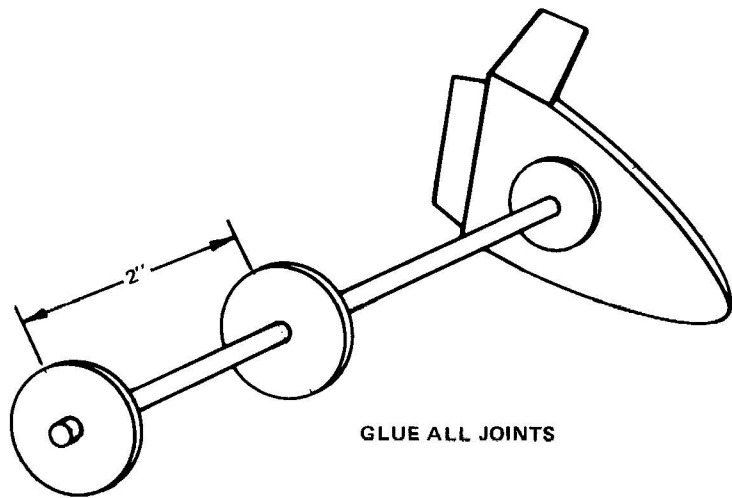
SIGHT ALONG MODEL FROM FRONT TO BE SURE DOWEL IS STRAIGHT



- 19 Glue the 10-3/4" long dowels to the conduit supports and the front of the forward hull tube. The front of each dowel should be even with the front of the tube. Glue the 9-1/2" dowel to the main body with its rear against the hull body, directly ahead of the launch lug. Sight along the tube from the front to be sure the dowel is straight. Glue the 3-1/4" dowel in place, 1/8" to the side of the 9-1/2" dowel as shown.

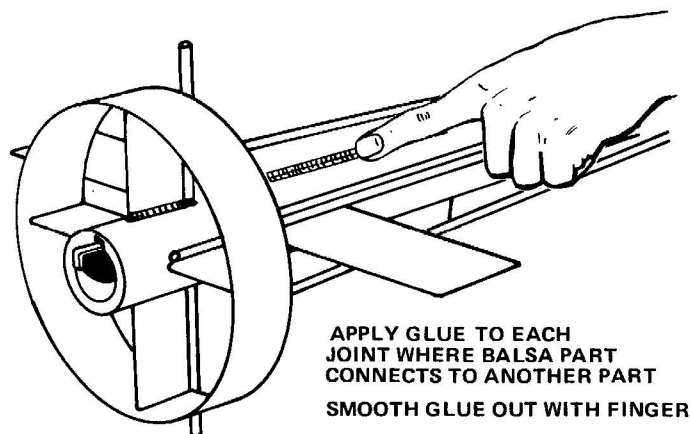


- 20 Glue the fins, elevon, and small support disc to the balsa shuttle body as shown. After the glue is dry, sand the leading edges of the balsa body to round them.



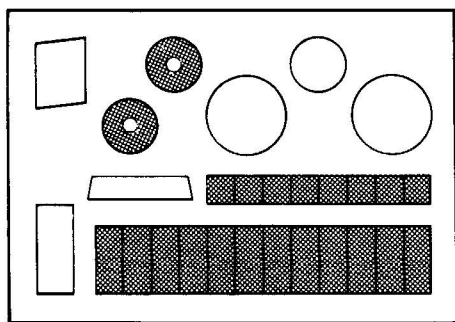
GLUE ALL JOINTS

21 Position and glue the two large card discs on the 4-1/4" dowel, one at an end and the other 2" from the first disc. Glue the other end of the dowel in the hole in the disc on the bottom of the shuttle. Hold the dowel in place while the glue sets.

