Kit #05152
Skill Level 3

Made In USA

Skill Level 3

Average Skills Needed

The Ibis is a futuristic interstellar aircraft to transport tourists to vacation destinations on other planets. It can cruise in both the vacuum of space and through the thick atmospheres surrounding the planet. It is a creation from the mind of Shrox, the futuristic rocket designer that has dreamt up several other rockets for Apogee Components.

This has a lot of forward fin area, which moves the CP forward. So be sure to add all the nose weight included to push the CG further towards the nose. Even though it has a futuristic shape, it features a ton of laser-cut parts, like all the fins and the slots on the main body tube and the inlet tube. It also has a molded transition with the slot for the engine hook already molded in. The kit is relatively easy to assemble, which is why it is only rated a skill level 3 on our complexity scale.

This is one kit you'll love showing off, because like all the Shrox designed models, it has a visual appeal that gathers attention from everyone that sees it. Let your imagination be the first passenger on the maiden voyage of your Ibis rocket.

Ibis Parts List

Item #	Item Name	Qty
10076	AT- 18/3.5" LC - Engine Mount Tube	1
10123	AT- 33/6.5" LC - Body Tube	1
10124	AT- 33/18" LC - Body Tube	1
13029	CR- 13/18	1
13031	CR- 18/24	1
13051	1/8" Launch Lug 1"	2
15572	Ibis Fin Sheet A 1/8" x 4" x 18" Balsa	1
15573	Ibis Fin Sheet B 1/8" x 4" x 18" Balsa	1
17060	Resin Boattail	1
19468	Plastic Nose Cone PNC-33	1
24043	Crimped Engine Hook	1
29114	18" Hex Plastic Parachute Pack	1
29515	100# Kevlar x 8ft	1
31118	Instruction Sheet A	1
31119	Instruction Sheet B	1
35592	Cardstock CR and Display Stand	1
41044	Decal Sheet	1
47124	Clear Plastic Bag 6 x 24	1
39002	Ibis Face Card	1

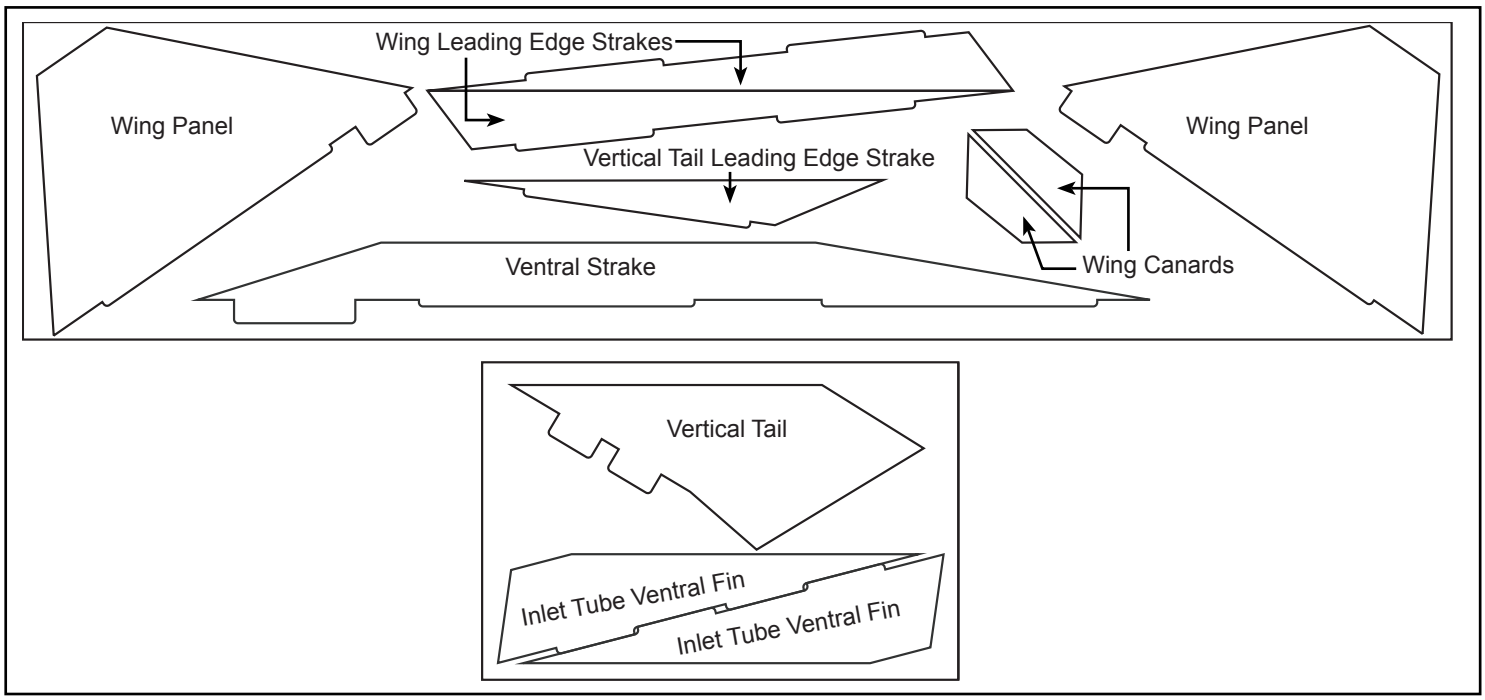
Necessary Tools and Materials

- ☐ Finishing Supplies (Primer, Paint)
- ☐ Hobby Knife with Sharp Blades
- ☐ Masking Tape
- ☐ Paper Towel
- ☐ Pencil
- ☐ Plastic Sheet (to cover the work surface)
- ☐ Rocket Engine
- ☐ Ruler
- ☐ Safety Glasses
- ☐ Sand Paper (220 and 400 grit)
- ☐ Scissors
- ☐ Super Glue (CyA adhesive medium viscosity) or Plastic Model Cement
- ☐ Wood Dowel
- ☐ Wood Filler
- ☐ Wood Glue (or White Glue)
- ☐ Wood Sealer/Sanding Sealer

