

Building a Rocket Cradle

(Continued from page 4)

template. Your cradles and shelves will then be completely interchangeable! ♦

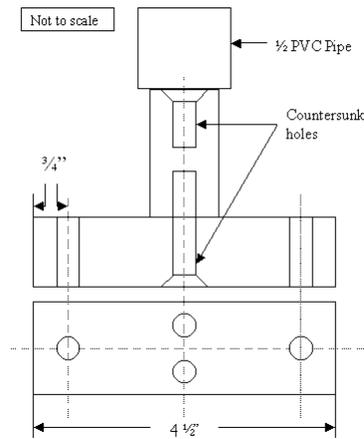
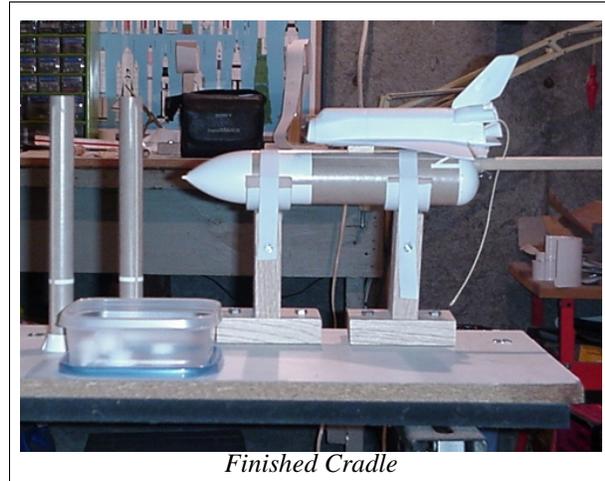


Diagram A



Finished Cradle

THE ESSENCE OF BEING A ROCKETEER

by Evan Ross

I recently had an epiphany about being a Rocketeer. It's not really about rockets. Perhaps, at first, it is, but that's just an early part of the life cycle. It evolves. Forget about the carton upon carton of unbuilt kits filling my closet, office, garage, and workshop. Pay no heed to the insane prices that starry eyed collectors will pay on eBay or ROL for out of production units.

It's really about adhesives!

I realized this a couple of mornings ago as I was wrestling with the 50lb, steel reinforced, magnetic shielded, uranium insulated torture devices that claim to be snow boots. These are standard issue for New Englanders. Not only do they make you feel like something out of Godzilla movie, they also excel at depositing melting ice, wet sand, and salt on the kitchen floor.

As I was lacing them up I realized, once again, that the aglet (the plastic coating at the end of the lace) had disintegrated. Of course, I had first noticed it weeks before but I kept forgetting to buy new laces. This morning, however, my twisted little

brain was determined to do something about it. "I know! I'll saturate it with CA!"

I went to my workbench and dug through the rolls of duct tape, mylar tape, and masking tape (1", 3/4", and 1/2"). I pushed aside the epoxy (6 minute, 15 minute, 30 minute, extra thin 8 minute with measuring pumps, and finishing/coating style). As an added bonus I also knocked over the disposable cups and Popsicle sticks that I use for mixing the epoxy. I rummaged through the traditional yellow carpenters' glue (in the big bottle, little bottle, and syringes), contact cement, plastic cement, the various permanent and temporary aerosol adhesives, and the bottle of polyurethane glue that I don't know what it's for. Finally I came to the rack of CA: rubberized, thin, thick, extra thick, extra extra thick that used to be medium long ago, dissolver, accelerator, and dozens of replacement tips and caps for the bottles.

I applied a couple drops of medium CA to the end of the lace, let it cure, and then trimmed away any threads that were sticking out.

