

More Notes

3D ROCKETRY

CIRCULUS 4

Instructions



CIRCULUS 4 PARTS

- 1- 12.75" Weighted Plastic Nose Cone
- 1- 17" X 4" Body Tube
- 1- 7.5" X 38MM Motor Tube
- 2- 3/16" Plywood Centering Rings
- 6- 3/16" x 1/4" Basswood Strips
- 3- 3/16" Plywood Fins
- 1 - 10-1/4" dia. x 3" Tail Ring
- 2- 1010 Rail Buttons
- 1 - 3/16" N. C. Bulkhead W/Stop
- 1 - 1/4" N. C. Eyebolt/Washers/Nuts
- 1 - 3/16" Eyebolt/Washers/Nuts

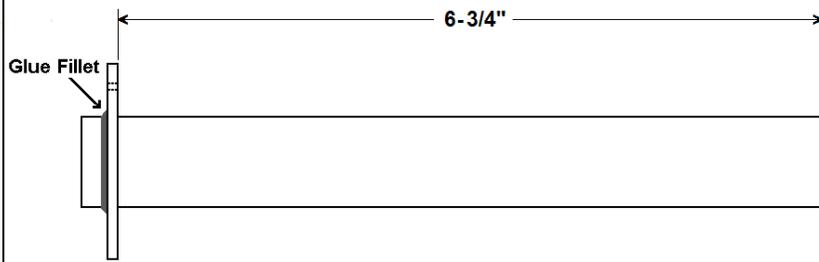
3D Rocketry, Statement of Limitation of Liability

Limitation of Liability: Model rockets are not toys. Model rockets are functional rockets constructed of lightweight materials and launched using pre-manufactured, NAR safety certified model rocket motors in accordance with the NAR Model Rocket Safety Code. Model rockets, if misused, can cause injury, property damage and even death. 3D Rocketry certifies that it has exercised reasonable care in the design and manufacture of its products. Once sold, we cannot assume any liability for product storage, transportation or usage. 3D Rocketry shall not be held responsible for any property damage or personal injury whatsoever arising from the handling, storage, use or misuse of our product. The buyer assumes all risks and liabilities there from and accepts and uses 3D Rocketry products on these conditions.

3D ROCKETRY

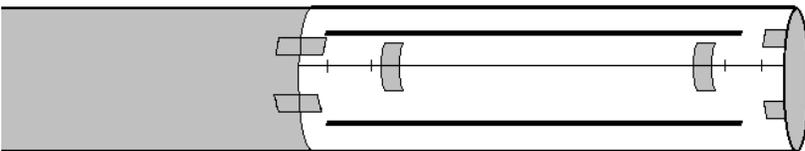
Step 1

(Tip: Dry fit fins, centering rings, bulkhead, motor tube and tail ring before assembly to insure all parts line up correctly. Some slight sanding or trimming may be needed.) Glue centering ring that has a small hole to motor tube 6-3/4 in. from bottom of tube as shown. Apply a few layers of fillet glue at the top of forward ring. Let each fillet layer of glue dry before applying next layer. Allow this assembly to dry thoroughly before gluing in main tube! **Do not glue rear centering in place at this time.**



Step 2

Cut out fin slot template guide. Tape slot guide around body tube lining it up with the small guide lines and end of body tube. Next tape down fin guide at the end of body tube and at top of fin guide. **Make sure template can not move while cutting or marking tube.** The slots can be cut out a couple of different ways. 1) Cut out paper slots and trace slots on to body tube with pencil or poke holes at each corner point, connect pin dots with straight edge and carefully cut out slots with a hobby knife freehand or with a straight edge. 2) Cut slots out using a dremel type tool. After cutting slots sand or trim slots so fins slide through easily but snugly.