Manufactured in the USA by:
Apogee Components Inc.
Colorado Springs, Colorado, USA
Visit us online at:
www.ApogeeRockets.com

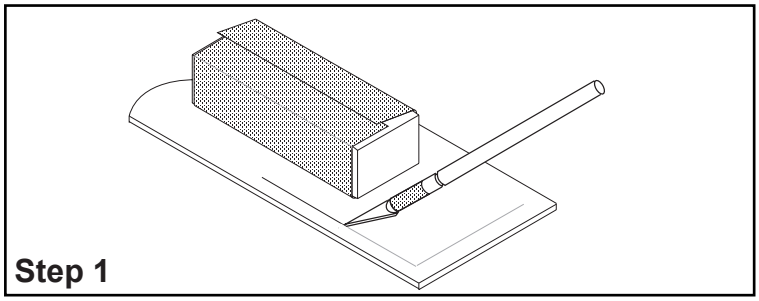
Identify the Balsa Parts

☐ Use these images to identify the different fins on the balsa sheets

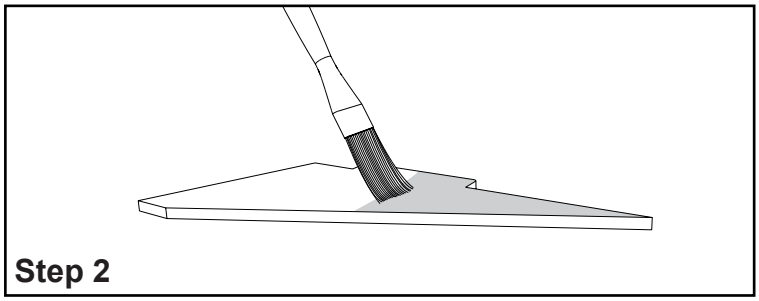


Ibis Assembly Instructions

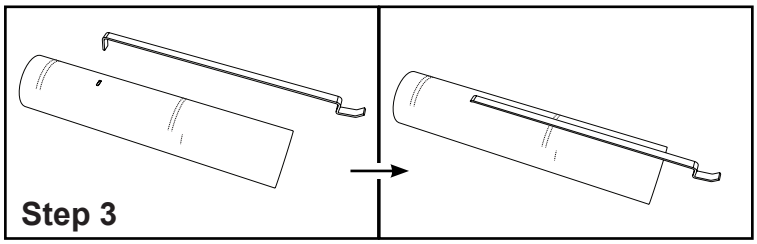
☐ 1. Fine sand the balsa laser-cut sheets using 200 grit sandpaper before removing the fins. Carefully remove all the pieces from the balsa sheet by freeing the edges with a sharp hobby knife.



☐ 2. Sealing and sanding the balsa fins reduces drag by making the surface very smooth. It also improves the rocket's appearance. Apply a coat of sanding sealer to the fins with a paintbrush. When the sealer is dry, lightly sand the sealed surfaces. Repeat the sealing and sanding procedure until the balsa grain is filled and the fins look and feel smooth.

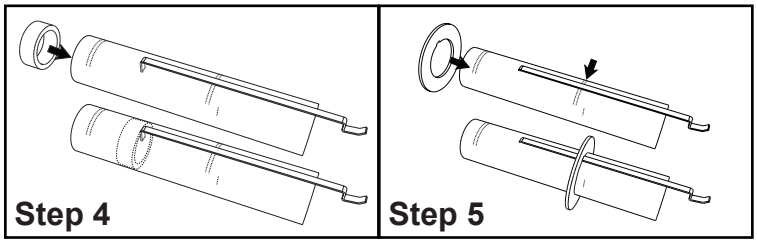


☐ 3. Insert the tang of the metal engine clip into the slot cut into the engine mount tube as shown.

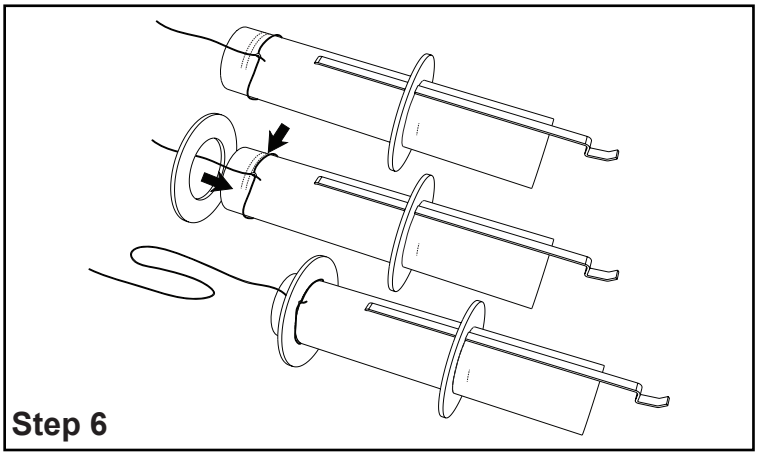


☐ 4. Take the blue ring and glue it inside the front end of the tube using wood glue. You can use a rocket engine to push it in until it butts against the metal engine hook tang on the inside of the tube. Remove the rocket engine casing immediately, and wipe away the excess glue on both sides of the engine block. Allow the glue time to dry.

