



star gazer

THE STAR GAZER IS A SUPER ROCKET, DESIGNED FOR THE EXPERIENCED ROCKETEER, AND PERMITS YOU TO REACH EXTREME ALTITUDES THROUGH STAGING OF F.S.I. ENGINES. WHEN F.S.I. D OR E ENGINES ARE USED, ALTITUDES OVER 4,000 FEET ARE OBTAINABLE. TO REALLY FLY HIGH THIS IS THE ROCKET FOR YOU. F.S.I. A, B, OR C ENGINES MAY ALSO BE USED FOR LOWER, YET, AMAZING ALTITUDES FLIGHTS. THE UPPER STAGE RETURN TO EARTH ON A BEAUTIFUL PARACHUTE WHILE THE LOWER STAGE GENTLY TUMBLES TO EARTH. BOTH STAGES MAY BE USED OVER AND OVER AGAIN.

NATIONAL ASSOCIATION
OF
ROCKETRY APPROVED ENGINES



Recommended F.S.I. Engines

1st Stage	2nd Stage
B 3-0	B 3-6
C 4-0	C 4-6
D 6-0	D 6-8
D 18-0	D 18-4
E 5-0	D 18-6
	E 5-6

a high flying model

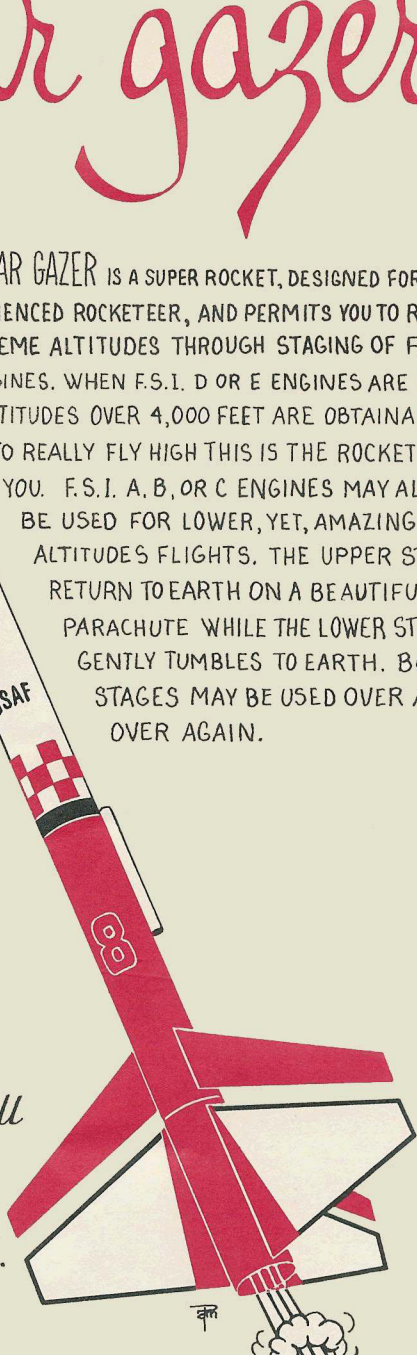
23" tall

KIT NO. MRK.II

FLIGHT SYSTEMS, INC.

