

Estes Industries Rocket Plan No. 37

ATMOSPHERIC SOUNDING PROJECTILE

SEMI-SCALE
Operation Redwing
Configuration

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About the ASP

The ASP is a high-performance solid-propellant rocket designed and built by the Cooper Development Corporation to transport up to 80 pound payloads. The name refers to the entire rocket, but the motor unit has proven adaptable for transporting a large variety of payloads of varying shapes.

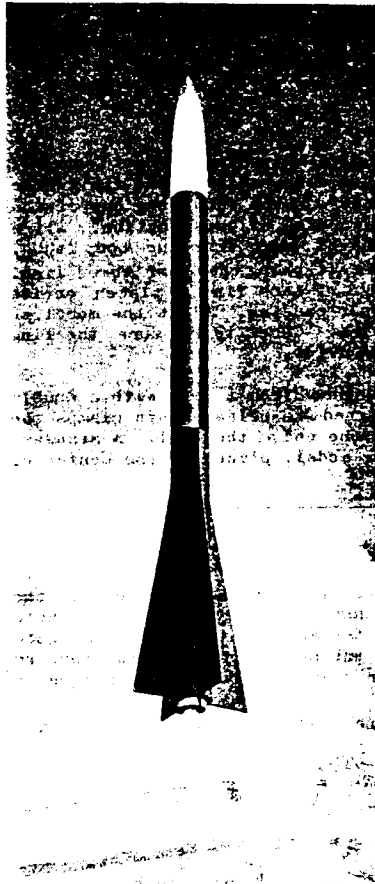
Primary development of the ASP was for launchings through nuclear clouds for radiation measurements under conditions too dangerous or too high to employ manned aircraft. During Operation Redwing, 41 units were launched at the Pacific Proving Grounds. All flights were successful, providing much useful information not previously available.

PARTS LIST

1 Body Tube	Part No. BT-50
1 Engine Tube	Part No. BT-20J
1 Balsa Nose Cone	Part No. BNC-50Y
1 Sheet Balsa Fin Stock	Part No. BFS-20
1 Engine Holder	Part No. EH-2
1 Pair Spacing Rings	Part No. RA-2050
1 Shock Cord	Part No. SC-1
1 Parachute Kit	Part No. PK-12A
1 Screw Eye	Part No. SE-1
1 Launching Lug	Part No. LL-2A

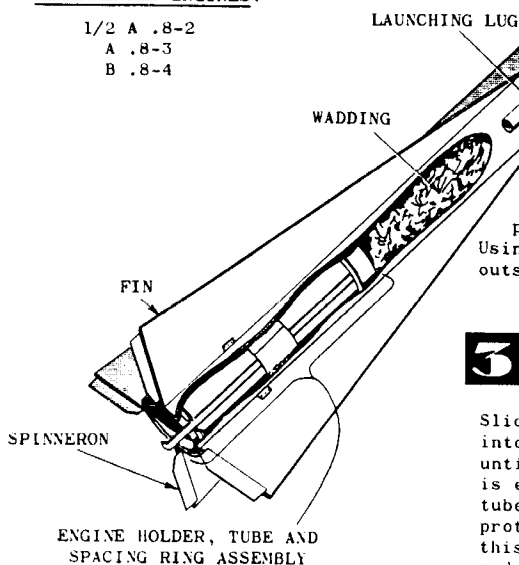
ADDITIONAL TOOLS AND SUPPLIES

Extra strong white glue, model knife, scissors, 1 sheet each of medium and fine sandpaper, ball point pen or pencil, a ruler and one or two index cards.

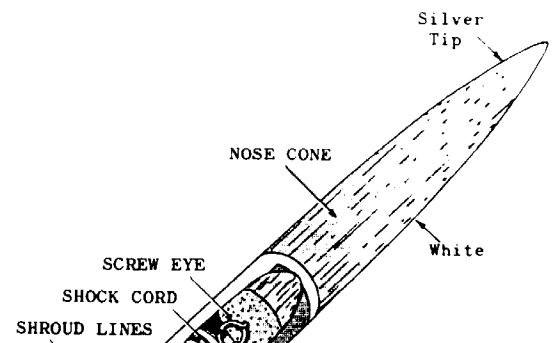


RECOMMENDED ENGINES:

- 1/2 A .8-2
- A .8-3
- B .8-4



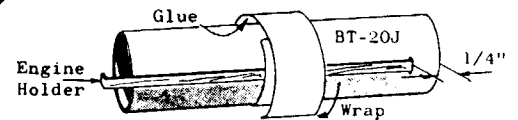
ENGINE HOLDER, TUBE AND SPACING RING ASSEMBLY



Assembly

1 Engine Holder

Measure 1/4" from one end of the BT-20J engine tube and cut a slot to take the front hook of the engine holder as shown.