☐ 5. Glue one of the centering rings over the tube and engine hook as shown. The ring is positioned between the etched lines on the tube. There is a small notch on the inside of the ring that slips over the engine hook.

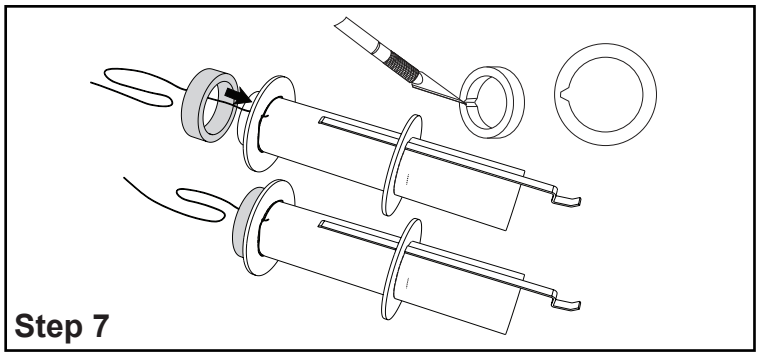


☐ 6. Pass one end of the shock cord through the remaining centering ring and tie the cord around the engine mount tube. Cinch the cord tight to the tube. Run a bead of wood glue around the forward end of the engine mount tube between the etched lines on the tube. Slip the ring onto the forward end of the motor mount tube so that the ring is between the etched lines near the front of the tube as shown. Pull the cord so that the loop is tight up against the side of the centering ring.



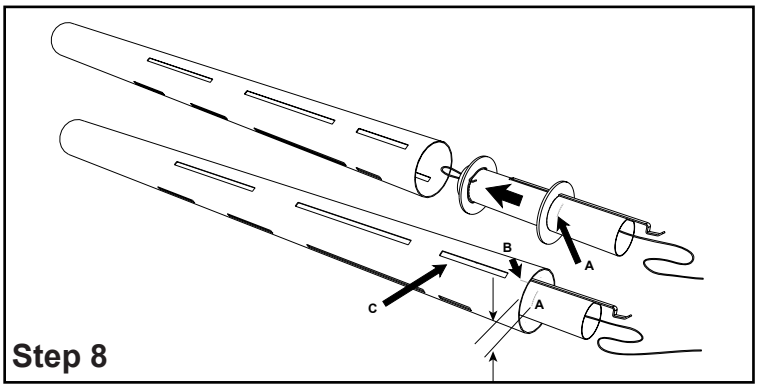
Step 6

☐ 7. Cut a small notch on the inside of the green centering ring. This notch will be for the shock cord to fit under the ring. Pass the loose end of the shock cord through the green centering ring and glue the ring over the front of engine mount tube so that it butts up against the large centering ring. This ring prevents the shock cord from being pulled off the engine mount tube at parachute ejection. Apply glue fillets to both sides of all of the centering rings and allow to dry.



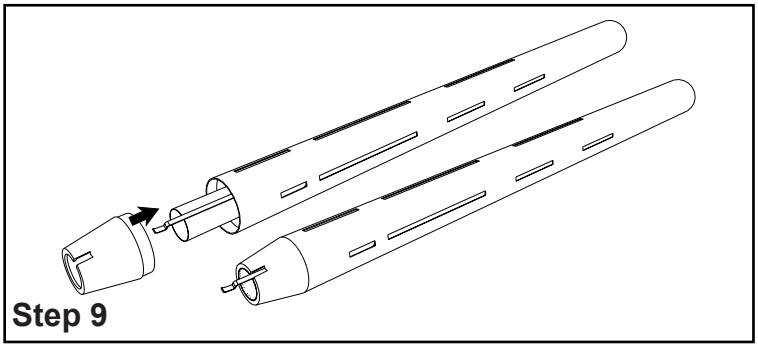
Step 7

☐ 8. Temporarily pass the shock cord through the engine mount and out the rear. This will keep it glue-free when gluing the engine mount into the tube. Be sure to understand the illustration before you apply the wood glue in this step. TEST FIT FIRST! The etched line (A) will be even with the back end of the body tube. The engine hook must NOT be in line with any of the slots on the tube (B). And when inserted, the front centering ring must not be visible in any of the slots on the tube (C). All the slots for the fins should be clear and open.



Step 8

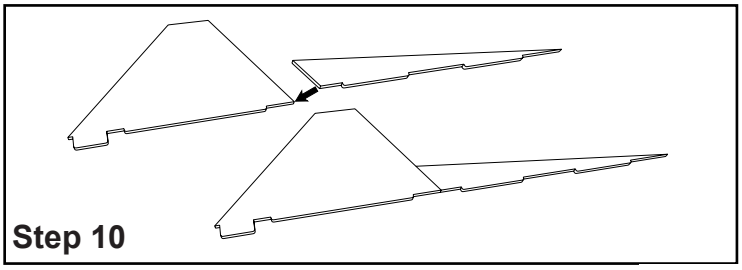
Using a wood dowel, apply wood glue 2 inches (51 mm) inside the aft end of the big body tube. (NOTE: The aft end is the side with the most slots cut into it). Also put glue on the aft ring of the motor mount. Quickly and smoothly insert the motor mount tube into the aft end of the body tube SO THE ETCHED LINE IS EVEN WITH THE EDGE OF THE TUBE. When the glue is dry, pass the shock cord back through the motor mount, so that it comes out the front end of the rocket.



