



## Skill Level 3

### Average Skills Needed

The Skonk Wulf is a cool retrofuturistic version of a World War II jet fighter. It is meant to represent what the engineers might have developed if the war had continued. It is a creation from the mind of Shrox, the futuristic rocket designer that has dreamt up several other rockets for Apogee Components.

This rocket is short-and-stubby, but it has a lot of fin area so it flies straight and true. Despite its odd shape, it features a ton of laser cut parts, like all the fins and the main body tube. This makes the kit relatively easy to assemble, which is why it is only rated a skill level 3 on our complexity scale. The hardest part is gluing the canted tip panels to the wing. We include a special jig to help you put them on correctly, so the rocket looks great and flies even better.

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 who sees it.

Kit #05153  
Skill Level 3

Made In USA

# Skonk Wulf

## Skonk Wulf Parts List

Item #	Item Name	Qty
10091	AT-24/3.75"	1
10186	AT-66/14.2" Body Tube	1
13031	CR 18/24	1
13314	CR 24/66 1/8" Plywood	2
13056	1/4" Launch Lug	1
14262	1/8" x 5.5" Wood Dowel	2
15570	Skonk Wulf Fin Sheet A	1
15571	Skonk Wulf Fin Sheet B	1
15493	Skonk Wulf Dihedral Jig	1
19480	Nose Cone PNC-66	1
29114	18" Hex Plastic Parachute Pack	1
24043	Crimped Engine Hook	1
29520	300# Kevlar x 8Ft	1
31116	Instruction Sheet A	1
31117	Instruction Sheet B	1
41043	Decal Sheet	1
47124	Clear Plastic Bag	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

**SHROCKETS**  
BY APOGEE

Manufactured in the USA by:  
**Apogee Components Inc.**  
Colorado Springs, Colorado, USA  
Visit us online at:  
[www.ApogeeRockets.com](http://www.ApogeeRockets.com)

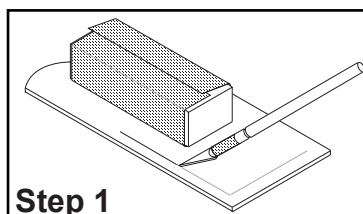
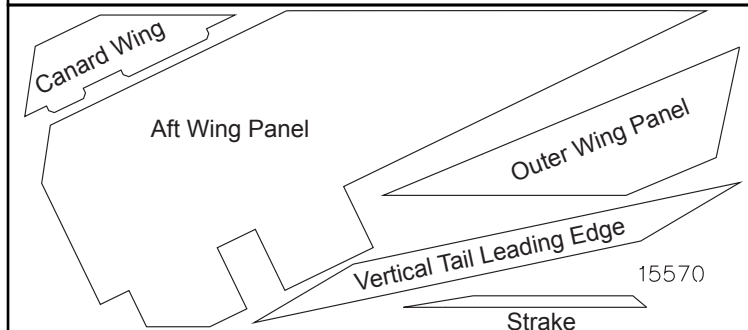
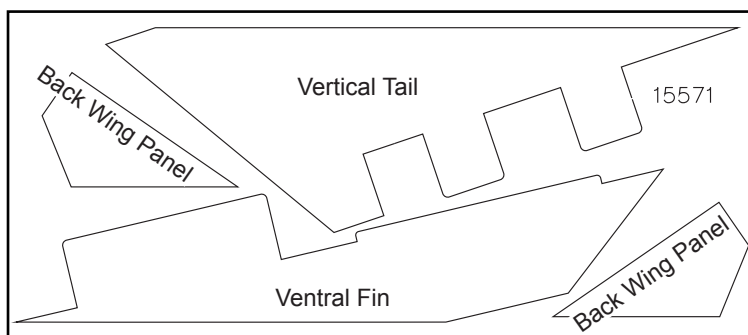
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## Identify the Balsa Parts

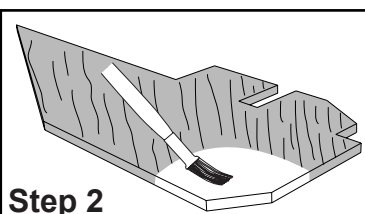
- Use the images on the right to identify the different fins on the balsa sheets.

