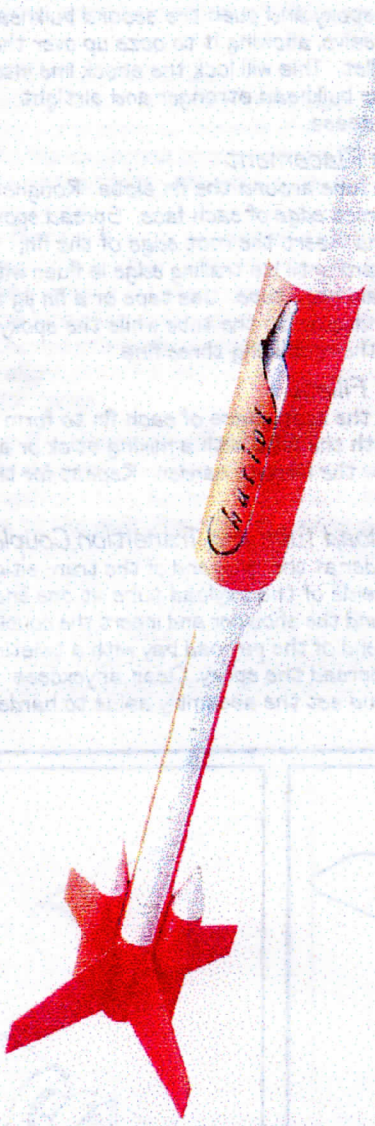
Chariot

Assembly Guide



RUGGED-ROCKETS

Introduction

Congratulations on your purchase of a Rugged-Rocket kit. Unlike other kits, your Rugged-Rocket can give you hundreds of flights, for years of enjoyment. The phenolic and fiberglass construction is water resistant and extremely tough. However, such materials require special adhesives and construction techniques. Be sure to follow each assembly step carefully. As a supplement to these instructions, Rocket Vision has prepared a series of tutorial web-pages covering each area of construction, including animations and detailed graphics to help make your Rugged-Rocket assembly perfect. The URL is http://www.rocketvision .com/Library/Assembly_Guide/welcome_to_ guide.asp

❑ Kit Contents and Tools

First, lay out the kit making sure that it is complete and that you can identify all the parts. Be certain that you have all the tools and materials you will need. Your kit should contain the following parts:

- ❑ Nose Cone Package
  - ❑ Nose Cone 2"
  - ❑ Nose Cone 1" (2)
  - ❑ Coupler Bulkhead (2)
  - ❑ Transition Coupler
  - ❑ Nose Cone Retention Screw (2)
- ❑ Recovery Package
  - ❑ Parachute
  - ❑ Nomex Parachute Protector
  - ❑ 6 Split Rings
  - ❑ Launch Lugs (2)
  - ❑ 1 Shock Line (Heavy Cord)
  - ❑ 2 Attachment Lines (Heavy Cord)
  - ❑ 3 Shroud Lines (Light Cord)
- ❑ Side Tube (2)
- ❑ Booster Airframe Tube
- ❑ Payload Section Tube
- ❑ Motor Mount Tube
- ❑ 4 Fins
- ❑ Decal Sheet

Required Tools & Materials

- ❑ Masking Tape
- ❑ Sandpaper (Fine or 300 grit)
- ❑ 5-minute and 20-minute (2-Ton) Epoxy
- ❑ Plastic Model Cement (solvent type)
- ❑ X-acto or other hobby knife
- ❑ Scissors
- ❑ Newspapers
- ❑ Spray Paint & Primer

Optional Materials

These optional materials will help you finish your rocket like a master modeler:

- ❑ Water-based or Acrylic Decal Overcoat or Future floor wax
- ❑ Micro-Sol Decal Setting Solution

❑ Step 1 - Test fit all Pieces

Make sure all parts will fit together properly. If necessary, sand slots or couplers for a proper fit.

❑ Step 2 - Sand fins, bulkheads and transitions

Sand the root edges of the fins to remove the parting tabs. Round the leading and tip edges of the fins. Sand the round bulkheads to remove the parting tab and to ensure a good fit into the transition coupler.

❑ Step 3- Shock Line

Tie a small knot at one end of the shock line. Attach a split ring to the opposite end, then attach a second split ring eight inches from the first and attach a third ring eight inches from the second.