Step 9

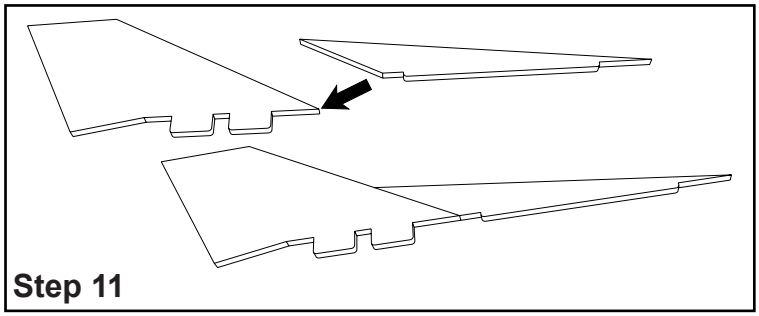
☐ 9. Inspect the resin boattail, and remove any flashing with a hobby knife. Test fit the piece over the engine mount tube. Scuff up the short shoulder with sandpaper. Using thick superglue, attach the boattail to the back of the tube.

☐ 10. Using wood glue attach the leading edge strake to the vertical fin as shown. Lay the piece on a flat surface cover it with a plastic sheet and weigh it down with a heavy book while the glue dries so the panel surfaces are flush with each other.

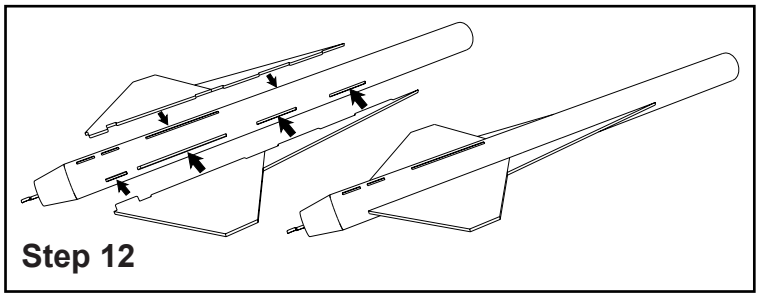


Step 10

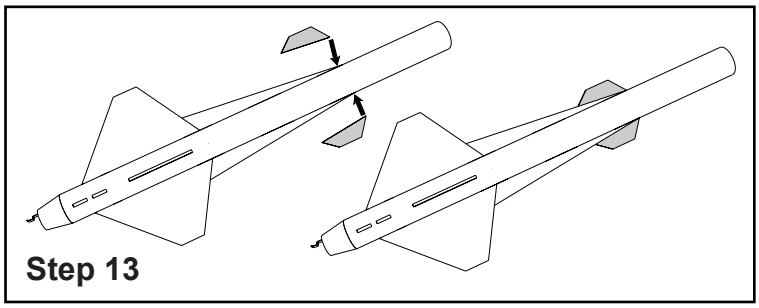
☐ 11. Following the directions of the previous step, glue the two wing leading edge strakes to the two wing panels as shown. Allow the glue time to dry.



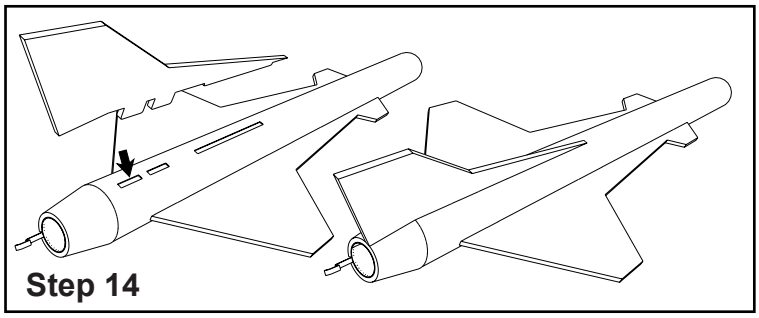
☐ 12. Test fit the wing panels in the slots in the body tube. Apply wood glue to all the edges of the aft wing panels that will touch the rocket body, including the wider through-the-wall fin tabs. Allow the glue to dry for a few minutes to become tacky, and then attach both aft wing panels into the slots on the rocket's body. Make sure they sit perpendicular to the tube and that the fin tab is glued to the engine mount tube installed in step 8.



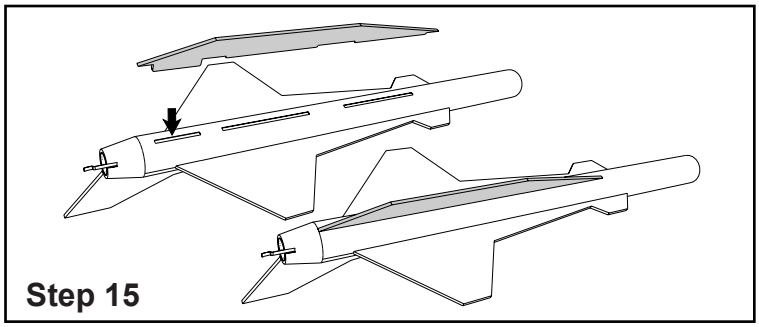
☐ 13. The canard pieces are glued to the wing leading edge strakes as shown using wood glue. The front edges line up with the front edge of the strakes. Sight down the end of the tube to make sure the top and bottom surfaces of the canards line up with the surfaces of the wings.