It was at that point, as the CA fumes were clearing from the room, that I wondered, "How did I manage to accumulate all these glues and, more importantly, do I have enough?" ♦

Starship Vincia

(Continued from page 6)

- i. Thread the two ends of the kevlar static line through the holes in the 50/60 centering ring from the forward side; double knot the ends on

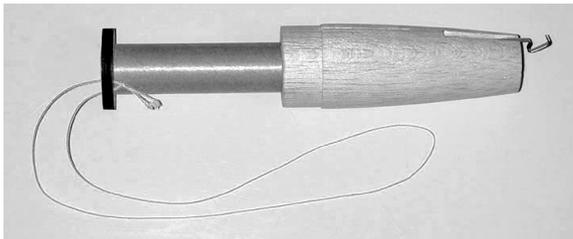


Figure 1

the aft side of 50/60 centering ring. Figure 1 shows the completed engine mount and boat tail assembly.

- j. Drop the kevlar static line loop down the forward end of the BT-50 motor mount tube, to get it out of the way for installation of the motor mount tube/boat tail assembly.
- k. Mark a glue applicator for the BT-60 airframe tube to 50/60 centering ring bond (4"); apply glue to the interior of the BT-60 airframe tube, 4" from the aft end.
- l. Partially insert the BT-50 motor mount tube/boat tail assembly into the BT-60 airframe tube.
- m. Apply glue to the BT-60 airframe tube aft interior.
- n. Fully insert/seat the BT-50 motor mount tube/boat tail assembly in

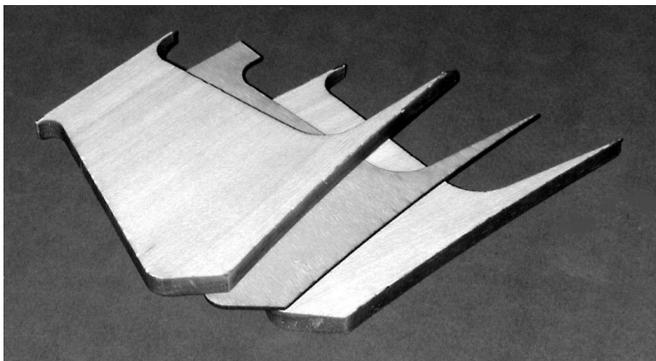


Figure 2

the BT-60 airframe tube.

- o. Let the airframe assembly dry in the vertical position, forward end up.

2) Fins

- a. Epoxy the 1/4" balsa fin outer layers to each side of 1/16" plywood core, carefully aligning the edges. See figure 2 for the fin layers.
- b. Clamp and let the fin laminates dry.
- c. Sand the balsa outer layers from root to tip so the tip thickness is about 1/4" total. See

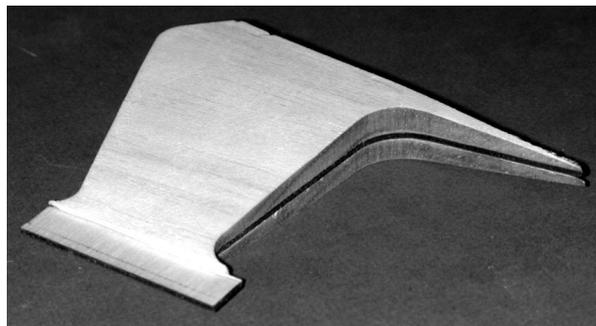


Figure 3

- d. Airfoil the fins and leading edge strakes. A piece of sandpaper wrapped around BT-5, BT-20 and BT-50 body tubes may be useful tools for shaping the compound curves of the fins. Sturdier tools like the Tadpole Sanding Shapes and PermaGrit Sanding Tools are available from suppliers like MicroMark. Don't panic if the shaping's not perfect; a lot of touchup sculpting can be done later with filler.

- e. Mark the BT-5 tip pod tubes lengthwise for the fin core tang slots with 2 lines 1/16" apart. I used the underside of an X-acto razor saw miter box as a straightedge; use whatever works for you. Using the fin tip pod nose and tail

cone body tube inserts as guides, cross mark the parallel lines at the ends of the slots.