Lay the shock line along the motor mount tube with the knot close to the end of the tube. Secure the shock line to the motor mount tube with two small pieces of clear adhesive tape. (a)

❑ Step 4 - Motor Mount and Retainer

Apply epoxy to the inside of the main body tube just forward of the fin slots. Pass the shock line through the body tube and insert the motor mount tube slowly with a twisting motion, being careful not to build up a ridge of epoxy ahead of the tube. Apply epoxy to the last inch of motor mount tube and push it flush with the end of the main body tube. If necessary, us a rubber band or masking tape to hold the body tube flush against the motor mount while the epoxy sets. Use a brush or stirring stick to remove excess epoxy from the fin slots and from the inside of the main body tube forward of the motor mount. Set the body tube aside until the epoxy is set. After the epoxy is hard, trim away the knot in the shock line.

❑ Step 5 - Transition Coupler and Payload Shockline

Rough up both faces of the bulkheads and the inside surface of the transition coupler. Tie one end of one of the short lengths of heavy Kevlar shock line through one of the round bulkheads . Enlarge the hole with a drill or hobby knife if necessary. Tie a split ring to the free end of the line. Apply epoxy to the shoulder inside the narrow end of the transition coupler and set the bulkhead against the shoulder. Cover the inside top surface of the bulkhead with epoxy and push the second bulkhead down into the adhesive, allowing it to ooze up over the edges to form a fillet. This will lock the shock line into place and make the bulkhead stronger and airtight against ejection gasses.

❑ Step 6 - Fin Placement

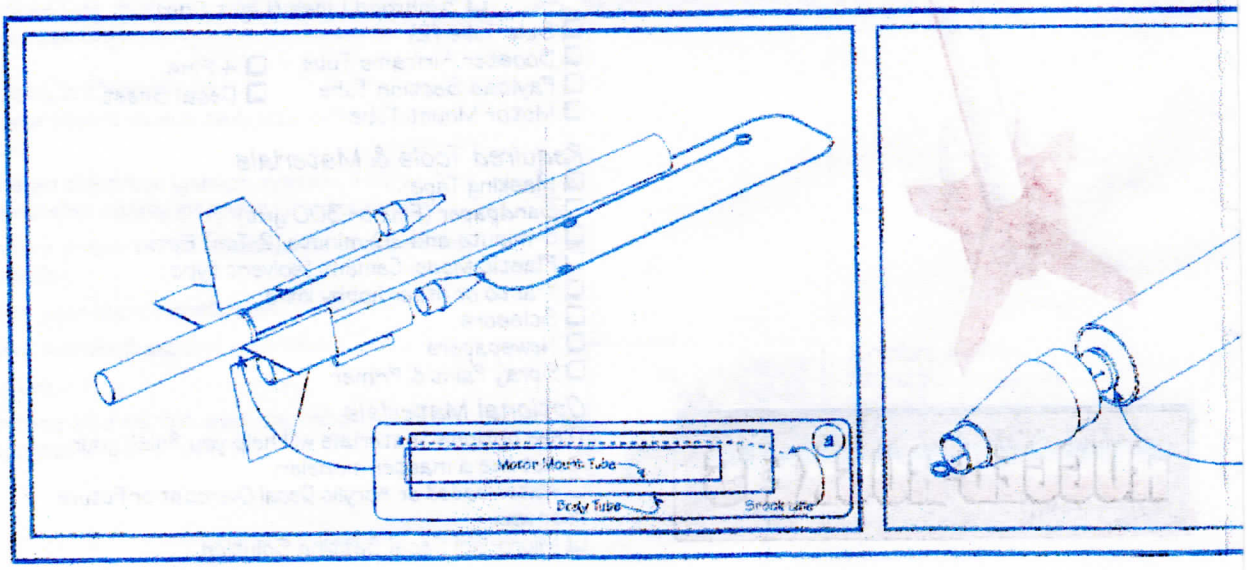
Roughen the body tube around the fin slots. Roughen the fins along the root edge of each face. Spread epoxy along a fin slot and insert the root edge of the fin, sliding the fin forward until its trailing edge is flush with the base of the main body tube. Use tape or a fin jig to hold the fin perpendicular to the tube while the epoxy sets. Repeat for the remaining three fins.