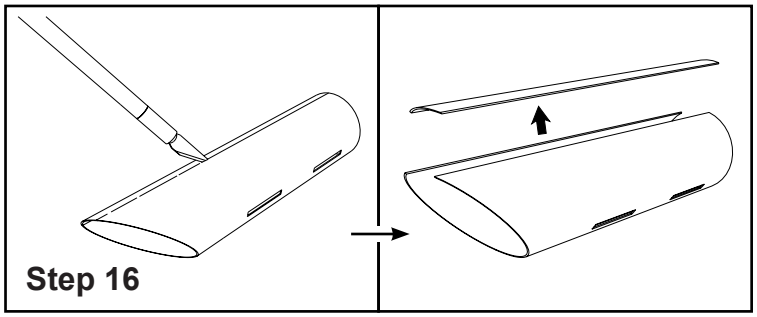
☐ 14. Attaching the vertical tail requires two different types of glue. The portion of the tail that mates to the plastic boattail should be attached using thick super glue. The forward portion that is along the tube can be attached using wood glue. Test fit it first before you apply the glue. Note: You can use thick superglue on the entire vertical tail if you feel comfortable using that type of glue.



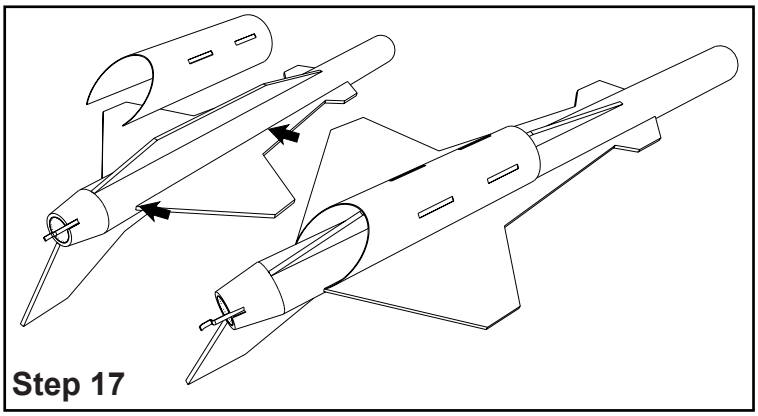
☐ 15. Attach the ventral strake to the bottom of the rocket using wood glue.



☐ 16. Using a hobby knife, cut through the tick marks on the bottom of the inlet tube and completely remove the portion shown. It can be discarded.

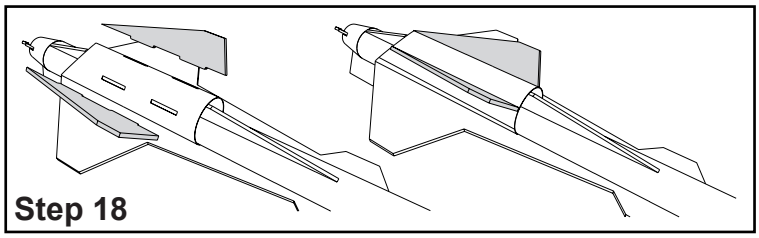


☐ 17. Test fit the intake tube to the bottom of the rocket. The edges of the inlet tube mate into the joint line of the wings. Note where the front edge starts on the wings and the ventral strake. Apply wood glue to the locations where it touches the rocket, and position it on the rocket. Allow the glue time to dry.



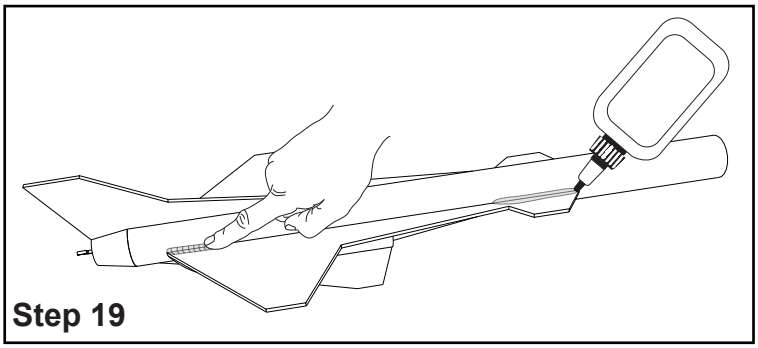
Step 17

☐ 18. Glue the inlet tube ventral fins into the slots as shown. Make sure they project perpendicular from the tube.



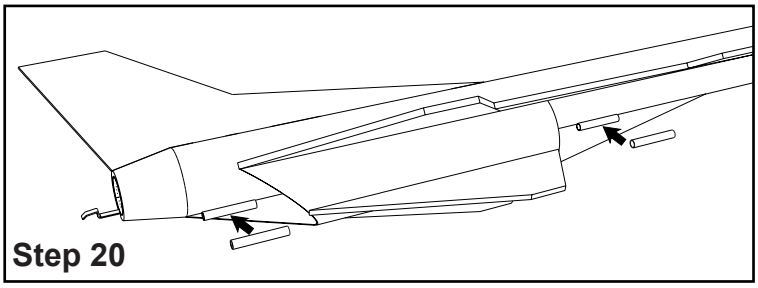
Step 18

☐ 19. Apply a bead of wood glue to both sides of each fin-body tube joint. Pull your finger along the joint to smooth out and remove the excess glue. Lay the tubes horizontally while the glue dries.



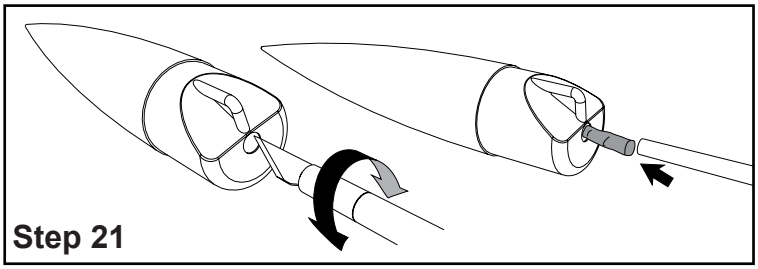
Step 19

☐ 20. Glue the two launch lugs to the side of the ventral strake on the bottom of the rocket. One is positioned just forward of the inlet tube, and the other near the rear of the ventral strake.