P. O. BOX 145

LOUISVILLE, COLORADO 80027



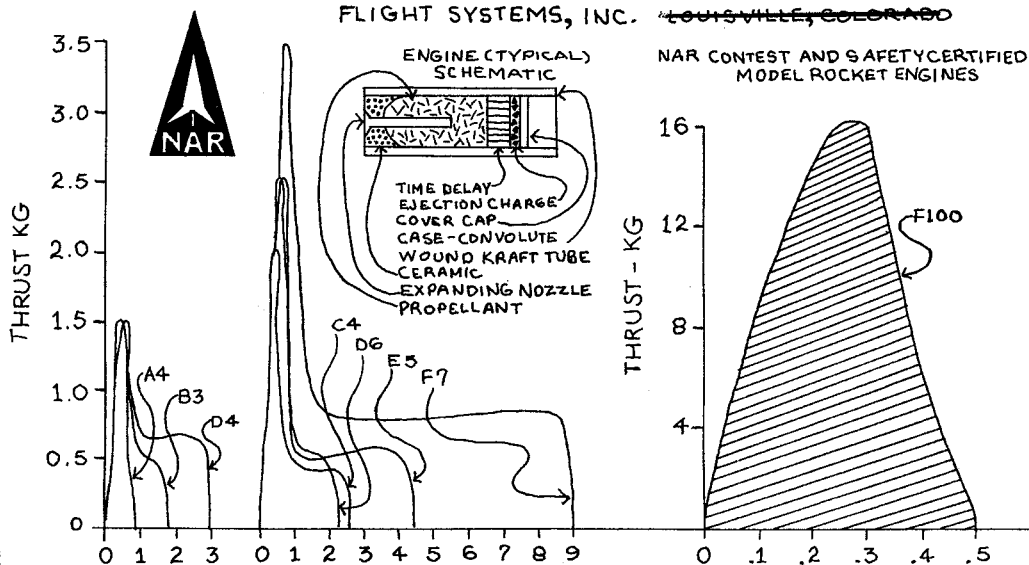
methods for assembly

FOLLOW THIS ORDER:

- ① **1ST STAGE FINS**— ALL OF THE FINS IN YOUR KIT ARE MARKED WITH ONE RED EDGE; THIS IS THE EDGE THAT IS TO BE GLUED TO THE APPROPRIATE BODY TUBE. PRIOR TO GLUING TO BODY TUBE YOU MAY WANT TO SAND AND ROUND OFF ALL FIN EDGES EXCEPT **DO NOT SAND RED EDGE**. FOR THE 1ST STAGE SECTION TAKE ONE OF THE 1ST STAGE FINS AND PLACE A SMALL AMOUNT OF ELMER'S GLUE ALONG THE RED EDGE AND IMMEDIATELY PRESS AGAINST ONE BLACK FIN ALIGNMENT MARK ON THE 1ST STAGE BODY TUBE (2 3/4" LONG X 7/8" DIAMETER). HOLD SECURELY UNTIL GLUE SETS. BE SURE FIN IS PARALLEL TO BODY TUBE AND RADIAL THROUGH CENTER LINE OF BODY TUBE. REPEAT FOR THE OTHER TWO REMAINING FINS. AFTER ALL GLUE HAS DRIED, PLACE TWO MORE COATS OF GLUE ALONG FIN AND BODY TUBE (BOTH SIDES) LETTING EACH COAT DRY BETWEEN APPLICATIONS. THIS BUILDS UP A STRONG GLUE FILLET. SEE ASSEMBLY DETAILS FOR PROPER POSITIONING OF 1ST STAGE FINS ON BODY TUBE.
- ② **2ND STAGE FINS**— THE 2ND STAGE BODY TUBE IS MADE UP OF 2 EQUAL LENGTHS JOINED BY A COUPLER. TAKE THE TWO 8" X 7/8" BODY TUBES (DO NOT USE END WITH 3 BLACK FIN ALIGNMENT MARKS) AND SPREAD A 3/4" LONG LAYER OF ELMER'S GLUE ON INSIDE OF BODY TUBE. NOW QUICKLY INSERT 1/2 OF THE COUPLER. TAKE THE OTHER BODY TUBE AND SPREAD A 3/4" LAYER OF GLUE INSIDE EITHER END. QUICKLY PRESS ONTO COUPLER UNTIL BODY TUBES ARE TOUCHING. NEXT (QUICKLY) LAY GLOED BODY TUBE ON FLAT SURFACE AND ROLL JOINED TUBES WITH PALM OF YOUR HAND. THIS WILL INSURE THAT BODY TUBES ARE STRAIGHT AND PARALLEL. LET LIE ON FLAT SURFACE UNTIL GLUE DRIES. PLACE A HEAVY BAND OF ELMER'S GLUE ABOUT 2" INSIDE OF JOINED BODY TUBE ON END WITH 3 BLACK FIN ALIGNMENT MARKS. NOW INSERT THRUST RING BY USING A F.S.I. A, B, C, OR D ROCKET ENGINE. PUSH THRUST RING FORWARD UNTIL A, B, C, OR D ENGINE PROJECTS 1/4" OUTSIDE 2ND STAGE BODY TUBE. FOR F.S.I. "E" ENGINE PUSH FORWARD UNTIL 3/8" OF ENGINE PROJECTS OUTSIDE BODY TUBE. THE THRUST RING FORCES THE GLUE FORWARD AND PROVIDES FOR A STRONG BOND OF THRUST RING TO BODY TUBE. NOW EXTRACT ENGINE AND LET GLUE DRY. WIPE OFF WITH DAMP CLOTH ANY GLUE ADHERING TO INSIDE OR OUTSIDE OF ENGINE. **DO NOT USE NOZZLE END OF ENGINE.** AFTER THRUST RING HAS DRIED, TAKE ONE OF THE 2ND STAGE PLYWOOD FINS AND GLUE TO BODY TUBE ON END WITH 3 BLACK FIN ALIGNMENT MARKS FOLLOWING THE GENERAL METHOD STATED IN ABOVE, 1ST STAGE DIRECTIONS. REPEAT FOR THE TWO REMAINING 2ND STAGE FINS. BE SURE TO ADD 2 MORE STRONG GLUE FILLETS TO FINS AND BODY TUBE. FOR POSITION OF 2ND STAGE FINS ON 2ND STAGE BODY TUBE, SEE ASSEMBLY DETAILS.