❑ Step 7 - Fin Fillets

Apply epoxy along the root edges of each fin to form a small fillet. Smooth the fillet with a mixing stick or a gloved finger. Allow the fillet to harden. Repeat for the remaining fins.

❑ Step 8 - Payload Tube and Transition Coupler

Roughen the shoulder at the large end of the tran- sition coupler and the inside of the payload tube at one end. Spread epoxy around the shoulder and insert the coupler into the prepared end of the payload bay with a twisting motion to evenly spread the epoxy. Clean anyexcess epoxy with a rag and set the assembly aside to harden.



❑ Step 9 - Side Tubes

Roughen the outside surface of the side tubes and a five inch area between fins at the base of the body tube 90 degrees around the tube from the motor clip. Roughen the inside of a tube at one end and the shoulder of the small nose cone. Epoxy the nose cone into place in the tube. Spread epoxy along the one side of the side tube and position it along the main body tube, parallel with the axis and flush with the base. Use tape or round caps to hold it in position while it sets. Repeat with the other side tube, positioning it 180 degrees from the first tube.

❑ Step 10 - Launch Lugs

Roughen up a two inch long area on the side of the payload tube. Apply some epoxy to the side of the launch lug and set it onto the roughened area, aligning it with the long axis of the payload tube. Allow the epoxy to harden, then apply epoxy fillets.

When the first lug is ready, assemble the body tube and payload bay. Slip a 1/8 or 3/16 inch rod and twist the payload bay until the rod aligns with the side of a side tube. Mark a line along the rod to align the second launch lug. Remove the rod and apply epoxy to the lug. Set the lug onto the alignment mark and let the epoxy harden. Fillet the lug with epoxy.

❑ Step 11 - Recovery System

Tie a split ring onto the parachute protector with a short length of heavy Kevlar. The parachute protector attaches to the split ring closest to the airframe. Tie the end of each shroud line through an eyelet on the parachute, making three loops. (b) Thread the shroud line through a split ring then bring the parachute though the resulting loop. Make sure all the shrouds are even. The parachute attaches to the hindmost shock line ring. The payload bay attaches to the second split ring.

❑ Step 12 - Nose Cone

Insert the nose cone into the foreward end of the payload bay. Secure the nose cone with two screws.

❑ Step 13 - Packing the Parachute

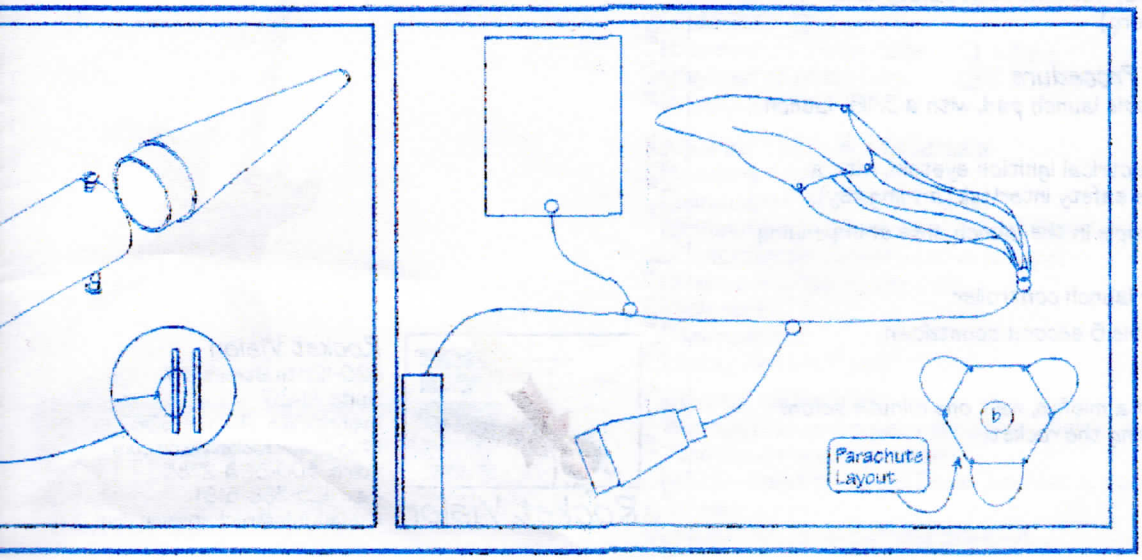
Begin by crumpling then inserting the Nomex parachute protector into the airframe. Ensure the nomex is filling the tube not lying against the side of the airframe. Then fold and pack the parachute.