## Assembly Steps

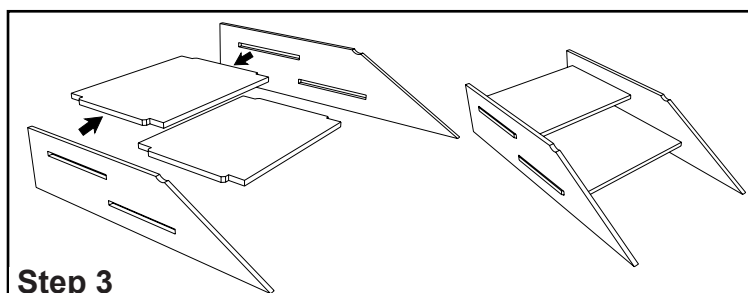
- 1. Fine sand the balsa laser-cut sheets using 200 grit sandpaper before removing the fins. Carefully remove all the pieces from the balsa sheet by freeing the edges with a sharp hobby knife. You can also remove all the little paper pieces in the slots on the tubes.
- 2. Sealing and sanding the balsa 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. Carefully remove all the pieces from the cardstock sheet by freeing the edges with a sharp hobby knife. Assemble the cardstock wing tip dihedral jig using wood glue. The tabs on the ends of the middle support pieces are inserted into the slots on the side plates.
- 4. Mark the short white body tube 2 inches (51 mm) from one end. Using a hobby knife make a slit at the line about 1/8 inch (3mm) wide. Insert the end of the engine hook into the slit as shown.
- 5. Take the green 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.
- 6. Mark the engine mount tube at 1/4 inch (6 mm) from the aft end as shown. Glue one of the wooden centering rings over the tube and engine hook at this line using wood glue. There is a small removable notch on the inside of the ring that slips over the engine hook.
- 7. Pass one end of the shock cord through the remaining wooden centering ring and tie the cord around the motor mount tube. Cinch the cord tight to the tube. Run a bead of wood glue around the forward end of the motor mount tube. Slip the ring onto the forward end of the motor mount tube so that the front edge of the ring is no more than 1/16 inch (1mm) from the front 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.