- f. Slot the BT-5 tip pod tubes along

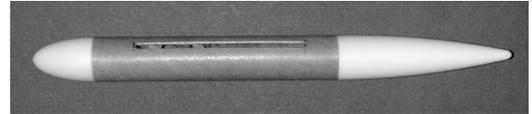


Figure 4

the marked lines to remove a 1/16" x 2 1/4" segment. Use a cutting guide to make sure the slot is parallel to the axis of the fin pod tube. This is critical to the appearance of the finished model. See figure 4.

- g. Glue the PNC5AX (long) nose cones at one end and PNC5V (short) nose cones at the other end of each tip pod tube. Let the tip pods dry.
- h. Glue the tip pods to the fin laminates, inserting the fin core tangs into the tip pod slots. The long (PNC5AX) tip pod nose cone is forward, and the short (PNC5V) tip pod tail cone is aft. Be sure each tip pod's longitudinal axis is parallel to the airframe's longitudinal axis and the tip pod diameter at the attachment slot is aligned with the fin's root to tip center line. Glue fillet the tip pod/fin laminate joins.
- i. Let the fin assemblies dry.

3) Nose Cone

If the PNC60RL plastic nose cone is *not* available, use the BMS balsa equivalent as follows:

- a. If desired, remove the first 1/2" of the nose cone tip and round the tip. This may be worth doing to minimize flight damage to the nose cone tip.
- b. Split the nose cone in half lengthwise.
- c. With carving tools, scoop out the nose cone halves to within 1/4" of the outer edge and 1" of the tip and base.
- d. Fill the nose cone halves with 3 oz. modeling clay total.
- e. Plane the clay inserts so the nose

- cone halves fit together perfectly
- f. Glue the nose cone halves together, carefully aligning the halves.
 - g. Let the nose cone assembly dry.
 - h. Punch a pilot hole for the eyescrew in the center of the nose cone body tube insert.
 - i. Thread the eyescrew into the nose cone and remove.
 - j. Fill the eyescrew hole with glue and rethread the eyescrew into the nose cone body tube insert.

If the PNC60RL is available, roll the modeling clay into thin strips that will fit through the axial hole in the nose cone base and tamp the clay down with an unsharpened pencil. When 3 oz. of clay have been tamped into the nose cone, dribble a small amount of quick setting epoxy on top of the clay and stand the nose cone upright (tip down) until the epoxy sets, to hold the clay ballast in place. If you use highly exothermic epoxy in a large enough quantity, you may soften the plastic of the nose cone enough to distort it. To be absolutely safe, you may want to stand the nose cone in a jar of ice water deep enough to cool the epoxy until it sets.

4) Overall assembly

- a. Mark the BT-60 airframe tube and boat tail for the 4 fins and launch lug. Align the launch lug with the engine hook, centered between two adjacent fins. The most important requirement is that the fin centerline at the aft end of the boat tail be perfectly aligned with the centerline along the body tube. Sight down the length of the airframe from the aft end to make sure this is the case.
- b. Using 5-minute epoxy, tack the fin assemblies to the airframe assembly. For the strongest bond, lightly sand the surface of the body tube where the fins will be attached. The trailing

edge root of the fin is flush with the aft end of the motor mount tube/boat tail. Use an alignment jig or template to insure that the fin assemblies are properly aligned (i. e., at right angles to one another with fin root to tip centerlines passing through airframe longitudinal axis, and tip pod longitudinal axes parallel to airframe longitudinal axis). ***This step is critical to ensuring that the model flies straight and true.*** Take your time and get it right. A sheet of graph paper tacked to a cardboard sheet, with a hole cut for the engine hook, and the fin centerlines marked (with radial ticks to help center the axis of the model) may be useful.