- ③ **SHOCK CORD AND MOUNT**— TAKE THE RED FIBER BOARD MOUNT WITH THE THREE 1/8" DIAMETER HOLES IN IT AND THREAD THE SHOCK CORD THROUGH THE 3 HOLES AS SHOWN ON DETAIL B. NOW SPREAD A HEAVY LAYER OF ELMER'S GLUE ALL OVER THE SIDE OPPOSITE THE SHOCK CORD KNOT, TAKING UP SLACK IN CORD. CURVE SHOCK CORD MOUNT AND INSERT INTO NOSE CONE END OF BODY TUBE AND FIRMLY PRESS IN PLACE, USING FINGER OR 3/8" DOWEL ROD UNTIL GLUE HOLDS FIRMLY. ASSEMBLY DETAIL SHEET SHOWS PROPER POSITION IN BODY TUBE. NOW LAY ASIDE UNTIL ALL GLUE IS DRIED BEFORE PROCEEDING WITH NEXT ASSEMBLY STEP.
- ④ **FLAMEPROOF WADDING**— BE SURE THAT FLAMEPROOF WADDING IS USED EACH TIME ROCKET IS FIRED. PUSH WADDING ALL THE WAY DOWN TO TOP OF THRUST RING AND PACK IN FIRMLY WITH A 5/8" DOWEL OR SIMILAR TOOL. USE ENOUGH WADDING TO MAKE APPROXIMATELY A 5/8" LONG PLUG. SEE ASSEMBLY DETAIL SHEET.
- ⑤ **PARACHUTE**— THE PARACHUTE IS MARKED IN INCHES. CUT WITH SCISSORS ALONG THE INCH LINES THAT GIVE YOU THE SIZE PARACHUTE YOU DESIRE (FOR STARGAZER ROCKET - 14"). LAY PARACHUTE ON FLAT SURFACE AND ATTACH SHROUD LINES TO PARACHUTE USING PARACHUTE GLUE TABS (SEE DETAIL C), CAUTION: LET NO PORTION OF TAB PROJECT BEYOND PARACHUTE AS GLUE ON TAB WILL STICK PARACHUTE TOGETHER AND INTERFERE WITH ITS OPENING. TRY NOT TO TOUCH THE GLOED SIDE OF TAB WITH FINGERS.
- ⑥ **SHOCK CORD AND PARACHUTE**— AFTER TYING SHOCK CORD TO SCREW EYE (DETAIL D), COIL SHOCK CORD AROUND YOUR FINGER AND STUFF INTO BODY TUBE. NEXT FOLD PARACHUTE AS SHOWN ON ASSEMBLY DRAWING, GATHER THE PARACHUTE TOGETHER LIGHTLY. THEN WRAP SHROUD LINES GENTLY AROUND FOLDED PARACHUTE AS SHOWN IN DETAIL C. DIAMETER OF FOLDED PARACHUTE SHOULD BE SLIGHTLY SMALLER THAN INSIDE DIAMETER OF BODY TUBE. ALL DETAILS ARE SHOWN ON ASSEMBLY DETAIL SHEET. BE SURE NOSE CONE IS A GENTLE FIT INTO BODY TUBE. LIGHT SANDING MAY BE NEEDED. BE SURE TO SNAP PARACHUTE SWIVEL TO SCREW EYE.
- ⑦ **STAGED ROCKET ENGINES**— FOR THE 1ST STAGE USE A F.S.I. BOOSTER ENGINE AND FOR THE 2ND STAGE USE A F.S.I. SUSTAINER OR SINGLE STAGE ENGINE. **DO NOT ALTER THIS ARRANGEMENT.** INSERT INTO THE NOZZLE OF THE 2ND STAGE ENGINE THE ENGINE IGNITOR SUPPLIED WITH EACH F.S.I. ROCKET ENGINE. NOW LAY BOTH THE 1ST AND 2ND STAGE ENGINES ON A FLAT SURFACE AND BUTT THE 1ST STAGE AGAINST THE 2ND STAGE ENGINE AND WRAP THE BUTT JOINT WITH ONE ONLY LAYER OF MASKING TAPE (FOLLOW DETAIL E DIRECTIONS). NOW TAKE THE TAPED ENGINES AND WRAP SUFFICIENT MASKING TAPE AROUND THE 2ND STAGE ENGINE AT THE 2 LOCATIONS SHOWN ON DETAIL E TO INSURE A FIRM FIT OF 2ND STAGE ENGINE TO 2ND STAGE BODY TUBE. NOW PUSH TAPED ENGINES INTO 2ND STAGE BODY TUBE UNTIL THEY TOUCH THRUST RING. NOW WRAP THE 1ST STAGE ENGINE WITH MASKING TAPE (SEE DETAIL E) USING ONLY ENOUGH TAPE TO LIGHTLY SECURE 1ST STAGE SECTION TO 1ST STAGE ENGINE. NOW PUSH THE 1ST STAGE SECTION ONTO THE 1ST STAGE ENGINE UNTIL UPPER AND LOWER FINS ARE SEPARATED BY APPROX. 1/8". YOUR STAR GAZER IS NOW READY TO LAUNCH. ALL F.S.I. MODEL ROCKET ENGINES HAVE DETAILS FOR LAUNCHING AND FIRING. ASK YOUR DEALER FOR THESE INSTRUCTIONS.