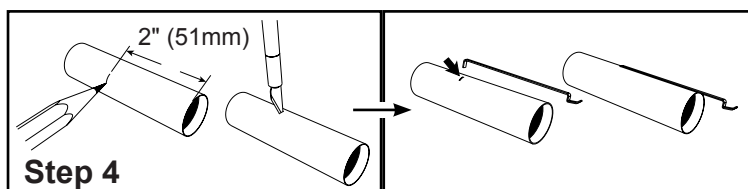
Step 1



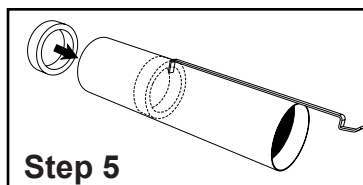
Step 2



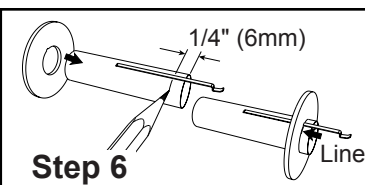
Step 3



Step 4

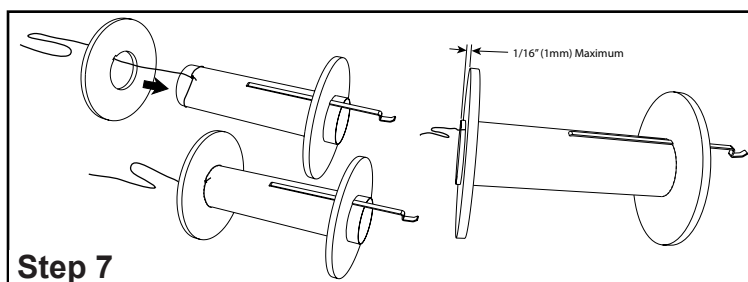


Step 5



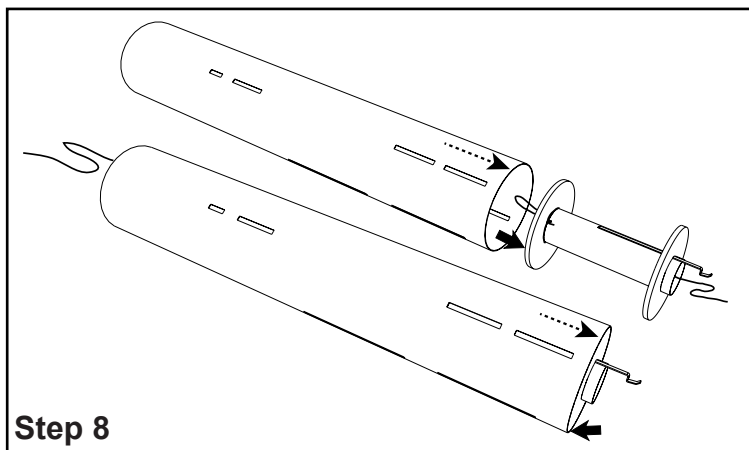
Step 6

1/16" (1mm) Max

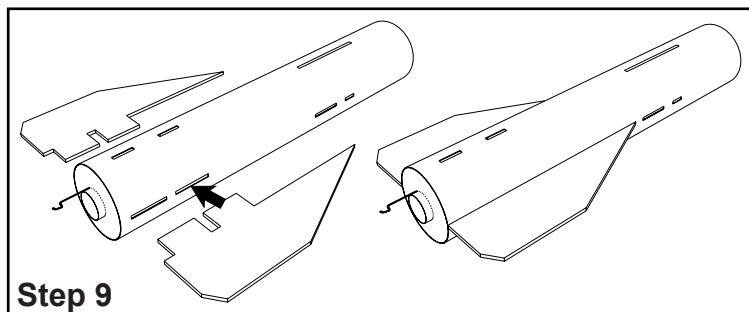


Step 7

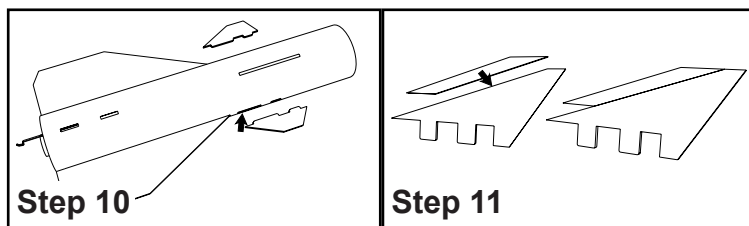
- ☐ 8. Temporarily pass the shock cord through the motor mount and out the rear. This will keep it glue-free when gluing the engine mount into the tube. Using a wood dowel, apply wood glue 3 inches (76 mm) inside the aft end of the big body tube. (NOTE: The aft end is the side with the most slots cut 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 BACK RING IS EVEN WITH THE EDGE OF THE TUBE. Also, the engine hook should NOT be in line with any of the slots cut out on 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.



- ☐ 9. Apply wood glue to all the edges of the aft wing panels that will touch the rocket body, including the through-the-wall fin tabs. Allow the glue to dry for a few minutes to become tacky, and then insert 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 the previous step.



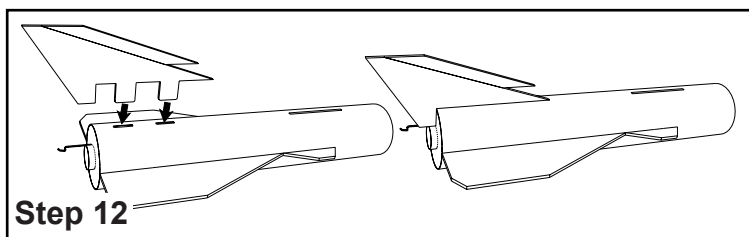
- ☐ 10. Using wood glue, insert the two small canard wings into the slots that are just forward of the wing panels as shown.