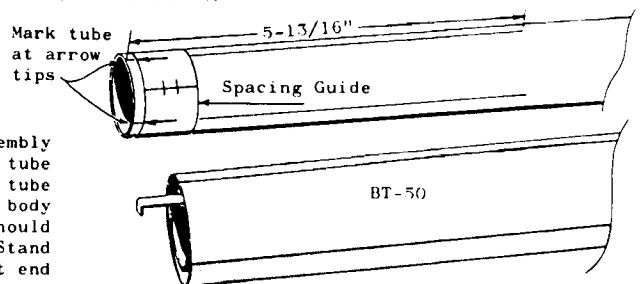
Cut a 1/2" X 5" strip of bond paper and apply a coat of glue to one side. Wrap this strip around the engine tube and holder as shown. Cut a 3/16" slot from one spacing ring and slip onto the rear of the engine tube.



Center the slot so the engine holder has room to operate smoothly. Slip the other ring onto the front of the engine tube as shown. Apply a fillet of glue to both sides of each ring-body tube joint and set aside to dry.

2 Mark the Body Tube for Fins

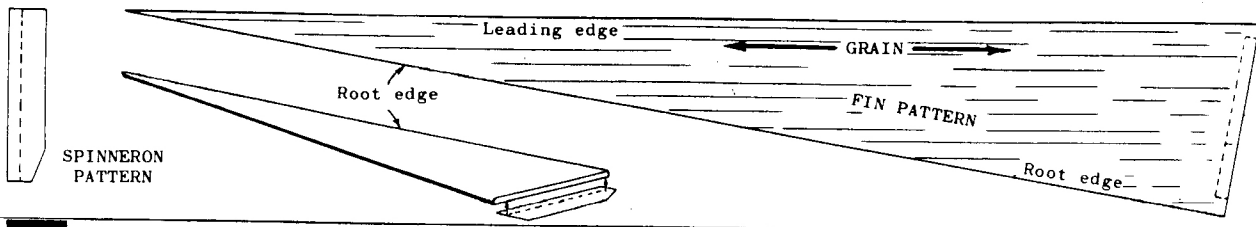
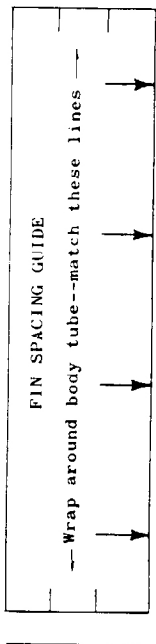
Trace the fin spacing guide onto typing paper and cut out. Cut a 16" long piece of BT-50 body tube and wrap the guide around one end and mark the tube. Using a drawer or door sill as a straight edge, extend a line from the marks up the outside of the body tube for 5-13/16" as shown.



Ends flush

3 Install the Engine Holder

Slide the engine holder assembly into the rear of the body tube until the rear of the engine tube is even with the end of the body tube. The engine holder should protrude 1/4" as shown. Stand this assembly on the front end and fill the space between the two tubes with glue. (Do not let the glue run into the slot.) Stand this assembly aside to dry completely.

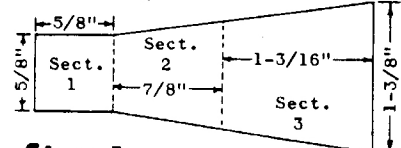


4 Fin Preparation

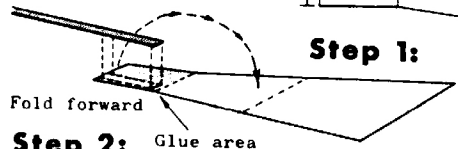
Trace the fin pattern onto heavy paper and cut out. Lay the pattern on the fin stock so the wood grain matches the grain direction shown and trace out 4 such fins. Cut out the fins and sand them as shown. Trace the spinneron pattern onto a piece of index stock and cut out. Use the first spinneron as a pattern to trace around and make 3 more spinnerons. Glue the spinnerons in position on the left side of each fin trailing edge with the taper toward the root edge as shown.

5 Shock Cord Mount

Start with a piece of bond paper of the dimensions shown.

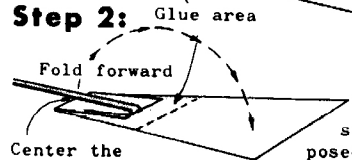


When cut out, prefold at the dotted lines.



Step 1:

Apply glue to section 1. Lay the end of the shock cord into place. Fold the 1st. section over the second one as shown.