- c. Fill the boat tail/fin assembly gaps with gap filling epoxy.
- d. Let the fin/airframe joins cure completely.
- e. Carefully cut the launch lug leading and trailing edges at a 45 degree angle.
- f. Attach the launch lug just ahead of the boat tail. For the strongest bond, lightly sand the surfaces to be glued, and use a double glue joint.
- g. Glue fillet the launch lug/body tube joint.
- h. Fillet the airframe/launch lug, airframe/fin, and fin/tip pod joins

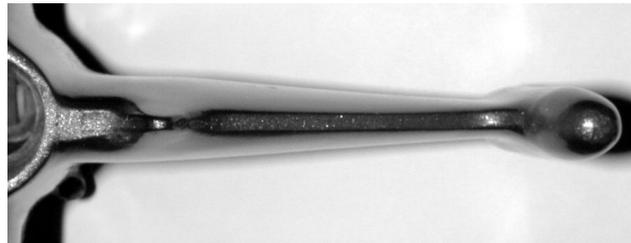


Figure 5

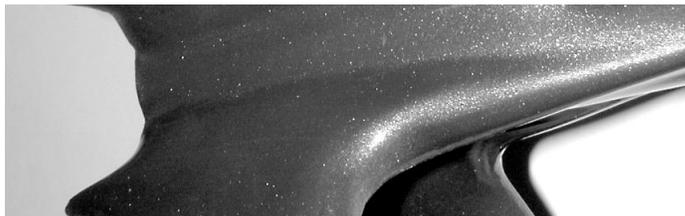


Figure 6

with wood filler. The launch lug fillets should be about 1/8" radius, tip pod fillets should be about 1/4" radius, and airframe fillets about 1/2" radius. The airframe fillet radius will decrease forward along the fin strakes. See figures 5 and 6 for the appearance of the finished fillets.

- i. Let the fillets dry.
 - j. Sand the fillets. Repeat these two steps as necessary. This is the work that ultimately pays off in the finished appearance of the model.
 - k. Using thick diluted filler, fill the body tube and tip pod tube spirals. After the spirals have dried, sand, removing all the filler except that in the spirals. Repeat as necessary.
 - l. Using thin diluted filler, fill/seal the nose cone, boat tail, fins and tip pod nose and tail cones. After the surfaces have dried, sand and repeat as necessary.
- 5) Install the recovery system of your choice.
 - 6) Paint -- spray on primer, fine sand (400 grit wet/dry), touch up with filler/sealer as necessary, spray primer, fine sand, repeat as necessary, spray undercoat, spray finish coat. A final clearcoat is recommended.

Fly with a Estes 24mm D12-3 engine.

Expected performance is about 200' or 60m. If you're brave or crazy, an Aerotech E15-7 will give you about 850' (250m.) and an E30 about 970' (300m.). If you plan to fly this model with a 24mm RMS system, make sure you trim the forward end of the engine hook appropriately. ♦

Building Tip

- **Wear safety glasses when using adhesives.**

CA and epoxy can cause serious and long-term damage should it make contact with the eyes. Because of the chance of accidental spillage, you should always use safety glasses when applying glues.

Flight Log—Fall 2000

(continued from page 5)

Flight Log November 20, 2000	Single Stage, Sin- gle Engine	Single Stage, Clustered	Multi-staged	Mutli-staged, clus- tered	High Power Certifica- tions
Flight Break- down	Micro Max 0 1/4 A 0 1/2 A 0 A 25 B 24 C 51 D 32 E 17 F 33 G 29 H 9 I 0 J 0	4 x Micro Max 1 2 x D 2 3 x D 2	C -> B 1 D -> B 1 D -> C 1 D -> D 1	4 x C -> 1 x C 1	0
Total Motors	220	14	8	5	
Total Flights	220	5	4	1	

Confused?

If you'd like to know more about sport rocketry, and want to participate in our regular launches, join CMASS!

Amused?

If you enjoyed reading this newsletter and would like to receive it as it's published, join CMASS!

Or just owe dues?

If your mailing label says your dues are due, do your duty today with the handy form below!

Wow! I'm psyched! I want to join CMASS!