TYPICAL THRUST/TIME CURVES for MODEL ROCKET ENGINES

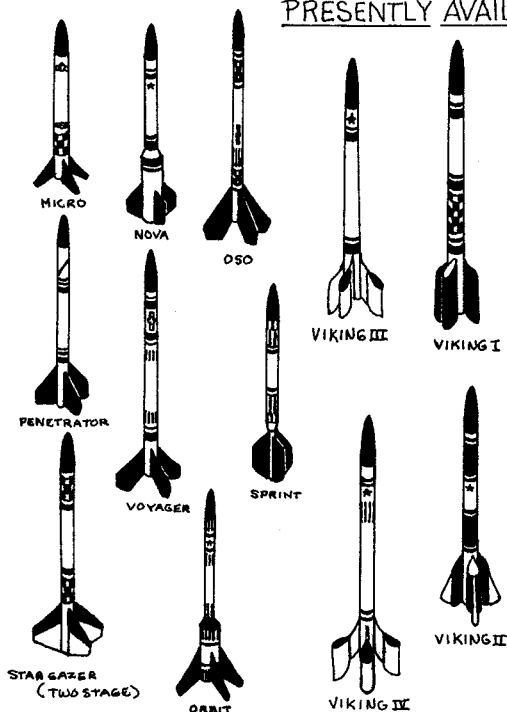
FLIGHT SYSTEMS, INC. ~~LOUISVILLE, COLORADO~~



ALL OF THE ABOVE ROCKET ENGINES ARE AVAILABLE AT MOST OF THE BETTER HOBBY SHOPS THROUGHOUT THE UNITED STATES. IF YOUR FAVORITE HOBBY STORE DOES NOT STOCK THE F.S.I. LINE, HAVE HIM WRITE US FOR OUR LATEST CATALOG AND PRICES. IF YOU DESIRE YOUR OWN CATALOG, ~~SEND \$6.00 TO FLIGHT SYSTEMS, INC. BOX 145, LOUISVILLE, COLORADO 80027.~~

YOU HAVE JUST PURCHASED ONE OF FSI'S SUPERIOR QUALITY MODEL ROCKETS. OTHER FINE FSI KITS ARE ALSO AVAILABLE. THE FSI ROCKET FLEET IS CONSTANTLY BEING ADDED TO. SEE ALL OF THESE MODELS AT YOUR HOBBY DEALER.