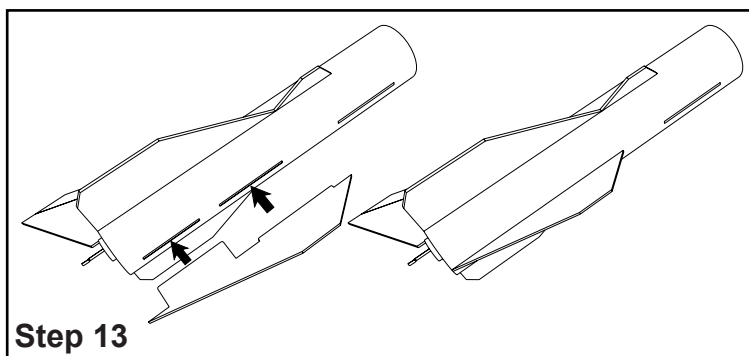
- ☐ 11. Attach the leading edge portion to the vertical tail using wood glue. Allow the glue time to dry.

**Step 11**

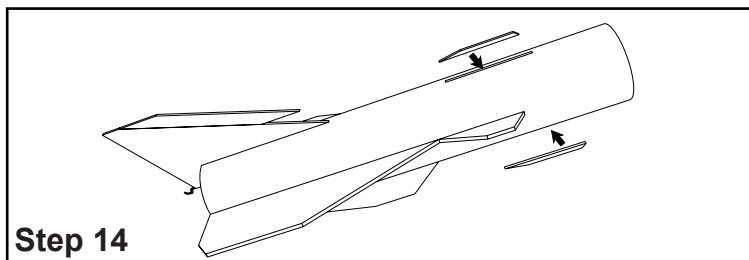
- ☐ 12. Using wood glue, insert the vertical tail into the slots on the tube. The back portion of the tail overhangs the tube and is glued to the side of the aft centering ring. Allow the glue time to dry.



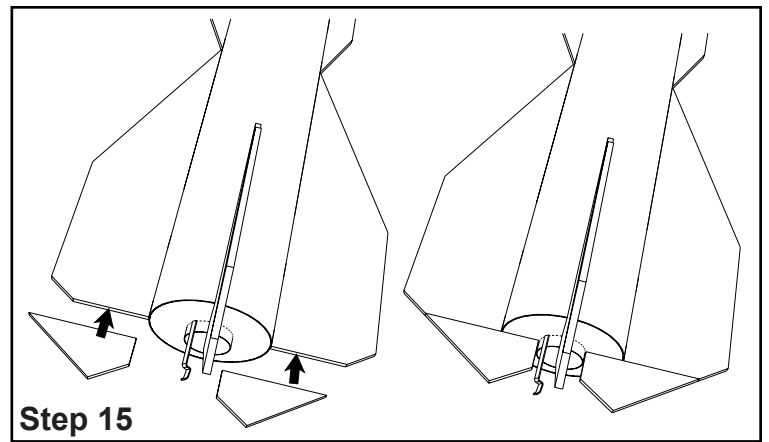
- ☐ 13. Using wood glue, insert the ventral fin into the slots that are on the bottom of the tube.



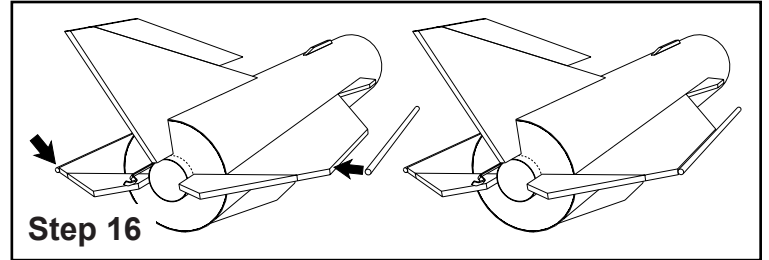
- ☐ 14. Attach the two balsa wood strakes to the forward part of the tube as shown. The locations are etched on the tube.