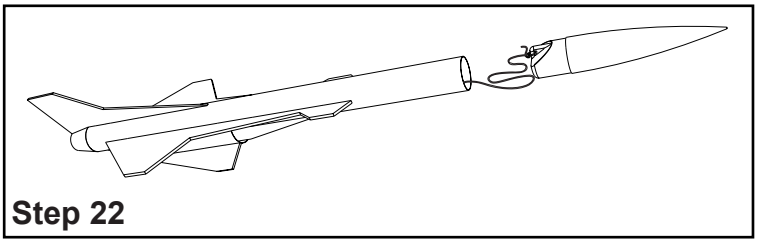
Step 20

☐ 21. Using the blade of your hobby knife, enlarge the hole on the base of the nose cone so that the nose weight can be inserted. Roll up the clay into a snake so that it will fit through the hole. Press it into the tip of the nose cone with a wood dowel.



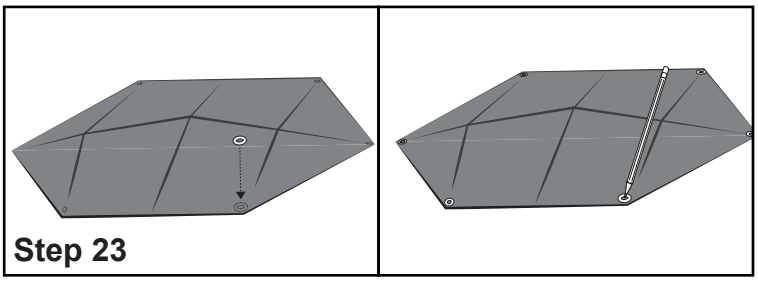
Step 21

☐ 22. Tie the free end of the yellow shock cord to the plastic loop on the base of the nose cone. Put a little bit of wood glue on the knot to secure it in place. Allow the glue to dry.



Step 22

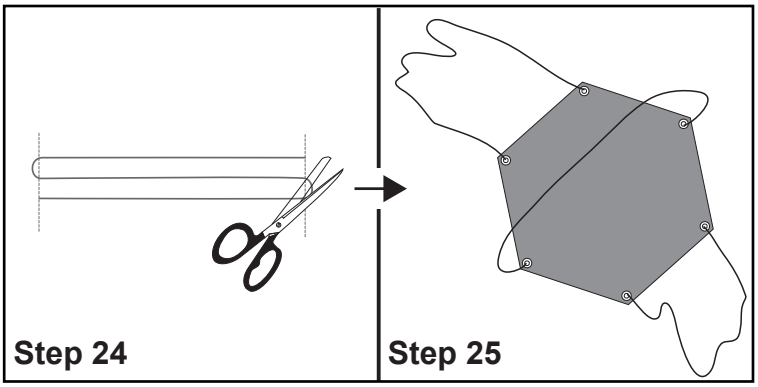
☐ 23. Place one reinforcement ring on each of the corners. Take a sharp pencil or knife and poke a hole through the plastic in the center of each ring.



Step 23

☐ 24. Cut the shroud lines to make a total of three lines of equal length.

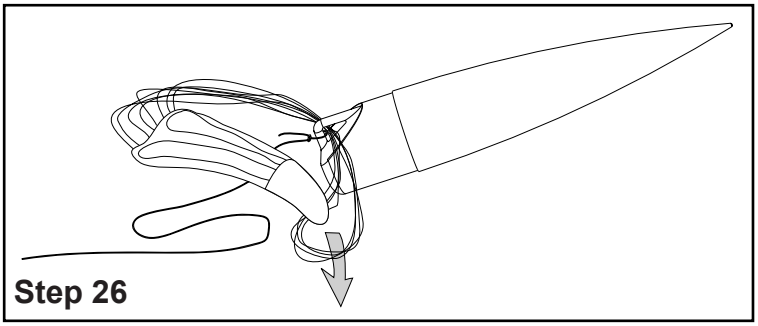
☐ 25. Pull each parachute line end through a parachute reinforcement ring and tie using two overhand knots. Repeat for all the corners as shown.



Step 24

Step 25

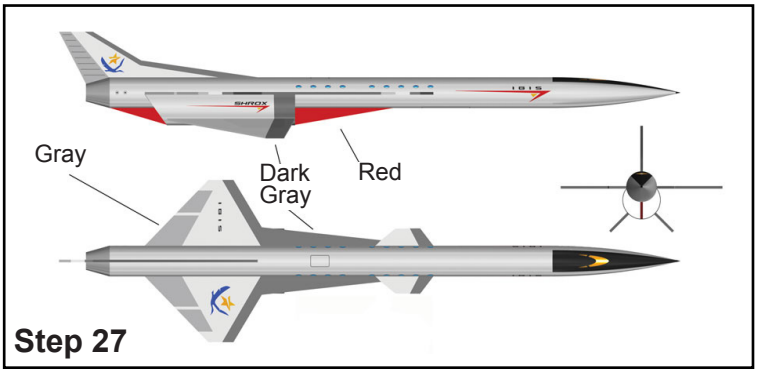
☐ 26. Holding the parachute at the center of its top, pull the lines together to even up the ends. Thread the 3 looped lines through the loop at the base of the nose cone. Take the top of the parachute and pull it through all three string loops at the same time and then pull to tighten the knot. This securely attaches the parachute to the rocket.



