

About Semroc

Semroc was started by Carl McLawhorn in his college dorm at North Carolina State University in November, 1967. Convincing a small group of investors in his home town of Ayden, North Carolina to invest in a small corporation, the company was re-incorporated as Semroc Astronautics Corporation on December 31, 1969.

Semroc produced a full line of model rocket kits and motors. At its peak, Semroc had twenty-five full time employees working at two facilities. One was for research and development, printing, shipping, and administration. The other was outside of town and handled all production and model rocket motor manufacturing. For several years, Semroc successfully sold model rocket kits, supplies, and motors by mail-order and in hobby shops. In early 1971, Semroc became insolvent and had to close its doors.

After 31 years of dreams and preparations, Semroc Astronautics Corporation was reincorporated on April 2, 2002 with a strong commitment to helping put the fun back into model rocketry. Many years of excellent service to the rocketry community passed by until sadly, on August 11 2013, Carl passed away and left a great void in the hearts of many rocketeers. He is forever in our hearts and minds.

In February of 2015, Semroc was sold to eRockets and moved to Dayton, Ohio where it resides today. It is our goal to continue the level of service and dedication to the hobby that Carl and his family were so well known for. We strive to serve you, our customers, to the best of our abilities as we carry the vision of Carl McLawhorn boldly into the future.

About the Stellar Arrow™

The Stellar Arrow came about as a collaboration of ideas from the members of the "Wright Stuff Rocketeers" NAR Section. The members were given the general parts for the rocket minus the fins and were asked to come up with a rocket that we could produce as a kit. We left it up to the imagination of the club members to design the fins and the paint scheme. Once the members came up with their designs, there was a vote taken as to the best design for the fins, paint scheme, and name. The winners are what you see here, The "Stellar Arrow". Phil Queen took the design, completed the engineering needs and wrote the instructions. Graphics are by Jeff Kodysz.



**Plastic
Nose Cone**

**Laser Cut
Plywood Fins**

**Tapered
Motor Retainer**

**Screw
Together
Body Tube
Coupler**

**15"
Parachute
Recovery**

FLYING MODEL
ROCKET KIT

Made in the U.S.A by Semroc - Dayton, Ohio

Stellar Arrow™ Kit No. KA-08

Specifications		Engines / Altitude	
Body Diameter	1.64" (4.2 cm)	C11-3	250'
Length	38.0" (96.5 cm)	D12-5	600'
Fin Span	5.125" (13.02 cm)	E12-6	987'
Net Weight	5.4 oz (153.09 g)	E30FJ-6	1308'
		F24-7	1535'

Skill Level 2

BEFORE YOU START!

Make sure you have all the parts included in this kit that are listed in the Parts List in these instructions. In addition to the parts included in this kit, you will also need the tools and materials listed below. Read the entire instructions before beginning to assemble your rocket. When you are thoroughly familiar with these instructions, begin construction. Read each step and study the accompanying drawings. Check off each step as it is completed. In each step, test-fit the parts together before applying any glue. It is sometimes necessary to sand lightly or build-up some parts to obtain a precision fit. If you are uncertain of the identity of some parts, refer to the exploded view. It is important that you always ensure that you have adequate glue joints.

TOOLS

You will need the following for your assembly:

- Pencil
- Ruler
- Knife
- Q-Tip or Glue Applicator
- Wood/Modelers Putty
- White or Wood Glue
- 220 Grit Sandpaper
- Brush or Spray Paint

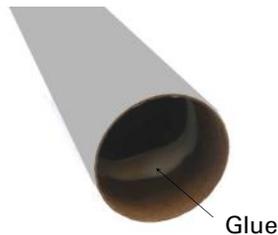
ASSEMBLY JIG PREP

1. Find the Thrust Block Positioning Tool (N) and fold the outside edges toward themselves and form it into a triangle.

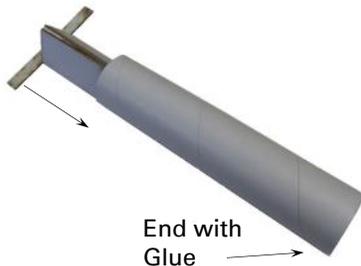


MOTOR MOUNT

2. Locate the 4.5" Motor Tube (C) and using a Q-Tip or a scrap piece of Balsa wood, put a ring of glue inside the tube approx. 1" from one end of the tube.