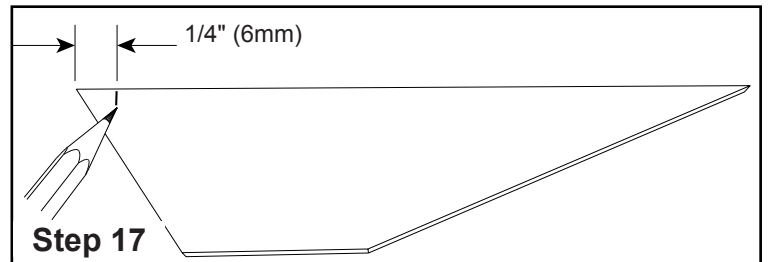
- 15. The back wing panels are glued to the trailing edge of the wing as shown. Note that they are also glued to the back centering ring and the motor mount tube.



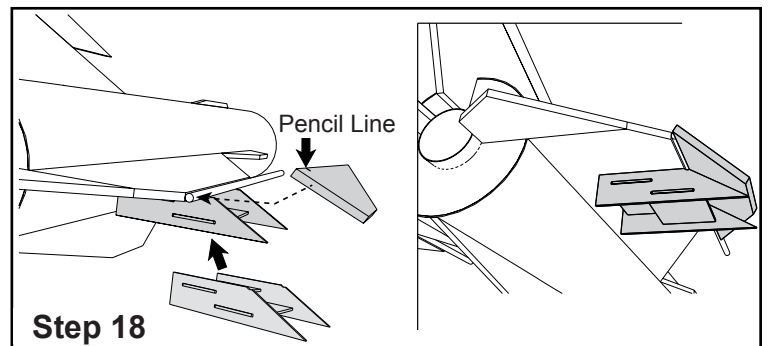
- 16. Glue the two wooden dowels to the tips of the wings as shown. The aft end of the dowel is flush with the end of the wing tip.



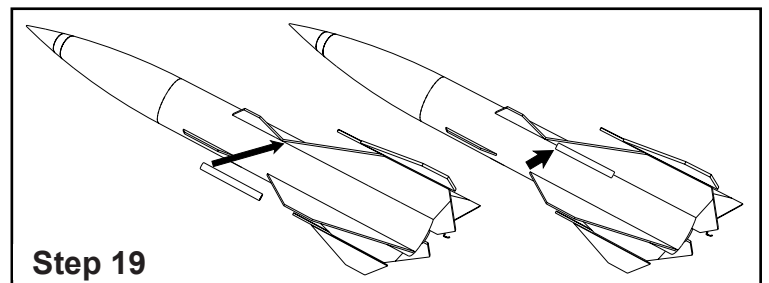
- 17. Mark the two outer wing panels 1/4 inch (6mm) from the edge as shown.



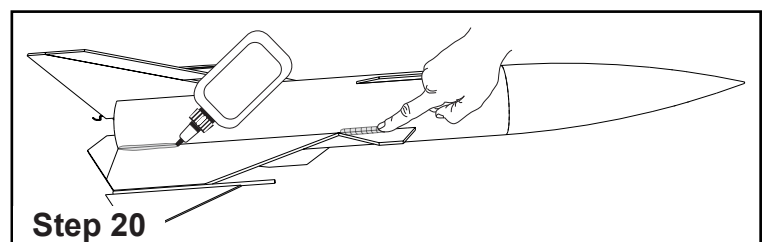
- 18. When gluing the outer wing panels to the wood dowel on the tip of the wing, the mark will be positioned on the end of the dowel. That means it hangs over the aft edge approximately 1/4 inch. Use the dihedral guide to correctly angle the wing tip as shown. It can be used for both wing tips.