PRESENTLY AVAILABLE FSI MODEL ROCKET KITS



RECOMMENDED FSI ENGINES

MICRO: A4-4, B3-4, C4-4, D4-6

PENETRATOR: A4-4, B3-4, C4-4, D4-6, D6-6, E5-6

STAR 1st stage: B3-0, C4-0, D6-0, E5-0
GAZER 2nd stage: B3-6, C4-6, D6-8, D4-8, E5-6

NOVA: B3-4, C4-4, D4-6, D6-6, E5-6, F7-6

VOYAGER: D6-6, F7-6, F100-B

ORBIT: B3-4, C4-4, D4-6, D6-6, E5-6, F7-6

OSO: D6-6, F7-6, F100-B

SPRINT: C4-4, D4-6, D6-6

VIKING I: A4-4, B3-4, C4-4, D4-6, D6-6, E5-6

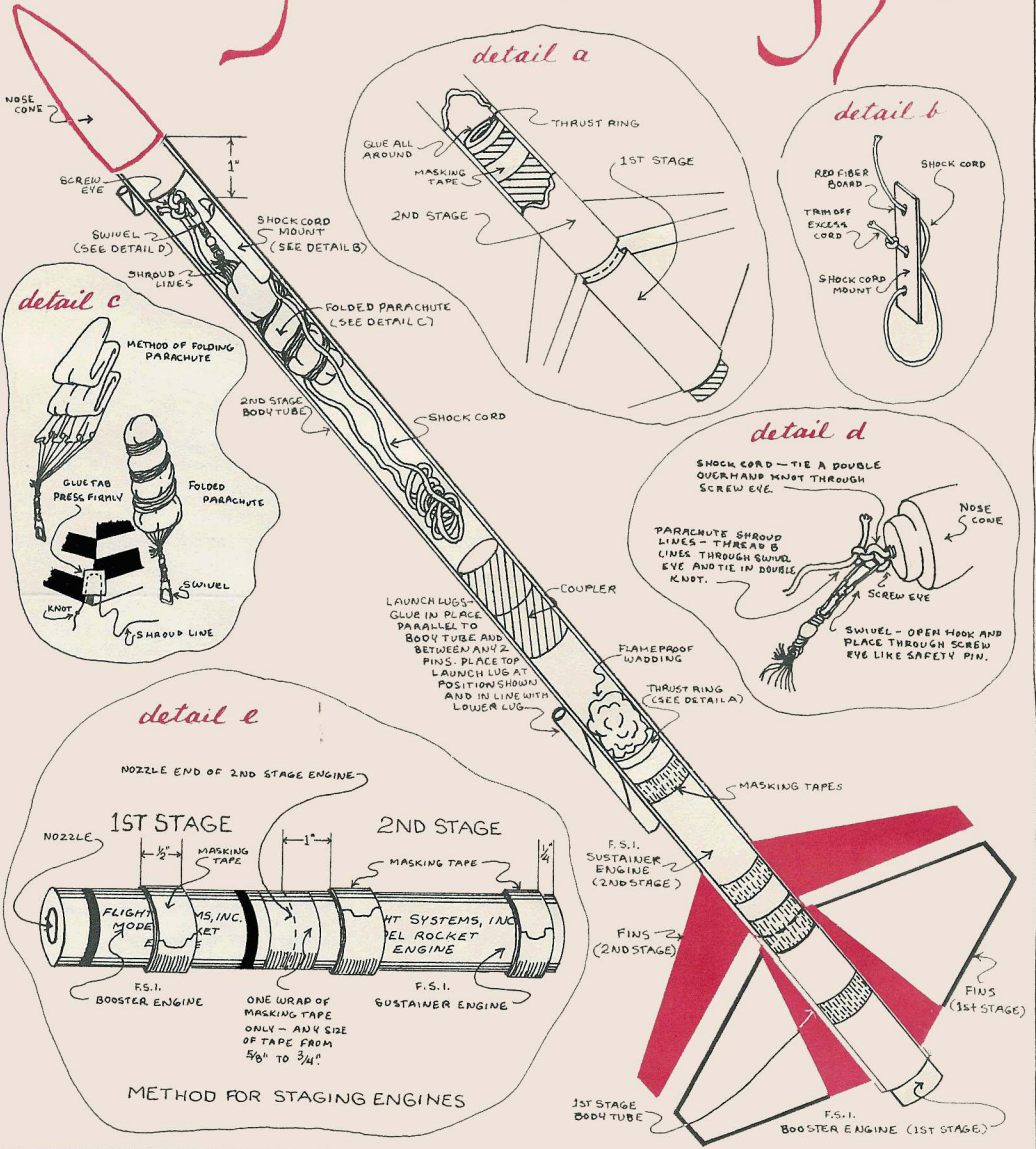
VIKING II: A4-4, B3-4, C4-4, D4-6, D6-6, E5-6