Name: _____ Date of Birth: _____

Street: _____ Age: _____

City: _____ State: _____ Zip Code : _____ Phone: (____) _____

Internet Address, if any: _____ Work: (____) _____

- I am a NAR member (Number: _____) HPR Certification Level: None; H/I; J/K/L
- I am not a NAR member and wish Associate status.

CMASS dues cover twelve months and are due January 1 or July 1. Check according to your age:

- 14 or younger: \$4
- 15-17: \$6
- 18 or older: \$8

Make checks payable to CMASS. Send to CMASS, 72 Prendiville Way, Marlboro, MA 01752

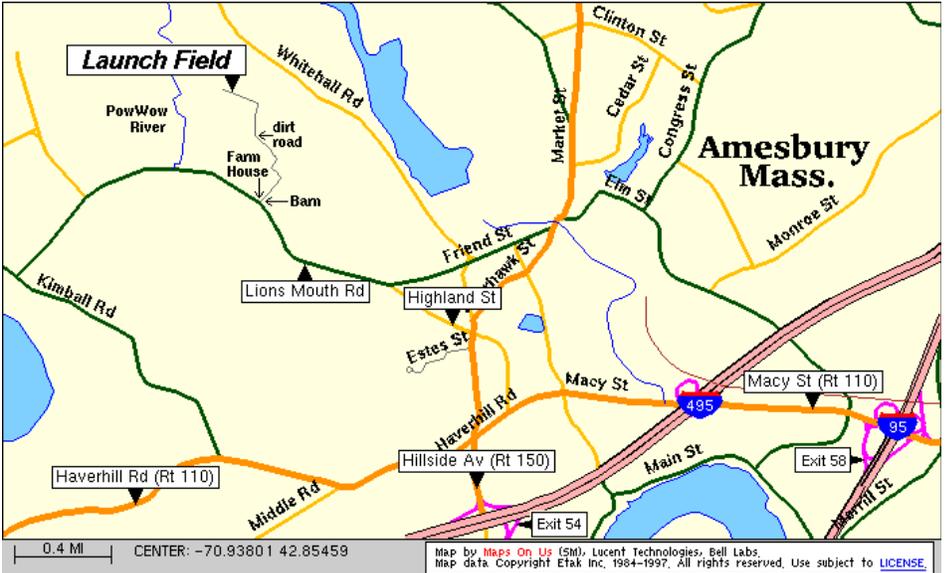
COUNTDOWN CALENDAR

Visit <http://www.cmass.org> for the latest information

Scheduled Launches Launches at Woodsom Farm Park in Amesbury MA have a 9:00am setup and a 10:00am start. Saturday launches may be postponed to Sunday in case of inclement weather. If the weather looks questionable, on the day of the launch, call **781.231.1018** before heading out to the field. **PLEASE DRIVE SLOWLY ON THE DIRT ROAD!**

ALL DATES ARE TENTATIVE, PENDING APPROVAL!

- April 28:** Sport launch, Woodsom Farm Park, Amesbury, MA
- May 19:** World Record Attempt, 1000 Rocket Launch, Tewksbury, MA
- June 16:** Sport launch, Halifax, MA (with Frontier Rocketry)
- July 7:** Sport launch, Amesbury, MA
- July 28:** Sport launch, Amesbury, MA
- August 18:** Sport launch, Amesbury, MA



- June 16:** Sport launch, Halifax, MA (with Frontier Rocketry)
- September 29:** Sport launch, Amesbury, MA
- October 20:** Sport launch, Amesbury, MA
- November 3:** Sport launch, Amesbury, MA

1st and 3rd Tuesday of Each Month

CMASS Meetings and Building Sessions
 7:00-10:00pm. Meetings alternate between Bill Spadafora's and Doug Steinfeld's houses.
 Visit <http://www.cmass.org> or call **508.481.9331** for the latest information.



The Sentinel
 Central Massachusetts Spacemodeling Society
 72 Prendiville Way, Marlborough MA 01752
<http://www.cmass.org> sentinel@cmass.org