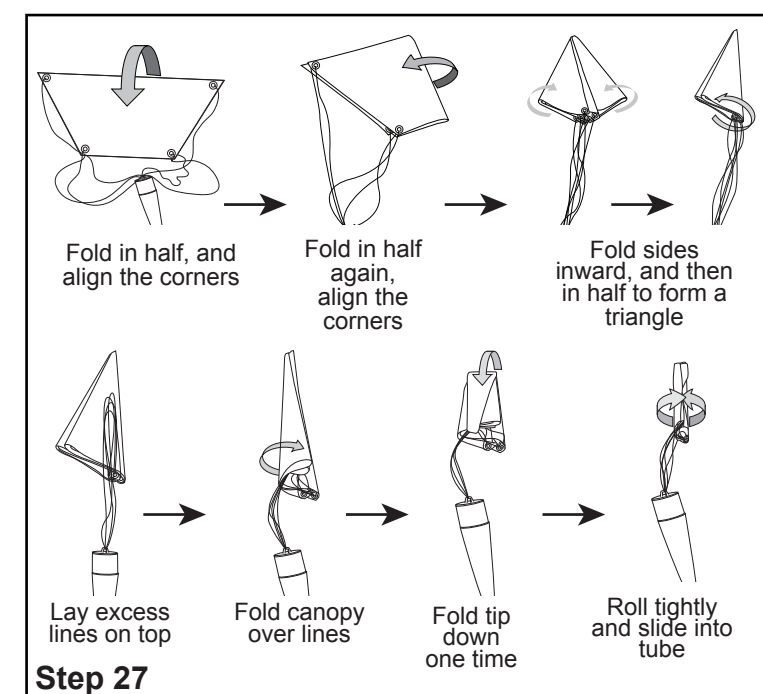
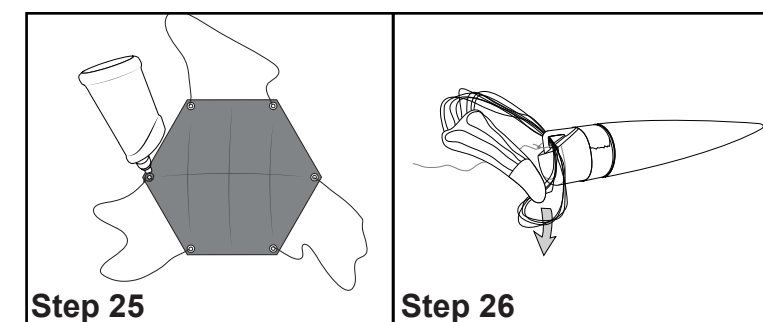
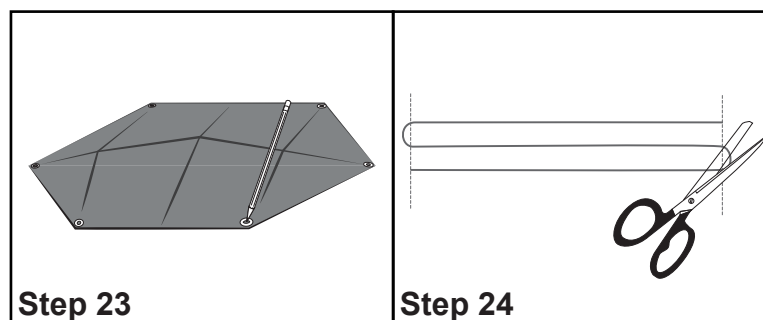
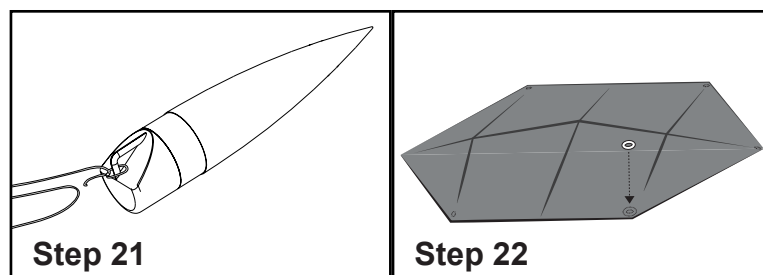
- 19. Glue the launch lug under the wing, so that it is just behind the leading edge of the large wing panel as shown.