VIKING III: A4-4, B3-4, C4-4, D4-6, D6-6, E5-6

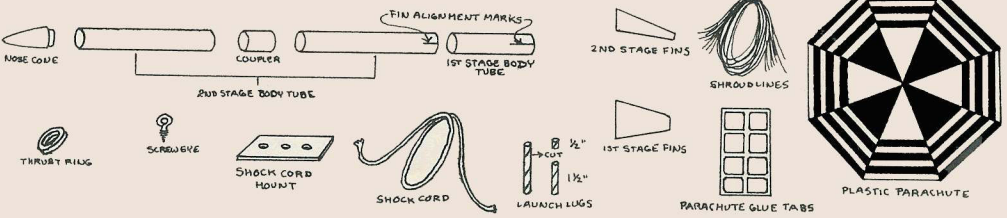
VIKING IV: F7-6, F100-B

A COMPLETE LINE OF QUALITY FIRING CIRCUITS, LAUNCH GEAR, MODEL ROCKET ACCESSORIES AND INSTRUMENTS ARE ALSO AVAILABLE FROM FSI. SEE YOUR DEALER FOR DETAILS.

assembly details for star gazer

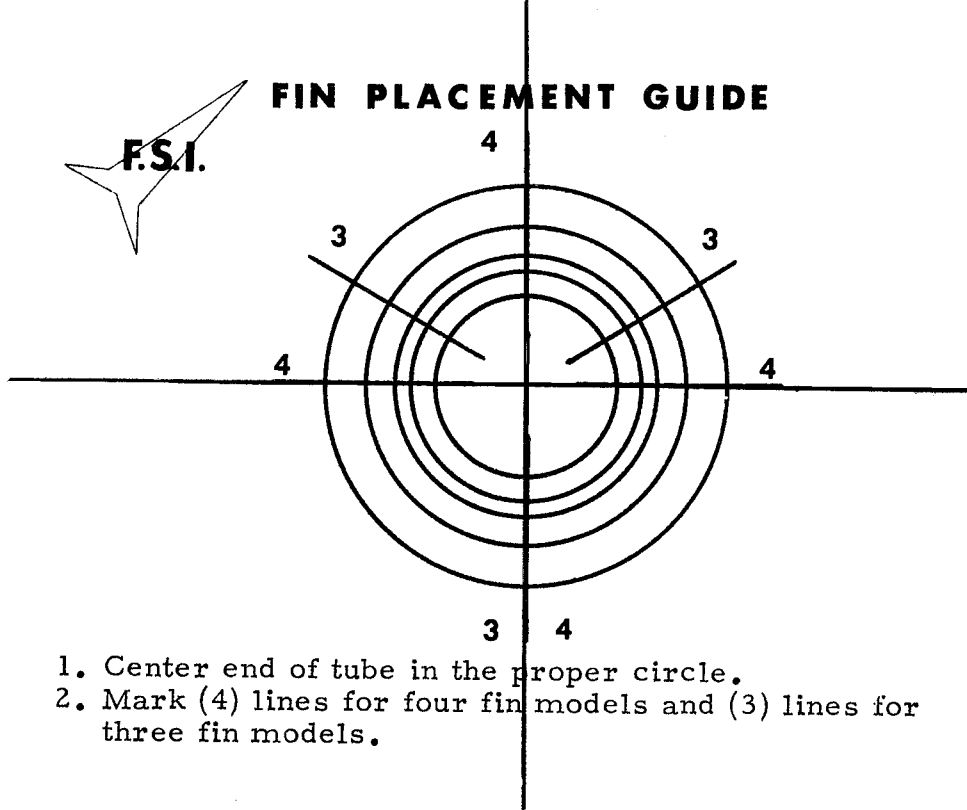


Parts List





FIN PLACEMENT GUIDE



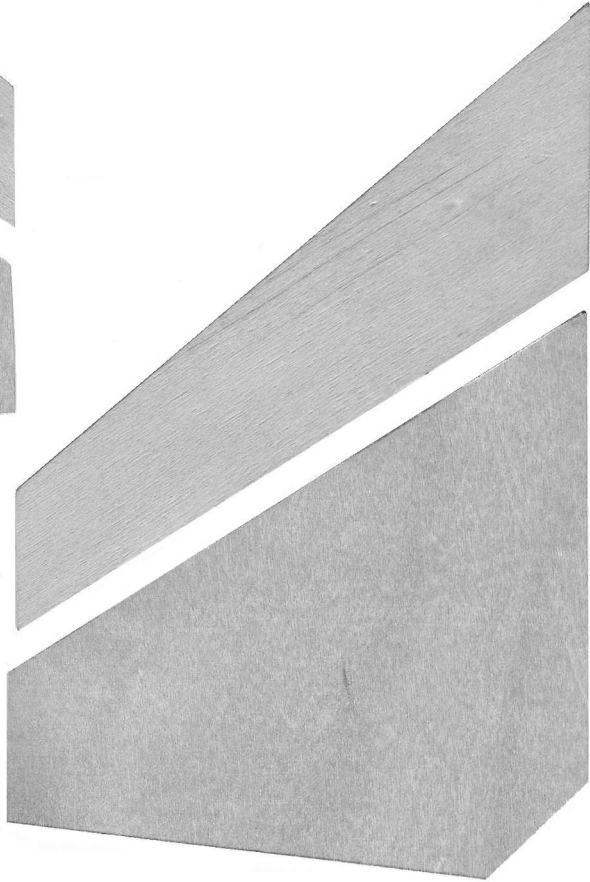
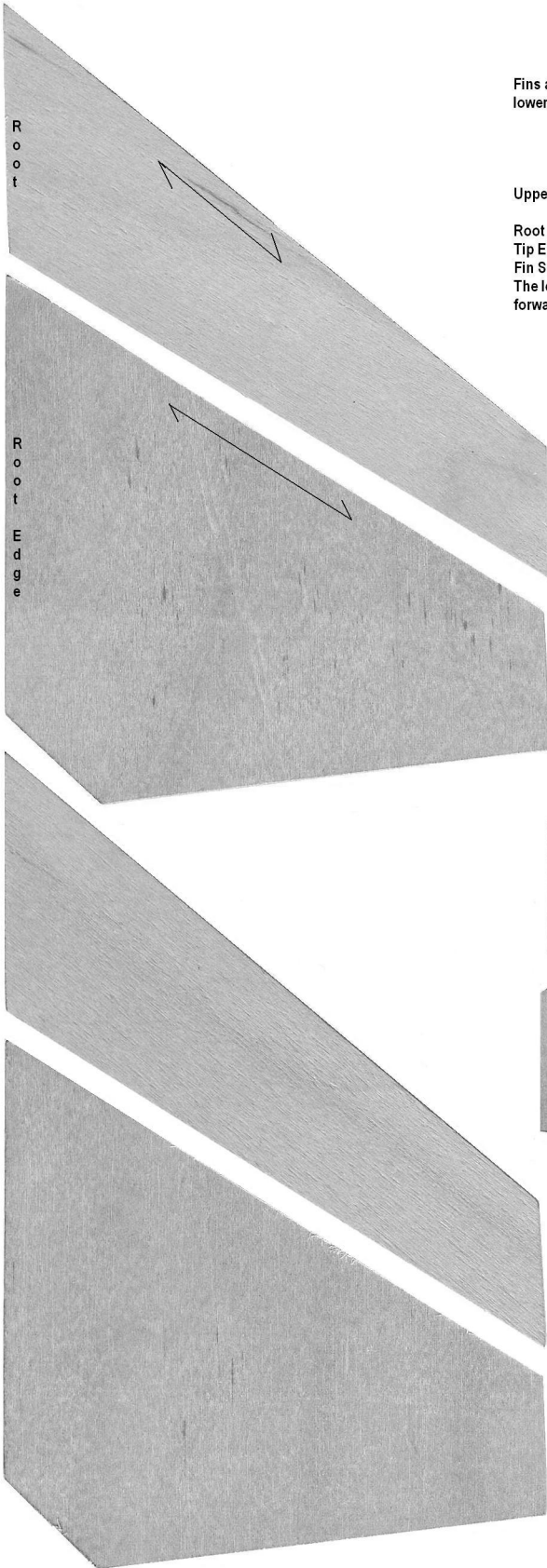
1. Center end of tube in the proper circle.
2. Mark (4) lines for four fin models and (3) lines for three fin models.