❑ Step 14 - Painting

Prime your rocket with the nose cone in place following the instructions on the paint label. Sand lightly between each primer coat to smooth the finish. Then apply the color coat of your choice.

❑ Step 15 - Decals

Cut out the decals using a very sharp hobby knife, leaving a 1/16" clear border around the graphics. Use warm water to lightly wet the area of the model where you're about to apply the decal. Put the decal in warm water for about 30 seconds. Don't wait for it to float off the backing. Once the backing paper is saturated, the decal is ready for transfer. Put the decal on the model in roughly the final position, then put your fingertip on one edge of the decal and gradually slide the backing paper from beneath. Use a soft brush position the decal while still wet. Expert modelers may use Micro-Sol decal setting solution to soften and seal the decal in its final position. Do not try to reposition a decal treated with Micro-Sol. Let the decal dry overnight. You may use an optional water-based overcoat such as Model Master Acryl, Poly S, or Future brand floor wax.



Motor Selection

Use the following table to help select a motor for your flight. These suggested field sizes are at least as large as the NAR safety code requirements for the motor size.

Mfg.	Motor	Est. Altitude	Field Size
FS	E15-4	1300'	700'
FS	F72-10	3100'	1,500'
FS	G55-10	4,300'	2,000'

Flight Preparation

To prepare your Rugged-Rocket for flight, first pack the recovery system, then install the motor. Begin by crumpling then inserting the Nomex parachute protector into the airframe. Then fold and pack the parachute. Insert the nosecone, and check for proper fit. It should be easily removable, but should not fall out when the rocket is turned upside down.

Now install the motor. Rugged-Rockets use a friction fit motor mount system. Use masking tape, wrapped in a spiral pattern around the motor, to make a snug fit. You can use a firm surface to help press the motor into place, ensuring it is inserted fully into the rocket. Make sure the motor fits tightly, and that its lower edge is flush with the bottom of the rocket. See Post-Flight to remove a spent motor.

Flight

Model rocketry is an activity that has been enjoyed safely for more than thirty years. What has made it so safe for so long is adherence to a safety code. Use the following launch proceedure, from the NAR safety code. (www.nar.org)

Launch Procedure

Use a stable launch pad, with a 3/16" launch rod.

Use an electrical ignition system, with a removable safety interlock (arming key).

Inform people in the launch area of impending launch.

Arm your launch controller.

Give audible 5 second countdown.

LAUNCH!

In case of a misfire, wait one minute before approaching the rocket.

Post-Flight

After recovering your Rugged-Rocket, remove the spent motor and inspect the rocket for damage. An easy way to remove the motor is to use a dowel, about four inches longer than the booster airframe of your rocket, and about 3/4" in diameter. Make sure that the parachute, parachute-protector and shock-line are out of the way, then insert the dowel into the booster until it's pressing against the top of the motor. Turn the booster upside down, place the dowel on a firm surface, then pull the booster down over the dowel, ejecting the spent motor.

Clean-up & Storage

When storing your Rugged-Rocket, remove the parachute and Nomex protector. Don't leave them packed in the rocket for extended periods of time. The parachute may take on a permanent "set" which could prevent it from opening properly.

Satisfaction Guarantee

If for any reason you are not satisfied with your Rugged-Rocket, return it to Rocket Vision for a free replacement or refund. Our goal is for you to be satisfied with your purchase. This guarentee covers materials and workmanship; we cannot be responsible for assembly or use of the kit.

Legalities

As we cannot control how our products are used, we cannot assume any responsibility for damages. Rocket Vision shall not be held responsible for any personal injury or property damage resulting from the use of this product. The buyer assumes all risks and liabilities arising from such use, and uses our product under these conditions. If any of these terms are unacceptable, return the unassembled kit to Rocket Vision for a prompt refund.

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