Step 26

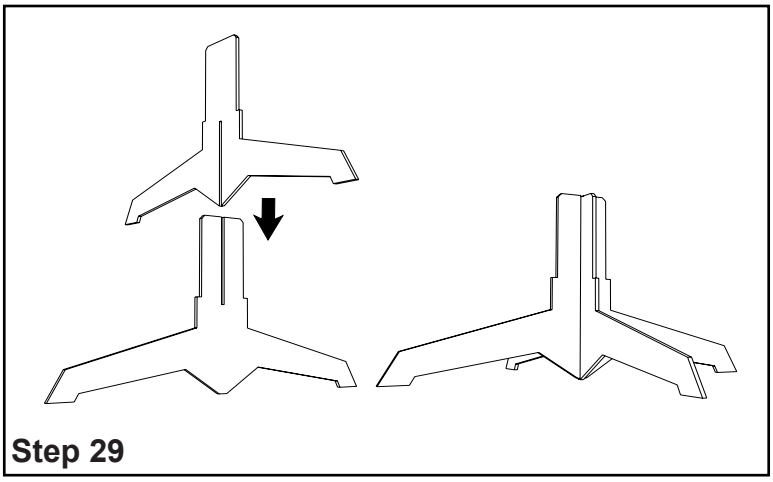
☐ 27. Roll a piece of paper and insert it into the aft end of the body tube so you can hold the model while painting it. For best results, paint the model with primer before using the final paint colors. Follow the directions on the paint can, and always paint outdoors with the wind against your back. Let the paint harden at least 24 hours before proceeding. A paint and decal scheme is shown here for reference.

☐ 28. When the paint is dry, the decal stickers can be applied to the rocket as desired.



Step 27

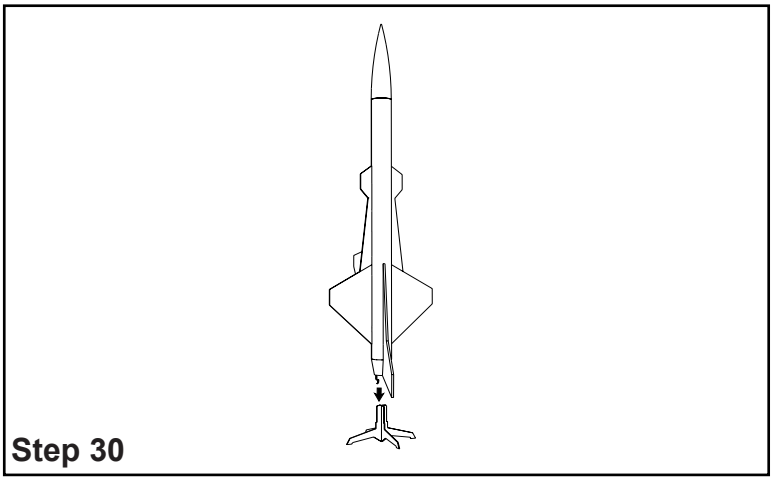
☐ 29. Remove the display stand parts from the laser-cut sheet. Glue them together using wood glue as shown. Allow the glue time to dry.



Step 29

☐ 30. You can place your Ibis rocket on the display stand for everyone to gaze at when you are not launching it.

Congratulations! Your Ibis rocket is now complete.



Step 30

Launching the Ibis

☐ The motor matrix shown here was developed using the RockSim software (www.RockSim.com). Initial conditions were: slightly breezy (3-7mph wind), with a straight up launch angle. You can use RockSim to find other motor combinations that will work well in the Ibis rocket kit. Download the RockSim file for this kit at: https://www.apogeerockets.com/downloads/rock-sim_files/ibis.rkt.zip

Motor	Produced By:	Estimated Altitude ft
B4-2	Estes	200
B6-4	Estes	219
C6-5	Estes	564
D10-7	AeroTech	1235
D21-7	AeroTech	1265

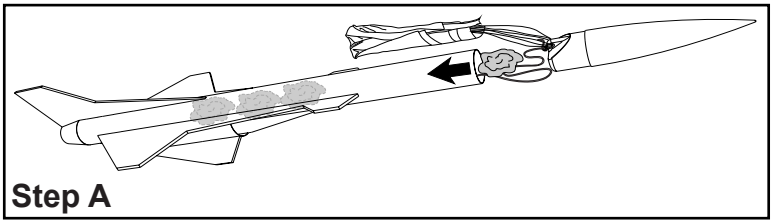
Launch Supplies Needed

To launch your rocket you will need the following supplies:
- A model rocket launch pad and launch controller
- Flame resistant recovery wadding
- Recommended Rocket Engines: See chart above.