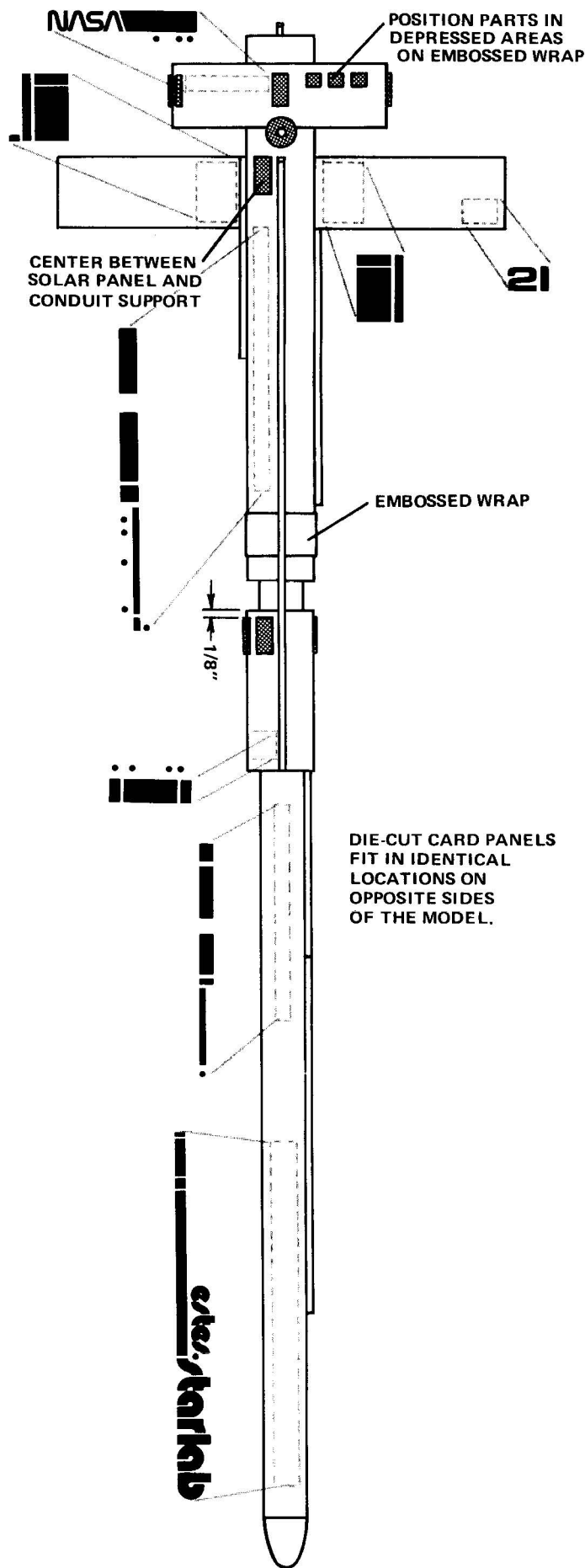


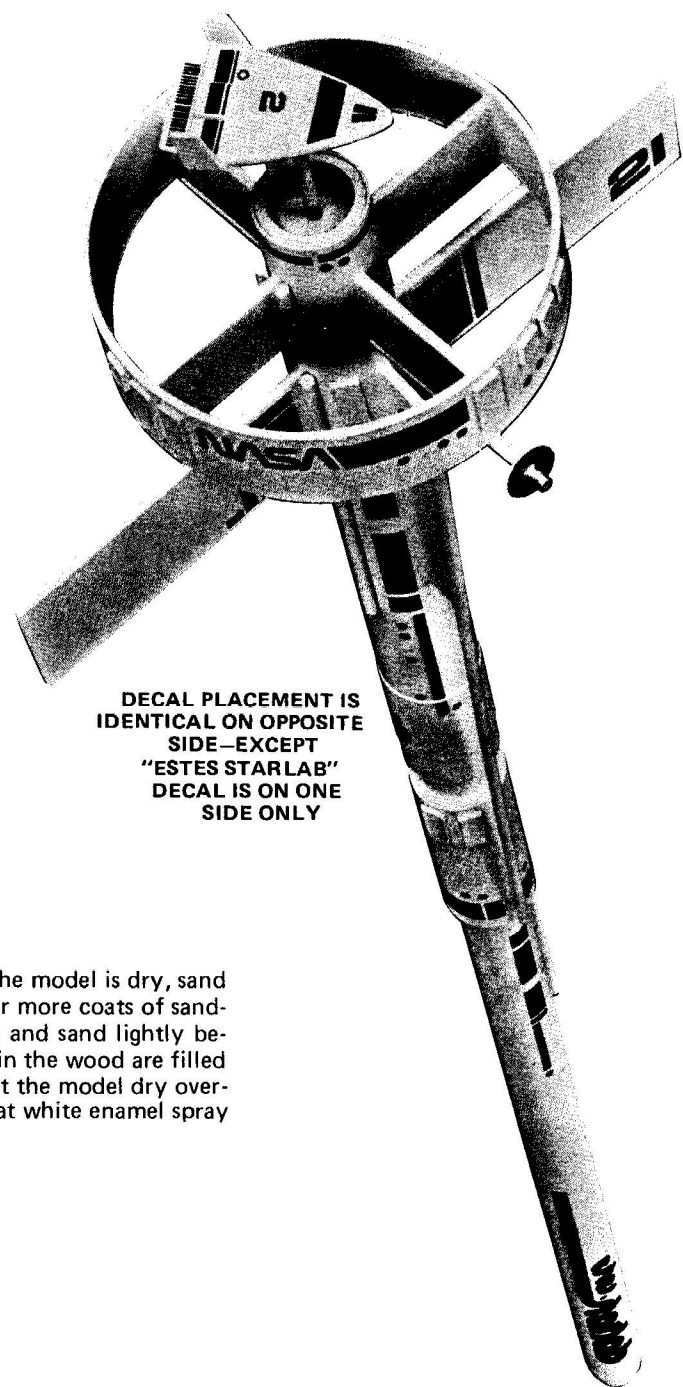
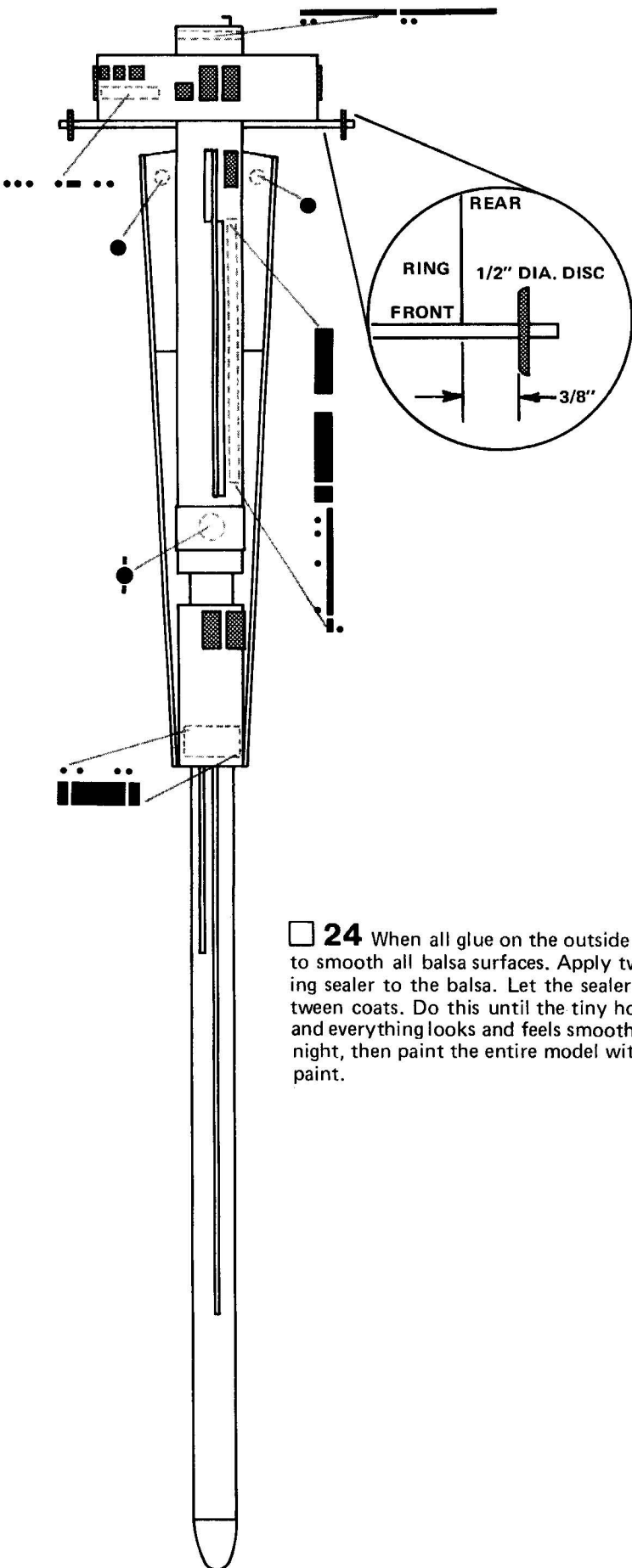
APPLY GLUE TO EACH JOINT WHERE Balsa PART CONNECTS TO ANOTHER PART SMOOTH GLUE OUT WITH FINGER