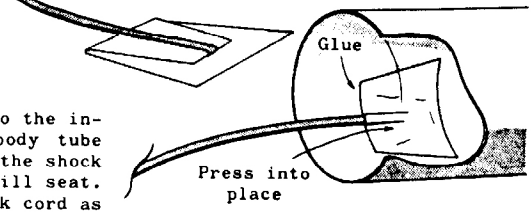


Step 2:

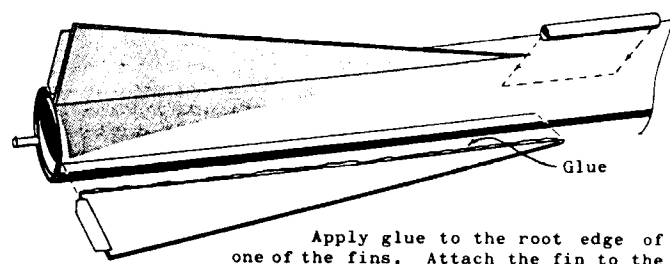
Apply glue over the backside of the first and the exposed part of section 2. Lay the shock cord as shown and fold the cord and section 2, over section 3.

Step 3:

Apply glue to the inside of the body tube in the area the shock cord mount will seat. Hold the shock cord as shown and place the mount into position, pressing it to conform to the inside curve of the body tube. Allow to dry.



S Fin Attachment & Launching Lug



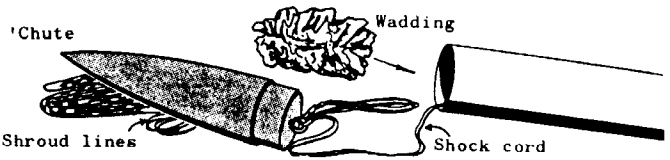
Apply glue to the root edge of one of the fins. Attach the fin to the rocket's body tube with the edge of the fin along one of the guide lines drawn in the third step of construction. Align the fin so it projects straight away from the body tube. The same steps are followed in attaching the other three fins. Make sure that the same edge of each fin is placed on its guide line to maintain proper spacing. Place the model on its nose while the glue dries. Check to be sure the fins stay straight while the glue dries.

The full size ASP is launched from a rail with a double clamp shoe arrangement designed to release both clamps the moment the lead shoe leaves the end of the rail. A standard launching lug is used on the model, placed at the center of gravity as shown above.

9 Final Assembly

Tie the shock cord and shroud lines to the screw eye in the base of the nose cone as shown below. Push the parachute into the body tube and pack the shroud lines and shock cord over it. Push the base of the nose cone into the forward end of the body tube. Your model of the ASP is now ready to be painted.

The ASP is painted black, red and white with a silver tip

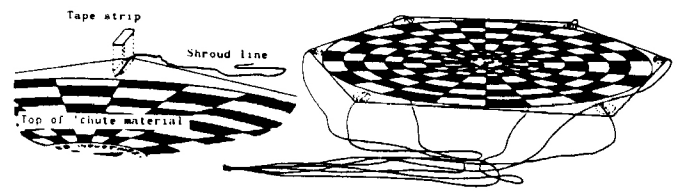


as shown in the overall view. Before finishing, apply a glue fillet to both sides of the fins and launching lug. Support the model on its side while all fillets dry hard and clear. Sand all balsa surfaces with extra fine sandpaper apply a coat of sanding sealer to the balsa, let dry and sand lightly. Repeat this step until all surfaces look and feel smooth. Give the rocket at least one clean base coat of glossy white enamel or dope, and sand lightly once more. The ASP is ready for two or more coats of the final colors.

COUNTDOWN CHECKLIST

- 11- Pack flame resistant wadding in from the front of the body tube, fold the 'chute and insert on top of the wadding. Pack the shroud lines and shock cord into the tube on top of the 'chute and insert the nose cone.
- 10- Select an engine. The 1/2A.8-2 is best for first flights. Install an electrical igniter into the nozzle as directed in the instructions which came with the engine. Insert the engine into the engine tube until the rear hook of the engine holder snaps into place behind the rear edge of the engine casing.
- 9- Place the rocket on the launcher. Check to be sure the panel is disarmed. Clean the micro-clips and attach them to the igniter leads.
- 8- Clear the launch area, alert the recovery crew and any trackers.
- 7- Check for low flying aircraft and unauthorized persons in the recovery area.
- 6- Arm the launch panel.
- 5- -4- -3- -2- -1- LAUNCH!

6 Parachute Assembly



Trim the parachute material as instructed in the kit. Spread the parachute material on a flat surface printed side up. Place a shroud line over an attachment point and apply a tape strip over it as shown above. Do this at all six points. Gather all the shroud lines and tie a knot at the extreme end of the group.

7 Installing the Screw Eye

Thread the screw eye into the nose cone, then remove it



Squirt glue into the hole and re-insert the screw eye.