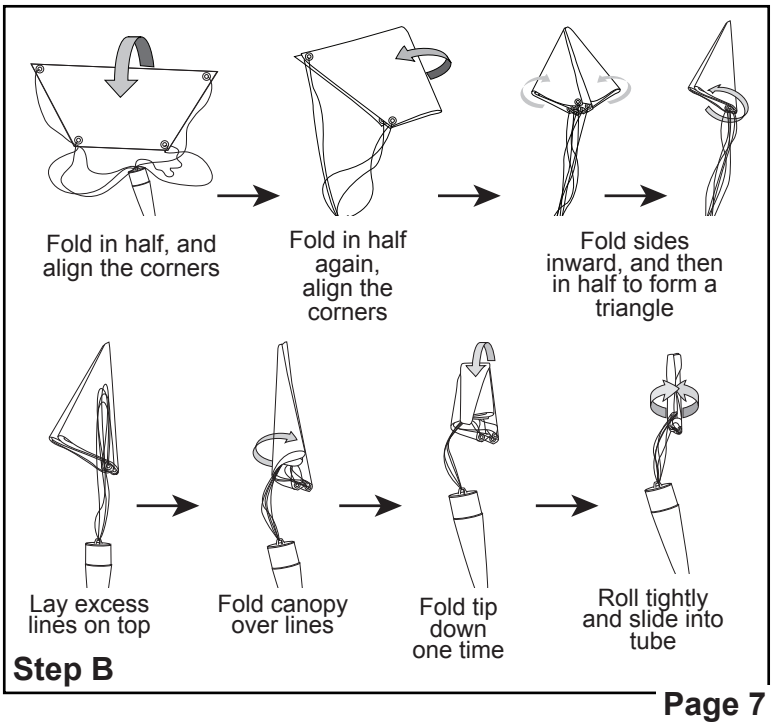
Rocket Preflight

☐ A. Crumple and insert 4 sheets of recovery wadding into the body tube.

☐ B. Fold the parachute and insert it into the tube with the shock cord.



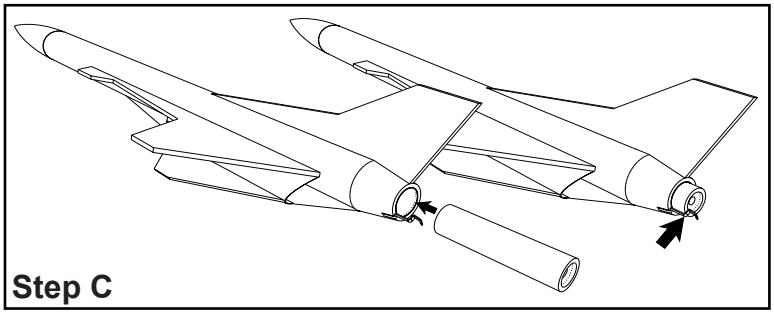
Step A



Step B

☐ C. Insert the rocket motor into the aft end of the rocket.

☐ D. Insert and secure the engine starter as directed on the package the engines came with.


Step C

Countdown and Launch Procedure

Fly your rocket on a large field that isn't near any power lines, trees, or low flying aircraft; The larger the field, the greater your chances of recovering your rocket. The launch area around the pad must be free of dry weeds and brown grass. Launch only during calm weather with very little or no wind and good visibility.

☐ 10. Remove the safety key from the launch controller.

☐ 9. Slide the launch lugs over the launch rod to place the rocket on the pad. The rocket should slide freely over the rod.

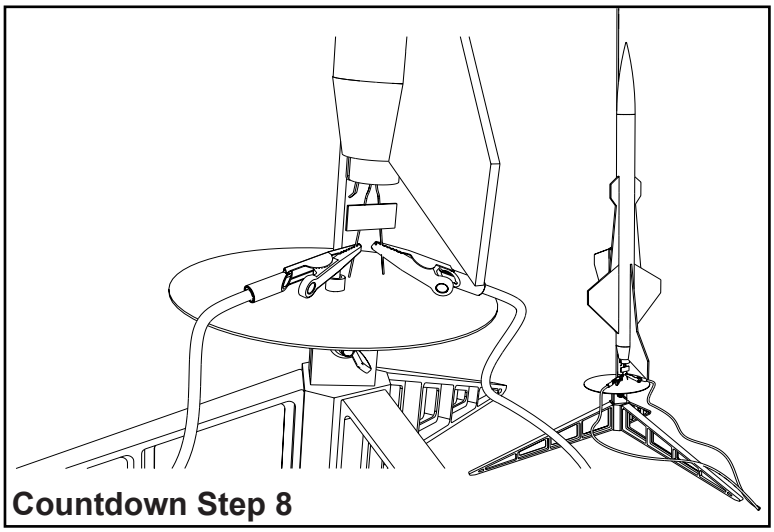
☐ 8. Attach the micro-clips to the igniter. The clips must not touch each other or the metal blast deflector.

☐ 7. Stand back from your rocket as far as the launch wire allows (at least 5 meters - 15 feet).

☐ 6. Insert the safety key to arm the launch system. The light (or buzzer) on the controller should come on.

☐ Give a loud countdown 5 ... 4 ... 3 ... 2 ... 1 ... LAUNCH!

☐ Push and hold the button until the engine ignites. Then remove the safety key and place the safety cap on the launch rod.


Countdown Step 8

Misfire Procedure

Occasionally the igniter will burn, but the motor will fail to ignite. If this happens, the cause is that the pyrogen on the igniter was not in contact with the engines propellant. When an ignition failure occurs, remove the safety key from the launch controller and wait 60 seconds before approaching the rocket. Remove the old igniter from the engine and install a new one. Make sure that the igniter is insert fully into the engine and touches the propellant. Secure the igniter as directed on the engine package and repeat the countdown and launch procedure.

Always follow the NAR* Model Rocket Safety Code when launching model rockets.

*National Association of Rocketry
**Kevlar® is a brand name of E.I. DuPont for their selection of aramid fibers. Only DuPont makes Kevlar®edge of the tube as shown. Lay the shock cord in the pre-cut slot on the inside of the ring. Pull the cord so that the loop is tight up against the side of the centering ring. Apply glue fillets to both sides of the centering rings and allow to dry.

Need parts or accesorries to go along with this kit?

Go online and order at www.ApogeeRockets.com or call us and order at **719-535-9335.** We're available M-F: 9:00am-5:00pm MST

Recommended items:	Weblink
Rocket Engines	www.ApogeeRockets.com/Rocket_Motors
Launch Controllers	www.ApogeeRockets.com/Launch_Controllers
Launch Pads	www.ApogeeRockets.com/Launch_Pads