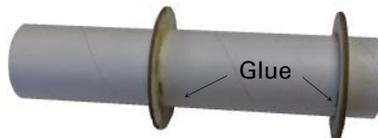
3. Starting from the end opposite from where you put the glue, insert the Thrust Block (E) into the Motor Tube. Use the Thrust Block Positioning Tool to push the Thrust Block into the tube and into the glue you have in the tube. By going in from this direction, it will keep any excess glue on the other side of the Thrust Block out of the way of any Motors you would put in your Rocket. Make sure the Tool is pushed in completely or the Motor Retainer will not function properly. When you have the Thrust Block in place, remove the tool before the glue grabs it and keeps it from being removed.



4. Mark the Motor Tube at 1 15/16" and at 4 1/16" from the end opposite the Thrust Block.



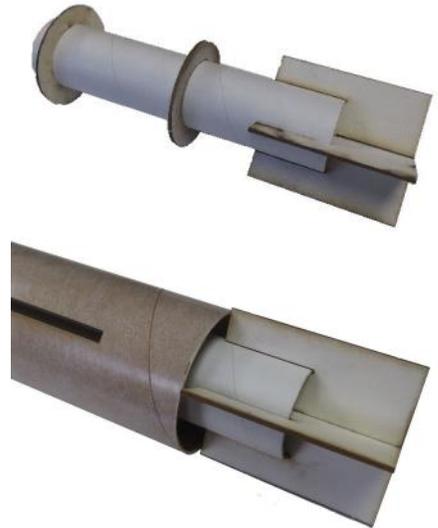
5. Glue the Centering Rings (F) onto the Motor Tube with the rings even with the marks you made on the tube. Add a Glue Fillet to both sides of the Centering Rings for added strength. Set aside to dry.



6. Assemble the Motor Mount Insertion Jig (O) as shown in the picture below. **Note:** This Jig determines how far the motor mount tube sticks out of the rear of the Body Tube. You can use the Jig as a stand to allow the glue to dry in the next step.



7. Test fit the Motor Mount into the end of the slotted body tube (A). Make sure the mount slides in easily. Remove the motor mount and put a ring of glue at the top of the fin slots. Also put a ring of glue on the top of the lower centering ring on the motor tube. Using the Motor Mount Insertion Jig (O), insert the Motor Mount in the Body Tube until the Gauge is against the Body Tube. Do this in one smooth motion. **(Note:)** Proper Motor Tube positioning is critical to the Motor Retainer function of the Tail Cone. Stand the Body Tube in an upright position to allow the glue a chance to migrate to the joint between the Rings and the Body Tube. Allow to Dry.



8. Glue on the Motor Retainer (G). Remove the Insertion Jig and apply a line of glue to the inside rear of the Body Tube. Apply a thin film of glue on the lip of the threaded coupler ring of the Retainer. Insert it in the end of the body tube over the Motor Tube. Make sure the threaded coupler seats completely against the body tube. Wipe off any excess glue that may have squeezed out during insertion of the coupler. Unscrew the Retainer portion just to make sure it doesn't get locked on while the glue dries. Allow glue to dry.



9. Using the Fin Alignment tool, make a mark on the Lower Body Tube (A) half way between the slots for the fins. After you have made the mark, use a drawer or a door jamb to draw a straight line along the body tube forward of the slots for the fins. This is where the Launch Lug will be attached after you have the fins mounted.



ATTACH FINS

❑ 10. Take the fins (H) and lightly sand any burn marks off of the edges of the fins before you glue them to the body tube. This will allow the glue to work its way into the fibers of the wood, and give you a stronger glue joint. For better performance, lightly round the leading, outer and trailing edges of the fins. Use the Fin Alignment tool to make sure the fins are projecting straight out from the body tube as shown. Repeat until all three fins are glued on. Apply a glue fillet along the fin/body tube joint for added strength.



❑ 11. Attach the Launch Lug (I) to the Lower body Tube with the rear most end of the Launch Lug just forward of the leading edges of the fins. Make sure the Launch Lug is parallel with the body tube. After the Launch Lug has had a chance to dry, add glue fillets for extra strength.

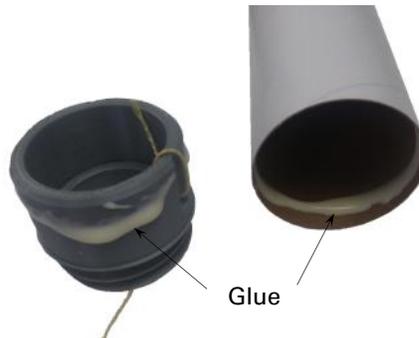


COUPLER

❑ 12. Separate the threaded coupler (J) and attach the Yellow Kevlar Shock Cord (K) to the half that has the male threads. Attach the shock cord to the coupler half by way of the hole in the side of the part as shown. Make sure the cord is securely fastened.