22 Apply a glue reinforcement to each joint where a sheet balsa part connects to another part. Holding the rocket horizontally, apply a line of glue to the joint and smooth it out with your finger. Support the rocket horizontally while the glue dries.



23 Glue the card detail pieces (part U) shown in the illustrations at the right in place. Six small rectangles and eight squares fit on the smooth sections of the ring. Don't use too much glue, or you'll have a messy joint. The other six small rectangles glue to the hull in the positions shown, identically on opposite sides of the model. Glue two small discs to the dowels ahead of the ring, 3/8" from the ring as pictured.





DECAL PLACEMENT IS IDENTICAL ON OPPOSITE SIDE—EXCEPT "ESTES STARLAB" DECAL IS ON ONE SIDE ONLY

24 When all glue on the outside of the model is dry, sand to smooth all balsa surfaces. Apply two or more coats of sanding sealer to the balsa. Let the sealer dry and sand lightly between coats. Do this until the tiny holes in the wood are filled and everything looks and feels smooth. Let the model dry overnight, then paint the entire model with flat white enamel spray paint.

25 After the paint on the model has dried completely, apply decals (part V). To apply the water-transfer decals, cut out an individual section of the decal and dip it in lukewarm water for 10 to 15 seconds. When the decal slides easily on the backing paper, slip it from the backing sheet onto the model. Blot excess water away. Apply all decals in the locations shown in the illustrations on this page and the next.

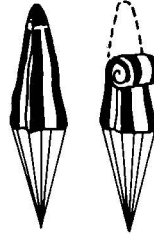


COUNTDOWN CHECKLIST

RECOVERY WADDING



T-14 Pack four or five squares of loosely crumpled recovery wadding into the body tube from the front. As you install the wadding, hold the shock cord stretched along one side of the body and push the wadding back with a long pencil or ball point pen.



FOLD AND WRAP SHROUD LINES AROUND PARACHUTE



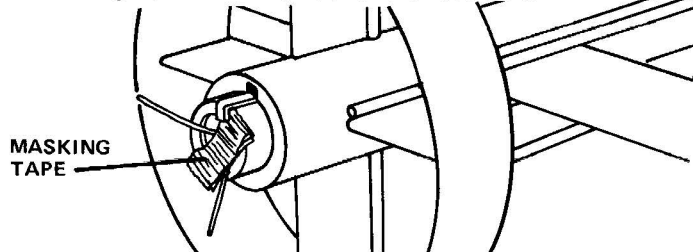
INSERT AFTER WADDING

T-13 Fold the parachute into a triangular shape. Roll 'chute tightly as shown and wrap shroud lines around it. If 'chute is too large, unroll it and repack until it slides easily into rocket. A fit that is too tight may prevent parachute from ejecting properly.