- 20. 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.



- ☐ 21. 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.
- ☐ 22. Place one reinforcement ring on each of the marked corners of the plastic parachute canopy.
- ☐ 23. Take a sharp pencil or knife and poke a hole through the plastic in the center of each ring.
- ☐ 24. Find the shroud line and cut the string into three equal lengths as shown.
- ☐ 25. Tie the shroud lines through the ring holes as shown. Put a little bit of glue on the knots to secure them in place. Allow the glue to dry.
- ☐ 26. Holding the parachute at the center of its top, pull the lines together to even up the ends. Thread the four 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.
- ☐ 27. Fold the parachute and insert it into the body tube.
- ☐ 28. 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, then apply the vinyl decals using the face card for reference.
- ☐ 29. When the paint is dry, the decal stickers can be applied to the rocket as desired.
- ☐ 30. Congratulations! Your Skonk Wulf rocket is now complete.



## Launching the Skonk Wulf

The motor matrix shown here was developed using the RockSim software ([www.RockSim.com](http://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 Skonk Wulf rocket kit. Download the RockSim file for this kit and a free trial-version of RockSim at: [www.ApogeeRockets.com/Rocket-Kits/Skill-Level-3-Model-Rocket-Kits/Skonk-Wulf#rock-sim](http://www.ApogeeRockets.com/Rocket-Kits/Skill-Level-3-Model-Rocket-Kits/Skonk-Wulf#rock-sim)

## Launch Supplies Needed

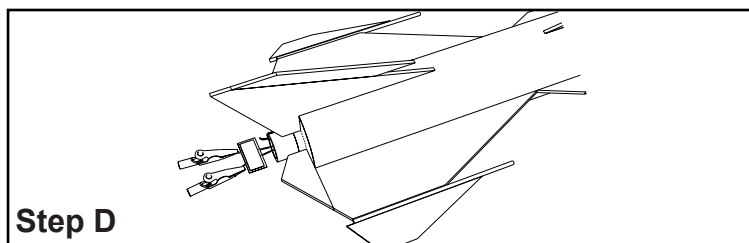
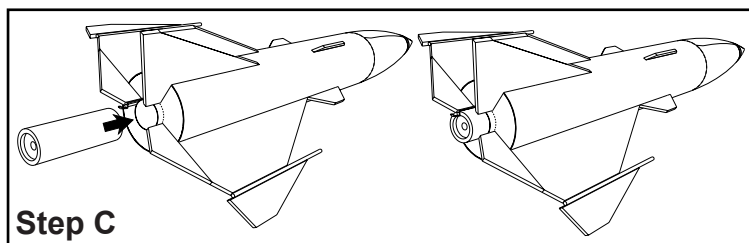
- To launch your rocket you will need the following supplies:
- A model rocket launch pad and launch controller
  - Flame resistant recovery wadding
  - Rocket Engine (Use chart)

Motor	Produced By:	Estimated Altitude ft
D12-3	Estes	485
E15W-7	Aerotech	1398
F24W-7	AeroTech	1477
F39T-6	AeroTech	1499



## Rocket Preflight

- ☐ A. Crumple and insert 5 sheets of recovery wadding into the body tube.
- ☐ B. Fold the parachute and insert it into the tube with the shock cord.
- ☐ 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.



## 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.

## 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](http://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	<a href="http://www.ApogeeRockets.com/Rocket_Motors">www.ApogeeRockets.com/Rocket_Motors</a>
Launch Controllers	<a href="http://www.ApogeeRockets.com/Launch_Controllers">www.ApogeeRockets.com/Launch_Controllers</a>
Launch Pads	<a href="http://www.ApogeeRockets.com/Launch_Pads">www.ApogeeRockets.com/Launch_Pads</a>