BEFORE YOU START

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.

TOOLS AND MATERIALS

In addition to the parts included in this kit you will need: Scissors, pencil, ruler, fine or extra-fine grit sandpaper, sanding sealer, a medium-size modeling paint brush, modeling knife with sharp blade, modeler's razor saw, emery board, camouflage gray, light earth, forest green, and dark earth enamel spray paints, household white glue or resin glue (Eimer's, Titebond, or similar), tube-type plastic cement and masking tape. Other types of glue or cement are not recommended.

PARTS LIST

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<td>B</td>
<td>Engine Hook (type EH-2)</td>
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<td>C</td>
<td>Hook Retainer Tube (type BT-52AG) 2&quot; Long</td>
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<td>D</td>
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ASSEMBLY INSTRUCTIONS

1. Mark the engine mount tube (part A) at 1" and 2-3/8" from one end. Cut a 1/8" long slit at the 2-3/8" mark. Gently bend the engine hook (part B) so that it bows upward very slightly in the middle. (Study the drawing. Don't bend the wrong way.) Insert one end of the engine hook into the slit in the tube. Temporarily tape engine hook in place.

2. Apply a heavy line of glue on the engine hook rearward from the slit to the 1" mark. Slip hook retainer tube (part C) down onto forward end of engine mount tube and slide it back over engine hook to the 1" mark. Wipe away any excess glue and remove tape from engine hook.

3. Mark the engine mount tube 5-7/8" from the rear of the tube. Remove the two large centering rings from the die-cut card sheet (part D). Slide the ring without the slot over the front of the tube and down to the mark. Slip the centering ring with slot onto the front of the tube. Apply a line of glue to the ring/tube joint on both sides of each ring. Smooth glue out with finger and wipe away excess glue.

4. Remove the remaining centering ring from the die-cut card sheet. Trim out the notch as shown. Apply a line of glue around rear end of engine mount tube. Be sure not to get glue onto engine hook. Slide ring over end of tube into glue. Make sure centering ring is 1/8" from end of tube and notch is over engine hook. Apply glue to both sides of ring/tube joint and smooth glue out with your finger. Wipe away excess glue. Be sure not to get glue in notch or under hook.

5. Carefully saw nibs off.

6. Cut the ends from the tail cone with a modeler’s razor saw. Make repeated light cuts around the grooves. Work slowly to avoid tearing the plastic. Sand excess plastic lip away at the front and rear of the part with an emery board or sanding block.
Pass end of shock cord (part F) through slot in front centering ring. Tie a double knot as shown. Pull knot tight against backside of centering ring. Apply a small amount of glue to each side of slot.

Apply a line of tube-type plastic cement around the inside of the body tube rear and on the edge of the small centering ring. Slide tail cone into body tube. Looking at the rear of the rocket, position the tail cone so that the engine hook is centered between two slots in tail cone as shown. Push cone into the tube until shoulder of cone is evenly against the tube end. Wipe away any excess cement from around the outside of the tube. Apply cement to ring/tail cone joint using a stick.

Temporarily stuff shock cord inside engine mount tube. Slide engine mount into rear of the rocket body tube (part G) so it's just inside body tube as shown. Insert the tail cone into the body tube and push it into the tube along with the engine mount tube until tail cone shoulder is against the end of the tube. Carefully remove the tail cone. Do not disturb the position of the engine mount. Apply a narrow line of white glue around the rear ring where it meets the body tube as shown. Stand the tube upright and allow to dry for several minutes.

Apply a line of white glue around the forward centering ring where it meets the body tube. Stand the tube upright while glue dries. Check to be sure there are no gaps or holes in the glue joint when dry. Apply more glue if necessary.

Cut two 1" lengths from the launch lug (part H). Use a dowel or stick for internal support when cutting to prevent crushing the lug. Glue lugs to body on alignment line, even with tube ends as shown. Sight-align lugs carefully to be sure that the launch rod will slide freely through them.
Sand both sides of each fin sheet.

Use knife to free fins.

Stack fins and sand edges.

Slightly round leading edge.

Keep all edges except leading edge square.

Fine-sand the balsa die-cut sheets (part I). Free the fin edges with a sharp knife, then carefully remove the die-cut fins from the sheet. Stack fins together and lightly sand edges square and straight. Sand leading edge of each fin round. Leave all other edges square.

Test fit fins in slots.

Root edges touch outside surface of tail cone.

Cut away view.

Root edges of tabs touch engine tube.

Lightly sand root edges don't sand too much!

Using a scrap piece of balsa sheet as a gauge, sand slots in tail cone with emery board or piece of sandpaper to enlarge slots, if necessary, to have a good fit. Test-fit each fin in its slot. Make sure the fin root edges touch the engine tube inside the tail cone and the outside surface of the tail cone. If the fin does not fit properly, lightly sand the end tabs of the fins until you get a good fit.

Cut out the fin alignment template (part J) from the pattern sheet on the back of the panel. Coat the fin tabs with generous amounts of white glue. Push each fin all the way into its slot until it touches the engine tube and seats against the outside surface of the tail cone. Check alignment with fin alignment template. Repeat this procedure with each fin. After all fins are in place, check alignment again with template. Stand rocket body upside down. Do not set rocket on its fins while glue sets.

Rub cement into fin joint. Smooth out with a finger.

When fins have dried, apply a plastic cement reinforcement along fin and tail cone joints. Hold model level and apply a line of tube-type plastic cement to both sides of each fin joint. Rub cement into fin and tail cone joint. Smooth out the cement with your finger. Keep the model level until cement dries.

Roll clay into snake.

Insert clay into nose cone.

Pack clay tightly into tip of nose cone.

Carefully remove any plastic from eyelet.

Roll clay weight (part K) into a thin "snake". Cut into 1" sections and drop through hole in rear of nose cone (part L). Pack the clay firmly into the nose using a small dowel or stick. Use all the clay. Trim and sand all excess plastic from the nose cone. Carefully open the molded eyelet at the rear of the nose cone. Wash all outside surfaces of nose cone with lukewarm, soapy water, rinse, and thoroughly dry.
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**PAINT SCHEME**

A single color, green paint scheme is the simplest for the V-2. Pactra flat forest green or flat olive drab spray enamel is recommended. If you prefer a camouflage paint scheme, paint entire rocket with a base coat of camouflage gray spray paint. The following Pactra flat enamel spray colors are recommended for the camouflage pattern: light earth, forest green, and dark earth enamel spray paints. Follow the camouflage pattern drawing.

**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 D12-3 or D12-5 model rocket engines
- Use a D12-3 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 of America
*NAR—National Association of Rocketry
COUNTDOWN CHECKLIST

T-13
Pack 8 or 10 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.

T-12
FORM

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 lines back along parachute and then back down to 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 nose cone 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.

T-11
INSERT IGNITER IN NOZZLE

Select an engine and install an igniter as directed in the engine instructions. The engines recommended for use with this rocket are the D12-3, and D12-5 made by Estes.

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!

T-8

LAUNCH LUGS

3/16" LAUNCH ROD ONLY

ROCKET STAND-OFF

DEFLECTOR

MICRO-CLIPS

Slide the launch rod (A 3/16" diameter launch rod must be used) 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.
The tailcone is from the current silver comet kit.
The BT-80 is 7.5 inch long.
You could use the nose cone from the silver comet but the detail would need to be sanded off and any "Gaps" filled or patched, so the nose cone from the Phoenix would be easier.
Make the fins from 3/32nd inch balsa (or plywood for more strength).
The BT-50 motor tube is 7 3/4 inches long.