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-12 Pack shock cord neatly into rocket, then slide nose cone into place. Nose cone should separate easily from rocket body tube, but should not be extremely loose. If it is too tight, sand inside of body tube end and shoulder of nose cone with extra fine sandpaper.

If nose cone is too loose, add a wrapping of transparent tape or masking tape to the shoulder of the nose cone.



T-11 Select an engine and install an igniter as directed in the engine instructions.

T-10 Insert engine into rocket. Engine hook must latch securely over end of engine.

T-9 Disarm the launch panel--remove safety key.

T-8 Place rocket on launch pad, making sure rocket slides freely on launch rod. Clean the micro-clips and attach them to the igniter.

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!!

MISFIRE PROCEDURE

Occasionally the igniter will heat and burn into two pieces without igniting the engine. This is almost always caused by a failure to install it correctly. Disarm the launch panel, remove the model, clean the igniter residue from the nozzle, and install a new igniter. Follow the launching procedure again.

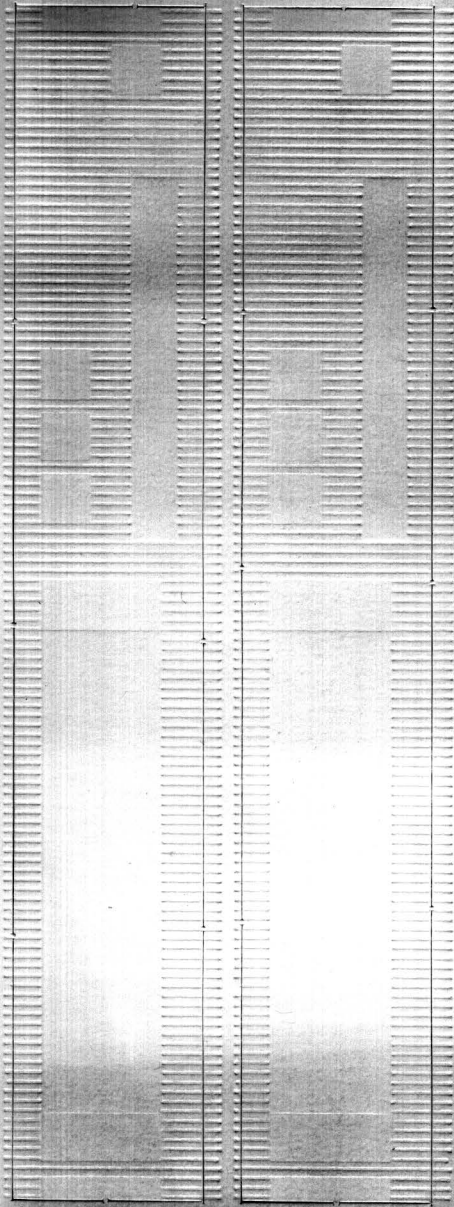
LAUNCHING COMPONENTS

To launch your model you will need the following items:

- An Estes model rocket launching system.
- Parachute recovery wadding (Estes Cat. No. 2274).
- Estes B6-4 or C6-5 model rocket engines. (Use a B6-4 engine for the first flight.)

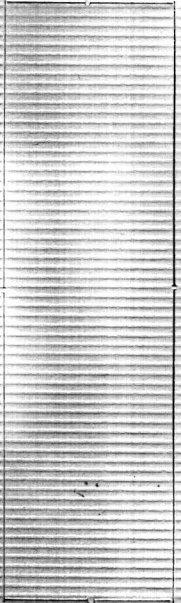
Be sure to follow the HIAA-NAR* Model Rocketry Safety Code when carrying out your model rocketry activities.

*HIAA-NAR - Hobby Industry Association of America
National Association of Rocketry



APPLY WITH THIS SURFACE
AWAY FROM MODEL.