❑ 13. Feed the shock cord back through the coupler so that it comes out the side with the threads. This will get the cord out of the way for when you go to insert the coupler into the body tube.



❑ 14. Spread glue around the inside of the end of the Upper body tube (B), and also around the outside of the coupler before inserting the coupler into the body tube. Make sure the coupler goes into the body tube completely. Wipe off any excess glue that squeezes out, making sure to keep it off of the threads. When the glue is dry, feed the shock cord so it comes out the other end of the body tube.

❑ 15. Glue the other half of the coupler into the Lower Body Tube in the same way. Clean up any glue squeezed out, keeping it off of the threads.



NOSE CONE

❑ 16. Attach the Shock Cord to the loop on the Nose Cone (D). Tie the shock cord on securely. Put the shock cord back into the tube and check the fit of the Nose Cone in the Body Tube. If the Nose Cone is too tight, sand the shoulder of the cone so it fits better. If it is too loose, add some masking tape around the shoulder until it fits better.

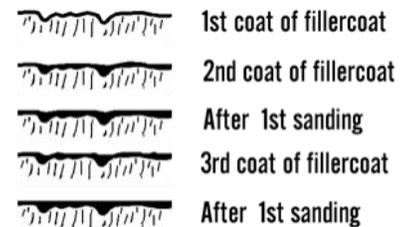


❑ 17. Follow the instructions on the Parachute Package (L) and construct a 15" Parachute. Remove the Nose Cone and attach the Parachute to the Nose Cone where you attached the shock cord. Fold the Parachute and insert it into the body tube and reinstall the nose cone.

❑ 18. Connect the two body tubes together with the threaded coupler and you have completed your STELLAR ARROW.

FINISHING

❑ 19. Prepare the wood for a smooth looking finish. Fill the wood grain with Fill'n'Finish, balsa fillercoat, or sanding sealer. When dry, sand with fine sandpaper. Repeat until smooth.



FLIGHT PREP

20. The Stellar Arrow files on 24mm rocket motors. If you are going to be flying it on a C11, or D12 Black powder motor you will need to insert the MC-909 Spacer (M) that was included with your kit to take up the extra space in the motor tube.

21. Put recovery wadding into the top of the lower body tube. Use a sufficient quantity to protect the parachute, about 1 1/2 times the diameter of the body tube is enough.

22. Fold the parachute and pack it and the shock cord in the upper body tube. Slide the nose cone into place, making sure it does not pinch the shock cord or parachute.

23. Screw the two body tubes back together to get the Stellar Arrow into it's Flight Configuration.

24. Remove the Tail Cone and insert the Motor of your choice using the MC-909 Spacer if needed. Re-install the Tail Cone to lock the motor in place.

25. Refer to the model rocket engine manufacturer's instructions to complete the engine prepping. Different engines have different igniters and methods of hooking them up to the launch controllers.

26. Launch your Stellar Arrow™ from a 3/16" diameter by 36" long launch rod. Always launch in a vertical position in calm winds. Use a smaller engine for the first flights.

27. Make sure the sky is clear and the range is clear. Perform a countdown. 5-4-3-2-1-Launch. Recover your Stellar Arrow Rocket and remove and properly dispose of the spent motor.

28. Carefully check all parts of your rocket before each flight as a part of your pre-flight checklist.

Parts List

A	1	Body Tube	BT-60180S3
B	1	Body Tube	BT-60NS
C	1	Body Tube	ST-945
D	1	Plastic Nose Cone	PNC-60R
E	1	Thrust Ring	TR-9
F	2	Centering Rings	CR-7-9
G	1	Tail Cone Retainer	TCR-60-3DS
H	1	Laser cut Fins	FA-08
I	1	Launch Lug	LL-330
J	1	Plastic Coupler	CPL-60-3DS
K	1	Kevlar Cord	SCK-90
L	1	Chute Pak	CP-12-24
M	1	D Engine Spacer	MC-909
	1	Thrust Block Tool	TKA-08
	1	Motor Mount Tool (Not Shown)	
	1	Decal (Not Shown)	DKA-08