FSI MRK-2 Star Gazer Fin Patterns

Fins are made from 1/16", 3-ply plywood,
lower and upper stages.

Upper Stage:

Root Edge: 1.375"
Tip Edge: 0.75"
Fin Semi Span: 3.0"
The leading edge of the fin tip is 2.75" aft of the
forward tip of the root edge.



Lower Stage

Root Edge: 2.5"
Tip Edge: 0.75"
Fin Semi Span: 3.0"
Leading edge sweeps back 2.0"
Trailing edge of fin would intercept
body tube 3.0" from leading edge of
fin root.



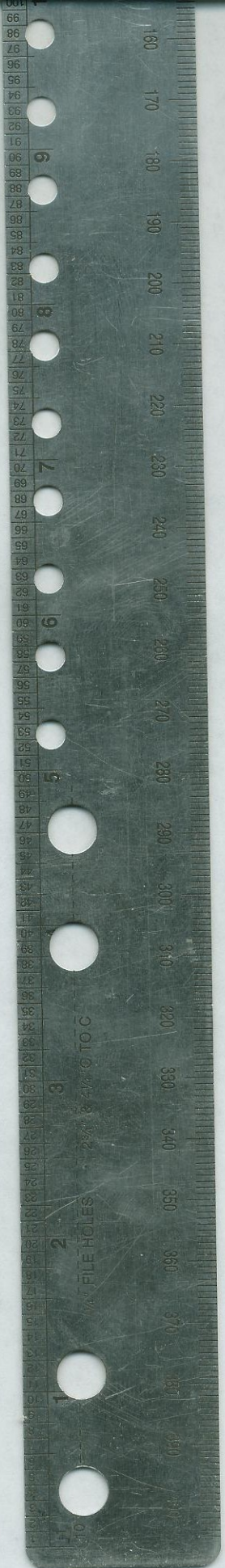
STARGAZER

1 1 2 2 3 3



1 2 2 3 3

FLIGHT SYSTEMS



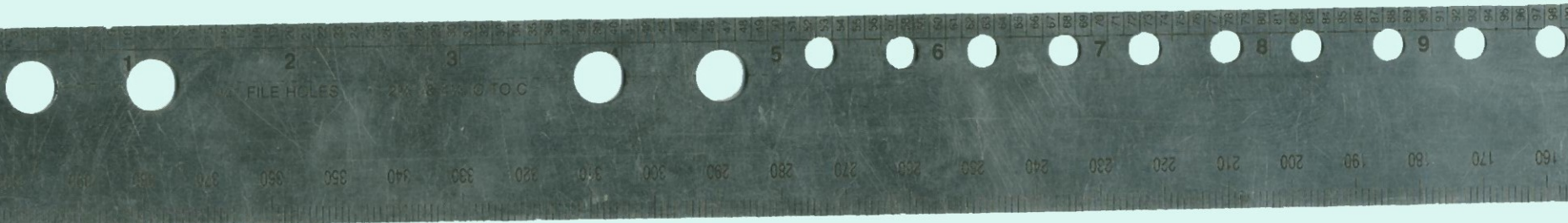
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1 1 2 2 3 3

FLIGHT SYSTEMS

1 1 2 2 3 3



F.S.I. Star Gazer kit MRK-2

Parts List

Description	Dimensions	FSI Part #	Comments
Booster Body Tube	0.903" x 2.75"	HRT-804	See Note #1
Upper Body Tube	(2)	0.903 x 8.0"	HRT-808
Nose Cone		3.0" Long	HNC-81
Motor Block		TR-1	For .908 tube
Tube Coupler			For .908 tube
Launch Lug	0.125" x 2.0"	LL-23	(1/8" I.D. x 2" L)
Parachute		P-12	8 sided Select-a-chute; 12" is more than enough
Shock Cord Anchor		SA-6	
Screw Eye	3/8" diam.	ES-21	
Shock Cord	1/8" x 24"	S-1	Round elastic

See fin template sheet for fin dimensions and notes.