1 Inch



PN37661 ESTES EW-88

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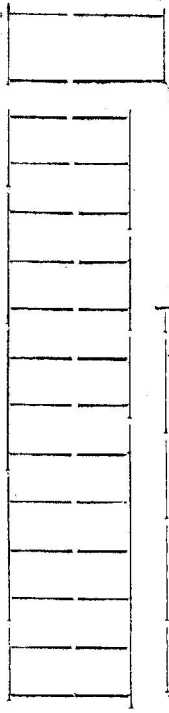
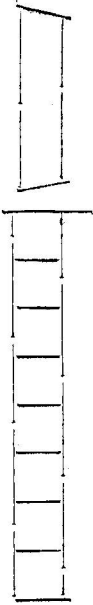
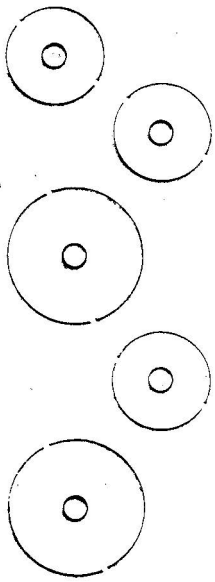
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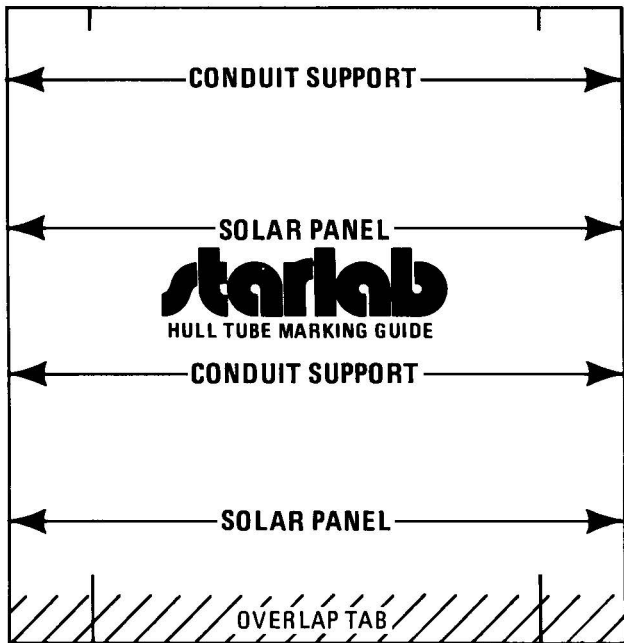
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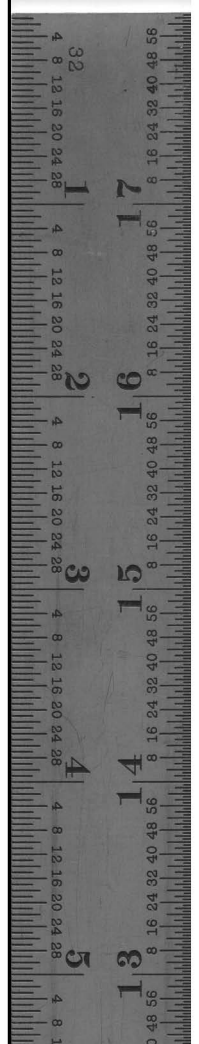
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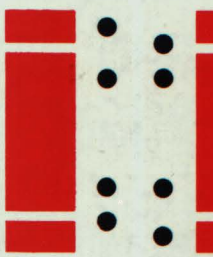




