Estes Industries Rocket Plan No. 22

Tiger Shark

Two-Stage Rocket with Gliding Booster!

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Gather the modeling tools you will need--scissors, a knife, a bottle of white glue, sheets of medium and fine sandpaper and a ruler.

Begin Construction

To preserve the plans and the instructions on the other side, carefully trace the fin patterns onto another sheet of paper. If you have carbon paper you can trace the patterns directly onto the balsa fin stock. By placing the patterns as shown in Fig. 1 you will get all the booster fins from one piece of balsa. The upper stage fins will come from the second piece, leaving some to spare.

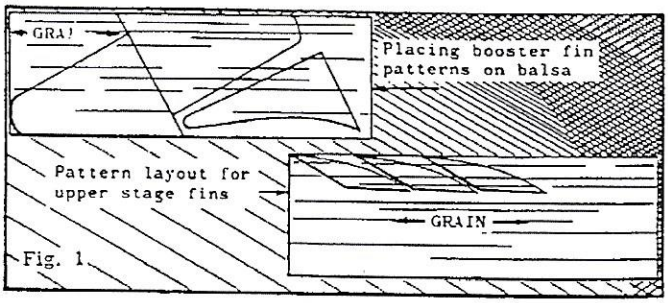


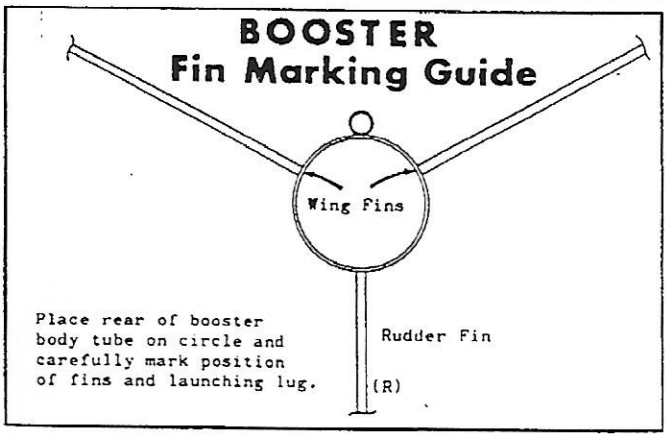
Fig. 1

Give all the fins a first sanding, rounding all but the root edges as shown in Fig. 2. Sand all flat surfaces with the grain to give a smooth surface.



Fig. 2

-THIS MUST BE DONE CORRECTLY-



Use the booster fin guide (shown above) to mark the booster body tube. Three fins are used, and they must be placed in the correct relationship to the others in order to make the booster glide. The small fin is the rudder. Place a small "R" by your mark on the body tube for this fin so there will be no confusion

PARTS LIST

1	Body Tube	#BT-20D
1	Body Tube	#BT-20G
1	Nose Cone	#BNC-20N
2	Sheets Fin Stock	#BFS-20
1	Screw Eye	#SE-1
1	Tape Disc	#TD-1
2	Engine Blocks	#EB-20A
1	Shock Cord	#SC-1
1	Launching Lug	#LL-1C
1	Streamer	#SM-1