3D ROCKETRY

Notes:

Recommended Parachute : 30" - 36" Nylon

Recommended 38MM Motors for first flight :

| <u>Aerotech Single Use</u> | <u>Aerotech Reloads</u> | <u>CTI Reloads</u> |
|----------------------------|-------------------------|--------------------|
| H100-7 | G69-6 | G50-6 |
| G80-7 (29mm) | G61-6 | G58-6 |

Due to motor mount length

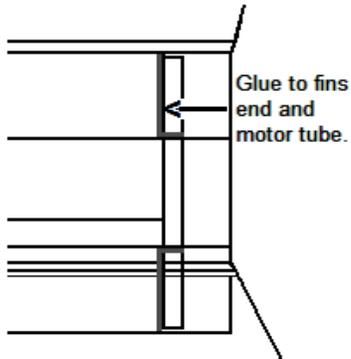
DO NOT EXCEED A 203mm LONG MOTOR!!

3D ROCKETRY

Step 9

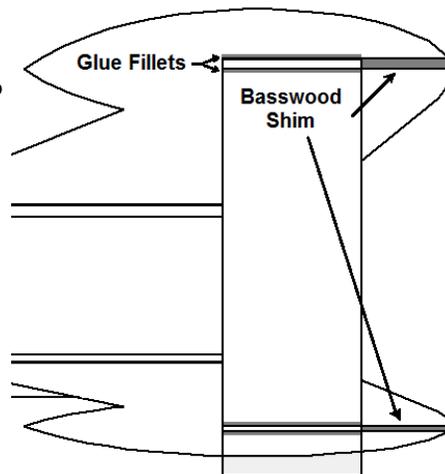
Glue the rear ring to the rear edge of the fins, body tube and motor tube. Attach the rail buttons at your desired locations. I suggest mounting the rail buttons into the centering rings.

(Tip: Adding rail button standoffs made with wood will protect your body tube paint job from the launch rail scratching it.)



Step 10

1) After fins are good and dry, slide tail ring into notches on the fins. Some light sanding of the fin notch may be needed to get a snug fit. Glue tail ring in notches and apply thin fillets to all ring/fin connections.
2) After ring is dry, glue in supplied basswood shims. After shims are dry sand and smooth them till flush with fins. Attach a retainer, parachute and most importantly...



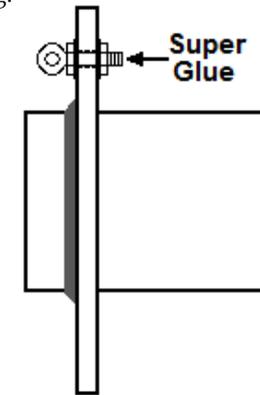
ENJOY!!

3D ROCKETRY

Step 3

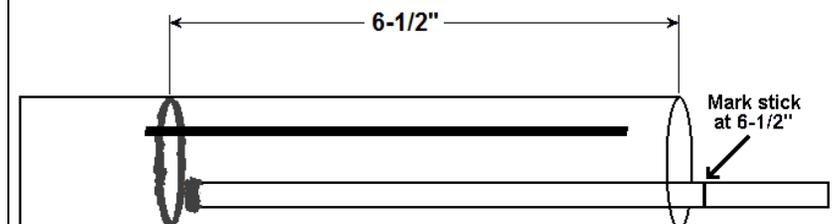
After the forward centering ring is thoroughly dry on the motor tube, install the 3/16 in. shock cord eyebolt as shown. Leave the nuts loose so the bolt can spin freely. Apply a few drops of super glue to the **threads only** to prevent the nuts from loosening.

When installing motor tube in the main body tube do not block fin slots with eyebolt.



Step 4

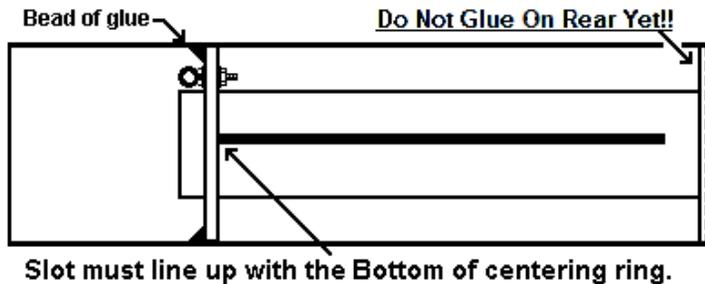
(Tip: Sanding the fin slot on the inside of the tube keeps the centering rings from binding when inserting motor tube assembly.) Find a scrap piece of stick that's about 10 in. to 12 in. long and mark the scrap piece at 6-1/2 in. Apply a generous ring of glue inside the main body tube at the 6-1/2 in. mark as shown.