STARLAB PATTERN SHEET

83229





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estes. starlab

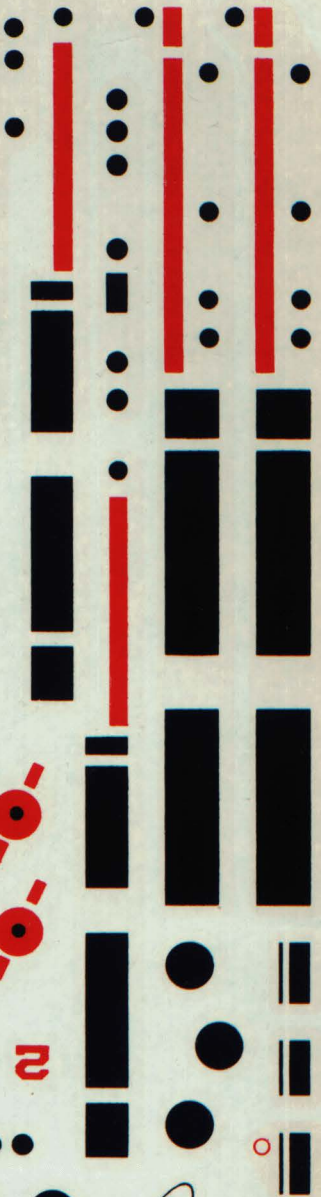


VSVN

VSVN



2



ESTES INDUSTRIES
PN37094 KD-88





12 12



VSVN

ESTES INDUSTRIES

PN37094

KD-88



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VSVN



PARTS LIST KIT NO. 1288								
Quantity	Description	Type	Number	Details1	Details2	Details3	Details4	Comment
1	STAGE COUPLER	JT-20C	30254	0.650" ID	0.708" OD	0.75" long	fits BT-20	
1	PAPER BODY TUBE	BT-20	30316	18" long	0.710" ID	0.736" OD	0.013" wall	
1	PAPER BODY TUBE	BT-20B	30320	8.65" long	0.710" ID	0.736" OD	0.013" wall	
1	SPLIT ADAPTER RING	AR-20508	80425	BT-20 in BT-50				
3	CENTERING RINGS	AR-2050	3101	BT-20 in BT-50				
1	Pattern Sheet	SP-88	83229					Scan
1	ENGINE HOLDER	EH-2	3141/35025	2.8" long	.100" wide	.025" thick		Reg. & D
1	Shock Cord	SC-1LD	85743	1/8" x 24"				
1	PAPER BODY TUBE	BT-50J	30362	2.75" long	0.950" ID	0.976" OD	0.013" wall	
1	PAPER BODY TUBE	BT-50W	30372	9.5" long	0.950" ID	0.976" OD	0.013" wall	
1	BALSA FIN STOCK	BFS-40	3172	1/8" thick	3" wide	9" long		BF-88/32296
1	Screw Eye	SE-2A	38252	3/4" long				
1	BALSA NOSE CONE	BNC-20A	70224	.813" long	.736" dia.	.25" shoulder		
3	DOWEL	WD-1	32056	1/8" dia.	18" long			Wood
1	PAPER BODY TUBE	SBT-394AJ	30449	1" long	3.876" ID	3.918" OD	0.021" wall	Special for 1288 Starlab
1	LAUNCH LUG	LL-2C	2325	5/32" ID	1/8" rod	5" long		
1	Parachute	PK-12A	2263	12" dia.				
1	Shroud Line	SLT-72	38238	72"				
6	Tape Disc	TD-3F	38406	1/2" dia.				6x
1	Embossed Panel Sheet	EW-88	37661					Scan
1	Die-Cut Card Sheet	TA-88	30064					Scan
1	Decal	KD-88	37094					Scan

Starlab FLYING MODEL ROCKET



Instructions for assembly and flight details, including a list of materials and a diagram of the rocket's trajectory.



LESTER ENGINEERING TOYS AND ROCKETS



Starlab

FLYING MODEL ROCKET



FLYING MODEL
ROCKET

ORBIT LEVEL 3

Starlab Flying Model Rocket is a high-quality, durable, and easy-to-use model rocket. It is designed for use in schools and homes, and is suitable for children aged 10 and above. The rocket is made of high-quality materials and is designed to be easy to assemble and launch. It is a great way to introduce children to the world of space exploration and rocketry.



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