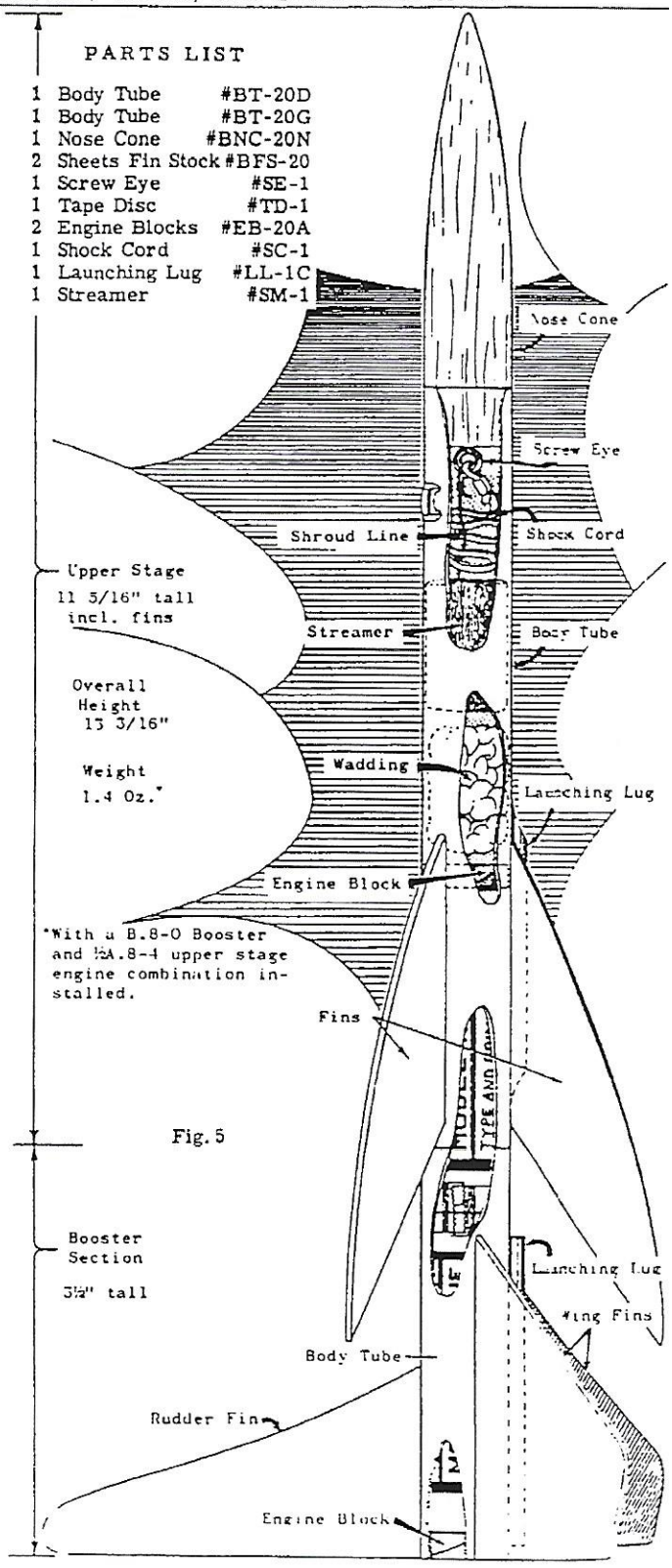


Fig. 5

when gluing on the fins. Don't glue the engine block in the 3.5" long BT-20G booster body yet. Since the weight of balsa varies from one sheet to the next you should fine-trim your booster by test gliding with an expended engine casing in place. By moving the engine casing forward or back a fraction of an inch, a clean rudder-up glide of 15 or more feet should be obtained from a hand toss. When you have located the best position mark the inside of the tube at the nozzle end of the engine casing and glue the engine block into the tube with the forward edge of the block against the mark. Fig. 3 shows the center of gravity for the booster without the engine casing, but with all other parts of the stage in place.

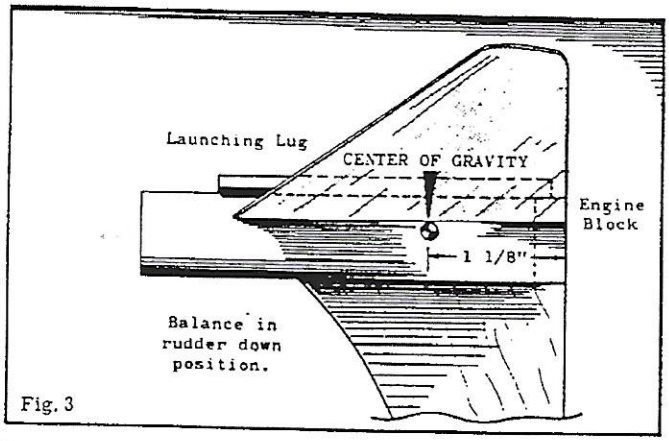


Fig. 3

— BUILDING THE UPPER STAGE —

Use the standard proceedure for building the upper stage A streamer recovery is used for obvious reasons. Mark and line the positions of the fins using the marking guide in Fig. 4. Next

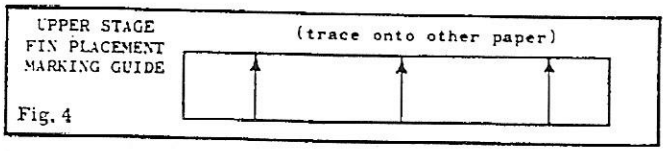


Fig. 4

tape a couple of engine casings together and insert one end into the booster section. Smear glue with a brush or finger about 2" up into the back end of the 6.5" body tube you have just marked for the fins. Place the second engine block into the end of the body tube and push it into place with engines and booster. This assures proper placement of the engine block in the upper stage and perfect mating of the two body tube sections.

Install a launching lug in the position shown in Fig. 5. Install the shock cord and the screw eye in the usual way, then attach the streamer.

— FINISHING INFO —

Touch up any rough balsa surfaces with extra fine sandpaper. Apply sanding sealer evenly to the balsa and let it dry thoroughly. Sand with extra fine sandpaper, apply more sanding sealer, let dry and sand again. Repeat this proceedure as necessary until the balsa is mirror-smooth. Apply at least one even base coat of white dope or enamel to provide a clean background for following colors. Give the rocket at least one final coat of red, a fluorescent color or any other high visibility color to aid in tracking. CAUTION: Enamel paint may be applied over a coat of thoroughly dry butyrate dope, but butyrate dope should never be applied over enamel as the dope will make the enamel under it bubble.

— PRELAUNCH STEPS —

Tape an upper and lower stage engine together as described in TR-2, using cellophane tape. The lower stage engine should make a snug fit in the booster section. Usually one layer of tape is enough to make an upper stage engine fit tightly in place. As you press the two units together, line up the launching lugs. Install wadding and pack the streamer and shock cord into place and top off with the nose cone. Install the igniter.

Assign at least one observer to watch each stage. On first flights use an A. 8-0 booster engine and a 1/4A. 8-4 upper stage engine. The booster should glide 16 seconds or more. The test models averaged 30 seconds with B. 8-0 engines.