3D ROCKETRY

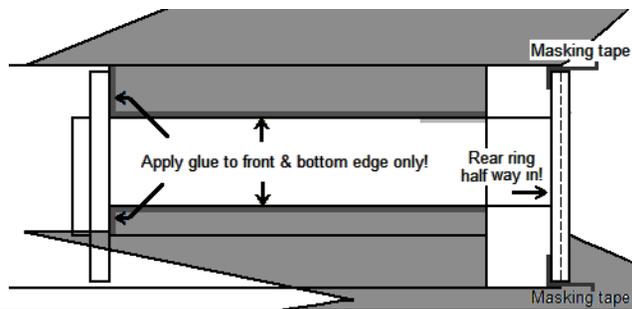
Step 5

Insert the motor tube assembly into the main tube till the bottom of the top centering ring is at the top of the fin slot. Motor tube should be flush with end of main tube. Place lower centering ring on partially to align motor tube but **do not glue ring to motor tube yet.** (TIP: Placing pieces of masking tape on lower ring helps to pull it out after assembly is dry. See step 6) Stand up the completed assembly with the motor tube end down until the glue dries. Look down into the top of the body tube and check to make sure you have a good bead of glue around the edge of the centering ring and body tube.



Step 6

Leave the masking tape on the rear centering ring so you can apply optional internal fillets after gluing on fins. **Insert rear ring in half way only!** Apply glue to the **front and bottom edges** of the fins only as shown and carefully slide in slot until fin touches motor tube. Allow each fin to dry before gluing next one. Using the supplied fin angle template will keep fins at the right angle. (INTERNAL FILLET TIP: Use glue wood or thinned epoxy dripped at the end of the internal fin/motor tube connection and allow glue to flow all the way down the connection. This method greatly increases the internal fin to motor tube connections.)

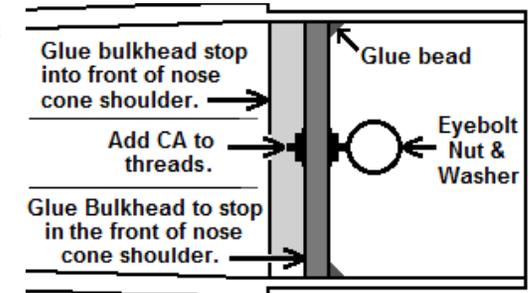


3D ROCKETRY

Step 7

(1) Insert eyebolt, washer and nut thru bulkhead. Attach inside washer and nut then finger tighten so eyebolt will spin. Add a few drops of CA to the end of the eyebolt threads. (2) Sand inside the nose cone shoulder where the bulkhead stop and bulkhead are going to go with coarse paper. (Some sanding of bulkhead edges and inner shoulder may be needed to get a good snug fit. (3) Apply epoxy to the front area of the inner shoulder and insert bulkhead stop all the way into the nose cone shoulder and allow to dry. (4) Glue the plywood bulkhead to bulkhead stop and to nose cone shoulder. Allow to dry thoroughly. (5) Apply epoxy bead around the outer edge of the bulkhead to hold in place, as shown.

DO NOT REMOVE NOSE CONE FILLING MATERIAL!! (It is 5.25 oz of stability weight.)



Step 8

1) Apply a moderate fillet of glue to the outer fin/body tube connection to fill in the gaps and to reinforce the fins. Use your finger to smooth out the fillet. Let dry before adding trim. 2) Lay basswood trim along fin and body tube and mark length and angle to cut on trim. I found that it is easier to rough cut trim at front, glue on trim and then sand to correct angle. Use a light coat of glue when attaching trim because the glue will flow out and make a mess. (Tip: Sanding bottom edge of trim at a slight angle makes a tighter fit along body tube.)

